US Army. Signal Corps

ANNUAL REPORT, 1873/74

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Annual Report of the Chief Signal Officer, U.S. Army Signal Corps

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REPORT

OF

THE CHIEF SIGNAL-OFFICER.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL-OFFICER,
Washington, D. C., November 1, 1874.

SIR: Instruction in the drills of the Signal Service with arms, in military signaling and telegraphy, meteorology, and the duties of the Signal Service at signal-stations and at stations of observation and report, has continued during the past year at the signal school of instruction and practice at Fort Whipple, Va.

The regular drills with arms, the forms for parades, and other military duties are strictly observed at the post, to form a body of selected soldiers, fitted by especial instruction for especial duties, but drilled to habits of discipline which permit their action to be, no matter how widely they may be separated, that of a unit. The special drills of the service require as antecedents the practice-drills in use with the Army; the plan for each drill requiring that the soldiers engaged upon it shall be able to protect themselves, their camps, implements, and trains, or stations, if necessary. For in-door instruction the soldiers are in classes under the supervision of suitable commissioned and non-commissioned officers. Instruction in the International code of signals has been added to the course during the year. The regular drills of practice for field-signals, the practice for the International code, the drills of the field telegraph train, the construction-drill for the erection of permanent lines, have been steadily conducted, and with satisfactory results. The schedule of drills and studies now had at the post is in paper 1.

The average force at the post to maintain the school of practice, and from which details are made, as required, to supply the different stations throughout the United States, and for the wants of the different branches of duty now allotted to the service, has been one hundred and forty men. This number will be largely reduced by details for telegraphic-line construction. Four officers have been instructed at the post during the year. Fifty-four private soldiers, applicants for promotion to the grade of sergeant in the Signal Service under the rules, have been under instruction, of whom thirty-eight were examined by the board convened for that purpose and promoted, three were ordered on station as assistants, and two were discharged before completion of the course. Eleven are still under instruction. One hundred enlisted men have been under instruction to be assistants to sergeants on station. Of these, fifty-three have completed the full course and have been ordered to stations; twenty-five were ordered away before completing the course one was dropped from the instruction-rolls for misconduct; three are waiting orders; and eighteen are still under instruction. Papers 2 and 3.

A new building for the purposes of instruction has been completed since the date of the last report. The recitation-rooms are now commo-

dious. The rooms for telegraphic practice are well supplied with the instruments used with field-telegraphic trains or in the working of permanent telegraphic lines. The battery-room offers facilities for practical instruction in the care of the different galvanic batteries in ordinary use. The telegraphic practice for each class has occupied from three to four hours daily. A station-room, furnished and equipped as are ordinary stations for meteorological observations, is set aside for station-practice, and in this room the soldiers are familiarized with all the forms of station-duty before being detached on service. The facilities for instruction, the good equipment of the trains, the supply of the necessary materials for the different practicings, together with the permanency of the force now serving, and the superior character of the men which constitute it, have added greatly to the advantages of the post. The instruction of the classes in military signaling, military telegraphy, and meteorology has been under the immediate charge of First Lieut. C. E. Kilbourne, acting signal-officer. The drill with arms, the drills of the telegraphic trains, and the drills in construction for telegraphic purposes, have been conducted by the officers of the post under the immediate superintendency of Bvt. Capt. R. P. Strong, acting signal-officer, the officer in charge.

The character of the buildings at the post has been much improved. The instruction-building, the buildings for the officers-quarters, and that for the protection of the field-telegraphic train, in process of construction at the last annual report, have been completed and are in use. Two buildings for laundresses' quarters have been constructed. A new building for a commissary and quartermaster store-house is in process of construction, and will soon be completed.

By direction of the Quartermaster-General, and after a careful examination of the ground by him, a plan for supplying the post with water was adopted. In pursuance of this there have been erected an engine-house, with a pump capable of raising 2,400 gallons of water per hour, and a reservoir of 10,000 gallons capacity, and elevated 18 feet above the ground. Supply-pipes have been run to the officers' quarters, to the instruction-building, guard-house, wash-rooms in barracks, and to the stables. In carrying out this plan, especial attention has been given to making proper provision against fire. It now requires only a sufficient supply of hose and a suitable reel to render the post comparatively safe from serious injury.

The sanitary condition of the post is good. The hospital continues under the able management of Dr. L. W. Ritchie, acting assistant surgeon, U. S. A.

First Lieut. Richard P. Strong, Acting Signal-Officer, U. S. A., has been in charge of the post since the date of last report; his duties have been faithfully discharged.

The post of Fort Whipple constitutes, as established, the only school of instruction in the United States at which either officer or enlisted man can receive the full tuition and the thorough practice necessary for the proper discharge of the duties of the signal service. All officers and enlisted men of the signal service pass regularly the course of instruction at this post. It is recommended that all officers intended to serve as acting signal-officers and instructors in the different geographical military departments, be here instructed before serving on any detached duty.

The Chief Signal-Officer has dwelt at length in preceding reports upon the benefit to the United States to result from the maintenance of this post and the force of the Signal-Service upon their appropriate duties.

With the men here instructed the United States has kept up, during the year, the net-work of signal-stations now extending over so great a territory, and has had always ready for service soldiers who give its forces a facility of communication no other country possesses. The construction and management of the military telegraphic lines, now recognized as absolutely necessary for the safety and development of the interior as any other protection the Army can render, already employ every available man who can be spared for that duty from the wider field of the other duties of the service. There have been constructed during the year, by parties of construction detailed from the post, one hundred and ninety-three miles of telegraphic line for the sea-coast service, and involving the laying of four cables, and men of the same force are now employed in the construction and operation of lines in Texas and Arizona, the stations upon which become at once telegraph stations and stations of observation for the Signal-Service.

Recruiting for the Signal-Service has been conducted under the direction of the War Department, that the recruiting officers of the general recruiting service at designated stations should enlist and order to this office such men, they passing the required physical examination, as may be presented to them by the recruiting sergeants of the Signal-Service. Especial care has been taken in enlisting recruits to select only those who have been well recommended for intelligence and sobriety, and who have been able to pass a rigid educational examination. The result has been manifested in the improved conduct of the men and in the decrease of desertions and courts-martial. The corps has been maintained at the full strength authorized by law, with the necessary reserve. While the popularity of the service has been remarkable, its requirements are not always understood by those who apply to be enlisted. The trouble at one time occasioned to the Secretary of War by recruits complaining of the military duties considered by this office essential, has, however, been obviated by the use of the series of circulars and instructions, shown in Papers 6 and 7, hereto annexed, which are so brought to the notice of every applicant for enlistment, the recruiting-sergeant and the recruiting-officer, that misapprehension seems to be impossible. The recruits are divided into classes, those for the "full" and those for the "field signal-service." The first-mentioned are such as are, after examination by the sergeant, considered by him fitted by education and intelligence for the full duties of the Signal-Service, including not only the duties connected with field-signals and telegraphy, but the duties of sergeants at stations of observation. These men are placed on duty at Fort Whipple, Va., as private soldiers of the Signal-Service for at least two months, after which they have the privilege, on their own application, their conduct being good, of appearing before a board of officers as candidates to be placed under the tuition necessary to be assistants to sergeants on stations. Passing this examination the soldier continues the course, still performing his military duties, until such time as he is reported by the instructor competent to be an assistant. He may then be detailed on duty as an assistant to a sergeant on station. After six months' service satisfactorily rendered as such assistant, during which time he recites regularly to the sergeant in charge, and upon a favorable report, he may be ordered to Fort Whipple to be placed under the additional special military instruction given to candidates for the grade of sergeant. This additional instruction lasts about two months. Upon its completion he is ordered before a board of officers convened at this office for final examination on the special subjects of the instruction, and also before an-

other board convened at Fort Whipple for report on his proficiency in the drill and duties of the Signal-Service, with and without arms, and his understanding of the military duties and responsibilities of sergeants in the Signal-Service, this examination embracing the more essential of the Articles of War, Army regulations, and customs of the service applicable to the duties of the grade above mentioned. On passing both of these boards, the candidate, as vacancies occur, is promoted to be sergeant in the Signal-Service, but, as a rule, is obliged to serve one month at Fort Whipple before being ordered on station, during which period, in addition to his other duties, he takes, under the direction of the instructor, such observations and makes such records and reports as may keep him familiar with the duties of an observer.

Applicants who, in the judgment of the recruiting sergeants, are not fitted by education and intelligence for the full duties of the Signal-Service, but who are of such ability and character as to render them qualified for its field duties, *i. e.*, those of field-signals and telegraphy, as distinguished from those including the duties of signal-sergeants, may be presented to the recruiting-officer for enlistment for "field-signal service." The recruits so enlisted are not precluded from eventual advancement to the full duties of the Signal-Service and promotion, in case they prove fit and worthy.

A division is also made, after enlistment among the private soldiers, by which those of good conduct, who pass specified examinations in elementary education, military signaling and telegraphy, and the duties and drill (with and without arms) of soldiers of the Signal-Service, are announced as privates of the first class, and wear the special designation in uniform provided.

The systematic course by which the enlisted men are selected, drilled, examined, instructed, tested by practice, instructed in higher branches, again examined and again tested before being intrusted with the management of stations, has thrown much labor upon the several boards of examination. The preliminary board for the examination of applicants to be placed under the first course of instruction, has held a session at this office on every Thursday during the year, and has examined (including re-examinations) one hundred and sixty-eight applicants, of whom ninety-five have passed.

The board convened at this office for the examination of candidates for promotion to the grade of sergeant meets, from time to time, as the instructor at Fort Whipple reports candidates ready for examination, and has examined during the year fifty-two candidates, of whom all but two have passed and been promoted.

A board convened at Fort Whipple further examines the candidates for sergeantcies in the general duties of soldiers and non-commissioned officers, and the special drill of the Signal-Service.

The morning report of Fort Whipple for September 30 includes sixteen non-commissioned officers and one hundred and thirty-one privates as present. Of these, seven non-commissioned officers and thirty-seven privates are under special instruction.

The act approved June 16, 1874, required the service to be maintained at its organization of one hundred and fifty sergeants, thirty corporals, to be selected from the privates, and privates, in the proportion of two to each sergeant. This force, with the necessary reserve to fill vacancies as they occur, has been maintained. This legislation has been productive of the best results.

The instruction in the duties of the Signal-Service elsewhere than at Fort Whipple has been as follows:

One of the officers at the Military Academy at West Point is designated as instructor in military signaling and telegraphy, in addition to other duties, but no reports have been received from him showing the amount of time devoted to this duty or the progress made by the cadets.

Second Lieut. Philip Reade, Third United States Infantry, remained on duty as Acting Signal-Officer of the Department of Missouri until relieved by orders from the General of the Army, August 27, 1874, in order that he might accompany his regiment, which had been ordered from the Department.

The course of instruction in this department has been limited to a knowledge of the use of the day and night signals. One hundred and forty-seven officers and four hundred and forty enlisted men have been instructed during the year. Of this number, fifty-six officers and one hundred and twenty-six enlisted men are reported as proficient in the use of the general service code, as taught in the field.

Instruction has been given at eighteen posts in the department, and each company commander, on taking the field, is required, by department orders, to take with him at least one general-service kit and two telescopes or marine glasses. Thorough instruction, even in the field course, has been rendered difficult, owing to the numerous changes in stations of troops and the various other duties required of them. In relieving Lieutenant Reade, the department commander pays a high compliment to his energy and zeal.

Officers have been designated by two other department commanders to act as instructors in signaling, but their reports exhibit no satisfactory results. Neither of the officers detailed has any practical knowledge of the duty. The rule should be invariable, that all officers detailed as instructors in any branch of the Signal-Service, should be themselves first instructed at the established post of instruction.

The work done at this Office has become extensive, covering a wide field of operation, with many and complicated details, each requiring to be carefully elaborated for each day, and each limited for its discharge to fixed and very brief periods of time. The steadily-improving organization of the service, with the system of regulations adopted, has permitted each branch of duty to be carried on with regularity.

The correspondence of the Office, in its several divisions, is of large amount. Fifty-two thousand three hundred and ninety-six letters have been sent, and four hundred and seventy-seven thousand five hundred and sixty-two received during the year, the record of which is classified in paper 4. The aggregate of the correspondence is five hundred and twenty-nine thousand nine hundred and fifty-eight letters and documents sent and received, exclusive of publications and telegrams.

The numerous requests for information on every subject, many of them only indirectly connected with the duties of this Office, require of themselves much attention.

The Office is in communication with many foreign correspondents, having now official relation with scientists and the chiefs of the meterological services of nearly every prominent power in the northern hemisphere.

Bvt. Lieut. Col. Garrick Mallery, acting signal-officer and assistant, has remained during the year in charge of records, general correspondence and orders, with the superintendence of enlistments and other duties especially assigned to him. The various duties in his care have been well rendered.

The amount of work in the property division of the Office has largely in-

creased during the year. First Lieut. Henry Jackson, acting signal-officer and property and disbursing officer, has remained in charge. In addition to these duties, Lieutenant Jackson, as in charge of the map-room, has supervised the preparation of two hundred and two maps and charts, and continued the collection of statistics for obtaining the accurate elevations of the several stations of observation. Lines of levels for the purpose have been received by him as follows: From railroad engineers, twenty-two; from Professor Hayden's survey, six; from miscellaneous sources, twelve; making a total of forty. The thanks of the Office are extended to the parties furnishing the information.

One hundred and sixty dollars and eighty-four cents have been received, during the year, from the sale of maps and other publications, in accordance with the act of Congress of March 3, 1874, authorizing such sale.

Three hundred and seventeen meteorological instruments have been purchased since last report, and three hundred and twenty-seven issued.

The average cost of maintaining and working a station of observation during the past year has been $516.56. This amount is exclusive of the cost of telegraphing reports.

The library of the Office has been increased to three thousand two hundred and fifty-five bound volumes, and has upon its files many pamphlets and valuable maps and charts. The works are selected wholly with reference to their value to the scientific branches connected with the duties imposed upon the Office. Many of them have been obtained without expense to the United States through the system of exchanges established. Paper 5 exhibits a list of contributions to the library thus had.

Bvt. Capt. H. W. Howgate, acting signal-officer and assistant, has continued to have general charge of instruction and general supervision of sergeants and assistants, and of the receipt, record, and publication of the weather-reports, which duties, together with others specially assigned him, have been performed with ability. The following is the record of stations reported by this officer:

ALBANY, N. Y.

[*Official number*, 16.]

Latitude	42° 40′
Longitude	73° 45′
Elevation of barometer above sea-level	174 feet.

The station was established by Sergt. Frederick Meyer in December, 1873, and reports began on the 22d of that month, and have been continued regularly. The offices were at first located in the observatory building, and the one used as a machine-shop—the meteorological instruments being in the former and the printing-press in the latter. A new building was put up during the summer, by the trustees of the observatory, for the Signal-Service, into which the instruments have been removed, and which is also occupied by the men as quarters. Sergeant Meyer was in charge until transferred to the central office, June 17, 1874, and succeeded by Sergt. Alois Donhauser, who still remains. There are six assistants at present on duty, two of whom are printers and one a telegraph-operator. The care of the observatory and astronomical instruments occupies the entire time of one man, under the supervision of the sergeant in charge. Lieut. W. B. Weir, acting signal-officer, was in charge of the station for a few weeks during the summer,

at a time when extensive repairs were required and important local changes being made. In addition to this force Private Forman was sent from the central office, and remained from July 10 to August 31, to repair several of the delicate instruments and get all in good running order, a task for which he was well fitted from long experience in the observatory. In addition to the usual meteorological work of a station, a certain amount of astronomical work is done here in making observations for time, and in furnishing standard time to various corporations and individuals by telegraph. Farmers' bulletins have been issued regularly since January 1, 1874, to 257 post-offices, and the usual publication of tri-daily reports made in the daily newspapers and in the form of bulletins. All reports passing over the New York and Milwaukee circuit are received here. The station was inspected in July, and found in excellent condition so far as the regular station-work was concerned. Both Sergeant Meyer and Sergeant Donhauser have displayed marked intelligence and ability in the discharge of their complicated duties, and they have been fortunate in their assistants. Two men only have been relieved for misconduct, and one transferred to the central office. The following extract is given from the last semi-annual report of the sergeant: "Several State officials, who own large farms, have frequently expressed themselves that they entirely depend upon the Signal-Service report in spring when planting and in fall when harvesting. Observations are made every clear night in observing the transit of two stars, one zenith and one equatorial, over the wires of the meridian circle, and recording the times of these transits by means of a printing chronograph which is set to run with a sidereal clock. The times of transit so recorded are reduced to the mean of the wires, corrected for level and collimation errors, and then employed for finding the azimuth errors, and after correction for azimuth is made, the error and rate of the sidereal clock are determined. The sidereal clock is compared by means of the printing chronograph with the mean-time clock, and the error of the latter clock ascertained. The mean-time clock is constantly kept regulated to correct mean local time, care being taken that the error of the clock will never exceed two seconds of correct mean local time, as found by astronomical observation. Time is transmitted by the mean-time clock itself, which is connected with a repeating-instrument, in such a manner that the latter will close every second during the last two minutes of every hour."

PUBLICATIONS.

Number of farmer's bulletins issued from January 1, 1874, to September 30, 1874	148,841
Number of bulletins issued from January 1, 1874, to September 30, 1874	7,703
Number of press-reports issued from January 1, 1874, to September 30, 1874	112
Number of Form 15 (manifold) issued from January 1, 1874, to September 30, 1874	352
Number of Form 22 (manifold) issued from January 1, 1874, to September 30, 1874	62
Total	157,070

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge.

ALPENA, MICH.

[*Official number*, 85.]

Latitude	45° 05′
Longitude	83° 28′
Mean barometer for year ending September 30, 1874	30. 011
Mean temperature for year ending September 30, 1874	40°.9
Amount of rain-fall for year ending September 30, 1874	28.01 inches.

The office is at the corner of Fletcher and Dock streets, as at date of last report. The location is not a good one, and will be changed as soon as a suitable room can be procured. Sergt. F. P. Bayes was in charge until July 15, 1874, when he was transferred to another station, and succeeded by Sergt. T. S. Collins, who still remains. Both men have made all reports satisfactorily. Telegraphic reports have been frequently delayed by interruptions on the line, which passes through an unsettled country for a considerable part of its length. One assistant is on duty, and is favorably mentioned by the sergeant for his good conduct. The station was inspected in August, and found in good condition. Fifteen cautionary signals have been displayed, all of which are reported as justified at the station. Of storm of October 17 and 18, 1873, the sergeant remarks: "Steamer George L. Dunlap left this port before signal was hoisted, but was obliged to put back, and with the steamer W. R. Clinton, remained in port all the 17th. No sailing craft left port." And of storm of November 11, 12, and 13, 1873: "Steamers remained in during display of signals." Of storm of December 1 and 2, 1873: "Steamers delayed going out on account of signals;" and of storm of September 9, 1874: "Steamer John Sherman left port at 8 a. m. for Bay City, but had to return."

The inspector reports that the business men say the cautionary signals are of great service to them. Reports from other stations are not received here.

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, one standard water thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard self-register for anemometer, one standard rain-gauge, one standard wind-vane.

ATLANTIC CITY, N. J.

[*Official number*, 116.]

Latitude	39° 22′
Longitude	74° 25′
Elevation of barometer above sea-level	23 feet.

This station was established December 10, 1873, by Sergt. Wm. Slater, who stills remains in charge, and has given full satisfaction by the manner in which he has performed his duties.

The office is located in the first of the life-saving stations at the north end of the town, and within 100 yards of the light-house.

The instrument shelter is of the standard portable pattern, and is placed at the north end of the building, and raised one foot from the ground. The anemometer, wind-vane, and rain-gauge are on the building, and well exposed. The station is supplied with a complete outfit

for using International signals, and the sergeant on duty is properly instructed in their use. Reports are sent regularly to Philadelphia, where they are put upon the signal wire and transmitted to the central office.

The station was inspected in March, 1874, and found in excellent condition. It is proposed to connect the office with the other stations on the New Jersey coast by telegraph during the present year, and material for this purpose has already been purchased, and a working party sent out to construct the line.

Twenty cautionary signals have been displayed, of which number eighteen are reported as fully verified at the station.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

AUGUSTA, GA.

[*Official number*, 23.]

Latitude	33° 28′
Longitude	81° 54′
Mean barometer for year ending September 30, 1874	30.101
Mean temperature for year ending September 30, 1874	64° 1′
Amount of rain-fall for year ending September 30, 1874	59.79 inches.

No change has been made in the location of the office. Sergt. N. D. Lane continued in charge of station until June 8, 1874, when he was transferred to another station on account of his health, and succeeded by Sergt. H. Bessant, who had been on duty as assistant from March 6, 1874. There are three assistants on duty, one of them being a printer charged with the issue of farmer's bulletins. One assistant was transferred to a northern station in July, 1874, on account of failing health. Sixty-seven post-offices are supplied with two copies of the bulletin daily, except Sundays. The station was inspected in December, 1873, and found in fair condition. Proper instructions were issued to bring it up to the standard, which it is believed have been carried out, as all reports since that date have been received regularly and in satisfactory form.

PUBLICATIONS.

Number of farmer's bulletins issued during year ending September 30, 1874	45,554
Number of maps issued during year ending September 30, 1874	1,231
Number of bulletins issued during year ending September 30, 1874	1,934
Number of p. m. press-reports issued during year ending September 30, 1874	610
Number of Form 22 issued during year ending September 30, 1874	38
Total	49,367

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

BALTIMORE, MD.

[*Official number*, 18.]

Latitude	39° 18′
Longitude	76° 38′
Mean barometer for year ending September 30, 1874	30.062
Mean temperature for year ending September 30, 1874	54° 3
Amount of rain-fall for year ending September 30, 1874	40.32 inches.

The office remains at the corner of South and Water streets, the only change made during the year being the addition of an adjoining room, for the free use of which the service is indebted to the courtesy of the owners of the building. Sergt. H. J. Penrod was in charge until September 12, 1874, when he was discharged the service upon his own request, to accept a civil position of trust. He was succeeded by Sergt. W. T. Boyd. Three assistants have been relieved during the year for misconduct, one deserted, one was called in for discharge, and one transferred to another station. There are three assistants now on duty, of whom two are sergeants, recently promoted. The station was formally inspected in January, 1874, and informally on several other dates during the year, and always found in excellent condition. Sergeant Penrod attended to his office-duties closely, and all reports were made with promptness and regularity. The office is connected by wire with the central office, and one of the assistants is kept on duty as an operator.

Thirteen cautionary signals have been displayed, of which six are reported as fully verified, and one as partly verified at the station. Signals are duplicated on Federal Hill, by Mr. M. L. Dudley, at the Marine Observatory, whence they are visible over a much greater portion of the harbor than from the office-roof. The following extracts are given from Sergeant Penrod's report for the past six months: "Twice during the half year the observer was summoned before the civil courts to testify as to the weather on particular days at this station. The court of common pleas in the first case ruled the record not evidence, on account of its not being the original record; and second, because the observer could not swear positively from his own personal knowledge that it snowed heavily (as the record shows) on a certain day a year or more passed. In the second case, superior court, there being no objection made, the record was admitted as evidence.

"A prominent lawyer here at the next meeting of the legislature will endeavor to have an act of assembly passed making the Signal-Service records evidence before the courts. Several times during the six months has the observer been called on to state the condition of the weather on particular days, in order to settle difficulties and disputes in regard to the shipping and handling of grain at Baltimore during rainy, snowy, foggy, or of misty weather. The western merchants sometimes complain of the delay here in transferring their grain at the great elevators. The commission merchants fall back on our record to show the state and condition of the weather, and that satisfies the western owners. The railroad officials use our statement as to the time of commencement and ending of rain in keeping the hours of work of their employés.

"The 1 a. m. probabilities and synopsis are published by all the morning papers, Sun, American, Gazette, Wecker, and Correspondent. The afternoon paper (News) publishes the 10 a. m. probabilities only for this section of country as received through the Franklin Telegraph Company.

"The same gratifying interest is manifested by the people in regard to the probabilities as at date of my last report. Even the dry-goods

merchants are governed by them in exposing their goods before their store doors. When the least mistake is made in the probabilities it is heard from most every person on the street, and this is the best evidence of their being consulted. Fifty weather-maps are sent here for distribution daily, from the central office, and conspicuously posted in the leading public offices and places of business. They reach here by two o'clock each afternoon, and are promptly distributed."

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	5,583
Number of Form 22 issued during the year ending September 30, 1874	152
Number of Form 15 issued during the year ending September 30, 1874	48
Number of press-reports issued during the year ending September 30, 1874	1,585
Total	7,368

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one double self-register for anemometer and anemoscope, one standard wind-vane, one standard rain-gauge.

BANGOR, ME.

[*Official number*, 111.]

This station was established for the distribution of farmers' bulletins, and 86,414 copies have been issued to 158 post-offices since it was opened.

The first bulletin was issued November 6, 1873. Private Harry Barton was in charge until February 7, 1874, when he was relieved by Sergt. John T. Downes, who still remains, and has given satisfaction. There is one assistant on duty to insure the prompt issue of the bulletins.

The average time of receiving the synopsis and probabilities is 2.15 a. m., and the average time of mailing 4.30 a. m. The office is located at No. 12 Main street, on the second floor, and in close proximity to the telegraph and post offices. The station was inspected in March, 1874, and found in good condition. The inspector reports that a lively interest is taken in the service by the citizens of Bangor, and that the commercial men are anxious to have cautionary signals displayed there, and also at the mouth of the Penobscot.

BARNEGAT, N. J.

[*Official number*, 115.]

Latitude	39° 48′
Longitude	74° 09′
Elevation of barometer above sea-level	21 feet.

The station was established December 10, 1873, by Sergt. A. M. Geissenger, and the office is located in the second floor of Life-Saving Station No. 16, which is one mile north of Barnegat Inlet and two miles north of the light-house. The nearest post-office is at Forked River, through which all mail for the station is forwarded. The instrument-shelter is of the standard portable pattern adopted for the Signal-Service, and is fastened to the northern end of the building and about one foot above the ground. The anemometer is placed on a post 100 yards east of the

building on a sand-hill, and the rain-gauge is ten feet south of the anemometer. All of the instruments are well exposed. Sergeant Geissenger was relieved for misconduct May 1, 1874, and succeeded by Sergt. Frank Mangels, who was also relieved for misconduct August 8, 1874. Sergt. E. D. Holbrook is now in charge and doing fairly. An assistant is furnished the station during the summer months, when the crew of the life-service are not on duty. Private A. S. Embree, first assigned in this capacity, deserted July 6, 1874, and was succeeded by Private Eugene Peters, who still remains. Both men on station are telegraph operators, and the office is connected by telegraph with the central office, and reports sent regularly over the whole circuit. Special reports of shipping disasters and of vessels passing the station are made daily. The men are proficient in the use of the International signal-code, and provided with the necessary apparatus for communicating with passing vessels when required. The station was inspected in March, 1874, and found in good condition. Nine cautionary signals have been displayed, of which eight are reported as verified at the station.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard maximum thermometer, two standard minimum thermometers, one standard hygrometer, one standard anemometer, one standard rain-gauge, one small wind-vane.

BISMARCK, DAKOTA TERRITORY.

[*Official number*, 104.]

Latitude	46° 48′
Longitude	100° 38′
Elevation of barometer above sea-level	1,677 feet.

The station was established by Sergt. J. H. Smith, and began reporting September 15, 1874. The office is located on Main street, above Third, and contains two rooms, with one window in each.

The exposure for roof instruments is good, and the shelter for the other instruments is of the standard pattern.

The station has not been inspected.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

BOSTON, MASS.

[*Official number*, 13.]

Latitude	42° 21′
Longitude	71° 04′
Mean barometer for year ending September 30, 1874	30.014
Mean temperature for year ending September 30, 1874	48° 2
Amount of rain-fall for year ending September 30, 1874	56.47 inches.

The office remains at 103 Court street, as at last report. Sergt. Powell G. Dietz remained in charge until March 2, 1874, when he was relieved

for misconduct and ordered to Fort Whipple, Va., but deserted before reaching that post. He was succeeded by Sergt. D. C. Ralston, who still remains and gives satisfaction. Four assistants are on duty, one of whom is a sergeant and two of them printers, charged with the issue of farmers' bulletins, with which 682 post-offices are supplied daily, (except Sundays.) Four men have been relieved during the year for misconduct, one transferred to the central office, and one called in for promotion. The men now on duty are reported upon favorably by the sergeant in charge. The station was inspected in February, 1874, and found in as good condition as the office facilities would permit. The citizens are desirous of having the office removed to the new post-office building when completed, and it is recommended that steps be taken to have the change made, as the present location is a bad one. Twenty-five cautionary signals have been displayed, of which fourteen are reported as fully verified, and one as partly verified, at the station. Of the storm of November 17 and 18, 1873, the sergeant remarks: "The shipping remained in port fully prepared for the storm. Disasters are reported as having occurred on the coast, among which is the schooner Robt. Raikes, ashore on Nahant, and all on board lost. No damage done in the city, but in the adjacent country the gale was very destructive. The signals are duplicated from the roof of a grain-elevator in East Boston, whence they are visible from the greater part of the harbor." The sergeant reports as follows in reference to the interest manifested in the service: "The farmers' bulletins proved to be of inestimable value to the community in general; hardly a day passes by but that several gentlemen from nearly every part of the New England States call at this office, and not only express their great admiration for the correctness of the forecasts, but also their gratitude for the benefit they derive from their publication. The interest of the public in general for the operations of the Signal-Service in this place manifests itself daily in the most gratifying manner. Chemists, lawyers, physicians, scientific men, and men of all vocations can be found daily in the office."

PUBLICATIONS.

Number of farmer's bulletins issued during the year ending September 30, 1874	292,428
Number of maps issued during the year ending September 30, 1874	9,572
Number of daily bulletins issued during the year ending September 30, 1874	12,263
Number of press-reports issued during the year ending September 30, 1874	1,978
Number of Form 22 issued during the year ending September 30, 1874	116
Total	312,757

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard minimum thermometers, one standard maximum thermometer, one standard hygrometer, one double self-register for anemometer and anemoscope, one standard anemometer, one small wind-vane, one standard rain-gauge.

BRECKENRIDGE, MINN.

[*Official number*, 82.]

Latitude	46° 11′
Longitude	96° 17′
Mean barometer for the year ending September 30, 1874	29.981
Temperature for the year ending September 30, 1874	37° 2
Amount of rain-fall for the year ending September 30, 1874	28.06 inches.

The location of office remains unchanged since last report.

The building is a very poor one, but a better one cannot be pro-

cured for the authorized rent, although there are many suitable buildings unoccupied.

The owners of buildings appear unwilling to rent to the Government at fair rates. In view of this fact the removal of the station to Fargo, on the Northern Pacific Railroad, is recommended. Sergt. C. A. Shaw was transferred to another station, October 2, 1873, and succeeded by Sergt. Newton Phelps, who was called in for discharge, May 22, 1874, and succeeded by Sergt. Herrman Frey, who still remains. All mail-reports have been forwarded regularly and in satisfactory form. The telegraphic reports are occasionally delayed by interruptions on the line.

There is no assistant at the station, nor is one needed.

INSTRUMENTS ON STATION.

One standard barometer, two standard thermometers, two standard minimum thermometers, two standard maximum thermometers, one standard hygrometer, two anemometers, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

BUFFALO, N. Y.

[*Official number*, 33.]

Latitude	42° 53′
Longitude	78° 55′
Mean barometer for year ending September 30, 1874	30° 001
Mean temperature for year ending September 30, 1874	45°.7
Amount of rain-fall for year ending September 30, 1874	39.37 inches.

No change has been made in the location of the office since the date of last report. Sergt. W. H. Colesberry was relieved November 20, 1873, and succeeded by Sergt. James Mitchell, who continues in charge, and has displayed marked zeal and intelligence in the performance of his duties. Six assistants are on duty here at present, but one is assigned temporarily and will be relieved as soon as his services are required elsewhere. Two of the assistants are printers, and have charge of the issue of farmers' bulletins, which are furnished daily, except Sundays, to 257 post-offices. One assistant has been called in for promotion during the year, and two for misconduct.

The station was inspected in July, 1874, and found in excellent condition.

Twenty-six cautionary signals have been displayed, of which number thirteen are reported fully verified, and four partly verified at the station.

Of the storm of October 28 and 29, 1873, the sergeant remarks: "Two propellers and one schooner left port while the signal was flying, but were obliged to return;" and of storm of October 30 and 31, and November 1, 1873: "The schooner Ellington left this port while signal was displayed, and being unable to withstand the gale, she put back, and while trying to reach this harbor was dashed to pieces on the breakwater;" and of storm of December 4 and 5, 1873: "The most severe storm at this point since 1844, excepting gale of 1865. Wires of various telegraph companies blown down. Water unusually high at this end of the lake. Breakwater at entrance of harbor damaged to extent of several thousand dollars by lashing of waves."

Signals are duplicated under the direction of the sergeant by Capt. C. P. Dorr, on the roof of a building which is visible from a greater part of the harbor. The sergeant reports that the members of the meteoro-

logical committee have manifested unusual interest in the service, and have been collecting data from the signal-reports for the purpose of comparing the climate of Buffalo with that of other cities throughout the country. He also reports that few captains of vessels will leave port while the cautionary signal is displayed.

All reports passing over the New York and the Milwaukee circuit are received here, and it is the point of transfer for the Canadian reports.

The newspapers give a liberal amount of space to the publication of the regular daily reports, and also of those issued from the central office.

PUBLICATIONS.

Number of farmer's bulletins issued during year ending September 30, 1874	166,684
Number of bulletins issued during year ending September 30, 1874	11,008
Number of maps issued during year ending September 30, 1874	5,952
Number of press-reports issued during year ending September 30, 1874	1,650
Number of local reports issued during year ending September 30, 1874	1,065
Number of Form 15 (manifold) issued during year ending September 30, 1874	331
Number of Form 22 issued during year ending September 30, 1874	65
Total	186,755

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, one standard minimum thermometer, one standard maximum thermomter, one standard water-thermometer, one standard hygrometer, three standard anemometers, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

BURLINGTON, IOWA.

[*Official number*, 122.]

This station was established for the distribution of farmers' bulletins, and is in charge of Priv. E. L. Thompson, a practical printer, who has done good servive in the central office for nearly two years. The first bulletin was issued September 30, 1874, and 157 offices are supplied daily except on Sundays.

The office is located in Union Hall, corner of Main and Valley streets.

BURLINGTON, VT.

[*Official number*, 45.]

Latitude	44° 29′
Longitude	73° 15′
Mean barometer for year ending September 30, 1874	30.002
Mean temperature for year ending September 30, 1874	43° 6
Amount of rain-fall for year ending September 30, 1874	37.75 inches.

The location of office was changed August 1, 1874, from the City Hotel to Fisher's Block, at the southeast corner of Bank and Church streets, where the facilities for exposure of instruments are very much better.

Sergt. George H. Ellery, who was in charge at date of last report, was relieved December 15, 1873, for discharge, and succeeded by Sergt. W. H. Colesberry, who was relieved for misconduct February 9, 1874. Sergt. D. C. Ralston was in charge until March 2, 1874, when he was transferred

to another station and succeeded by Sergt. W. A. Chapman, who still remains and performs his duties satisfactorily. The station was inspected in October, 1873, and found in good condition.

PUBLICATIONS.

Number of Form 15 (manifold) issued during the year ending September 30, 1874.	169
Number of Form 22 (manifold) issued during the year ending September 30, 1874.	25
Number of press-reports issued during the year ending September 30, 1874.....	391
Total.....	585

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

CAIRO, ILL.

[*Official number*, 53.]

Latitude.....	37° 00′
Longitude.....	89° 12′
Mean barometer for the year ending September 30, 1874.....	30.060
Mean temperature for the year ending September 30, 1874.....	58°.4
Amount of rain-fall for the year ending September 30, 1874 ..	48.06 inches.

The office remains at No. 71 Ohio Levee, and is well located. The instrument-shelter has been described in previons reports, and is one of the best in use on station. Sergt. E. Garland was on duty until January 13, 1874, when he was relieved by Sergt. Edwin Booth, who remained until July 27, 1874, when he was succeeded by Sergt. Thomas Jones. Both Sergeants Garland and Booth were relieved for neglect of duty, and punished by reduction to the ranks. There has been no change of assistant during the year. The station was inspected in January, 1874, and again in September, 1874, and was unfavorably reported upon on both occasions. The present sergeant is doing better than his predecessors, but is still not up to the standard.

Reports from twenty other river stations are received here each afternoon, and published in the usual manner. Fifteen maps are also received daily from Saint Louis, and posted in the principal public places.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874.....	2,347
Number of press-reports issued during the year ending September 30, 1874....	603
Number of local reports issued during the year ending September 30, 1874	72
Number of Form 22 issued during the year ending September 30, 1874	27
Number of Form 26 issued during the year ending September 30, 1874.....	5,963
Total	9,002

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one minimum thermometer, two maximum thermometers, two water-thermometers, one hygrometer, one anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

CAPE HATTERAS, N. C.

[*Official number*, 123.]

Latitude	35° 14′
Longitude	75° 30′
Elevation of barometer above sea-level	7¼ feet.

The station was established August 18, 1874, by Sergt. Geo. Onslow, who remains in charge, with one assistant. Both men are competent telegraph-operators, and in addition to the regular station work have to keep the telegraph-line in repair half way to Cape Henry. The office is located temporarily on the first floor of the building occupied by the assistant light-keeper, and the exposure for instruments is as good as can be obtained with the present facilities. The instrument-shelter is of the standard portable pattern, and here, as at other coast-stations, has been found to work satisfactorily.

Two cautionary signals have been displayed, both of which are reported as verified at the station.

Of the storm of September 28 and 29, 1874, the sergeant remarks: "Wind at 9.20 p. m., of the 28th, blew at the rate of seventy-five miles per hour, carrying off cups of anemometer, which were recovered next morning."

The station is in direct telegraphic communication over the signal-wire with the central office, and reports are sent regularly in the usual form. The station is supplied with a full set of International signal-flags, and the sergeant in charge is fully instructed in their use. The station has not yet been inspected.

INSTRUMENTS ON STATION.

One standard barometer, two standard thermometers, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

CAPE HENRY, VA.

[*Official number*, 118.]

Latitude	36° 56′
Longitude	76° 00′
Elevation of barometer above sea-level	23 feet.

The station was established December 9, 1873, by Sergt. Wm. Stein, who still remains in charge, and has given entire satisfaction by the promptness and regularity with which all his reports have been forwarded.

The office was located in the building occupied by the light-keeper, and has remained there, the only change being its removal, April 20, 1874, to a room on another floor of the same building. Two assistants, both of whom are fair telegraph-operators, are on duty, and have the repair of the line on each side of the station to attend to. One man takes half the distance to Norfolk, and the other, half the distance to Cape Hatteras, when necessary, leaving the sergeant to attend to the regular station duties.

Two other men were assigned temporarily in September, but have been since relieved, as their services were required elsewhere. The

station is supplied with an International signal outfit, and is in direct communication with the central office, to which regular reports are made daily, and also such special reports of disasters to shipping as may be required.

The instrument-shelter is of the standard portable pattern and is well located. The exposure of all instruments is good. Eighteen cautionary signals have been displayed, of which twelve are reported as verified at the station. The station has not been inspected.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one small wind-vane, one standard rain-gauge.

CAPE MAY, N. J.

[*Official number*, 54.]

Latitude	38° 56′
Longitude	74° 58′
Mean barometer for year ending September 30, 1874	30.057
Mean temperature for year ending September 30, 1874	52°.4
Amount of rain-fall for the year ending September 30, 1874	46.93 inches.

No change has been made in the location of the office during the year, and Sergt. Theodore F. Townsend still remains in charge. All reports, telegraphic and mail, have been rendered promptly and in a satisfactory manner. An assistant was ordered to the station April 9, 1874, and still remains. Thirty-three cautionary signals have been displayed during the year, of which twenty-four are reported by the sergeant as justified at the station and nine not justified. The sergeant reports that while the signal was flying on the 6th, 7th, and 8th of October, 1873, a large fleet of vessels anchored under the shelter of Cape May and remained until it was lowered. The same general interest in the service prevails as at last report, and the office has many visitors from the guests of the several hotels, who desire to obtain information about the weather before starting out on fishing or other pleasure excursions. As no reports are received from other stations, the only publications have been those of local observations furnished to the local press.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard maximum thermometer, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

CHARLESTON, S. C.

[*Official number*, 21.]

Latitude	32° 45′
Longitude	79° 55′
Mean barometer for year ending September 30, 1874	30.093
Mean temperature for year ending September 30, 1874	65°.6
Amount of rain-fall for year ending September 30, 1874	67.70 inches.

The office remains at the corner of Bay and Broad streets, and is well located for the display of cautionary signals and for the exposure of in-

struments. Sergt. M. L. Hearne continues in charge as at date of last report. Two assistants have been called in for promotion during the year, and one for discharge. Two are now on duty. The station was inspected in December, 1873, and found in bad condition. The sergeant was sharply reprimanded, and since that date reports have been rendered satisfactorily. All reports passing over the New York and Savannah circuit have been received here since February 4, 1874, and are read with interest by the cotton merchants and other business men. Six cautionary signals have been displayed, of which number five are reported as justified at the station. In reference to one of these displays the sergeant writes as follows:

"At 3 p. m. of October 6, 1873, the roof of the Northeastern depot blew off, killing one man and mortally wounding several others. Steamer Equator struck on the bar at entrance of harbor and was considerably injured. On the 5th of April last, two vessels and one steamer remained in the harbor, after seeing the signal hoisted, although they were ready to leave at the time. The captains came to the office for information, and decided not to leave while the storm lasted."

PUBLICATIONS.

Number of daily bulletins issued during year ending September 30, 1874	2,950
Number of maps issued during year ending September 30, 1874	1,908
Number of press-reports issued during year ending September 30, 1874	507
Number of Form 22 issued during year ending September 30, 1874	42
Number of Form 15 (manifold) issued during year ending September 30, 1874	320
Total	5,727

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one maximum thermometer, one minimum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

CHEYENNE, W. T.

[*Official number*, 68.]

Latitude	41° 12′
Longitude	104° 42′
Mean barometer for year ending September 30, 1874	29.957
Mean temperature for year ending September 30, 1874	45°.6
Amount of rain-fall for year ending September 30, 1874	8.60 inches.

The office was removed May 20, 1874, to the second floor of the building, on the south side of Seventeenth street, between Dodge and Ransom streets.

The location is a good one, and within easy reach of the telegraph-office and principal business-houses.

Sergt. A. C. Dobbins has been in charge since the station was opened in 1870, and attended to his duty faithfully and well.

There is no assistant now on duty; the one named in last report was transferred May 8th, 1874, to another point where his services were more urgently required.

The station was inspected in August, 1874, and found in good condition.

PUBLICATIONS.

Number of bulletins issued during year ending September 30, 1874	1,481
Number of press-reports issued during year ending September 30, 1874	169
Number of Form 22 issued during year ending September 30, 1874	49
Total	1,699

INSTRUMENTS ON STATION.

One standard barometer, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standardrain-gauge, one standard wind-vane.

CHICAGO, ILL.

[*Official number*, 37.]

Latitude	41° 52′
Longitude	87° 38′
Mean barometer for year ending September 30, 1874	30.012
Mean temperature, year ending September 30, 1874	49°.5
Amount of rain-fall for the year ending September 30, 1874	31.09 inches.

The location of the office has not been changed since last report, but one small room has been added as necessary for the work of the station.

Serg. W. S. Kaufman remains in charge, and has forwarded all reports regularly and satisfactorily. Six assistants are on duty, and the work cannot be properly done with a less number. Three of the assistants are printers, and have charge of the weather-maps and issue of farmers' bulletins. Seven hundred and thirty-two post-offices are supplied regularly with the latter.

Two assistants have been called in for promotion, one deserted, and two transferred to other stations.

All reports passing over the New York and Milwaukee circuit are received here, and it is also the point of transfer for reports from the West and South, and the amount of work necessarily done is unusually large; the generally correct manner in which Sergeant Kaufman has attended to his duty is worthy of commendation.

The station was inspected in August, 1874, and found in good condition.

Twenty-seven cautionary signals have been displayed, of which fourteen are reported as fully verified and three as partly verified. The signals are duplicated by the sergeant upon the roof of the Central Hotel building, whence they are visible from a greater part of the harbor. Arrangements have been made for the display of signals from the new light-house when it is completed.

PUBLICATIONS.

Number of farmers' bulletins issued during the year ending September 30, 1874	539,187
Number of bulletins issued during the year ending September 30, 1874	7,104
Number of maps issued during the year ending September 30, 1874	27,420
Number of press-reports issued during the year ending September 30, 1874	2,714
Number of Form 22 issued during the year ending September 30, 1874	151
Total	576,576

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

CINCINNATI, OHIO.

[*Official number*, 65.]

Latitude	39° 06′
Longitude	84° 26′
Mean barometer for year ending September 30, 1874	30.071
Mean temperature for year ending September 30, 1874	56°.6
Amount of rain-fall for year ending September 30, 1874	40.07 inches.

The office remains in the same building as at date of last report, and the location cannot well be improved upon. Sergt. Theodore Mosher was transferred to the central office October 2, 1873, and succeeded by Sergt. E. H. Singleton, who remained until discharged at his own request, February 25, 1874. He was succeeded by Sergt. J. O. Manson, who was relieved August 25, 1874, upon the recommendation of the inspecting officer. Sergt. S. S. Bassler has been in charge since that date, and has shown himself to be an energetic, hard-working, intelligent sergeant. Here, as at other large stations, there has been great difficulty in securing good assistants, and numerous changes have consequently been made during the year. Three men have been relieved for misconduct, and five transferred to other stations. Sergt. J. M. Watson was the senior assistant until assigned to the charge of another station, and succeeded in his position by Sergt. Edward Lloyd. The size of the station and the amount of night-work done render it necessary to have a non-commissioned officer constantly on duty.

There are five assistants now on duty, of whom three are printers. Farmers' bulletins are printed and issued regularly to 617 post-offices. Maps are issued daily, and judicously distributed. The station was inspected in December, 1873, and again in September, 1874, and found in good condition on both occasions. The present working force is composed of good, industrious men, fully competent to do their work, but kept constantly employed, and when one is unable, from sickness, to attend to his duty, it is necessary to employ civilian assistance. An additional assistant was recommended by the inspector who last visited the station, and will be furnished when a suitable man can be spared. A full set of meteorological instruments was displayed again this year in the exposition building, and the morning synopsis and probabilities printed there during the exposition, being telegraphed from the central office for that purpose. The following extracts from the report of the sergeant, for the six months ending June 30, 1874, are given to show the use made of the reports: "The river reports have been of unusual interest to our steamboat-men, coal-dealers, and other merchants interested in the river trade. The information they give has, in no few instances, led to important results, and been of great value to the public, and more especially to those directly engaged in the river trade. To know the stages of water in the rivers throughout the country is an aid to business transactions connected with the river, that is of incalculable value. The steamboat-men, as they become more acquainted with our bench-marks, pay more attention to these reports, and make good use of the valuable information they give, and though the stations from which reports are received are not as numerous as desired, yet it is hoped they will gradually be established at every point where the information they give can be made of interest to the public. The weather-reports are of great value to the pork and provision packers of this city, they being governed in a great measure by the favorable indications of the reports. They carefully consult them daily, and also interview the sergeant in charge. The

medical fraternity also make constant use of the reports, and in some instances regulate their mode of treatment by the changes in the meteorological conditions of the atmosphere. The study of our reports opens to them a field for exploration, one which has already rendered some valuable information, and promises to add more. Searching out and defining the relations existing between atmospheric conditions and contagious diseases are some of the advantages these reports afford the medical profession, while there are others that might be enumerated. The board of health have deemed it of special importance to show the meteorological condition of the atmosphere, in connection with their weekly reports, and have published full local reports regularly, in connection with their weekly mortuary report, the data for which have been furnished from this office."

The daily reports received here are printed in excellent form by the leading daily newspapers, which give a large amount of space to the data furnished from the signal-office, and in many ways manifest a lively and gratifying interest in the service.

PUBLICATIONS.

Number of farmers' bulletins issued during year ending September 30, 1874	445,233
Number of maps issued during year ending September 30, 1874	49,666
Number of bulletins issued during year ending September 30, 1874	12,340
Number of press-reports issued during year ending September 30, 1874	2,230
Number of local reports issued during year ending September 30, 1874	445
Number of Form 15 (manifold) issued during year ending September 30, 1874	3,460
Number of Form 22 issued during year ending September 30, 1874	153
Number of Form 26 issued during year ending September 30, 1874	5,829
Total	519,356

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

CLEVELAND, OHIO.

[*Official number*, 34.]

Latitude	41° 30′
Longitude	81° 47′
Mean barometer for year ending September 30, 1874	29.987
Mean temperature for year ending September 30, 1874	50°.4
Amount of rain-fall for year ending September 30, 1874	38.56 inches.

No change has been made in the location of office, but a new instrument-shelter has been erected on the roof of the office building to secure a better exposure for the instruments. Serg't. Will Stromberger remains in charge, and has performed all his duties in a satisfactory manner. Two assistants have been called in for promotion during the year, one of whom has been promoted to the grade of sergeant, while the other is still under instruction. Two assistants are now on duty, both of whom are favorably mentioned by the sergeant for good conduct. The station was inspected in July, 1874, and found in excellent condition. Twenty-three cautionary signals have been displayed, of which number seventeen are reported as verified at the station. Of the storm of April 5, 6, 9, and 10, 1874, the sergeant remarks: "All the shipping remained in port on seeing the signals." "The signal ordered up on the

28th of June, 1874, caused general comment all over the city, because it was put up when there was not a cloud visible, and was succeeded early the next morning by a storm of such short duration and so much intensity as to cause wakefulness with more than half our citizens."

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	5,727
Number of maps issued during the year ending September 30, 1874	8,089
Number of press-reports issued during the year ending September 30, 1874	1,137
Number of local forms issued during the year ending September 30, 1874	1,821
Number of Form 15 (manifold) issued during the year ending September 30, 1874	4,617
Number of Form 22 issued during the year ending September 30, 1874	58
Total	21,449

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one double self-register for anemometer and anemoscope, one standard wind-vane, two standard rain-gauges.

COLORADO SPRINGS, COL.

[*Official number*, 109.]

Latitude	38° 55′
Longitude	104° 58′

This station was established originally as a base of supplies for the one on the summit of Pike's Peak, but was furnished with instruments, and eventually made independent of the summit so far as management is concerned. It is connected by the signal telegraph-line with the summit, and is the point of transfer of all messages between that station and points eastward. The office was moved in the latter part of March to a more favorable location in the town, and is now comfortably fitted up.

All supplies for the summit-station are collected here, and sent up under the direction of the sergeant in charge, who is provided with the necessary means of transportation for this purpose. Sergt. D. H. Sackett was in charge, under the direction of the sergeant at the summit-station, until January 29, 1874, when he was transferred to another station, and succeeded by Sergeant Fenton, who still remains, and whose management has been entirely satisfactory.

Speaking of him the inspecting-officer remarks: "Sergeant Fenton has evidently the interests of the service at heart, and has been unremitting in his labors." The station was inspected formally in February, 1874, and informally several times since that date, and has been uniformly found in excellent condition.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge, one standard wind-vane.

CORINNE, UTAH.

[*Official number*, 70.]

Latitude	41°,30′
Longitude	112° 10′

This station was in charge of Sergt. S. W. Beall until broken up, March 14, 1874, and transferred to Salt Lake City.

His reports were forwarded regularly and in satisfactory form.

PUBLICATIONS.

Number of press reports issued from October 1, 1873, to March 14, 1874	49
Number of bulletins issued from October 1, 1873, to March 14, 1874	196
Number of Form 22 issued from October 1, 1873, to March 14, 1874	2
Total	247

CORSICANA, TEX.

[*Official number*, 107.]

Latitude	32° 05′
Longitude	96° 30′
Elevation of barometer above sea-level	447 feet.

This station was established September 1, 1874, by Sergt. W. D. McChesney, who began reporting on the morning of September 15, sending his reports to Galveston, where they are transferred to the central office. The office is located in Molloy's Hotel, on the corner of Harden and Beaton Streets, and within fifty yards of the telegraph-office. The room selected is in the second story, and well lighted. The instrument-shelter is of the standard pattern, and the exposure for roof-instruments is good. There is no assistant at the station, and it has not yet been inspected.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge, one small wind-vane.

DAVENPORT, IOWA.

[*Official number*, 51.]

Latitude	41° 32′
Longitude	90° 38′
Mean barometer for year ending September 30, 1874	30.020
Mean temperature for year ending September 30, 1874	49°.5
Amount of rain-fall for year ending September 30, 1874	38.47 inches.

The office remains in the First National Bank building, at the southwest corner of Second and Main streets, and is well located for business purposes. It is not well lighted, as the only window is darkened by the instrument-shelter.

Sergt. S. P. Ruthven continues in charge, and has the same assistant as at date of last report. Both men are favorably mentioned by the officer who inspected the station in April and found it in good condition.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	5,367
Number of Form 26 issued during the year ending September 30, 1874	1,236
Number of Form 22 issued during the year ending September 30, 1874	15
Total	6,618

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard maximum thermometer, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-guage, one standard wind-vane.

DENVER, COL.

[*Official number*, 76.]

Latitude	39° 44′
Longitude	105°.04
Mean barometer for year ending September 30, 1874	30.004
Mean temperature for year ending September 30, 1874	48°.6
Amount of rain-fall for year ending September 30, 1874	13.99 inches.

The office remains at No. 384 Holladay street, as at date of last report, and is well located. Sergt. Henry Fenton was in charge until transferred to another station January 29, 1874. He was succeeded by Sergt. D. H. Sackett, who was arrested for gross misconduct February 25, 1874, and sent to Cheyenne for confinement. Sergt. P. J. Huneke was at once sent from Washington to succeed him; and the station-work was done by Private J. H. Smith, the assistant at Colorado Springs, until his arrival.

All reports have been made in a satisfactory manner during the year.

The station was inspected in March, 1874, and found in good condition.

The following extracts are given from the reports of the sergeant in charge:

The interest taken by the citizens of Denver in the Signal-Service is general only in so far that most every one has a desire to know the maximum and minimum temperature, the velocity of wind, and the amount of precipitation, and that they place the utmost reliance in the accuracy of the reports of the service.

But there are special classes who utilize the reports, and to whom they are of great value. First among these stand the physicians, not only of Denver but of the whole Territory. At a recent convention of doctors of medicine, held in this city, they organized a committee on climatology, of which Dr. Charles Dennison was elected president. In studying the peculiarities of this climate and its effects upon the human system, they make use of the signal-service reports in connection with the reports of private observers in the different parts of the Territory, and Dr. Dennison assures me that they are very valuable in this respect on account of their reliability.

The people of Denver are naturally in favor of immigration, and among other inducements they hold out to the new-comer the favorable climate of Colorado, referring to the signal-service weather-reports to bear them out in the truth of their statements.

The reports are also used by those interested in irrigation, who state that the knowledge of the amount of rain-fall is of great importance to them.

The average velocity of wind, its pressure, and monthly amount in miles traveled, is used by constructors of wind-mills, which branch of industry is growing daily in this Territory, as the main portion of the land will have to be irrigated by means of wells, whence the water is raised by wind-power.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	1,397
Number of local reports issued during the year ending September 30, 1874	376
Number of Form 22 issued during the year ending September 30, 1874	71
Number of weekly means issued during the year ending September 30, 1874	38
Total	1,882

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard maximum thermometer, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

DETROIT, MICH.

[*Official number*, 36.]

Latitude	42° 21′
Longitude	83° 07′
Mean barometer for year ending September 30, 1874	29.996
Mean temperature for year ending September 30, 1874	47°.9
Amount of rain-fall for year ending September 30, 1874	31.31 inches,

No change has been made in the location of the office since the date of last report. Sergt. William Finn continues in charge, and has performed his duties intelligently and satisfactorily. Numerous changes in the assistants have been made during the year. Two have been called in for promotion, three transferred to other stations, and two relieved for misconduct. Four assistants are now on duty, of whom two are printers, and all are favorably mentioned by the sergeant. Two of the assistants are printers, charged with the issue of farmers' bulletins, which are issued daily, except Sundays, to 351 post-offices. The station was inspected in August, 1874, and found in excellent condition. Eighteen cautionary signals have been displayed, of which five are reported as verified at the station. Since July, 1874, these signals have been duplicated, under the direction of the sergeant, by Messrs. Dunlap, Donaldson & Co., on their warehouse, whence they are visible to most of the shipping in the river. Of storm of April 27, 28, and 29, 1874, the sergeant remarks: "Marine reports show that violent winds prevailed on Lakes Huron and Erie. Ten vessels remained in port, weather-bound, and in consequence of signal. The press and lake-men are unanimous in acknowledging the great benefit of the warning." The sergeant reports: "The interest in the service has been steadily on the increase, the utmost capabilities of the office being taxed to supply the demand for the reports." All reports passing over the New York and Milwaukee circuit are received here, and selections from them regularly published in the daily newspapers.

PUBLICATIONS.

Number of farmer's bulletins issued during the year ending September 30, 1874	213,331
Number of maps issued during the year ending September 30, 1874	5,218
Number of bulletins issued during the year ending September 30, 1874	9,872
Number of Form 22 issued during the year ending September 30, 1874	71
Total	228,492

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

DODGE CITY, KANS.

[*Official number*, 106.]

Latitude	37° 39′
Longitude	100° 08′
Elevation of barometer above sea-level	2,482 feet.

The station was established September 1, 1874, by Sergt. M. L. Landers, who began reporting September 15, sending reports to Leavenworth, where they are transferred to the central office.

The office is located in the Dodge House, but a detailed description of it cannot be given as none has yet been received from the sergeant.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

DUBUQUE, IOWA.

[*Official number*, 98.]

Latitude	42° 30′
Longitude	90° 45′
Mean barometer for year ending September 30, 1874	30.021
Mean temperature	48°.6
Amount of rain-fall	28.07 inches.

The office remains at the corner of Main and Sixth streets, and Sergt. R. J. Bell continues in charge. He was sick and unable to perform duty for four days in January and fifteen days in February, 1874, during which time the station-work was performed satisfactorily by Dr. Henry Astel.

Sergeant Bell is a zealous, hard-working man, and has rendered all reports satisfactorily while his health permitted him to do so. Only the afternoon reports are sent by telegraph, being important to river-men in showing the depth of water in the river at that point.

The citizens are desirous of receiving reports from other points on the river. The station was inspected in April, and found in excellent condition.

PUBLICATIONS.

Number of local reports issued during the year ending September 30, 1874	935
Number of Form 22 issued during the year ending September 30, 1874	41
Total	976

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

DULUTH, MINN.

[*Official number*, 40.]

Latitude	46° 48′
Longitude	92° 08′
Mean barometer for year ending September 30, 1874	29.972
Mean temperature for year ending September 30, 1874	39°.4
Amount of rain-fall for year ending September 30, 1874	34.59 inches.

No change has been made in the location of the office since last report, nor has any change been made in the men on duty. Sergt. R. R. Martin,

in charge, has rendered all reports promptly and satisfactorily, and his assistant is commended for steadiness and attention to duty. Both men are fair telegraph-operators. Twenty-four cautionary signals have been displayed, of which sixteen are reported as verified at the station.

The station was inspected in May, 1874, and found in good condition.

The sergeant reports a gratifying amount of interest manifested in the service by the inhabitants, and calls for meteorological information frequent. Captains of lake-vessels are in the habit of calling at the office before sailing to ascertain the probable character of the weather on the lake.

PUBLICATIONS.

Number of local reports issued during year ending September 30, 1874	731
Number of special reports issued during year ending September 30, 1874	36
Number of Form 22 issued during the year ending September 30, 1874	63
Total	830

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

EASTPORT, ME.

(*Official number*, 94.)

Latitude	44° 55′
Longitude	66° 54′
Mean barometer for year ending September 30, 1874	29.922
Mean temperature for year ending September 30, 1874	40°.9
Amount of rain-fall for the year ending September 30, 1874	48.83 inches.

No change has been made in the location of the office at this station. Sergt. W. C. W. Shreck was in charge until relieved on account of ill health, October 24, 1873. He was succeeded on that date by Sergt. T. C. Taylor, who still remains. All reports have been rendered regularly and promptly. Private D. C. Murphy has been on duty as assistant during the whole year. Thirty-five cautionary signals have been displayed, of which twenty-five are reported as fully verified, and five partly verified at the station. Relative to storm of November 17, 18, and 19, 1873, the sergeant remarks: "This was the most severe storm experienced at this place for twelve months past. The coast between Eastport and Boston was strewn with wrecks. Several schooners took shelter at this port, remaining as long as the signal was displayed." The station was inspected in March, 1874, and found in excellent condition. Reports from five other stations are received here in the morning and afternoon of each day, and from twenty-five at midnight.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	4,452
Number of Form 22 issued during the year ending September 30, 1874	27
Number of press-reports issued during the year ending September 30, 1874	7
Total	4,486

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard water-thermometer, one standard minimum thermometer, one standard

maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

ERIE, PA.

(*Official number*, 97.)

Latitude	42° 07′
Longitude	80° 10′
Mean barometer for year ending September 30, 1874	29.993
Mean temperature for year ending September 30, 1874	49°.2
Amount of rain-fall for year ending September 30, 1874	45.65 inches.

The office remains in the building corner Fifth and State streets, where it was located at date of last report. Sergt. E. F. McComas remains in charge, and has made all reports regularly and in a satisfactory manner. One assistant was relieved August 17, 1874, for misconduct, and his place supplied by another instructed man, who still remains. Twenty-four cautionary signals have been displayed, of which number fifteen are reported as verified at the station. Signals are duplicated under the direction of the sergeant in charge, from the Reed House, from which location they are visible from the greater part of the harbor. The station was inspected in July, 1874, and the general appearance of the office reported upon unfavorably by the inspector. Steps have been taken to correct the reported irregularities. The same number of reports are received here as at other stations on the New York and Milwaukee circuit.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	7,704
Number of maps issued during the year ending September 30, 1874	3,922
Number of Form 15 (manifold) issued during the year ending September 30, 1874	2,702
Number of local forms issued during the year ending September 30, 1874	690
Number of Form 22 issued during the year ending September 30, 1874	63
Total	15,081

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, two standard maximum thermometers, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

ESCANABA, MICH.

[*Official number*, 49.]

Latitude	45° 46′
Longitude	87° 14′
Mean barometer for year ending September 30, 1874	29.982
Mean temperature for year ending September 30, 1874	40°.1
Amount of rain-fall for year ending September 30, 1874	28.18 inches.

The office was moved, July 15, 1874, from the Tilden House to the corner of Ludington and Dousman streets, in order to secure a better exposure for instruments. The present location is a good one, and well suited for the display of signals. Sergt. Edward Lloyd was in charge until August 27, 1874, when he was transferred to another station, and succeeded by Sergt. James M. Watson. One assistant has been called in since last report for promotion, and his place filled by another instructed man.

The station was inspected in August, and its condition found to be such that a change in its management was at once made. Twenty-five cautionary signals have been displayed, of which eighteen are reported as verified at the station.

Of the storm of October 13, 1873, the sergeant remarks: "A number of vessels remained in harbor on account of the signal;" and of the storm of June 11 and 12, 1874: "No vessels left port during the display of signals. From information received it appears that a severe storm prevailed on Lake Michigan."

Of storm of September 19 and 20, 1874, he says: "Steamer Alpena left after signals were hoisted, but returned that afternoon on account of rough weather. Four steamers were ready to sail, but remained in."

The telegraphic service at this station has been very much improved since the date of the last annual report.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, two standard water-thermometers, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

FORT BENTON, MONT.

[*Official number*, 71.]

Latitude	47° 52′
Longitude	110° 40′
Mean barometer for year ending September 30, 1874	29.976
Mean temperature for year ending September 30, 1874	42°.5
Amount of rain-fall for year ending September 30, 1874	9.88 inches.

The office remains as at date of last report, and Sergt. Wm. McGillivray continues in charge. There has been no telegraphic communication since January 6, 1874, but all mail reports have been forwarded promptly, and with as much regularity as the mail facilities would permit. As there is no prospect of the telegraph-line being repaired to this point, it is suggested that the station be abandoned.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard self-register for anemometer, one standard rain-gauge, one small wind-vane.

FORT GIBSON, IND. T.

[*Official number*, 93.]

Latitude	35° 43′
Longitude	95° 16′
Mean barometer for year ending September 30, 1874	29.991
Mean temperature for year ending September 30, 1874	60°3
Amount of rain-fall for year ending September 30, 1874	39.16 inches.

The office is located in one of the best buildings in the town, and affords an excellent exposure for the instruments. Sergt. T. A. Taylor was relieved March 2, 1874, upon the recommendation of the inspecting officer. His successor, Sergt. S. B. Lum, was relieved March 25, 1874, by Sergt. B. C. Anderson, who still remains and gives satisfaction.

There is one assistant on duty, who is favorably mentioned by the sergeant for good conduct and steady habits. Both men are fair telegraph operators. The station was inspected in February, 1874, and found in such bad condition that the sergeant was immediately relieved. Reports from other stations are not received here.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard maximum thermometers, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one small wind-vane, one standard rain-gauge.

FORT SULLY, DAK.

[*Official number*, 83.]

Latitude	44° 39′
Longitude	100° 40′
Mean barometer for the year ending September 30, 1874	29.912
Mean temperature for the year ending September 30, 1874	46°.2
Amount of rain-fall for the year ending September 30, 1874	14.89 inches.

No change has been made in the location of the office since the date of last annual report. Sergt. William Ramsay was in charge until called in for discharge, January 23, 1874, and succeeded by Sergt. C. E. Brinsmade, who still remains and has given satisfaction by the promptness and regularity with which he has forwarded all reports. The services of an assistant becoming necessary to keep the telegraph-line in repair, Private H. M. Wells was ordered to the station April 3, 1874. On September 1 he was moved to Fort Thompson, in order that he might attend more readily to the line between Forts Sully and Randall.

The station was inspected in June, 1874, and found in good condition. Since that date, however, the station barometer has been broken and is not yet replaced. Observations are made with the barometer at post hospital.

Two barometers, sent from the central office, have reached the station in an unserviceable condition.

INSTRUMENTS ON STATION.

Three standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

GALVESTON, TEX.

[*Official number*, 55.]

Latitude	29° 18′
Longitude	94° 50′
Mean barometer for year ending September 30, 1874	30.051
Mean temperature for year ending September 30, 1874	72°.8
Amount of rain-fall for year ending September 30, 1874	54.49 inches.

No change has been made in the location of the office since the establishment of the station, nor is any considered necessary, as the exposure for instruments and means of access to the leading business-places are as good as can be found in the city.

Sergt. E. O'C. McInerney continues in charge and has performed all his duties zealously and intelligently. There is one assistant at present

on duty, who is favorably mentioned by the sergeant for good conduct, but whose relief is recommended on the ground of ill health. The station was inspected in February, 1874, and found in good condition.

The following extracts are given from the reports of the sergeant:

The members of the "cotton exchange" take deep interest in our reports, which are regularly furnished them, and some time since, at one of the meetings, drew up, and with unanimous consent forwarded, a series of resolutions to the honorable Secretary of War praying for an extension of the system and an increase of stations in Texas and the other cotton-producing States.

The Chamber of Commerce in its annual review (a copy of which I forwarded to Washington) speaks in the most complimentary manner possible of the benefits it has already derived from the signal service, and points out the future advantages which agriculture and the various departments of commercial industry will derive from its labors, and the useful knowledge its full development is sure to spread among the people.

The farmer, the sailor, the merchant, the cotton factor, the physician, the journalist, and the scientist, are all alike deeply and favorably impressed with the importance and utility of the signal-service system; those in every walk of life and profession look on it and accept it as one of the necessary and indispensable institutions of the land.

In March, Dr. Wilkinson, of this city, called on me for such statistical information as I could furnish him of the rain-fall, temperature, &c., of the summer of 1873, that he might submit the same to the medical convention at Dallas, Texas, which was held chiefly for the purpose of investigating the causes and peculiarities of diseases in general, but more particularly of yellow fever.

The condition of the atmosphere, its extremes of temperature and moisture, is almost universally admitted to be a powerful agent in the prevention or production of this much-dreaded disease. Hence the desire of the Dallas convention for accurate and reliable information.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	113
Number of press-reports issued during the year ending September 30, 1874	482
Number of local reports issued during the year ending September 30, 1874	40
Number of Forms 22 issued during the year ending September 30, 1874	26
Number of monthly reports for the cotton exchange	5
Total	666

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

GRAND HAVEN, MICH.

[*Official number*, 48.]

Latitude	43° 05′
Longitude	86° 18′
Mean barometer for year ending September 30, 1874	30.005
Mean temperature for year ending September 30, 1874	47°.0

The office remains at the corner of Fourth and Washington streets, as at date of last report. The location is a poor one for the display of cautionary signals, but good in other respects. The expense of putting up the suitable flag-staff has prevented the duplication of signals from a point from where they would be visible to passing vessels.

Sergt. F. F. Wood was in charge of station until April 1, 1874, when he was ordered in for discharge, and was succeeded by Sergt. A. J. Berry, who still remains. An assistant was ordered here in October, 1873.

The station was inspected in August, 1874, and the general management reported upon unfavorably.

Twenty-five cautionary signals have been displayed, of which number fifteen are reported as verified at the station.

PUBLICATIONS.

Number of local reports issued during year ending September 30, 1874	718
Number of Forms 22 issued during year ending September 30, 1874	19
Total	737

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

INDIANAPOLIS, IND.

[*Official number*, 43.]

Latitude	39° 47′
Longitude	86° 06′
Mean barometer for the year ending September 30, 1871	30.022
Mean temperature for the year ending September 30, 1874	54°.4
Amount of rain-fall for the year ending September 30, 1874	46.26 inches.

The office remains at the corner of Washington and Meridian streets, and is well located. The only change made during the year was the removal to other rooms in the same building to accommodate the wants of the telegraph company. Sergt. C. F. R. Wappenhans remains in charge, and, as in previous years, has performed his duties satisfactorily.

There is one assistant now on duty, and two have been called in for promotion during the year.

The station has been twice inspected, once in December, 1873, and again in September, 1874, and on both occasions was found in excellent condition. The inspector reports that the sergeant understands his work thoroughly and gives his whole time to his office duties. The only change recommended was in the instrument-shelter, which has been ordered. The following extracts are given from the semi-annual report of the sergeant for June 30, 1874:

Freight-agents of the different railroads have often made use of these records in noting the prevalence of rain and the force or amount of rain-fall.

During the winter, pork-packers requested to be furnished with a table of temperatures for each day of the past month, to select their packages for shipment according to the higher or lower temperature prevailing when the animal was killed and the meat was packed, as it was to their advantage to send off such meat first of the animal when killed during a more moderate temperature.

The probabilities published in the papers are read with great reliance in their correctness by almost every reader of the different papers, and I know that the labors of builders, contractors, painters, owners of brick-yards, and others have been regulated according to the probable state of the weather as expressed in the probabilities.

To illustrate one of the many instances of the usefulness of timely information of an approaching freezing temperature, permit me to state the following:

Mr. Mallot, a gentleman largely interested in the cutting of ice, at La Porte, in the northern part of the State, had been in daily communication with this office, when in this city, by personal application or receipt of bulletins, or when absent at La Porte, by telegraphic communication.

Some time during the latter part of the past winter a rain had set in, melting part of the still remaining ice, or at least covering it with water to the depth of several inches. It being late in the season many of the ice-men at La Porte, from Louisville, Chicago, and other places, believing that the opportunity of cutting more ice this winter had passed, returned therefore to their homes. Seeing, by a very low temperature prevail-

ing in the west and northwest, that it would also extend to this place, although, perhaps, in not so severe a degree, Mr. Mallot was informed, by telegraph, that freezing weather was expected in about forty-eight hours. On this information he immediately built an ice-house, near a lake where the ice had not been disturbed by cutting before it was covered by rain, and made further preparation for immediate action should the ice become thick enough.

The lower temperature reached La Porte somewhat earlier than anticipated, and very soon the ice was thick enough for cutting. Early Monday morning Mr. Mallot employed all the force he could muster to cut ice, and continued to do so uninterrupted for more than three days, permitting him thereby to fill all his contracts, which had been very doubtful heretofore.

After the frost had set in the ice-men, who had gone home, returned; but, too late, for when they had finished their preparations for cutting and housing the ice, the frost diminished, and the ice, thawing, was soon driven out of the lake.

Mr. Mallot, being also a managing officer of the Indianapolis and Peru Railroad, made use of the weather reports to arrange his trains, for whenever there were indications of a cessation of freezing weather, cars and locomotives used for the transport of ice at one end of the road could be used to better advantage at other points until, at an indication of the return of frost, or its continuance, more cars could be sent to those points where ice was cut.

This station is on the Chicago and Cincinnati circuit, and receives twenty-one reports in the morning and afternoon, and seventy-two at midnight. These reports have recently been published by the daily newspapers in excellent form, and it is believed their publication will be continued regularly hereafter.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	8,405
Number of local reports issued during the year ending September 30, 1874	824
Number of Form 15 (manifold) issued during the year ending September 30, 1874	6,737
Number of Form 22 (manifold) issued during the year ending September 30, 1874	89
Number of Form 26 (manifold) issued during the year ending September 30, 1874	425
Total	16,480

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

INDIANOLA, TEX.

[*Official number*, 84.]

Latitude	28° 32′
Longitude	96° 38′
Mean barometer for the year ending September 30, 1874	30.075
Mean temperature for the year ending September 30, 1874	70°.0
Amount of rain-fall for the year ending September 30, 1874	45.32 inches.

No change has been made in the location of office since date of last report, and Sergt. Frank Mansfield still remains in charge, and has forwarded all reports regularly and in a satisfactory form. An assistant was sent to the station February 17, 1874, and has not been removed up to this date. The station was inspected in February, 1874, and found in good condition. There is considerable interest manifested in the service, chiefly among the masters of the coasting-vessels which enter this port.

PUBLICATIONS.

Number of Form 22 issued during the year ending September 30, 1874	44
Number of weekly means issued during the year ending September 34, 1874	38
Total	82

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, two standard minimum thermometers, one standard maximum thermometer, one standard water thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

JACKSONVILLE, FLA.

[*Official number*, 73.]

Latitude	30° 24′
Longitude	80° 40′
Mean barometer for the year ending September 30, 1874	30.090
Mean temperature for the year ending September 30, 1874	69°.3
Amount of rain-fall for the year ending September 30, 1874	56.53 inches.

The office remains in the Freedman's Bank building, as at last report, and no change has been made in the men on duty. Sergt. R. McLaughlin has performed his duties satisfactorily, and rendered all reports promptly and properly. Both the sergeant and his assistant are warmly commended by the inspecting officer, who visited the station in December, 1873, and found office and records in excellent condition. Seven cautionary signals have been displayed, of which three are reported as verified at the station. The sergeant reports that "the parties deriving the most benefit from the service at this point are the lumber-shippers, and shipping in general. In the underwriters' agency is posted a notice to vessels not to leave port while the signal flag is flying, and which is universally observed by them, whether they are insured or not."

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	4,847
Number of local reports issued during the year ending September 30, 1874	153
Number of Form 22 issued during the year ending September 30, 1874	69
Total	5,069

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

KEOKUK, IOWA.

[*Official number*, 47.]

Latitude	40° 23′
Longitude	91° 25′
Mean barometer for the year ending September 30, 1874	29.995
Mean temperature for the year ending September 30, 1874	52°.4
Amount of rain-fall for the year ending September 30, 1874	44.76 inches.

The office remains at the corner of Main and Second streets, and is well located. Sergt. James H. Marsh was relieved November 8, 1873, for misconduct, and succeeded by Sergt. T. S. Collins, who remained until transferred to another station, July 15, 1874, since which date Sergt. William Black has been in charge. One assistant has been relieved during the year for misconduct, and his place supplied by a competent man. The station was inspected in April, 1874, and found in good condition. The river reports are of value to shippers and river-men, and this is the

particular class who manifest the most interest and derive the most benefit from the reports. From the probabilities furnished the press they can tell what will probably be the condition of the weather North, and from the local bulletins posted they ascertain the actual condition of the weather, and from the river reports know the stage of water, thus enabling them to regulate their shipments so as to insure the safe delivery of the same. Contractors and engineers who are constructing levees, bridges, and other public works receive the benefits of the river reports when called for by them; and one gentleman, Mr. E. L. Corttrell, chief engineer of the Sny Island levee, Louisiana, Mo., has been furnished reports of the rise and fall of the river daily during the past two years.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	3,166
Number of maps issued during the year ending September 30, 1874	11
Number of local reports issued during the year ending September 30, 1874	48
Number of Form 22 issued during the year ending September 30, 1874	24
Number of Form 26 issued during the year ending September 30, 1874	2,519
Total	5,768

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

KEY WEST, FLA.

[*Official number*, 25.]

Latitude	24° 32′
Longitude	81° 48′
Mean barometer for the year ending September 30, 1874	30.06
Mean temperature for the year ending September 30, 1874	76°.8
Amount of rain-fall for the year ending September 30, 1874	3468 inches.

The office remains in the Louvre Hotel, as at date of last report, and is within easy reach of the principal public offices and business-houses. Sergt. B. C. Anderson was relieved on account of ill-health March 28, 1874, and succeeded by Sergt. John D. Sumet. Both men have attended faithfully to their duties, and forwarded reports as promptly as the mail and telegraphic facilities would permit.

One assistant was called in for promotion during the year, and succeeded by another instructed man, who is still on duty. The station was inspected in January, 1874, and found in fair condition.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	2,935
Number of press-reports issued during the year ending September 30, 1874	51
Number of Form 22 issued during the year ending September 30, 1874	2
Total	2,988

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard water-thermometer, one standard minimum thermometer, two standard maximum thermometers, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

KNOXVILLE, TENN.

[*Official number*, 42.]

Latitude	35° 56′
Longitude	83° 58′
Mean barometer for the year ending September 30, 1874	30.071
Mean temperature for the year ending September 30, 1874	57°.5
Amount of rain-fall for the year ending September 30, 1874, 63.50 inches.	

The office remains in the university as at last report, and is given without cost to the United States.

Sergt. John K. Payne remains in charge, and has given satisfaction. All reports have been made promptly and satisfactorily.

An assistant was assigned to the station in December, 1873, and was called in for promotion in August, 1874, and succeeded by another competent man. The station was inspected in April, and found in excellent condition.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	920
Number of press-reports issued during the year ending September 30, 1874	312
Number of Form 22 issued during the year ending September 30, 1874	34
Total	1,266

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

LA CROSSE, WIS.

[*Official number*, 87.]

Latitude	43° 48′
Longitude	91° 23′
Mean barometer for the year ending September 30, 1874	30.035
Mean temperature for the year ending September 30, 1874	45°.9′
Amount of rain-fall for the year ending September 30, 1874, 31.04 inches.	

The only change made in the office at the station during the year has been its removal from the room formerly occupied to another and better one in the same building. Sergt. Richard Williams was relieved October 6, 1873, and called in for discharge. He was succeeded by Sergt. W. E. Smith, who still remains, and has given satisfaction. An assistant was furnished him from June 20, 1874, to September 14, 1874, on account of his ill-health. The station was inspected in May, 1874, and found in good condition.

PUBLICATIONS.

Number of press-reports issued during the year ending September 30, 1874	642
Number of Form 22 issued during the year ending September 30, 1874	15
Total	657

INSTRUMENTS ON STATION.

One standard barometer, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

LAKE CITY, FLA.

[*Official number*, 24.]

Latitude	30° 13′
Longitude	82° 40′
Mean barometer for the year ending September 30, 1874	30.087
Mean temperature for the year ending September 30, 1874	67°.7
Amount of rain-fall for the year ending September 30, 1874,	40.15 inches.

No change has been made in the location of the office during the year, nor has any been made in the men on duty. Sergt. A. D. Woolcott continues in charge, and has one assistant. All reports have been made promptly and in creditable form. The station was inspected in December, 1873, and found in good condition. But little interest is taken in the service here, and as the only object of its establishment has been rendered useless by the consolidation of the telegraph-offices, its removal to some more desirable location is recommended.

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

LEAVENWORTH, KANS.

[*Official number*, 52.]

Latitude	39° 19′
Longitude	94° 58′
Mean barometer for the year ending September 30, 1874	29.978
Mean temperature for the year ending September 30, 1874	54°.4
Amount of rain-fall for the year ending September 30, 1874	35.04 inches.

The office remains at No. 315 Delaware street, and is well located for business purposes. Sergt. George S. Rowley was relieved February 17, 1874, and upon the recommendation of the inspecting officer reduced to the rank of a private soldier for neglect of duty. He was succeeded by Sergt. H. M. Wells, who also neglected his duty, and was reduced, being relieved March 26, 1874, by Sergt. E. McGovern, who stills remains in charge and performs his duties satisfactorily. Two assistants are now on duty, one of whom is a printer charged with the issue of farmers' bulletins, which are supplied regularly to 210 post-offices. One assistant has been called in for promotion during the year, one transferred to another station, one to the central office, and one relieved for misconduct. The station was inspected in March, 1874, and found in poor condition. It is believed, however, that at present it is greatly improved, as all reports are made regularly and satisfactorily, and the amount of work done sufficient to keep the men busy.

PUBLICATIONS.

Number of farmers' bulletins issued during the year ending September 30, 1874,	103,935
Number of bulletins issued during the year ending September 30, 1874	1,736
Number of press-reports issued during the year ending September 30, 1874	369
Number of local reports issued during the year ending September 30, 1874	415
Number of Form 22 issued during the year ending September 30, 1874	88
Number of Form 26 issued during the year ending September 30, 1874	1,331
Total	107,874

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

LEXINGTON, KY.

[*Official number*, 90.]

Latitude	38° 08′
Longitude	84° 33′
Mean barometer for the year ending September 30, 1874	30.049
Mean temperature for the year ending September 30, 1874	55°.5
Amount of rain-fall for the year ending September 30, 1874	50.04 inches.

The office remains in the university building as at last report, and is still in charge of Sergt. W. S. Jewell. All reports have been rendered promptly and satisfactorily, and the sergeant's conduct is favorably mentioned by the regents of the university. Since the 3d of March, 1874, the midnight reports from twenty-one stations have been received here once a day from Cincinnati, and are published in the usual manner.

This station has never been inspected.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	1,775
Number of local reports issued during the year ending September 30, 1874	98
Total	1,873

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one minimum thermometer, one maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

LOGANSPORT, IND.

[*Official number*, 124.]

This is a printing station, established for the distribution of farmer's bulletins, and is in charge of Corporal Lloyd Prather, who has one assistant. The first bulletin was issued July 15, 1874, and since that date 21,666 bulletins have been issued to 196 post-offices. The average time of receiving the synopsis and probabilities from the central office, via Cincinnati, is 2 a. m., and the average time of mailing the printed copies 4.30 a. m. The work has been well done, and no issues have been missed up to this date. The office is located at No. 48 Fourth street, between Broadway and Market streets.

LONG BRANCH, N. J.

[*Official number*, 113.]

Latitude	40° 18′
Longitude	73° 59
Elevation of barometer above sea-level	28 feet 7 inches.

The station was established December 10, 1873, by Sergt. George W. McKee, who remained in charge until his death from typhoid fever,

September 14, 1874. He was succeeded by Corporal Isaac T. Shadle, who had been his assistant since the station was opened. Sergeant McKee was an intelligent, faithful man, who attended to all his work with scrupulous fidelity, and died at his post like a true soldier. The office is in the life-saving house north of the town of Long Branch, and is well located. The instrument-shelter is of the standard portable pattern. A full set of flags, for the International code, is on the station, and the men on duty instructed in their use. The office is connected by telegraph with the central office, and full reports are sent regularly, as at the other sea-coast stations. Nineteen cautionary signals have been displayed, of which number fifteen have been fully verified at the station. The line from Sandy Hook to Barnegat is repaired from this point.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge, one small wind-vane.

LOUISVILLE, KY.

[*Official number*, 64.]

Latitude	38° 18′
Longitude	85° 52′
Mean barometer for the year ending September 30, 1874	30.039
Mean temperature for the year ending September 30, 1874	57°.2
Amount of rain-fall for the year ending September 30, 1874	43.33 inches.

The office is located on the fifth floor of a building at the corner of Main and Bullitt streets, and is within easy reach of the principal public buildings and business houses.

Sergt. J. W. Craig was in charge until July 27, 1874, when he was relieved for misconduct and succeeded by Sergt. James H. Marsh, his assistant, who was promoted on station. One assistant was relieved March 20, 1874, for misconduct; the present assistant gives satisfaction.

The station was inspected in January, 1874, and again in September, 1874.

Reports are received here from seven stations each morning and midnight, and from twenty stations in the afternoon.

The newspapers publish all reports furnished to them, and the citizens, generally, take great interest in the service.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	11,807
Number of press-reports (local) issued during the year ending September 30, 1874	1,820
Number of Form 15 (manifold) issued during the year ending September 30, 1874	800
Number of Form 22 issued during the year ending September 30, 1874	64
Number of Form 26 issued during the year ending September 30, 1874	7,541
Total	22,032

Twenty-three weather-maps are received here daily from Cincinnati, and displayed in the principal public buildings.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one minimum thermometer, one maximum thermometer, one water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

LYNCHBURGH, VA.

[*Official number*, 44.]

Latitude	37° 30′
Longitude	79° 02′
Mean barometer for the year ending September 30, 1874	30.072
Mean temperature for the year ending September 30, 1874	56°.5
Amount of rain-fall for the year ending September 30, 1874	44.74 inches.

The location of the office has not been changed during the year, and Sergt. H. U. Jones continues in charge. His reports, both mail and telegraphic, have been forwarded regularly and in creditable form.

Although the only reports received here are those from Knoxville, considerable interest is manifested in the service, especially by the tobacco-manufacturers, who are governed to a great extent, in arranging their work, by the probabilities issued from the central office.

The local newspapers print all observations furnished them. The station was inspected in April, 1874, and found in good condition.

PUBLICATIONS.

Number of local press-reports issued for the year ending Spetember 30, 1874	934
Number of Form 22 issued for the year ending September 30, 1874	36
Total	970

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemomoter, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

MARQUETTE, MICH.

[*Official number*, 50.]

Latitude	46° 33′
Longitude	87° 36′
Mean barometer for the year ending September 30, 1874	29.980
Mean temperature for the year ending September 30, 1874	40°.8
Amount of rain-fall for the year ending September 30, 1874	21.32 inches.

No change has been made in the location of the office, nor is any considered desirable, as the present one is well adapted for the exposure of instruments and display of signals.

Sergt. W. H. Clentenon remains in charge, and has performed all his duties intelligently and satisfactorily. Since April 9, 1874, he has had an assistant, as the receipt of signal-orders made the work too severe for one man.

The station was inspected in August, 1874, and found in excellent condition.

Twenty-one cautionary signals have been displayed, of which number thirteen are reported as verified at the station. The sergeant reports:

Frequent applications for information concerning the anticipated state of the weather have been made during the spring and summer by persons having business or pleasure on the water in this vicinity, and in most cases reliable information was furnished them. One gentleman, in particular, who is largely interested in mining, has made several calls in quest of information relative to atmospheric humidity, and at one time when the hygrometer showed the atmosphere to be very dry, he immediately telegraphed to the mines (distant forty miles) to turn out all hands to guard against fires in the woods, the settlement having been burned out last year during similar weather.

Reports from other stations are not received here.

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard maximum thermometer, one standard minimum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register to anemometer, one standard rain-gauge, one standard wind-vane.

MEMPHIS, TENN.

[*Official number*, 62.]

Latitude	35° 07′
Longitude	90° 07′
Mean barometer for the year ending September 30, 1874	30.098
Mean temperature for the year ending September 30, 1874	61°.6
Amount of rain-fall for the year ending September 30, 1874	49.39 inches.

The office is at No. 254 Second street, and is well located. Sergt. S. W. Rhode was transferred, September 14, 1874, to another station, having served here continuously and faithfully since August 28, 1871. He was succeeded by Sergt. H. M. Ludwig. There are two assistants on duty, one of whom is a printer, charged with the issue of farmers' bulletins, which are supplied regularly to sixty post-offices. One assistant has been called in during the year for promotion, and one transferred to the central office. The station was inspected in January, 1874, and found in excellent condition. Referring to Sergeant Rhode, the inspector remarks: "His valuable services rendered during the late epidemic, as a member of the Howard Association, have won for him a reputation of which he may well be proud." The chairman of the meteorological committee, Mr. Semmes, urges strongly the establishment of a special river station at Randolph, on the Mississippi, above Memphis, during the winter months at least, to give timely warning of floods and ice gorges at that point. The following extracts from the semi-annual reports of Sergeant Rhode refer to the interest in the service manifested by the citizens:

Owing to the fact that the cholera, in an epidemic form, prevailed here during the greater portion of the latter part of last year, the service has made but little advancement. Business has been partly, and for a short time entirely, suspended during that period. The city for four months was nearly depopulated. The river-travel and the business were almost entirely suspended for three months; consequently there was no one here to be benefited by our reports. The observations were taken regularly and promptly during the epidemic, though very often there were doubts whether any of us would escape the dreaded scourge. A large number of physicians and scientific men have called upon me for meteorological data during the period of the late yellow-fever epidemic. The value of these observations during that time has been fully demonstrated. I have in every instance been able to furnish all the information desired.

The Farmers' Bulletins have been issued regularly, and from verbal reports I have received from a number of places where they are posted, I am led to believe that the agricultural community have been greatly benefited by this system of diffusing reports and prognostics of the service. During the overflow of the Mississippi and its tributaries during the past six months the value of the river-report was conclusively proven. Planters in the valley south of this station were daily informed by the telegraph and press of the condition of the upper rivers, and were thus enabled to prepare for the flood long before it reached them.

Levee superintendents were informed in time for them to strengthen the levees, and it is owing to this fact that the damage done was not greater.

The reports of the service are watched, read, and used by almost all classes of persons. Mr. Victor D. Fuchs, a large dealer in oysters, fish, game, &c., buys and sells his goods by the reports of this service. The railroad, express, and steamboat companies use the reports very often to determine to whom to charge the damage to goods by exposure and so forth.

The cotton merchants are frequent applicants for information.

Large quantities of cotton, in passing through different persons' hands, are often damaged by exposure to the weather. Such cases as these are often brought into court, and to determine at what time the weather was such as to damage exposed cotton, recourse is had to reports, which are very beneficial in this respect.

PUBLICATIONS.

Number of farmers' bulletins issued during the year ending September 30, 1874	40,262
Number of bulletins issued during the year ending September 30, 1874	3,789
Number of press-reports issued during the year ending September 30, 1874	6
Number of Form 22 issued during the year ending September 30, 1874	38
Number of Form 26 issued during the year ending September 30, 1874	3,204
Total	47,299

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard water-thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, standard rain-gauge, one stanard wind-vane.

MILWAUKEE, WIS.

[*Official number*, 38.]

Latitude	43° 03′
Longitude	87° 54′
Mean barometer for the year ending September 30, 1874	30.036
Mean temperature for the year ending September 30, 1874	45°.8
Amount of rain-fall for the year ending September 30, 1874	31.95 inches.

The office is located as at last report—in the building of the Northwestern Life Insurance Company, at the corner of Wisconsin street and Broadway. Sergt. H. M. Ludwig was in charge until September 14, 1874, when he was transferred to Memphis, Tenn., and succeeded by Sergt. S. W. Rhode, who remains in charge and forwards all reports regularly and satisfactorily.

The station was inspected in August, 1874, and the general appearance of the office found satisfactory. Two assistants are now on duty, and two have been called in during the year for promotion. Twenty-five cautionary signals have been displayed, of which number seventeen are reported as fully verified at the station. Of the storm of October 28 and 29, 1873, the sergeant remarks:

"Numerous vessels remained in port. The master of the schooner Stella returned thanks for timely warning;" and of storm of June 11 and 12, 1874: "Small vessels remained in port during gale; numerous visits from lake-men."

In his semi-annual report, the sergeant says:

Among the citizens, and especially the shipping fraternity, the signal service is regarded as a necessity to commerce.

In the early part of June the editorial convention meeting in this city, a number of that body favored this office with a visit, and all expressed a high opinion of the service, and volunteered the information that the same state of feeling existed in the agricultural districts where the probabilities are received.

Referring to the cautionary displays, I may briefly state that the observance and individual interest has become a marked necessity with the business men in general.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	7,513
Number of maps issued during the year ending September 30, 1874	3,148
Number of local reports issued during the year ending September 30, 1874	28

Number of Form 15 (manifold) issued during the year ending September 30, 1874	4,335
Number of Form 22 (manifold) issued during the year ending September 30, 1874	47
Total	15,071

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one wind-vane.

MOBILE, ALA.

[*Official number*, 27.]

Latitude	30° 42′
Longitude	88°.59′
Mean barometer for year ending September 30, 1874	30.092
Mean temperature for year ending September 30, 1874	67°.6
Amount of rain-fall for year ending September 30, 1874	58.20 inches.

The location of the office has not been changed during the year. It is central and convenient to most of the public offices, and, in a meteorological point of view, as good as can be obtained within the city limits. Sergt. D. O'Donoghue has been on duty here since November, 1871, and has performed all his work in an intelligent and satisfactory manner. One assistant has been called in for promotion during the year, and was succeeded by another instructed man. The station was inspected in January, 1874, and found in excellent condition. Five cautionary signals have been displayed, of which three are reported as justified at the station. All reports passing over the New Orleans and Augusta circuit have been received here since February, 1874, and selections from them are published by the daily press.

The following extracts from the sergeant's reports are given to show the local interest taken in the service:

The citizens take a lively interest in the reports. The secretaries of the board of trade and cotton-exchange are most anxious to have the reports increased. The cotton-exchange in particular has been most desirous to receive reports from the cotton-districts. As regards the probabilities, they are relied upon, and if it happen that they are not strictly accurate for Mobile alone, not taking the entire Gulf States in account, some seem to be disappointed.

As an evidence of the usefulness of the Signal-Service, beyond the purpose for which it was originally intended, it is well to state the following: In December, 1872, a large lot of cotton was purchased by an English merchant, and before or during the loading of the ship, the cotton was badly damaged by water. The English merchant brought suit against the Mobile merchant for not furnishing the cotton at the appointed time. The plea set up was to the effect that the weather was rainy and cloudy during the time allowed for drying the cotton, so that it was not delivered till long after the term of the contract.

The lawyer of the English merchant applied at this office, in April, 1874, for the number of cloudy and rainy days during December, 1872, and January, 1873, which this office was able to furnish. The weather-reports clearly sustained the plea in the case. It is well to state for your information, that the medical profession in this city are taking a very great interest in the daily reports.

On March 20, 1874, a letter was received from the secretary of Galveston, Texas, Medical Association, requesting to be furnished with the weekly mean temperature and humidity for June, July, August, and September. The request was complied with, and the mean daily barometer, thermometer, humidity, and the amount of rain-fall for each day, and prevailing wind, sent, and the month of October included, in addition.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874,	3,841
Number of press-reports issued during the year ending September 30, 1874.	1,045
Number of Form 15 (manifold) issued during the year ending September 30, 1874,	1,775
Number of Form 22 issued during the year ending September 30, 1874	37
Total	6,698

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

MONTGOMERY, ALA.

[*Official number*, 26.]

Latitude,	32° 22′
Longitude,	86° 23′
Mean barometer for the year ending September 30, 1874,	30.095
Mean temperature for the year ending September 30, 1874,	65°.8′
Amount of rain-fall for the year ending September 30, 1874	Blank.

The office is located at No. 10 Market street, on the third floor of a four-story building in immediate proximity to the principal business and public offices in the city. The roof exposure for the instruments is good, and the instrument-shelter of the standard pattern. Sergt. Geo. A. Clum was relieved from charge, February 2, 1874, and succeeded by Sergt. E. T. Carvalho, who left the station without authority, September 17, 1874, while laboring under a temporary attack of insanity.

The duties were performed by Private Mayhew until the arrival of Corp. W. J. Evans, September 21. Sergeant Clum was sick from October 8 to November 5, 1873, and Sergt. J. F. Tenny was sent to work the station during that time.

There are two assistants on duty, one of whom is a printer, charged with the issue of farmer's bulletins, which are furnished to 45 offices. One assistant was called in for discharge during the year, and one transferred to another station. The station was inspected in January, 1874, and found in fair condition. All reports passing over the New Orleans and Augusta circuit are received here, and selections from them published by the local press.

The sergeant reports that "the benefits derived from the reports of the Signal-Service at this station are mainly restricted to the cotton-growing interests of the State. The reports on temperature and amount of rain-fall are taken notice of, as these phenomena are recognized to influence the prospects of the cotton-crop more than any other, and the cotton-merchants and others interested will be enabled to base on the reports their calculation for this special branch of the mercantile trade."

PUBLICATIONS.

Number of farmer's bulletins issued during the year ending September 30, 1874	22,001
Number of bulletins issued during the year ending September 30, 1874	3,314
Number of press-reports issued during the year ending September 30, 1874	444
Number of Form 22 issued during the year ending September 30, 1874	70
Number of local reports issued during the year ending September 30, 1874	129
Total	25,958

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

MORGANTOWN, W. VA.

[*Official number*, 92.]

Latitude	39° 36′
Longitude	79° 52′
Mean barometer for year ending September 30, 1874	30.022
Mean temperature for year ending September 30, 1874	53°.5
Amount of rain-fall for year ending September 30, 1874	47.04 inches.

The office remains in the university, and has been in charge of Sergt. Lawrence Dunne since November 8, 1873, on which date he relieved Sergeant Fee, who was called in for misconduct.

Telegraphic reports are not sent from this station except in special cases. All mail-reports have been made with commendable neatness and regularity. The station has not been inspected during the year. Local observations have been published weekly in the Morgantown Weekly Post.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one minimum thermometer, one maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

MT. WASHINGTON, N. H.

[*Official number*, 46.]

Latitude	40° 16′ 25″
Longitude	71° 16′ 26″
Mean barometer for the year ending September 30, 1874	29.968
Mean temperature for the year ending September 30, 1874	25°.6
Amount of rain-fall for the year ending September 30, 1874	82.97 inches.

The office remains in the building constructed for the station last year, which has been found comfortable and well adapted to the uses for which it was designed. Sergt. A. R. Thornett remained in charge until June 1, 1874, when, at his own request, he was transferred to the Portland station, and succeeded by Sergt. William Line, who had been his senior assistant since September 17, 1872. Both these sergeants have performed their duties intelligently and satisfactorily. Two assistants are now on the station, one of whom has been there over a year, and both of whom are hardy, reliable men.

The station was inspected in October, 1873, and found in fair condition.

Considerable trouble has been experienced in keeping the instruments in repair, and at the present time there is no serviceable anemometer on the station. One has been made, however, especially designed to withstand the strong winds and frosts to which the location is subjected, and will be forwarded in time for use during the ensuing winter.

The telegraph-line has been repaired, and in a great measure replaced by new wire, and is now in good working order.

The situation of the men upon this station has been greatly improved since its first occupation in 1870.

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard minimum thermometer, four standard maximum thermometers, one standard hygrometer, four standard anemometers, one self-register for anemometer, one small wind-vane, two standard rain-gauges.

NASHVILLE, TENN.

[*Official number*, 63.]

Latitude	36° 11′
Longitude	86° 53′
Mean barometer for year ending September 30, 1874	30 .065
Mean temperature for year ending September 30, 1874	61°.3
Amount of rain-fall for year ending September 30, 1874	59.76 inches.

Location of office remains unchanged. Sergt. A. C. Ford remains in charge, and has performed his station duties in a satisfactory manner. One assistant was called in for promotion July 20, 1874.

There are two assistants at present on duty, one of whom is a printer, having charge of the issue of farmers' bulletins. The station was inspected in January, 1874, and found in excellent condition.

The office has furnished meteorological data to numerous applicants during the year. In addition to the local reports in the daily newspapers, copies of monthly and annual reports have been furnished to the State offices, and also to agricultural societies throughout the State.

The extreme high water in the Cumberland River during the of April made the river-reports especially valuable.

PUBLICATIONS.

Number of farmers' bulletins issued during year ending September 30, 1874	61,714
Number of bulletins issued during year ending September 30, 1874	8,104
Number of local-press reports issued during year ending September 30, 1874	634
Number of Forms 15 (manifold) issued during year ending September 30, 1874	880
Number of Forms 22 issued during year ending September 30, 1874	135
Number of Forms 26 issued during year ending September 30, 1874	3,647
Total	75,114

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one minimum thermometer, one maximum thermometer, one water thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

NEW HAVEN, CONN.

[*Official number*, 96.]

Latitude	41° 17′
Longitude	72° 57′
Mean barometer for the year ending September 30, 1874	30. 046
Mean temperature for the year ending September 30, 1874	48°.2
Amount of rain-fall for the year ending September 30, 1874	64.04 inches.

The office remains in the sixth story of the insurance building, at No. 368 Chapel street, and its location could not be improved upon. Sergt. Wm. Black was in charge until July 15, 1874, when he was transferred to another station and succeeded by Sergt. F. P. Bayes.

Telegraphic reports are not sent from this station except in special cases. All mail-reports have been forwarded regularly and promptly.

The station was inspected in November, 1873, and found in excellent condition.

Twenty-eight cautionary signals have been displayed, of which number eighteen are reported as fully verified and one as partly verified at the station. Of storm of February 13 and 14, 1874, the sergeant remarks: "The storm was very severe on the sound. On the night of the 13th and 14th, and about 24 hours after signal was hoisted, numerous disasters occurred to vessels bound to this port, two of which went down only a few miles from the station. No vessels cleared while signal was flying;" and of storm of September 17, 18, and 19, 1874, he says, "Steamer Continental, for New York, left, but had to return. Storm did much damage in country."

The following extracts are given from the sergeant's semi-annual report for June 30, 1874:

During the May term of the court of common pleas, held in this city, while a legal case was pending, in which it was alleged that one party had released water from a sewer and inundated property of the other, the records of the station were brought into evidence. This testimony refuted a damaging argument against the complainant, that the overflow was due to a copious rain, showing that none had fallen, as stated.

Professor John Osborn, chief engineer of the Fair Haven Water Company, of this city, has devised some method of obtaining from the records of temperature and rain-fall the condition of the water in the company's reservoirs or lakes, which are situated about two miles distant from the station, on high hills. The professor calls at the office-rooms after nearly every rain-storm, and makes deductions from the observations. By request of the mayor, and after approval by the Chief Signal-Officer, a brief summary of the station-observations for 1873 was contributed to the city year-book for that year. This recapitulation was published in excellent form, and is regarded as comprising a very important item in the compilation.

The press-reports appear to have attracted considerable attention, as shown in several interviews had with the editors of two papers published here. The first informed me that the probabilities appeared "to be the most important item appearing in (his) our columns. In several instances, when telegraph was interrupted so that the probabilities could not be published, numerous communications have been received from our country subscribers calling attention to the omission. The paper appears to be incomplete without it." The second remarked that "Were it not for obtaining news from Washington, especially the 1 a. m. weather-report, we could not take, as we do at considerable expense, the night-telegrams of the American Press Association."

PUBLICATIONS.

Number of Form 22 issued during the year ending September 30, 1874	56
Number of local reports issued during the year ending September 30, 1874	1,194
Total	1,250

INSTRUMENTS ON STATION.

Three standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

NEW LONDON, CONN.

[*Official number*, 14.]

Latitude	41° 22′
Longitude	72° 9′
Mean barometer for year ending September 30, 1874	30 039
Mean temperature for year ending September 30, 1874	47°.7
Amount of rain-fall for year ending September 30, 1874	65.35 inches.

The office was moved December 1, 1863, to the upper floor of the custom-house, and is admirably located, being three squares from the

telegraph-office and four from the post-office. The roof of the building affords a good exposure for the display of cautionary signals. Sergt. T. O'Neill was in charge until June 29, 1874, when he was relieved and succeeded by Sergt. Geo. H. Crane, who still remains. All reports have been regularly and promptly made. There is one assistant at the station, who has been on duty during the whole year, and is reported to be a competent, reliable man. The station has been twice inspected during the year, and found in excellent condition on both occasions. Thirty-two cautionary signals have been displayed, of which twenty are reported as wholly verified and two partially verified. This station is on the New York and Eastport circuit, and receives five reports morning and afternoon and twenty-five at midnight.

PUBLICATIONS.

Number of bulletins issued during year ending September 30, 1874	6,545
Number of Form 15 (manifold) issued during year ending September 30, 1874	3,945
Number of Form 22 (manifold) issued during year ending September 30 1874	39
Total	10,529

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard water-thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

NEW ORLEANS, LA.

[*Official number*, 28.]

Latitude	29° 58′
Longitude	90° 07′
Mean barometer for the year ending September 30, 1874	30.073
Mean temperature for the year ending September 30, 1874	69°.5
Amount of rain-fall for the year ending September 30, 1874	67.98 inches.

The office remains in the custom-house. Sergt. Nelson Gorom continues in charge, and has given satisfaction by the regularity and accuracy of his reports. One assistant was called in, November, 1873, for promotion. One was relieved in January, 1874, for misconduct, and another in May, 1874, for discharge. There are now three assistants on duty, one of whom is a printer charged with the issue of farmers' bulletins.

The station was inspected in January, 1874, and found in good condition.

Six cautionary signals have been displayed, of which number three are reported as verified at the station.

Reports from fifteen stations are received each morning and midnight, and from twenty-eight stations each afternoon. In addition to these, reports are received from all the special river-stations during the season of high water.

The sergeant reports as follows:

The interest hitherto manifested in our reports continues to increase.

The addition of the eastern circuit, by which reports are received from the several stations throughout the cotton-growing regions, has been very favorably received by the cotton-brokers and those interested in the cotton-traffic. A lively interest is still manifested by that portion of our shipping community who navigate the Mississippi and its tributaries. Especially was this interest heightened during the high water of

the river last spring, when the importance of the knowledge of a rise or fall of an inch became general among the people of this State.

The river attained its highest recorded height on April 15 and 16, when it was six-tenths of a foot above high-water mark of 1871.

PUBLICATIONS.

Number of farmers' bulletins issued during the year ending September 30, 1874	18,690
Number of bulletins issued during the year ending September 30, 1874	11,564
Number of Form 26 issued during the year ending September 30, 1874	6,602
Number of Form 22 issued during the year ending September 30, 1874	53
Total	36,909

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-registerfor anemometer, two standard rain-gauges, one standard wind-vane.

NEW YORK CITY.

[*Official number*, 15.]

Latitude	40° 42′ 43″
Longitude	74° 00′ 03″
Mean barometer for year ending September 30, 1874	30.048
Mean temperature for year ending September 30, 1874	51°.4
Amount of rain-fall for year ending September 30, 1874	42.63 inches.

The location of the office at this station has not been changed since the date of last report. Sergt. C. R. Estabrook was in charge until January 29, 1874, when he was discharged at his own request. He was succeeded by Sergt. H. E. Cole, who still remains and attends to his various duties in a highly satisfactory manner. Sergt. M. F. Tighe is the senior assistant on duty, and has been conspicuously zealous in the performance of his duties. There are five other assistants on duty at present, of whom three are printers, charged with the issue of weather-maps and farmers' bulletins. Two assistants have been relieved during the year for misconduct, one for discharge, and five transferred to other stations. Six hundred and thirty-seven post-offices are furnished daily, except Sundays' with the farmers' bulletins, and the weather-maps have a large local circulation. They are now printed and distributed wholly by the office force, and the result is much more satisfactory than when other parties had charge of this duty.

The station was inspected in November, 1873, and in March, 1874, and on both occasions was found in excellent condition. Sergeant Estabrook left the service with an enviable reputation for faithfulness and zeal in the discharge of his official duties, and his successor has been equally fortunate in establishing such a reputation during the time he has been in charge. Thirty cautionary signals have been displayed, of which number twenty-one are reported as fully verified at the station. A large signal-lantern has been erected on the roof of the observatory building since last report, which shows a light visible from all parts of the harbor. It is lighted by electricity, which obviates the necessity of personal exposure on the roof for that purpose.

PUBLICATIONS.

Number of farmers' bulletins issued during year ending September 30, 1874	378,900
Number of maps issued during year ending September 30, 1874	87,294
Number of bulletins issued during year ending September 30, 1874	7,306
Number of Form 26 issued during year ending September 30, 1874	658
Number of Form 22 issued during year ending September 30, 1874	56
Total	474,214

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, two standard minimum thermometers, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, two standard anemometers, one double self-register for anemometer and anemoscope, one standard wind-vane, two standard rain-gauges.

NORFOLK, VA.

[*Official number*, 30.]

Latitude	36° 51′
Longitude	76° 19′
Mean barometer for year ending September 30, 1874	30.087
Mean temperature for year ending September 30, 1874	58°.4
Amount of rain-fall for year ending September 30, 1874	55.27 inches.

No change has been made in the location of the office, nor is any considered desirable at present. Sergt. E. W. McGann remains in charge, and has rendered all reports promptly. He is a fair telegraph-operator, and has given general satisfaction in his management of the station.

One assistant has been called in for promotion, three for misconduct, and one for discharge during the year.

Two assistants are required on account of the additional work imposed by the construction of the telegraph-line to Cape Hatteras.

Until September 1, 1874, the station formed the northern terminus of that line, and all telegrams were necessarily transferred here; since that date it has become a way-station merely on the circuit, but the men are required to practice several hours daily upon the line in addition to their regular station-duties. The station was inspected in December, 1873, and found in fair condition. Several irregularities were noted and corrected by the inspector.

All reports passing over the New York and Savannah circuit are received here, in addition to the reports from Cape Henry and Cape Hatteras, but only the local observations are printed in the newspapers.

Twenty-five cautionary signals have been displayed, of which nineteen are reported as fully verified, and two partly verified at the station.

Of storm of October 6, 7, and 8, 1873, the sergeant remarks, "Storm severe; the extent of the injury is not known; fourteen vessels have put in here disabled, having lost their anchors, masts, sails, &c.;" and of storm of October 27, 1873, "The Baltimore steamer while crossing to Portsmouth was so unmanageable on account of the high wind, that she ran several feet into her wharf. Three vessels delayed their departures;" and of storm of January 7 and 8, 1874, "Baltimore steamer unable to land at Old Point. No vessels attempted to leave during the display of signals;" and of storm of February 9 and 10, 1874, "No vessels left port during the display. A large number of vessels were driven into Hampton Roads on account of the violence of the storm outside." Of storm of March 31 and April 1 and 2, 1874, he reports: "This signal was fully justified; a heavy gale outside. A fleet of 200 sailing-vessels put into Hampton Roads and remained there until the signal was lowered."

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	2,936
Number of maps issued during the year ending September 30, 1874	1,421
Number of press-reports issued during the year ending September 30, 1874	740
Number of local reports issued during the year ending September 30, 1874	130
Number of Form 15 (manifold) issued during the year ending September 30, 1874	2,614
Number of Form 22 issued during the year ending September 30, 1874	33
Total	7,874

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

NORTH PLATTE, NEB.

[*Official number*, 105.]

Latitude	41° 8′ ?
Longitude	100° 53′ ?
Elevation of barometer above sea-level	2,846 feet.

This station was established by Corp. John R. Williams, (since promoted to sergeant,) and reports began September 18, 1864, being sent over the San Francisco and Chicago circuit, on which it is located.

The office is in the school-building, a fine structure recently completed, and is furnished free of rent through the liberality of the citizens, represented by the board of school directors. At present, access to the roof cannot be had, and the vane and anemometer are exposed temporarily on staffs near the building. The instrument-shelter is of the standard pattern, and the exposure a good one.

Sergeant Williams has received every courtesy from the citizens in establishing the station, and the thanks of the office are due them for their assistance. Sergeant Williams is a good telegraph-operator and a competent observer.

INSTRUMENTS ON STATIONS.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

OMAHA, NEB.

[*Official number*, 67.]

Latitude	41° 16′
Longitude	96° 00′
Mean barometer for year ending September 30, 1874	29.978
Mean temperature for year ending September 30, 1874	49°.7
Amount of rain-fall for year ending September 30, 1874	25.65 inches.

The office remains at the corner of Thirteenth and Farnam streets, and Sergt. Thomas Cleary continues in charge, with the same assistant who was on duty at date of last report. Both men are favorably mentioned by the inspecting officer, who visited the station in June, 1874, when it was found in excellent condition. Sergeant Cleary is a fair telegraph-operator. All reports have been forwarded regularly and promptly and in good form. Reports passing over the Chicago and San Francisco circuit are received here, and selections from them published in the local press.

The sergeant remarks in his semi-annual report that "Among those most interested in the reports are the commission-merchants, who receive and make consignments of game, fish, &c., in the cold months, when merchandise of the kind would be liable to injury by mild weather during transportation; also the railroad companies, who frequently send to this office for records of the weather for past months, in order to settle difficulties arising from delays and damage to freight in shipment, when such injuries are imputed to the weather."

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	8,005
Number of Form 22 issued during the year ending September 30, 1874	44
Total	8,049

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard maximum thermometer, one standard minimum thermometer, one standard water-thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

OSWEGO, N. Y.

[*Official number*, 31.]

Latitude	42° 28′
Longitude	76° 35′
Mean barometer for year ending September 30, 1874	30.014
Mean temperature for year ending September 30, 1874	46°.5
Amount of rain-fall for year ending September 30, 1874	41.22 inches.

No change has been made in location of office during the year. Sergt. B. F. Hough still continues in charge of station. Two assistants have been relieved during the year for misconduct. The present assistant has been on duty since March 31, 1874, and is favorably mentioned by the sergeant. The station was inspected in July, 1874, and was found in excellent condition. Sergeant Hough has been on duty here since the establishment of the station, and is officially commended by the chairman of the meteorological committee of the board of trade for the attentive and intelligent manner in which he has performed his duties. Nineteen cautionary signals have been displayed, of which eleven have been reported as verified at the station.

Referring to storm of October 20 and 21, 1873, the sergeant remarks: "One vessel left port before signal was displayed, and was obliged to return. One schooner was driven ashore in trying to make this harbor, and was, together with her cargo, an entire loss."

The inspecting officer reports that it is a general practice for the captains of vessels engaged in the lake-trade to consult the office records before leaving port.

PUBLICATIONS.

Number of maps issued during the year ending September 30, 1874	3,824
Number of bulletins issued during the year ending September 30, 1874	5,132
Number of press-reports issued during the year ending September 30, 1874	658
Number of local reports issued during the year ending September 30, 1874	624
Number of Form 22 issued during the year ending September 30, 1874	46
Total	10,284

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, two standard hygrometers, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

PECK'S BEACH, N. J.

[*Official number*, 117.]

Latitude	39° 11′
Longitude	74° 41′
Elevation of barometer above sea-level	20 feet.

The station was established December 10, 1873, by Sergt. John O. Barnes, who still remains in charge, and has given satisfaction. He has had an assistant since April 6, 1874. Both men are fair telegraph-operators. The office is located in the southern end of the life-saving building. The instrument shelter is of the standard portable form, and is fastened to the northeast end of the building, 1½ feet from the ground. The anemometer and wind-vane are placed on poles set in the ground. All the instruments are well exposed. The station is provided with a complete set of International signals, and the men are fully instructed in their use. The station is connected by telegraph, built by the Signal-Service, with the Western Union office at Seaville, and regular reports are sent, as from all the sea-coast stations. It will soon be placed in the same circuit with the other stations on the New Jersey coast, and report direct to the central office. The station was inspected in March, 1874, and found in excellent condition, so far as the work of the men was concerned. Communication with the mainland by telegraph is unreliable in winter, owing to the large masses of ice that drift through the small inlets between the beach and the main land. Sixteen cautionary signals have been displayed, of which ten are reported as fully verified at the station.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge, one small wind-vane.

PEMBINA, DAK.

[*Official number*, 86.]

Latitude	49° 00′
Longitude	97° 05′
Mean barometer for year ending September 30, 1874	29.967
Mean temperature for year ending September 30, 1874	34°.3
Amount of rain-fall for year ending September 30, 1874	12.79 inches.

No change has been made in the location of office and instruments since last report.

Sergt. Sidney Powell still remains in charge. Reports were made with regularity until the first of September, since which date those by mail have been interrupted, although the telegraphic ones have been received whenever the line was working.

The station was inspected in May, 1874, and found in good condition.

Sergeant Powell is a fair telegraph-operator, and sends his own reports.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard minimum thermometers, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one small wind-vane, one standard rain-gauge.

PITTSBURGH, PA.

[*Official number*, 41.]

Latitude	40° 32′
Longitude	80° 02′
Mean barometer for year ending September 30, 1874	30.017
Mean temperature for year ending September 30, 1874	52°.6
Amount of rain-fall for year ending September 30, 1874	44.26 inches.

The office remains in the First National Bank building, and is well located. Sergt. James B. Murray was relieved December 23, 1873, and succeeded by Sergt. D. O'Leary, who was in turn relieved February 28, 1874, by Sergt. George H. Rohe, who remains and gives full satisfaction. There are three assistants at present on duty, of whom two are printers, charged with the issue of the farmers' bulletins, which are supplied to 313 post-offices daily, except Sundays. All the men now on duty are hard-working and faithful. One assistant has been called in for promotion during the year, and three for misconduct. The station was inspected in December, 1873, and found in such bad condition that the sergeant in charge was at once relieved and reduced to the rank of a private soldier for neglect of duty. All reports passing over the Cincinnati and Washington circuit are received here, and published daily in the several newspapers.

PUBLICATIONS.

Number of farmers' bulletins issued during the year ending September 30, 1874	185,822
Number of bulletins issued during the year ending September 30, 1874	9,484
Number of Form 22 issued during the year ending September 30, 1874	90
Number of Form 26 issued during the year ending September 30, 1874	2,650
Total	198,046

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, two standard water-thermometers, one standard anemometer, one standard hygrometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

PIKE'S PEAK, COLO.

[*Official number*, 99.]

Latitude	38° 48′
Longitude	104° 59′

Sergt. George Boehmer was relieved from charge of this station October 20, 1873, for gross mismanagement, and succeeded by Sergt. Robert Seyboth, who remained until September 12, 1874, when he was relieved at his own request on account of ill-health caused by exposure, and transferred to another station where the work was less arduous. Sergt. William Phoedovius, his senior assistant, was promoted to the grade of sergeant and placed in charge of the station. Five assistants have been relieved during the year and assigned to duty elsewhere. Two assistants are now on the station, and will probably remain until next spring if the state of their health permits. All reports by mail have been regularly forwarded, and all by telegraph as regularly as the communication allowed. Sergeant Seyboth discharged his duties at this isolated station in the most satisfactory manner. The station was inspected in June, 1874, and found in good condition. As the house built for the men on the summit was found too small for their accommodation and the storage of necessary supplies, an addition has been made to it, and the condition of the men will be much more comfortable the ensuing winter than it was last season. The telegraph-line has been put in good repair, and it is hoped that communication will be maintained regularly hereafter between the summit and base. Full details of the daily life of the men on this station are given in the extracts from Sergeant Seyboth's journal, paper 6.

INSTRUMENTS ON STATION.

Three standard barometers, one standard thermometer, two standard minimum thermometers, two standard maximum thermometers, three standard hygrometers, four standard anemometers, one standard rain-gauge, one small wind-vane.

PHILADELPHIA, PA.

[*Official number*, 17.]

Latitude	39° 57′
Longitude	75° 10′
Mean barometer for year ending September 30, 1874	30.067
Mean temperature for year ending September 30, 1874	52°.5
Amount of rain-fall for year ending September 30, 1874	49.32 inches.

The office is located in the same building as at the date of last report, and is in the business heart of the city. A printing-room has been added on the ground floor of the building, which greatly increases the facilities for performing the station work, especially at night.

Sergt. W. T. Boyd was in charge until transferred to another station, September 12, 1874. He was succeeded by Sergt. Robert Seyboth, transferred here from Pike's Peak; Sergt. E. W. Boutelle is the senior assistant on duty, and was in temporary charge of station from the time Sergeant Boyd left until the arrival of his successor.

Two assistants have been called in for promotion during the year, seven relieved for misconduct, and one transferred to the central office. The station has been especially unfortunate in its assistants up to this date. There are six assistants now on duty, of whom two are printers, charged with the issue of maps and farmers' bulletins.

The issue of the bulletins began July 1, 1874, and 479 post-offices are supplied regularly. The station was inspected in September, 1874, and found in fair condition. Speaking of the sergeants on duty, the inspector remarks:

> Sergeant Boyd appears to have been very attentive to his office-work, but has evidently neglected the outside work. Sergeant Boutelle has attended to his work carefully and faithfully.

This is a telegraph-station, being on the line connecting the central office with the New Jersey coast, and two men are required to attend to this part of the work. 190 maps are printed daily, and distributed by a messenger employed by the Marine Board of Underwriters.

All reports passing over the New York and Savannah circuit are received here and bulletined in the usual manner. The local observations are published weekly by the Board of Health in excellent form.

PUBLICATIONS.

Number of maps issued during the year ending September 30, 1874	58,580
Number of farmers' bulletins issued during the year ending September 30, 1874	89,900
Number of bulletins issued during the year ending September 30, 1874	9,464
Number of press-reports issued during the year ending September 30, 1874	147
Number of local reports issued during the year ending September 30, 1874	27
Number of Form 15 (manifold) issued during the year ending September 30, 1874	4,027
Number of Form 22 issued during the year ending September 30, 1874	127
Number of Form 26 issued during the year ending September 30, 1874	156
Total	162,428

INSTRUMENTS ON STATION.

Three standard barometers, two standard thermometers, four standard minimum thermometers, one standard maximum thermometer, one

standard water-thermometer, one hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

PORT HURON, MICH.

[*Official number*, 103.]

Latitude	42° 58′
Longitude	82° 29′
Elevation of barometer above sea-level	630 feet.

The station was established July 14, 1874, by Sergt. N. D. Lane, who began reporting July 25, since which date there has been no interruption in the reports. The office is located in the southwest corner of the second story of the city-hall, and is within easy reach of the telegraph and post-offices and the principal business houses. The instrument-shelter is of the standard pattern, and is in the tower of the city-hall. The exposure for anemometer and wind-vane on the building is fair, and that of the rain-gauge good. Free use of the office-rooms and other required facilities is given by the city council. Cautionary signals are displayed from the staff on the city-hall, and are visible from all parts of the harbor. One signal only has been ordered here since the station was opened, and that is reported as fully verified. Reports from all lake stations are received here and published in the usual manner. The local press devotes a liberal amount of space to the service, and prints the reports in excellent form. There is one assistant on duty, and one has been found necessary at all cautionary stations, owing to the length of time that the office is held open daily.

INSTRUMENTS ON STATION.

One standard barometer, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge, one standard wind-vane.

PORTLAND, ME.

[*Official number*, 12.]

Latitude	43° 40′
Longitude	70° 14′
Mean barometer for the year ending September 30, 1874	29 942
Mean temperature for year ending September 30, 18774	44°.2
Amount of rain-fall for year ending September 30, 1874	42.23 inches.

The office was removed September 30, 1873, to Boyd's Block, corner of Middle and Exchange streets, and is located on the third floor.

Sergt. A. B. Williams was in charge until August 29, 1874, when he was called in for discharge, and succeeded by Sergt. A. R. Thornett, who still remains in charge. One assistant has been ordered in for promotion during the year; another instructed man was sent to replace him, and still remains.

The station was inspected in the latter part of February, 1874, and found in fair condition only. Since February 4, 1874, reports from five other stations are received here in the morning and afternoon, and from twenty-five at midnight.

Thirty-two cautionary signals have been displayed, of which twenty-five are reported as verified at the station.

Relative to the storm of October 7, 1873, the sergeant remarks: "No damage reported, but the heaviest sea known for years." Of storm of

October 20 and 21, 1873: "New York and Boston steamers remained in. Saint John's steamer, coming to this place, encountered gale and was damaged." Of storm of November 17, 18, and 19, 1873: "Steamers and vessels remained in; those at sea sustained considerable damage; one of the severest storms at sea for years." Of the storm of April 29, 30, and May 1, 1874: "Schooner H. A. Chase set sail while signals were flying, and sunk in sight of all, a short distance outside of harbor, with the loss of all hands."

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	3,729
Number of Form 25 (manifold) issued during the year ending September 30, 1874	805
Number of Form 22 issued during the year ending September 30, 1874	53
Total	4,587

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, two standard anemometers, one self-register to anemometer, one standard rain-gauge, one standard wind-vane.

PORTLAND, O.

[*Official number*, 74.]

Latitude	46° 30′
Longitude	122° 27′ 30″
Mean barometer for year ending September 30, 1874	30.083
Mean temperature for year ending September 30, 1874	52°.8
Amount of rain-fall for year ending September 30, 1864	43.69 inches.

The office was moved December 22, 1873, to its present location, at the southwest corner of Washington and Front streets. It is on the upper floor of a three-story building, with a good roof-exposure for the wind-vane and anemometer, and a northern exposure for the instrument-shelter. It is in the business portion of the city, near the public offices and buildings. Sergt. J. E. Evans remains in charge, with the same assistant who was on duty at last report. Both men are highly commended by the inspecting-officer, who visited the station in August, 1874. There has been occasional delay in forwarding mail reports, but the telegraphic ones have been sent promptly and regularly when the line was in working order. The sergeant reports as follows in reference to the interest manifested in the service: "The public interest in the service has increased greatly within the last year, as it is considered of great advantage to the State that three reports daily are telegraphed from this city and bulletined in all the eastern cities where stations are established, thereby giving the people of other States an opportunity to know that the climate of Oregon is mild, and does not have as much rain-fall as is generally supposed."

The inspector reports as follows on the condition of the station: "The office-rooms, instruments, books, records, &c., are in first-class condition. All records are up to date, letters properly indorsed and filed, circulars and orders clean, and neatly filed." The daily papers publish all local reports and the monthly means and weather review.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard minimum thermometers, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, two small wind-vanes.

PUNTA RASSA, FLA.

[*Official number*, 59.)

Latitude	26° 29′
Longitude	82° 10′
Mean barometer for year ending September 30, 1874	30°.087
Mean temperature for year ending September 30, 1874	73°.5
Amount of rain-fall for year ending September 30, 1874	44.45 inches.

No change has been made in the location of the office since date o last report. Sergt. M. J. Shanefelter remains in charge. All reports have been made satisfactorily and as promptly as the somewhat imperfect mail and telegraphic facilities would permit. Private E. K. Moore who was on duty as assistant, died October 18, 1873, at Key West' where he had been sent for proper medical treatment. He was an intelligent, faithful man, steady in his habits, and prompt in the discharge of duty. The present assistant has been on duty since December 9, and has given satisfaction.

The following report of the cyclone of October 6 and 7, 1873, is given in the words of Sergeant Shanefelter:

During the afternoon of the 5th the barometer fell steadily and constantly, reaching 29.77 by midnight. Fresh, increasing to brisk winds from the east. Upper clouds hidden; lower stratus and nimbus moving rapidly with the surface-winds. On the 6th, barometer continued to fall rapidly, accompanied with four-quarter cirro-stratus clouds, moving slowly from the south.

Nimbus (scud-clouds) arose from the east after 8 a. m., moving rapidly with the surface-winds; light drizzly rain falling at short intervals; wind from the southeast and east, brisk velocity, and rapidly increasing to high. After 10 a. m., barometer began to fall more and more rapidly; upper clouds becoming hidden, scud-clouds, nimbus, and stratus flying very low and rapidly with the surface-winds; vane very unsteady; wind fluctuating between the points east and southeast, and rapidly increasing in velocity; drizzly rain continuing to fall at intervals.

After 4 p. m. heavy rain fell, (during ten minutes;) blowing at sixty-four miles per hour from the southeast, sweeping all before it; barometer 29.10, and falling with great rapidity; top part of anemometer blown off and disappeared; water 11 feet above mean tide; all land flooded, even the highest points; sea very rough, waves 10 feet high in harbor. Wind from the southeast and south, with velocity increasing to about seventy-five miles per hour, until about 8.45 p. m. Barometer 28.83 at 6.10 p. m., 28.63 at 7.15, 28.57 at 7.43, 28.43 at 8.25, and 28.40 at 8.45 p. m., when the wind lulled and barometer began to rise rapidly, very suddenly; wind north (having shifted by the west) at 9 p. m., and barometer having risen to 28.56. Suddenly, shortly after 9 p. m., began blowing from the northwest with fearful velocity, increasing to about ninety miles per hour, (and accompanied with heavy fall of rain during about fifteen minutes.)

After 11 p. m. began blowing more steady, and rain fell at longer intervals. Water 14 feet above mean tide at 9 p. m. Barometer still rising on the 7th, and wind decreasing in velocity, and a little drizzling rain falling at intervals. Began clearing up after 2.15 a. m. Sky almost entirely clear by 5 a. m.; wind brisk and from the northwest. At 6 a. m. wind from the north and fresh; fair but very cool, temperature having fallen to 66°.

DAMAGES.

Signal service: Total loss of two broken chairs, stove and fixtures, dipper, water-bucket, wash-basin, fire-shovel, wall-tent and fly, one-fourth ton of coal, cord of wood, ax and helve, hatchet and helve, lumber forming frame of wall-tent, and top part (cups and arms) of anemometer, all swept away by the sea.

Personal: Wearing-apparel, bed-clothes and provisions, valued at $100, swept away by the sea.

Telegraph company: Wharf and cattle-pen swept away, cistern damaged; also building, amounting in all to $1,500.

Manager telegraph-office: Hogs and chickens drowned and wearing-apparel much damaged—$150.

Joseph Sawyer, (Punta Rassa:) Clothes, chickens, and small building lost—$150.

Señor Antonio, (Punta Rassa:) Clothes, provisions, small building, and other articles lost; also boat damaged—$300.

Smack Minnie, with cargo of fish, ashore near El Esterro River, six miles from Punta Rassa; can be got off. Damages: Mast cut out, fish entire loss—$2,000.

El Esterro fishery entirely destroyed—$1,000.

Small-boat (name unknown) capsized and lost, crew saved, two miles from Punta Rassa—$700.

Schooner Beauregard high and dry ashore on Sinabel Island, two and a quarter miles southwest from Punta Rassa; can be got off—$500. Not injured.

Steamer Huntress sunk by Sinabel Island, two and a quarter miles southwest from Punta Rassa. Total loss, with cargo aboard—$30,000.

Dr. Hunter, Sinabel Island: Loss of buildings, lumber, provisions, boats, &c.—$75,000.

Captivo, Punctillio-Blanco, and Gasparral fisheries. Total loss, $3,000.

The United States revenue-cutter Northern was at Punta Rassa during the whole of the cyclone, had four anchors out, and kept full head of steam. Not damaged; stood it splendidly, but tried her very much. No lives known to be lost about here. Several houses blown down at Fort Myers.

The station was inspected in January, 1874, and found in excellent condition so far as records and men were concerned.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

ROCHESTER, N. Y.

[*Official number*, 32.]

Latitude	43° 08′
Longitude	77° 51′
Mean barometer for the year ending September 30, 1874	29.991
Mean temperature for the year ending September 30, 1874	46°.5
Amount of rain-fall for the year ending September 30, 1874	47.17 inches.

The office still remains in Power's Block, and is satisfactorily located. Sergt. F. M. M. Beall was in charge of station until August 17, 1874, when he was transferred to the central office and succeeded by Sergt. L. E. Sebree. Both sergeants have given satisfaction by the promptness and regularity of their reports. One assistant was called in for promotion during the year. At present there are two assistants on duty, the work having recently been found too arduous for a single one. The station was inspected in July, 1874, and everything found in excellent condition, the instruments being in good order and well cared for, the reports, &c., also being well kept up, and posted in a very prompt manner. Nineteen cautionary signals have been displayed, of which fourteen are reported as verified at the station. Of one of the storms for which signals were displayed, that of October 20, 1870, the sergeant remarks:

The storm was accompanied by a heavy rain and northerly wind, making it very dangerous for south coastwise vessels, of which a number are reported wrecked. Rain-storm lasted sixty and a half hours.

During the past half-year the sergeant has been summoned before the different local courts with weather records to give information bear-

ing on cases pending nine different times, and it has been considered that the information obtained from the records had more or less influence in the result of each case.

PUBLICATIONS.

Number of bulletins issued during year ending September 30, 1874	7,009
Number of press-reports issued during year ending September 30, 1874	1,388
Number of maps issued during year ending September 30, 1874	4,085
Number of Form 15 (manifold) issued during the year ending September 30, 1874	4,903
Number of Form 22 (manifold) issued during the year ending September 30, 1874	201
Total	17,586

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard minimum thermometers, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

SALT LAKE CITY, UTAH.

[*Official number*, 70.]

Latitude	41° 10′
Longitude	112° 00′
Elevation of barometer above sea-level	4,350 feet.

The station was established March 19, 1874, by Sergt. S. W. Beall, and took the place of Corinne station, abandoned on that date.

The office is located at the southeast corner of East Temple and First South streets, on the upper floor of the building. The roof-exposure for instruments is a good one, and the instrument-shelter is well built and properly placed.

The rod of the wind-vane passes through the roof and registers on the ceiling of the office. Sergeant Beall was transferred to another station June 30, 1874, and succeeded by Sergt. W. B. Webster, who still remains. One assistant has been called in during the year for promotion. The present assistant is favorably mentioned for attention to duty. The station was inspected in August, 1874, and found in fair condition.

All reports passing over the Chicago and San Francisco circuit are received here and published by the daily press.

PUBLICATIONS.

Number of bulletins issued from March 19, 1874, to September 30, 1874	620
Number of press-reports issued from March 19, 1874, to September 30, 1874	274
Number of Form 22 issued from March 19, 1874, to September 30, 1874	21
Number of local reports issued from March 19, 1874, to September 30, 1874	77
Total	992

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

SAN DIEGO, CAL.

[*Official number*, 75.]

Latitude	32° 44′ 41″
Longitude	117° 08′ 00″
Mean barometer for the year ending September 30, 1874	30.017
Mean temperature for the year ending September 30, 1874	59°.9
Amount of rain-fall for the year ending September 30, 1874	15.10 inches.

No change has been made in the location of office since last report, and Sergt. J. B. Wells continues in charge. All reports have been made regularly and satisfactorily. Owing to the ill-health of Sergeant Wells it was found necessary in March, 1874, to send an assistant to the station to guard against any interruption of the reports. The station was inspected in September, 1874, and found in excellent condition. The citizens manifest considerable interest in the working of the office, and the daily newspapers print the local reports in full.

PUBLICATIONS.

Number of press-reports issued during the year ending September 30, 1874	804
Number of local reports issued during the year ending September 30, 1874	346
Number of Form 22 issued during the year ending September 30, 1874	12
Total	1,162

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, two standard rain-gauges.

SANDY HOOK, N. J.

[*Official number*, 112.]

Latitude	40° 28′
Longitude	74° 01′
Elevation of barometer above sea-level	23 feet.

The station was established December 10, 1873, by Sergt. John R. Williams, who remained in charge until July 20, 1874, when he was succeeded by Sergt. J. J. Nanry. One assistant was called in for reported misconduct September 2, 1874, and another man sent to replace him Both men on duty are fair telegraph-operators.

The office was located in Life-Saving Station No. 1 until May 29, when it was removed to a more desirable position in the building of the Engineer Corps, formerly occupied by the commanding-officer of the forces employed in constructing a fort at that point, where the exposure for instruments and the facilities for displaying signals are greatly improved.

The station is supplied with a complete outfit for using International signals, and is in direct telegraph communication with the central office.

Eighteen cautionary signals have been displayed during the year, of which number twelve are reported as fully verified at the station. The station was inspected in March, 1874, before its removal from its original location, and found in good condition, so far as the office records and internal management were concerned.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

SAN FRANCISCO, CAL.

[*Official number*, 29.]

Latitude	37° 47′ 35″
Longitude	122° 26′ 15″
Mean barometer for the year ending September 30, 1874	30.022
Mean temperature for the year ending September 30, 1874	55°.5
Amount of rain-fall for the year ending September 30, 1874	24.67 inches.

The location of the office remains as at last report, and cannot well be improved. Sergt. W. B. Webster was in charge until transferred to another station, June 30, 1874, when he was succeeded by Sergt. S. W. Beall. No change has been made in the assistants during the year. All reports have been made regularly and satisfactorily. The station was inspected in August, 1874, and found in excellent condition. The only reports received here are those passing over the Chicago and San Francisco circuit, and only the local observations are published by the daily press.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	2,216
Number of Form 22 issued during the year ending September 30, 1874	46
Total	2,262

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, two standard rain-gauges.

SANTA FÉ, N. MEX.

[*Official number*, 69.]

Latitude	35° 41
Longitude	106° 10′
Mean barometer for year ending September 30, 1874	29.772
Mean temperature for year ending September 30, 1874	48°.8
Amount of rain-fall for year ending September 30, 1874	15.80 inches.

No change has been made in the location of the office during the year. Sergt. John P. Clum was ordered in, December 15, 1873, for discharge, and was succeeded by Sergt. William McElroy, who still remains in charge. The mail-reports from this station have been forwarded with regularity since Sergeant McElroy assumed charge, but the telegraphic reports have been irregular, owing to frequent interruptions in the communication between Santa Fé and Pueblo. The station has not been inspected since last report.

PUBLICATIONS.

Number of morning press-reports issued during the year ending September 30, 1874	221
Number of Form 22 issued during the year ending September 30, 1874	8
Total	229

INSTRUMENTS ON STATION.

Two standard barometers, three standard thermometers, three standard minimum thermometers, two standard maximum thermometers, one standard hygrometer, one standard anemometer, one self register for anemometer, one standard rain-gauge, one standard wind-vane.

SAVANNAH, GA.

[*Official number*, 22.]

Latitude	32° 05′
Longitude	81° 08′
Mean barometer for year ending September 30, 1874	30.106
Mean temperature for year ending September 30, 1874	65°.9
Amount of rain-fall for year ending September 30, 1874	63.14 inches.

The office remains at the corner of Bull and Bay streets, and the location could not be improved for the exposure of instruments and the display of signals. Sergt. J. O. Manson was transferred to another station February 25, 1874, and succeeded by Sergt. W. S. Popple, who continues in charge, and under whose energetic management the usefulness of the station has been largely increased. One assistant has been called in for promotion and one for misconduct during the year. Two assistants are now on duty, and are necessary for the proper performance of the station-work. Sergeant Popple is a fair telegraph-operator. Reports from the Florida and West Indian stations are transferred here to the New York circuit, of which this station is the southern terminal. All reports passing over the circuit are received here, and published in creditable form by the newspapers. The station was inspected in December, 1873, and found in good condition. Six cautionary signals have been displayed, of which four are reported as fully verified at the station.

The sergeant reports that the committee appointed by the Chamber of Commerce has rendered valuable service in connection with the management of the station. They have also aided in many other important matters, which have tended to bring the station into intimate relations with the business circles of the place, which had not before then been the case. Since the 1st of May, 1874, reports from the Mississippi Valley have been received at this station. These reports were urgently sought for by, and furnished at the request of, the members of the Chamber of Commerce, the Cotton Exchange, and other leading and influential citizens of Savannah.

To further the shipping and mercantile interest by aiding in the display of cautionary signals, at the urgent request of leading merchants and shippers, the members of the Chamber of Commerce and Cotton Exchange, a station has recently been established at Tybee Island, eighteen miles down the river on the coast. This island being the point at which nearly all vessels for this port receive waiting and sailing orders, the importance of the station is great, and the community strongly approve of it, and say that it has largely increased the safety of their marine interests and added to the safety and value of their port.

PUBLICATIONS.

Number of maps issued during year ending September 30, 1874	4,003
Number of bulletins issued during year ending September 30, 1874	6,950
Number of press-reports issued during year ending September 30, 1874	319
Number of local reports issued during year ending September 30, 1874	616
Number of Form 22 issued during year ending September 30, 1874	55
Total	11,943

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

SHREVEPORT, LA.

[*Official number*, 72.]

Latitude	32° 30′
Longitude	93° 45′
Mean barometer for year ending September 30, 1874	30.050
Mean temperature for year ending September 30, 1874	66°.2
Amount of rain-fall for year ending September 30, 1874	63.08 inches.

No change has been made during the year in the location of the office. Private J. G. Lynch was in charge of station alone from the death of Sergeant Coyle until November 24, 1873, when Sergt. James O'Dowd was assigned to the station. Private Lynch attended to the work faithfully and steadily, and all reports were promptly forwarded. Sergeant O'Dowd has been in poor health a portion of the time, and his reports in consequence have been delayed. Private Lynch was called in for promotion in July, and his successor was relieved for misconduct after a month's duty. The present assistant is favorably mentioned for attention to duty. The station was inspected in February, 1874, and found in fair condition. The river-gauge constructed last year has been washed away and is not yet replaced. Reports from other stations are not received here, but the local reports are regularly published in the local press.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard water-thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

SPRINGFIELD, MASS.

[*Official number*, 110.]

Corporal John G. Murray has remained in charge during the whole year, and performed his duties satisfactorily and promptly. Observations are not made at this station, the work being limited to the printing and distribution of farmers' bulletins. Eighty-six offices are supplied with two copies daily, except Sundays. Since last report 46,034 bulletins have been distributed. The Synopsis and Probabilities are received from Washington at 12.45 a. m., and the average time of mailing the printed copies has been 3.30 a. m. The office remains in the Republican building, and was inspected in February, 1874, and found in excellent condition.

SQUAN BEACH, N. J.

[*Official number*, 114.]

Latitude	40° 08′
Longitude	74° 01′
Elevation of barometer above sea-level	23 feet.

The station was established, December 10, 1873, by Sergt. D. M. Kennedy, who still remains in charge, with one assistant. Both men are fair telegraph-operators, and thoroughly competent to perform their duties. One assistant was relieved in July, for misconduct. The office is on the second floor of the life-saving station, and is of the same general character as at the stations on the coast already described. The instrument-shelter is of the standard portable pattern and elevated four feet from the ground. The anemometer and wind-vane are on poles erected near the building and well exposed. A complete set of International signal-flags is at the station, and the men are instructed in their use. Ten cautionary signals have been displayed, of which eight are reported as verified at the station. The office is in direct telegraphic communication over the signal-line with the central office, and reports regularly all passing shipping and all disasters to vessels in addition to the usual meteorological observations. The station was inspected in March, 1874, and found in good condition.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one small wind-vane, one standard rain-gauge.

SAINT LOUIS, MO.

[*Official number*, 66.]

Latitude	38° 37′ 28″
Longitude	90° 15′ 16″
Mean barometer for year ending September 30, 1874	30.050
Mean temperature for year ending September 30, 1874	56°.1
Amount of rain-fall for year ending September 30, 1874	42.93 inches.

The office remains in the building of the Saint Louis Life-Insurance Company, at the corner of Sixth and Locust streets, and is admirably located.

Two rooms are occupied, one as an office and the other as a printing-room, the latter being furnished free of cost by the insurance company. Sergt. E. H. Singleton was relieved from charge of the station October 2, 1873, and succeeded by Sergt. W. O. Bailey, who had been on duty as senior assistant for some months previously. He was transferred to another station January 29, 1874, and Sergt. S. S. Bassler left in charge until May 27, 1874, when he was relieved for irregular conduct, and succeeded by Sergt. George Prender, who still remains and manages the station satisfactorily.

Numerous changes in the assistants have been made during the year for various reasons, but it is believed that the present force is composed of steady, reliable men. One assistant has been called in for promotion, four transferred to duty elsewhere, two called in for discharge, and three relieved for misconduct. At present there are six assistants on

duty, and complaint is made that the amount of work done is too great for this force. Three of the men are printers, charged with the issue of maps and farmers' bulletins; 468 post-offices are supplied daily with the bulletins, and the maps are distributed to most of the prominent public places in the city. Corporal Fleming is the senior assistant. The station was inspected in March, 1874, and again in September, 1874. At the first inspection matters were found in a very unsatisfactory condition, and several changes in the working-force were made with good results. At the second inspection, the officer reports very favorably of the appearance of the office and records, and compliments Sergeant Prender for his zeal and general attention to duty. His monthly reports to the central office have been made out with especial care and neatness. Referring to the public interest in the working of the office, the sergeant says:

All classes of people in this city appear to be deeply interested in the work of the signal service, and business men are more or less governed by the daily predictions.

Tourists include this office among the places worthy of inspection and examination; strangers of note frequently call; pleasure parties appoint committees to consult the observer; parents bring their sons here to receive their first instructions in meteorology; scientific gentlemen compare their observations with the official records. Indirectly the value of property is determined here, for no important sale occurs until the signal-office is consulted in regard to the weather. Invalids needing the invigorating influence of the open air ask advice. To insurance agents the probabilities and bulletins are indispensable. Parties contemplating a change of residence hasten or postpone the transfer of goods in the faith of the Signal Bureau.

Through the instrumentality of this service the artist determines in advance his patronage and profits; the hearts of the little ones pic-nic bent beat high or low; none are free from its influence.

The daily newspapers devote a liberal amount of space to the publication of reports daily and monthly, and give them in excellent form. All reports passing over the Chicago and Cincinnati circuit are received here, and those from stations to the west and southwest are transferred to the central office.

PUBLICATIONS.

Number of farmers' bulletins issued during the year ending September 30, 1874	413,342
Number of bulletins issued during the year ending September 30, 1874	12,037
Number of maps issued during the year ending September 30, 1874	53,731
Number of local reports issued during the year ending September 30, 1874	927
Number of Form 22 issued during the year ending September 30, 1874	318
Number of Form 26 issued during the year ending September 30, 1874	3,106
Total	483,461

INSTRUMENTS ON STATION.

Two standard barometers, one standard thermometer, one standard maximum thermometer, one standard minimum thermometer, two standard water thermometers, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

SAINT MICHAELS, ALASKA.

[*Official number*, 119.]

Latitude	63° 48′
Longitude	162° 10′

Private Lucien M. Turner was ordered, March 18, 1874, to proceed to this point to open a station of observation. He left San Francisco in April, fully provided with all necessary instruments and other supplies. He reports his arrival here on May 25, after a passage of 38 days from

San Francisco, with all instruments in good condition except one barometer, which was accidently broken. An instrument-shelter has been constructed as nearly of the standard pattern as the facilities of the place would allow, and the anemometer, wind-vane, and rain-gauge are well exposed.

Detailed reports from this station cannot be received until the summer of 1875.

In addition to meteorological observations, Private Turner is instructed to make a collection of specimens in natural history for scientific purposes.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, three standard minimum thermometers, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge.

SAINT PAUL'S ISLAND, ALASKA.

[*Official number*, 120.]

Latitude	57° 38′
Longitude	169° 50′
Elevation of barometer above sea-level	unknown.

Private C. P. Fish remains in charge, and his full reports to July 4, 1874, have been received at the central office. As he can only communicate once a year, the amount of material requires more time for examination and discussion than has elapsed since its receipt. The following abstract of the records from June 1, 1873, to May 30, 1874, contains the leading facts, and will be interesting as an authentic exhibit of the climate of Behring's Sea:

Abstract of meteorological records for the months from June, 1873, to May, 1874, inclusive.

ISLAND OF SAINT PAUL, BEHRING SEA.

Month of record.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.
Mean of barometer corrected	29.814	29.934	29.894	29.588	29.326	29.492	29.442	29.546	29.734	29.862	29.702	29.735
Maximum of barometer	30.25	30.18	30.22	30.15	30.19	30.24	30.35	30.86	30.64	30.50	30.18	30.24
Minimum of barometer	29.33	29.35	28.89	28.94	28.30	28.62	28.61	28.62	28.83	28.91	29.20	28.68
Monthly range of barometer	.92	.83	1.33	1.21	1.89	1.62	1.74	2.24	1.81	1.59	.98	1.56
Greatest daily range of barometer	.51	.45	.97	.63	.97	.64	1.08	.63	.94	.94	.53	.71
Least daily range of barometer	.02	.03	.03	.02	.02	.02	.08	.08	.06	.04	.95	.04
Mean daily range of barometer	.147	.152	.204	.235	.305	.253	.399	.263	.348	.296	.189	.198
Mean of exposed thermometer	37°.47	42°.98	46°.55	43°.05	37°.85	32°.37	29°.95	29°.86	33°.55	33°	34°.51	38°.96
Maximum of thermometer	47°	52°	55°	49°	46°	41°	40°	37°	40°	42°	45°	52°
Minimum of thermometer	28°	36°	39°	35°	31°	23°	12°	8°	19°	19°	21°	25°
Monthly range of thermometer	19°	16°	16°	14°	15°	18°	28°	29°	21°	23°	24°	27°
Mean on warmest day of thermometer	42°	46°	49°	46°	43°.5	39°	38°.5	35°	38°	38°.5	40°	45°
Mean on coldest day of thermometer	33°	39°	42°	39°	33°	26°	15°	16°	25°	24°.5	24°.5	31°
Greatest daily range of thermometer	16°	13°	12°	9°	10°	11°	19°	19°	15°	16°	11°	14°
Least daily range of thermometer	3°	3°	2°	2°	1°	1°	1°	1°	2°	2°	1°	3°
Mean of maxima of thermometer	41°.50	46°.13	49°.61	45°.60	39°.9	34°.37	33°.55	32°.94	35°.57	35°.74	37°.63	43°.61
Mean of minima of thermometer	33°	39°.68	43°.32	40°.50	35°.8	30°.37	26°.35	26°.77	31°.54	30°.26	31°.40	35°.06
Mean daily range of thermometer	8°.5	6°.45	6°.29	5°.10	4°.1	4°.00	7°.20	6°.17	4°.03	5°.48	6°.23	8°.55
Mean relative humidity	87.06	89.81	89.44	89.04	84.51	86.57	83.47	86.95	87.37	84.04	89.39	77.41
Maximum relative humidity	100.	100.	96.	100.	95.	100.	.95.	100.	100.	100.	94.	91.
Minimum relative humidity	67.	75.	67.	65.	61.	68.	55	68.	68.	68.	52.	53.
Prevailing wind	E.	S.	S.	S. E.	N. W.	N.	S.	E.	S.	W.	S. E.	N. E.
Number of miles traveled by wind	14.387	11.587	12.075	11.055	15.010	12.972	16.998	15.174	11.251	13.303	11.047	8.450
Mean daily velocity of wind	47.96	373.8	389.5	368.5	484.2	432.4	548.3	489.5	401.8	429.1	368.2	352.1
Mean hourly velocity of wind	19.98	15.57	16.23	15.35	20.17	18.02	22.85	20.40	16.70	17.88	15.34	11.36
Maximum hourly velocity of wind	40	46	62	76	77	61	71	54	53	46	42	38
Proportion of cloudiness, (Form 4)	86.9	96.4	95.2	83.1	89.9	82.9	82.3	83.78	80.5	83.2	83.6	76.1
Proportion of fog	26.7	50.2	48.9	20.5	8.1	9.4	0.	2.5	12.8	9.6	2.8	12.1

Prevailing cloud, (not including fog:) June, cirrus stratus; July, cirrus compounds; August, cirrus compounds; September, cumulus; October, cirrus compounds; November, cumulus; December, cirrus compounds; January, cirrus; February, cirrus compounds; March, cirrus; April, cumulus; May, cumulus.

	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.
Amount rain-fall in inches	0.50	2.65	2.61	2.64	3.89	3.61	5.60	3.23	5.33	3.06	.84	.58
Greatest daily amount rain-fall	.24	.78	.67	.44	.86	.53	1.15	.84	1.26	.47	.31	.15
Amount melted hail and snow, (included in rainfall)	.15	.00	.00	.00	.62	2.16	3.12	2.03	2.84	1.52	.65	.34
Number of days on which precipitation occurred	21	25	26	27	31	30	30	31	28	30	29	21
Number of days on which rain fell	15	25	26	27	24	18	20	23	23	20	20	17
Number of days on which hail or snow fell	9	0	0	2	18	25	28	24	20	26	25	15

INSTRUMENTS ON STATION.

Two standard barometers, four standard thermometers, two standard maximum thermometers, two standard minimum thermometers, two standard hygrometers, two standard anemometers.

SAINT PAUL, MINN.

[*Official number*, 39.]

Latitude	44° 53′
Longitude	93° 05′
Mean barometer for year ending September 30, 1874	29.955
Mean temperature for year ending September 30, 1874	42°.6
Amount of rain-fall	33.42 inches.

No change has been made in the location of the office since last report. Sergt. H. E. Cole was transferred to another station January 29, 1874, and succeeded by Sergt. W. O. Bailey, who still remains and has given satisfaction. The same assistant who was on duty at last report still remains.

The station was inspected in May, 1874, and found in good condition.

The following extract is given from the sergeant's semi-annual report:

Capt. John H. Raney, agent Northwestern Packet Company, regards these reports with decided esteem and unlimited confidence. When required to estimate the tariff on freights to and from points throughout the Mississippi, Missouri, and Ohio Valleys, our reports are referred to as the only bases by which an accurate estimate can be arrived at. These reports are also used very extensively in another direction. Lumber-merchants, who are interested in valuable and extensive shipments of rafted logs from Stillwater and other points on the upper Mississippi, watch and accept our reports as the only reliable authority by which they may properly govern their shipments. This information was brought to my notice by Mr. W. H. Clark, a prominent citizen and lumber-merchant of Saint Louis, who is at present managing his business interests in this section of the country, and frequently visits the office to obtain information, which your sergeant is enabled to furnish.

This is only one example of numerous other cases, which illustrate the increasing popularity and influence of the signal-service reports.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	1,978
Number of press-reports issued during the year ending September 30, 1874	651
Number of Form 26 issued during the year ending September 30, 1874	1,808
Number of Form 22 issued during the year ending September 30, 1874	88
Total	4,525

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain-gauge.

THATCHER'S ISLAND, MASS.

[*Official number*, 125.]

Latitude	42° 36′
Longitude	70° 34′

This station was established September 3, 1874, for the display of cautionary signals only, and is not supplied with instruments. It is connected with the mainland and the Western Union Telegraph office

in Rockport by cable and a short land-line built by the Signal Service. A flag-staff for displaying signals has been erected, but quarters for the man in charge have not yet been secured. Private Edmund Davis is on duty, and is a fair telegraph operator.

TOLEDO, OHIO.

[*Official number*, 35.]

Latitude	41° 40′
Longitude	83° 32′
Mean barometer for year ending September 30, 1874	30.021
Mean temperature	51°.0
Amount of rain-fall	32.53 inches.

No change has been made in the location of the office at this station since last report. Sergt. J. E. Cook remains in charge, and has performed his duties in a satisfactory manner. He was absent with permission during the month of December, 1873, and Sergt. S. B. Lum attended to the station-work until his return. One assistant was promoted during the year and assigned to the charge of another station. Two assistants are now on duty. The station was inspected in July, 1874, and everything found in good condition. Twenty-two cautionary signals have been displayed, of which fifteen are reported as wholly verified and three as partly verified at the station. Since February 4, 1874, reports have been received here from fifty other stations in the morning and afternoon, and from seventy stations at midnight.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	5,069
Number of maps issued during the year ending September 30, 1874	3,144
Number of press-reports issued during the year ending September 30, 1874	335
Number of Form 15 (manifold) issued during the year ending September 30, 1874	2,426
Number of Form 22 issued during the year ending September 30, 1874	42
Total	11,016

INSTRUMENTS ON STATIONS.

Two standard barometers, two standard thermometers, one standard water-thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one double self-register for anemometer and anemoscope, one standard wind-vane, one standard rain-gauge.

TYBEE ISLAND, GA.

[*Official number*, 121.]

Latitude	32° 00′
Longitude	80° 52′
Elevation of barometer above sea-level	28¼ feet.

This station was established June 11, 1874, by Sergt. Hugh R. Stockman, who still remains in charge and has no assistant. The office is located in a one-story building 150 feet from the beach. Regular observations are made and mailed weekly to the central office, and tri-daily synchronous reports are telegraphed regularly to Savannah at the request of the merchants of that city, and free of cost to the Government. The station is designed especially for the display of cautionary

signals, and will undoubtedly be useful to the shipping of Savannah for this reason. A severe storm visited the station September 28, 1874, of which the sergeant remarks: "Instrument-shelter carried six feet toward the west. * * The gardens of the Tybee light-station and all low portions of the island flooded with salt-water. Boat-houses of Tybee Telegraph Company, Tybee light-station and private parties destroyed, and their boats washed from 50 to 100 feet above high-water mark. Verandas, fences, &c., knocked down."

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, two standard hygrometers, two standard anemometers, one small wind-vane, one standard rain-gauge.

VICKSBURGH, MISS.

[*Official number*, 61.]

Latitude	32° 23′
Longitude	90° 54′
Mean barometer for year ending September 30, 1874	30.121
Mean temperature for year ending September 30, 1874	66°.5
Amount of rain-fall for year ending September 30, 1874	65.24 inches.

No change has been made in the location of the office during the year, and Sergt. John Dascomb remains in charge, with one assistant. Two assistants have been relieved, one for promotion and the other for misconduct. The station was inspected in January, 1874, and found in fair condition. All reports passing over the New Orleans and Cincinnati circuit are received here, and selections from them published in the daily newspapers. Considerable interest is taken in the reports by the medical fraternity, and also by the citizens engaged in the river trade.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	1,680
Number of Form 26 issued during the year ending September 30, 1874	1,941
Number of Form 22 issued during the year ending September 30, 1874	34
Total	3,655

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, two small wind-vanes.

VIRGINIA CITY, MONT.

[*Official number*, 77.]

Latitude	45° 20′
Longitude	112° 03′

The location of office remains as at date of last report, and Sergt. J. B. Campbell continues in charge. Telegraphic communication with this station is very irregular and uncertain, and many failures have occurred from this cause. The mail-reports have also been received

very irregularly, owing to the frequent illness of the sergeant and his consequent inability to make out the forms at the proper time. The station has not been inspected during the year.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard wind-vane, one standard rain gauge.

WASHINGTON, D. C.

[*Official number*, 19.]

Latitude	38° 53′
Longitude	77° 01′.
Mean barometer for year ending September 30, 1874	30.068
Mean temperature for year ending September 30, 1874	55°.8
Amount of rain-fall for year ending September 30, 1874	39.23 inches.

Sergt. Theodore Smith was in charge of the office until October 1, 1873, when he was commissioned a second lieutenant in the Fifteenth United States Infantry, and succeeded by Sergt. Theodore Mosher, who was transferred from Cincinnati for that purpose. During the year he has performed all the duties imposed upon him promptly, intelligently, and faithfully. Untiring in his labors, and possessed of unusual executive ability, he is entitled to special commendation.

Sergts. T. B. Jennings and E. B. Robbins remain in charge of the office night-reliefs, and have been constant and regular in the performance of their duties. Sergt. James B. Newlin continues in charge of the correspondence of the station division, and, as in previous years, acquitted himself to the entire satisfaction of the officer in charge of stations. Sergt. H. C. Hirst remains in charge of the printing-room, and Sergt. P. F. Nagle of the lithographic rooms, and this fact is of itself sufficient evidence that they have worked zealously and satisfactorily.

In the lithographic department marked improvement has been made in the character of the work turned out, while that from the printing-office will compare favorably with any other office in the city.

While special mention is made of these men, it is only just to say that they have been aided by an excellent corps of assistants.

PUBLICATIONS.

Number of bulletins issued during the year ending September 30, 1874	18,241
Number of maps issued during the year ending September 30, 1874	140,837
Number of farmers' bulletins issued during the year ending September 30, 1874	182,490
Number of weekly weather-chronicles issued during the year ending September 30, 1874	20,068
Number of monthly weather-reviews issued during the year ending September 30, 1874	11,940
Number of international bulletins issued during the year ending September 30, 1874	75,287
Number of special river-reports issued during the year ending September 30, 1874	2,312
Number of Form 15 (manifold) issued during the year ending September 30, 1874	5,540
Number of Form 22 issued during the year ending September 30, 1874	137
Total	456,852

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one double self-register for anemometer and anemoscope, one standard wind-vane, one standard rain-gauge.

WILMINGTON, N. C.

[*Official number*, 20.]

Latitude	34° 11′
Longitude	78° 10′
Mean barometer for year ending September 30, 1874	30.092
Mean temperature for year ending September 30, 1874	63°.4
Amount of rain-fall for year ending September 30, 1874	56.02 inches.

The location of the office remains unchanged.

Sergt. Otto Schutze, who was in charge at the date of last report, was relieved June 20, 1874, by Sergt. S. B. Lum. Both men have made their returns regularly and promptly. Two assistants have been relieved during the year, one to assume charge of another station and the other as a candidate for promotion. Two assistants are now on duty, and both are favorably mentioned by the sergeant for their attention to duty.

The station was inspected December 9, 1873, and found in excellent condition.

Seventeen cautionary signals have been displayed during the year, of which fourteen are reported as wholly verified and two partially verified at the station.

Previous to February 4, 1874, no reports were received here from other stations, but since that date full reports from all stations are received at midnight, and those from all but the northwest and extreme west in the morning and afternoon.

PUBLICATIONS.

Number of bulletins issued during year ending September 30, 1874	3,408
Number of maps issued during year ending September 30, 1874	1,166
Number of local reports issued during year ending September 30, 1874	285
Number of Form 22 issued during year ending September 30, 1874	31
Total	4,890

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, two standard anemometers, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

WOOD'S HOLE, MASS.

[*Official number*, 60.]

Latitude	41° 33′
Longitude	70° 40′
Mean barometer for the year ending September 30, 1874	30.037
Mean temperature for the year ending September 30, 1874	48°.0
Amount of rain-fall for the year ending September 30, 1874	53.90 inches.

The office was moved, October 31, 1873, from Water street to Main street, near the telegraph and post offices. The location is a good one for the exposure of instruments and the display of cautionary signals. Sergt. J. K. P. Purdum continues in charge, and has forwarded his reports in a satisfactory manner.

The station was inspected in October, 1873, and found in fair condition. Twenty-eight cautionary signals have been displayed, of which twenty-two were verified at the station. The interest taken in the service at this point by sea-going men appears to be on the increase.

The sergeant reports that whenever the signal is hoisted nearly every vessel in sight puts into harbor and remains until it is lowered. Reports are not received here from other stations.

INSTRUMENTS ON STATION.

One standard barometer, two standard thermometers, one standard water-thermometer, one standard minimum thermometer, one standard maximum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

WYTHEVILLE, VA.

[*Official number*, 91.]

Latitude	36° 56′
Longitude	81° 00′
Mean barometer for year ending September 30, 1874	29.862
Mean temperature for year ending September 30, 1874	51°.3
Amount of rain-fall for year ending September 30, 1874	40.66 inches.

The location of the office remains unchanged, and Sergt. F. Z. Gosewisch continues in charge. He was absent, with permission, from August 1 to September 1, 1874, during which time the station-duty was performed by Sergt. John Laurens, who was sent from the central office for that purpose. The station was inspected in April, 1874, and found in excellent condition. The inspector commends Sergeant Gosewisch for his close attention to duty. All reports have been forwarded promptly and in satisfactory form.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard maximum thermometer, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one standard wind-vane.

YANKTON, DAK.

[*Official number*, 95.]

Latitude	42° 45′
Longitude	97° 30′
Mean barometer for year ending September 30, 1874	30.018
Mean temperature for year ending September 30, 1874	46°.4
Amount of rain-fall for year ending September 30, 1874	23.16 inches.

No change has been made in the location of the office at this station during the year. Sergt. Newton Phelps was in charge until October 2, 1873, when he was relieved by Sergt. C. A. Shaw, who has managed the station satisfactorily since that date without assistance. The station

was inspected in June, and found in good condition. Telegraphic communication has been somewhat irregular, but improvement in this respect is promised at an early date.

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, two standard minimum thermometers, two standard maximum thermometers, one standard water-thermometer, two standard hygrometers, one standard anemometer, one self-register for anemometer, one standard rain-gauge, one small wind-vane.

BRITISH AMERICAN STATIONS.

Instruments for five stations were sent in May, 1874, to Mr. Kittson, the agent of the Hudson Bay Company, at Saint Paul, Minn., with the request that they be forwarded to the designated points at as early a date as practicable. Full instructions accompanied each set of instruments, and upon the receipt of a favorable reply from Mr. Kittson, Lieutenant Gibbon, acting signal-officer, was ordered to take personal charge of the instruments and deliver them in good condition to the agent at Fort Garry, Manitoba. Only one of the stations has been heard from, that at Fort Simpson, where the supplies arrived in good condition.

The following table shows the points selected and their geographical location:

FORT CHIPPEYAN.

Latitude	59° 00′
Longitude	112° 00′

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard hygrometer, one standard anemometer, one standard rain-gauge.

CUMBERLAND HOUSE.

Latitude	53° 30′
Longitude	102° 00′

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard hygrometer, one standard anemometer, one standard rain-gauge.

FORT YORK, (YORK FACTORY.)

Latitude	57° 45′
Longitude	92° 30′

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard hygrometer, one standard anemometer, one standard rain-gauge.

FORT McPHERSON.

Latitude	67° 00′
Longitude	134° 30′

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard hygrometer, one standard anemometer, one standard rain-gauge.

FORT SIMPSON.

Latitude	62° 00′
Longitude	122° 00′

INSTRUMENTS ON STATION.

Two standard barometers, two standard thermometers, one standard hygrometer, one standard anemometer, one standard rain-gauge.

WEST INDIAN STATIONS.

Three new stations in the West Indies have been added during the year, and reports received from them irregularly by telegraph. All those mentioned in the last annual report continue making reports as regularly as the telegraphic facilities will permit. Mr. James Gall, of Kingston, Jamaica, has exercised, under the direction of the central office, a general supervision over these stations, and the office is under especial obligations to him for the public-spirited manner in which he has attended to this duty.

HAVANA, CUBA.

[*Official number*, 100.]

Latitude	23° 9′ 24″
Longitude	82° 22′

Reports received by telegraph from October 1 to November 7, 1873, and from June 1, 1874, until the date of this report, and will be continued during the month of October. During the interval reports have been forwarded regularly by mail. Mr. Charles Hasselbrink continues to make the observations.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard hygrometer, one standard rain-gauge, one standard anemometer.

KINGSTON, JAMAICA.

[*Official number*, 4.]

Latitude	17° 58′
Longitude	76° 47′ 30″

Reports forwarded by telegraph until November 26, 1873, and from June 1, 1874, to date. Mail-reports forwarded regularly during the whole year. Mr. James Gall is the observer, and has taken a lively interest in the work.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard maximum thermometer, one standard minimum thermometer, one standard anemometer, one standard hygrometer, one standard rain-gauge, one small wind-vane.

SANTIAGO DE CUBA.

[*Official number*, 3.]

Latitude	19° 55′
Longitude	75° 50′

Telegraphic reports received from June 2, 1874, to date. Mail-reports regularly since January 1, 1874. Mr. Robert Mason is the observer.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard hygrometer, one standard anemometer.

ST. THOMAS.

[*Official number*, 102.]

Latitude	18° 20′ 24″
Longitude	64° 55′ 45″

Telegraphic reports began with the afternoon report of June 3, 1874, but have been received very irregularly, owing to a local difficulty in reference to the possession of the instruments. This will soon be settled and work recommenced in the proper manner. Mr. W. S. Cameron is the present observer.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard hygrometer, one standard rain-gauge, one small wind-vane, one standard anemometer.

GUADELOUPE.

(Point-a-Pitre.)

[*Official number*, 9.]

Latitude	16° 03′
Longitude	61° 30′

Telegraphic reports began July 9, 1874, and have been received irregularly since that date. Considerable difficulty was experienced in getting a barometer to this station, but this has been finally overcome. Mr. L. V. Bigard is the observer.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, two standard hygrometers, one standard anemometer, one standard rain-gauge, one small wind-vane.

BARBADOES.

(Bridgetown.)

[*Official number*, 8.]

Latitude	13° 4′ 12″
Longitude	59° 37′

The telegraphic reports began June 2, 1874, with Mr. E. Racker as observer, and have been forwarded since that date whenever practicable. Mail-reports are received regularly.

INSTRUMENTS ON STATION.

One standard barometer, one standard thermometer, one standard hygrometer, one standard anemometer, one standard rain-gauge, one small wind-vane.

The telegraphic reports from all these stations have been forwarded by mail from Key West, since September 16, owing to an interruption in the cable communication between Key West and Punta Rassa.

SPECIAL RIVER-STATIONS.

One station, that at Helena, Ark., has been added during the year. Reports have been made daily by telegraph from October 1 to November 30, 1873, and from April 1 to June 30, 1874. They will be resumed again October 1, and continued until the close of navigation on the western rivers.

Observations during the intervals were taken regularly and forwarded weekly by mail to the central office, and where special circumstances appeared to render it necessary reports were telegraphed to the same point.

A rain-gauge and wind-vane have been issued to each station, in order to make the observations more complete, and reports of rain-fall are now included daily with the other data.

The observer at Freeport has purchased a set of instruments for his personal use, and forwards weekly reports of his observations to this office.

From Mr. J. B. Miles, at Helena, much valuable information has been received in reference to the Mississippi River, especially during the flood of the present year.

Doctor Childs, at Plattsmouth, Neb., has also given especial attention to his records, while all have done well; and an examination of the accompanying table will show that few changes have been required during the year.

Stations.	Rivers.	Names.	Commenced reporting.
1. Freeport, Pa	Alleghany	David Alter	April 17, 1873
2. Hermann, Mo	Missouri	Edward Kehr	April 24, 1873
3. Jefferson City, Mo	Missouri	Louis C. Lohman	May 12, 1873
4. Oil City, Pa	Alleghany	W. R. Stevenson, C. E	April 20, 1873
5. Brownsville, Pa	Monongahela	J. Allen Hubbs	June 6, 1873
6. Evansville, Ind	Ohio	A. C. Pushee	April 21, 1873
7. Confluence, Pa	Youghiogheny	M. Tannehill	April 23, 1873
8. New Geneva, Pa	Monongahela	H. T. Davenport	April 24, 1873
9. Lexington, Mo	Missouri	Z. S. Mitchell	April 28, 1873
10. Kansas City, Mo	Missouri	W. A. M. Vaughan	April 21, 1873
11. Brunswick, Mo	Missouri	G. D. Kennedy	May 1, 1873
12. Little Rock, Ark	Arkansas	C. H. Conradt	April 21, 1873
13. Plattsmouth, Neb	Missouri	A. L. Child, M. D	April 20, 1873
14. Marietta, Ohio	Ohio	J. H. Best	April 19, 1873
15. Saint Joseph, Mo	Missouri	Robert Gunn	May 8, 1873
16. Warsaw, Ill	Mississippi	D. H. Cox	May 7, 1873
17. Paducah, Ky	Ohio	Capt. C. Bachman	May 1, 1873
18. Boonville, Mo	Missouri	C. P. Forman	April 28, 1873
19. Le Claire, Iowa	Mississippi	C. P. Disney	June 2, 1873
20. Helena, Ark	Mississippi	J. B. Miles	Feb. 25, 1874

CANADIAN STATIONS.

Six new stations have been added during the year, and another one is promised on October 1, 1874. Three of the new stations do not report by telegraph, but their records are mailed weekly by Professor Kingston to Washington, with the records from the telegraphic stations. None of those named in last report have been discontinued, and all reports have been received with great regularity.

The old stations are named in the accompanying table:

Toronto, Ontario. Official number, 58. Latitude, 43° 39′ 24″; longitude, 79° 21′.

Montreal, Quebec. Official number, 56. Latitude, 45° 30′; longitude, 73° 25′.

Quebec, Quebec. Official number, 57. Latitude, 46° 29′ 12″; longitude, 71° 13′ 45′.

Kingston, Ontario. Official number, 80. Latitude, 44° 12′; longitude, 75° 41′.

Port Stanley, Ontario. Official number, 78. Latitude, 42° 40′; longitude, 81° 13′.

Port Dover, Ontario. Official number, 79. Latitude, 42° 47′; longitude, 80° 13′.

Saugeen, Ontario. Official number, 81. Latitude, 42° 40′; longitude, 81° 16′.

Fort Garry, Manitoba. Official number, 88. Latitude, 49° 52′; longitude, 96° 58′.

Halifax, Nova Scotia. Official number, 89. Latitude, 44° 39′ 42″; longitude, 63° 35′ 30″.

Chatham, New Brunswick. Official number, 2. Latitude, 47° 01′; longitude, 65° 30′.

Cape Rozier, Quebec. Official number, 1. Latitude, 48° 56′; longitude, 64° 21′.

The new stations are as follows:

BROCKVILLE, ONTARIO.

[*Official number*, 126.]

Latitude	44° 33′
Longitude	75° 45′
Elevation of barometer above sea-level	Unknown.

Reports began October 26, 1874.
Received by mail.

CHARLOTTETOWN, PRINCE EDWARD'S ISLAND.

[*Official number*, 127.]

Latitude	46° 15′
Longitude	63° 07′
Elevation of barometer above sea-level	Unknown.

Began reporting March 1, 1874.
Reports received by mail.

FATHER POINT, QUEBEC.

[*Official number*, 5.]

Latitude	49° 30′
Longitude	68° 30′
Elevation of barometer above sea-level	Unknown.

Began reporting October 12, 1873.
Reports received by telegraph via Toronto and Buffalo.

OTTAWA, ONTARIO.

[*Official number*, 101.]

Latitude	45° 22′
Longitude	75° 45′
Elevation of barometer above sea-level	Unknown.

Began reporting January 1, 1874.
Reports received by telegraph via Toronto and Buffalo.

STAYNER, ONTARIO.

[*Official number*, 128.]

Latitude	44° 25′
Longitude	80° 15′
Elevation of barometer above sea-level	Unknown.

Began reporting October 27, 1873.
Reports received by mail.

SYDNEY, CAPE BRETON.

[*Official number*, 6.]

Latitude	46° 18′
Longitude	60° 09′
Elevation of barometer above sea-level	Unknown.

Began reporting November 16, 1873.
Reports received by telegraph via Toronto and Buffalo.

All instruments on these stations belong to the Canadian government, and the observers are under the immediate direction of Prof. G. T. Kingston.

The meteorological statistics of the several stations in detail are given in papers 7, 8, 9, 10, and 11.

RECAPITULATION.

Number of sergeants on station September 30, 1874	101
Number of corporals on station September 30, 1874	7
Number of privates on station September 30, 1874	139
Total	247

Of this number, four sergeants and four privates are on duty in the central office.

Number of deaths on station during year ending September 30, 1874	3
Number of desertions from station during year ending September 30, 1874	7

PUBLICATIONS.

Number of maps issued during the year ending September 30, 1874	470,622
Number of farmers' bulletins issued during the year ending September 30, 1874	3,491,046
Number of regular bulletins issued during the year ending September 30, 1874	281,066
Number of river-bulletins (Form 26) issued during the year ending September 30, 1874	50,955
Number of press-reports issued during the year ending September 30, 1874	38,832
Number of Form 15 (manifold) issued during the year ending September 30, 1874	50,786
Number of Form 22 issued during the year ending September 30, 1874	3,718
Number of weekly weather-chronicles issued during the year ending September 30, 1874	20,068
Number of monthly weather-reviews issued during the year ending September 30, 1874	11,940
Number of international bulletins issued during the year ending September 30, 1874	75,287
Total publications	4,494,320

The labor of maintaining so large a number of stations, charged with so many different duties, each of which must be exactly rendered, and at certain instants of time day and night throughout the year, is very great. The Chief Signal-Officer has to congratulate himself that they are occupied by men of such attainment and character that comparatively few difficulties occur.

The forms herewith, papers 12, 13, and 14, are those of the tri-daily reports, as received from the stations tri-daily in cipher over a system of telegraphic circuits connecting with this Office, which have been heretofore sufficiently explained. On these cipher-forms each space of two lines contains the report of a single station. The bulletin-forms, papers 15, 16, and 17, contain the same reports, after translation from the cipher, and exhibit the information conveyed in each.

Since the date of the last annual report sixteen additional stations of observation and report have been established. Of this number seven are within the territory of the United States, near the one hundredth meridian; nine are upon the Atlantic coast, being stations of the coast-service of the Office connected with the life-saving stations. Reports are, by comity of exchange, received from six additional stations, established by the authorities of the Dominion of Canada and within the Dominion. The total number of daily reports now had by exchange from the Dominion is seventeen. In pursuance of the plan entered upon at the request of the chief of the Dominion meteorological office, warnings of approaching dangerous storms are habitually telegraphed from this office to Toronto. The display of signals by the Dominion authorities is based upon these telegrams. The friendly relations thus maintained between the two services are of benefit to both.

In the annual report of the Chief Signal-Officer of 1872 reference was made to the plan, had always in view in the occupation of stations, to so arrange that each might, from its point of observation, give notice of meteoric changes and warn against unusual disturbances for its particular section, while all should be so placed as in a series of lines, and in such relations each to the other, that the reports of any one and the contiguous stations received at the other stations, as they passed by telegraph toward the central office at Washington, should of themselves give notice of marked approaching meteoric changes. The reports of all, concentrated and charted at the central office, are intended to enable the extent, movement, and course of the disturbance to be defined and ob-

served from report to report, and warnings to be issued, by publications or by signals, at any time for the benefit of all. It is to this system, and in pursuance of this plan, the additions of the present year have been made. The stations this year established in the West Indies are extended far southward and eastward, to Barbadoes and the Windward Islands; thence the long line of guardian points runs with few breaks, and these each month decreasing, past the Capes of Florida. and, following the Atlantic coast, stretches to the distant northeast, at Farther Point and Halifax. Near the southern extremity of this line, the experience of meteorists has located the frequent origin of cyclones, which sometimes sweep in a single course through the islands and over the whole eastern portion of the United States in the vicinity of the sea. Near the northern extremity the indications of the greater number of such storms pass from the study-charts of this Office, and are lost over the Atlantic. The service of the West Indian stations has yet something of the imperfection due to their recent establishment. The telegraphic communication by cable between them has been but for a short time accomplished, and it is frequently interrupted. The observers cannot be held to that rigid rule which makes the regular reports of the service throughout the United States at once prompt and reliable. The delay of the distant reports even for a day does not, however, always destroy their usefulness. The time of movement of any storm may last for days after its ravages have commenced and are reported. As time goes on, and the work takes permanent shape, when the reports shall be regularly received at the hours due, and their indications understood by tried experience, it seems almost impossible that the great hurricanes, which pass the stations and are watched thus from the beginning of their course, should precipitate themselves unheralded on our coasts, or reach them without such warnings given as will enable those who heed them to shun their force.

The display of cautionary signals at Key West has been justified by the existence of these stations, and is ordered. The accuracy of similar displays will be increased at all the coast-stations thence northward. The class of tempests which, having their origin at sea or among the West Indies, seem to pass thence upon the Gulf of Mexico, and, coursing northward over the Gulf coast of the United States, to move over the southeastern interior to the sea-coast, or, reaching the valley of the Mississippi, are traced in their course until they reach the great lakes, will sometimes equally evoke at their origin and in their first movement the warning reports of these stations. Later, the changing reports of the Gulf-coast stations ought to give indications of their coming. A storm once originated and on its course, once fairly within the scope of the stations of the interior, the study-charts of this Office can hardly fail to indicate, in their ceaseless sequence, the place of its existence, its extent, and something of its probable march.

On the eastern coast itself the sea-coast service stations of this Office, in connection with the life-saving service, and located in the life-saving service stations, have been established during the year, at intervals, upon the sea-shore from Sandy Hook to Cape May, and from the dreaded Cape Hatteras to Cape Henry. The telegraphic wires connect each station with this Office. In addition to the regular tri-daily meteoric reports, these stations report tri-daily the condition of the sea, the character of the sea-swell, and its direction. From the time that a storm in movement upon or near the coast reaches one of these stations, or the sea-swell, which sometimes so far foreruns the storm, begins to break there with notable violence, it is possible to hear of the storm's progress

from hour to hour. It is during the year past, and at these stations, that the study of the sea-swell, has been first commenced in the United States for such purposes of premonition. While it has been known to scientists, and the knowledge has been for years traditional among the sea-faring and coast population, that the sea-swell rolling in upon the coast is often the forerunner by many hours of that coming storm in which it has its origin, or often gives the only indication of storms which, passing far out at sea, may never reach the coast on which their dead waves break, but later fall upon some other coast, which might be timely warned, there has been, until the establishment of this service, these stations, and these lines, no facilities by which such knowledge could be made available, or the facts carefully and systematically studied in reference to their possible practical value. The usual instrumental indications at the different stations, supplemented by the indications thus to be had from the sea itself, will be of more than ordinary value. The hope is not without foundation that, as this chain of stations extends and the stations are perfected, such a knowledge of premonitory facts and of conditions actually existing on the sea-coast will be had as will enable the coasting-trade of the United States, as well as the sea-commerce from the larger ports, to be warned in time against dangers of the sea to which they are now exposed. The coast-station at Cape Hatteras is, on account of the frequent storms in its vicinity, regarded as of especial importance.

The added stations secured in the northeast and in Canada enable a better care to be had of the New England and northeastern coasts, and will in time teach something of the disturbances which, passing to the northward of the northern limits of the United States, have been hitherto too soon lost from the study-charts to admit of their being properly examined. In the seasons of approaching frosts, and in those in which markedly low temperatures accompany high barometric pressures extending slowly southward, the indications here first noticed permit information valuable to agriculture and other interests to be given. The additional stations in the far Northwest furnish added facilities for the work of such prognostication, besides answering the immediate purposes of their location, that is, to enable a more complete study to be had of disturbances which, first noticed in the Northwest, might, these stations failing, approach the western lakes without being so soon perceived. The line of stations west of the Mississippi has been pressed steadily westward along the whole length of the Mississippi Valley. Each of these stations increases by its reports the value of the whole system of reports, and each aids in the long study which must be had before the meteoric conditions over the vast plateau of the western interior, stretching north and south to the limits of the United States, east and west until it closely approaches the Mississippi Valley and the Pacific Ocean, can be fully understood, or the indications to be had from the changes there be rightly combined with those exhibited at the stations lying to the eastward and at lower levels for the studies incidental to the duties of this Office. It is by the western limit of stations here described that the more accurate studies of the Office are now limited. Farther west the territory was within the memory of those now living the Great American Desert. The time has been very short for careful meteoric study of this region, yet very many disturbances, afterward felt in the populated portions of the United States, seem to originate in or to pass over it. As this great territorial extent is penetrated by roads, by railways, and by telegraphs, the effort cannot cease to occupy

it by stations of observation, each of which will render it less difficult to establish and to benefit by those to follow.

There has been no increase of stations upon the Pacific coast. The distance, the difficulty of telegraphic communication, and the small sums appropriated for the service, have rendered it hitherto almost impracticable to make one. The opportunities are, however, now greatly improving with the extension of the military telegraphs in Arizona and California. It is contemplated to make the stations upon these lines reporting stations as rapidly as they are occupied by the signal-service. The station on the Aleutian Islands, half-way across the Pacific, has been continued, and a station has been established at Saint Michael's, Alaska, to make a connection as closely as possible with the Russian system of meteorological observation. The preliminary action has been had for the record and forwarding of simultaneous observations to be taken at the Sandwich Islands and on the Bermudas.

In this review of reporting stations it has been attempted to show, with brevity, the views with which the plan of location has been pursued, and, to some extent, the improvement upon the information before had by this office gained by those recently established.

The scope of the full system of reports of the United States, which, having its stations in almost every State, is fringed by these additions, is by them almost complete, so far as telegraphic facilities will admit. It is westward only that greater extension is possible upon our own territory.

A brief reference was made, in the last annual report, to the benefits hoped to result from the proceedings of the Vienna Congress of Meteorologists which had then very recently terminated its session. A proposition, to the effect that it is desirable, with a view to their exchange, that at least one observation, of such character as to be suitable for the publication of synoptic charts, be taken and recorded daily and simultaneously at as many stations as practicable throughout the world, had been unanimously adopted. This Office had already entered into correspondence, requesting exchanges of such reports, with different officers and institutions representing different nations. The assent of the meteorological service of Russia, as represented by the energetic co-operation of Prof. H. Wild, director of the Russian Imperial Observatory at St. Petersburg, was that first had, and has been followed by that of Turkey, through Prof. A. Coumbary, director of the Central Observatory at Constantinople; England, through Mr. Robert Scott, director of the Meteorological Office, London; Austria, through Prof. Carl Jelinek, director of the Imperial and Royal Central Meteorological Institute at Vienna; Belgium, through Prof. E. Quetelet, director of the Royal Observatory at Brussels; Denmark, through Captain Hoffmeyer, director of the Royal Danish Meteorological Institute at Copenhagen; France, through MM. U. J. Leverrier, director of the Observatory at Paris, Marie Davy, director of the Observatory at Montsouris, and St. Claire Deville, inspector-general of meteorological establishments; Algiers, through M. le General Farre, commandant superieur du génie; Italy, through Prof. Giovanni Cantoni, Royal University at Pavia; the Netherlands, through Prof. Buys Ballot, director of the Royal Meteorological Institute of the Netherlands at Utrecht; Norway, through Prof. H. Mohn, director of the Royal Norwegian Meteorological Institute at Christiania; Spain, through Prof. A. Aquilar, director of the Royal Observatory at Madrid; Portugal, through Prof. F. de Silveira, director of the Royal Polytechnic School at Lisbon; Switzerland, through Prof. E. Plantemour, director of

the Geneva Observatory at Geneva; Dominion of Canada, through Prof. G. T. Kingston, director of the Magnetic Observatory at Toronto.

The concurrence of so many nations, representing a territory covering the larger inhabited portions of the northern hemisphere, seems to put beyond question the ultimate success of the undertaking to secure daily a simultaneous report of the meteoric conditions over the greater portion of the earth's surface. Time only is needed to extend the co-operation to countries which have not yet entered upon it, and to develop the system of similar observations, already commenced by the Office upon the sea. The opinion has become so general among scientific men that it is necessary to study the atmosphere of the earth as a unit, and the prospect of valuable discovery is so fair, that skilled and energetic co-laborers are found wherever the request is made. As an acknowledgment of the courtesy of the co-laborers, it has been the practice of this Office to furnish each a copy of the daily record of the Office made simultaneously with his own, and a copy of the monthly review. To encourage the work for the future, to render some return to those engaged upon it, and to render possible that general study which benefits all alike, the issue of the International Bulletin of Simultaneous Reports, paper 18, has been commenced. It is the intention to furnish a copy of this bulletin to each of those who become, under the plan of work above mentioned, correspondents of the Office for the Simultaneous Report; or, at their option, correspondents may receive other publications of the Office, such as the Suggestions for the Practical Use of Meteorological Reports and Weather-maps, Charts of the Average Course of Storm-tracks on Land and at Sea, &c. The average number of daily simultaneous observations now made abroad is two hundred and fourteen. It is not possible, nor is it necessary here, to dwell at length upon the advantages time will develop in the progress of this work. They will readily suggest themselves to any who propose to devote themselves to the studies it will make possible. It is enough for the purposes of this report to state that it secures for the United States the wise and cordial co-operation of a world for the solution of questions upon which the United States has entered, and will secure for the world, it is hoped, a better knowledge of the atmosphere and insight into atmospheric changes than has been hitherto possible. In the years to come, when the value of such reports has been fully tested, and telegraphic facilities are extended, the same organization which permits these readings to be now simultaneously taken, will enable as many of them as may be necessary to be telegraphically exchanged. Two hours' time would be sufficient to concentrate the land-reports of the northern hemisphere. The chart herewith, paper 19, exhibits the location of the stations from which the series of reports is now received, or assurance had that they will be forwarded.

On January 1, 1874, in pursuance of a plan agreed upon, the distinguished secretary of the Smithsonian Institution, Prof. Joseph Henry, proposed, in a letter herewith annexed, paper 20, to place in the charge of this Office, from that date, the very extensive system of meteorological reports made by volunteer observers in all parts of the United States, which, organized by the Smithsonian Institution in 1848, had been successfully conducted under its management for twenty-four years. With the approval of the Secretary of War, the charge thus courteously tendered was accepted by this Office, and the reports of the three hundred and eighty-three observers heretofore reporting to the Smithsonian Institution are now regularly entered on its files. These reports are of observations made at 7 a. m., 2 p. m., and 9 p. m., local time, at

the different stations named. Papers 21 and 22 exhibit the circulars issued to the correspondents. Paper 23 is the form adopted by this Office upon which observations of this character are now entered.

On June 19, the very courteous proposal was made by the Surgeon-General of the Army, Brig. Gen. Joseph K. Barnes, brevet major-general United States Army, to place at the disposal of this Office, after having extracts made from them at the office of the Surgeon-General, the extensive series of observations made by the medical officers of the Army at the different military posts and stations. These reports, the continuation of the series commenced by the Medical Department in 1819, are, like those of the Smithsonian series, from observations made at 7 a. m., 2 p. m., and 9 p. m. The proposal of the Surgeon-General was accepted in a communication of date June 26, 1874. The series of the Medical Department is now regularly received and entered on the record-files of the Office. The series, at present, numbers one hundred and twenty-three. The record of observations is as the specimen form herewith, paper 24. The total of daily reports filed at the Office now numbers as follows: Total number of daily simultaneous telegraphic reports, one hundred and eight; total international simultaneous reports, two hundred and fourteen; total volunteer reports, three hundred and eighty-three; total reports of Medical Corps of the Army, one hundred and twenty-three, making a total of eight hundred and twenty-eight reports received regularly for discussion.

The data now accumulated on the files at this Office, and to which reference is thus made, afford scope for generalization differing from, and perhaps more extensive than, any now had by any one nation. The daily published study-charts of the Office, the Monthly Review, with the accompanying maps, the maps of this Office, of which copies are furnished for the census report; the charts of average directions of movement of areas of low barometer; the charts of average barometric pressures at the hours of tri-daily report, are studies of this description. Incidental to the labors which permit the announcement of probable storms, are those of this character, to be based on discussions of the data, the results of which may be, perhaps, as valuable for practical uses as any relating to premonitions simply.

The movements of areas of low barometer, with accompanying disturbances, are seen to follow, so far as relates to the United States, courses which it seems may be, to a certain degree, defined by months. The average rain-areas can be traced. The storms are seen to differ in violence and extent with the different seasons, to move with different velocities and in different directions at different times of the year, and to exhibit their changes with a certain regularity. Each chart of generalizations becomes thus, in effect, an almost rule for the future, the rule condensing in itself the accumulated experience of years. By similar labors the average meteoric condition for each section and station in the United States can be traced. Thus, for every section and for every season, there are its prevailing winds, which differ each in their duration, intensity, temperature, and humidity. Often, with certain winds, the probabilities of accompanying or following rain are found to increase or diminish. To certain winds it is better the farmer should expose his crops if he seeks to dry them. With other winds it is wise to plant; with certain winds it is safe to sail from sea or lake ports, expecting a continuance of the wind and fair weather; with others, storms are probable. For each element of the meteoric conditions, the barometric pressure, the humidity, the temperature, the clouds, &c., the Office charts and the reports upon its files open a similar field for study; and

deductions are to be made looking similarly to practical ends. The study of these different conditions, and the determining of rules by which premonitions are to be made, with reasonable accuracy, reaches, in effect, to that of the climatology of the United States. Upon this study the Office is now entering. Its data carefully gathered upon its files, the instrumental readings made by its own observers under its own rules for the period of three years, now warrant deductions to be sought which could not be earlier attempted. The policy pursued by the Office of diffusing, as widely as possible and in condensed form, the information in its possession, enables it to benefit in studies like these by the labors of students everywhere. The results return to it in the able suggestions, based upon deductions had from its charts and data, by distinguished scholars, who thus become its associates in more definitely forming the rules on which its duties rest.

The daily official deductions, constituting the tri-daily Synopses and Probabilities, as they are styled, and the deductions in pursuance of which the orders for the display of cautionary signals are given, when necessary, are based upon the regular reports of the service-stations of observation, transmitted tri-daily by telegraph, after passing over a system of telegraphic circuits so arranged as to at once concentrate the reports at this Office, and distribute, in doing so, certain numbers of them at designated cities and posts. Special reports are demanded from any station or number of stations whenever impending disturbances threaten. The Synopses are those of the meteoric conditions existing over or near the United States, for each period of twenty-four hours terminating at the hour for each general report. The Probabilities are announcements of the changes, considered from the study of the charts, in connection with such rules and generalizations as the experience of the Office and the study of meteorologists seem to have determined, as probably to happen within the twenty-four hours then next ensuing. The study for each issue requires the drafting and study of three charts. These charts to exhibit charto-graphically the data furnished by the simultaneous report of the one hundred and eight stations, heretofore referred to, located in the United States on the Atlantic and Pacific coasts, the coasts of the Gulf and of the Lakes, in the western interior, and in the Dominion of Canada, Nova Scotia, New Brunswick, and the West India Islands. The charts are as follows:

(*a*) A chart of barometric pressures, the temperatures, and the winds, together with the wind-direction and velocities at the different stations, and the precipitation occurring, exhibits barometric pressures and the temperatures in the relation to districts of territory and to each other by a system of isobaric and isothermal lines inscribed; the wind-directions by arrows at the different stations. (*b*) A chart of the cloud-conditions prevailing over the United States, on which the different varieties of cloud reported at the stations appear by symbols. On this chart, also, are indicated the weather, as reported at each station, the direction and movement of lower and upper clouds, and each morning the minimum temperature of the preceding night, in relation to districts of territory. (*c*) A chart of the relative humidities over territorial districts, with the temperature at the several stations. This chart of humidities enables studies to be made for territorial sections, the difficulties attending the study of observations of this character being obviated, to a very considerable extent, by the intercorrection of the stations among themselves, and by the great extent of the regions over which the readings are made simultaneously. In fields so great, purely

local conditions, in part, disappear, or affect very little the general result. With improving experience and improved instruments, the charts will improve in accuracy, and their especial indications be better understood in their relation to the atmospheric changes to be anticipated. (Papers 25, 26, 27.) The total of the readings of different instruments inscribed on each series of charts, as exhibiting the elements of the general meteoric condition, and to be considered at each report, reaches the number of two thousand one hundred and sixty. The duties of the preparation of these charts and reports have been under the immediate charge of Assistant Cleveland Abbe, A. M., First Lieut. Robert Craig, Acting Signal-Officer and Assistant, First Lieut. H. H. C. Dunwoody, Acting Signal-Officer and Assistant, and Assistant T. B. Maury, A. M., who have been relieved and alternated in the discharge of these and other special duties at such times as directed under the instructions of the Chief Signal-Officer. The daily series of study-charts are nine in number. The yearly series number three thousand two hundred and eighty-five. The field which such a series, continuing for years, opens for study and investigation is almost without a limit, and is one upon which this Office has but begun to enter.

The statements of Synopses and Probabilities have been furnished for the press at the regular hours: 1 o'clock a. m., 10.30 a. m., and 7.30 p. m., daily, and under the same rules as in preceding years. There has been no failure in the delivery of any report during this period. The total number of statements thus issued for publication has been one thousand and ninety-five. These have been telegraphed, at the moment of their issue, to the principal cities, and have appeared in some form in almost every journal in the United States. The great diffusion thus given this intelligence has, of course, its advantages. The Office has found itself, however, exposed to unexpected difficulties. It has been the plan of the Chief Signal-Officer that these published statements should never appear without the publication, also, of at least a portion of the data on which they are based, the full rehearsal of the synopsis of the conditions preceding the forecast, and the full publication of the forecast in the words in which it is issued. Every press-association receiving the statement from the Office receives it on the condition that, if used at all, it shall be printed in full, and each has formally accepted the condition. Thus given to the public, the meteoric indications on which the announcements are based can be seen, the statements are better understood, and can be correctly judged by local indications upon points often so doubtful that they are stated with hesitation. The haste of our public life does not always permit this, and the Office sometimes finds itself held responsible for what purports to be its utterances so garbled in the press as not to be recognizable. It is but just to American journalists to say that the instances are very rare in which, when attention has been directed to this error, they have failed to correct it. A careful analysis of these statements of the Office, made since the date of the last report, and a comparison with the meteoric conditions occurring within the twenty-four hours and within the district to which each statement has had reference, has given an average of eighty-four and four-tenths per cent. as verified. The mode of comparison is set forth in Papers 28 and 29. The popular faith in the announcements of the Office, now entering on the fourth year of their issue, has remained unchanged; nor is it at any time sensibly lessened by the errors which now and then direct attention to the fact that, in the present condition of science, premonitions, having in their scope a territory so great as that of the United States, cannot always be correct for every part of a district. The

close watch kept upon this Office, and the popular knowledge of the subject of its duties, for which it takes to itself some credit in its character of instructor, cannot, perhaps, be better evidenced than in the quiet criticisms to which it is subjected if an error now and then occurs in a work in which, three years ago, any success was by many deemed impossible.

The systematic instruction of officers of the Signal-Service to fit them for duties of this description has been continued, though greatly interfered with, by the small force charged with the now very extensive duties of the Office in its different branches, each of which contributes its share to the success of the whole. The duties on which the officers are engaged, each in his sphere, are such as necessarily lay well the foundation for the courses of especial study and practice. The courses once commenced, the skill increases with acquired experience. The studies to which reference has been hitherto made, and the data condensed for generalization, improve each year the material before the student for consideration.

The display of cautionary day and night storm-signals at times of threatened dangers has been had when necessary, during the year, at the following principal ports and harbors of the United States located upon the lakes, the Atlantic, and Gulf coasts: New Orleans, Mobile, Jacksonville, Savannah, Charleston, Wilmington, Cape Hatteras, Norfolk, Cape Henry, Baltimore, Cape May, Peck's Beach, Atlantic City, Barnegat, Squan Beach, Long Branch, Sandy Hook, New York, New Haven, New London, Wood's Hole, Boston, Portland, Eastport, Oswego, Rochester, Buffalo, Erie, Cleveland, Toledo, Detroit, Port Huron, Alpena, Grand Haven, Chicago, Milwaukee, Escanaba, Marquette, Duluth, Key West, Thatcher's Island, and Tybee Island. During this period seven hundred and sixty-two signals have been ordered, counting each display of each signal at each port a separate display, in anticipation of seventy-two dangerous storms. Of this number, five hundred and sixty-one, or seventy-five per cent., have been reported as verified by the occurrence of dangerous winds at the points of display or within the radius of one hundred miles, as set forth in the rules of the Office. In no instance, during the year, has any great storm reached, without fair warning given, the lakes, or any of the great ports of the United States. The signal ordered by this Office is always cautionary in its character, not announcing absolutely a storm will come, but that indications are sufficiently threatening to call for caution, both as to going to sea and for preparation for rough weather if vessels are about to sail. Accuracy will improve as the data of the Office become full enough to enable it to be judged from experience what local wind-velocities are, in general, indicated in the different seasons, and by the differing meteoric conditions, as to accompany the different barometric gradients over this continent. It is to the solution of such questions that the study of the Office is directed. Disturbances moving from the Atlantic seaward cannot, of course, be closely watched, unless the future of the sea-coast stations shall fix the indications; but those which pass along the coasts themselves, or move over the interior, so plainly exhibit their presence on the charts, that there seems to be no danger of failing to note their existence in time to give fair warning in their probable course. Reference is not here had to the sudden and local changes, as in thunder-storms and tornadoes, but to the great atmospheric disturbances which formerly swept over territorial sections of the country unforeseen and unrecorded.

The Office has extended, under the direction of the Secretary of War,

and since the date of the last annual report, its efforts to exhibit, as widely as possible throughout the agricultural districts of the country, the results of the daily office-studies, in the form of the forecasts issuing from it, and has been in regular correspondence, in reference to its duties, with committees appointed for the purpose by one hundred and sixteen agricultural societies. (Paper 30.) In the year just past six thousand two hundred and eighty-six farmers' bulletins, exhibiting the daily forecasts, have been posted daily for public use in as many different post-offices in different cities, villages, and hamlets, located in the interior and farming regions of the country. The extent of the labor needed to reach, even in part, the vast agricultural population of the United States, is wide. At midnight of each day the midnight report of forecast is telegraphed from the central office to twenty centers of distribution, located in the different States according to the charts herewith. The centers of distribution are as follows: Albany, N. Y.; Augusta, Ga.; Bangor, Me.; Boston, Mass.; Buffalo, N. Y.; Burlington, Iowa; Chicago, Ill.; Cincinnati, Ohio; Detroit, Mich.; Leavenworth, Kans.; Logansport, Ind.; Memphis, Tenn.; Montgomery, Ala.; New Orleans, La.; Nashville, Tenn.; New York, N. Y.; Philadelphia, Pa.; Pittsburgh, Pa.; Springfield, Mass.; Saint Louis, Mo.; Washington, D. C. These centers of distribution have been located with careful reference to the number of the farming populations in the different sections of the United States, and the facilities to be had at each center for rapidly reaching with information the greatest number of individuals. The telegraphed report received at the center of distribution is at once printed by enlisted men of the Signal-Service upon bulletins, enveloped as rapidly as printed, in post-office wrappers already stamped, and addressed to the different post-offices within a radius of as many miles as can be reached by the swiftest conveyance by 2 p. m. of the following day, and are then placed in charge of the Post-Office Department, by an arrangement by which they are distributed by the fastest mails to every post-office addressed. An order of the Postmaster-General requires that each bulletin, on its receipt at the post-office addressed, shall be displayed in a frame provided by this Office, and notice of the hour of its receipt and of the moment of its display reported. The bulletins have reached the different offices and have been displayed in each in the frames at the average hour of 11 a. m. The average time thus elapsing from the moment at which the dispatch has left this Office at midnight until it has appeared, printed and bulletined, in the interior towns and villages over the territory, extending from Maine to Louisiana, has been ten hours. The fact that the interior populations can thus be reached has been established. With each year it is possible to extend the field of distribution. With each year the popular knowledge of the uses of the bulletin and some increased interest in and study of meteorology, renders the farming communities better able to judge of its correctness and to benefit by its contents. It is contemplated, as the work of the Office progresses and generalizations can be given, to add to the bulletin such brief rules as may be developed in regard to its uses in connection with such instruments as may be readily had for local use, and such others as relate to the particular crops had in hand at the different seasons of the year, with reference to the atmospheric conditions then occurring.

It requires some reflection to appreciate the extent of this work, its economy, and the great numbers of the populations it aims to benefit directly.

During the session of the last Congress the Chief Signal-Officer submitted to one of the committees an estimate, the plan of which shows

that if the total cost of each bulletin-station at which the bulletin is displayed at each different post-office, hamlet, village, or city, was computed to be thirty-one cents per day only, the sum so resulting would meet every expense caused by the Signal-Service. A very few tons of hay saved in the course of the year in the vicinity of each station would more than compensate for the expenditures. Communications from the different districts show a general and intelligent use of these reports by the populations for which they are intended.

The duties of the Office in connection with the river-reports of the year have had relations to occurrences of unusual interest. As in the preceding years, the regular or daily reports of the changing depths of the waters in the river-channels have been recorded and published with regularity for the benefit of the river-commerce at the principal cities and ports existing on the great rivers, and have enabled the commercial populations to regulate intelligently the movement of the river-shipping. The data had at this Office, though meager, suffice to permit a foreknowledge of changes of importance likely to happen, and enable useful warnings to be given of coming floods, ice-floods, and sudden and great rises or falls of the river-levels. As an instance, a fair premonition was had throughout the Mississippi Valley of the great flood occurring in the months of last spring, and during the continuance of them special river-reports exhibited daily, with sufficient accuracy, the coming rises or falls. How much depended, in individual cases, upon these reports, cannot be known. It is sufficient for the purposes of the report to state that, without them, there were no reports directly to reach the people, and none at all comparable with these in their extent and regularity. The study of the rivers, made necessary by occurrences of this nature, has required that there should be established for each portion of the river-courses a certain level or depth of water, a rise above which is held to be dangerous to river-interests, and has, for this reason, been designated as the "danger-level." The report of First Lieut. A. W. Greely, Acting Signal-Officer, who, under instructions from the Chief Signal-Officer, has made a minute examination of the Mississippi, Missouri, and Ohio Rivers, to establish this "level," together with the added information derived from replies to inquiries from this Office, are submitted herewith in Papers 31, 32, and 33.

In connection with this study, a chart of the basins of the different principal rivers within the limits of the water-sheds of each has been compiled from the best attainable authorities, and a river-slate designed, on which are outlined the different averaged grades of the beds of the different rivers at the different parts of their course, from the head of navigation on each to the mouths by which they empty into other rivers or into the sea. (Paper 34.) The flood-waves can be traced in outline on this slate, and their movements thus noted from day to day. With this preparation, it is comparatively easy to know—an unusually heavy rain-fall being noted within any water-shed—into what river it will flow; to mark next the rise of that river, as given by the reports; to know something of the rapidity of the current with which the flood-wave must follow its course; to note then into what river the wave will pass, and, tracing in the same manner, to follow its progress to the sea. The plan of observation can be applied to any river. With stations properly placed, it can be made impossible for a flood to follow its course without notice given by telegraph of its coming. Papers 35 to 43 exhibit charts of fluctuation, to enable study to be made as to average depths of water, the average frequency of floods at the different months of the year, &c.

To the river-reports has been added for the two years now just passed, at the request of Prof. Spencer F. Baird, United States Commissioner of Fish and Fisheries, a daily report of surface and bottom water-temperatures of the rivers and lakes and on the sea-coast, the object had in view being to determine the proper rivers and lakes in which to place the different varieties of food-fishes. It is necessary, for this purpose, to ascertain the extremes and means of the water-temperatures. These water-temperatures sometimes indicate the fact that the winter snows are thawing in the Rocky Mountain ranges in advance of other information. A similar study of water-temperatures on the Atlantic coast will give, it may be hoped, clue to yet unknown ocean-currents.

The display of bulletins of river-reports during the year has been at the following stations: Cairo, Cincinnati, Davenport, Dubuque, Keokuk, La Crosse, Leavenworth, Louisville, Memphis, Nashville, New Orleans, Omaha, Pittsburgh, Shreveport, Saint Louis, Saint Paul, Vicksburg, Yankton, Dak., and Helena, Ark.

Another series of reports, having reference to internal navigation, that of the announcement from day to day of such probable approaching changes of temperature for the different sections of the United States as would be likely to cause the freezing of the canals, or in other cases as would open them sufficiently to permit the great commerce sometimes caught and held by the ice at ports upon them to be pressed forward toward the termini of the canal, was for the first time issued during the days of the closing navigation of last fall and the beginning of winter. Many thousands of tons of merchandise and hundreds of canal-barges are annually afloat at this season of the year. The quantity of grain in transit is sometimes so large that the markets of the great cities are influenced by its movement and by the possibility of its reaching or failing to reach tide-water. Other interests are affected. The canal-reports of this Office were, under the circumstances, received with satisfaction by the commercial associations of the cities, and now constitute for the months of November, December, and January one of the regular issues of the Office. Papers 44, 45, and 46 exhibit specimens of special river, water-temperature, and canal reports.

The forms for and the facts stated in the bulletins published for the uses of farmers and seamen, for the river-reports, the canals, and the other varied interests the bulletins are intended to reach, will change gradually with increasing knowledge and facilities. Each form has, however, its object, and cannot be changed until long tests have shown it is safe to make the changes. The forms at present used are intended especially to call into use and to have information contained in the bulletin supplemented by the local knowledge of those who avail themselves of it, and by the indications of the instruments in the hands of the many competent observers throughout the country.

The regularly-printed publications of the Office have been issued during the year. Copies of these papers, the Office Weekly Weather Chronicle and the Office Monthly Review, sufficiently illustrate their character. (Papers 47 and 48.) The scope of the Review has been very greatly extended during the year by the increased number of regular and volunteer reports received, all of which are valuable for reference, and a general study of which enters necessarily into the study for the preparation of each Review. The three charts which accompany each issue of the Review exhibit an improvement, due to the increase of data. When it is considered that each of these charts is, to some extent, the reduction of data first chronicled on the ninety separate charts for the month, and exhibits thus a generalization of the conditions existing during the

month, it will be readily understood how much this constant monthly reduction simplifies the matter of generalization for the year. The wide circulation given this Review meets, in part, the expressed wish for generalizations prepared by this Office, while the receipt of a copy is considered by the hundreds of volunteer observers at once a sufficient acknowledgment and compensation for their labors. Assistants Abbe, Craig, Dunwoody, and Maury have alternated in the charge of the preparation of these papers and of the charts which accompany them. The preparation of the matter for the volumes of the reports, synopses, probabilities, and facts, commenced in 1872, has been continued. These volumes, containing the record of all the tri-daily reports received at the Office from the date at which such record commenced; the tri-daily charts, based upon the study of each report; the synopses and probabilities on that date issued; with a statement of the facts or meteoric conditions which subsequent reports have shown actually existed at the time for which each forecast was made, will constitute, when issued, a meteoric record more full, perhaps, than any now published.

By an unfortunate misunderstanding, either of the intent of Congress in appropriating money for the public printing, a proportionate share of which was presumably to be used for the work of this Office, or of the information upon which Congress has acted, this work has been very greatly delayed, the data of three months only of thirty-two being yet in form for issue. It is especially recommended that a sufficient appropriation be estimated in the annual appropriation for printing for the War Department to meet the expense of this issue.

A number of charts have been prepared in the map-room of the Office under the charge of Lieutenant Jackson. An atlas of twelve charts, exhibiting the average direction of movement of areas of low barometer for each month of the year, has been here charted; the facts exhibited on these charts being deduced from the comparison of the three thousand three hundred and seventy-five tri-daily charts prepared and on file in this Office up to the date of its issue, as exhibited first in the charts of the Monthly Review, and by the reduction of these charts to the twelve which make the atlas.

The form of procedure has been as follows: The tracks of movement of all areas of low barometer for the month of January, for instance, are found laid down on the regular monthly charts of the Office prepared for the purpose, one chart being used for each January. Upon this chart are selected groups of all the tracks following the same general direction, *e. g.*, those of disturbances traced from the Gulf of Mexico, from the Southwest, from the Northwest, or from the Lake region. The points (in latitude) at which the mean track of each group crosses the meridians of longitude in the January of the first year are marked (approximately) on the meridians. These points of crossing are then connected by continuous colored lines. Each of these colored lines thus represents the favorite pathway pursued by the disturbances or storms of each group for the January of that particular year. At each end of every line is noted the number of areas of low barometer of each group of which the line shows the mean direction. The same process is then repeated for the January low barometers of the following year; the lines of mean direction pursued by them are similarly established, and the lines charted in another color, with the number of disturbances of which they respectively represent the mean course entered at each end of each line. The process is thus repeated successively for each year under consideration, and the results thus charted in a special color for each year. After all the mean January disturbances or storm-tracks of

each group have been thus laid down in their appropriate colors for each year on the final January chart of grand means, the mean of all the means—giving the mean-direction of all these mean-directions; for each group is determined and outlined in the same manner that each separate mean was found. These grand means of all the separate tracks of all the separate groups for January are put down in broad, dark-colored bands on the large chart, and suggest, at a glance, and approximately, the probable course of any storm of any group that may arise during that particalar month (January) in any future year.

In this investigation, the few erratic and unusual tracks are necessarily omitted in the grand mean; but their number and course are given in special lines.

Very many details may be had from such charts of generalization, in addition to their relation to movements of areas of low barometer. Thus it appears upon the charts that, for the period for which they are constructed, nearly 90 per cent. more of the disturbances traced have been first noted in the Northwest and the Great Plains than in the southern parts of the country. From May to November few disturbances are from the Southwest as compared with the number from the Northwest and Rocky Mountain region. In winter, comparatively few disturbances first appear near Florida, and of those areas of low barometer first noticed on the Gulf, few pass over Florida, Eastern Georgia, and the Carolinas, in that season. A very considerable number of areas of low barometer are traced over the New England States; they seem quite evenly distributed throughout the year. About 84 per cent. of these disturbances are first noticed in the West and Northwest. Few disturbances, comparatively, are first noticed in the Gulf, and of these nearly one-half are found in the months of February and September. Of the disturbances at sea noticed over the Gulf and off the Florida coasts, those occurring late in the fall and in the winter months are generally traced parallel to the Atlantic coasts. Those noticed at other seasons are more erratic in their course. Of the disturbances appearing in the Gulf and Southwestern States, during the months of February, March, and April, a majority are traced in an easterly direction, south of the Appalachian range, and their courses then deflect northeastwardly along the coast. During the summer, fall, and winter months, a majority are traced in a northeasterly direction—west of said range. These instances are referred to as illustrations only of the studies the chart permits.

The utility of these and similar deductions the charts make easily practicable is manifest, whether viewed in relation to the pre-announcement and foreknowledge of the probable course of storms in the United States, or upon the seas in their vicinity, or with regard to the agricultural operations of the country, or the study of its climatology.

In considering the significance of the daily weather-reports telegraphically issued from this Office and printed in the newspapers, the seaman, the farmer, or the unscientific reader, with the charts of the mean directions before him, may, by referring to the proper month, have some correct idea as to the probable path an approaching storm of any group will select, and he will be able, in a measure, to anticipate its effects in his own locality. It seems probable that, when a larger induction enables the Office to more perfectly chart the monthly paths of storms, their prevision and prediction, with the aid of the tri-daily press-reports, will be made practicable to a larger circle of intelligent private observers.

Another series of charts, based upon the data of the Office, collated and reduced under the careful supervision of Assistant Abbe, has been

similarly prepared in the map-room. Copies of these charts have been furnished the Census Bureau to accompany the census report now in preparation.

In addition to this work there have been here prepared the charts of the fluctuations of the rivers, mean-barometer charts, charts of river-basins, charts of the mean barometric readings reduced to sea-level at each reporting station at the respective hours for each separate tri-daily report for each month of the year, &c., and other charts, having for their purpose the condensation, for use, of such information as is daily needed in the study for the reports issuing from this Office.

By the publications of the Office, which have been heretofore referred to, and specimen copies of which accompany this report; by the signals displayed by day or at night at times of probable danger by the announcements of probable changes of weather in the synopses and probabilities furnished thrice daily to the press; the farmers' bulletins exhibited at so many villages and hamlets in the interior; the river and canal reports made with reference to river and canal interests; the bulletins of data exhibited at all the great cities and ports; the symbol-maps displayed in board-of-trade rooms and rooms of chambers of commerce; the weekly chronicles and monthly weather-reviews furnished to agricultural societies, commercial associations, and correspondents of this Office; the daily weather-maps; the monthly charts; and, finally, the charts condensing the results of years of observation, it is believed that the information emanating from this Office reaches daily not less than one-third of all the households in the United States. The first uses of its studies and of the data on its files thus accomplished, the condensed records furnished for the more careful study of scientists everywhere, equal, perhaps, in their form and in the regularity of their publication, those furnished by any similar institution in any country.

The work in the instrument and model room, referred to in preceding reports, has been steadily continued. It is sought, by the construction of model instruments, and the study of those hitherto devised in other countries and our own, to arrive at a reliable and economical form of self-registration for the different instruments, the readings from which enter as elements into the established meteoric reports. The benefits to result from such continuous and self-recorded readings have been long recognized. From the time at which such instruments can be supplied and used at the stations of observation within the scope of the service of the United States, a record will commence unparalleled in value to the country by any hitherto attempted. A few years of observation on such a scale, with instruments compared and readings attested, would result in the establishing of such facts and the solution of such questions relating at once to climatology and the pre-announcement of meteoric changes as cannot without them be hoped for. Among the instruments devised for the Office in the year have been a barometer and rain-gauge, both continuously self-registering by electricity, by Lieut. D. J. Gibbon, acting signal-officer; a thermometer, self-registering, made for the Office by Professor Hough, of Albany, N. Y., and a self-registering rain-gauge by Lieut. Henry Jackson, acting signal-officer and assistant. The ingenuity displayed in the construction of these instruments is remarkable. The tests for durability, facility of management, and steadiness of record have not yet seemed so fully met as to permit their general use. The removal of the inaccuracies is regarded, however, as a question of time, and the period to elapse a short one only before it will be possible to equip the necessary stations with apparatus so self-registering as to allow every instrument to be exposed withsuch

similar conditions of level and shelter as will render these readings comparable and correct for any practical purposes. The uses of the collection of instruments in the instrument-room of this Office have served well the end for which it was made by the inventions they have inspired, aside from their value for purposes of instruction. A number of very beautiful and ingenious models, exhibiting visibly the different character of clouds, storm-movements, and the differing atmospheric conditions over the earth's surface at different seasons of the year, have been added to the office-collection by the labor of Sergt. P. Monet.

The purpose hitherto mentioned in the reports of this Office of arranging an instrument to be so devised as to be at once simple, strong, and inexpensive for the farmer's use, and for general use in connection with the daily bulletin, has been kept in view. The embarrassment to which the Office is subjected by constant changes of its force, has, to some extent, delayed the necessary tests; but there seems little reason to doubt that an instrument can be so arranged that its readings, supplemented by some knowledge of local signs, and by the information furnished in the bulletin-report of the Office, will enable the farming and interior communities to profit by a knowledge of coming changes better than they can now have.

It is essential to work so constant and exact as that required from the numerous stations now connected with the Office, that each station should be frequently and minutely inspected, the books and papers examined, and the instruments compared with the standard instruments. Each station ought to be inspected at least once in each period of six months. Eighty-two stations have been inspected since last report. The officers employed upon this duty have been Lieuts. A. W. Greely, F. C. Grugan, and D. J. Gibbon, acting signal-officers. The service is found to be an arduous one. The inspection necessitates a stay of some days at the station to be inspected, a critical comparison of the instruments, and a formal and minute report in writing. It renders necessary an almost constant movement of the officers from place to place, and involves much labor. The field of this duty has been commensurate with the territory of the United States. The exceedingly small force of acting signal-officers has caused the work to fall with too severe a stress upon those employed upon it. Paper 49 exhibits stations inspected.

The sea-coast service of the Signal-Service in connection with the life-saving service has grown steadily in importance. At the date of the last report a telegraphic line reaching from Sandy Hook to Barnegat had been erected, and a line from Norfolk to Cape Hatteras was in process of construction. Both of these lines have been completed. The act of Congress requiring this service contemplates the establishment of signal-stations at life-saving stations and light-houses at points along the coast in such manner that the coast and the sea in their vicinity may be at once kept under observation, warnings of approaching storms be given to vessels within signal-distance, and information of disasters and other incidents occurring be rapidly conveyed to the chain of life-saving stations and to the central office. An advantage incidental to such duties is that they permit communication to be had by signal with vessels passing in sight of any station. The soldiers of the corps upon this service are skilled as line-builders and as operators. They have been taught to take and report meteorological observations, and, as signal-men, are practiced in both the Army and Navy codes, and in that code of permanent flag-signals, known as the International code, to enable them to communicate telegraphically with vessels of any nationality.

The extent of the field for service valuable to almost every interes represented upon our shores, the seas, or lakes, the duties of such a corps can occupy, will suggest themselves without lengthy rehearsal. Brought to that degree of perfection which they can attain, if the service is properly sustained, a vessel approaching our coast, or coasting it, ought first to be warned of a storm, if one is impending within the scope of the observation of the central office. If the storm is not shunned, and shipwreck is impending, aid can be summoned to come on steamers from ports far or near, perhaps in time to avert the disaster. If the aid fail, and the ship must strike, the life-saving service can be concentrated from sections beyond the vicinity, and in any force needed. If the wreck happens, notice can go to the wrecking companies, to the insurance, and to others interested in the vessel, while lists of passengers and crews, saved or lost, can be known, and provision sought for their necessities. Throughout all the course of the occurrence the central office can be constantly informed. A naval vessel appearing off one of the signal-stations can transmit a communication to Washington, or receive orders in cipher and by signal. In time of war, with the system com pleted, no part of the coast could be menaced without instant knowledge at the great centers, at headquarters, along the coast, or throughout the country, if need be, of the character of the menace and the locality. In time of peace, if desirable for commerce, a record can be kept of passing vessels, showing their signals, or brief messages can be signaled to or from them. It is contemplated to equip each station with a semaphore for uses of this kind when flags may fail, and for the purpose of enabling them to better communicate with foreign vessels.

Some reference has been already made to the character of the meteoric reports to be had at these stations. These will comprise readings taken at the actual sea-level, &c., records of sea-waves, tides, temperatures, and rise and fall of sea-level, such as it has not been in the power of the country to have hitherto, and the indications from which patient study will not fail to determine. Already, in their imperfect condition, the reports give knowledge of atmospheric disturbances existing on the sea.

Those who have devoted attention to meteoric study will easily comprehend how fully, all other monitions failing, a storm in its gradual march along the coast will give notice itself of its advance along a chain of stations connected by telegraph, and charged with no other duty than that of watching it. As the lines and stations are extended, in pursuance of law, these advantages, now limited to the Atlantic coasts, will reach also the shores of the lakes, the Gulf coasts, and the coasts of the Pacific. The work of extension must be slow, perhaps the labor of years. The results to be had are worth both the time and the labor. The telegraphic wires connecting these stations enter directly the office of the Chief Signal-Officer, and the stations and lines will become there a school of practice on which both officers and men of the service are drilled by the actual management of the lines for the telegraphic service on the far frontier or for the emergencies to arise when the Army takes the field. The plan for this instruction requires the stations to be kept open day and night, the men going to the instruments by reliefs, and the general charge of the lines and of stations being in the care of officers who are to take it by periods. Each officer will, during the time of his detail, be responsible for the equipment and management of lines and stations, the skill of the operator and the thorough discharge of their duties.

Reconnaissances for lines of this character have been made during the present year by Lieutenants Craig and Dunwoody. The lines upon the coast have been erected by enlisted men of the service and First

Lieutenants George S. Grimes and C. C. Wolcott and Second Lieut. W. B. Weir, acting signal-officers. The stations were first manned on the section from Washington by Sandy Hook to Cape May on April 1, 1874. That from Washington to Hatteras on September 1, 1874.

In the supervisory duties relating to the construction of the lines, Bvt. Capt. H. W. Howgate has rendered valuable assistance, and that officer has been temporarily charged with their immediate management until the service shall be organized for the plan of details above referred to. Paper 50 exhibits the regulations for the sea-coast service now in use.

Since the date at which the sea-coast lines were put in operation, an average number of nine hundred and eighty-eight words has been transmitted daily to and from each station over the lines. The stations now occupied are Sandy Hook, Long Branch, Squan Beach, Barnegat, Atlantic City, Peck's Beach, and Cape May, New Jersey; Cape Henry, Virginia; and Cape Hatteras, North Carolina.

By an act of Congress approved March 3, 1873, the duty was imposed upon the Secretary of War of causing to be constructed a military telegraph from San Diego, California, via Fort Yuma and Maricopa Wells, to Prescott and Tucson, Arizona. Subsequently an act approved June 23, 1874, directed the extension of the Arizona line from Prescott to Camps Verde and Apache, Arizona, and required certain reports and duties to be under the direction of the Chief Signal-Officer. An act approved June 3, 1874, authorized the Secretary of War to construct a telegraph-line for the protection of the frontier population against Indian and other depredations. On July 30, 1874, orders were issued from the War Department directing the Chief Signal-Officer to assume charge, subject to the direction of the Secretary of War, of the construction, maintenance, and operation of the different lines provided by these acts.

On August 19, First Lieut. Allyn Capron, acting signal-officer, U. S. A., was assigned to the charge of the lines in Texas and the Indian Territory, assisted by J. C. Van Duzer, as Superintendent of Construction. (Papers 51 and 52.) On August 26, Second Lieut. Theodore Smith, acting signal-officer, U. S. A., was assigned to the charge of the lines in Arizona. The appropriation for the construction of the lines in the Indian Territory and Texan frontier had been estimated for by the Chief Signal-Officer and submitted to Congress by the Secretary of War, based upon the assumption that the lines, being for military uses, and running through territories which the United States holds occupied by troops for their protection against Indians and other depredations, would be properly and almost of necessity constructed by the labor of enlisted men. The sums appropriated are, for this reason, so small as to be barely sufficient for the purchase of material alone. The Texan line will be in length about twelve hundred miles. The country through which it passes is, in great part, a desert over which nomadic tribes of Indians wander, and shelter is to be found only at sparse military posts. The troops there stationed are at almost constant war with the fighting tribes, or they pursue bands of marauders crossing the Mexican frontier for purposes of plunder. There is no region in which lines of telegraph are more needed to render safe the development of the country and to aid in military operations. There is, perhaps, none in which it is more difficult to construct such lines. The officers charged with the duty have, however, entered zealously upon it, and have found themselves well sustained by the commanding generals and the general sentiment of the resident population by whom the promise of safety to life

and benefit to property to follow the completion of the works is fully appreciated.

But little difficulty is anticipated in the extension of the lines in Arizona. The appropriation is greatly inadequate for the work undertaken, but supports for the wires—that material of the line the most expensive and that transported with the greatest difficulty—can, it is believed, be procured and prepared by the working-parties on or near the ground, and the work is in fair progress.

The enactment of Congress permitting the receipts of the lines in this Territory to be used for the purposes of the lines is of important assistance. After a careful reconnaissance of the line the officer in charge reports the portion already erected and in operation as in good working condition. A force of eight enlisted operators of the Signal-Service has been detailed to take charge of the stations. In the case of the Texas line, greater difficulties are to be encountered.

The great length of the line, part of which extends through an almost unknown country, has not permitted the minute reconnaissance of the route necessary to give, in detail, the amount or kind of material which can be drawn from the country in the different sections through which it passes, nor the especial difficulties to be anticipated in each. Enough, however, is known to permit it to be estimated that an additional appropriation will be necessary to complete the work undertaken.

The advantages secured in undertakings of this character by the organization of the Signal-Service and its drills of instruction at Fort Whipple, by means of which a force of trained soldiers, systematically drilled at the same time in the work of telegraphic construction, the operation of the lines, and the defense both of themselves and of the lines, when necessary, evidence themselves in these instances. The lines can be carried anywhere it is possible for troops to go, and the force employed upon them goes upon the duty with as little question, and with the same feeling that they will be properly cared for, with which they would enter upon any other duty. The wise foresight of Congress, which has provided these lines for the interior, and has turned the service of a portion of the Army in this direction, has supplemented the force of the Army by one of the most powerful aids to make that force everywhere, in a threatened district, available, to enable it to be concentrated anywhere for purposes of defense or pursuit, and to permit it to be in the power of the commanding general to know almost the course and location of raiding parties, as their movements are studied with the aid of telegraphic reports on the maps before him. It brings an aid equally efficient to advance the civilization of the country, to make the passage through, or settlement in it, comparatively safe, and to render its citizens, in time, fully able to protect themselves. The distances between the stations need not be great; a very few men can hold one of them; the lines follow the traveled routes of emigration, and aid can be at any time summoned. Little settlements will grow up, the military posts of the frontiers and the interior will be no longer isolated. The inducements to enterprise, to carry settlement forward, will cease to be counteracted by the thought that such settlement amounts to self-banishment. The messages of business or pleasure can go from post or station in less time than the courier now needs to saddle his horse before mounting to carry the dispatch the first twenty miles.

As a measure of economy for the Army alone, the outlay is more than warranted. It is recommended that measures be taken gradually to connect, as the work can be done, the posts of the Army now so isolated in the interior and Indian country, a certain number of them

being brought within the bond of connection each year. The officers and men of the Army and the citizens of the West and the western frontiers are not alone interested in works of this description. The chain of stations to be opened and occupied by soldiers of the Signal-Service becomes at once a chain of stations of observation of those meteoric changes which, in their path, pass over the valley of the Mississippi, the eastern and populated States, and will enable more certain pre-announcements to be made and at greater periods in advance. From these stations may be had the first warnings of the dreaded "northers" forming in the interior or on their course to the Gulf of Mexico. The control of the lines will enable inquiry to be made at any time. The signals of caution to be displayed on the lakes, the Atlantic and the Gulf coasts, for the benefit of the commercial interests of our most eastern people, may, it is possible in the hereafter, be traced to the first forewarnings thus given at stations inaccessible without these lines. The community of interests is thus wide-spread. So great a portion of our territory ought not to remain a region almost unknown and unoccupied. So much of our Army ought not to be without the power of co-operation when the work to secure both the co-operation and the development demands, comparatively, little of either outlay or labor.

The circuit telegraphic service of the Office has been, during the past year, essentially the same in style as for the preceding years. The system of working forms of circuits adopted by the Office has been sufficiently described in preceding reports. This service was had over the lines of the Pacific and Atlantic Telegraph Company until December 27, 1873, at which time, the control of those lines having passed into the management of the Western Union Telegraph Company, the service was transferred to the wires of that company. On February 4, 1874, the Western Union Company accepted a system of work on that day tendered, and since that date the station-messages have been transmitted over the lines of that organization. A considerable number of messages and reports from centers of distribution, &c., pass over the lines of the Atlantic and Pacific and Franklin Telegraph Companies. The average number of station-reports transmitted daily has been ninety-six. Nine hundred and forty-one thousand eight hundred and sixty cipher words of weather-reports have been received at, and one hundred and thirty-seven thousand one hundred and twenty-eight sent from, this Office during the year. Six thousand six hundred and ninety-five telegraphic messages, other than weather-reports, but connected with that work, have also been received, and seven thousand five hundred and seventy-eight sent. There have also been received at this Office twenty-five thousand six hundred and eighty cipher-words of special river-reports.

The telegraphic business of the Office has been conducted during the past year with less difficulty than in the years preceding. In December, 1873, the Hon. Reverdy Johnson was commissioned by the Attorney-General as special assistant to the Attorney-General in matters in controversy between the United States and various telegraph companies. The grave questions which had arisen as to the rights of the United States and the duties of the companies in reference to the telegraphic service of the United States, submitted for his consideration, have elicited the official opinion published herewith, (Paper 53,) while other official action has been taken by him to bring to a settlement the matters at issue.

The service has been further benefited by the act of Congress, approved June 23, 1874, entitled "An act to protect lines of telegraph

constructed or used by the United States from malicious injury or obstruction." (Paper 54.)

The Chief Signal-Officer has often referred to the rapidity of the telegraphic work required for this Office, and which the organization of the Office makes possible. It is hardly yet generally realized, however, that in the average time of one hour and ten minutes from that moment at which its observers at stations throughout the great territory the service covers are required to read simultaneously the different instruments at the different stations, the whole of these readings, made thus at places covering an area almost continental, have been recorded, written, and telegraphed in cipher, and received and registered in this Office. The average time elapsing from the time at which the readings at the stations have been taken at the stations, to that at which the summary reports, based on these data, have been issued from the Office, has been one hour and forty minutes.

Assistant Cleveland Abbe furnishes a preliminary report on the auroral display of April 7, 1874, (Paper 55,) and Assistant Thompson B. Maury one on barometric gradients in the United States. (Paper 56.)

Prof. I. A. Lapham contributes this year, as in several preceding ones, an interesting and valuable list of disasters on the lakes. (Paper 57.)

A list of such boards of trade, chambers of commerce, and other organizations, apart from those directly connected with agriculture, as have appointed permanent committees to confer with this Office, is given in Paper 58. Paper 59 exhibits the names of stations for whose establishment requests have been made, but which have not been established September 30, 1874.

With this rehearsal of the duties of this Office, the report of active service for the year terminates. The scope of its service is now better filled than in any preceding year. The work of organization, hitherto so engrossing, can now give place to that of improving its working. The time has now arrived when the Chief Signal-Officer deems it his duty to urge earnestly upon the Secretary of War the need of some form of more permanent organization to continue with improvement in the line of duty marked out. With duties, perhaps, as extensive as important, and reaching directly more interests of the people of the United States than those of any other bureau of the War Department; with duties dependent, also, for their best success upon patient study and long experience, in which the skill of the officer, his value to the service and the country increases with constant practice, the officers serving upon it are held by a system of uncertain details only. The work of the Office is daily embarrassed as details change. It might be wholly broken up, without intention even, by a single misconceived order, or one drawn in ignorance of the facts. Often the long labor of instruction goes on until the officer is just ready to take his share in the real labor of the service, when his personal interests call him away to some other corps which offers at least permanent position, or the needs of a company somewhere summon him to it. The struggle for the best success is, with such drawbacks, discouraging. The knowledge of duty imperfectly done may rest with the Office. The real loss is more widely felt throughout the United States. The prevision of the Secretary of War has hitherto guarded against many dangers. But the interests of the United States dependent upon the service, the sums invested to secure its success, the connections established at home and abroad, are such that they ought not to be without the protection of legislative enactment. In no duty of our Army has a service so extensive existed, serving continuously for so many years, with duties which aim to come home

to every citizen, without formal provision made for its officers. The duties of the officers require it. Separated from their companies and commands, and held strictly to a service which has no holidays and which knows no rest; required to devote to it the best energies and talents of the best portion of their lives, serving in it continuously, as has chanced to some, through details of ten years' duration, in peace and in war, living and dying in this service alone, it is right that the permanency of their service should be recognized, and that they should look forward to advancement in it. The full duties of the Signal Service include those applicable to peace as well as war. To attain proficiency in them, the whole time of an officer during years of study and application is requisite. They comprise the military duties of the field signal service and also all the duties of the service in relation to the display of warning signals giving notice in advance of storms and floods. The latter involves the study of meteoric indications and the practice and habit of controlling the organization spread over the United States, of managing the taking, telegraphing, receipt, and collation of reports from the different stations; of deducing correct results from them and of giving necessary warnings by signals or otherwise when danger threatens. The value of the officer constantly increases with the experience had in the observation of storms, the study of meteoric indications, and the correct ordering of signals. To fulfill its demands reliably, the employment of a selected officer, once placed upon this duty, must be permanent. Provision should be made for such permanent employment, for the same reason that it is made for the permanent employment of officers on any other special service, on which may rest both life and property. It will be fatal to the service if it is attempted long to perform its duties by uncertain details.

I earnestly recommend that it be sought of Congress that it be enacted that the President be authorized to detail or appoint as assistants to the Chief Signal Officer eight officers with the rank and pay of captains, and eight with the rank and pay of first lieutenants, while so serving. The additional expense to the United States would amount to very few hundreds of dollars. The benefits to result to the service would be worth many times the expenditure.

For the enlisted men of the service there is now no future. Without legislation providing for the grades above them, they are cut off from any hope of advancement in their own service, that strongest of inducements to faithful labor which wise legislation has always provided. The act of Congress approved June 16, 1874, fixing the permanency of the service with the non-commissioned grades, has been productive of the most beneficial results. The tone of the service has been in every way improved. It would be difficult to find a more intelligent, better ordered and selected body of men than those who wear its uniform. It is right such men should have every encouragement. On any non-commissioned officer of the service rests the immediate care of the station at which he may be, separated sometimes many hundreds of miles from this office. Present there, he represents the United States in his duties with boards of trade, commercial associations, the press, and the large populations the station duties reach. Upon his faithfulness, honesty, sobriety and good conduct depend the success and reputation of the service. It is recommended, and it is necessary to retain them, that the pay of these men be made equal to that of the most favored enlisted men of the Army.

At the close of another year's service the Chief Signal Officer finds, as he reviews the results of the year, many causes for encouragement.

While the field of duty has become great, it promises grand returns to resolute labor. The Office has to acknowledge a cordial and wide-spread co-operation at home and abroad. The wide systems of observation intrusted to its care by those hitherto charged with them, evidence the belief that there will be effort, at least, to use them wisely. It labors now in a work to which none of the great family of nations are strangers. The use of the work accomplished, the magnitude of that in the future, have been well-appreciated by scientists. There has been wanting neither acknowledgment of services already rendered, nor incentive to future effort. The popular support, and the support of the press, so long and generously given, have been continued. Criticism has been temperate, and willing to be easily satisfied. Legislation has been favorable. To aids like these, and the steady support the Secretary of War has found it his duty to render, the advance of the work has been due. There seems no difficulty to be encountered in the future greater than has been already met in the past. The opportunities for rendering a public good have widened as the service has extended. The limits to bound that which is possible, cannot be estimated.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

Brig. Gen., (Bvt. Ass'g'd,) Chief Signal Officer, U. S. A.

PAPER 1.

Schedule of drills and recitations at Signal School of Instruction, Fort Whipple, Va.

DRILLS.

Train drill	Daily.
Flag and torch drills	Daily.
Carbine drills	Daily.

RECITATIONS AND PRACTICE.

Manual of signals	Daily.
Meteorology	Daily.
Telegraphy	Daily.
International signals	Daily.
Telegraphic practice	Daily.
Wand practice	Daily.
Field signal practice	Daily.

PAPER 2.

Table showing the instruction of candidates for the grade of observer-sergeants from October 1, 1873, to September 30, 1874.

Name.	Instruction commenced.	Date of promotion.	Remarks.
Simon S. Bassler	July 10, 1873	Oct. 1, 1873	In charge of station at Cincinnati, Ohio; reduced July 9, 1874; appointed corporal August 10, 1874; appointed sergeant August 25, 1874.
James Mitchell	Aug. 9, 1873	Oct. 1, 1873	In charge of station at Buffalo, N. Y.
Theodore C. Taylor	Jan. 14, 1873	Oct. 1, 1873	In charge of station at Eastport, Me.
Daniel O'Leary	July 21, 1873	Oct. 1, 1873	Reduced March 23, 1874; now on duty as assistant at Pike's Peak, Colo.
John R. Williams	Aug. 7, 1873	Nov. 1, 1873	Reduced July 18, 1874; appointed corporal September 10, 1874; in charge of station at North Platte, Neb.

Table showing the instruction of candidates for grade of observer-sergeants, &c.—Continued.

Name.	Instruction commenced.	Date of promotion.	Remarks.
George W. McKee	Aug. 21, 1873	Nov. 1, 1873	Died at Long Branch, N. J., September 14, 1874.
John O. Barnes	Aug. 8, 1873	Nov. 1, 1873	In charge of station at Peak's Beach, N. J.
Sherman B. Lum	Aug. 21, 1873	Nov. 1, 1873	In charge of station at Wilmington, N. C.
Allen M. Geissinger	Aug. 21, 1873	Dec. 1, 1873	Reduced June 29, 1874; now on duty as assistant at Baltimore, Md.
William Stein	Sept. 6, 1873	Dec. 1, 1873	In charge of station at Cape Henry, Va.
Edwin Booth	Sept. 8, 1873	Dec. 13, 1873	Reduced August 14, 1874; now on duty as assistant at Erie, Pa.
Henry Bossant	Sept. 10, 1873	Feb. 16, 1874	In charge of station at Augusta, Ga.
Denis M. Kennedy	Sept. 10, 1873	Dec. 1, 1873	In charge of station at Squan Beach, N. J.
William D. Halliday	Oct. 9, 1873	Feb. 25, 1874	Discharged April 15, 1874.
John Laurens	Oct. 15, 1873	Jan. 10, 1874	On duty at office of Chief Signal Officer.
Emile T. Carvalho	Oct. 18, 1873	Jan. 10, 1874	In arrest at Fort Whipple, Va.
Herbert M. Wells	Oct. 18, 1873	Feb. 16, 1874	Reduced April 3, 1874; now on duty as assistant at Fort Sully, Dak.
Alois Donhauser	Oct. 22, 1873	Jan. 10, 1874	In charge of station at Albany, N. Y.
Winfield S. Popple	Nov. 2, 1873	Feb. 16, 1874	In charge of station at Savannah Ga.
Thomas Jones	Nov. 3, 1873	Feb. 16, 1874	In charge of station at Cairo, Ill
Peter J. Huneke	Nov. 20, 1873	Feb. 16, 1874	In charge of station at Denver, Colo.
John J. Nanry	Dec. 1, 1873	Mar. 25, 1874	In charge of station at Sandy Hook, N. J.
John D. Sumet	Dec. 2, 1873	Mar. 25, 1874	In charge of station at Key West, Fla.
Adonirum J. Berry	Dec. 4, 1873	Mar. 25, 1874	In charge of station at Grand Haven, Mich.
George H. Rohe	Dec. 6, 1873	Feb. 16, 1874	In charge of station at Pittsburgh, Pa.
Edgar McGovern	Dec. 11, 1873	Mar. 25, 1874	In charge of station at Leavenworth, Kans
George H. Crane	Dec. 23, 1873	Apr. 1, 1874	In charge of station at New London, Conn.
Charles L. Josselyn	Dec. 27, 1873	Apr. 1, 1874	Reduced June 4, 1874; now on duty as assistant at Saint Louis, Mo.
Frank Mangels	Jan. 1, 1874	Apr. 1, 1874	Reduced August 24, 1874; now on duty at Fort Whipple, Va.
Hermann Frey	Jan. 3, 1874	Apr. 1, 1874	In charge of station at Breckenridge, Minn.
Edward D. Holbrook	Feb. 24, 1874	Aug. 8, 1874	In charge of station at Barnegat, N. J.
James H. Smith, (2d)	Apr. 25, 1874	Aug. 22, 1874	In charge of station at Bismarck, Dak.
Edward W. Boutelle	May 7, 1874	July 27, 1874	Temporarily in charge of station at Philadelphia, Pa.
Milton M. Lewis	Apr. 26, 1874	.....	Discharged July 13, 1874.
William J. Evans	May 19, 1874	.....	Promoted corporal September 21, 1874; in charge of station at Montgomery, Ala.
William D. McChesney	May 21, 1874	Aug. 22, 1874	In charge of station at Corsicana, Tex.
Edward Moran	May 27, 1874	.....	Discharged July 3, 1874.
Michael L. Landers	June 1, 1874	Aug. 22, 1874	In charge of station at Dodge City, Kans.
John G. Lynch	July 29, 1874	.....	Still under instruction.
Jacob M. Frantz	Aug. 1, 1874	.....	Do.
Jerome J. Weinberg	Aug. 17, 1874	.....	Do.
John C. Senger	Aug. 17, 1874	.....	In confinement at Fort Whipple, Va.
Robert B. Watkins	Aug. 19, 1874	.....	Still under instruction.
Charles A. Smith	Aug. 19, 1874	.....	Do.
Dwight D. Stansell	Aug. 28, 1874	.....	Do.
James T. Minchin	Sept. 3, 1874	.....	Do.
Charles W. Hobbs	Sept. 14, 1874	.....	Do.
John V. Brown	Sept. 16, 1874	.....	Do.
Cyrus Cramer	Sept. 17, 1874	.....	Do.
Charles Dill	Sept. 18, 1874	.....	Do.

PAPER 3.—*Enlisted men instructed for the position of assistants to observer-sergeants from October 1, 1873, to September 30, 1874.*

Names.	Placed under instruction for assistant.	Reported qualified as assistant.	Ordered on station.	Remarks.
Isaac R. Birt	Sept. 6, 1873	Nov. 22, 1873	Dec. 9, 1873	On duty as assistant at Punta Rassa, Fla.
Harry S. Montague	Sept. 11, 1873	Nov. 15, 1873	Dec. 15, 1873	On duty as assistant at Toledo, Ohio.
Charles H. Mays	Sept. 11, 1873	Nov. 22, 1873	Dec. 13, 1873	Ordered to Fort Whipple, Va., for misconduct.
Thomas Murray	Sept. 15, 1873	Nov. 15, 1873	Nov. 29, 1873	On duty at Office of Chief Signal-Officer.
Rupert R. Rodgers	Sept. 15, 1873	Dec. 6, 1873	Dec. 16, 1873	On duty as assistant at Albany, N. Y.; promoted corporal July 22, 1874.
Cyrus Cramer	Sept. 23, 1873	Dec. 6, 1873	Dec. 20, 1873	Ordered to Fort Whipple, Va., for promotion.
Adolphus E. H. Burgtorf	Oct. 1, 1873	.....	.....	Dropped from instruction; discharged January 23, 1874.

PAPER 3.—*Enlisted men instructed for assistants to observer-sergeants, &c.*—Continued.

Names.	Placed under instruction for assistant.	Reported qualified as assistant.	Ordered on station.	Remarks.
Richard O'Dowd	Oct. 4, 1873	Dec. 27, 1873	Dec. 29, 1873	On duty as assistant at Wilmington, N. C.
Robert B. Watkins	Oct. 4, 1873	Dec. 6, 1873	Dec. 9, 1873	Ordered to Fort Whipple, Va., for promotion.
Charles Holmes	Oct. 4, 1873	.....	Dec. 1, 1873	On duty at Office of Chief Signal-Officer.
William F. Allen	Oct. 4, 1873	.....	Mar. 24, 1874	On duty as assistant at San Diego, Cal.
Fred. W. Conant	Oct. 4, 1873	Dec. 6, 1873	Dec. 13, 1873	On duty as assistant at Buffalo, N. Y.
Hermann Voss	Aug. 30, 1873	.....	May 6, 1874	On duty as assistant at Charleston, S. C.
Sidney J. Bronson	Aug. 2, 1873	Oct. 11, 1873	Oct. 17, 1873	On duty as assistant at Squan Beach, N. J.
John Moll	Aug. 30, 1873	Oct. 16, 1873	Oct. 16, 1873	Discharged the service of United States August 14, 1874.
Robert Reeder	Aug. 21, 1873	Oct. 18, 1873	Oct. 24, 1873	On duty as assistant at Chicago, Ill.
Lucius A. Welsh	Aug. 21, 1873	Oct. 18, 1873	Oct. 24, 1873	On duty as assistant at Milwaukee, Wis.
James H. Bryce	Aug. 21, 1873	Oct. 18, 1873	Oct. 24, 1873	On duty as assistant at Leavenworth, Kans.
Charles A. Ray	Aug. 25, 1873	Nov. 1, 1873	Nov. 13, 1873	On duty as assistant at Long Branch, N. J.
Pierson R. Murphey	Aug. 15, 1873	Nov. 1, 1873	Nov. 24, 1873	On duty as assistant at Escanaba, Mich.
George Feller	Aug. 30, 1873	Nov. 1, 1873	Nov. 24, 1873	On duty as assistant at New Orleans, La.
James T. Minchin	Aug. 15, 1873	Nov. 1, 1873	Nov. 24, 1873	Ordered to Fort Whipple, Va., for promotion.
Ira W. Birt	Aug. 15, 1873	Nov. 1, 1873	Nov. 24, 1873	On duty as assistant at Memphis, Tenn.
Samuel W. Naylor	Aug. 30, 1873	Nov. 22, 1873	Dec. 13, 1873	On duty as assistant at Buffalo, N. Y.
Moses E. Woodard	Oct. 15, 1873	.....	.....	Died June 7, 1874.
Eugene E. Clements	Oct. 18, 1873	Dec. 27, 1873	Dec. 29, 1873	On duty as assistant at Cincinnati, Ohio.
Neill Dumont	Nov. 14, 1873	.....	Dec. 23, 1873	Ordered to Fort Whipple, Va., for misconduct.
Lemuel H. Foster	Nov. 22, 1873	.....	Dec. 23, 1873	On duty as assistant at Augusta, Ga.
Penton Bellville	Nov. 22, 1873	.....	Dec. 31, 1873	On duty as assistant at Fort Gibson, Ind. Ter.
William Story	Dec. 13, 1873	Feb. 7, 1874	Feb. 20, 1874	Ordered to Fort Whipple, Va., for misconduct.
George H. Schroder	Dec. 30, 1873	Feb. 7, 1874	Feb. 11, 1874	On duty as assistant at Savannah, Ga.
John McKenna	Dec. 30, 1873	.....	Jan. 14, 1874	On duty as assistant at Norfolk, Va.
William Baber	Dec. 30, 1873	Feb. 7, 1874	Feb. 26, 1874	On duty as assistant at Toledo, Ohio.
George H. Smith	Jan. 14, 1874	Feb. 7, 1874	Feb. 11, 1874	On duty as assistant at Milwaukee, Wis.
Thomas A. Forbes	Jan. 15, 1874	.....	Mar. 2, 1874	On duty as assistant at Key West, Fla.
John Craig	Jan. 24, 1874	.....	Mar. 3, 1874	On duty as assistant at Oswego, N. Y.
Lucien M. Turner	Mar. 9, 1874	.....	Mar. 19, 1874	In charge of station at St. Michael's, Norton Sound, Alaska.
Hiram W. Tibbetts	Mar. 19, 1874	.....	Apr. 1, 1874	On duty as assistant at Pittsburgh, Pa.
John F. Conners	Apr. 4, 1874	.....	May 22, 1874	On duty as assistant at Keokuk, Iowa.
George B. Sharp	Apr. 25, 1874	.....	.....	Ordered to Fort Whipple, Va., for misconduct from Office of Chief Signal-Officer.
Joseph W. Compton	Apr. 26, 1874	.....	June 1, 1874	On duty at Office of Chief Signal-Officer.
George B. Till	May 9, 1874	.....	May 22, 1874	On duty as assistant at Cleveland, Ohio.
Owen S. M. Cone	May 9, 1874	.....	May 27, 1874	On duty as assistant at New Orleans, La.
Egbert Van Dyk	May 9, 1874	.....	June 6, 1874	On duty at Office of Chief Signal-Officer.
Frank B. Cooksey	May 15, 1874	June 27, 1874	June 30, 1874	On duty as assistant at Buffalo, N. Y.
Robert M. Barnitz	May 19, 1874	.....	.....	On duty at Office of Chief Signal-Officer.
John J. Buckley	June 6, 1874	.....	July 14, 1874	Ordered to Fort Whipple, Va., for misconduct.
Isaac Menah	June 6, 1874	July 25, 1874	.....	Dropped from instruction.

PAPER 3.—*Enlisted men instruceed for assistants to observer-sergeants, &c.*—Continued.

Names.	Placed under instruction for assistant.	Reported qualified as assistant.	Ordered on station.	Remarks.
Edward H. Woods	June 9, 1874	Aug. 1, 1874	Aug. 8, 1874	On duty as assistant at Vicksburgh, Miss.
Richard J. Lewis	June 18, 1874	July 25, 1874	July 27, 1874	On duty as assistant at Saint Louis, Mo.
Llewellyern C. Stanford	June 26, 1874	July 25, 1874	.....	On duty at Office of Chief Signal-Officer.
Charles W. Roby	July 1, 1874	July 25, 1874	July 27, 1874	On duty as assistant at Albany, N. Y.
John T. O'Keefe	July 1, 1874	Aug. 1, 1874	Aug. 1, 1874	On duty as assistant at Philadelphia, Pa.
Charles J. King	July 16, 1874	.....	Sept. 3, 1874	On duty as assistant at Mount Washington, N. H.
Robert T. Porter	July 16, 1874	Aug. 15, 1874	Aug. 19, 1874	On duty as assistant at Shreveport, La.
Harry Hall	July 16, 1874	Aug. 8, 1874	Aug. 11, 1874	On duty as assistant at Mobile, Ala.
John C. Rogers	July 16, 1874	Aug. 15, 1874	Aug. 21, 1874	On duty as assistant at Louisville, Ky.
Thomas Gibson	July 16, 1874	Aug. 8, 1874	Aug. 11, 1874	On duty as assistant at Wilmington, N. C.
Herbert S. Foster	July 16, 1874	Sept. 5, 1874	Sept. 12, 1874	On duty as assistant at Albany, N. Y.
Ignatius V. Wallace	July 16, 1874	Aug. 8, 1874	Aug. 11, 1874	On duty as assistant at Knoxville, Tenn.
Clinton C. Norris	July 16, 1874	Aug. 22, 1874	Aug. 26, 1874	On duty as assistant at Charleston, S. C.
Theodore V. Van Heusen	July 16, 1874	Aug. 8, 1874	Aug. 11, 1874	On duty as assistant at Indianapolis, Ind.
John W. Wildman	July 16, 1874	Aug. 22, 1874	Aug. 26, 1874	On duty as assistant at Cleveland, Ohio.
Edward T. Upperman	July 16, 1874	Aug. 8, 1874	Aug. 13, 1874	Ordered to Fort Whipple, Va., for misconduct.
Richard N. Eastlack	July 16, 1874	.....	.....	Ordered to Fort Whipple, Va., for misconduct from Office of Chief Signal-Officer.
William Sheil	July 22, 1874	Sept. 19, 1874	Sept. 21, 1874	On duty as assistant at Rochester, N. Y.
Richard O. Trent	July 22, 1874	Aug. 22, 1874	Aug. 25, 1874	On duty as assistant at Detroit, Mich.
Joseph W. Buck	July 23, 1874	Sept. 26, 1874	.....	Awaiting orders at Fort Whipple, Va.
John Hart	July 24, 1874	Sept. 5, 1874	.....	On duty at Office of Chief Signal-Officer.
John T. Cochran	July 24, 1874	Aug. 22, 1874	Aug. 26, 1874	On duty as assistant at Salt Lake City.
John M. Clifford	July 24, 1874	Sept. 26, 1874	.....	Awaiting orders at Fort Whipple, Va.
Edward B. Garriott	July 24, 1874	Aug. 29, 1874	Sept. 3, 1874	On duty as assistant at Portland, Me.
Joseph B. Chapman	July 24, 1874	.....	.....	Dropped from instruction.
William H. Knight	July 24, 1874	Aug. 22, 1874	Aug. 26, 1874	On duty as assistant at Detroit, Mich.
Martin Hoover	July 24, 1874	Sept. 26, 1874	.....	Awaiting orders at Fort Whipple, Va.
John J. Tuttle	Aug. 1, 1874	Sept. 12, 1874	Sept. 12, 1874	On duty as assistant at Pike's Peak, Colo.
Henry L. Boyce	Aug. 1, 1874	Sept. 12, 1874	Sept. 16, 1874	On duty as assistant at Port Huron, Mich.
William H. Agey	Aug. 1, 1874	Sept. 19, 1874	Sept. 21, 1874	On duty as assistant at Philadelphia, Pa.
Frank B. Woodbury	Aug. 1, 1874	Sept. 12, 1874	Sept. 12, 1874	Do.
Harry F. McFarland	Aug. 14, 1874	.....	.....	Still under instruction.
Oliver H. Lowery	Aug. 8, 1874	.....	.....	Do.
Henry H. Hull	Aug. 8, 1874	.....	.....	Do.
George W. Kelsey	Aug. 12, 1874	.....	.....	Do.
Michael McGaurau	Aug. 12, 1874	.....	.....	Do.
John W. Smith	Aug. 17, 1874	.....	.....	Do.
Edmund Davis	Aug. 21, 1874	.....	Sept. 3, 1874	In charge of station at Rockport, Mass.
John McGlone	Aug. 17, 1874	.....	.....	Still under instruction.
Orin Parker	Aug. 17, 1874	.....	.....	Do.
John W. Case	Aug. 22, 1874	.....	.....	Do.
John C. Rickli	Aug. 22, 1874	.....	.....	Do.
Henry Blair	Aug. 29, 1874	.....	.....	Do.
James J. Fitzgerald	Sept. 5, 1874	.....	.....	Do.
Frederick J. Papst	Sept. 5, 1874	.....	.....	Do.
James F. Burke	Sept. 7, 1874	.....	.....	Do.
William H. Sayers	Sept. 15, 1874	.....	.....	Do.
Thomas B. Bowlus	Sept. 15, 1874	.....	.....	Do.
James H. Crowley	Sept. 15, 1874	.....	.....	Do.
Edward F. Kubel	Sept. 15, 1874	.....	.....	Do.

PAPER 4.

Exhibiting the communications sent from and received at the office of the Chief Signal-Officer (exclusive of telegrams) from October 1, 1873, to September 30, 1874.

SENT.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

To heads of Departments and Bureaus	117	
To observer-sergeants in reference to their duties	12,516	
In reply to applications for stations and others similar	39	
To telegraph-companies in reference to transmission of weather-reports, erection of telegraph-lines, &c	490	
To boards of trade, chambers of commerce, agricultural societies, &c	374	
To postmasters in reference to weather-bulletins	9,541	
To foreign correspondents relating to this division in general	127	
To foreign correspondents relating to synchronous reports	90	
To volunteer observers throughout the United States	951	
General and special orders and circulars with reference to this division	9,166	
Miscellaneous	1,132	
Total		34,543

SIGNAL-DIVISION.

To heads of Departments and Bureaus	122	
Relating to duties and discipline at Signal-Service school of instruction and post at Fort Whipple, Virginia	1,279	
Relating to recruiting and enlistment	70	
Answers to applications for appointment in the Signal-Service United States Army	750	
General and special orders and circulars with reference to this division	1,209	
Miscellaneous	254	
Total		3,684

PROPERTY-DIVISION.

To heads of Departments and Bureaus	459	
To manufacturers and others in reference to instruments, equipments, &c	715	
To observer-sergeants and other enlisted men in reference to property and money accounts	9,570	
In reference to quarterly returns of officers	939	
Miscellaneous	2,486	
Total		14,169
Aggregate		52,396

RECEIVED.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

From heads of Departments and Bureaus	65
Applications for establishment of new stations	45
From telegraph-companies in reference to transmission of weather-reports, construction of telegraph-lines, &c	227
From observer-sergeants in reference to their duties	11,421
From boards of trade, chambers of commerce, and agricultural societies	2,372
From foreign correspondents relating to this division in general	395
From foreign correspondents relating to synchronous weather-reports	1,236
From volunteer observers throughout the United States relating to observations and reports	4,121
Reports relative to instruction of observer-sergeants and assistants	2,807

Mailed reports from observer-sergeants on station	249,183	
Meteorological charts, abstracts of journals, forms, &c., received from observer-sergeants on station	57,003	
Reports from postmasters throughout the United States in reference to weather-bulletins received and posted by them	117,137	
Miscellaneous	2,797	
Total		448,809

SIGNAL-DIVISION.

From heads of Departments and Bureaus	274	
Relating to duties and discipline at Signal-Service school of instruction and post of Fort Whipple, Virginia	426	
Relating to instruction in signaling at Fort Whipple, Virginia, and in different military departments	97	
Relating to recruiting and enlistment	230	
Applications for appointment in the Signal-Service United States Army	623	
Miscellaneous	1,860	
Total		3,510

PROPERTY-DIVISION.

From heads of Departments and Bureaus	435	
From manufacturers and others relating to instruments, equipments, &c	394	
From officers concerning property, quarterly returns, &c	1,188	
From observer-sergeants and other enlisted men relating to property and money accounts	17,721	
Regarding property transferred to stations	2,091	
Miscellaneous	3,414	
Total		25,243
Aggregate		477,562
Aggregate sent		52,396
Aggregate received		477,562
Aggregate sent and received		529,958

Table showing the number of cipher-words and messages sent and received by telegraph at the central office, Washington, D. C., from October 1, 1873, *to September* 30, 1874, *inclusive.*

Cipher-words of weather-reports sent	137,128
Telegraphic messages other than weather-reports sent	7,578
Cipher-words of weather-reports received	941,860
Cipher-words of special river-reports received	25,680
Telegraphic messages other than weather-reports received	6,695

PAPER 5.

List of publications received from foreign countries since September 30, 1873.

Rapporti sulle osservazioni dell' eclisse totale di sole 22 dicembre 1870, eseguite in Sicilia dalla commissione italiana. Palermo, 1872.

Die Witterungsverhältnisse des Jahres 1871, nach den Beobachtungen der würtembergishen meteorologischen Stationen zusammengestellt von Dr. H. Schoder. Stuttgart, 1873. Mit Uebersicht über Witterungsverhältnisse des Monats Januar von Juli 1873, nach den Beobachtungen der würtembergischen Stationen.

Normale Wärmemittel (Fortsetzung vom würtembergischen Jahrbuch, 1870.) C. Canstatt.

Anno XXV^{mo} della corrispondenza scientifica, bulletino delle osservazioni ozonometriche meteorologiche, fatte in Roma da Caterina Scarpellini.

Results of meteorological observations made at the Radcliffe observatory, Oxford, in the year 1870, under the superintendence of the Rev. Robert Main.
Jahrbücher der königlichen Central-Anstalt für Meteorologie und Erdmagnetismus von Dr. Guido Scheuzl. 1ster Band, Jahrgang 1871. Buda Pest, 1873.
Resultate aus den meteorologischen Beobachtungen angestellt an vierundzwanzig königlich-sächsischen Stationen im Jahre 1870, bearbeitet von Dr. C. Bruhns. Leipzig, 1873.
Monatliche Berichte über die Resultate aus den meteorologischen Beobachtungen angestellt an den königlich-sächsischen Stationen im Jahre 1872. Mitgetheilt nach den Zusammenstellungen im statistischen Bureau des königlichen Ministeriums des Innern von Dr. C. Bruhns. Dresden, 1873.
Vent, sa direction et sa force observées à Perpignan avec un anémométrographe électrique par le Dr. Fines. Perpignan, 1873.
Bulletin météorologique du département des Pyrénées-orientales, publié sous les auspices du conseil général, année 1872. Perpignan, 1873.
De la prédiction du mouvement des tempêtes africaines et des périodes météorologiques par M. H. Farry. (2 copies.) Alger, 1873.
Die geographische Verbreitung der Gewitter in Mittel-Europa im Jahre 1856, so wie über die gegenseitige Beziehung zwischen dem Auftreten der Gewitter, der Temperatur, der Windrichtung und dem Barometerstande, von Dr. M. A. F. Prestel. Wien, 1858.
Die Gewitter des Jahres 1855: ein Beitrag zur Physiologie der Atmosphäre, von Dr. M. A. F. Prestel. Emden, 1856.
Der Boden, das Klima und die Witterung von Ostfriesland, sowie der gesammten deutschen Tiefebene in Beziehung zu den land- und volkswirthschaftlichen interessen, dem Seefahrtsbetriebe und den Gesundheits-Verhältnissen, dargestellt von Dr. M. A. F. Prestel. Emden, 1872
Procédé pour déterminer la direction et la force du vent; suppression des girouettes; application aux cyclones. Par M. H. Tarry.
Les cyclones du soleil comparées à ceux de notre atmosphère. Par M. H. Tarry.
Prolegomeni alle studie delle burrasche del clima di Roma per Giuseppe Lais, D. O., assistante all' osservatorio pontificio del Collegio romano. (2 copies.) Roma, 1873.
Sulla possibile connessione tra le eclisse di sole ed il magnetisme terrestre: memoria del P. Francesco Denza Barnabita. Roma, 1873.
Bemerkungen über die Meereshöhe von Tiflis, von A. Moritz. (Lu le 22 mars 1866.)
Der Bewegungsmechanismus am Drehthurme des Observatoriums zu Tiflis, von A. Moritz. Tiflis, 1866.
Ueber die Anwendung des Pistor'schen Reflections-Kreises zum Messen von Angular-Distanzen zwischen terrestrischen Objecten, von Dr. A. Moritz. Tiflis.
Schemacha und seine Erdbeben (ein Beitrag zur Beantwortung der Fragen welche sich an das Erdbeben vom 16. (28.) Januar 1872, knüpfen), von A. Moritz. Tiflis, 1872.
Exercices hypsométriques, par A. Moritz. Tiflis, 1869.
Die Sonnenfinsterniss vom 6. März (22. Februar) 1867, von A. Moritz. Tiflis, 1867.
Zwei Bemerkungen zu Regnaults Tafel der Spannkraft des Wasserdampfes, von A. Moritz. Tiflis, 1870.
Sammlung von Hülfstafeln zur Berechnung barometrischer Höhenbestimmungen, zusammengestellt von A. Moritz und H. Kiefer. Tiflis, 1870.
Erdbeben in Kaukasien im Jahre 1868: Auszüge aus Mittheilungen der Tifliser Zeitung "Kaukas," zusammengestellt von H. Kiefer. Tiflis, 1869.
Collection de tables à l'usage des stations météorologiques du Caucase, calculées par A. Moritz. Tiflis, 1868.
Materialien zu einer Klimatologie des Kaukasus, gesammelt und herausgegeben von A. Moritz. (Abtheilung 3: Klimatologische Skizzen, Band 1.) Tiflis, 1871.
Annals of the Imperial Botanical Society, St Petersburg. Vols. 1 and 2, 4 parts, 1871-73.
Observatoire d'Alger, 1re partie, panorama météorologique du climat d'Alger, observations météorologiques, 33 tableaux, 1 tableau graphique. Janvier 1872. Par M. Bulard.
Report upon the rain-fall of Barbados, and upon its influence on the sugar-crops, 1847-71, with two supplements, 1873-74. By Gov. Rawson. Barbados, 1874.
Jahrbücher der kaiserlich-königlichen Central-Anstalt für Meteorologie und Erdmagnetismus, von Carl Jelinek und Ferdinand Osnaghi. Neue Folge, 8. Band, Jahrgang 1871. Wien, 1873.
Zeitschrift der österreichischen Gesellschaft für Meteorologie, redigirt von C. Jelinek und J. Hann. 8. Band. 1873.
Nederlandsch meteorologisch Jaarboek voor 1872-73 [2 vols.], uitgegeven door het koninklijk nederlandsch meteorologisch Institut. Vierentwintigste Jaargang, erste Deel. Waarnemingen in Nederland. Utrecht, 1872-73.
Repertorium für Meteorologie, herausgegeben von der kaiserlichen Akademie der Wissenschaften, redigirt von Dr. H. Wild. Band 3. St. Petersburg, 1874.
Annalen des physikalischen Centralobservatoriums, herausgegeben von H. Wild. Jahrgang 1872. St. Petersburg, 1873.

Jahresbericht des physikalischen Centralobservatoriums für 1871 und 1872, der Akademie abgestattet von H. Wild. St. Petersburg, 1873.
Studien über meteorologische Instrumente und Beobachtungs-Methoden. 1. Ueber die Bestimmung des Luftdrucks. Von H. Wild. St. Petersburg, 1874.
Mittheilungen aus dem Gebiete des Seewesens, herausgegben vom kaiserlich-königlichen hydrographischen Amte, Marine-Bibliothek. [Vol. 1.] 1. Jahrgang. Pola, 1873.
Vierter Jahresbericht der meteorologischen Central-Station Carlsruhe über die Ergebnisse der an den meteorologischen Stationen des Grossherzogthums Baden im Jahre 1872 angestellten Beobachtungen, bearbeitet von Dr. Lübeck. Karlsruhe, 1873.
Erster und zweiter Jahresbericht für das meteorologische Jahr 1869 und 1870, enthaltend die Ergebnisse der meteorologischen Beobachtungen der badischen Stationen, bearbeitet von Dr. F. Weber.
Ueber einen einfachen Verdunstungsmesser für Sommer und Winter, von H. Wild, 13. (24.) Februar 1874.
Luftens Temperatur i og udenfor Christiania, samt dens Fraudring med Hojden, sammesteds af H. Mohn. Christiania, 1874.
Ponts et chaussées. Service hydrométique du bassin de la Seine, résumé des observations centralisées pendant les années 1871 et 1872, par M. G. Lemoine, sous la direction de M. E. Belgrand, avec 9 charts. Versailles, 1873. Et observations sur les cours d'eau et la pluie centralisées pendant l'années 1872, par M. Belgrand et M. G. Lemoine.
Quarterly weather-reports of the Meteorological Office, London, part 3, July to September, 1871; part 3, July to September, 1872; part 4, October to December, 1872; part 1, January to March, 1873.
Daily weather-bulletin, July, 1872, to June, 1873. 2 volumes.
Report of the meteorological committee of the Royal Society for the year ending December 31, 1873.
Third report of the Meteorological Office of the Dominion of Canada, for the fiscal year ended June 30, 1873, by G. T. Kingston, M. A., superintendent.
Geological survey of Newfoundland, by A. Murray: report of progress for the year 1873.
Magnetische und meteorologische Beobachtungen auf der kaiserlich-königlichen Sternwarte zu Prag im Jahre 1872, auf öffenliche Kosten herausgegeben von Carl Hornstein. Prag, 1873.
Notice sur le service météorologique aux États-Unis, par M. Malézieux. Paris, 1873.
Bericht über Wetter-Telegraphie und Sturmwarnungen, abgestattet an den meteorologischen Congress in Wien, von der dafür auf der Leipziger Conferenz ernannten Comité, redigirt von G. V. Boguslawski. Berlin, 1874.
An attempt to establish relation between the velocity of wind and its force, by Robert H. Scott.
Report on weather-telegraphy and storm-warnings, presented to the meteorological congress at Vienna by a committee appointed at the Leipsic conference. (Published by authority of the meteorological committee.) London, 1874.
Charter and by-laws of the Meteorological Society, London.
Studii intorno ai diametre solari del P. Paolo Rosa, della Compagnia di Gesu, assistente all' osservatorio pontificio del Collegio romano. Roma, 1874.
An abstract from the meteorological register of the observatory of Algiers. November, 1863, to May, 1864.
Météorologie sécheresse et inondations nécessité de reboisement, par M. Bulard.
Observatoire d'Alger. Résumé météorologique des deuxième et troisième trimestres de 1868, par M. Bulard. Observatoires météorologiques, janvier et février 1871. Résumé météorologique des mois de mars, avril et mai 1871. M. Bulard.

PAPER 6.

[Extract from daily journal.]

SUMMIT OF PIKE'S PEAK, COLORADO TERRITORY.

OCTOBER, 1873.

Water, which having to be conveyed in demijohns a distance of three-fourths of a mile over the worst part of the trail on foot, has been rather scarce with us; but that part of the labor has been done away with since October 22, on which day a terrific snow-storm began, and continued for three days and nights, and during that time deposited about three feet of snow on the peak, (the fall of snow being much heavier, but owing to the prevalence of a high wind—estimated at fifty miles per hour—during

the snow-storm, the snow was drifted and blown into the gullies and ravines that surround the peak, where it now lies in immense banks.)

This snow, melted, is our only drink, and the process is a slow one, owing to the lack of vessels on hand, a tea-kettle and iron dinner-pot being the only ones fit for use.

The winter has set in with unusual severity and earlier by a month than at any time during the last twenty years. Thus croaks the oldest inhabitant.

It is a notable fact that nearly everybody complains of sickness on ascending the mountain for the first time, the symptoms being dizziness and headache, accompanied by vomiting. I, myself, was affected in this manner during the first two days, but feel quite well now.

NOVEMBER, 1873.

November 1.—Commenced taking regular observations at 5.42 a. m. Weather today very variable.

November 2.—At 4.45 p. m. a curious and remarkable phenomenon was observed. In the distance to the northeast a heavy mist was hanging over the plains. On this mist was depicted a perfect shadow or profile of our Peak by means of the setting sun. The image was very realistic; so much so, that one could hardly credit that it was merely a shadow and not a lofty peak rising abruptly from the prairie. This continued for the space of fifteen minutes, when it gradually melted away in the mist as the sun was setting behind the gigantic peaks of the "Snowy Range." During the presence of the phenomenon we watched it with curious interest, and much regretted when it faded from our sight.

(NOTE.—This phenomenon has since been observed to be of almost daily occurrence, both at sunrise and sunset.)

November 9.—Three men came to the summit about fifteen minutes after sunrise; they started at 2 a. m. just to watch "Old Sol" make his first appearance over the plains—a spectacle the like of which but few mortals are favored with—and after a very tiresome journey of four hours they had the satisfaction of being just fifteen minutes too late. These three men were not very enthusiastic when they started for home again.

November 10.—The shadow of the Peak was again depicted on the haze at sunset; it seems to be a common occurrence at sunset, with a hazy or smoky lower atmosphere. I also saw the shadow cast by a very small cirrus cloud (due south of us) stretching way to the western horizon and coming to a sharp point there. This was between 2 and 3 p. m.

November 10.—A lady, accompanied by a guide, visited the summit this afternoon. She expressed much surprise that a station should be established at such an out-of-the-way place, when there were plenty of better places down below! *Sancta simplicitas.*

November 17.—This day will be remembered by us years hence. The temperature kept on increasing after 9 p. m. of last night; the maximum thermometer reading as high as 32° this morning. The moderately brisk wind prevailing at last observation on Sunday night increased to a hurricane shortly after midnight, which shook our house to its very foundation. The northwest end of the roof, although weighted down by heavy rocks, was frequently lifted up several inches above the wall, tearing away the plastering, which fell in showers over my bed, desk, and the floor. Sleep was out of the question, as I momentarily expected to see the roof fly off and leave us in the cold. Lying awake, I could hear the tin being wrenched off the sheathing-boards, where we had nailed it with great pains and much confidence in its security.

November 17.—Morning brought no abatement of the gale. At 5.30 a. m. I went out doors to wet the bulb of our hygrometer. On turning the northeast corner of the house, a terrific squall landed me, unceremoniously, in a ditch six feet to the leeward.

The anemometer showed an average velocity of sixty-five miles per hour, but some of the squalls were greatly superior in force. As the condition of our roof became more and more alarming, I determined to put some more rocks on top of it, although it was nearly impossible to stand up in the face of the hurricane. Lemman, the heaviest and strongest, took his position on top of the roof, and with the aid of a rope hauled up a number of the heaviest possible rocks, myself and Smith assisting from below with poles. It was terrible work, for often, after getting a rock nearly to the roof, a sudden gust of wind would knock all three of us off our legs, and the rock would barely miss falling on Smith or myself. However, we succeeded in getting up about a ton of rock, which effectually stopped the lifting of the roof. As soon as the gale subsides we will put up as many more. The hurricane abated somewhat during the afternoon, backing more to the westward; but the sky, which had been almost cloudless, became overcast with a low sheet of stratus, looking very much like coming snow. The temperature fell rapidly, with increasing humidity; the barometer also continued its downward course. At 6.30 p. m. a furious storm of snow and sleet set in; the wind rose to heavy squalls, and veered to the northeast, and the thermometer gave promise of reaching the zero-point before morning. Snow ended before midnight, but a very heavy northeast gale continued throughout. The telegraph-line was "down" this morning, and after

dinner I sent Smith down the mountain to repair the break, but he returned with the report that the line was O. K. as far as timber-line. At 3 p. m. the line was spliced by Sergeant Sackett, who had left Colorado Springs this morning, and I sent off the forenoon and afternoon reports. Sergeant Sackett, accompanied by two gentlemen, reached the summit at 8 p. m. and remained over night. Sergeant Sackett reports the line as having been broken in nine different places by the falling of timber, and in the opinion of every one it will be impossible to keep the line in repair unless the timber is cut down on either side of it. Just as I was about to send off the midnight report the line parted again.

November 19.—Mr. Copley, the wood-contractor, called here to-day. He is going to petition Congress for permission to build a hotel near the summit. I hope and pray that some one will be allowed to build, for the visitors will bother us to death, and eat us out of house and home if we have to shelter and feed them. It is said that last summer over two thousand people visited the summit, and as many more would have come had there been any trail. Encouraging prospect for next summer.

November 20.—To-night I played a game of checkers by telegraph with Capt. W. W. Allen, at Colorado Springs. The boards used are numbered from 1 to 32, and each player, as he moves from one number to another, records both by telegraph. We attempted to cook beans for supper, but ten hours of constant boiling left them still hard, and so we had to go to bed beanless.

November 21.—A very light snow fell during the afternoon, the snow-clouds hanging over the plains, much fringed at the lower ends, as seen when a heavy rain-shower is observed from a distance, but the fringes appeared to hang in mid-air, unable to reach the earth, being apparently dissolved on entering the warm and dry lower atmosphere.

November 22.—Snow commenced falling in the early morning and continued throughout the day, the fall being very heavy during the afternoon. There was little or no wind at day-break, but toward noon a brisk northeast wind set in, causing heavy drifts. The snow is of a very fine texture, very dry, and, like dust, penetrates through the smallest cracks in doors, windows, and walls. The depth of snow I estimated at 2 feet 6 inches, melted snow, 2, 6 inches, but the rain-gauge is very unreliable with winds and drifts.

Immediately after breakfast I sent out Smith to repair the line, which he did by 11 a. m. Returning, he encountered the very heavy snow-storm prevailing on the Peak, and lost the trail. He had to pick his way back over the rocks, and arrived here at about 1 p. m., nearly dead with cold and exhaustion. Duty on Pike's Peak is not fun. If any proof were needed that we are above ordinary circumstances, the astonishing boldness or tameness of our only companions, mice, would furnish that proof. Not only are they running about the office in broad daylight and getting under my pillow at night, but this afternoon a very intelligent-looking mouse got actually on the desk while I was writing, and almost allowed itself to be touched. While on the floor, Lemman threw it a few cheese-crumbs, which it devoured, sitting on its hind legs like a squirrel. These mice are of a light-brown color, having long ears and sharp, pointed noses, singularly expressive and large eyes, and are not nearly as repulsive-looking as their brethren of the lower regions.

November 23.—Snow ended during the night, and morning broke with a clear sky, but such heavy snow-drifts that one could hardly see six paces ahead. This continued all day, and in the evening so high and dense a cloud of snow-dust was raised by the very brisk northerly wind that the people of Colorado Springs took it to be smoke from a large fire, and inquired by telegraph if our house was burning.

Considerable free or atmospheric electricity manifested itself when the binding-screws of the relay were touched with wet fingers. A few mornings ago I accidentally touched the stove-pipe before a fire was built, and immediately a bright and long spark passed with a crackling sound between it and my fingers. No sparks could be drawn by repeating the touch.

November 24.—The wood-packers arrived this p. m.; the men were nearly frozen, and said they had been deceived by the mild, pleasant weather two miles below the summit, else they would not have attempted to come up here. Two of their "burros" froze to death Saturday night. The snow is over four feet deep on some parts of the trail.

Brown brought up our mail, a most welcome gift, as we have not received any in a week before.

A strange-looking animal jumped on the cross-bar of our instrument-shelter and looked through the window as if it wanted to come inside. It was nearly the size of a cat, with a long, bushy tail and mouse-colored pelt. Its head resembled that of a rat, but much larger. Before we could open the window the animal took fright and disappeared. I intend to set a trap for it.

Sergeant Sackett, who is encamped at the lake, telegraphed me to-night that in dipping water out of the lake he caught a shrimp. It has been often doubted whether this lake contains animal life; but that shrimp settles the question.

November 25.—The woodmen, to whom I gave a description of the animal seen last night, pronounce it a rock marten.

November 27.—Thanksgiving Day, but no turkey on Pike's Peak. However, Smith baked some nice short-cake and dried-apple pies for dinner, which reminded us of to-day's importance. And while I am thinking that to-day the Christian world below gives thanks to the Almighty for the many blessings of the past year, I feel deeply that we three laborers in the field of science have also just cause to be thankful for His protection from the dangers of our position.

It seems to me that nature herself was doing her best to glorify the day, for a grander and more sublime spectacle than sunrise this morning, human eyes never beheld. The plains below us were covered with a dense mist, perfectly level, and the instant the first golden edge of the sun rose above it, this mass of vapor was converted into a swelling mass of liquid fire, while above dense, black, stratus clouds were driven with lightning speed before the gale, their lower, ragged surfaces being dipped into and reflecting the glory as they sailed to the eastward.

Weather cold and damp throughout, with a continuous gale from the southwest and west. Far below us to the east a perfect sea of stratus and cumulus clouds spread itself over the prairie and lower mountains, while threatening-looking detached masses of snow-clouds swept over the summit, at times enveloping us with a pall of frozen vapor.

Mr. Raymond, the carpenter, arrived here this p. m., as well as the provision-train, bringing the new instrument-shelter and stove-top, also a most valuable present for me from a kind-hearted young lady at Colorado Springs, a lively female kitten, which felt at home immediately on being released from Lemman's overcoat pocket, where it had made the journey.

Mr. Raymond, who had never been on the summit before, severely felt the effects of our rarefied atmosphere, and staggered about like a drunken man. Our provisions are now all up, and I think all the wood we are going to get this winter, for the wood-packers have broken up camp and returned to Colorado Springs, although about fourteen cords of wood are due, according to the contract. But the severe weather of the past week makes it almost impossible to continue the work. On their last trip the men, strong and hardy mountaineers as they are, were almost crying when they came in to warm themselves, so severely did they suffer from the cold.

November 30.—Our cat caught its first mouse to-night, and something like a rat was crushed to death in the steel trap outside. The main difference between the "victim" and the common rat is in the tail, which is of nearly equal thickness throughout and covered with fur, the same as the rest of its body.

The principal meteorological features of November were: a spell of very mild and pleasant weather, with light winds between the 2d and 15th, inclusive; a hurricane from the north and northeast, with snow and low temperature on the 17th and 18th; a heavy snow-storm on the 22d, and a continuous westerly gale from the 25th to the end of the month.

DECEMBER, 1873.

December 1.—Another rat (?) was caught in the steel trap this evening; they are very curious-looking animals, and I would scarcely call them "rats," only they resemble rats more than any other animal I know of.

December 2.—The summit was constantly enveloped in a dense cloud of frozen vapor, keeping the humidity at saturation, and never once lifting.

December 3.—Although this has been a terrible day, and I should not have thought it possible for any human being to brave the great cold and violent drifts for any length of time, yet Smith, who had stayed at the lake cabin all last night, started for the summit this morning, not knowing how cold it really was, nor how blinding the snow-drifts above timber-line. I certainly did not expect him, and was horrified when at about 3 p. m. Smith staggered into the house more dead than alive, looking like a walking pillar of snow and ice. His left hand was badly frozen, and although I immediately rubbed it with snow, and succeeded in restoring the greater part of it, yet the ends of his fingers were too far gone, and he will doubtless lose part of them. The poor fellow had sought shelter at the wood-camp, but found it all snowed up, and so was compelled to continue his journey. He suffered agonies during the evening and night.

December 5.—Lemman saw the fresh tracks of a bear to-day; being unarmed he was more pleased to see the tracks than the bear himself.

December 7.—This has been a long, dreary day indeed. The summit was enveloped throughout in a dense cloud of frozen vapor, cutting off all view beyond the distance of a few yards, while heavy snow and sleet fell at short intervals during the day and night, drifting in deep banks around our door by the strong southwest wind.

NOTE.—I am informed by an observer at Colorado Springs that the "summit" was enveloped by a small, well-defined cumulus cloud, while the rest of the sky was entirely clear during Sunday.

The air was heavily charged with electricity from 2 to 3 p. m., (at which time it was snowing and sleeting.) My attention was first attracted by the working of the relay. Thinking that the line was fixed, I hastened to adjust the instrument, but the severe shock I received convinced me that something stronger than our battery had charged the wires. I cut out the instrument and screwed the lightning-arrester closer, and in a few minutes a continuous stream of electricity passed between the two plates of the arrester, with a loud noise, resembling that produced by a child's rattle. The electric fluid passed, not in sparks, but in five or six continuous streams of light as thick as a pencil-lead, for two or three minutes at a time, with short intervals between.

December 9.—A short distance below the summit, I witnessed the interesting sight of clouds being rapidly formed and dissolved again as the humid southwest wind ascended and passed over the Peak. The sky was clear, but within a few hundred feet of the highest ridge small, fleecy clouds would suddenly form, increase in size until they were just over the summit, and then disappear again as they passed down the opposite slope. This happened between 11 a. m. and 1 p. m.

December 10.—For several mornings past I have noticed a sheet of clouds stretching over the valley of the Arkansas, southwest of the Peak, which to me seems to rest on the plains, but which probably have an elevation of some 1,500 feet. These clouds disappear toward noon. The mountains west of the Peak are generally capped with cumulus clouds, apparently stationary, but no doubt in constant transformation.

December 14.—Captain Allen, of Colorado Springs; Mr. S. B. Minsball, of Mount Pleasant, Henry County, Iowa, and Private Smith arrived here after 2 p. m., having been under way five hours between the lake and summit. An ordinary good walker ought to make the trip in three. They saw plenty of deer and mountain-sheep, coming up, also tracks of mountain-bison. Sergeant Sackett sent me one of the most beautifully-colored birds I ever saw; it was killed near the timber-line. Will send it to Captain Howgate, together with one of our curious rats. Captain Allen and Mr. Minsball proved to be very genial company, and I spent the evening more pleasantly than any other since I have been up here.

December 17.—Sackett telegraphed me last night that he caught a water-bug in the lake, and says he will bring it up to-morrow.

All of our reports are published in full in papers and magazines. The Gazette pertinently asks: "Did any one feel thankful on Thursday (Thanksgiving) that they were not signal-officers on duty at the top of Pike's Peak?" Yes. Well, we were thankful for our good stove, and didn't envy your comforts in the least, Mr. Editor.

December 20.—A most wonderful and novel sight met my astonished eyes on opening the door this morning; the plains had disappeared, and in their place there was, as natural as could be, the ocean, with rolling billows and spray dashing against the rocks of the mountain's base, which mountains had the appearance of towering islands. But the most striking effect was produced by the rigid immobility of the whole picture. Imagine the ocean stirred up by a stiff breeze and then, by some magic, to be suddenly turned into ice, billows, spray, and all, and you have an idea of what I saw. To make the whole as deceiving as possible, the cañons, gullies, and ravines below were all filled with a level sheet of clouds, as if the water had flown into them and turned to ice with the main body. All this was many thousand feet below us; the cloud could not have over 1,500 or 2,000 feet elevation above the plains, and between them and the summit the sky was clear, but far above us stretched forth an unbroken sheet of cirro-stratus clouds which obscured the sun, and prevented his rays from falling on the "frozen sea" below. This lasted for several hours, but as the sun got higher the clouds began to lift, losing their fantastic shapes, while the upper stratum appeared to descend, the mixture giving rise to light snow, which commenced at 11.30 a. m.

I have seen a bird on the very summit. In color and shape it much resembled the European sparrow, but its body had more roundness than that of any other bird I know of. It looked as if ready to burst.

December 23.—To-day, at 4.15 p. m., I observed a strange and beautiful phenomenon. To the south and west, pictured on a cloud, was a portion of the snowy range, lying far to the westward. So realistic was the representation that one could scarcely realize that actual mountains did not extend (as seemingly) into the sky. The phenomenon was of short duration.

December 24.—Smith reached the summit at noon, having stayed alone at the lake cabin last night. He says that he heard a suspicious noise around the cabin during the night, but did not think much of it until the following morning, when he found tracks of a bear all around the cabin.

When he reached the timber-line this morning, he saw a mountain-bison not more than a hundred yards distant; the animal at first exhibited an inclination to make closer acquaintance with Smith, but thought better of it, and walked off, to the great relief of Smith, who had no arms with him, and, beside, is crippled in one hand.

December 25.—Christmas; and a dreary one, indeed, despite the many "Merry Christmases" wished us over the telegraph-line. The wind continued very high from

the northwest, and increased to a heavy gale after sundown, which made the heavy rocks on our roof roll about like so many pebbles, and forced the fine snow-dust through the smallest cracks in door, windows, and roof. By keeping the stove at red heat, and sitting close to it, we managed to bake on one side and freeze on the other. The principal meteorological features of December were: 1st. Frequent snow-storms, high westerly winds, low temperature, and great humidity, during the first half of the month; in one instance the thermometer fell to —26°, the barometer also reaching a minimum height of 29.18 on the same day, (3d instant.) 2d. Moderate wind and temperature and fair weather to the 24th. 3d. Heavy gales, backing from north to west, with comparatively high temperature, low humidity, and fair weather during the remaining week.

JANUARY, 1874.

January 1.—The new year opened very promising, with a clear sky and mild temperature, but the wind still blowing a stiff breeze from the west.

January 2.—It was hard to tell when day commenced or night ended, or *vice versa*, for a cloud of great density rested on the summit throughout, the frozen particles of which were deposited on everything, the telegraph-line appearing like a huge white snake, several inches in thickness, twisting and writhing under the influence of a stiff breeze.

January 4.—Yesterday's storm was undoubtedly the heaviest of the season. On the northwest side of the Peak a mountain of snow was accumulated, at least a hundred feet in height, and the trail is entirely obliterated.

January 10.—At 4 p. m. I observed two peculiar bands of cirri, stretching across the entire heavens, a little north of the zenith, from west-northwest to east-southeast, converging at the horizon, and having a breadth of about five degrees near the center. The particles of clouds composing them were rapidly moving in the direction of the bands, but the bands themselves seemed to be stationary until obscured. Their appearance resembled very much the illustration given in Plate VII, Instructions to Observer-Sergeants, viz: Compact, rounded masses (cirro cumuli) in the center, interwoven with long, delicate fibers, which also formed the well-defined edge of the bands. During the presence of the bands the sky north of them was clear, while to the south an almost unbroken sheet of cirro-stratus clouds was to be seen.

January 11.—A "lunar halo" was observed at 5.42 a. m., the sky being covered with cirro-stratus clouds, while far below the breaking day revealed a "perfect sea" composed of an unbroken, level sheet of dense, whitish clouds. This mass of vapor filled all ravines and cañons, covering the lower ridges and peaks, while the higher ones rose above it like islands in the midst of the ocean. It was a very picturesque sight, and remained unchanged all day. The base station reported "light snow."

January 12.—Saw another little bird on the summit to-day, of the same species as the one I had seen before. I guess they are snow-birds.

January 14.—As usual, of late, the clouds hung over the Arkansas Valley, completely obscuring it from view. Looking down on the spot from here, it resembles nothing so much as a spacious bay or estuary; the cloud-covered plains, in their bluish-gray color and level, placid surface, bearing a not inapt resemblance to the mighty ocean itself, and the shifting and rolling of these cloud-billows, at times, renders the illusion almost perfect.

January 16.—Another fair day with brisk wind from west, that increased to a heavy gale of fifty miles by 9 p. m., and with fierce persistency kept howling and roaring like some mighty monster over the summit, as if seeking for its prey. For a while it took quite a hold on our roof, and, notwithstanding the ton or two of rock piled thereon, I gave it up for lost more than once. But the wind moderated somewhat by midnight and I breathed freer, although I passed a sleepless night.

January 17.—During the latter part of the afternoon a cloud enveloped the summit, so dense that not a rock could be seen 10 feet from the doorway, and reminded me of nothing so much as a London fog in November, only the London "particular" is far from being as cold as our visitor. I stood in one place; the house, not ten yards to my left, had disappeared in the mist like the Phantom Ship; around me, in a radii of 10 feet, rough, frost-speckled rocks; beyond and above this line, nothingness.

I must not forget to mention that this morning, at 5.30 a. m., I saw on the summit, seated contentedly on a frost-covered rock, a bird somewhat larger than a blue jay, and too large for a snow-bird. It appeared to be of a dark-gray color, but that may have been owing to the illusive mist that hangs over the summit at early dawn. I hurried in to get the carbine, but when I came out again the bird was *non est*. I was very sorry that I could not capture the *rara avis*—any species of feathered biped is that at this elevation in winter—but "what can't be cured," &c.

January 23.—A heavy gale from the northwest prevailed all day, causing most violent snow-drifts and effectually clearing the Peak of its white shroud. But few clouds were to be seen, yet so dense were the drifts as to entirely obscure the lower country; huge banks of snow accumulated on the outside of our doors, so that we could not shut them after they had been opened once, and had to use spikes and braces

to keep them at least partly closed. It was a most disagreeable day, and made one sigh as occasionally we caught a glimpse of the warm, sunny plains below.

January 25.—A very pleasant day throughout; weather like this makes one almost forget it is an exception and not the rule, for no one can appreciate and enjoy such mildness more than we do, after weeks of piercingly cold hurricanes and snow-storms.

Our little snow-bird visits us regularly every day now, feasting on the crumbs around the house. It is quite tame, and I am pretty certain that it is one and the same bird that comes every day.

January 26.—The sky became partly overcast with cirrus and cirro-stratus clouds during the forenoon, which were at first observed to move from due south, but later in the day changed their course to southwest. This is quite an uncommon occurrence; usually the upper clouds move from west and northwest.

January 29.—This morning I found a large rat sunning himself on the door-sill without attempting to run when I opened the door. I inveigled him into the office intending to cage and tame him, but he died in a few hours. He was evidently a patriarch, one of the oldest inhabitants, and very likely died of old age, though his long ears showed signs of rough usage, as if he had been worsted in a family quarrel. He belonged to the species of "wood or mountain rats," with big head, long ears, and bushy tail, claw like a prairie dog, and immense whiskers. His fangs were fully three-eighths of an inch in length.

The principal meteorological features of January were strong gales, heavy snow, and low temperature during the first week, followed by generally cloudy weather, with frequent gales, until the 18th, when the heaviest snow-storm of the season occurred; light snows fell at intervals for several days afterward. The latter part of the month, with the exception of the last day, was characterized by generally pleasant weather, with moderately brisk to light winds.

All hands were more or less frost-bitten during this month; Private Cramer and myself pretty badly. Private Lemman had a severe attack of neuralgia; Private Boutelle is now seriously ill with inflammatory rheumatism. I myself suffered with diphtheria during the greater part of the month. Altogether, January has been rather hard on us.

FEBRUARY, 1874.

February 7.—The wind backed to the west during last night and increased to a stiff gale toward morning.

A strange phenomenon was observed at 9 p. m.; the sky appeared to be perfectly clear and the stars shone brightly, yet snow was falling fast in good-sized flakes; the wind had veered to the north, from which direction the snow-flakes were coming, and I was particularly struck by the fact that they did not appear to fall from above, but that their path made a sharp angle with the summit. This "snow from a clear sky" continued for some fifteen minutes, when the sky became overcast and the summit enveloped in dense clouds. Snow ceased soon afterward. Very probably the snow-cloud ascended the northern slope of the Peak, invisible to us, and the flakes were drifted in advance of the cloud by the brisk north wind then prevailing. This would also account for the peculiar horizontal direction of the flakes as mentioned above.

February 8.—This has been one of the few days on which we had reason to congratulate ourselves for being far above our fellow-beings at Colorado Springs, for while we on the summit enjoyed a very pleasant day, with a clear sky and bright sunshine, all the world below us, at least that portion of it which comes under our bird's-eye view, was covered with one grand ocean of whitish clouds, assuming all manner of fantastic shapes, and having apparently great density and vertical thickness. It was a fine sight, and I am sorry to say we enjoyed it none the less when Sergeant Fenton told me how damp and disagreeable it was below, and how it was snowing and sleeting.

February 13.—It is characteristic of southwest wind that clouds are formed immediately over and on the Peak during its prevalence. These clouds appear to be purely local, and, to an observer below, the summit is usually hidden by a small stationary cumulus cloud, which is frequently the only cloud visible to him.

February 14.—General E. A. Merritt, New York, and Mr. E. S. Nettleton, chief engineer Central Improvement Company, left the springs at 10 a. m., with Mr. Copley as guide, and arrived on the summit at 7.40 p. m. As the snow-drifts were violent and the cloud on summit very dense, they had a pretty hard trip from timber-line up. All were much frosted and exhausted on reaching the house, and, though professing to feel quite well in other respects, were soon passing through the various stages of Pike's Peak fever. Mr. Copley, who has been up here frequently, was the first to surrender his supper as a tribute to "Old Pike," and the others passed a wretched night, being unable to sleep and complaining of violent headache and nausea. I strongly suspect that if it were generally known what heavy penalties are attached to the glory of having ascended Pike's Peak, visitors would be pretty scarce up here.

February 15.—Our visitors remained more or less sick all day, but were nevertheless determined to enjoy all the fine sights and views which the Peak affords so liberally on

a fine day. They were enthusiastic over the really splendid sunset and the usual realistic shadow cast by the Peak on the haze to the east.

February 21.—Complete lunar halo at 9 p. m.

February 24.—As a curious illustration of the rapidity with which water boils at this elevation, I will mention that this evening a dish-pan full of loose snow was set on the hot stove to melt, and in a very short time the water in the bottom of the pan began to boil, while the snow on top of it was yet some three or four inches deep. Thrusting my finger through the snow, I found that it had formed a solid crust above the boiling water; but even this was not sufficient to condense all the steam, which escaped with loud hisses through its icy confines.

February 25.—One of the days to be remembered. A gale from the southwest continued throughout, bringing back in indescribably dense drifts the snow which yesterday had been blown to the southward, and a great deal more in the bargain. The prevailing cold weather has rendered the snow very hard, so that the icy missiles, moving at the rate of forty miles per hour, inflicted severe pain on all unprotected flesh.

The principal meteorological features of February were:

Changeable weather, with occasional light snows, during the first ten days, followed by a week of cloudy weather, with much snow and heavy westerly gales.

A spell of very low temperature occurred between the 20th and 26th, and during the greater part of this time the summit was enveloped in dense clouds.

MARCH, 1874.

March 7.—At 9 p. m. I observed a faint whitish light on the horizon in a north-northeast direction from the summit. The light resembled an auroral arch, but was very indistinct, and had only a few degrees elevation above the horizon; no motions, such as streamers or "merry dancers," could be discerned. This is the first time that I observed anything like an aurora from the summit.

March 13.—A perfect sea of clouds overhanging the plains at daybreak, while above the Peak the sky was cloudless. This sea was violently agitated soon after sunrise, and its component vapors ascended to higher regions, forming the cumuli which surrounded the Peak during the greater part of the day.

March 22.—A very swift upper current from the southwest was observed at 4 p. m., the cumuli of small elevation sailed slowly before the prevailing wind, while far above them a number of delicate, well-defined cirro-cumuli were rapidly moving from the southwest.

March 23.—At night, as the fleecy clouds passed swiftly across the moon, they produced, successively, coronæ of exceeding beauty, often exhibiting three different series of colored circles.

The characteristic meteorological features of the month of March were: Much cloudiness, great humidity, and frequent light snows, especially during the middle and latter part of the month. Southwest winds predominated to an unusual extent. The mean temperature is lower than might be expected from the spring month, being about equal to December and below that of January. Two great barometric depressions occurred during the month, culminating on the 5th and 16th, respectively, accompanied by low temperature and snow, and followed by strong gales as the pressure recovered.

APRIL, 1874.

April 9.—Never, during the whole winter, has there been such an immense quantity of snow on the Peak as at present, and it certainly looks as if the greater part of it could not melt before July or August.

April 15.—The quantity of snow deposited on the summit since yesterday exceeds by far any previous fall, and the aspect of the whole Peak is radically changed. Owing to the moderate winds which accompanied the deposit, the summit is now uniformly covered over with four feet of snow, whose glaring, level surface is broken only here and there by a bowlder of more than ordinary size. Immediately around the house the snow has accumulated to a bank over seven feet in height, being nearly level with the roof.

Fully two feet of snow fell to-day, and if a strong wind springs up before this immense quantity has time to harden, the fury of the drifts will be terrific.

April has proved itself the most disagreeable month since the opening of this station in November last.

There have been but nine fair days in the entire month, while snow or sleet fell on fifteen different days, and on the remaining six the summit was generally enveloped in dense clouds. The total amount of "melted snow" exceeds that of the past five months put together.

High winds were less frequent than during the winter months, so-called, with a corresponding diminution in the total monthly velocity. No remarkable barometric depression occurred; an area of unusually high pressure passed over us between the 25th

and 30th instants, accompanied by very pleasant, mild, and dry weather. Heavy gales preceded and followed it. A remarkable feature of April has been the predominancy of more moderate northerly winds over the usually westerly gales. Snow-storms occurred most frequently with northeast or southeast winds instead of with a southwest wind, as during the winter months.

Formerly the winds usually changed between north and south by the west, while during April the most frequent change took place by the east, both in veering and backing. No other phenomena worthy of special remark were observed.

MAY, 1874.

May 2.—At night the summit was densely enveloped. The fury of the wind-squalls was terrific, and kept both Lemman and myself awake, although we are well accustomed to the howling gale.

May 8.—In the afternoon and evening the wind blew in gusts of great force, which, as on yesterday, were much more severe on the southern slope than on the summit. On the south edge of the summit-plateau I found it altogether impossible to stand up against the wind, and turning to retrace my steps, I was violently hurled to the ground, or snow, rather.

May 9.—Winter has resumed full sway, and to-day's weather would have done credit to January. In the early morning the sky was nearly cloudless, but soon after 7 a. m. the summit became enveloped, and sleet commenced to fall at 9 a. m., continuing at intervals throughout the day and night.

A high southwest to west wind prevailed in the morning, which veered to the northwest during the forenoon, and increased to a stiff gale in the evening.

Private O'Leary, who left the summit on the 27th ultimo, arrived here quite unexpectedly at 11 a. m., in company with a Mr. Sanders.

It appears that much anxiety was felt by the good people below on our account, and O'Leary states that prayers were offered in our behalf at different churches before his arrival.

May 11.—The rumbling of distant thunder was heard at and after midday, but no lightning could be seen. At the same time the wire became so strongly and steadily charged as to deceive me into the belief that the line had been repaired. For about ten minutes I could make plain signals with the key, and during the entire day severe shocks were felt by any one touching the wire.

May 14.—At 10 a. m. the wind veered to the northwest, from which quarter black, threatening, cumulo-stratus clouds advanced rapidly, heaving and rolling like genuine thunder heads. Sleet began to fall as soon as they reached the Peak. For three hours the summit remained densely enveloped; at 12 noon it hailed very heavily, the stones being as large as peas, and of soft white snow throughout, without any nucleus. The thermometer fell with the beginning of the storm and did not rise again after it had passed over.

May 21.—Near the summit I found several small bugs on the snow, and among them a lady-bug, of a dull straw color, which I preserved for Professor Baird. The weather clouded over toward midday, and hail and sleet fell at short intervals throughout the afternoon and evening, accompanied by thunder and lightning. A flash of fire about two feet long leaped from the lightning-arrester into the office, illuminating the room but doing no damage. Thunder and hail clouds passed above and below the summit. Fair weather with fresh north winds at night.

May 20.—Sleet fell, accompanied by thunder and lightning. The afternoon report could not be sent. The lightning-arrester kept up a continual fizzing during the afternoon.

May 22.—Summer appears to have commenced at last even on Pike's Peak, for throughout to-day the thermometer stood above 30°, and reached a maximum of 42° at noon. Base-station reports a maximum of 93°.

Two thunder-storms passed below the Peak, both advancing from the northwest to the south and east and disappearing in the northeast. Sunset was extremely beautiful; rose-colored streamers like festoons extended from clouds to plains in fantastic combinations, exhibiting splendid contrasts of light and shade.

May 24.—A heavy thunder-storm passed slowly and directly over the Peak between 10 a. m. and 3 p. m.; the temperature declined during its passage, and large sparks passed constantly through the lightning-arrester, while a strange crackling of the snow could be heard at times. While making the 2 p. m. out-door observation I heard the snow crackle as mentioned, and at the same time I felt on both temples, directly below the brass buttons on my cap, a pain as if from a slight burn; putting up my hands, there was a sharp crack, and all pain had disappeared.

May 29.—A violent thunder-storm, accompanied by sleet, passed over the Peak from south-southeast to west-northwest. It came upon us so suddenly, that I had barely time to cut out the telegraph-instrument before blinding flashes of fire came into both rooms from the lightning-arrester and stoves; loud reports followed in rapid succes-

sion, while outside the noise of thunder-claps was almost drowned by the rattling of the indescribably heavy showers of sleet which followed each discharge. The storm appeared to surround us in all directions. At 7 p. m. a bolt struck close to the north window, and at the same time a heavy discharge took place through the lightning-arrester, which made me for a moment believe that the building itself had been struck and was on fire; a cloud of smoke filled the embrasure of the north window, which was afterward found to have resulted from the melting of the rubber-insulation on the office-wires. On account of the smallness of the office-room, I considered it safer to retreat to the kitchen, when I found both assistants about to run, under the belief that the house was on fire. After this discharge the storm passed slowly to the westward, and we were already beginning to breathe more freely, when the wind veered to the southwest and brought back the storm in all its fury.

The rattling of torrents of sleet, mingled with the incessant rolls of thunder, the blinding flashes and loud reports in the room, were enough to make the stoutest heart quail. The storm continued until 8.10 p. m., when it disappeared in the northeast, and sleet was succeeded by heavy snow.

The principal meteorological features of May were greatly increased temperature and pressure; numerous thunder-storms, with heavy showers of sleet and wet snow; and more variable winds than usual, especially during the middle and latter part of the month. The first thunder-storm of the year occurred on May 11; between the 18th and 31st they were of almost daily occurrence, generally advancing from southwest to northeast, and passing above and below the summit. Much sleet and snow fell on the 29th, 30th, and 31st. From the 8th to the end of the month more or less sleet fell on nearly every day, the weather generally clouding up toward noon and clearing again in the evening. Atmospheric electricity made itself frequently and uncomfortably felt by discharges through stove and lightning-arrester.

JUNE, 1874.

June 2.—At 2.30 p. m. storm-clouds advanced, with a violent whirling motion, from a point south and east of the summit, and close over the mountains surrounding the Peak in that direction. The vortex crept slowly along the eastern slope of the Peak, and the clouds were hurrying toward it from all directions; thus, over the summit they moved from the west and northwest, south of the summit from southwest and southeast, and north of it from the northeast and north; the whole mass revolving "against the sun." At the same time the clouds had a strong downward tendency, while from the center of the vortex dense whitish masses of vapor poured upward like volumes of smoke Thunder and lightning accompanied the storm, and heavy showers of sleet fell on the summit. The wind during and after the storm blew steadily and briskly from the west. At night the weather cleared up, but continuous silent lightning illuminated the entire eastern horizon.

June 5.—At 10 a. m. we were surprised by the arrival of two strangers—visitors they proved to be—a Dr. Peter Julian, from Kansas, and Mr. Hayslip, from Colorado Springs. After taking a view from the summit, and partaking of a "high" dinner, they left us "in peace."

June 6.—First Lieut. A. W. Greeley, inspecting-officer, accompanied by Mr. Copley, arrived on the summit at 10.30 a. m. Mr. Copley returned to the lake at 2 p. m., while Lieutenant Greeley remains to inspect the station. The weather remained clear until evening, when a very dense smoke obscured south and east, and rose to some distance above the summit. Faint auroral streamers, extending some 40° above the northeast horizon, were observed at 9.30 p. m., while directly beneath them the usual sheet-lightning flashed incessantly. No trace of the aurora remained at 10 p. m.

June 7.—Two strangers paid us a visit this noon; they remained but a few hours.

June 8.—Returning to the summit, I collected a great many bugs, spiders, and flies, also a large humble-bee, near the house. All of these insects I found more or less benumbed on the snow, the southwest gale of the past few days having very likely carried them up here from lower regions. Two gentlemen and quite a small boy made the Peak this p. m. from Manitou, via old trail, returning again after a short survey of the summit. They stated that several others were coming behind them, but these seem to have given out before reaching the goal. The boy stood the trip like a regular.

June 9.—Lieutenant Greeley, after inspecting instruments, books, property, &c., this morning left the summit at 9.15 a. m., following, or at least intending to follow, the old trail to Manitou.

June 10.—I collected several varieties of small flowers and plants at an elevation of 12,500 feet and below.

June 12.—A gentleman and "Sam," the guide, visited the station this p. m., via old trail. Two others came up on the new trail, rough-looking customers, who vented their feelings in a savage whoop as soon as they reached the summit. I thought

"Injuns sure," and looked after carbine and revolver, but they turned out to be a well disposed Scotchman and a taciturn Missourian, both laborers, apparently.

June 15.—A party of visitors attempted the Peak via old trail, but only one of them reached the summit with the guide.

June 16.—Spectrum colors were seen at sunset on some of the cloud streamers over the plains.

O'Leary arrived here at 6 a. m., with some butter and sugar, and accompanied by four gentlemen; another party of five gentlemen arrived soon afterward from Manitou. They were all from the clergymen's convention at Saint Louis, and stated that several others had given out before reaching the summit. Shortly after they had left, Mr. Copley and two gentlemen from Colorado Springs put in an appearance, verifying the old saw, "it never rains but it pours."

June 17.—Two visitors from Manitou, with guide, arrived here at noon. Dinner being on the table, I invited them to join us, but our spread-out—beans, tea, and bread and butter—found little favor in their eyes. Lemman shot a large cony this morning about ten yards from the house. His skin will be saved for Professor Baird.

June 18.—A solitary visitor gladdened our hearts this morning; a second one did not have breath enough left for the last half-mile, and stayed below. One of Mr. Copley's men repaired the trail near the summit to-day.

June 19.—Two Boston gentlemen, editors, with guide, paid us a visit this noon; two more visitors arrived soon after them, all via old trail.

June 20.—Four visitors to-day, among them, as a curiosity, a man with only one leg, who rode to within a short distance of the house. Flies and bugs are appearing in countless numbers.

June 21.—At about 4.30 a. m., Lemman and myself were roused by a rough and noisy crowd of seven men, who had come up here to see the sun rise. They were too late for old Sol, however, and departed again at 7 a. m., much to our satisfaction. Messrs. Moody and Atwater, of Colorado Springs, arrived late this evening and remained over night; both suffered somewhat from Pike's Peak fever. As a curiosity, I may mention that a large butterfly disported himself about the summit this forenoon.

June 22.—To-day I found near the summit the first grasshopper of the season; I also collected from the surface of the snow quite a number of bugs.

A party of six visitors, with guide, arrived at noon via old trail. Mr. Guernsey, photographer, and assistant reached the station at 2.30 p. m., after taking a number of views on the new trail. Mr. Guernsey will remain a few days to take summit views.

June 23.—Mr. Guernsey took some very fine views of the station to-day. Three visitors this noon; a fourth solitary pleasure-seeker roused me out of bed at 10 o'clock to-night, and asked for sleeping-room. He spread his blankets on the floor, where it is to be hoped he enjoyed Pike's Peak to his heart's content.

June 24.—Fourteen visitors to-day, mostly Texans, and a few Kansas City men. They came, one or two at a time, up the old trail, and most of them were well fagged out. Our mysterious visitor of last night got up this morning before day-break and left without a word. None of us had seen his face or learned his name. Mr. Guernsey started for Colorado Springs this forenoon.

June 25.—Only two visitors to-day, both tourists from Manitou. Day opened clear, with a fresh southwest gale, which moderated to brisk velocity during the forenoon.

June 26.—Six visitors to-day, besides Mr. Nettleton, surveyor, and assistant, who are taking elevations, and arrived on the summit this evening.

June 27.—Mr. Nettleton finished his measurements to-day. Starting from the bench-mark of the Denver and Rio Grande Railroad at Colorado Springs, he has measured with the spirit-level the elevations along the entire trail between said bench-mark and the highest rock on the summit of Pike's Peak. This rock sits about 100 feet northwest of the house, and Mr. Nettleton found its elevation to be 14,092.6 feet above sea-level. The elevation of railroad bench-mark at Colorado Springs is 5,935.6 feet. Height of summit of Pike's Peak above bench-mark, 8,157 feet. Providing the bench-mark is correct, this measurement is undoubtedly the most accurate one ever made of any peak in the Rocky Mountains. Mr. Nettleton is an engineer of acknowledged ability.

Three visitors this morning, in spite of the heavy gale. They had camped over night a short distance below the summit, and were more dead than alive when they reached the house from the combined effects of the gale and the cold. One of them was utterly unable to articulate for some time after his arrival. A fourth had sense enough to turn back without undergoing the miseries of the last mile.

June 28.—Mr. Nettleton and assistant left the summit at 8 a. m., after taking, at my request, the accurate angles of all prominent peaks in the main range. Going down, he measured length of trail from summit to railroad depot at Colorado Springs, and to-night sent me by telegraph the distances in feet of all prominent points on the trail. From the railroad depot to this station, via Government trail, the distance is 17.47 miles.

June 29.—Two visitors on mules made the summit at about 3 a. m.; not wishing to disturb us at such an early hour, they remained outside until 5.30 a. m., by which time

the frosty morning had rendered them almost speechless. They didn't think much of sunrise on Pike's Peak.

June was characterized by generally mild and pleasant weather, with a few very local thunder-storms and accompanying showers of sleet.

The barometer was unusually high throughout the month, and was observed to rise and fall pretty regularly, with a rise and fall of temperature. The relative humidity shows a decided diminution, as compared with preceding months. High winds were frequent; very heavy gales prevailed from the 3d to 10th instant, and on the 27th instant. I have closely watched the beginnings and progress of the local storms which were so frequent during the latter part of May, and not uncommon during June, and have found that the great majority of them originated over the extensive parks west, southwest, and northwest of this peak, and dividing it from the main range. The lower strata of air become powerfully heated, and are probably at this season of the year, when the surrounding mountains discharge their melting snows into the parks, heavily charged with moisture. The usual cold, heavy west winds descending the eastern slope of the main range, and wedging under the heated, moist, lower strata, might explain the frequency of our local storms during the hottest part of the day.

Bugs of all kinds, flies, and spiders are very numerous on the summit. Since the middle of June I have collected a number of specimens from the surface of the snow, where they can be found in great abundance, all more or less benumbed. They are probably deposited there by ascending winds. Grasshoppers have also put in appearance; they are said to be quite numerous during summer.

Several varieties of delicate and very beautiful flowers can now be found on the summit plateau; the southern slope is in many places literally covered by them. Ninety-one persons have visited this station during June. No lady visitor has gladdened our hearts as yet. The great majority of visitors are sick when they reach the house; *a free use of whisky as a stimulant in climbing is a fruitful source of indisposition.* A cup of tea is generally acknowledged by visitors to be the best thing they had tasted for a long time, and relieves Pike's Peak fever.

Sunrise parties come here at 2 or 3 o'clock in the morning, and generally don't care a straw about sunrise if they can get into the house and hug the stove.

JULY, 1874.

July 1.—A heavy thunder-storm passed over the summit, from southwest to northeast, between noon and 2 p. m., and sleet of remarkable size fell during its progress. The stones were of hard snow, without nucleus, and many of them as large as a pigeon's egg. Violent cloud-whirls were observed before the beginning of sleet, the wind backing to the southeast, with falling temperature. A party of visitors were caught in the storm not far from the summit, and stated that they all experienced peculiar burning sensations on face and hands, and heard a hissing sound proceeding from hair and whiskers. The comet is plainly visible from here with the naked eye.

July 3.—Went to the lake this morning and collected a number of water-bugs and leeches. Three visitors to-day, among them the first lady of the season, Miss Penelope E. Ambler, of Mount Pleasant, Iowa.

July 5.—Extensive fires are raging among the foot-hills northwest of this peak, and the lower atmosphere is filled with smoke and haze.

July 9.—Small storm-clouds passed the eastern slope of the Peak between 2 and 3 p. m., treating us to the first rain of the season, in very light and short showers; but these were only forerunners of a heavy thunder-storm. Countless numbers of mosquitoes made their first appearance to-day, much to our annoyance. I had not expected to see these little pests on Pike's Peak. Mr. Copley, who is repairing the line between lake and summit, telegraphed me this forenoon that he twice got knocked down by electric shocks while splicing the wire.

July 12.—Five visitors to-day, among them Dr. H. Lindeher, a Swedish professor, from Stockholm.

July 16.—A very severe thunder-storm passed over the summit between 1 and 3 p. m., accompanied by mixed rain and hail. Sharp flashes and reports came through the lightning-arrester, to the terror of several lady visitors; outside of the building the electric effects were still more startling. The strange crackling of the hail mentioned before was again heard, and at the same time my whiskers became strongly electrified and repellent, and gave quite audible hissing sounds. In spite of the cap I wore, my scalp appeared to be pricked with hundreds of red-hot needles, and a burning sensation was felt on face and hands. Several of the visitors who were outside at the time experienced the same effects. A large dog who had followed his master out-doors became terrified, and made for the door with a pitiful howl.

July 19.—Maximum temperature 45°. A severe thunder-storm passed close over the Peak between 1.30 and 2.30 p. m. The lightning struck the telegraph-wire between the second and third poles from the house, and for a moment the wire resembled a rope of fire, and vibrated violently for some minutes after the discharge, but no damage was

done. Frequent loud discharges took place along the ground-wire, between it and the rocks on which it rests. Hair and whiskers of any one out-doors were electrified by each discharge.

July 20.—Mr. Louis Nell, chief topographer of Lieutenant Wheeler's exploring expedition, arrived this evening with one assistant. They are to remain here until favorable opportunities offer for taking the angles of the most prominent peaks in the main range, in order to continue their triangulations.

July 21.—Heavy hail began to fall at 2.05 p. m.; the stones varying in size from one-tenth to four-tenths of an inch in diameter, mostly composed of solid transparent ice. One of the heaviest thunder-storms of the season advanced upon the Peak from the northwest, and appeared to remain stationary on the summit until its fury expended. The hail came down in continuous torrents until 7.30 p. m., and was succeeded by light rain. The lightning was terrific, and the heavy crash of the thunder was heard simultaneous with each flash. Not only did the constant crackling of the fallen hail indicate the highly electrified state of the summit, but from the very rocks proceeded a peculiar clattering noise, as if they were shaken by subterranean convulsions. Heavy flashes and loud reports came through the arrester in quick succession, and although I had opened the key, the lightning jumped the space and worked the relay until I took all wires off it.

July 23.—A large prairie-fire could be seen at night, due east from the summit.

July 31.—A very interesting optical phenomenon was observed during the magnificent sunset this evening; a sunset the beauty of which it is beyond the capability of my pen to describe. A light rain was falling on the summit, while in the west the sun was just about to disappear behind the Snowy Range in an almost clear horizon. To the east from foot-hills north and south a magnificent rainbow spanned an arc of fully 270° or three-fourths of a circle. White, fleecy clouds passed inside the arc from south to north, and on them was depicted a very accurate shadow of the house, with chimneys and parapet complete. Had one of us been on the roof, his figure and motions would have been faithfully copied on these clouds.

July was remarkable for a very steady and high barometer, unusually light and variable winds, and frequent severe thunder-storms. The latter occurred on seventeen different days, and often two or more during one afternoon. The wind was generally observed to blow toward the storm in the beginning, and from the storm as it approached and passed the Peak. The lightning made itself frequently and disagreeably felt in the office through the telegraph-wire, and out-doors by a peculiar burning or pricking sensation on face, hands, and scalp, accompanied by hissing sounds. It is my honest belief that sooner or later this station will be injured if not destroyed by lightning, and any one who has witnessed one of our severe electric storms will arrive at the same conclusion. The first rain of the season fell on the 9th instant, and light showers of it were frequent after that date. Quite a heavy snow fell on the 26th; light showers on the 28th.

Two hundred and ninety persons visited this station during July, including fifty ladies. They generally arrive in large parties and crowd at once into the small office, to see which appears to be the sole object of most visitors. To accommodate such wholesale invasions I have four serviceable chairs and barely room enough to place them. To make observations or to do any kind of work while such an invasion lasts is one of the most difficult and unpleasant tasks I have ever been called upon to undertake.

AUGUST, 1874.

August 1.—At night a dense cloud rested on the Peak, incessantly illuminated by brilliant though silent lightning. At 9 p. m. light rain began to fall, and at 9.46 p. m. torrents of large hail poured down with a noise that made sleep impossible; the lightning became very sharp, and thunder was heard occasionally, but only in short and feeble peals. Hail ceased at 10.45 p. m. as suddenly as it had begun.

Two eagles alighted not far from the house this forenoon, but were not accommodating enough to wait until I could bring a gun to bear on them. One of them was very large.

August 3.—The barometer continued to rise until 10 a. m., but fell steadily thereafter. Day opened cold and cloudy, with a fresh southerly wind; sleet began to fall at 2.05 p. m., and throughout the remainder of the day and night more or less heavy showers of hail, rain, and snow followed each other in quick succession. A heavy thunder-shower passed over the summit between 2.45 p. m. and 5 p. m., affording the novel sight of heavy snow with thunder and lightning. A heavy wet snow fell also late at night.

Fenton informed me that a water-spout had bursted over the Colorado Divide, and that all bridges had been washed away at Colorado Springs. The lightning rendered the line almost useless the entire afternoon. I got severely shocked when sending my report.

August 8.—Professor Gardner, of Hayden's expedition, put in appearance to complete some work left unfinished from last year. He remains over night, with one assistant.

August 19.—A dense smoke is still obscuring the plains. Six visitors, including some ladies, arrived this forenoon, though for what purposes I am unable to say, since one was unable to see 50 feet ahead. The novelty of a heavy snow-storm in the middle of August compensated them in a measure for the poor view, or rather no view at all.

August 27.—A few days past a graceful little ferret made its appearance on the Peak, and is now busily engaged in hunting conies, rats, and mice. It is quite tame, and comes into the office when we have no visitors, where it allows itself to be caught and handled without difficulty.

August, like the preceding summer-months, was chiefly remarkable for numerous local storms, though they were of less severity than those of June and July. Thunder-storms occurred on twelve different days, the majority of them passing below the summit. Rain, hail, and snow fell often during one and the same storm in succession. Quite a heavy snow-storm occurred on the 13th. Light to brisk winds pre dominated; fresh gales prevailed on the 4th, 10th, 18th, 25th, and 31st, but they were all of short duration. Three hundred and forty persons of both sexes have visited this station during August.

September 2.—At 5 p. m. the clouds enveloping the summit broke, disclosing a most beautiful view of an ocean of clouds far below us, above which the foot-hills rose like so many islands.

September 9.—Ten visitors to-day, among them "Grace Greenwood" (Mrs. Lippincott) and daughter, of literary fame.

September 28.—Surveyor Kellogg, of Denver, and two assistants visited the Peak for the purpose of locating it and the township to which it belongs.

September 29.—Some very pretty little birds of a dark color with white spots and in shape similar to swallows were seen about the summit. During the month the fluctuations of the barometer were quite steady, maximum daily range not exceeding .13 of an inch. It was steadily rising toward the latter part of the month. The temperature during the third week of the month was quite low, reaching as low a point as 13°; but the first and last portions of the month were comparatively warm, and the thermometer stood mostly above freezing during that time. Clear weather was prevailing during the first and last week of the month. A heavy snow-storm occurred on the 22d day of the month, which attired the Peak in a white robe to the depth of 2 and 3 feet. A few thunder storms were observed below the summit. Brisk and high southwesterly winds prevailed during the month.

The telegraph line was in good order during the month, and a few interruptions that occurred were promptly remedied.

PAPER 7.

STATISTICS OF STATIONS.

Monthly and annual mean pressure—October, 1873, to September 30, 1874.

Stations.	1873.			1874.									Annual mean.
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	
Albany, N. Y	.....	.....	.....	30.091	30.117	29.903	29.972	29.884	29.882	29.931	29.956	30.036	.....
Alpena, Mich	29.998	29.967	30.042	30.089	30.129	29.997	30.087	29.959	29.926	29.934	30.022	29.988	30.011
Atlantic City, N. J	.....	.....	.....	30.184	30.143	30.008	30.042	29.985	29.981	30.041	30.022	30.089	.....
Augusta, Ga	30.110	30.091	30.243	30.245	30.169	30.091	30.052	30.009	30.034	30.073	30.029	30.067	30.101
Baltimore, Md	30.125	29.997	30.171	30.186	30.149	30.018	30.042	29.972	29.970	30.011	30.023	30.081	30.062
Barnegat, N. J	.....	.....	.....	30.185	30.159	30.020	30.012	29.907	29.892	29.944	29.937	30.015	.....
Boston, Mass	30.054	29.914	30.098	30.136	30.125	29.907	29.988	29.924	29.931	30.005	30.004	30.085	30.014
Breckinridge, Minn	30.021	30.033	30.095	30.120	30.121	30.098	30.043	29.847	29.776	29.839	29.886	29.897	29.981
Buffalo, N. Y	29.989	29.929	30.072	30.075	30.115	29.970	30.038	29.929	29.927	29.943	29.995	30.031	30.001
Burlington, Vt	30.029	29.916	30.096	30.118	30.154	29.912	29.996	29.987	29.900	29.953	29.984	30.066	30.002
Cape Henry, Va	.....	.....	.....	30.125	30.080	29.865	29.965	29.752	29.930	29.979	29.956	29.995	.....
Cairo, Ill	30.118	30.054	30.173	30.165	30.130	30.070	30.033	29.980	29.980	30.002	29.974	30.048	30.060
Cape May, N. J	30.069	29.964	30.160	30.161	30.156	30.022	30.034	29.986	29.989	30.043	30.019	30.083	30.057
Charleston, S. C	30.105	30.072	30.234	30.245	30.167	30.087	30.061	29.984	30.012	30.058	30.038	30.058	30.093
Cheyenne, Wyo	30.030	29.997	29.893	29.843	29.816	29.809	29.931	29.944	29.981	30.098	30.079	30.062	29.957
Chicago, Ill	30.026	29.990	30.100	30.093	30.101	30.033	30.061	29.957	29.901	29.939	29.953	29.991	30.012
Cincinnati, Ohio	30.118	30.051	30.177	30.173	30.141	30.092	30.062	29.989	29.979	30.007	30.007	30.059	30.071
Cleveland, Ohio	29.971	29.913	30.061	30.050	30.074	29.986	30.007	29.929	29.939	29.939	29.974	30.009	29.987
Colorado Springs, Colo	.....	.....	29.916	29.876	29.821	29.811	29.929	29.936	29.963	30.077	30.062	30.042	.....
Corinne, Utah	30.131	30.173	30.095	30.070	30.028	.....	.....	.....	.....	.....	.....	.....	.....
Davenport, Iowa	30.045	30.012	30.109	30.121	30.114	30.057	30.048	29.925	29.905	29.947	29.949	30.013	30.020
Denver, Colo	30.077	30.060	29.975	29.929	29.870	29.888	29.998	29.981	29.995	30.111	30.091	30.076	30.004
Detroit, Mich	29.999	29.947	30.071	30.074	30.102	29.987	30.029	29.928	29.906	29.930	29.982	30.003	29.996
Dubuque, Iowa	30.016	30.009	30.086	30.193	30.106	30.043	30.058	29.937	29.910	29.923	29.970	30.004	30.021
Du Luth, Minn	29.936	29.981	30.010	30.077	30.071	30.012	30.041	29.946	29.873	29.881	29.963	29.920	29.972
Eastport, Me	29.980	29.746	29.942	29.974	29.918	29.742	29.932	29.899	29.888	29.997	29.980	30.066	29.922
Erie, Pa	29.995	29.924	30.072	30.054	30.099	29.985	30.021	29.924	29.914	29.931	29.980	30.016	29.993
Escanaba, Mich	29.953	29.957	29.999	30.064	30.089	29.991	30.071	29.941	29.870	29.898	29.996	29.952	29.982
Fort Benton, Mont	30.118	30.053	30.018	29.925	29.916	30.006	30.012	29.955	29.950	29.770	29.994	30.010	29.976
Fort Gibson, Ind. T	30.080	30.061	30.133	30.114	30.068	29.951	29.936	29.900	29.894	29.925	29.867	29.959	29.991
Fort Sully, Dak	29.993	29.983	30.105	30.045	30.013	30.008	29.920	29.737	29.681	29.766	29.813	29.879	29.912
Galveston, Tex	30.110	30.110	30.170	30.160	30.080	29.980	30.010	30.010	29.997	30.022	29.993	29.973	30.051
Grand Haven, Mich	29.979	29.947	30.056	30.083	30.105	30.017	30.067	29.958	29.927	29.941	29.989	29.998	30.005
Indianapolis, Ind	30.062	30.010	30.125	30.120	30.099	30.044	30.016	29.940	29.925	29.954	29.952	30.020	30.022
Indianola, Tex	30.140	30.142	30.192	30.187	30.100	29.993	30.036	30.033	30.015	30.051	30.018	29.994	30.075
Jacksonville, Fla	30.075	30.087	30.204	30.218	30.135	30.095	30.077	30.009	30.050	30.075	30.029	30.029	30.090
Keokuk, Iowa	30.039	29.998	30.101	30.104	30.090	30.039	30.009	29.892	29.880	29.909	29.903	29.976	29.995
Key West, Fla	29.995	30.076	30.124	30.146	30.112	30.086	30.074	30.004	30.054	30.072	30.010	29.980	30.061
Knoxville, Tenn	30.123	30.060	30.219	30.209	30.140	30.079	30.007	29.973	29.983	30.028	29.988	30.046	30.071

Monthly and annual mean pressure—October, 1873, to September, 1874—Continued.

Stations.	1873.			1874.									Annual mean.
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	
La Crosse, Wis	30.050	30.057	30.130	30.148	30.138	30.085	30.079	29.943	29.896	29.921	29.979	29.992	30.035
Lake City, Fla	30.085	30.099	30.208	30.220	30.131	30.085	30.073	29.999	30.045	30.064	30.018	30.022	30.087
Leavenworth, Kans	30.054	30.024	30.128	30.117	30.107	30.010	29.999	29.865	29.843	29.886	29.854	29.958	29.978
Lexington, Ky	30.097	30.031	30.171	30.143	30.119	30.055	30.024	29.970	29.962	29.989	29.984	30.050	30.049
Louisville, Ky	30.093	30.038	30.168	30.160	30.110	30.060	30.014	29.951	29.939	29.965	29.947	30.026	30.039
Long Branch, N. J	.....	.....	.....	30.127	30.124	29.942	29.983	29.925	29.919	29.977	29.972	30.045	.....
Lynchburgh, Va	30.089	30.017	30.192	30.211	30.169	30.048	30.042	29.977	29.987	30.021	30.028	30.080	30.072
Marquette, Mich	29.955	29.959	29.993	30.057	30.090	29.990	30.071	29.945	29.880	29.898	29.999	29.928	29.980
Memphis, Tenn	30.130	30.320	30.212	30.195	30.141	30.082	30.044	30.009	29.996	30.023	29.989	30.045	30.098
Milwaukee, Wis	30.024	30.003	30.087	30.128	30.127	30.052	30.098	29.989	29.952	29.967	30.010	30.002	30.036
Mobile, Ala	30.121	30.124	30.216	30.214	30.127	30.079	30.063	30.030	30.037	30.054	30.017	30.025	30.092
Montgomery, Ala	30.120	30.118	30.248	30.231	30.147	30.085	30.054	30.018	30.026	30.053	30.011	30.045	30.095
Morgantown, W. Va	30.051	29.976	30.138	30.130	30.101	30.017	29.989	29.936	29.929	29.965	29.989	30.041	30.022
Mount Washington, N. H	30.070	29.637	29.815	29.815	29.759	29.702	29.834	30.028	30.139	30.276	30.252	30.288	29.968
Nashville, Tenn	30.122	30.070	30.198	30.193	30.123	30.069	30.017	29.979	29.979	29.998	29.973	30.057	30.065
New Haven, Conn	30.053	29.953	30.138	30.174	30.158	29.975	30.024	29.959	29.958	30.023	30.026	30.108	30.046
New London, Conn	30.060	29.947	30.120	30.160	30.140	29.949	30.021	29.968	29.960	30.031	30.015	30.097	30.039
New Orleans, La	30.107	30.105	30.182	30.186	30.108	30.052	30.040	30.024	30.019	30.039	30.006	30.006	30.073
New York, N. Y	30.067	29.959	30.143	30.172	30.154	29.995	30.036	29.959	29.956	30.021	30.015	30.096	30.048
Norfolk, Va	30.089	30.013	30.204	30.219	30.179	30.052	30.054	30.008	30.022	30.071	30.038	30.094	30.087
Omaha, Nebr	30.020	30.065	30.117	30.104	30.084	30.048	29.991	29.845	29.812	29.860	29.845	29.943	29.978
Oswego, N. Y	30.016	29.929	30.082	30.099	30.142	29.966	30.036	29.931	29.945	29.956	30.014	30.055	30.014
Pembina, Dak	29.927	30.055	30.045	30.141	30.076	30.088	30.053	29.886	29.796	29.809	29.883	29.849	29.967
Philadelphia, Pa	30.073	29.992	30.165	30.193	30.174	30.022	30.055	29.982	29.990	30.030	30.032	30.100	30.067
Pike's Peak, Colo	.....	29.947	29.750	29.732	29.623	29.676	29.813	30.023	30.156	30.316	30.279	30.137	.....
Peck's Beach, N. J	.....	.....	.....	30.186	30.165	30.020	30.050	29.997	29.997	30.055	30.031	30.096	.....
Pittsburgh, Pa	30.040	29.970	30.112	30.112	30.110	30.023	30.017	29.946	29.935	29.955	29.987	30.003	30.017
Port Huron, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30.017	.....
Portland, Me	29.982	29.823	30.022	30.064	30.039	29.805	29.955	29.854	29.854	29.937	29.941	30.032	29.942
Portland, Oreg	30.245	30.174	30.033	30.017	30.093	29.984	30.116	30.037	30.101	30.071	30.065	30.06	30.083
Punta Rassa, Fla	30.025	30.105	30.161	30.187	30.133	30.104	30.097	30.026	30.073	30.086	30.030	30.016	30.087
Rochester, N. Y	29.998	29.893	30.071	30.066	30.118	29.949	30.018	29.907	29.918	29.935	29.990	30.028	29.991
Salt Lake City, Utah	.....	.....	.....	.....	.....	.....	29.941	29.835	29.898	29.981	29.942	29.983	.....
Sandy Hook, N. J	.....	.....	.....	30.163	30.153	29.982	30.030	29.960	29.961	30.020	30.010	30.073	.....
San Diego, Cal	30.010	30.055	30.080	30.078	30.093	30.080	30.080	29.980	29.939	29.963	29.943	29.905	30.017
San Francisco, Cal	30.041	30.079	30.034	30.100	30.063	30.050	30.097	29.998	29.967	29.959	29.966	30.912	30.022
Santa Fé, N. Mex	29.875	29.856	29.780	29.752	29.633	29.617	29.668	29.726	29.784	29.876	29.879	29.82	29.772
Savannah, Ga	30.115	30.100	30.240	29.245	30.167	30.091	30.074	30.016	30.051	30.080	30.036	30.058	30.106
Shreveport, La	30.134	30.107	30.190	30.171	30.100	30.015	30.015	29.996	29.983	30.013	29.964	29.912	30.050
Saint Louis, Mo	30.106	30.051	30.164	30.148	30.125	30.079	30.046	29.955	29.955	29.980	29.969	30.029	30.050
Saint Paul, Minn	29.963	29.968	30.045	30.073	30.082	30.030	30.003	29.860	29.797	29.842	29.892	29.908	29.955

Squan Beach, N. J	.....	.....	.....	30.170	30.153	29.972	30.023	29.962	29.967	30.017	30.015	30.082	.....
Toledo, Ohio	30.016	29.965	30.100	30.092	30.122	30.030	30.056	29.957	29.943	29.971	29.983	30.018	30.021
Vicksburgh, Miss	30.190	30.160	30.268	30.241	30.150	30.068	30.063	30.063	30.044	30.078	30.054	30.080	30.121
Virginia City, Mont	.....	29.756	29.632	29.601	29.590	29.548	29.683	29.685	29.705	29.784	29.763	29.783	.....
Washington, D. C	30.081	30.005	30.176	30.188	30.178	30.039	30.054	29.985	29.983	30.021	30.027	30.086	30.068
Wilmington, N. C	30.098	30.046	30.214	30.236	30.169	30.062	30.063	30.008	30.046	30.089	30.005	30.066	30.092
Wood's Hole, Mass	30.080	29.930	30.130	30.159	30.114	29.934	30.006	29.962	29.958	30.043	30.022	30.110	30.037
Wytheville, Va	29.881	29.790	29.973	29.962	29.909	29.863	29.811	29.787	29.809	29.832	29.828	29.895	29.862
Yankton, Dak	30.051	30.059	30.181	30.170	30.168	30.116	30.038	29.875	29.814	29.880	29.886	29.979	30.018

PAPER 8.

Monthly and annual mean temperature—October, 1873, to September 30, 1874.

Stations.	1873.			1874.									Annual means.
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Albany, N. Y	.....	.....	.....	28.8	22.8	31.5	36.7	56.6	66.2	71.1	66.9	63.3	.....
Alpena, Mich	41.8	26.2	28	21.6	20	24.6	29.9	49.8	60.2	65.1	63.3	59.9	40.9
Atlantic City, N. J	.....	.....	.....	36	34.1	38.6	42.9	55.4	66.8	70.3	69.5	67.8	.....
Augusta, Ga	60.7	51.5	48.1	50.2	50.5	59	63.2	72.5	81.4	78.5	78.8	74.7	64.1
Baltimore, Md	44.2	41	40.4	39.1	37.3	43.7	46.9	63.1	75.9	77.3	72.8	69.9	54.3
Barnegat, N. J	.....	.....	.....	35.5	32.8	38.1	41.4	55.5	69.3	70.2	69.1	66.6	.....
Boston, Mass	53	33.4	32.9	31.2	28.3	35.3	39.1	56.1	65.9	72.2	67.7	63.8	48.2
Breckinridge, Minn	38.2	23.4	8	2.6	4.2	15.1	34	60.2	65.9	70.2	67.8	57.7	37.2
Buffalo, N. Y	48.5	30.6	31.9	23.1	25.4	30.3	34.2	52.4	64.3	69.4	67.9	65.5	45.7
Burlington, Vt	48.7	26.8	25.9	23.1	19.6	28.6	34.3	53.6	64.7	70.4	66.1	61.9	43.6
Cape Henry, Va	.....	.....	.....	44.9	42.9	46.7	51.7	65.5	76.2	76.5	73.8	72.0	.....
Cairo, Ill	53.8	45	40.9	39.3	40.1	48.4	52	70.2	79.7	81.3	78.6	71.9	58.4
Cape May, N. J	56.1	42.2	40.6	38.1	35.7	40.7	44.4	56	68.5	69.2	68.8	68.6	52.4
Charleston, S. C	63.9	54.8	51.4	52.1	51.5	59.9	67.7	71.4	81	79.3	79.1	75.8	65.6
Cheyenne, Wyo	42.5	40.1	27.6	30.4	22.9	28.9	39	56.6	65.2	71.8	68.6	54.2	45.6
Chicago, Ill	49.1	34.4	32.4	29.1	31.5	36.3	38.7	58.5	70.2	74.7	71.9	66.8	49.5
Cincinnati, Ohio	53.3	40.9	40.6	37.3	39	44.3	48.3	67.9	79.6	79.3	77.4	71.9	56.6
Cleveland, Ohio	51.2	36.6	36.7	32.7	31.2	37.1	39.4	59.6	70.4	72.4	70.2	66.9	50.4
Colorado Springs, Colo	.....	.....	26.9	30.3	25.5	34.5	38.5	58.6	68.9	73.2	70.3	56.7	.....
Corinne, Utah	45.6	40.5	21.4	25.2	21.7	.....	.....	.....	.....	.....	.....	.....	.....
Davenport, Iowa	48.3	34.6	29.7	23.7	25.9	34.7	41.6	64.5	73.2	78	74.4	65.5	49.5
Denver, Colo	45.2	40.6	22.4	31.5	24.7	36.4	43.1	61.9	70	76.1	73.0	59.0	48.6
Detroit, Mich	47.9	32.2	32.7	28.9	27.5	34.4	37.3	59	68.9	71.4	67.9	66.7	47.9
Dubuque, Iowa	46.6	31.3	28.7	21.2	24	33.6	41.7	65.3	71.7	80	74.2	65.5	48.6
Du Luth, Minn	43.5	24.5	19.7	13	16.3	23.8	32.8	50.2	57.8	67.9	64.0	59.4	39.4
Eastport, Me	49.3	29.2	25.6	25.5	20.9	29.4	33.4	47.7	54.7	59.6	59.2	56.3	40.9
Erie, Pa	50.7	34.5	35.1	31.6	28.1	34	37	57	69.6	72.7	71.4	69.4	49.2
Escanaba, Mich	41.7	25.5	25.8	18.2	17.3	22.8	29.1	48.9	60.6	66.9	64.4	60.1	40.1
Fort Benton, Mont	40.3	35.1	13.7	11.3	22.4	18.4	44.4	59.2	63	75.1	69.1	58.0	42.5
Fort Gibson, Ind. T	56.9	49.8	40.6	39.5	41.3	52.2	53.3	70.3	78.6	83.1	86.1	71.5	60.3
Fort Sully, Dak	42.1	35.1	14.9	16.1	20.3	27.7	43.9	63.2	70.2	79.2	76.1	65.2	46.2
Galveston, Tex	71	77	77	55	58	67	66	75	81.7	82.5	84.4	79.5	72.8
Grand Haven, Mich	46.9	33.3	34	28.4	27.6	32.2	36.3	56.6	65.9	70.4	68.4	63.9	47
Indianapolis, Ind	51	37.5	37.6	35.6	36	42.2	45.6	66.2	77.4	78.5	75.9	69.6	54.4
Indianola, Tex	70.1	63	58.3	55.5	58.4	67.3	66.1	74.9	81.2	82.3	84.3	79.2	70.0
Jacksonville, Fla	71.6	59.4	56.4	55.2	58.8	66.3	70.3	75.1	80.6	79.7	81.5	77.4	69.3
Keokuk, Iowa	49.8	38.9	32	27.8	29.4	38.3	44.6	67.2	76.7	80.5	76.8	67.1	52.4
Key West, Fla	76.4	72.7	71.4	68.5	74	76.1	78	80	83	83	84.0	75	76.8
Knoxville, Tenn	53.1	44.5	42.2	38.9	43.4	50.2	54.2	67.5	76.1	77.1	73.8	69.2	57.5

La Crosse, Wis	40	28.9	24.2	20.2	21.3	29.4	40.5	64.3	70.8	77.1	71.9	62.9	45.9
Lake City, Fla	65.2	57.3	54.7	53.9	59.5	65	67.8	74.2	78.7	78.5	82.1	75.5	67.7
Leavenworth, Kans	56.9	41.8	31.9	28.4	28.8	40	49	67.3	77.4	82.8	81.3	66.8	54.4
Lexington, Ky	53.8	40.7	39.6	36.5	39.2	44.3	46.9	63.6	77.9	77.8	75.1	70.9	55.5
Louisville, Ky	54	41.5	38.7	37.5	39.5	45.6	48.8	68.2	80.7	80.7	79.3	72.2	57.2
Long Branch, N. J	.....	.....	.....	36.5	32.8	38.7	41	56.2	68.3	71.4	69.9	67.5	.....
Lynchburgh, Va	53.6	42.5	40.4	39.9	41.1	47.5	51	66.1	77.4	77.9	72.0	69.0	56.5
Memphis, Tenn	56	49	44	45	45	53	55	72.4	81	82.8	82.9	73.2	61.6
Marquette, Mich	43	26	26.8	23.4	19.2	23.9	30.3	51.3	58.8	64.5	62.9	60.2	40.8
Milwaukee, Wis	46.4	30.9	29.6	23.3	26.3	31.2	36.9	55.8	66.1	71.5	68.1	63.6	45.8
Mobile, Ala	65.2	57.7	54.1	53.3	56.7	63.3	64.3	73.6	80.1	80.8	83.8	77.9	67.6
Montgomery, Ala	64.4	54.2	50.2	51.3	54.5	61	62.4	73.3	79.7	79.9	82.6	76.2	65.8
Morgantown, W. Va	52.2	38.2	38.7	38.5	38.9	42.1	45.7	62.9	74.2	74.1	69.5	66.9	53.5
Mount Washington, N. H	32.1	8.6	10.7	11.2	6.3	12.8	14.2	32.5	42.9	48.5	43.9	43.4	25.6
Nashville, Tenn	56.8	47.1	44.6	42.3	44.5	51.7	54.7	72	83.5	83.4	81.5	73.4	61.3
New Haven, Conn	52.7	34	32.6	32.1	28.3	30.5	39.8	56.8	67.4	72.2	67.9	64.8	48.2
New London, Conn	52.7	34.6	34.2	33.4	29.5	34.6	39.7	55.5	55.5	70.9	67.7	64.5	47.7
New Orleans, La	68.2	61.2	56.6	56	59.1	66.2	65.6	75.7	81.3	81.4	83.9	78.9	69.5
New York, N. Y	55.6	37.9	36.9	34.7	31.5	38.3	41.6	58.6	70.4	73.9	70.8	67.2	51.4
Norfolk, Va	57.6	47.2	44.5	45.2	43.1	48.9	52.2	64.1	77.7	76.9	73.2	70.4	58.4
Omaha, Nebr	48.5	38.5	25.2	22.3	23.4	33.8	45.1	66.6	73.2	80	77.3	63.0	49.7
Oswego, N. Y	50.9	32.3	33.3	28.7	25.9	32.5	36.7	53.7	62.1	69.8	67.5	65.4	46.5
Pembina, Dak	35.4	16.1	6.6	—3.	2.6	11.9	29.4	55.3	64.4	69.9	67.0	56.2	34.3
Philadelphia, Pa	54.7	38.3	38.3	36.7	33.2	40	42.5	59.9	73	74.7	71.1	68.0	52.5
Pike's Peak, Colo	.....	15.9	4.5	6.1	—.05	4.8	7.7	23.6	35	42	39.5	29.6	.....
Peck's Beach, N. J	.....	.....	.....	35.7	33.4	38.7	42.7	55.4	69.1	70.2	69.2	67.5	.....
Pittsburgh, Pa	57.3	35.8	37.1	35.5	34.4	39.3	43.3	61.9	73.9	74.7	70.4	67.6	52.6
Port Huron, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.0	.....
Portland, Me	50.5	29.2	26.3	24.9	24	32.7	36.7	52.5	61.7	67.2	64.6	60.3	44.2
Portland, Oreg	49.9	47.4	37	42.9	43.7	45.1	53.9	59.7	60.2	68.3	64.7	61.0	52.8
Punta Rassa, Fla	72.8	66.9	65.6	63.3	69.1	72.1	74.3	76.1	79.9	79.7	83.7	79.2	73.5
Rochester, N. Y	48.6	30.3	31.6	28.9	25	31.5	35.7	56.5	65.6	70.7	68.0	65.5	46.5
Salt Lake City, Utah	.....	.....	.....	.....	.....	.....	48.2	61.6	68.1	78.2	74.7	62.6	.....
Sandy Hook, N. J	.....	.....	.....	32.6	28.6	34.8	38.2	54.1	66.3	73.1	70.2	67.2	.....
San Diego, Cal	62	60.2	54.6	54.8	52.2	52	56	61	63.5	68.7	68.2	65.3	59.9
San Francisco, Cal	59.1	57.4	50.6	48.9	50.9	50.6	54.7	57.7	59.2	57.7	58.7	60.8	55.5
Savannah, Ga	63.4	55.3	51.8	52.4	53.3	62.2	66	72.2	80.7	79	79.0	75.3	65.9
Santa Fé, N. Mex	51	41.1	25.8	31	27.8	36.2	42.1	59.8	69.3	71.1	69.9	61.0	48.8
Shreveport, La	62.6	56.5	49.9	50.4	51.6	60.5	61	75.2	82.7	82.5	86.0	75.4	66.2
Saint Louis, Mo	52.3	41.8	37.2	35.5	36.6	43.1	47.6	69.5	79.2	81.5	78.3	70.2	56.1
Saint Paul, Minn	41.3	25.6	18.6	13.8	14.4	23.7	37.5	62.2	68.7	74.7	70.5	60.9	42.6
Squan Beach, N. J	.....	.....	.....	34	31	36.7	40	54.2	67.2	69.2	68.8	66.4	.....
Toledo, Ohio	50	35.7	35.8	32.4	31.1	37.5	40.8	62.1	72.1	74.7	72.0	67.5	51.0
Vicksburgh, Miss	63	57	52.4	52.2	54	62.5	57.7	75.4	81.9	81.1	84.6	76.9	66.5
Virginia City, Mont	.....	35.6	16.7	23.1	18.4	24.1	38.4	51.1	53.9	67.7	61.8	50.2	.....
Washington, D. C	55.3	41.4	40.9	40.5	36.4	44.6	47.8	64.3	77.2	78.4	73.2	70.4	55.8
Wilmington, N. C	61.4	52.5	49.2	50.1	48.1	57.3	62.8	70.1	80.1	79.1	76.7	74.1	63.4
Wood's Hole, Mass	54	38	36	34.7	30	34.9	38.2	51.3	61.8	67.8	66.2	63.8	48.0
Wytheville, Va	48.6	32.5	36.7	35.8	37.9	42.3	48.1	60.1	70	69.9	66.5	61.9	51.3
Yankton, Dak	46.1	35.9	18.1	15.6	18.8	30.6	44.4	62.1	70.7	78.2	74.2	61.7	46.4

PAPER 9.—*Maximum, minimum, and mean temperatures.*

ALBANY, N. Y.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	37	24	8	−10	41	12	37	15	49	35	73	50	77	51	72	63	77	52
2	.....	.....	.....	.....	.....	.....	41	28	19	−16	46	31	48	29	45	34	68	45	77	63	74	57	81	57
3	.....	.....	.....	.....	.....	.....	47	35	30	7	49	30	40	29	59	33	69	52	74	60	67	48	85	55
4	.....	.....	.....	.....	.....	.....	57	45	29	17	53	26	29	15	61	36	75	49	75	53	71	49	67	46
5	.....	.....	.....	.....	.....	.....	57	25	21	5	34	20	39	19	57	39	79	59	70	59	74	51	72	51
6	.....	.....	.....	.....	.....	.....	35	25	22	− 4	35	18	39	27	60	35	85	64	79	53	76	52	75	59
7	.....	.....	.....	.....	.....	.....	55	25	15	− 5	36	23	48	31	48	29	84	64	85	62	78	56	73	54
8	.....	.....	.....	.....	.....	.....	55	20	20	− 9	40	30	48	33	59	35	75	62	87	63	75	66	78	53
9	.....	.....	.....	.....	.....	.....	44	28	22	− 6	31	11	41	33	83	41	83	58	78	62	78	64	76	50
10	.....	.....	.....	.....	.....	.....	44	25	28	15	20	10	38	29	84	47	77	58	75	62	85	59	86	52
11	.....	.....	.....	.....	.....	.....	40	32	30	15	20	10	39.5	20	63	43	61	52	75	68	83	58	85	65
12	.....	.....	.....	.....	.....	.....	35	21	34	8	21	7	30	13	66	40	70	57	69	57	85	65	75	58
13	.....	.....	.....	.....	.....	.....	31	18	49	30	16	5	42	19	75	43	61	50	83	65	76	64	72	61
14	.....	.....	.....	.....	.....	.....	34	18	48	29	28	11	60	34	75	53	72	47	85	58	68	61	77	56
15	.....	.....	.....	.....	.....	.....	30	10	42	22	32	12	64	44	74	43	80	52	92	67	75	56	76	63
16	.....	.....	.....	.....	.....	.....	18	− 3	38	28	42	21	48	32	64	50	77	52	80	56	77	54	74	58
17	.....	.....	.....	.....	.....	.....	24	4	30	13	44.5	35	38	31	68	51	76	60	77	58	80	57	64	58
18	.....	.....	.....	.....	.....	.....	32	− 1	24	8	61	44	45	22	66	48	70	59	78	56	81	59	63	58
19	.....	.....	.....	.....	.....	.....	(*)	26	38.5	11	59	40	59	34	61	44	68	58	87	63	74	54	70	57
20	.....	.....	.....	.....	.....	.....	.....	13	45	33	44	30	45	37	60	43	67	52	82	68	84	64	68	57
21	.....	.....	.....	.....	.....	.....	.....	13	42.5	36	55	28	43	30	63	50	76	56	77	64	77	59	63	45
22	.....	.....	.....	.....	(†)	.....	.....	35	38	31	43	30	49	33	59	41	84	57	76	56	70	51	63	39
23	.....	.....	.....	.....	.....	.....	.....	31	47	30	32	9	42	36	67	45	87	65	80	56	66	45	70	46
24	.....	.....	.....	.....	.....	.....	.....	24	34	21	24	6	46	35	73	53	72	57	81	63	69	54	72	45
25	.....	.....	.....	.....	36	26	24	6	26	19	52	20	45	31	64	56	75	53	80	62	71	44	76	51
26	.....	.....	.....	.....	33	23	17	− 5	30	18	56	34	38	30	63	49	68	58	80	65	72	52	78	50
27	.....	.....	.....	.....	37	30	39	12	33	16	39	22	43	30	69	47	79	57	81	67	73	47	77	51
28	.....	.....	.....	.....	36.5	24	44	23	37	10	38	28	43	29	82	51	89	58	81	63	76	48	72	55
29	.....	.....	.....	.....	35	25	35	20	.....	.....	33	20	39	29	85	59	92	66	72	62	78	55	67	52
30	.....	.....	.....	.....	28	9	38	0	.....	.....	49	26	43	25	84	61	71	58	79	56	78	54	56	44
31	.....	.....	.....	.....	35	20	13	− 1	.....	.....	34	20	.....	.....	85	63	.....	.....	78	58	77	54	.....	.....
Range	.....	.....	.....	.....	.....	.....	62°		65°		56°		51°		52°		47°		41°		41°		47°	
Monthly means	.....	.....	.....	.....	.....	.....	28°.8		22°.8		31°.5		36°.7		56°.6		66°.2		71°.1		66°.9		63°.3	

* *Maximum thermometer broken.*

† Station opened December 22, 1873.

Maximum, minimum, and mean temperatures—Continued.

ALPENA, MICH.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.		April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	51	(*)	40	.....	29	.....	41	.....	15	.....	52	.....	38	.....	57	.....	62	45	72	52	72	57	69	45
2	56	.....	39	.....	41	.....	38	.....	21	.....	53	.....	34	.....	47	.....	56	38	73	57	70	51	85	53
3	46	.....	34	.....	51	.....	51	.....	22	.....	39	.....	20	.....	48	.....	56	47	67	51	69	45	67	44
4	47	.....	46	.....	46	.....	40	.....	24	.....	30	.....	27	.....	56	.....	59	47	68	57	72	47	62	36
5	52	.....	31	.....	24	.....	22	.....	23	.....	28	.....	28	.....	57	.....	72	52	73	55	64	45	70	56
6	39	.....	36	.....	30	.....	31	.....	23	.....	32	.....	40	.....	48	.....	71	51	84	65	66	56	76	51
7	62	.....	43	.....	31	.....	28	.....	22	.....	37	.....	39	.....	45	.....	(†)	47	86	61	74	54	70	51
8	56	.....	40	.....	38	.....	36	.....	27	.....	31	.....	32	.....	48	.....	.....	48	78	62	78	54	76	57
9	57	.....	33	.....	41	.....	33	.....	26	.....	24	.....	30	.....	91	.....	.....	49	73	53	70	56	80	60
10	67	.....	34	.....	32	.....	33	.....	27	.....	28	.....	43	.....	83	.....	.....	46	82	57	72	58	81	61
11	62	.....	35	.....	37	.....	27	.....	19	.....	20	.....	30	.....	54	.....	.....	44	68	53	83	61	79	64
12	46	.....	31	.....	33	.....	21	.....	35	.....	9	.....	31	.....	63	.....	.....	42	66	48	81	62	79	60
13	53	.....	25	.....	30	.....	26	.....	45	.....	23	.....	40	.....	64	40	.....	40	74	50	64	53	73	61
14	61	.....	26	.....	39	.....	20	.....	33	.....	31	.....	57	.....	48	40	.....	48	89	59	70	46	76	61
15	54	.....	38	.....	46	.....	9	.....	39	.....	32	.....	46	.....	46	41	.....	50	87	63	76	49	66	48
16	61	.....	37	.....	38	.....	18	.....	34	.....	36	.....	32	.....	56	43	.....	51	67	54	69	48	60	42
17	53	.....	37	.....	40	.....	30	.....	28	.....	45	.....	40	.....	47	39	.....	53	67	54	86	61	62	57
18	60	.....	33	.....	37	.....	34	.....	26	.....	52	.....	59	.....	56	33	.....	52	76	57	73	52	66	55
19	44	.....	22	.....	34	.....	32	.....	37	.....	41	.....	35	.....	52	33	.....	53	91	62	79	56	69	54
20	40	.....	17	.....	29	.....	26	.....	34	.....	42	.....	34	.....	54	42	.....	61	69	52	76	60	60	41
21	46	.....	30	.....	27	.....	37	.....	32	.....	39	.....	41	.....	62	38	.....	60	77	47	66	54	62	34
22	48	.....	33	.....	32	.....	36	.....	27	.....	37	.....	45	.....	62	38	.....	59	74	51	61	50	70	48
23	52	.....	30	.....	37	.....	27	.....	29	.....	18	.....	33	.....	54	45	.....	67	77	60	65	49	65	46
24	50	.....	29	.....	36	.....	15	.....	23	.....	32	.....	34	.....	55	42	.....	52	76	60	71	45	80	48
25	46	.....	25	.....	32	.....	11	.....	14	.....	39	.....	41	.....	60	44	78	57	84	66	68	48	70	51
26	42	.....	23	.....	35	.....	28	.....	28	.....	28	.....	40	.....	68	45	69	58	78	61	68	48	67	61
27	40	.....	25	.....	33	.....	33	.....	30	.....	32	.....	37	.....	69	45	72	54	71	53	69	51	68	49
28	35	.....	27	.....	28	.....	27	.....	37	.....	23	.....	38	.....	76	52	97	59	72	51	69	48	62	44
29	33	.....	23	.....	29	.....	24	.....	.....	.....	36	.....	43	.....	58	51	80	53	76	50	70	54	61	42
30	37	.....	21	.....	29	.....	7	.....	.....	.....	32	.....	46	.....	84	55	72	48	69	48	70	51	50	38
31	40	.....	.....	.....	32	.....	18	.....	.....	.....	21	.....	.....	.....	79	54	.....	.....	79	59	68	51	.....	.....
Range																			44°		41°		51°	
Monthly means	41°.8		26°.2		28°		21°.6		20°		24°.6		29°.9		49°.8		60°.2		65°.1		63°.3		60°	

* Minimum thermometer broken.

† Maximum thermometer out of order.

Maximum, minimum, and mean temperatures—Continued.

ATLANTIC CITY, N. J.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	43	36	29	19	43	31	36	31	67	44	78	58	77	68	76	65	75	61
2	.....	.....	.....	.....	.....	.....	45	41	36	25	48	31	44	33	54	44	61	50	78	68	77	66	81	58
3	.....	.....	.....	.....	.....	.....	48	41	36	29	51	37	51	38	54	36	61	55	80	64	74	57	79	64
4	.....	.....	.....	.....	.....	.....	49	43	33	24	62	37	47	25	54	42	74	58	73	65	72	59	75	65
5	.....	.....	.....	.....	.....	.....	50	38	33	21	43	30	46	22	50	44	70	58	73	64	74	57	72	66
6	.....	.....	.....	.....	.....	.....	48	37	30	17	39	34	64	43	54	40	70	62	67	60	78	59	77	65
7	.....	.....	.....	.....	.....	.....	49	45	31	21	50	37	48	42	53	42	73	63	74	62	78	66	86	64
8	.....	.....	.....	.....	.....	.....	48	35	32	14	46	32	44	37	69	45	93	65	76	64	73	67	81	62
9	.....	.....	.....	.....	.....	.....	45	32	36	17	37	28	44	39	83	52	79	65	76	66	79	66	72	64
10	.....	.....	.....	.....	*50	28	48	37	30	25	43	26	47	36	83	56	79	68	76	66	80	64	76	57
11	.....	.....	.....	.....	47	26	45	30	40	24	39	27	48	30	67	44	70	66	75	65	79	66	82	64
12	.....	.....	.....	.....	55	45	36	25	38	25	40	23	42	23	53	43	86	67	74	64	78	68	76	67
13	.....	.....	.....	.....	54	40	36	26	45	38	29	19	41	27	63	47	71	57	74	64	81	70	71	68
14	.....	.....	.....	.....	42	29	39	24	54	36	41	22	53	39	63	51	70	57	77	63	73	68	73	67
15	.....	.....	.....	.....	44	28	27	11	41	33	39	22	65	47	54	49	74	55	76	62	73	64	78	68
16	.....	.....	.....	.....	49	37	24	10	55	35	40	33	57	42	68	52	74	64	79	64	77	61	72	69
17	.....	.....	.....	.....	45	31	28	11	39	23	46	38	43	38	62	52	82	66	76	64	75	65	71	66
18	.....	.....	.....	.....	55	27	37	17	31	17	52	41	43	35	67	52	82	63	80	63	82	57	77	69
19	.....	.....	.....	.....	49	36	41	33	43	31	55	41	46	36	69	44	72	58	79	64	77	67	70	66
20	.....	.....	.....	.....	44	34	39	30	51	38	57	38	53	42	59	52	64	58	77	67	83	70	71	62
21	.....	.....	.....	.....	35	24	42	36	49	38	47	33	62	41	67	62	75	57	76	64	86	71	69	55
22	.....	.....	.....	.....	33	19	48	39	49	41	57	40	48	36	68	48	78	62	73	62	82	66	64	53
23	.....	.....	.....	.....	34	29	61	40	60	39	49	27	48	43	62	48	84	65	78	60	72	66	70	54
24	.....	.....	.....	.....	37	24	41	28	53	32	35	17	49	39	58	53	88	67	77	62	70	62	72	55
25	.....	.....	.....	.....	36	24	29	17	55	31	44	23	45	41	63	53	78	59	80	63	70	66	73	59
26	.....	.....	.....	.....	41	32	34	12	38	33	48	41	48	36	74	54	89	69	81	68	69	57	74	60
27	.....	.....	.....	.....	42	34	41	33	40	29	48	37	59	36	67	53	74	67	81	69	69	58	73	61
28	.....	.....	.....	.....	42	30	53	38	43	23	52	38	45	39	71	55	75	65	82	67	69	57	68	64
29	.....	.....	.....	.....	42	28	41	27	.....	.....	46	36	42	31	68	54	81	68	74	68	70	55	71	56
30	.....	.....	.....	.....	36	20	39	26	.....	.....	49	37	56	42	63	56	84	70	82	62	74	57	66	50
31	.....	.....	.....	.....	39	20	42	28	.....	.....	43	32	.....	.....	68	56	.....	.....	79	64	74	60	.....	.....
Range	.....	.....	.....	.....	.....	.....	51°		46°		45°		43°		47°		31°		22°		31°		36°	
Monthly means	.....	.....	.....	.....	37°.4		36°		34°.1		38°.6		42°.9		55°.4		68°.8		70°.3		69°.5		67°8	

* Station opened December 13, 1873.

Maximum, minimum, and mean temperatures—Continued.

AUGUSTA, GA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	97	70	90	74	93	68	84	66
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	73	90	72	96	75	85	64
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	68	85	72	94	75	87	67
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	73	88	70	92	74	88	66
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	73	97	70	88	69	87	67
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*73	53	90	73	92	76	87	70	86	66
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	52	88	73	89	71	82	70	88	67
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	54	91	74	90	68	90	69	91	69
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	55	94	74	91	72	92	68	92	67
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	56	97	78	89	70	92	68	83	69
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	59	91	73	85	69	97	71	86	68
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	64	92	72	80	68.5	101	78	85	66
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	62	86	71	85	69	95	74	87	68
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	66	87	72	89	69	94	72	81	71
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	66	86	69	92	71	91	67	86	73
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	66	85	71	94	70	89	73	87	71
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	60	86	71	95	71	86	68	88	70
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	59	89	72	93	71	88	66	89	69
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	59	93	70	84	71	90	73	85	69
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	55	93	70	89	69	92	74	87	69
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	62	90	72	89	71	95	73	81	66
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	62	90	69	92	72	93	72	79	62
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	57	92	71	87	71	90	71	80	59
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	65	97	73	86	70	92	73	84	64
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95	69	99.5	78	86	70	81	70	84	67
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	73	96	78	81	73	84	61	84	67
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	71	97	74	85.5	70	81	65	81	64
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	64	90	74	84	71	72	62	70	60
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	67	91	72	90	73	67	61	76	57
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	69	90	71	86	72	76	62	79	53
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	69	.....	.....	90	70	81	65	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31°.5		29°		40°		39°	
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72°.5		81°.4		78°.5		78°.8		74.°7	

* Station supplied with self-registering maximum and minimum thermometers May 6, 1874.

Maximum, minimum, and mean temperatures—Continued.

BALTIMORE, MD.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	65.5	47	53.5	31	36	30	44	33	29	23.5	52	30	41	31	70	47	79	62	86	67	86	70	83	63.5
2	67	52.5	58	31.5	39	32	52	39	31	20	54	33	45	35	59	48	72	56	86	69	84	68.5	82	59
3	70	51.5	62	43	52	35	55	42	38	28.5	59	39	54	36	60	41	63	57	87	69	81.5	62	88	65
4	68.5	53	58	33	73	51	67	46	38	28	68	42	46	32.5	53	42	74	58	92	67	79	61	75	65
5	73.5	58	62	44	44	(*)	56	36	38	24	52	35	42	28	60	44	82	64	80	69	79	59	78	64
6	64	46	51	39	41	.....	54	34	32	21	46	34	64	36	64	45	82	70	81	65	82	63	81	67
7	54	41	51.5	40	38	.....	62	50	32	22	46	34	62	47	62	46	90	70	83	65	74	67	85	65
8	72	48	59	47	48	.....	53	37	36	22	48	35	55	45	73	44	96	74	92	68	76	68	90	66
9	70	51	56	42	59	41	49	33	36	15	39	29	56	41	83	55	97.5	74	92	74	87	66.5	80	66
10	65	46	46.5	38	49	36	48.5	36	36	27	49	32	51	39	89	63	89	76	95.5	75	86	69	82	59
11	67	46	46	33	53	33	45	33	43	26	44	33	64	35	76	49	79	72	86	73	86.5	65	88	66
12	64	51	47	36	70	48	40	30	41	27	45	28	44	27	65	45	87	70	84	72	88	67	89.5	70.5
13	60	43	49	28	63	40	34	27	49	37	31	23	48	29	74	53	74	61	87	71	87.5	72.5	77	68.5
14	71	44	40.5	26	44	33	40	27	50	38	42	25	60	41	77	57	77	54	92	69	79	65	76	69
15	68	49	48	28	53	32	30	14	47	34	47	31	68	55	68	57	80.5	57	94	73	86.5	65	78	68
16	73	48	64	34	50	37	24	13	57	35	44	35.5	62	46	70	55	79	63	89	74	84	61	72	68
17	73	55	44	34	51	33	29	13	45	31	55	40	47	41	72	58	83	68	84	66	82	61	73	64.5
18	69	59	43	34	57	38	35	14	37	22	54	49	48	40	67	54	90	64	86.5	66	91	60	77	64
19	71	60	42	32	53	40	45	29.5	42	26	72	49	47	42	72	47	83	62.5	88	68.5	86	71	79	67
20	53	43	39	24	45	34	47	35	51	36	55	45	55	44	69	53	73	63	91	69	97	69	73	62
21	52	42	42	22	38	26	47	32	72	45	56.5	37	60	46	67	53	80	61.5	81	69	96	75	69	55
22	63	40	42	29	36	25	65	42	74	51	56	43	60	44	71	49	86	63	84	65	82	66	70	51
23	66	43	43	28	38.5	28	69	42	78	52	48	30	52	45	71	47	95	68.5	84	64.5	71	61.5	73	52
24	65	50	53.5	39	46	29	46	29	57	34	39	23	58	44	67	60	93	76.5	82	67	70	59	75	58
25	61	46	47	36	41	30.5	29	22	40	27	56	26	51	41	83	60	89	64	84	70.5	69	63	76	58
26	59	38.5	41	31	40	32	36	18	38	25	62	41	53	37.5	75	58	91	74	85	71.5	73	56.5	79	59
27	65	51.5	52	34	42	34	47	35	43	29	57	43	61	39	73	54	82	72	76	71	72	55	79	59
28	55	38	42	30	43	34	57	39	45	22	57	42	54	38	82	62	93	72	83	71	75	53.5	72	64
29	48	31	39	29	43	30	58	33	.....	.....	52	39	46	33	84	60	97	75	78.5	67	74	52	63	59
30	48	30	39	25	41	24	43	30	.....	.....	62	36	58	34	83	63	85	73	84	64	75	54	64	53
31	48	33.5	.....	.....	13	21	43	29	.....	.....	51	33	.....	.....	84	65.5	.....	.....	87	62.5	77	63	.....	.....
Range	43°		42°		.....		56°		63°		49°		41°		48°		43°.5		33°		45°		39°	
Monthly means	44°.2		41°		40°.4		39°.1		37°.3		43°.7		46°.9		63°.1		75°.9		77°.3		72°.8		69°.9	

* Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

BARNEGAT, N. J.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	46	26	25	18	46	29	33	.....	63	.....	77	.....	83	.....	87	.....	77	.....
2	.....	.....	.....	.....	.....	.....	46	38	34	23	47	33	40	.....	54	.....	60	.....	80	.....	84	.....	82	.....
3	.....	.....	.....	.....	.....	.....	54	40	36	29	50	38	50	.....	61	.....	64	.....	76	.....	79	.....	84	.....
4	.....	.....	.....	.....	.....	.....	53	42	31	25	61	36	42	.....	60	.....	67	.....	80	.....	74	.....	66	.....
5	.....	.....	.....	.....	.....	.....	49	36	34	21	46	30	43	.....	51	.....	74	.....	76	.....	73	.....	73	.....
6	.....	.....	.....	.....	.....	.....	47	35	28	13	36	32	60	.....	51	.....	73	.....	67	.....	77	.....	74	.....
7	.....	.....	.....	.....	.....	.....	51	46	28	21	51	36	42	.....	50	.....	83	.....	78	.....	80	.....	83	.....
8	.....	.....	.....	.....	.....	.....	48	35	29	11	45	32	44	.....	70	.....	92	.....	80	.....	75	.....	78	.....
9	.....	.....	.....	.....	.....	.....	45	31	35	18	37	27	42	.....	81	.....	83	.....	84	.....	69	.....	73	.....
10	.....	.....	.....	.....	53	33	48	32	31	25	38	24	44	.....	85	.....	79	.....	85	.....	84	.....	79	.....
11	.....	.....	.....	.....	47	34	43	33	35	21	37	27	51	.....	52	.....	70	.....	81	.....	78	.....	80	.....
12	.....	.....	.....	.....	61	43	36	27	38	26	38	27	40	.....	51	.....	90	.....	76	.....	83	.....	72	.....
13	.....	.....	.....	.....	53	38	35	25	45	35	32	18	42	.....	70	.....	70	.....	84	.....	83	.....	71	.....
14	.....	.....	.....	.....	40	30	35	24	54	35	38	22	61	.....	70	.....	70	.....	82	.....	70	.....	74	.....
15	.....	.....	.....	.....	47	32	22	11	40	34	34	23	58	.....	51	.....	79	.....	84	.....	73	.....	79	.....
16	.....	.....	.....	.....	50	35	22	9	51	36	40	29	57	.....	65	.....	77	.....	85	.....	74	.....	71	.....
17	.....	.....	.....	.....	50	32	25	11	37	22	45	34	43	.....	67	.....	80	.....	70	.....	73	.....	68	.....
18	.....	.....	.....	.....	51	33	39	16	31	16	53	39	41	.....	62	.....	80	.....	78	.....	89	.....	69	.....
19	.....	.....	.....	.....	54	36	44	36	43	31	55	42	49	.....	69	.....	70	.....	81	.....	75	.....	69	.....
20	.....	.....	.....	.....	44	34	38	31	47	39	50	40	52	.....	65	.....	64	.....	77	.....	95	.....	72	.....
21	.....	.....	.....	.....	36	24	43	35	50	38	47	35	55	.....	67	.....	73	.....	78	.....	86	.....	67	.....
22	.....	.....	.....	.....	32	22	50	39	47	37	52	40	52	.....	68	.....	80	.....	71	.....	77	.....	62	.....
23	.....	.....	.....	.....	38	27	61	42	56	38	39	32	45	.....	70	.....	94	.....	80	.....	70	.....	71	.....
24	.....	.....	.....	.....	36	25	42	30	49	30	37	18	48	.....	61	.....	86	.....	77	.....	72	.....	73	.....
25	.....	.....	.....	.....	38	28	30	17	32	28	47	27	46	.....	65	.....	82	.....	83	.....	68	.....	76	.....
26	.....	.....	.....	.....	42	33	29	10	34	20	55	39	47	.....	70	.....	85	.....	82	.....	70	.....	74	.....
27	.....	.....	.....	.....	42	33	42	28	38	27	42	26	57	.....	68	.....	71	.....	83	.....	68	.....	71	.....
28	.....	.....	.....	.....	42	30	48	37	40	24	52	(†)	44	.....	70	.....	81	.....	81	.....	69	.....	65	.....
29	.....	.....	.....	.....	41	29	41	30	.....	.....	39	.....	42	.....	73	.....	87	.....	72	.....	69	.....	66	.....
30	.....	.....	.....	.....	28	21	36	24	.....	.....	51	.....	55	.....	62	.....	84	.....	78	.....	74	.....	59	.....
31	.....	.....	.....	.....	37	18	42	25	.....	.....	41	.....	.....	.....	70	.....	.....	.....	82	.....	75	.....	.....	.....
Range	.....	.....	.....	.....	.....	.....	52°		45°		43°		.....		.....		.....		.....		.....		.....	
Monthly means	.....	.....	.....	.....	36°.9		35°.5		32°.8		38°.1		41°.4		55°.5		69°.3		70°.2		69°.1		66°.6	

* Station opened December 10, 1873.

† Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

BOSTON, MASS.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	61	40	49	37	19	6	45	23	15	2	49	26	40	16	48	34	62	50	85	60	86	66	77.5	61.5
2	65	45	55	33	27	13	47	37	16	0	59	24	40	26	45	33	66	49	81	62	82	63	81	58.5
3	69	43	57	37	56	21	44	34	30	10	60.5	36	46	30	59	32	71	49	81	62	75	55	87	62
4	67	50.5	52	33	62	50	60	43	33	18	58	36	33	20	65	49	62	52	74	60	78	53	69	51.5
5	73	56	52	32	50	30	55	32	21	9	43	21	41	11	53	35	81	52	65	54	75	56.5	68.5	52
6	72	55	45	30	43	25	37	31	20	7	40	19	50	30	57	35	77	58	68	57	76	58	77	61
7	58	45	47	27	36	21	44	29	25	9	39	31	40	30	49	39	70	56	83	56	85	60	74	60
8	60	45	50	44	39	18	55	40	29	10	41	26	46	30	57	(*)	83	64	87	65	75	64	76	59.5
9	57	32	50	37	51	33	50	33	34	14	35	22	42	35	67	.....	80	62	86	70	69	60	70	59
10	61.5	41	37	27	40	28	47	35	35	11	29	19	40	34	75	.....	78	56	80	69	89	63	90	60
11	64	40	43	26	40	25	40	31	35	19	26	12	51	30	52	.....	61	52	84	70	91	68	83.5	69
12	64	46	55	34	40	38	34	25	37	12	26	11	32	20	67	.....	63	52	73	56	88	67	69.5	57.5
13	55	42	44	27	43	27	30	18	52	23	23	10	45	20	82	.....	67	53	82	56	76	66	70	51
14	67	41	31	20	35	25	32	20	52	33	38	18	67	32	81	58	77	49.5	87	64	65	59	76	56
15	69	43	41	20	37	30	21	12	41	28	38	20	66	51	59	50	82	55	94	68	70	59	76.5	57.5
16	71	48	36	25	47	30	16	8	42	28	43	22	52	42	52	43	81	62	91	68	74	58	74	65
17	63	44	41	24	44	30	26	7	33	18	40	33	42	32	74	48	73	62	85	63	72	58	67	59.5
18	62	36	36	29	45	33	38	13	37	12	60	39	47	29	68	51	71	61	82	62	84	59	61.5	59
19	71	52	36	25	43	33	47	30	40	17	63	47	62	34	64	49	62	50	89	66	77	62	61	57.5
20	66	56	30	22	41	32	34	22	54	33	54	34	48	36	67	50	56	49	86	66	84	66	66	57
21	66	50	37	21	32	15	37	19	42	38	52	29	60	34	55	47	68	53	77	66	80	65	69	52.5
22	68	50	44	27	32	17	50	34	45	35	45	34	53	34	58	45	86	53	82.5	46	72	56.5	63.5	46.5
23	71	46	42	27	36	11	60	38	52	35	37	20	43	34	69	44	89	71	80	60	67.5	56	70	47
24	70	51	47	29	41.5	24	42	27	34	26	27	6	52	34	72	52	75	63	85.5	64	69	51	70	51.5
25	59	42	33	22	38	34	23	10	34	22	47	19	42	33	61	56	82	59	88	63	70	53	79	56
26	54	37	24	12	39	22	16	0	34	16	58	40	39.5	32	73	53	79	63	83	65	70	51	72	57.5
27	63	48	27	11	35	21	29	14	37	22.5	45	33	51	35	68	50	79	60	87	64	71	51	63	53.5
28	53	41	29	11	34	22	40	22	34	14	44	32	48	33	83	54	92	59	87.5	64	75	53	65	52
29	46	37	32	11	37	24	36	20	.....	.....	36	28	40	33	69	54	98	68	81	67	78	58	63.5	58.5
30	48	32	38	12	29	11	32	5	.....	.....	49	25	42	31	66	54	83	66	82	63	81	56	64	51
31	48	42	.....	.....	34	14	17	5	.....	.....	38	23	.....	.....	86	63	.....	.....	86	62	83	60	.....	.....
Range	41°		46°		56°		60°		54°		57°		56°		.....		49°		40°		40°		43°.5	
Monthly means	53°		33°.4		32°.9		31°.2		28°.3		35°.3		39°.1		56°.1		65°.8		72°.2		67°.7		63°.8	

* Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

BRECKENRIDGE, MINN.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	56	19	42	13	28	18	33	20	21	−8	37	7	35	20	58	47	69	40	75	55	74	49	78	62
2	48	27	22	12	27	−2	34	15	28	4	32	15	27	10	62	40	65	50	88	59	67	54	60	47
3	46	35	52	11	2	−6	26	−8	17	4	20	−10	24	10	60	33	76	43	89	75	81	53	68	37
4	66	35	39	13	4	−16	−2	−23	17	−7	20	−11	26	0	62	30	72	54	89	60	75	62	67	48
5	36	34	37	18	5	−25	26	−12	20	−9	31	0	41	6	68	34	68	44	79	66	79	59	75	38
6	55	15	51	15	15	−25	30	3	19	0	24	−8	28	15	70	34	70	54	85	60	83	59	88	49
7	72	35	41	19	29	11	35	3	26	5	10	−1	37	14	84	34	78	51	88	59	79	59	91	58
8	73	40	39	19	32	8	40	12	23	0	2	−15	31	16	93	51	64	50	85	63	87	56	91	59
9	71	43	38	28	8	−10	10	0	14	−11	20	0	45	17	96	63	64	41	80	61	89	61	78	68
10	68	37	46	25	34	−16	8	0	11	−3	14	−9	47	27	78	54	54	41	72	52	82	60	71	55
11	57	25	43	19	21	−6	0	−14	28	−7	8	−11	34	21	59	42	56	41	78	52	79	64	74	54
12	57	26	27	10	8	−14	11	−15	15	−6	2	−25	45	25	60	40	72	38	83	64	67	56	67	40
13	66	45	29	12	15	−10	−4	−27	4	−20	17	−24	56	25	68	33	76	48	86	57	74	60	68	37
14	61	25	48	19	21	−8	−23	−32	6	−15	37	16	36	27	48	44	72	54	84	65	82	61	55	34
15	59	43	52	29	16	1	−4	−24	14	−25	38	20	39	23	59	39	68	54	76	50	85	63	65	26
16	60	40	46	34	15	0	18	−4	11	−13	37	33	52	28	60	41	89	46	87	55	81	63	66	45
17	56	33	36	14	15	−9	40	15	29	−15	40	29	50	34	62	33	86	56	84	59	74	51	63	48
18	47	32	14	1	19	−4	30	−14	32	23	29	24	40	15	80	36	88	70	92	62	74	50	55	43
19	58	33	23	−7	17	−10	1	−27	28	−10	28	13	47	23	68	48	90	65	70	56	75	63	54	36
20	61	24	32	10	−4	−29	26	0	28	−11	25	16	39	29	69	34	86	65	81	44	71	53	62	34
21	51	31	32	11	28	−15	25	−13	−9	−21	29	5	46	25	78	44	91	68	86	50	74	58	69	39
22	31	19	24	3	23	7	−10	−21	5	−15	19	1	34	20	83	53	92	69	87	55	72	56	70	36
23	33	15	46	18	26	4	−10	−22	−3	−20	16	−10	54	20	88	54	90	70	79	60	70	58	81	41
24	36	12	36	21	26	−3	−5	−33	12	−29	41	4	50	33	74	58	90	71	83	56	76	58	83	40
25	33	12	21	14	33	8	10	−25	17	−24	38	10	44	31	80	48	84	67	75	58	80	58	76	53
26	31	21	23	10	25	2	23	0	19	−1	18	0	42	27	91	58	87	68	69	51	66	61	59	49
27	28	30	10	−6	20	−3	14	−3	33	−5	23	8	46	37	93	62	81	67	77	45	68	62	64	40
28	32	10	15	−11	24	8	8	−10	31	−9	24	−3	56	37	88	64	71	55	81	56	91	66	75	32
29	35	22	18	−1	13	−8	2	−13	.....	.....	34	16	73	40	86	61	80	48	78	50	74	59	65	32
30	34	12	27	12	16	−9	−2	−15	.....	.....	26	10	70	47	75	58	74	58	88	51	77	48	78	30
31	30	13	.....	.....	35	6	10	−8	.....	.....	29	2	.....	.....	69	48	.....	.....	74	60	79	56	.....	.....
Range	61°		63°		64°		73°		62°		64°		73°		66°		52°		42°		43°		65°	
Monthly means	38°.2		23°.4		8°		2°.6		4°.2		15°.1		34°		60°.2		65°.9		70°.2		67°.8		57°.7	

Maximum, minimum, and mean temperatures.—Continued

BROCKVILLE, CANADA

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	45	29	6	− 8	40	27	2	−25	40	21	33	8	49	29	63	50	77	51	77	60	82	49
2	.....	.....	52	34	39	0	39	30	0	−17	47	22	42	21	46	33	69	42	80	56	71	55	83	53
3	.....	.....	46	23	45	37	49	37	18	− 2	55	37	36	22	61	32	67	44	74	58	71	46	75	44
4	.....	.....	49	22	58	33	62	43	23	7	50	16	24	7	59	30	71	55	73	56	78	44	69	39
5	.....	.....	49	20	35	26	44	17	15	−11	23	8	35	14	56	34	83	54	75	59	78	48	79	44
6	.....	.....	36	20	30	23	30	16	7	−22	24	11	40	27	46	33	70	58	81	55	79	48	74	62
7	.....	.....	47	26	36	14	35	28	10	− 5	37	20	44	28	54	25	82	53	87	64	78	54	78	53
8	.....	.....	45	38	35	19	37	32	20	−12	37	29	40	22	59	37	74	55	83	63	83	59	80	52
9	.....	.....	40	26	45	34	40	31	28	− 4	30	11	36	23	63	42	79	50	79	59	87	56	81	44
10	.....	.....	33	20	38	23	37	30	28	15	17	9	38	25	59	44	68	54	76	58	83	60	84	60
11	.....	.....	32	28	38	24	34	18	24	6	15	4	37	18	62	39	58	48	72	59	86	57	79	60
12	.....	.....	37	25	38	26	23	9	16	−12	15	1	32	12	73	42	65	50	68	56	89	65	71	54
13	.....	.....	27	16	28	13	15	4	46	11	20	4	44	18	73	53	67	46	77	60	77	45	83	52
14	.....	.....	28	11	31	1	16	8	42	25	28	14	61	33	68	47	70	48	81	57	76	50	85	62
15	.....	.....	30	23	32	21	11	1	43	18	33	10	55	37	71	39	75	51	84	66	82	46	83	62
16	.....	.....	30	22	40	29	10	− 8	41	27	42	11	55	23	78	48	72	60	76	59	81	47	66	54
17	.....	.....	26	22	41	21	20	−13	29	11	43	29	34	28	61	45	71	58	78	47	83	57	61	53
18	.....	.....	30	23	42	29	33	17	21	− 1	57	39	42	19	63	45	71	58	78	56	81	64	68	56
19	.....	.....	23	16	34	16	39	17	37	9	52	38	55	31	64	42	68	55	88	58	78	64	73	60
20	.....	.....	26	2	32	5	19	3	40	28	40	24	40	32	59	44	62	49	77	60	82	64	69	52
21	.....	.....	29	5	24	−11	36	6	30	23	48	29	44	31	60	47	77	48	80	50	67	56	63	43
22	.....	.....	26	12	29	20	49	33	28	17	37	27	49	29	62	43	77	55	79	51	68	48	67	36
23	.....	.....	27	22	29	17	51	24	40	22	34	8	41	28	63	35	82	62	82	53	70	44	70	53
24	.....	.....	24	19	31	20	33	9	35	6	27	3	43	28	70	49	71	48	87	56	74	40	73	47
25	.....	.....	23	11	31	19	11	− 9	22	15	40	19	43	24	68	52	71	50	89	65	77	47	77	47
26	49	33	15	− 1	31	19	0	−18	24	12	40	31	42	30	56	45	70	56	85	68	80	52	82	51
27	55	38	14	0	24	19	7	− 3	32	11	35	15	45	28	65	49	79	45	75	60	81	51	.....	.....
28	42	35	19	1	27	16	22	7	32	5	35	21	41	25	76	49	85	56	64	58	82	48	.....	.....
29	38	28	19	2	34	19	14	− 3	.....	.....	29	11	37	27	74	54	83	67	78	58	80	51	.....	.....
30	37	25	17	− 5	26	0	3	−18	.....	.....	40	24	47	29	82	54	72	54	84	55	83	50	.....	.....
31	51	31	.....	.....	33	24	1	−16	.....	.....	31	13	.....	.....	76	58	.....	.....	76	57	80	50	.....	.....
Range	.....	.....	57°		69°		80°		71°		56°		54°		57°		43°		42°		49°		.....	.....
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Maximum, minimum, and mean temperatures—Continued.

BUFFALO, N. Y.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	58	47	41	29	21	12	40	35	14	2.5	38.5	29	35.5	17.5	41	33	63	52	77.5	54	74	63.5	77.5	53
2	58.5	41	52	36	49	20	44	31	27.5	2	48.5	29.5	37	25	45	34	68	45	72	62	67	56	75	54
3	60	45.5	47.5	29	60	47.5	58	44	29	22	54	39	35.5	21	56	30	68	56	71	56	66	51.5	72	56
4	63	48	51	29	60	31	65.5	29	27.5	18.5	48.5	21	22	13.5	54	41	69	59	76	58.5	69	48.5	71.5	49
5	59.5	50	49.5	30	32	21.5	31	23	24.5	14	31.5	18	37	14	56	38.5	70	62	77	58.5	75.5	49	81.5	56
6	50.5	37.5	37	27	29.5	21.5	34	23.5	21.5	12.5	39.5	25.5	38	28	49	33	76	60	76	61.5	74	56	71	63
7	52	34	53.5	28	32	18	35.5	31.5	23	13	48.5	33	40	30	42	30	76	62	82	70	79.5	64.5	77.5	61
8	59	46.5	48	39	45	27.5	38	31.5	35.5	3.5	33	22	40	30	54	39	68	58	76.5	69	80.5	65.5	75	67
9	68	41.5	40.5	21.5	50	36	42	32	26.5	13	24.5	19	35	31	59	46	73	60	85	67	75	63.5	76	57
10	72.5	48	32	26	37	33.5	37	26	29.5	15.5	31	17	35	22	54	41	73.5	60	74	66	75	67.5	76	65
11	65.5	55.5	36	28	45	33	32	24	25	17	24	18	37	22.5	65	43	67.5	53	74	63	87	62.5	75	69.5
12	56.5	40.5	40.5	27	41.5	33	25.5	19	51	11	23	10.5	30	20	80	54	60	52	64.5	58.5	82.5	70	80	65
13	55.5	39.5	28	21	35	22	26	18	49.5	31.5	20.5	9	56	24	64	49.5	59	48	68	57	73	61	84	60.5
14	60.5	51.5	30	17.5	34	18.5	24.5	13.5	33.5	23	22	17	56	43	67	51	65	54	77	65.5	75	51.5	83	70.5
15	68	39	39	25.5	37	27	12	7	44.5	23	40	18	51	33	77	46	74	50	78	71	73.5	55	77	61
16	66.5	54	45.5	34.5	41	34	10	6	42	24.5	46	31	39	27.5	66	45.5	72	62	73.5	61	76	56	63	59
17	61	47.5	36	30	46	35	28.5	11	24.5	16	51.5	32	36	29.5	54	44.5	64	56	69	56.5	78	61	69	58
18	68.5	51	33	28	37.5	34.5	40	20	28.5	14	55.5	45.5	48	31	45.5	40.5	73	57	78	57	75	64.5	75	58
19	51.5	40	30	24	38.5	31	42	28	40.5	22.5	54.5	36	54	33	50	42	68	54	82.5	66	80	53	80	62.5
20	41	34	26	21	34.5	21.5	29	14.5	41.5	34	38	30.5	61	38.5	51	45	73	55	77.5	67	78	72	68	56
21	43.5	38.5	30	19	28	19.5	47	22	41.5	31.5	40	30	39	34	59	44	78	52	72.5	56	81	61	62	48.5
22	57	43	37	26	29	18.5	62	39	34	28	39	26	45.5	34	56.5	43	73	60.5	78	58.5	70.5	57	66	46
23	62.5	45	38.5	23	34	18	48	25	42	26.5	29	15.5	47	23.5	63	45	72	65	79	57.5	72	50.5	70	51
24	48	36.5	39	29	35.5	24	33	14	29	19.5	25	15	43	28.5	73	51	72	60	83.5	61	72	49	72	61
25	50	36	31	18	36	30	15.5	11	31	19	41	23.5	44	31.5	66.5	50	75	56	82	69.5	74	50	76	56
26	56	33	21.5	15.5	38	30	34	10	27	12.5	40	24	43	31	53	41	68	57.5	79	72	73.5	50.5	80	55
27	54	39	27	19	35	31	38	34	29	22	32	21	37.5	30.5	62.5	47	74	57	74	63	77	58	71	62
28	42.5	29	29	16	29	24	41.5	21	34	25	32	24	37	29	71	55	83	64	60	57	79	50.5	64	54
29	35	29.5	27	17	31	19	34	19	.....	.....	36	19	36	29	74	60	81	65	74	58.5	79	53.5	64	54
30	41	21	23	16	29	14	21	3.5	.....	.....	34	25.5	38.5	28.5	74	57	66	53	72.5	57.5	77	58.5	55	44
31	47	29.5	.....	.....	35	21	13.5	3.5	.....	.....	29.5	19	.....	.....	69	58	.....	.....	73.5	66	79	60	.....	.....
Range	51°.5		38°		48°		62°		49°		46°.5		47°		50°		33°		31°		39°.5		40°	
Monthly means	48°.5		30°.6		31°.9		28°.1		25°.4		30°.3		34°.2		52°.4		64°.3		69°.4		67°.9		65°.5	

Maximum, minimum, and mean temperatures—Continued.

BURLINGTON, VT.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	60	37	45	35	7	— 6	36	28	— 2	—14	40	20	35.	7	40	29	62	49	82	52	73	64	74	50
2	55	43	48	35	34	— 6	38	28	11	—20.5	50	34	46	25	42	30	71	43	77	59	70	57	75	49
3	47	38	48	26	45	34	44	35	30	10	54	42	46	22	59	34	70	51	73	60	65	52	76	51
4	59	43	27	23	56	39	56	43	20	12	53	23	20	10	60	39	72	56	75	57	76	55	68	42
5	69	57	45	26	42	29	55	20	8	— 3	23	12	39	12	53	38	80	64	75	59	74	50	69	50
6	60	39	35	25	27	24	34	18	7	— 3	24	13	40	22	46	32	69	61	80	56	76	51	78	62
7	45	36	44	23	27	18	44	33	3	— 4	38	24	49	32	51	30	83	61	84	66	73	57	70	59
8	52	35	47	32	36	17	54	34	17.5	0	40	15	46	29	53	35	72	62	85	68	76	58	71	52
9	58	38	37	27	46	38	41	33.5	24	8.5	33	16	34	28	62	39	82	55	79	65	76	59	74	48
10	67	41	29	26	38	24	41	32.5	29	18	18	10	33	26	52	42	66	54	76	62	83	61	80	50
11	70	44	34	25	38	22	37	27	19	14	12	7	38	20	62	42	57	48	77	66	86	61	69	51
12	60	42	40	34	39	29	27	11.5	24	5	11	1	28	12	67	43	68	52	65	58	87	69	69	53
13	46	39	36	20	28	15	18	13.5	47	25	16	5	38	13	75	46	57	50	80	61	70	62	75	50
14	62	43	36	20	31	10	22.5	11	44	27	22	15	52	35	66	49	73	48	87	61	69	57	79	60
15	52	40	27	20	25	16	14	7	39	25	27	16	58	45	74	40	76	52	88	67	76	56	74	62
16	66	47	33	24	41	28	11	4	40	29	47	17	49	23	64	49	75	62	78	65	79	51	70	58
17	52	40	33	24	39	22	17	0	20	12	49	39	34	29	67	48	74	59	77	60	81	59	63	54
18	58	47	27	23	41	28	33	13	19	7	57	45	47	28	56	46	64	57	82	57	79	63	61	54
19	55	39	28	23	27	18	41	28	35	12	56	41	53	36	59	46	61	54	88	64	74	51	72	54
20	45	42	28	21	34	14	28	6	42	34	34	25	43	35	61	46	66	51	78	62	78	63	70	56
21	63	53	26	16	24	4	36	8.5	38	23	48	21	42	35	55	48	74	54	75	55	72	59	60	45
22	59	42	28	21	29.5	16	48	36	38	21.5	40	28	45	32	55	45	82	58	76	54	66	52	64	39
23	65	45	28	23	26.5	14	49	27	50	24.5	30	7	45	32	67	40	83	68	82	55	67	43	68	52
24	59	41	35	20	28	10	32	18	36	12	20	2	43	34	68	49	70	49	84	67	67	46	71	47
25	48	36	21	16	33	15	18	— 5	26	16	43	18	48	28	66	53	68	53	84	66	71	45	74	53
26	50	34	12	5.5	33	19	1	—14.5	30.5	17	47	34	35	30	59	52	70	51	84	67	73	52	75	56
27	56	43	16.5	8	28	18	33	2	27	16	37	17	44	33	72	50	84	47	76	60	74	50	77	52
28	52	37	17	9	29	17	19	10	30	11	36	23	41	30	86	55	89	61	65	59	77	51	72	55
29	46	32	24	7	30	26	18	4	.....	.....	31	15	38	28	73	54	87	73	70	61	77	57	64	52
30	37	27	14	1	19	7	— 5	—10	.....	.....	39	25	40	28	81	56	75	62	80	57	79	62	53	44
31	45	35	.....	.....	36	17.5	1	—12	.....	.....	21	13	.....	.....	86	62	.....	.....	76	60	79	52	.....	.....
Range	43°		47°		52°		70°.5		67°.5		56°		51°		56°		56°		36°		44°		41°	
Monthly means	48°.7		26°.8		25°.9		23°.1		19°.6		28°.6		34°.3		53°.6		64°.7		70°.4		66°.1		61°.9	

Maximum, minimum, and mean temperatures—Continued.

CAIRO, ILL.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	71	48	53	24	68	53	49	39	39	33	50	40	42	33	75	59	85	70	90	68	84	68	86	65
2	69	50	52	40	63	60	62	43	35	31	59	39	57	33	72	62	86	68	94	72	85	68	90	66
3	72	56	56	42	67	39	64	57	43	27	65	47	61	34	80	57	89	70	92	72	88	66	90	69
4	78	61	61	35	39	22	50	24	45	29	60	38	57	38	58	53	91	71	96	73	89	66	87	68
5	73	56	65	41	33	25	30	16	41	27	54	38	64	42	61	55	91	73	94	70	71	66	82	68
6	80	41	66	42	35	30	39	29	44	37	59	47	52	35	75	48	93	74	95	72	89	67	85	69
7	55	37	70	43	46	34	43	24	42	31	60	38	53	44	76	56	95	74	99	76	94	76	87	71
8	68	42	67	43	64	43	54	28	46	28	49	34	52	47	79	58	91	74	94	69	92	75	86	68
9	71	48	69	43	59	29	52	41	43	32	60	30	50	33	81	56	91	74	87	72	82	69	89	72
10	77	53	66	43	50	36	58	41	53	25	58	44	53	33	81	65	85	74	84	67	101	75	87	70
11	79	57	68	42	67	47	46	30	63	38	48	32	70	42	82	64	86	68	86	69	101	76	90	68
12	73	47	50	32	68	43	35	26	64	52	47	33	73	49	85	61	75	61	90	69	101	75	89	69
13	64	43	43	25	43	28	35	32	61	33	43	24	73	51	85	63	81	58	92	67	101	78	92	66
14	69	50	51	29	46	30	25	15	49	30	50	32	75	57	84	64	88	62	91	73	90	77	88	69
15	76	49	72	40	49	31	19	6	61	38	49	40	59	49	80	61	80	69	81	70	83	70	76	63
16	80	63	65	46	56	32	25	12	52	38	57	43	59	42	70	59	83	68	85	73	89	65	69	61
17	82	63	49	40	63	43	46	19	45	29	72	51	47	38	79	54	88	65	89	70	93	69	78	65
18	77	53	45	28	60	39	52	42	36	28	(*)	57	60	40	72	55	89	66	89	73	96	71	87	64
19	58	42	30	19	47	39	56	39	58	35	.....	45	67	53	71	55	91	68	93	73	93	70	76	61
20	54	37	43	18	36	25	62	36	51	47	.....	45	61	46	82	59	93	72	94	75	90	74	74	53
21	55	33	53	35	39	21	66	58	51	44	.....	45	61	43	72	55	94	69	92	76	84	73	75	51
22	66	49	51	35	29	26	65	48	45	40	.....	42	64	49	78	59	95	68	90	74	91	71	76	55
23	67	54	54	35	44	33	51	28	42	24	.....	37	55	42	89	64	91	67	92	76	81	72	82	55
24	50	30	51	36	45	30	37	28	41	23	.....	28	51	40	92	71	91	73	96	77	86	68	72	66
25	57	37	41	32	40	30	42	22	36	27	.....	34	62	42	85	72	91	72	95	76	84	67	81	68
26	60	47	59	29	39	34	50	30	48	25	71	46	65	42	90	67	93	76	95	76	88	71	76	65
27	53	34	53	33	34	24	53	40	46	34	47	34	78	54	89	70	94	77	86	75	77	71	75	60
28	40	28	37	27	38	21	48	34	44	37	50	29	68	40	83	72	94	77	82	65	77	72	66	50
29	46	24	47	22	39	26	56	33	.....	.....	54	38	58	38	80	69	85	72	85	64	87	72	76	51
30	56	39	54	36	39	19	59	37	.....	.....	61	44	69	47	85	71	90	73	89	66	79	68	75	57
31	45	27	.....	.....	42	26	38	31	.....	.....	54	44	.....	.....	90	70	.....	.....	89	68	81	67	.....	.....
Range	58°		54°		49°		60°		41°		48°		45°		44°		37°		35°		36°		41°	
Monthly means	53°.8		45°		40°.9		39°.3		40°.1		48°.4		52°		70°.2		79°.7		81°.3		78°.6		71°.9	

* Maximum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

CAPE HATTERAS, N. C.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1																							(*)	64
2																								66
3																								62
4																								65
5																								69
6																								69
7																								67
8																								72
9																								68
10																								70
11																								72
12																								69
13																								72
14																								72
15																								75
16																								72
17																								74
18																								72
19																								71
20																								71
21																								65
22																								64
23																								65
24																								67
25																								69
26																								67
27																								67
28																								70
29																								65
30																								61
31																								
Range																								
Monthly mean																							72°.5	

* Station opened September 1, 1874. No maximum on station.

Maximum, minimum, and mean temperatures—Continued.

CAPE HENRY, VA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	56	.....	42	34	46	39	44	39	78	41	84	65	79	74	92	69	80	61
2	.....	.....	.....	.....	.....	.....	60	.....	44	35	53	42	43	39	64	52	69	58	83.5	71	87	71	85	65
3	.....	.....	.....	.....	.....	.....	65	.....	38	34	60	44	58	35	53	44	69	57	83	72	75	69.5	87	65
4	.....	.....	.....	.....	.....	.....	65	.....	43	31	71	47	67	39	55.5	45	76	66	84	68	74	67	83	67
5	.....	.....	.....	.....	.....	.....	62	.....	43	31	48	39	51	36	55	47	87	66	88.5	71	78	67	76	66.5
6	.....	.....	.....	.....	.....	.....	55.5	.....	47.5	34	48	40	75	50	62	44	81	70	71	66	83	65	87	71
7	.....	.....	.....	.....	.....	.....	62	.....	48	31	70	46	76	48	61	43	94	71	73	65	78	68.5	85	68
8	.....	.....	.....	.....	.....	.....	52	.....	37	31	55.5	41	51	41	76	45	94	76	89	68	82	66	89	65.5
9	.....	.....	.....	.....	.....	.....	55	.....	37	32	47	40	56	44	85	58	98	78	91.5	73	84	67	74	66.5
10	.....	.....	.....	.....	.....	.....	55	44	39	31	55	38	60	44	82	58	97	72	93	75	90	69	73	67
11	.....	.....	.....	.....	.....	.....	57	41	50	35	52	38.5	60	41	83	50	81	71	89.5	75	85	69	83	63
12	.....	.....	.....	.....	.....	.....	44	36	48	38	49	35	50	32	84	50	90	74	84	71	80	70	89	64
13	.....	.....	.....	.....	.....	.....	43	37	65	40	38	30	47	37	69	50.5	81	68	87	71	84	73	84	68
14	.....	.....	.....	.....	.....	.....	42.5	34	64	41	45	30.5	68	41	69	57	70	62	87	72	82	71	76	72
15	.....	.....	.....	.....	*55	(†)	34	24	45.5	40	49	35	79	61	63	54	72	63	90	74	81	70	79	72
16	.....	.....	.....	.....	60	.....	28	16	64	37	47	39	62	45	78	62	78	65	93.5	72	75	69	76	70
17	.....	.....	.....	.....	56.5	.....	35	23	44	36	53	45	53	41	72	58	86	70	78	70	78	70.5	76	70
18	.....	.....	.....	.....	56	.....	52	33	37	32	62	48	52	41	75	58	89	67	79	67	84	68	80	71
19	.....	.....	.....	.....	61.5	.....	53	39	53	36.5	79	60	58	42	68	53	83	69	81	67	90	68	78.5	69
20	.....	.....	.....	.....	52	.....	51.5	40	62	40	71	42	76	54	71	51	79	64.5	82	67	93	73	80	68
21	.....	.....	.....	.....	46	.....	54	40	77	44	47	43	74	53	72	55	72	62	92	72	95	75	72	65
22	.....	.....	.....	.....	40	.....	74	48	77	56	65	44	52	46	69	54	85	62	77	68	92	74.5	70	64.5
23	.....	.....	.....	.....	45	.....	76	46	79.5	58	60	39	64	44	72	56	93	68	76	69	77	73	71	64
24	.....	.....	.....	.....	42	.....	48	38	62	36	39	31	53	46	70	59	95.5	74	77	68	75	68	72	65
25	.....	.....	.....	.....	42	.....	38	29	41	35	56	30	70	45	89	61	85	70	79.5	67	73	67	74	64
26	.....	.....	.....	.....	43	.....	36.5	25	40	33	56	49	60	44	80	60	93.5	74	82	70	71	65	81	58
27	.....	.....	.....	.....	45.5	.....	53	32	51	32	64	47	62	47	71	58	91	73	81	70	70	64	82	61
28	.....	.....	.....	.....	45	.....	62	43	43	37	63	45	77	50	74	54	87.5	72	81	69	70	64	74	64
29	.....	.....	.....	.....	52.5	.....	50	38	.....	.....	52	43	65	40	76	65	93	75	85	69	73	64	72	61
30	.....	.....	.....	.....	43	.....	55	40	.....	.....	58	42	62	43	70	61	90	74	80.5	69.5	72	60	74	54
31	.....	.....	.....	.....	44.5	.....	62	42	.....	.....	52	42.5	.....	.....	73	60	.....	.....	81	64	69	61	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	48°.5		49°		47°		48°		41°		29°.5		35°		35°	
Monthly means	.....	.....	.....	.....	42°.7		44°.9		42°.9		46°.7		51°.7		65°.5		76°.2		76°.5		73°.8		72°	

*Station opened December 15, 1873.

†Minimum thermometer not in position.

Maximum, minimum, and mean temperatures—Continued.

CAPE MAY, N. J.

Day of month.	1873.						1874.																	
	October		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1										22		36		33		47		60		66		65	78	61
2										25		40		35		46		52		66		67	76	59
3										32		42		40		38		52		65		60	79	67
4								*45		30		41		39		42		57		63		57	71	65
5								39		26		32		25		44		58		63		58	74	67
6								38		20		37		46		45		62		60		62	77	67
7								49		25		40		43		45		61		59		65	81	66
8								39		23		35		39		46		66		64		66	83	69
9								36		18		31		40		53		69		67		65	76	63
10								39		24		30		40		56		67		68		66	76	57
11								36		27		31		37		45		66		66		65	83	66
12								31		31		28		26		44		65		65		67	84	68
13								25		40		23		25		50		61		64		68	72	68
14								30		39		23		39		53		58		63		67	74	68
15								15		36		31		46		52		60		62		63	76	68
16								13		37		37		44		51		62		64		63	74	68
17								18		29		41		37		53		65		64		60	75	65
18								20		18		43		37		52		65		63		59	74	66
19								34		32		43		41		49		63		64		67	71	67
20								34		39		40		44		52		58		64		70	73	63
21								37		40		37		46		54		55		64		71	67	57
22								42		44		43		43		51		62		64		66	65	51
23								41		44		32		43		54		63		64		66	69	53
24								31		35		20		42		54		68		61		60	70	57
25								21		31		34		40		52		60		63		62	71	61
26								16		25		43		39		57		69		68	†70	53	76	63
27								34		32		41		40		52		66		67	70	52	74	63
28								37		28		41		43		55		65		67	70	54	71	64
29								32				35		36		56		67		66	71	52	73	59
30								32				40		35		56		68		65	71	58	65	55
31								32				40				55				63	73	59		
Range																							33°	
Monthly means	56°.1		42°.2		40°.6		38°.1		35°.7		40°.7		44°.4		56°		68°.5		69°.2		68°.8		68°.6	

* Station supplied with minimum thermometer January 4, 1874.

† Station supplied with maximum thermometer August 26, 1874.

Maximum, minimum, and mean temperatures—Continued.

CAPE ROSIERE, CANADA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	45.9	31.4	.....	.....	15	6.3	20	4.3	−4	−13.5	12.5	−8	19	8	33	30	46	34	47	43.1	58	54.9	59	49.9
2	47	33.1	.....	.....	13.5	5.3	27.5	18.5	−6.5	−14.7	13.5	8	28	17.5	34	29	46.5	39.1	52	44.1	60	54.9	53	49.9
3	41.6	30.3	.....	.....	47.5	23	28	18	0	−10.5	35	13	28	24	45.5	30	49	40.1	48	43.6	55	51.9	58	45.1
4	43	29	.....	.....	45.5	31.5	44.5	30	7	0	41.5	29.7	28	5.5	42.5	30	55.5	44.1	52.5	43.1	58	51.9	56	44.1
5	50	38.9	.....	.....	34	18.5	37	11	8	2	30	15	28	2	33.5	27.2	53	50.9	49	43.6	56.5	46.9	63	50.9
6	62	46.6	.....	.....	18.5	8	16.5	6.3	3	0	16.5	9.3	27	20	33	24.7	63.5	46.5	53	45.1	55.5	46.1	65	45.9
7	51.3	40.1	.....	.....	16.5	6.3	34.5	24	4.5	−2.5	21.5	15.5	31	24	32.5	22.7	51	46	63.5	51.9	62	51.9	58	53.9
8	51.3	36	.....	.....	27.5	11.5	30.5	22.3	21.5	2.3	34	16.7	31	23.5	36	21.7	46	41	63	52.4	60	57.4	57	45.1
9	(*)	.....	38	33	31.5	21.7	32.5	16	23	19	34	32	30.8	16	36	30.7	43	39.1	71	55.9	63	54.9	56	46.1
10	.....	.....	35	26.7	26.5	9	33.5	24	21.5	15	32	30.5	23.5	14	38.5	31.7	47	37.1	63	54.4	62.5	56.9	57	47.9
11	.....	.....	29	22.6	28	10.5	34.5	26.7	21	16	31.5	28	26	19	47	26.7	50	41.1	60	52.9	70	56.9	55	46.9
12	.....	.....	32	20.7	27.5	11	30.5	17.5	18	14	29	24.3	27	17	47	36	44.5	35	62.5	49.9	75	54.9	54	46.9
13	.....	.....	44	27.2	25	11	13.5	3.5	28.5	4.8	37.5	25.3	24	16.5	45.5	33	41	38	57.5	49.4	62	48.9	55	41.1
14	.....	.....	28	17.3	15	6.5	13	−1.8	38	25.7	38	30	36	23	49	39.1	50	37	65	52.9	66	48.9	56	46.9
15	.....	.....	29.5	18.5	12.5	1.3	22	9	26	16	32	26.5	42	30	44	35	55.5	44	72	61.9	62	47.9	59	46.4
16	.....	.....	24.5	16	21	0.3	12.9	4.3	25	21	30	24	33	23.7	45	34	56.5	46	71	56.9	62	50.9	59	51.9
17	.....	.....	25	15	31	19	16	5.8	25.5	15	37	27	33	23	47	36	46	44	60	51.9	68	51.9	52	39
18	.....	.....	39	17	34.5	26.9	25	6.3	21	13	31	28	31.5	24.7	47	33	45	42	62	49.9	65	53.9	50.1	40.1
19	.....	.....	34	22.7	26	16.5	30.5	23.7	27.5	16	38.5	30.5	42.5	26.7	42	34	43	40	72	59.9	63	53.9	55	46.9
20	.....	.....	27	20.7	27	15.5	30	2.8	32	27	39	13.5	30	23.2	45.5	36	53.3	39.9	71	55.9	65	56.9	.....	.....
21	.....	.....	27.5	19.7	16.5	3.3	15	−3.2	28	17	22	11	30.5	26.7	46	36	55	42	58	50.9	64	46.1	.....	.....
22	.....	.....	27	14	15	1	31.5	16	18.5	11	18.5	13.5	29.5	24.7	45	39.1	56	40	62	49.9	55	45.1	.....	.....
23	.....	.....	27	14.5	16.5	3.3	38	29.2	17	10	18	13	32.5	22.7	46	36	61	52.9	67	53.9	59	47.9	.....	.....
24	.....	.....	33	13	29.5	17	11	1.3	14	7	14.5	4.3	37	25.7	45.5	35	57	46	71	57.9	59	45.1	.....	.....
25	.....	.....	30	19	15.5	4	9	−3.2	10.5	5.7	24.5	3.3	34	29	44.5	37	46	41	76	55.4	61	45.1	.....	.....
26	.....	.....	35	26.7	13.9	1.3	0	−14.7	11	6.3	25	16	31.5	28.7	44	39.1	55	43	71	65.9	59	47.9	.....	.....
27	.....	.....	31	23.7	14.5	4.3	−1	−13	17	3.7	25.5	12.5	36.5	27.7	45.5	36.1	59	45	68.5	55.4	59	47.9	.....	.....
28	.....	.....	27.5	20.7	23.5	9	14	−2.2	4.5	−6.7	19.5	12	36	29.7	52	41.1	59	46.6	59	54.9	64	52.9	.....	.....
29	.....	.....	26	13.5	23	12.5	12	2.5	.....	.....	19	8	35.5	31	45	39.1	61	47.1	59.5	53.9	65	54.9	.....	.....
30	.....	.....	15.5	5.3	21	4.3	3	−5	.....	.....	13.5	8.5	37.5	31	43.5	35	49	44	58	53.4	59	55	.....	.....
31	.....	.....	.....	.....	11.5	2.3	−3	−5.5	.....	.....	13	10.3	.....	.....	37.5	34	.....	.....	59.5	53.9	67	51.9	.....	.....
Range	.....	.....	.....	.....	47°.2		59°.2		52°.7		49°.5		40°.5		30°.3		29°.5		32°.9		29.9		.....	.....
Monthly means	.....	.....	.....	.....	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....

* Observer absent from October 9 until November 9, 1873.

Maximum, minimum, and mean temperatures—Continued.

CHARLESTON, S. C.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	56	37	60	41	54	51	77	65	75	57	91	74	85	77	88	74	77	70
2	.....	.....	.....	.....	.....	.....	62	47	52	45	63	40	68	52	78	61	86	72	89	75	91	78	80	69
3	.....	.....	.....	.....	.....	.....	62	54	50	40	66	50	65	47	79	64	88	70	84	70	83	73	81	71
4	.....	.....	.....	.....	.....	.....	63	54	52	40	75	53	72	52	67	60	84	76	86	74	83	73	81	69
5	.....	.....	.....	.....	.....	.....	63	58	52	35	63	50	65	58	66	55	84	74	92	74	80	68	81	71
6	.....	.....	.....	.....	.....	.....	66	57	60	44	70	50	75	62	71	51	85	76	82	73	81	73	81	70
7	.....	.....	.....	.....	.....	.....	64	40	57	46	74	62	76	65	73	55	86	77	82	71	85	73	83	71
8	.....	.....	.....	.....	.....	.....	49	36	48	36	63	47	77	65	78	62	90	78	85	73	83	73	85	71
9	.....	.....	.....	.....	.....	.....	54	36	50	35	64	43	74	69	77	65	91	77	86	77	84	71	85	71
10	.....	.....	.....	.....	.....	.....	60	47	54	35	69	49	69	55	75	62	91	77	87	74	89	72	77	66
11	.....	.....	.....	.....	.....	.....	64	45	58	35	60	47	62	45	75	64	87	77	84	74	91	71	77	69
12	.....	.....	.....	.....	.....	.....	54	46	58	43	56	41	63	50	70	64	90	77	86	70	90	78	79	70
13	.....	.....	.....	.....	.....	.....	54	43	68	51	54	44	60	50	75	65	80	72	85	69	87	73	80	71
14	.....	.....	.....	.....	.....	.....	55	43	63	52	53	37	73	59	72	64	79	71	85	75	84	73	78	68
15	.....	.....	.....	.....	.....	.....	45	34	56	44	55	46	76	64	79	65	80	69	87	76	85	71	84	75
16	.....	.....	.....	.....	.....	.....	38	27	65	45	65	51	79	66	85	65	85	74	90	75	90	59	85	75
17	.....	.....	.....	.....	.....	.....	41	28	57	42	71	60	76	68	85	65	88	77	91	77	75	52	87	73
18	.....	.....	.....	.....	.....	.....	61	38	47	38	74	60	68	58	84	67	87	74	86	79	88	50	84	75
19	.....	.....	.....	.....	.....	.....	60	43	56	37	77	63	77	61	73	64	91	70	80	73	89	58	83	78
20	.....	.....	.....	.....	.....	.....	65	48	68	43	76	60	77	68	82	66	87	76	82	71	82	58	84	75
21	.....	.....	.....	.....	.....	.....	60	49	72	54	78	61	82	66	86	69	83	74	86	77	81	57	77	70
22	.....	.....	.....	.....	.....	.....	68	54	70	57	80	62	77	65	74	65	85	75	90	73	88	48	77	66
23	.....	.....	.....	.....	.....	.....	69	59	76	60	69	59	79	66	77	65	89	75	81	73	92	74	79	66.5
24	.....	.....	.....	.....	.....	.....	64	48	64	41	61	48	81	67	86	68	92	74	81	71	89	74	80	68.5
25	.....	.....	.....	.....	.....	.....	51	36	46	40	61	48	78	59	87	73	95	77	82	72	80	71	80	71
26	.....	.....	.....	.....	.....	.....	46	33	49	38	65	58	78	54	92	74	96	80	84	72	81	68	79	71
27	.....	.....	.....	.....	.....	.....	60	38	65	44	68	55	71	55	88	72	90	74	80	72	77	65	79	72
28	.....	.....	.....	.....	*55	31	66	50	64	44	81	60	76	63	80	70	89	73	81	73	74	66	76	63
29	.....	.....	.....	.....	51	33	53	40	.....	.....	74	62	63	49	88	70	86	77	81	71	73	63	75	57
30	.....	.....	.....	.....	50	33	56	37	.....	.....	74	61	67	46	93	72	89	78	79	71	78	69	76	58
31	.....	.....	.....	.....	45	23	64	45	.....	.....	79	62	.....	.....	83	69	.....	.....	82	74	79	71	.....	.....
Range	.....	.....	.....	.....	.....	.....	42°		41°		44°		37°		42°		27°		23°		44°		30°	
Monthly means	.....	.....	.....	.....	51°.4		52°.1		51°.5		59°.9		67°.7		71°.4		81°		79°.3		79°.1		75°.8	

* Station supplied with self-registering maximum and minimum thermometers December 28, 1873.

Maximum, minimum, and mean temperatures—Continued.

CHARLOTTETOWN, PRINCE EDWARD'S ISLAND.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	in.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77.5	49.6	76.8	59.9
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79.4	56.6	65.9	50.5
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	54	63.7	55.1
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71.5	41.5	70.9	50.3
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58.3	48.4	75	48	69.7	52.2
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59.7	50.1	65	51.2	75.1	53.3
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	64	52.8	79.5	54	70.1	54.3
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73.2	53.2	75	57	64.5	54.2
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	76.4	56.1	75	58	57.0	47.3
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75.7	57	73	61	70.3	52.6
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80.6	62.2	78	62	67.7	48.7
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	58	80	61	55.2	48.9
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	55	84	55	52.6	43.5
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	55	66	54	62.6	48.2
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	61	64	55	70.2	48.2
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	65	*61.1	51.5	71.3	56.6
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	55	68.6	52	68	55.2
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	61	79.9	59.1	58.4	50
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	59.1	84	56.3	56.8	50
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81.9	61.3	76.4	59	60.3	52.1
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73.9	51.2	65	57.1	74.3	59.3
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70.9	51.2	74.2	50.2	72.7	49.2
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70.9	53.9	69.3	48.7	59.9	42.1
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75.3	58.3	72.3	52.7	70.3	45.1
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	60.6	67.3	46.7	71.5	49.4
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	60.5	67	59	74	48
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81.6	57.1	67.3	50	.....	.....
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83.7	61.3	67.8	48.6	.....	.....
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78.5	62.5	73	54.5	.....	.....
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	59	80.2	60.5	.....	.....
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77.5	49.8	77	58.7	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42°.5		.....	.....
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Observations taken at 8 a. m. from August 16, 1874.

Maximum, minimum, and mean temperatures—Continued.

CHATHAM, NEW BRUNSWICK.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	53.3	29.7	47.8	32.9	9.2	— 5.5	31.4	2.5	1	—12	23.2	—22	29.4	2.6	37.3	29.7	45.3	38.9	56.3	45.1	66.3	58.7	63.3	52.1
2	54.3	33.6	48.3	31.7	13.4	—16.3	33.9	25.2	7	—23	35.3	11.5	39.3	4.6	37.3	30.7	61.3	34.9	60.3	46.1	78.3	58.2	64.3	51.1
3	45.8	28.1	49.3	30.1	40.9	5.6	39.3	21.7	14	—26	51.3	9.6	38.3	16.7	54.3	31.7	77.3	39.9	58.3	51.1	69.3	51.9	71.3	48.1
4	50.3	21.7	38.3	18.7	54.3	38.9	48.1	33.1	25	10	52.3	38.1	31.4	10	56.3	31.7	63.3	55.1	65.3	50.1	71.3	48.1	68.3	42.1
5	60.3	44.1	42.8	15.1	46.3	20.2	51.3	15.3	12	— 5	46.3	17.3	34.4	7.6	53.3	29.7	74.3	55.1	58.8	48.6	68.3	50.6	77.3	45.9
6	67.3	50.6	30.4	12.6	24.4	9.1	18.3	5.8	0	—12	27.3	10.6	32.4	20.7	51.3	23.7	74.3	48.6	77.3	46.1	61.3	49.1	73.3	47.1
7	53.3	43.6	36.3	21.7	22.4	3.6	32.7	18.3	10	—15	36.3	9.6	44.3	12.6	55.3	24.7	64.3	48.1	76.3	57.7	79.3	50.1	69.1	58.8
8	58.3	39.1	39.3	20.7	25.4	5.6	48.1	28.7	20.4	— 9.5	33.6	21.7	45.3	24.7	51.3	28.7	59.3	43.4	81.3	53.6	66.3	57.7	61.3	51.2
9	55.3	33.6	41.3	32.1	39.7	16.2	48.1	28.2	33.4	10.5	33.6	27.7	34.4	23.7	56.3	27.7	49.3	40.5	75.3	56.1	71.3	57.7	73.3	44.1
10	64.3	30.7	33.4	25.1	34.4	7.6	35.1	25.7	32.4	4.6	39.3	20.7	27.4	21.2	51.3	29.7	54.3	36.9	84.3	53.1	66.5	62.8	72.3	51.1
11	71.7	33.4	28.4	19.4	22.4	5.6	37.3	26.3	24.4	16.8	48.3	13.6	37.3	12.6	61.3	28.7	64.3	40.9	83.3	62.2	86.3	55.6	61.3	43.1
12	55.3	38.9	35.1	13.6	35.3	14.6	32.4	15.3	23.4	1	34.4	17.8	29.4	16.3	69.3	32.7	58.3	34.9	70.3	53.6	84.3	62.7	59.3	41.8
13	53.3	33.1	45.3	30.3	21.4	1.6	18.9	6.3	42.6	— 6	32.1	13.6	40.3	12.6	77.3	41.1	59.3	45.1	74.3	49.1	68.6	54.7	70.3	35.5
14	45.8	31.7	31.4	20.2	16.4	8.8	16.3	1.0	49.3	26.2	38.3	25.2	56.3	26.7	62.3	43.1	70.3	39.9	84.3	65	67.3	51.6	74.3	43.6
15	51.3	31.7	23.9	16.7	9.4	— 3.6	20.4	0	36.3	15.7	47.3	21.7	63.3	30.7	63.3	31.7	74.3	47.6	85.3	59.2	73.3	54.1	74.3	54.1
16	56.3	27.7	25.9	19.7	22.7	— 5.5	10.4	— 3.1	27.4	21.7	53.3	19.7	46.3	31.6	65.3	32.7	74.3	41.1	84.5	64.7	74.3	48.6	69.3	55.1
17	49.3	28.1	30.4	19.7	37.3	15.8	20.4	— 6.5	31.4	15	57.3	24.7	43.3	24.7	56.3	40.2	58.3	51.1	76.3	58.6	79.3	47.3	38.8	47.1
18	53.3	22.7	46.8	22.7	30.4	15.8	30.4	— 4.5	28.4	9.4	41.7	26.7	49.3	26.7	71.3	37.9	55.3	47.1	83.8	52.1	65.3	58.2	56.3	44.1
19	64.3	43.1	40.3	26.6	33.9	17.7	44.3	19.7	36.3	— 2.6	52.3	32.9	50.3	25.7	58.3	42.1	47.3	43.1	84.3	58.2	75.3	51.1	59.3	50
20	65.8	44.1	27.3	19.1	21.4	7.2	33.9	2.5	36.3	27.7	41.6	17.3	48	27.7	72.3	39.9	51.5	43.1	76.3	60	61.3	54.1	73.3	56.2
21	56.3	50.1	32.4	15.7	11.4	— 2	17.8	— 7.1	31.4	9.6	35.3	11.6	32.4	27.2	65.3	35.9	63.3	46.1	77.1	52.1	72.8	51.3	67.1	49.1
22	59.3	46.1	24.4	13.6	19.8	— 4.5	36.1	17.7	34.3	15	32.3	16.1	39.3	23.7	50.3	44.1	82.3	51.2	77.3	53.1	68.3	45.1	64.3	40.1
23	63.3	35.9	21.4	5.8	29.4	14.6	43.3	34.9	17.4	12.4	30.4	8.6	47.2	22.5	55.3	37.9	82.3	61.1	79.3	48.1	68.5	44.1	69.3	35.9
24	61.3	38.7	24.5	1.6	28.4	2	40.6	9.8	21.4	— 1	14.4	2.5	46.3	23.7	57.3	34.4	61.1	49.6	85.3	55.1	69.8	42.6	71.3	43.6
25	53.7	36.1	32.4	24.5	8.3	—10.8	12.9	— 4.1	20.4	— 9.6	32.3	0.6	49.3	25.7	60	30.2	52.3	41.1	88.3	58.2	72.9	42.6	73.8	40.4
26	47.3	26.7	27.4	12.5	18.4	8.3	—4.1	—19.3	22.4	— 2.5	32.4	24.7	33.4	27.2	72.3	46.9	68.3	46.1	83.3	57.2	73.3	45.1	69.3	48.9
27	59.3	33.9	26.4	13.6	29.4	12.6	1.0	—21.8	29.4	— 0.5	30.4	12	46.3	27.2	72.3	51.9	82.3	43.1	84.3	56.2	75.3	42.1	.....	.....
28	54.3	41.1	28.4	12	25.7	13.6	15	1	16.4	—11.3	34.3	4.6	49.3	30.2	84.3	52.1	61.8	52.6	65.3	59	80.1	44.1	.....	.....
29	45.3	33.9	16.4	8.8	26.4	5.5	19.4	3.5	.....	.....	24.4	6.6	45.3	28.7	69.3	43.6	69.3	46.1	64.3	58.2	65.3	49.6	.....	.....
30	45.3	28.9	9.4	—2	18.4	— 1.6	7.3	—14.1	.....	.....	37.3	5.6	54.3	31.1	62.3	35.9	55.3	46.1	71.3	56.1	71.1	59.2	.....	.....
31	42.3	27.7	.....	.....	31.4	2.5	1.5	—33.3	.....	.....	26.2	5.3	.....	.....	58.3	44.3	.....	.....	82.3	52.6	75.3	58	.....	.....
Range	50°		51°.3		70°.6		84°.6		75°.3		79°.3		61°.2		60°.6		47°.4		43°.2		.....		.....	
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

CHEYENNE, W. T.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	67	30	51	24	46	26	51	27	33	6	53	23	36	13	72	35	63	44	94	54	77	52	70	44
2	72	38	50	27	39	− 7	51	32	32	15	55	27	50	21	47	33	72	46	96	56	84	50	39	33
3	75	46	60	27	16	− 9	39	4	31	5	35	23	50	33	46	28	79	46	96	50	89	49	49	32
4	79	43	56	37	30	10	28	7	24	7	32	13	45	25	64	23	74	49	98	48	88	60	71	44
5	63	35	56	28	32	8	39	11	27	12	32	4	51	25	71	32	78	48	89	59	82	61	78	45
6	75	37	62	35	35	13	47	13	40	16	25	− 3	35	20	79	34	76	49	91	54	77	54	82	48
7	80	45	58	31	38	10	50	29	47	21	36	5	37	24	84	40	84	49	91	54	85	52	85	48
8	64	41	62	37	38	23	44	35	34	9	43	7	45	30	80	40	76	47	90	54	90	53	82	46
9	70	39	65	32	39	10	47	33	37	15	44	22	53	30	64	39	61	49	91	52	87	52	83	49
10	71	38	60	32	38	13	48	25	52	32	38	20	68	33	50	29	57	38	91	50	84	56	70	41
11	66	32	44	24	34	15	27	22	52	29	49	24	66	30	58	33	67	34	92	51	85	49	64	43
12	76	38	57	14	24	10	53	19	30	13	53	27	53	35	50	36	80	42	91	63	93	44	64	32
13	62	35	64	33	49	17	30	9	40	12	56	24	49	32	65	40	65	45	93	62	83	54	69	48
14	72	31	62	30	49	13	36	5	47	19	45	21	46	22	63	42	58	44	86	63	91	51	61	34
15	42	29	60	35	50	27	55	29	43	23	48	13	46	25	70	30	72	40	86	52	90	54	78	35
16	45	28	62	35	42	24	57	36	45	12	48	26	36	15	76	34	85	44	91	47	90	59	73	42
17	42	27	50	24	41	20	49	31	48	22	32	21	45	15	79	43	91	54	88	53	75	52	66	36
18	41	25	39	13	35	18	39	19	46	19	32	− 3	55	19	81	42	85	52	83	60	88	56	48	33
19	60	24	55	22	29	20	46	18	36	18	33	7	51	25	77	44	92	51	68	50	89	58	60	29
20	67	38	48	23	34	15	41	5	34	9	43	15	36	25	80	45	96	55	78	55	82	38	53	36
21	62	20	49	23	46	14	22	7	15	1	37	18	35	20	76	46	95	65	80	58	81	57	69	37
22	27	13	49	19	40	12	27	− 4	12	−12	47	15	35	9	79	50	93	60	83	57	88	48	64	36
23	42	15	47	18	32	18	16	4	10	− 8	44	24	42	12	88	49	94	59	84	56	87	50	70	37
24	16	8	55	15	45	16	41	5	8	−24	53	26	57	28	79	49	89	58	86	62	85	49	77	34
25	23	5	56	30	48	27	49	10	28	−10	48	25	65	32	88	60	91	49	79	52	77	60	75	40
26	32	5	57	18	30	18	51	19	36	15	43	16	65	37	85	49	90	52	55	47	79	53	68	37
27	37	22	27	5	50	13	39	25	44	10	49	26	64	32	88	53	74	55	81	51	78	55	76	31
28	50	26	46	5	52	25	47	25	48	27	35	18	70	33	81	52	75	42	83	54	77	48	80	39
29	50	34	58	37	37	21	45	28	.....	.....	42	19	73	40	69	45	83	50	91	58	84	45	81	42
30	41	25	56	30	53	20	37	16	.....	.....	30	13	80	45	56	43	84	42	90	61	78	50	81	36
31	51	24	.....	.....	50	31	30	21	.....	.....	31	8	.....	.....	57	48	.....	.....	76	56	83	52	.....	.....
Range	75°		59°		62°		61°		76°		58°		71°		65°		62°		51°		49°		56°	
Monthly means	42°.5		40°.1		27°.6		30°.4		22°.9		28°.9		39°		56°.6		65°.2		71°.8		68°.6		54°.2	

Maximum, minimum, and mean temperatures—Continued.

CHICAGO, ILL.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	55	43	44	25	43	34	43	35	26	20	48	39	41	22	44	38	61	46	87	69	75	68	77	67
2	64	50	48	37	57	43	46	40	30	25	58	41	43	32	44	40	60	47	73	62	68	64	84	66
3	65	54	44	28	60	35	60	46	33	25	53	31	32	23	46	41	71	59	94	61	69	64	76	61
4	56	48	59	38	24	17	36	16	32	19	31	25	37	23	44	41	87	63	92	66	70	63	67	62
5	57	45	39	37	28	13	30	14	33	15	47	31	32	24	51	40	72	57	78	64	73	66	72	59
6	47	39	48	35	37	13	32	16	36	28	51	39	46	25	46	40	63	55	99	72	73	67	84	62
7	61	35	56	41	37	23	37	23	33	29	48	29	40	31	70	42	82	63	97	70	74	68	89	67
8	69	45	49	40	47	33	41	25	36	31	37	18	45	30	81	55	90	64	82	70	74	64	84	70
9	75	50	42	35	39	30	36	27	25	11	31	21	33	27	79	60	75	54	75	70	85	66	81	70
10	70	57	44	36	36	27	38	21	36	20	35	27	54	29	80	64	64	50	81	69	80	66	82	70
11	67	51	44	36	45	35	23	14	40	21	36	22	36	32	72	61	66	57	70	64	98	75	82	70
12	53	43	30	24	38	36	29	10	56	39	29	17	46	29	69	61	62	50	69	63	87	76	87	68
13	68	44	30	14	30	20	34	22	37	29	30	17	67	41	66	51	70	57	84	62	81	66	75	69
14	61	52	34	15	31	17	12	0	47	29	43	23	62	45	54	46	69	61	93	71	70	69	73	65
15	75	53	57	29	44	28	10	— 6	47	35	46	36	45	35	56	45	78	63	87	70	75	65	65	54
16	67	56	52	32	46	29	30	5	35	26	49	36	37	32	55	45	68	65	75	62	82	67	64	59
17	68	56	47	37	47	37	43	22	33	27	64	42	42	35	55	43	86	59	81	60	91	70	70	63
18	59	45	38	23	38	34	38	36	39	27	58	39	60	36	51	39	78	71	89	68	75	71	74	64
19	49	37	23	15	36	24	34	30	44	37	45	34	42	34	62	50	83	71	92	77	93	72	71	55
20	48	36	31	11	22	18	39	32	36	31	53	33	49	35	56	47	83	68	80	66	74	72	64	44
21	51	36	38	30	25	16	42	39	36	33	46	35	52	35	56	44	82	71	74	65	91	69	68	51
22	65	38	43	25	37	24	37	34	38	34	48	32	51	40	66	44	90	71	80	65	71	65	72	56
23	47	28	37	34	39	23	31	22	29	17	34	20	43	30	71	57	94	73	86	72	70	64	74	58
24	57	36	38	30	41	33	14	5	22	9	37	17	42	30	78	60	88	75	89	72	69	58	72	62
25	52	44	33	30	38	33	25	8	26	16	48	30	50	38	74	60	89	71	98	76	77	65	76	67
26	58	41	42	29	37	33	42	25	41	15	45	30	43	37	61	55	82	71	88	69	75	67	77	60
27	49	33	33	25	31	23	43	37	40	18	41	23	41	35	87	56	95	71	69	63	76	64	63	53
28	40	26	18	8	31	18	35	24	51	30	38	25	39	35	81	68	93	75	72	62	83	69	60	50
29	38	24	32	12	24	15	36	29	.....	.....	44	23	46	34	88	63	82	63	78	60	78	66	66	51
30	46	28	35	29	37	13	24	22	.....	.....	50	33	59	35	89	72	81	62	87	65	71	68	59	44
31	31	23	.....	.....	37	22	25	22	.....	.....	37	27	.....	.....	80	62	.....	.....	86	70	69	65	.....	.....
Range	52°		51°		47°		66°		47°		47°		45°		51°		49°		39°		40°		45°	
Monthly means	49°.1		34°.4		32°.4		29°.1		31°.5		36°.3		38°.7		58°.5		70°.2		74°.7		71°.9		66°.8	

Maximum, minimum, and mean temperatures—Continued.

CINCINNATI, OHIO.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	65	46	49	27	58	38	45	41	37	24	54	35	39	26	77	55	80	63	89	68	85	70	86	64
2	70	50	58	35	68	51	54	41	39	33	56	36	53	32	64	54	75	60	89	69	82	64	88	62
3	75	51	52	40	68	57	64	53	47	30	62	43	55	33	61	48	86	66	91	68	81.5	66	88	67
4	69	58	60	36	59	31	64	30	35	31	57	40	51	28	62	44	93	71	98.5	68	82	64	86	66
5	73	51	58	40	38	29	37	27	39	31	54	35	58	32	66	43	94	68	93	77	81	63	81	72
6	59	42	56	36	40	27	37	30	39	31	62	45	50	33	69	45	90	74	98	69	83	67	86	69
7	57	35	57	42	42	35	34	30	38	30	58	41	57	41	72	46	96	74	103	73	85	72	88	66
8	66	41	56	46	61	41	41	28	35	28	42	30	53	44	82	55	98	78	94.5	76	85	68	88	69
9	72	44	52	40	58	40	46	38	35	23	46	29	50	32	83	60	96	78	94	77	92	66	92	68
10	78	51	48	35	46	37	46	32	46	22	50	35	51	30	88	59	94	73	82	73	86	69	86	67
11	68	56	53	37	63	45	37	27	54	34	41	25	60	33	87	60	88	72	77	69	96	75	89	62
12	59	43	53	30	62	59	30	20	60	45	40	27	52	28	88	63	76	60	79.5	64	96	76	89	63
13	65	40	40	27	59	34	38	28	59	40	34	23	70	39	85	68	78	56	89	66	97	74	92	64
14	71	48	42	28	41	28	30	16	50	34	41	23	75	53	84	63	85	60	94	71	86	70	86	68
15	74	49	62	25	49	32	16	6	59	36	48	35	66	49	85	63	89	68	90	77	82	66	85	69
16	76	54	59	46	52	35	21	7	48	36	57	40	51	38	70	58	89	68	85	70	90	63	71	64
17	77	63	48	41	56	35	37	14	36	27	70	50	48	37	65	54	89	65	86.5	65	92	66	76	63
18	69	51	43	34	53	37	44	24	42	26	67	56	62	39	64	46	92	65	92	65	92	69	83	66
19	55	47	34	22	50	36	50	39	55	38	65	42	58	49	73	44	94	68	95	69	95	71	81	62
20	51	37	34	14	36	28	46	36	56	41	52	39	68	50	76	45	93	69	88	74	95	69	71	53
21	51	37	46	30	34	26	68	45	54	43	61	41	60	39	72	47	95	72	79	69	91	75	69	49.5
22	69	43	48	27	39	30	69	54	47	40	57	37	60	48	73	49	95	71	83	66	81	75	75	51
23	66	39	50	40	44	28	55	33	49	25	50	31	56	42	66	58	97	72	89.5	67	82	72	80	53
24	52	35	52	37	45	32	35	23	45	23	40	19	53	34	86	59	97	77	93	69	81	63	80	61
25	60	35	40	34	45	32	35	18	33	25	58	28	56	45	84	71	93	72	89	72	82	63	82	64
26	61	43	45	32	40	36	50	26	41	15	64	49	61	45	85	63	88	68	96	77	81.5	61	79	66
27	58	42	50	35	35	30	55	40	45	32	49	32	60	45	88	58	95	71	84	66	83	68	73	60
28	44	32	36	28	32	26	50	34	47	33	48	28	50	39	91	58	98.5	77	78	61	74	67	67	55
29	44	27	38	23	38	22	50	34	.....	.....	52	35	53	31	91	61	87	73	82	64	78	67	73	50
30	51	38	39	27	33	16	57	39	.....	.....	57	39	71	40	94	73	88	68	84	61	84	67	63	49
31	49	27	.....	.....	41	20	47	26	.....	.....	50	29	.....	.....	92	71	.....	.....	89	67	86	62	.....	.....
Range	51°		48°		52°		63°		45°		51°		49°		50°		42°.5		42°		36°		43°	
Monthly means	53°.3		40°.9		40°.6		37°.3		39°		44°.3		48°.3		67°.9		79°.6		79°.3		77°.4		71°.9	

Maximum, minimum, and mean temperatures—Continued.

CLEVELAND, OHIO.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	62	43	49	34	36	27	50	41	24	15	50	34	33	24	52	39	62	53	79	52	77	67	73	42
2	61	40	57	37	57	40	50	40	35	17	54	32	46	27	50	41	67	44	76	64	71	65	77	57
3	71	50	48	33	65	54	65	45	28	22	63	40	40	26	53	38	77	59	76	58	71	52	69.8	60
4	62	57	59	33	55	28	66	32	31	21	40	31	30	22	55	43	86	68	85	64	71	51	68	57
5	65	54	50	34	32	26	37	29	31	22	38	26	43	20	56	41	79	68	77	63	73	49	77	62
6	60	43	44	29	31	25	40	32	28	23	46	35	42	30	56	41	80	67	88	58	78	59	73	57
7	66	43	60	36	41	28	40	31	26	23	49	33	46	35	57	36	90	69	95	74	79	63	79	61.6
8	64	46	56	44	59	35	40	30	29	21	35	26	43	35	76	50	77	65	84	73	77	66	83.5	68.5
9	66	43	49	34	56	38	40	30	30	14	31	24	38	31	83	62	82	62	82	71	79	60	80	63
10	79	51	36	33	45	35	30	27	38	13	35	25	45	32	82	64	74	61	79	69	80	62	76.5	58
11	67	56	43	34	60	35	33	24	36	25	31	20	46	26	73	56	84	61	72	67	91	66	81.5	59
12	59	48	46	30	53	39	28	22	55	17	28	19	44	21	86	59	66	54	70	60	88	74	83	58
13	59	43	30	26	46	30	31	20	56	33	25	15	61	32	78	59	66	50	80	54	75	66	84.5	61
14	65	53	34	23	46	30	28	15	36	29	33	25	72	52	61	49	70	49	27	67	75	62	87	68.5
15	74	43	56	30	54	32	14	11	53	31	45	26	59	35	79	46	82	57	88	71	75	55	80	72.5
16	75	54	46	36	54	32	19	8	48	27	44	36	44	32	68	52	76	66	75	64	76.2	53	66	63
17	70	60	46	39	56	34	30	8	27	22	67	43	40	34	61	48	74	60	73	56	84	59	74	59.5
18	66	51	44	36	48	36	41	24	41	17	61	51	52	33	56	52	78	64	78	59	77	62	75	61
19	50	48	41	27	42	35	45	32	44	34	59	36.5	48	37	61	43	77	57	91	63	89.5	57.2	82	64.5
20	51	39	36	19	32	30	37	28	44	35	43	34	71	40	58	48	76	59	78	65	89.5	75	67	51.5
21	45	36	41	24	36	27	57	35	38	33	51	36	52	36	60	46	77	62	73	62	89.2	70.6	66	47
22	61	41	42	27	37	12	70	37	38	32	51	32	48	40	65	42	86	63	76	53	72.6	63.5	70	46.5
23	61	41	45	30	50	30	46	30	43	25	35.5	24	47	36	73	49	88	70	86	57	70.2	61.6	72	51.5
24	50	39	50	36	42	23	33	17	30	22	38	20	42	33	74	51	81	70	83	65	71	56	72	55
25	51	34	38	31	42	31	21	14	28	24	50	29	46	35	75	51	86	64	80	67	71.5	58.8	78.2	57
26	63	37	38	26	42	31	41	14	31	17	52	32	46	35	66	53	77	66	85	71	71.8	54	81	60.5
27	58	37	45	27	41	33	44	36	35	28	38	30	47	34	74	49	75	63	73	62	76.3	59.2	72	60.5
28	43	32	40	25	41	28	46	30	46	25	50	28	40	33	84	65	96	66	69	62	76	55.5	63.5	56
29	45	32	31	17	39	22	47	29	.....	.....	38	27	45	32	84	65	85	71	75	56	76	54	68	57
30	49	31	36	20	37	22	27	17	.....	.....	47	32	47	33	83	65	74	61	75	55	71	54	55	50
31	44	32	.....	.....	40	26	24	16	.....	.....	40	26	.....	.....	84	63	.....	.....	83	68	73	56	.....	.....
Range	48°		43°		53°		62°		43°		48°		52°		50°		52°		43°		42°		45°	
Monthly meaus	51°.2		36°.6		36°.7		32°.7		31°.2		37°.1		39°.4		59°.6		70°.4		72°.4		70°.2		66°.9	

Maximum, minimum, and mean temperatures—Continued.

COLORADO SPRINGS, COLO.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	63	41	60	20	(†)	.....	59	21	45	13	82	40	72	52	89	50	92	56	87	55
2	.....	.....	.....	.....	38	− 6	60	38	.....	.....	58	36	54	18	56	30	77	44	90	49	79	54	63	43
3	.....	.....	.....	.....	30	− 5	46	7	31	9	47	26	61	24	54	30	87	50	95	48	84	53.5	52	39
4	.....	.....	.....	.....	35	− 5	30	− 8	27	19	46	22	48	25	73	27	80	52	96	49	86	56	73	39
5	.....	.....	.....	.....	26	− 3	50	− 3	38	9	29	15	52	20	74	31	86	54	95	53	89	56	77	42
6	.....	.....	.....	.....	30	− 9	40	9	49	7	33	10	50	25	85	40	77	53	94	49	87	56	82	46
7	.....	.....	.....	.....	36	9	55	18	56	22	41	4	38	22	87	40	101	50	92	51	89	56	81.5	48
8	.....	.....	.....	.....	40	11	53	25	35	22	60	10	42	26	78	50	87	55	93	54	92	57	78	48
9	.....	.....	.....	.....	31	5	58	15	46	8	61	35	60	25	59	37	83	60	95	61	90	55	85	46
10	.....	.....	.....	.....	49	12	60	30	59	25	35	21	66	28	61	36	75	47	89	58	91	52	72	47
11	.....	.....	.....	.....	50	10	49	19	55	29	56	1	62	24	60	36	73	43	98	53	82	53	83	44
12	.....	.....	.....	.....	31	9	47	11	42	18	55	20	55	32	55	37	82	39	97	60	86	56	66	38
13	.....	.....	.....	.....	41	17	29	15	43	14	56	28	54	32	72	44	83	48	96	60	87	52	62	48
14	.....	.....	.....	.....	54	13	25	13	49	10	48	24	49	28	63	39	69	48	93	61	86	56	60	44
15	.....	.....	.....	.....	56	20	58	10	53	25	50	28	35	23	70	35	77	40	81	58	92.5	57	73	35
16	.....	.....	.....	.....	59	20	61	25	44	20	49	24	42	14	79	38	83	45	82	59	86	58	78	46
17	.....	.....	.....	.....	47	14	63	38	41	21	50	24	38	10	85	46	90	47	87	55	85	60	75	43
18	.....	.....	.....	.....	40	15	49	27	50	20	50	20	43	6	78	42	90	50	94	56	86	55	57	39
19	.....	.....	.....	.....	42	18	29	23	37	23	40	4	54	15	85	45	91	49	87	60	87	60	63	27
20	.....	.....	.....	.....	23	10	47	16	49	12	44	13	42	20	74	47	96	55	88	54	88	57	70	35
21	.....	.....	.....	.....	42	10	36	10	23	3	47	21	35	20	83	46	99	62	84	59	82	56	67	41
22	.....	.....	.....	.....	42	10	26	− 2	12	−10	55	30	30	16	92	45	93	55	93	57	82	56	57	42
23	.....	.....	.....	.....	37	10	30	−15	15	−11	41	11	47	5	86	45	91	52	88	60	85	54	63	45
24	.....	.....	*63	28	42	10	45	− 1	12	− 9	40	10	57	21	76	55	94	53	94	58	82.5	52	65	41
25	.....	.....	66	27	62	19	55	9	28	−17	52	30	70	35	90	47	95	61	89	60	82	58	76	39
26	.....	.....	66	27	49	10	60	15	48	3	53	27	73	37	83	46	94	52	61	53	78	57	64	46
27	.....	.....	22	9	49	10	50	24	51	12	61	20	72	34	90	45	90	63	78	54	84	56	71	38
28	.....	.....	21	0	61	21	54	16	51	18	60	20	74	32	90	48	79	46	84	53	81	54	77.5	41
29	.....	.....	57	9	33	11	31	20	.....	.....	48	24	82	34	70	50	88	48	95	52	82	52	77	46
30	.....	.....	64	20	65	9	41	15	.....	.....	35	23	78	41	57	47	86	49	94	61	83	54	75	41
31	.....	.....	.....	.....	63	14	(†)	.....	.....	.....	34	11	.....	.....	70	48	.....	.....	92	56	86	52	.....	.....
Range	.....	.....	.....	.....	74°		78°		76°		60°		77°		65°		62°		50°		40°.5		60°	
Monthly means	.....	.....	.....	.....	37.°4		26°.9		30°.3		25°.5		34°.5		58°.6		68°.9		73°.2		73°.3		56°.7	

* Station supplied with self-registering maximum and minimum thermometers November 24, 1873.

† No observations taken.

Maximum, minimum, and mean temperatures—Continued.

DAVENPORT, IOWA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. ax.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	65	44	42	23	51	30	45	34	25	17	41	36	42	21	64	48	72	55	87	71	80	66	81	59
2	67	52	54	32	59	50	44	34	26	17	56	38	41	30	57	44	65	51	86	66	79	60	84	67
3	60	52	43	23	59	20	60	34	28	14	46	34	42	28	45	40	76	58	95	69	76	61	67	56
4	58	52	57	35	21	9	36	9	25	11	35	25	37	22	53	42	86	60	97	75	80	62	61	56
5	57	43	44	31	23	9	22	5	28	8	43	27	39	25	67	40	75	65	98	70	79	65	74	56
6	49	33	50	38	30	20	36	12	32	25	48	39	41	25	67	45	81	61	98	74	76	69	84	63
7	60	37	58	38	34	26	34	13	32	25	39	23	45	27	74	49	82	66	94	72	82	65	86	68
8	67	45	63	20	45	34	36	23	34	20	30	14	52	34	81	58	85	67	86	72	86	67	89	72
9	74	53	47	36	36	22	34	26	25	5	36	22	43	26	81	62	78	62	86	72	86	68	84	70
10	74	58	48	36	36	22	22	22	40	20	36	28	55	31	71	59	78	55	82	68	93	71	84	71
11	65	48	45	34	40	35	23	9	43	26	35	24	49	30	72	57	70	55	77	64	95	80	85	73
12	60	38	32	19	36	29	25	7	49	31	28	16	52	30	77	61	69	50	82	56	92	74	81	69
13	72	48	29	18	30	16	26	7	31	18	32	12	63	42	75	54	71	53	88	66	87	72	75	65
14	71	48	38	19	33	17	7	− 7	40	16	39	25	55	41	72	56	70	60	93	75	81	65	74	53
15	72	54	62	33	41	23	6	−10	39	27	46	36	55	34	63	52	74	64	83	67	84	66	62	43
16	69	60	46	38	45	33	22	− 2	33	23	49	39	42	33	70	49	72	61	78	64	89	66	67	48
17	68	55	45	34	42	33	35	20	34	21	62	46	52	30	64	54	84	60	83	64	91	68	73	53
18	55	43	35	15	34	30	40	35	33	21	57	35	61	41	64	47	86	65	89	69	88	66	66	60
19	48	35	18	6	31	18	40	27	41	32	41	29	52	40	71	53	88	66	88	77	91	74	62	51
20	51	37	33	14	18	5	37	26	34	16	52	32	43	36	69	50	90	68	78	64	93	73	63	43
21	56	35	40	24	27	11	39	35	33	28	47	33	49	35	68	50	91	70	76	65	93	76	66	54
22	48	32	39	26	38	24	36	25	35	25	42	27	54	38	72	51	91	73	83	64	82	65	71	53
23	46	26	36	29	37	33	25	7	34	4	28	18	45	29	82	60	93	73	90	69	77	63	75	57
24	53	32	42	26	37	34	12	− 3	12	− 5	37	18	54	36	84	64	91	75	86	75	75	60	76	57
25	55	37	36	27	38	32	20	5	18	2	43	30	53	40	80	60	90	74	96	79	78	58	70	66
26	50	36	43	30	33	25	41	18	30	14	41	24	55	37	83	57	93	77	87	70	72	61	71	57
27	36	30	33	18	28	17	41	29	37	13	37	20	47	33	90	70	92	79	78	63	70	64	60	51
28	35	26	23	7	35	14	29	21	39	29	37	21	48	30	89	73	86	70	80	59	69	66	66	45
29	39	23	34	17	32	14	38	24	.....	.....	42	25	55	40	86	70	81	60	83	65	75	67	72	52
30	39	22	36	22	33	13	27	15	.....	.....	48	35	74	48	90	71	87	63	92	72	77	64	67	44
31	33	18	.....	.....	40	28	24	7	.....	.....	40	25	.....	.....	83	66	.....	.....	83	69	74	60	.....	.....
Range	56°		57°		54°		70°		54°		50°		53°		50°		43°		42°		37°		46°	
Monthly means	48°.3		34°.6		29°.7		23°.7		25°.9		34°.9		41°.6		64°.5		73°.2		78°		74°.4		65°.5	

Maximum, minimum, and mean temperatures—Continued.

DENVER, COLO.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	71	36	51	28	59	31	58	37	39	3	60	14	47	21	75	44	73	49	92	59	81.9	58.8	82.8	56
2	80	36	56	27	44	5	59	41	40	9	60	22	60	27	58	39	81	47	98	61	91.4	59.2	63.5	39.5
3	83	40	71	26	12	− 3	47	2	31	9	48	23	65	28	56	34	85	50	101	59	86	61.9	56.1	37.5
4	83	48	64	31	22	1	21	− 7	30	14	43	25	49	31	68	29	82	52	102	61	89	65.6	80.4	40.5
5	67	43	66	26	19	− 5	46	− 4	35	11	34	12	54	25	81	34	85	56	97	64.5	83.8	60.8	87	47.1
6	82	35	68	39	27	6	39	10	50	17	37	17	44	26	81	39	84	52	98.5	58.5	87.7	57.5	89.6	49.2
7	86	48	68	29	29	4	53	20	52	27	34	17	41	20	87	49	97	55	97	59	92	58.2	91.8	52
8	77	51	68	32	40	12	50	35	35	23	49	21	49	34	82	54	85	59	99	64	96.3	62.5	85	53.1
9	80	45	71	34	23	3	54	29	51	7	52	36	64	28	59	47	70	53	97	63	91.3	61.2	92	52.5
10	72	37	68	32	31	2	56	33	54	30	42	26	74	28	64	43	74	47	98.5	60	94.4	58.3	83.1	46
11	70	34	49	28	28	6	37	23	60	31	60	25	66	40	65	39	73	40	98.5	58	91.6	56.7	79.5	49
12	83	36	55	17	27	3	46	19	33	13	62	32	52	40	52	39	89	49	99	63.5	87.4	53.5	76.3	42.5
13	69	41	71	32	37	6	34	18	35	4	59	32	59	36	74	42	74	51	96	66	84	56.2	68.3	49.5
14	74	34	71	30	38	1	26	15	50	14	48	32	56	26	68	40	67	48	92	66	94.8	56.5	71.8	46
15	54	36	62	31	39	8	52	19	54	27	56	26	41	28	77	36	89	44	91	59	96.5	60	85.4	40
16	48	30	67	34	42	14	62	32	47	28	52	30	40	22	83	44	88	49	94	59	93.6	62.4	78.5	58
17	52	31	65	31	42	5	51	35	55	24	44	26	43	14	83	47	94	55	94	62	77	59.5	75.5	37
18	50	26	45	15	36	10	46	27	55	28	40	26	52	20	89	48	89	57	90	64.5	90.3	52	56.1	40.6
19	67	25	58	23	31	9	30	18	43	19	42	16	60	20	87	45	93	56	79	62	89.2	58.5	70.5	34.6
20	76	32	52	26	25	2	47	11	45	14	51	20	46	32	85	50	94.5	53.5	85.8	55	86.8	58.8	66.2	36
21	58	24	47	21	33	10	31	18	17	0	47	26	35	24	82	49	95.5	61	79.2	62.6	90	59.7	70.5	43.5
22	34	8	39	25	34	6	28	11	20	− 1	56	26	40	22	88	48	98.5	55	84.8	61.6	89.2	56	58.5	45
23	45	16	48	17	36	8	27	14	10	− 2	45	28	51	22	91	54	93	63	84.3	61.8	92.8	61.7	74.6	45
24	37	13	60	27	32	5	49	11	12	− 8	58	30	62	33	85	54	95	56	90.4	61.2	87	55.5	80	39
25	35	5	58	36	53	25	53	15	24	−11	55	35	73	34	90	53	98.5	58	86	59.6	86	65.6	85.8	41.5
26	43	14	59	26	42	16	53	20	34	0	45	31	74	38	84	57	92.5	57.5	64	51	81.5	63.5	71.5	42
27	50	28	28	10	36	11	47	33	38	0	59	27	69	37	92	56	87	66	84.2	51.8	88	56.2	80.9	37.5
28	59	27	54	− 1	47	25	56	23	39	13	52	25	80	36	85	52	82	49	86.2	57.8	87.5	52.6	85	39.8
29	62	33	62	30	30	20	57	29	.....	.....	46	24	82	41	74	48	91	53	96.8	60.8	91.2	51.2	86	45
30	52	27	61	29	58	13	44	21	.....	.....	42	21	83	42	61	47	87	54	94.2	65	84.2	63	85	44
31	52	22	.....	.....	58	33	40	18	.....	.....	39	17	.....	.....	64	52	.....	.....	87.8	63	88.9	58.1	.....	.....
Range	81°		72°		64°		69°		71°		50°		69°		63°		58°.5		51°		45°.3		57°.4	
Monthly means	45°.2		40°.6		22°.4		31°.5		24°.7		36°.4		43°.1		61°.9		70°		76°.1		73°		59°	

Maximum, minimum, and mean temperatures—Continued.

DETROIT, MICH.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	65	41	40	27	31	12	41	30	23	10	51	35	41	14	58	34	61	49	81	59	81	63	78	56
2	61	39	45	31	54	26	46	34	22	10	47	32	42	28	50	36	66	44	74	61	73	57	84	59
3	68	46	44	34	57	49	58	43	27	17	52	36	38	20	52	32	76	57	75	56	72	42	68	52
4	62	52	56	34	49	29	58	24	30	18	36	25	30	9	50	43	84	60	91	64	72	49	69	47
5	62	45	42	28	28	18	28	20	28	18	36	24	29	23	61	41	81	65	80	56	70	54	77	61
6	46	35	41	25	29	19	32	26	24	15	37	31	45	25	51	35	79	64	91	63	76	61	79	56
7	58	28	55	35	34	19	35	30	26	16	47	32	47	30	58	30	84	67	97	71	80	63	88	61.5
8	71	42	46	40	50	24	41	26	34	8	32	17	47	33	81	47	74	61	87	70	80	61	92	66
9	72	43	43	31	52	35	39	29	31	18	35	21	37	26	85	58	85	58	83	68	84	61	87	64
10	78	54	37	29	42	32	31	26	34	11	37	17	49	25	84	64	72	53	82	68	86	67	88	64
11	61	52	42	32	49	34	31	22	31	18	32	15	45	23	80	60	77	58	71	59	88	69	88	59
12	51	39	35	21	45	35	31	20	51	21	25	12	40	23	85	58	60	49	62	57	88	69	88	63
13	61	35	29	14	37	26	27	17	51	36	27	13	63	22	81	50	68	45	82	55	74	60	97	61
14	65	56	34	11	32	23	26	11	40	24	40	18	73	50	62	43	72	56	89	66	74	53	86	64
15	74	45	52	26	45	26	14	6	48	31	43	27	55	32	73	42	66	60	86	72	77	52	72	53
16	73	55	45	34	47	30	22	0	43	24	43	31	38	29	57	40	76	62	72	56	82	56	67	46
17	66	55	45	33	50	32	32	13	26	16	64	35	49	32	58	44	78	57	75	55	85	60	68	58
18	68	46	40	29	39	31	40	17	32	15	67	48	54	36	59	42	83	63	83	61	79	67	78	64
19	49	36	32	18	40	32	44	25	41	31	54	36	40	33	65	36	80	64	89	67	86	59	82	58
20	42	34	30	13	23	23	30	18	41	30	47	31	60	35	60	49	84	65	76	64	93	68	64	49
21	38	31	37	21	26	21	52	30	34	31	53	36	49	33	62	43	87	63	73	58	77	65	67	41
22	61	35	41	25	43	28	52	35	36	28	49	28	52	35	68	48	89	65	80	56	72	61	68	50
23	61	33	36	29	39	20	41	26	35	22	31	18	43	30	72	54	91	69	83	57	76	60	77	50
24	53	30	35	30	40	26	31	12	29	19	35	14	42	27	71	55	81	70	85	68	72	56	81	53
25	50	33	36	24	40	30	18	10	26	17	46	26	43	33	68	57	83	65	75	67	73	54	83	51
26	52	36	35	17	40	30	40	12	32	13	50	30	50	36	73	50	82	63	84	70	75	55	78	66
27	44	35	28	27	36	29	44	32	36	25	40	25	42	28	83	50	78	59	70	60	76	62	69	57
28	37	28	34	15	32	22	42	26	46	26	38	26	41	30	89	59	93	67	73	57	75	60	66	51
29	40	22	35	7	33	18	39	21	.....	.....	41	23	47	26	85	65	83	66	77	54	75	59	70	44
30	43	31	28	17	26	12	24	10	.....	.....	46	27	52	30	87	62	71	55	75	59	77	55	57	43
31	34	24	.....	.....	36	15	20	10	.....	.....	31	22	.....	.....	85	57	.....	.....	83	67	74	58	.....	.....
Range	56°		49°		45°		58°		43°		55°		64°		57°		49°		43°		41°		56°	
Monthly means	47°.9		32°.2		32°.7		28°.9		27°.5		34°.4		37°.3		59°		68°.9		71°.4		67°.9		66°.7	

Maximum, minimum, and mean temperatures—Continued.

DUBUQUE, IOWA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1																	71	54	86	65	81	63	85	57
2																	61	54	86	61	80	59	82	65
3																	73	55	99	66	75	62	68	54
4																	72	64	99	75	83	59	59	54
5																	73	60	101	73	77	63	75	50
6																	74	62	100	70	83	66	87	61
7																	77	67	98	72	81	61	90	65
8															*87	65	84	69	85	70	87	62	90	65
9															85	65	68	63	87	70	88	62	87	67
10															68	63	63	51	83	66	90	69	85	72
11															76	64	57	50	80	62	97	75	88	69
12															75	58	64	53	83	56	96	75	72	64
13															69	54	73	56	92	63	96	68	75	62
14															68	55	73	58	96	72	81	62	72	51
15															63	53	75	59	85	68	84	66	65	43
16															72	45	70	58	80	58	93	63	67	43
17															64	42	86	63	90	62	88	70	74	51
18															67	44	87	70	91	68	88	62	65	57
19															73	49	90	74	85	73	95	70	61	51
20															70	48	91	70	76	65	96	71	64	42
21															73	49	95	68	85	62	96	72	64	46
22															75	56	90	70	86	62	70	65	74	54
23															84	55	95	79	93	67	82	62	78	56
24															86	65	98	79	90	72	79	60	77	54
25															80	64	93	78	100	81	81	54	70	60
26															88	62	97	77	87	68	72	60	66	56
27															94	68	97	80	78	63	75	59	61	50
28															93	75	80	69	83	61	75	66	66	46
29															84	74	85	55	87	61	79	66	69	47
30															92	73	87	60	92	65	79	65	67	41
31															80	67			86	64	80	55		
Range																	48°		45°		44°		49°	
Monthly means	46°.6		31°.3		28°.7		21°.2		24°		33°.6		41°.7		65°.3		71°.7		80°		74°.2		65°.5	

* Station supplied with maximum and minimum thermometers May 8, 1874.

Maximum, minimum, and mean temperatures—Continued.

DULUTH, MINN.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58	42	71	48	72	58	73	60
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	41	65	53	68	55	67	53
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	42	65	50	68	55	69	45
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	44	68	50	65	55	65	51
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	49	83	51	64	59	71	54
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	46	82	62	75	56	69	53
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	64	46	89	65	77	62	71	57
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54	45	73	58	86	61	90	61
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	47	85	56	80	63	85	66
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	45	78	61	75	60	74	69
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	42	75	56	70	64	72	65
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	42	71	57	65	56	70	57
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*58	40	60	51	89	60	64	53	66	57
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	37	55	47	80	68	63	52	59	46
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	37	52	46	76	60	68	55	61	39
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	36	71	46	79	55	76	59	67	45
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	39	75	54	79	56	74	60	58	52
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	36	67	49	69	59	75	52	61	49
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	40	70	53	74	61	77	58	55	45
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	44	78	62	78	54	70	59	57	39
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	43	71	58	85	63	79	57	60	43
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	43	81	56	84	62	61	54	68	52
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	42	75	60	83	68	69	54	77	48
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	42	61	53	74	61	67	53	70	53
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	53	87	54	89	62	75	57	67	57
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59	46	78	55	73	61	73	61	63	54
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	47	69	55	77	53	68	59	56	49
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	76	45	65	53	75	55	67	64	71	48
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47	42	76	57	71	57	76	63	65	42
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	44	64	50	84	59	74	56	66	43
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	55	.....	.....	81	59	70	52	.....	.....
Range	.....		.....		.....		.....		.....		.....		.....		.....		46°		41°		34°		51°	
Monthly means	43°.5		24°.5		19°.7		13°		16°.3		23°.8		32°.8		50°.2		57°.8		67°.9		64°		59°.4	

* Station supplied with maximum and minimum thermometers May 13, 1874.

Maximum, minimum, and mean temperatures—Continued.

EASTPORT, ME.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	51	(*)	48	.....	6	.....	39	26	10	− 6	34	12	22	2	44	35	57	42	67	48	66	56	66	54
2	56	.....	49	.....	25	.....	39	33	6	−13	39	29	33	17	46	31	58	39	56	47	71	56	64	50
3	51	.....	54	.....	43	.....	39	30	29	2	43	33	37	24	50	33	67	43	51	47	68	54	65	50
4	54	.....	50	.....	53	.....	49	39	25	14	45	39	29	14	59	40	56	45	59	46	68	50	61	44
5	60	.....	45	.....	46	.....	50	29	15	0	40	20	34	11	51	37	63	46	55	46	67	55	62	46
6	56	.....	35	.....	30	.....	30	15	8	− 6	29	11	41	29	51	35	59	45	63	48	61	51	62	49
7	56	.....	40	.....	25	.....	46	30	10	− 6	32	12	38	30	47	36	57	48	58	46	67	53	69	51
8	56	.....	46	.....	30	.....	51	43	23	2	32	26	40	32	51	35	62	45	77	46	60	56	67	54
9	52	.....	44	.....	42	.....	45	34	29	12	36	26	39	16	51	34	62	45	77	56	59	54	62	52
10	55	.....	32	.....	37	.....	41	31	29	23	32	25	34	25	53	41	51	42	71	56	70	54	78	53
11	57	.....	28	.....	34	9	37	32	27	10	34	17	35	22	56	38	63	43	69	51	70	56	62	50
12	56	.....	51	.....	37	30	33	16	22	6	25	10	36	17	64	38	50	43	64	49	64	52	61	47
13	52	.....	44	.....	35	24	20	13	22	14	24	8	37	14	55	40	61	43	63	50	61	53	61	45
14	56	.....	29	.....	29	15	25	13	47	31	34	19	44	31	70	41	66	46	77	52	56	52	67	50
15	52	.....	23	.....	21	5	16	8	32	24	36	19	48	35	64	41	71	53	78	58	65	54	65	52
16	54	.....	29	.....	38	7	13	2	31	26	41	26	45	35	47	39	74	50	70	53	71	53	61	55
17	49	.....	36	.....	36	28	18	0	31	20	41	27	39	28	50	40	55	49	71	58	68	51	58	52
18	51	.....	50	.....	36.5	28	34	11	26	12	42	35	44	30	55	39	56	45	71	51	67	54	55	49
19	61	.....	37	.....	35	28	41	32	34	17	42	31	43	32	48	40	53	47	71	49	70	56	55	50
20	61	.....	29	.....	32	23	40	10	40	33	42	25	43	32	59	39	52	45	62	52	64	55	59	53
21	55	.....	30	.....	26	7	35	7	35	30	38	21	36	30	57	41	61	47	66	49	72	57	65	52
22	58	.....	34	.....	23	10	40	35	34	30	37	20	44	32	54	42	68	48	73	51	66	54	60	47
23	55	.....	26	.....	29	8	45	39	31	25	27	20	42	29	58	45	63	47	73	55	64	48	60	45
24	57	.....	32	.....	32	24	41	21	32	13	22	2	44	34	58	42	65	52	69	51	66	50	61	46
25	54	.....	28	.....	30	15	28	− 3	20	7	36	8	46	30	50	41	69	47	70	51	66	50	59	49
26	47	.....	26	.....	25	11	− 3	−20	24	12	44	19	36	28	53	45	72	49	70	52	64	50	57	53
27	59	.....	31	.....	28	14	29	−20	32	12	38	24	46	28	63	44	73	47	68	52	69	51	58	50
28	52	.....	20	.....	40	19	32	16	20	5	34	24	49	34	66	45	65	49	67	49	69	50	60	52
29	52	.....	18	.....	34	18	18	10	.....	.....	28	21	49	33	61	45	54	48	68	55	63	55	68	55
30	43	.....	12	.....	29	3	20	− 3	.....	.....	37	21	48	33	61	44	55	45	69	56	69	55	61	51
31	45	.....	.....	.....	29	6	20	−10	.....	.....	31	12	.....	.....	65	44	.....	.....	72	56	63	54	.....	.....
Range	.....		.....		.....		71°		60°		43°		47°		39°		35°		32°		24°		34°	
Monthly means	49°.3		29°.2		25°.6		25°.5		20°.9		29°.4		33°.4		47°.7		54°.7		59°.6		59°.2		56°.3	

* Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

ERIE, PA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	60	48	41	30	35	32	40	36	21	8	47	34	34	20	50	37	.....	56	.....	57	.....	68.5	76	61
2	58	46	53	35	55	35	46	38	30.5	9	57	37	41	29	46	38	.....	51	.....	65	.....	63.5	80	59
3	63	50	48	34	65	51	60	45	31	21	59	42	39	24	51	34	.....	61	.....	60	.....	54	74	64
4	64	56	55	34	65	30	70	30	30	20	53	26	25	15	56	44	.....	65	.....	67	72	60	68	56
5	61	53	49	35	31	26	31	27	26	14	32	23	40	16	58.5	40	.....	69	.....	63	71	55	81.5	63
6	53	41	40	32	32	26	37	27	25	13	41	31	40	28	48	37	.....	64	.....	62	74	65	76	66
7	52	37	56	35	40	25	37	32	26	20	53	34	44	34	52	31	.....	69	.....	72	80	65	76	66
8	60	50	49	41	55	35	37	32	24	12	35.5	23	42	33	65	45	.....	66	.....	75	78	69	78	71
9	66	46	44	33	57	38.5	41	32	30	13	25	18	37	31.5	76	63	.....	67	.....	72	79	65.5	78	68
10	76	57	37	31	39	35	36	28	28	15	27	24	41	29	79	65	.....	64	.....	68	81	68	79	66
11	66	55	40	32	52	36	34	26	28	18	26	12	42	25	70	53	.....	57	.....	67	90	66	81	70
12	55	44	41	30	49	37	28	22	50	18	26	11	34	17	81	57	.....	54	.....	59	87	79	81.5	66
13	57	39	31	22	39	28	29	19	53	30	22	11	59	25	75	57	.....	50	.....	58.5	78	66	82	70.5
14	61	50	31	22	34	29	28	16	32.5	25.5	32	20	71.5	49	64	51	.....	52	.....	66	76	59.5	87	71
15	65	46	46	26	42	32	16	11	47	31	37.5	20	59	34	(*)	51	.....	56	.....	76	79	59	82	64
16	74	58	48	39	45	34	21	11.5	43	25	43	37	37	31	.....	52	.....	66	.....	65	80	60	72	64
17	64	55	49	36	49	35	29.5	8	27	20	60	39	36.5	32.5	.....	45	.....	59	.....	60	84	65	70	63
18	68	53	40	32	46	36	42	23	34	13	63	51	42	32	.....	43	.....	61	.....	62	.....	.....	72	63
19	54	45	35	26	38	35	44	31.5	44	32	60	36.5	47	38	.....	38	.....	57	.....	62	84	61	84	62
20	46	36	28	20	36	25	35.5	22	43	35	38.5	33	70	39	.....	45	.....	60	.....	67	86	77	69	60
21	42	38	35	20	30	24	56	35	38	33	50	34	50	34	.....	46	.....	62	.....	64	83	69	65	56
22	60	39	40	28	31	24	67	41	35	31	46	31	46	37	.....	46	.....	64	.....	61	75	65	68	55
23	62	46	40	29	35	23	52	29	48	25.5	31	19	46	37	.....	48	.....	74	.....	60	72	63	70	59
24	48	38	43	34	38	25	34	17	28	22	28	17	40	31	.....	53	.....	66	.....	60.5	73	61	73	59
25	51	40	37	24	37	32	17	13	30	21	49	26	43	34	.....	54	.....	64	.....	73	74	58	76	63
26	57	37	29	25	37	31	38	9	29	10	49	26	40	33	.....	50	.....	66	.....	72	76	59	80	65
27	57	41	35	23	37	32	42.5	37	32	25	37	26	44	31	.....	46	.....	65	.....	65	78	61	72	64
28	43	31	32	24	33	25	43	27	38	25	35	27	38	33	.....	61	.....	68	.....	63.5	75	57	72	60
29	38	30	29	21	32	28	38	22.5	.....	.....	37	24	38	31	.....	65	.....	70	.....	63	75	59	66	59
30	44	30	30	22	26	18	23	10	.....	.....	42	31	40.5	31	.....	65	.....	58	.....	61	76	57	61	50
31	46	30	.....	.....	38	18	21	8	.....	.....	33	24	.....	.....	.....	64	.....	.....	.....	68	78	61	.....	.....
Range	46°		35°		39°		62°		45°		52°		56°.5		.....		.....		.....		.....		37°	
Monthly means	50°.7		34°.5		35°.1		31°.6		28°.1		34°		37°		57°		69°.6		72°.7		71°.4		69°.4	

* Maximum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

ESCANABA, MICH.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	48	70	52	68	52	71	44
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	39	71	50	66	47	73	57
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	48	70	53	70	39	64	42
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	47	72	54	72	45	65	42
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	49	73	49	64	48.5	63	51
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	48	80	62	69	56	67	46
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	50	79	62	73	51	74	50
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	47	79	51	77	53	79	58
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	45	75	46	77	61	79	59
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*61	43	59	42	78	46	74	54	77	65
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59	43	56	43	73	44	78	57	78	63
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	42	54	35	74	43	76	56	73	60
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	38	59	40	80	54	70	50	69	57
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54	34	65	44	78	56	70	42	68	50
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54	40	59	51	79	60	70	48	57	43
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	39	64	49	71	47	72	51	61	38
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	35	71	50	75	55	79	62	65	55
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58	32	66	53	74	53	72	50	67	55
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	35	76	59	92	59	73	62	66	46
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58	40	78	59	69	46	74	53	57	43
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	37	78	58	75	47	65	53	64	39
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	34	83	60	78	54	65	50.5	65	52
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54	36	85	62	79	61	65	47.5	65	55
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	40	73	57	78	59	68	41	69	52
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	44	83	54	73	64	71	48	69	53
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	40	78	58	70	59	72	54	66	56
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	46	73	56	71	46	74	54	60	47
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	46	88	59	73	48	74	63	65	44
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	46	72	56	74	46	72	61	62	42
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	49	67	45	69	61	67	54	52	40
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	49	.....	.....	88	54	70	46	.....	.....
Range	.....		.....		.....		.....		.....		.....		.....		.....		53°		46°		40°		41°	
Monthly means	41°.7		25°.5		25°.8		18°.2		17°.3		22°.8		29°.1		48°.9		60°.6		66°.9		64°.4		60°.1	

* Station supplied with maximum and minimum thermometers May 10, 1874.

Maximum, minimum, and mean temperatures—Continued.

FORT BENTON, MONT.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	(*)	31	.....	30	.....	−20	.....	34	.....	2	.....	.....	.....	18	.....	45	.....	49	.....	52	.....	41	.....	47
2	.....	29	.....	25	.....	−20	.....	−11	.....	24	.....	0	.....	20	.....	43	.....	55	.....	57	.....	55	.....	38
3	.....	24	.....	37	.....	−20	.....	−21	.....	8	.....	− 3	.....	26	.....	39	.....	42	.....	55	.....	56	.....	40
4	.....	39	.....	29	.....	−29	.....	−23	.....	7	.....	−10	.....	27	.....	40	.....	42	.....	65	.....	54	.....	46
5	.....	27	.....	20	.....	−34	.....	20	.....	10	.....	3	.....	27	.....	45	.....	52	.....	45	.....	61	.....	44
6	.....	32	.....	40	.....	−24	.....	15	.....	10	.....	− 4	.....	23	.....	49	.....	52	.....	53	.....	56	.....	57
7	.....	37	.....	35	.....	−10	.....	40	.....	24	.....	1	.....	23	.....	59	.....	49	.....	51	.....	55	.....	50
8	.....	47	.....	38	.....	3	.....	26	.....	7	.....	− 6	.....	32	.....	45	.....	47	.....	50	.....	53	.....	42
9	.....	39	.....	45	.....	−20	.....	10	.....	21	.....	−15	.....	28	.....	45	.....	48	.....	53	.....	45	.....	47
10	.....	38	.....	31	.....	−16	.....	16	.....	22	.....	−21	.....	29	.....	39	.....	46	.....	52	.....	49	.....	47
11	.....	25	.....	26	.....	1	.....	0	.....	0	.....	−19	.....	35	.....	38	.....	47	.....	57	.....	54	.....	44
12	.....	38	.....	8	.....	2	.....	−17	.....	−11	.....	− 5	.....	37	.....	37	.....	51	.....	56	.....	43	.....	30
13	.....	36	.....	26	.....	− 4	.....	−23	.....	− 5	.....	16	.....	34	.....	46	.....	52	.....	64	.....	55	.....	39
14	.....	34	.....	35	.....	1	.....	−18	.....	−13	.....	14	.....	29	.....	43	.....	46	.....	55	.....	50	.....	27
15	.....	28	.....	36	.....	9	.....	0	.....	25	.....	12	.....	31	.....	36	.....	57	.....	49	.....	56	.....	41
16	.....	15	.....	42	.....	17	.....	3	.....	12	.....	17	.....	22	.....	46	.....	50	.....	52	.....	51	.....	47
17	.....	30	.....	31	.....	11	.....	−10	.....	25	.....	10	.....	31	.....	49	.....	53	.....	62	.....	54	.....	40
18	.....	14	.....	21	.....	3	.....	−13	.....	0	.....	6	.....	22	.....	50	.....	45	.....	62	.....	63	.....	35
19	.....	41	.....	26	.....	3	.....	−14	.....	− 5	.....	12	.....	26	.....	46	.....	40	.....	46	.....	53	.....	43
20	.....	33	.....	18	.....	− 1	.....	−26	.....	11	.....	24	.....	23	.....	58	.....	53	.....	52	.....	56	.....	32
21	.....	8	.....	22	.....	15	.....	−29	.....	0	.....	20	.....	17	.....	56	.....	52	.....	58	.....	62	.....	38
22	.....	9	.....	16	.....	20	.....	−23	.....	0	.....	17	.....	22	.....	54	.....	50	.....	56	.....	53	.....	34
23	.....	9	.....	23	.....	16	.....	−26	.....	−20	.....	19	.....	43	.....	59	.....	58	.....	67	.....	50	.....	41
24	.....	9	.....	38	.....	19	.....	− 5	.....	−22	.....	21	.....	41	.....	47	.....	53	.....	60	.....	61	.....	45
25	.....	− 3	.....	32	.....	30	.....	− 3	.....	6	.....	1	.....	36	.....	53	.....	53	.....	50	.....	61	.....	48
26	.....	30	.....	13	.....	16	.....	22	.....	7	.....	0	.....	37	.....	52	.....	48	.....	37	.....	55	.....	35
27	.....	39	.....	− 5	.....	10	.....	20	.....	10	.....	10	.....	40	.....	50	.....	56	.....	54	.....	69	.....	33
28	.....	32	.....	−14	.....	13	.....	1	.....	17	.....	4	.....	40	.....	39	.....	50	.....	52	.....	58	.....	45
29	.....	28	.....	− 4	.....	−15	.....	− 5	.....	.....	.....	9	.....	38	.....	37	.....	49	.....	62	.....	48	.....	46
30	.....	20	.....	− 8	.....	− 9	.....	− 3	.....	.....	.....	8	.....	50	.....	44	.....	44	.....	55	.....	49	.....	50
31	.....	18	.....	.....	.....	32	.....	− 9	.....	.....	.....	12	.....	.....	.....	43	.....	.....	.....	53	.....	49	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monthly means	40°.3		35°.1		13°.7		11°.3		22°.4		18°.4		44°.4		59°.2		63°		75°.1		69°.1		58°.2	

* No maximum thermometer at this station.

Maximum, minimum, and mean temperatures—Continued.

FORT GARRY, MANITOBA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	39.5	19.5	31.6	21.3	14.7	0	25	2	17.2	−14.4	38.7	9.6	27.3	11.3	64.5	43.5	72.3	38.8	75	47.4	71.5	54.3	66	49.5
2	38.5	19	23	−10	3	− 7.3	31	11.7	12.3	4.6	11.2	− 5	21.5	− 5	52.8	35	71.5	50.2	80.3	53.4	76.5	45	63.5	41
3	41.5	16.5	31.5	−10.5	2	−18	12	−17	7.3	− 2.0	−11.4	20.2	20	−18	55.3	31.2	73	55	84	64.1	70.2	52.7	77	40.5
4	45	25	14.5	− 5	− 6	−13.8	−15.3	−26.7	8.5	− 7	11.4	−26	25.5	−16.5	61.5	36	68.3	47	85.3	65.4	72.8	60.5	78	46.1
5	36	21.8	24.5	− 3	− 5	−26	16.6	−23.2	15.6	−10.5	27.4	− 1	30	− 1	64.6	36.3	70.5	39	85.5	61.1	77.2	64.4	73	45
6	64	19.5	35.5	20	4	−17	19.5	− 1.5	14	7.3	14.4	− 5	26	− 3.5	64.3	35.4	66.3	43.5	86.2	57.4	85	65.7	80	48.5
7	74.3	35.4	21	9	22.5	0	32.0	11.0	24.2	− 1.4	2.2	− 5	28	5	76.5	41.8	75	52	82	55.4	84.9	51.5	87.5	55.5
8	76.5	39.3	23.7	−10.5	26.7	15	26.2	6.2	10.6	3	7.3	−19	32	− 7	94.5	52.2	53.6	42.3	85.1	57.4	86.9	55.1	88.5	52
9	63.3	42	32.2	19	17.3	− 7	3.3	− 9.0	16.3	−10.2	10.4	−13	37.4	− 7	73.5	49	69	30.5	77.5	57.1	89.2	57	57	65.5
10	50	31.5	31.6	15.3	11.2	− 9	3.0	− 6.5	4.3	− 9	7.8	−13.5	30	12	79	47	65.5	47.8	76.5	52	84.8	53.2	80	54.6
11	55.5	21	31.5	10.3	12.3	− 8	− 8	−16.3	22.4	0	2.6	−17.3	29.5	1.5	47.3	35	71	49.3	79.7	53.5	68.4	53.1	64.5	43.1
12	60	29.5	19.5	− 7.5	12.3	− 3	−12.6	−20	9.5	− 1.0	2	−25	44	18.5	50	32.3	71.8	42.3	84	64.6	69.5	54.3	70	37.5
13	55	32	18	− 1.5	18.4	− 7.3	−18.6	−29.3	− 1.5	−12	22	−17.4	41.3	33	61.4	26.2	76	48	79.3	57.6	77.4	46.1	71	45
14	53	28.2	35.2	8.5	25	3.5	−12.5	−30	− 1.5	−27.6	34	18.3	33	21.5	66	37	83.8	47.2	78	54.4	80	50.2	53	35.1
15	43	29.5	37.8	14.5	21.7	6.5	0	−14.2	9	−10.7	37.3	18.6	34.4	14.7	56.8	37	85.6	52.3	80	50.1	80	62.2	63.3	28.5
16	58	20.2	38.3	29	27.3	14	18.0	− 1.0	8.3	−17.3	38.6	31.8	46	25.5	53.4	33.7	85.5	53.2	79.6	53.4	(*)	(*)	60	44.7
17	46.5	36	29.2	8.3	24	0	21.4	− 3.5	26.3	− 3.6	40.2	21.5	35	14.5	60.2	27.5	91.2	57.4	87	53	.....	.....	57	46.5
18	42.5	32	7.5	− 5.5	17.6	4.5	− 3.5	−22.0	31.6	14.7	32	12.3	22.5	9	69.6	43.3	86.8	64.7	89.6	59.3	.....	.....	55	44
19	45.7	26	13.4	− 7.6	7	−18	− 3	−33	− 9	−17.3	27	5	32.5	9.3	59.6	36	83.5	52	69.8	52.1	.....	.....	53	37.1
20	60.5	30	23	5.7	3.3	−20.5	19.3	− 6.3	1	−16.1	19.5	3.6	38.5	20.3	66.8	30	88.3	48.5	84.7	49.6	.....	.....	54.3	37
21	51.8	32	20	0	17.2	−10	5.4	−20	− 7	−30	29	2.5	29.7	17	68	43.5	84.5	64	89.8	54.4	.....	.....	65.5	40.5
22	30.5	22	20.5	6.3	25.5	8	− 9.5	−27.4	0	−19.4	16.6	− 4.5	29.6	13.4	70.7	52	77.4	51.5	87	57.5	.....	.....	69.8	36.1
23	32	19	28.6	5.3	13.3	− 1	−14.4	−30	−10.4	−30.4	18	−15.2	42.6	17.6	70.7	50.7	83.3	55	82.5	50	77	51	69	47.1
24	31	17.3	29.3	14.5	15.3	− 5	−20.1	−36	− 4.4	−32.5	37.4	3.2	43	30	73.2	54	94	65	91.8	64	81.5	51.1	80.5	44.4
25	31	12.8	4.7	− 6.3	30.3	14.5	− 1.7	−38.7	6	−23	22	− 3	37	18	73	45.7	69.3	60	68	54	83.5	50.8	81	52.1
26	32.8	16.4	12	1.7	8.3	− 3	5.7	− 5.6	8.4	− 1.3	16	− 6.3	35.3	15.5	88.3	54.5	75.8	58.2	72	46	77.5	57.8	58.5	42.5
27	27.3	18.3	3.3	− 9.7	17.3	−10	1.3	− 2.4	4.3	−12.4	10.5	− 4	47.6	27.2	61.3	51	75	59.3	77.5	49.7	71	59.1	68.8	35.5
28	28.5	− 1	− 4.5	−21.3	21.4	2.4	− 1.5	− 7.3	27	−19.6	18.2	−12	54.6	29.3	63.2	46.3	64.9	51	75.2	53	69	64.1	67.0	33.1
29	35	24	− 5.3	−25.5	12.4	−11.3	− 5.4	−30.1	.....	.....	26.3	− 1.5	67	37.4	67.5	50	75	49.8	77.2	55.1	72	55.5	62.5	29.1
30	26	10	3.3	− 6.3	14.2	− 3.4	−12.4	−31.2	.....	.....	15	− 6.2	69.5	37.2	67.8	47	83.3	56.5	85.3	54.3	78	47.1	74.5	35.1
31	24.8	9.4	.....	.....	29	7.3	− 5.3	−28.5	.....	.....	30	− 1	.....	.....	61.5	43.3	.....	.....	73	51	76	60.9	.....	.....
Range	77°.5		63°.8		56°.3		70°.7		64°.1		66°.2		87°.5		68°.3		63°.5		45°.8		.....		60°	
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

* Maximum and minimum not forwarded from station.

Maximum, minimum, and mean temperatures—Continued.

FORT GIBSON, IND. T.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	67	51	63	28	68	62	59	36	32	27	54	42	48	32	80	61	90	67	83	69	98	74	98	65.5
2	75	48	57	45	69	62	64	40	39	23	72	41	60	31	80	59	83	67	90	67	88	70	98	74
3	81	55	63	36	80	23	76	60	50	22	78	43	70	33	57	51	91	68	92	67	98	70	89	64
4	83	56	65	48	29	14	69	12	55	33	64	37	76	50	59	46	91	69	92	67	101	77	89	59
5	86	54	64	43	43	24	39	11	50	37	59	51	46	38	68	49	92	70	85	69	105	80	91	61
6	57	40	67	34	38	30	43	19	45	26	67	42	58	36	75	40	92	67	91	71	105	75	93	73
7	67	34	68	46	53	37	51	20	52	23	55	29	48	41	83	45	94	69	96	71	106	75	82	73
8	72	45	70	44	58	47	54	20	56	35	64	35	47	42	80	58	90	70	98	75	104	74	81	70
9	80	53	72	38	48	37	55	30	51	31	64	48	51	36	78	60	90	73	88	73	105	75	82	69
10	82	58	78	37	65	50	59	31	57	26	60	38	65	30	70	58	87	69	90	71	105	83	84	71
11	80	56	67	38	70	55	48	33	65	41	52	36	73	43	77	60	83	62	89	69.5	104	82	86	71
12	75	42	45	30	67	31	42	31	69	47	59	30	70	42	78	56	78	58	90	65	104	76	91	69
13	76	48	60	23	41	25.5	42	23	47	26	60	36	75	51	82	56	85	58	94	73	103	76	91	69
14	77	53	67	28	48	20	28	14	57	29	51	43	75	51	85	60	91	63	94	71	101	72	87	64
15	78	55	72	49	55	31	31	13	61	46	51	43	54	33	80	61	84	64	89	69	96	79	73	53
16	77	62	68	48	66	41	42	22	58	38	66	46	46	41	76	64	85	64	91	69	97	75	77	54
17	68	65	77	36	55	31	44	29	43	33	73	54	54	36	86	52	87	61	92.5	72	101	75	86	62
18	60	45	43	30	55	29	60	39	53	37	73	50	56	44	84	53	91	66	94	71	95	74	91	66
19	62	33	43	22	43	27	55	26	55	36	55	39	56	48	80	53	91	65	96	71	94	71	74	52
20	68	35	58	30	39	22	54	22	50	36	64	38	53	43	89	66	93	65	97	73	96	72	77	49
21	74	42	62	35	43	30	65	48	45	34	71	52	60	41	88	61	92	70	100	76	94	72	67	53
22	58	38	64	53	39	25	58	31	36	28	63	41	52	41	89	62	92	71	98	74	101	72	72	57
23	53	26	53	39	39	33	43	24	38	20	63	47	55	41	91	64	90	69	101	79	90.5	72	67	62
24	60	33	55	35	40	35	42	29	44	24	57	34	62	35	91	65	89	72	102.5	75	97	67	80	61
25	61	45	52	36	38	29	49	24	36	18	67	41	68	40	94	68	90	73	104	81	100	75	82	63
26	56	36	68	39	48	28	44	39	53	21	69	48	82	46	92	66	93	75	102	78	99	73	82	62
27	59	20	45	27	33	23	59	40	57	34	48	36	77	46	90	68	93	75	96	73	97	79	78	43
28	39	20	44	26	48	19	51	30	51	45	58	31	60	46	79	67	93	74	96	92	100.5	79	76	45
29	59	18	54	28	44	27	62	32	..	..	68	47	70	38	81	67	85	70	91	64	100.5	73	84	45
30	64	28	68	44	42	15	43	29	..	..	58	52	79	54	89	68	89	69	93	66	93	71	87	51
31	45	24	.....	.....	52	28	42	30	..	..	51	34	..	..	91	67	..	..	99	67	91	66	..	..
Range	68°		56°		66°		65°		51°		49°		52°		54°		36°		40°		40°		55°	
Monthly means	56°.9		49°.8		40°.6		39°.5		41°.3		52°.2		53°		70°.3		78°.6		83°.1		86°.1		71°.5	

Maximum, minimum, and mean temperatures—Continued.

FORT SULLY, DAK.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	67	28	53	17	19	13	47	23	30	11	65	27	54	28	73	55	62	57	90	59	91	57	82	65
2	56	31	46	33	13	−1	50	30	32	10	52	33	55	18	57	34	67	57	80	70	96	63	65	52
3	53	35.5	72	28	3	−9	30	−12	28	7	39	7	31	22	51	38	90	52	106	79	92	55	70	39
4	77	35.5	49	22	−2	−20	16	−16	28	−5	26	4	25	16	57	41	77	52	101	72	103	69	74	49
5	52	36	48	21	4	−27	40	13	30	16	39	7	51	16	70	42	79	52	105	71	91	67	94	55
6	76	26	58	21	18	−2	40	25	32	10	33	17	45	23	71	43	74	56	91	67	95	67	101	55
7	81	40	59	21	25	8	47	1	36	16	24	5	56	26	90	55	84	58	93	67	94	60	107	69
8	76	42	64	29	27	9	45	30	32	10	25	6	49	26	96	59	68	56	99	70	92	64	95	72
9	74	49	61	31	12	0	45	24	36	0	27	12	63	32	82	59	67	52	97	66	96	70	83	70
10	66	47	60	30	30	8	38	16	24	11	26	2	75	33	60	39	58	39	91	57	92	70	82	51
11	68.5	38.5	45	33	25	3	19	10	35	8	28	7	58	23	46	35	70	42	91	64	86	59	75	55
12	78	43	46	26	25	−3	25	−3	18	7	31	1	78	39	55	40	83	50	96	67	80	55	81	38
13	65	47	43	17	38	21	0	−11	19	3	43	18	67	43	52	38	76	56	98	63	94	57	77	49
14	61.5	35	67	21	27	8	2	−14	10	−3	57	34	51	36	59	47	64	57	94	67	99	63	65	39
15	56	40.5	61	43	28	2	13	−7	41	−1	64	29	55	22	70	43	79	56	86	55	102	68	82	41
16	50	41	56	40	30	5	33	3	34	14	60	43	63	25	71	50	97	63	93	73	93	64	74	55
17	50	38	61	33	23	6	50	24	56	25	44	32	61	35	73	46	98	65	94	60	78	57	65	42
18	47	35	33	18	25	12	40	−3	46	33	34	25	42	25	80	46	87	67	100	74	97	60	60	50
19	61	40	42	15	25	0	20	13	34	9	48	13	64	22	76	50	87	63	81	61	91	66	68	46
20	73	39	47	24	12	−19	35	7	43	7	42	28	47	28	78	48	101	67	71	59	100	66	71	45
21	56	29	41	20	19	−3	14	−1	14	−7	49	23	51	31	82	60	105	74	89	64	82	61	76	43
22	36	20	43	23	29	3	5	−10	22	6	40	20	45	26	91	63	111	75	102	67	94	63	83	46
23	39	14	49	26	41	16	12	−6	8	−9	38	10	60	23	98	62	97	73	97	65	88	59	91	45
24	28	16	50	30	30	10	20	−5	18	−10.5	65	18	63	42	77	62	99	75	101	73	85	58	91	50
25	28	22	38	23	44	21	22	−6	32	−4	49	20	60	32	93	53	100	69	85	62	91	59	85	54
26	41	11	46	16	32	8	48	6	41	14	20	4	49	37	101	74	100	77	78	52	93	68	72	47
27	36	19	21	8	32	4	38	15	54	22	31.5	11	64	39	99	66	80	57	87	61	93	63	60	51
28	40	11	29	1	33	14	44	8	58	22	34	19	81	33	96	62	76	55	97	59	86	65	66	45
29	52	38	25	4	27	4	43	−7	.....	.....	53	12	89	52	69	60	86	61	99	66	89	62	72	52
30	44	16	22	12	23	1	5	−13	.....	.....	38	17	93	49	74	61	80	60	106	65	95	57	67	44
31	37	5	.....	.....	46	13	15	−8	.....	.....	49	13	.....	.....	82	54	.....	.....	88	69	103	72	.....	.....
Range	72°		71°		73°		66°		68°.5		64°		77°		67°		72°		54°		48°		69°	
Monthly means	44°.1		35°.1		14°.9		16°.1		20°.3		27°.7		43°.9		63°.2		70°.2		79°.2		76°.1		65°.2	

Maximum, minimum, and mean temperatures—Continued.

GALVESTON, TEX.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	73	93	81	91	80	91	80
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	74	96	75	91	81	90	79
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	76	91	77	91	79	88	76
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	76	89	74	94	80	83	74
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	76	89	74	94.5	80	84	75
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	76	88	80	92	80	87	76
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	77	92	80	92	80	88	79
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	78	90	79	94	81	88	81
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	78	90	80	93	82	88	80
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*80	71	88	78	88	81	92	82	87	80
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	72	90	78	87	76	93	82	86	74
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	71	91	78	90	74	93.5	82	87	77
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	68	91	77	90	79	94	83	86	78
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	69	91	80	87	78	98.5	80	86	77
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	69	91	80	82	76	96	79.5	83	74
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	71	90	78	84	72	92	79	85	73
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	70	89	77	87	72	92	80	87	76
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	70	83	78	89	77	89	78	88	80
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	71	84	78	90	78	87	74	82	73
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	71	89	77	90	78	83	75	85	73
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	71	92	76	91	80	89	77	83	73
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	72	90	77	90	79	92	82	84	78
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	73	84	76	90	79	85	79	84	72
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	74	87	78	90	81	84	74	83	74
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	74	90	79	90	80	90	80	80	75
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	76	90	80	90	81	91	79	84	75
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	74	89	80	90	78	91	81	85	73
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	75	90	79	95	76	90	80	75	70
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	75	92	80	89	81	90	81	75	66
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	77	92	81	93	81	93	79	77	66
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	73	.....	.....	92	80	92	81	.....	.....
Range	.....		.....		.....		.....		.....		.....		.....		.....		20°		23°		24°.5		25°	
Monthly means	70°		62°.6		58°		55°		58°		67°		66°		75°		81°.7		82°.5		84°.4		79°.5	

* Station supplied with maximum and minimum thermometers May 10, 1874.

Maximum, minimum, and mean temperatures—Continued.

GENEVA, N. Y., (HOBART COLLEGE OBSERVATORY.)

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	65	35	49	35	28	8	42	30	.....	.....	52	20	53	20	.....	.....	85	42	.....	.....	.....	.....	.....	.....
2	57	34	54	25	40	18	43	36	.....	.....	53	38	51	20	.....	.....	86	41	.....	.....	.....	.....	.....	.....
3	58	35	50	25	49	28	51	37	.....	.....	53	35	50	10	50	34	85	35	.....	.....	.....	.....	.....	.....
4	68	45	56	25	62	30	67	25	.....	.....	53	23	.....	.....	46	42	90	50	.....	.....	.....	.....	.....	.....
5	.....	.....	56	25	35	23	30	22	.....	.....	30	11	47	25	65	31	85	63	.....	.....	.....	.....	.....	.....
6	.....	.....	47	25	33	19	40	24	.....	.....	44	30	49	25	50	33	87	64	.....	.....	.....	.....	.....	.....
7	.....	.....	48	23	38	17	43	38	.....	.....	42	35	50	30	45	29	86	59	.....	.....	.....	.....	.....	.....
8	.....	.....	50	31	40	28	43	33	26	− 5	37	30	50	25	62	36	90	64	.....	.....	.....	.....	.....	.....
9	.....	.....	48	27	50	37	43	30	34	0	30	12	48	32	84	43	85	54	.....	.....	.....	.....	.....	.....
10	.....	.....	46	24	49	34	43	26	27	13	25	15	47	12	.....	.....	89	53	.....	.....	.....	.....	.....	.....
11	.....	.....	42	27	51	30	40	34	35	17	25	17	49	12	.....	.....	86	59	.....	.....	.....	.....	.....	.....
12	53	40	46	28	50	28	43	20	45	24	25	5	49	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	54	47	36	20	39	20	33	17	35	0	20	7	50	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
14	64	43	32	18	40	18	32	6	32	18	31	17	45	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15	64	36	40	22	39	19	46	3	40	20	40	15	60	37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	75	47	42	22	46	26	20	5	40	20	45	27	43	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17	60	41	34	26	46	30	30	5	25	8	50	40	35	30	85	45	.....	.....	.....	.....	.....	.....	.....	.....
18	62	51	42	27	48	22	37	21	35	10	62	47	49	32	90	47	.....	.....	.....	.....	.....	.....	.....	.....
19	50	40	42	26	39	29	40	24	38	10	60	39	49	32	59	40	.....	.....	.....	.....	.....	.....	.....	.....
20	43	35	46	18	40	24	26	14	40	32	50	20	58	35	52	40	.....	.....	.....	.....	.....	.....	.....	.....
21	51	41	32	18	33	23	41	21	43	28	50	25	47	30	49	41	.....	.....	.....	.....	.....	.....	.....	.....
22	60	43	39	26	53	14	53	40	43	28	50	25	54	31	62	47	.....	.....	.....	.....	.....	.....	.....	.....
23	66	42	40	25	29	10	60	24	57	28	40	20	49	29	60	49	.....	.....	.....	.....	.....	.....	.....	.....
24	53	34	40	25	33	10	37	7	50	28	40	20	40	25	70	50	.....	.....	.....	.....	.....	.....	.....	.....
25	51	31	40	15	35	29	(*)	.....	(*)	.....	31	19	39	21	74	53	.....	.....	.....	.....	.....	.....	.....	.....
26	53	31	25	7	38	25	15	− 9	30	15	55	25	.....	.....	73	50	.....	.....	.....	.....	.....	.....	.....	.....
27	57	40	38	18	37	24	37	10	43	18	50	37	.....	.....	79	.....	.....	.....	.....	.....	.....	.....	.....	.....
28	48	32	34	16	37	18	(*)	.....	41	20	40	34	.....	.....	87	45	.....	.....	.....	.....	.....	.....	.....	.....
29	41	37	34	16	37	11	(*)	.....	.....	.....	39	19	.....	.....	85	50	.....	.....	.....	.....	.....	.....	.....	.....
30	46	37	39	10	38	11	28	9	.....	.....	42	18	.....	.....	89	52	.....	.....	.....	.....	.....	.....	.....	.....
31	50	28	.....	.....	35	20	(*)	.....	.....	.....	37	20	.....	.....	88	58	.....	.....	.....	.....	.....	.....	.....	.....
Range	.....		49°		54°		.....		.....		57°		.....		.....		.....		.....		.....		.....	
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

* Observer sick.

Maximum, minimum, and mean temperatures—Continued.

GRAND HAVEN, MICH.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April.* Max.	1874. April.* Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	58	36	44	34	32	23	44	37	22	6	41	36	37	17	52	35	61	47	77	64	77	64	.....	.....
2	61	32	47	38	55	32	45	39	20	10	47	36	40	30	56	40	68	46	71	59	68	58	.....	.....
3	53	42	42	33	58	48	56	44	32	6	44	31	32	18	59	36	70	55	81	55	66	51	.....	.....
4	56	48	51	35	38	19	54	25	36	28	31	20	26	9	57	45	82	52	82	69	71	53	.....	.....
5	56	42	37	27	27	19	31	22	29	18	43	22	30	21	55	40	70	56	82	58	65	56	.....	.....
6	45	33	44	22	28	16	30	18	24	19	40	34	40	30	50	41	75	56	81	66	75	58	.....	.....
7	55	28	53	36	36	24	35	22	31	16	39	31	38	28	60	37	70	54	85	66	75	61	.....	.....
8	58	37	45	35	47	32	40	28	35	21	31	22	45	26	70	47	77	54	80	68	71	60	.....	.....
9	71	37	40	34	43	33	41	32	28	23	30	22	40	16	72	55	72	55	78	68	78	61	81	64
10	68	55	39	31	38	33	36	30	33	17	28	17	45	26	75	54	67	52	81	59	76	63	80	63
11	59	45	37	31	46	34	31	23	31	4	25	17	36	25	76	56	67	52	75	57	91	66	78	59
12	49	36	31	24	37	33	29	20	51	25	24	16	44	21	66	56	55	45	73	52	83	69	80	62
13	59	32	32	24	33	29	27	24	44	28	26	18	69	32	58	47	67	41	81	50	75	64	76	65
14	59	40	37	23	39	32	25	11	37	23	36	15	57	43	68	45	78	54	89	63	70	56	82	64
15	68	43	46	35	40	34	13	10	41	35	49	31	38	29	62	46	68	57	79	65	74	56	69	51
16	60	55	45	37	41	37	25	13	36	18	53	34	41	25	52	42	67	54	67	55	78	54	63	43
17	67	50	44	36	43	35	34	16	28	18	57	38	46	30	52	39	72	54	77	52	78	67	70	47
18	53	47	37	26	36	32	37	30	35	16	52	35	51	27	52	36	74	57	84	60	78	61	74	58
19	50	35	26	21	35	26	39	25	38	38	44	33	52	35	54	38	80	59	83	68	85	59	70	56
20	46	30	30	22	25	21	33	21	37	28	42	31	46	34	62	43	81	61	71	61	79	59	60	52
21	41	38	40	23	35	21	42	33	39	27	42	33	45	34	57	45	83	60	77	52	81	63	64	43
22	56	38	42	29	34	24	41	29	37	30	43	29	46	34	65	39	83	62	77	55	75	59	65	52
23	42	33	35	29	41	21	30	24	33	23	29	17	41	26	71	54	83	69	82	58	(*)	(*)	68	51
24	50	41	39	26	39	28	26	14	24	17	33	19	43	23	76	58	84	68	86	71	.....	.....	70	57
25	46	38	31	27	39	31	20	12	25	14	39	33	51	30	59	49	80	66	85	68	.....	.....	76	54
26	46	37	32	26	38	32	38	14	32	14	40	27	42	34	57	43	81	66	78	64	.....	.....	72	60
27	43	34	33	26	34	29	39	34	33	26	37	23	50	34	82	43	88	63	74	55	.....	.....	63	56
28	38	30	30	23	36	29	34	26	39	26	31	25	47	34	82	66	84	68	73	56	.....	.....	59	52
29	36	28	32	19	35	20	32	20	.....	.....	36	22	42	28	79	61	72	62	73	58	.....	.....	62	48
30	41	30	28	20	36	21	20	11	.....	.....	40	29	50	37	81	63	75	55	76	61	.....	.....	56	42
31	40	30	.....	.....	39	33	20	6	.....	.....	31	21	.....	.....	73	57	.....	.....	80	63	.....	.....	.....	.....
Range	43°		32°		42°		50°		47°		42°		66°		47°		47°		39°		.....		.....	
Monthly means	46°.9		33°.3		34°.		28°.4		27°.6		32°.2		36°.3		56°.6		65°.9		70°.4		68°.4		63°.9	

* Maximum and minimum thermometers broken.

Maximum, minimum, and mean temperatures—Continued.

HALIFAX, NOVA SCOTIA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	58.9	37	59.2	37.6	15.4	3.9	41.1	25	16	− 6.3	29.9	− 9	34.9	7.2	49.5	32.2	57	50.5	68	47.8	76	55.1	75.3	52.8
2	65.2	37.3	53.8	34.2	23	5	41.2	32.5	7.1	−11.3	45.3	22.8	29.8	18	55	30	57.8	38	61	47.2	74.5	60	71	51.1
3	58.6	35	56.4	38.9	47	18.8	41.2	33.6	30	− 9.9	50.4	28.8	35	27.2	45.2	33.5	68.8	36.5	54	43.3	78.8	54	76	55
4	58	35	45	28.5	53.9	39.1	47.2	33.3	33.1	19.7	47.9	37.8	38.9	16.2	65.3	38.3	64	43.5	60.9	47.1	67	49	69	48.1
5	60	46	56.9	26.4	53.9	33	47.8	33.1	22.9	4	45.1	27.3	35.3	8.9	56.3	30.5	54	47	54.2	48.8	73	47.5	74.8	45.7
6	70.8	51.3	33.5	21.8	34.1	16.2	33.7	21.6	10.3	− 3.3	28	19.3	41	25.2	61.8	34.5	63.8	46.8	70.6	47.9	57.8	53	67.5	46.4
7	66	50.1	37.6	18.2	29.5	12.8	48.8	28.8	19.5	− 8	39.7	18.6	40.2	28.2	52.7	31	60.6	46	69.9	50.5	77	51.3	65.7	59.7
8	61	47.3	56.2	24.9	27.2	16.4	51	40.6	22.8	−11.5	36.7	31.2	37.8	25	53.1	32	61.3	45	73.8	49.8	77.1	51.3	71.1	54.8
9	56.8	41.4	42.8	38.9	43.3	18.3	51	37.9	33.6	8.4	34	27.3	39	30.4	59.3	33	58.8	41.8	83.8	53.9	70.5	56.8	73.6	50.2
10	63.9	38.4	34.3	29.3	40.3	13.9	42	32.9	35	13.5	32	27.1	33.5	27.2	58.5	36.1	62.4	39.8	86	52.2	65.2	56.5	79.8	50.4
11	61	42.1	28	26.8	26	10.3	37	33	30	19.9	42	30	41.5	25.5	57.9	35	68	43.5	80.8	57	85.7	57	65	43.9
12	60.1	53.9	51	39	39.2	23	29.8	26.8	29.8	9.8	28.9	22.3	35.1	18.9	68.7	35.9	51.5	44.5	82.8	60	82	57.8	61.3	46.1
13	65.7	41.3	43.8	37.4	32.8	34	22.8	15.9	38.3	1.5	26.6	22	37.5	13.5	73.6	42	73.8	45.3	74	56	81.2	59	69.6	42
14	53.9	36.6	31.1	24.8	31.1	15.8	39	27	46.2	33	40.6	32.7	46	20.1	81.6	43.5	70.1	46.3	78.1	59.9	63.4	58	76	41
15	57.1	40.1	25	22.7	17.8	− 1.3	22.2	14.8	34.7	25	46.1	26	53.8	31.2	69.8	39	79.2	44.9	85.5	58.8	66.7	56	74.9	49.9
16	58.2	33.3	31.1	21.7	39.1	− 2.9	13.7	9	34.5	24.9	48.8	25.6	53	34.9	59	35.5	64.8	43.9	83.3	58.3	79.7	50	71.9	51
17	53	37.9	38.9	24.1	42.2	33.3	15.2	10.2	39.6	23	52.2	24.9	46.5	28.5	63	40.9	58.5	48.4	72.7	57	78.8	48	65.1	52.2
18	55.5	29.8	54	31.6	39.3	33.3	35.4	8.2	27	14.5	41.5	26	49.9	28.1	59.4	46.5	54	49.9	75.9	55.1	73.7	52	59.8	49.2
19	68.4	38.7	46.2	36.1	37.2	27.5	49.7	27	34	8.6	46.4	37.3	44.7	27.1	51.2	43.5	51.9	48.2	81	49.1	78.9	53	57.7	49.4
20	63.3	45	36.6	26	34.5	26.1	43.2	10	42.6	29.3	50.5	26	51	31	58.3	41.5	55.6	45.5	72.2	51.3	66.2	49.8	63.1	55.9
21	53.8	51.1	32.7	21.7	28.7	11.7	27.1	6.3	38	29.5	41	21.1	37.5	28.6	72.8	40.6	60	48.3	73	55.9	82.2	55.3	69.4	58.8
22	55.3	51.4	45.3	25.3	25	3.8	38	27.1	38	26.2	42.2	25.4	42.8	26.9	56	42.5	74.3	50.3	82.8	57.3	74.9	51.9	69.4	47.6
23	66.4	41.4	31.3	20.2	24	2.3	45.2	33.9	32	22	30.8	19	50.3	25.8	62.5	42	73.8	53.1	76.9	52.2	74.9	45.1	64.5	41
24	65.3	37.8	32.8	15.2	29.6	8	43.1	20.1	34.5	15	29.7	10	49.5	32.7	69.5	36	71.8	47	82.2	51.1	73.5	45.1	71.1	40
25	60.2	37	42.1	31.7	32.6	13.2	26.5	13.7	25.6	9.3	32.2	7.3	51.9	28.5	53.3	36	65	42.5	83.8	50	73.1	43.6	69.1	43.2
26	52	31.5	33.3	23	22.9	− 0.3	14.2	−14.8	19	− 1	54.5	31.4	35.2	32	56.3	45	73.8	46	79	49	71.5	51.5	70.6	43.8
27	59.2	30.4	30.8	15	28.6	19.2	24.9	−15.8	37.2	− 5	44.5	24	49.5	31	74.3	44.5	78.9	44	77.8	52.5	71.8	47.5	70.3	43.4
28	60	51.1	43.7	24	44	20	44.6	24.9	24.5	1	32	20.3	53.8	29.9	74.3	47.5	78.8	55.4	79	60.4	72.9	48	64.9	54.6
29	56.3	40	24.5	16.2	37.3	23.8	42.1	16.4	.....	.....	41.8	17.1	44.6	31.9	64.5	45.5	62	49.9	85.2	60.5	71.3	55.2	69.8	58.0
30	52.2	34	21.2	6.8	39.5	20.1	28.3	− 1.9	.....	.....	33.8	16.2	45.5	32	71	39.5	55	46.4	69	61.5	67.9	56.1	72.9	54.6
31	57	36.5	.....	.....	29.3	13.8	14.2	− 7.2	.....	.....	42.8	16.1	.....	.....	68.7	46	.....	.....	83	55.8	70	52	.....	.....
Range	41°		52°.4		56°.8		66°.8		57°.7		63°.5		46.6		51°.6		42°.7		42°.7		42°.1		36°	
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Maximum, minimum, and mean temperatures—Continued.

INDIANAPOLIS, IND.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	58	85	64	84	69	84	59
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	58	84	66	81	59	83	60
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	65	88	61	80	57	82	64
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	66	96	70	82	56	82	63
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	68	91	73	82	62	75	62
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	69	95	70	85	69	83	56
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	72	97	74	85	72	88	61
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*80	54	94	76	91	76	83	64	88	64
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	61	92	73	93	73	90	65	90	62
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	61	89	67	86	70	88	66	88	64
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	61	84	62	77	66	95	74	86	57
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	61	68	56	83	62	93	77	87	59
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	60	75	50	89	66	92	69	90	60
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	56	82	62	92	71	82	66	86	66
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	60	81	68	88	72	82	60	76	60
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	54	78	62	78	64	87	59.8	67	54
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	52	82	60	81	56	89	61	72	58
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	42	87	65	89	60	92	68	83	61
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	40	90	66	91	72	92	68	75	57
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	51	90	67	83	75	92	68	68	47
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	44	92	66	78	67	88	73	68	42
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	42	91	61	83	62	78	70	74	44
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	58	93	70	89	68	78	68	78	42
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	54	95	75	95	71	78	59	79	55
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	67	88	66	91	71	81	60	81	66
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	56	90	67	95	77	82	61	74	66
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	56	94	72	79	67	80	62	71	55
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	64	96	73	77	60	74	64	64	52
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	64	82	70	81	58	75	65	71	41
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	70	83	64	84	60	80	61	64	.46
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	68	.....	.....	87	66	81	63	.....	.....
Range	.....		.....		.....		.....		.....		.....		.....		.....		46°		39°		39°		49°	
Monthly means	51°		37°.5		37°.6		35°.6		36°		42°.2		45°.6		66°.2		77°.4		78°.5		75°.9		69°.6	

* Station supplied with maximum and minimum thermometers May 8, 1874.

Maximum, minimum, and mean temperatures—Continued.

INDIANOLA, TEXAS.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	79.5	71	72.5	61.5	76	63.5	71	52.5	52	39.5	75.5	65	64.5	41	79	65	91	70	90.5	76.5	93	78.5	88.5	79
2	81.5	73.5	76.5	63.5	76.5	66	74	(†)	50.5	36	75	62	66.5	49.5	78.5	69.5	88	72	93.5	73	94	78.5	87.5	77.5
3	(*)	.....	64.5	62	76	57.5	74.5	.....	54.5	45.5	76	67.5	72	51	81	71	88.5	73	90.5	71	94	78	88	71
4	.....	.....	67	59	58.5	47	66	.....	57	52.5	72	67	76.5	60	75	56	89	73	87.5	71	94	78.5	80	70
5	.....	.....	65.5	60	59	52	45	.....	69.5	56	75.5	68	83	69	77	56	89	74	88	74	95	77.5	75	70
6	78.5	65	70	58.5	76.5	59	51	.....	57.5	48	80	68	81	71	75.5	61	88	75	90.5	78.5	92.5	77	83	76
7	68	55	74	55.5	78.5	65	52	.....	60	42.5	70	56.5	79.5	72	77	60	90	76.5	90	78	93	78	87	72.5
8	77	61.5	77	58	77.5	66	64.5	.....	63.5	43	65.5	60.5	73	52	78	64	89	77	93	76.5	90.5	78.5	87.5	78
9	85	68.5	75	60	72.5	66	64.5	.....	60	46.5	71	64	62	48	81	68	89.5	77.5	92	77.5	95	79	87	78
10	81	72.5	71.5	59.5	69.5	66	69	.....	64.5	51	78	66	67	49	81.5	70	90	77	91	78.5	95	79.5	88	75.5
11	80	70	75	59	78	66	74	.....	70.5	58	70	45	69	53.5	82	71	89.5	78	95.5	76.5	94	79	88.5	76.5
12	84.5	70	65.5	53.5	77	54	74.5	.....	71.5	61.5	59	50	75.5	62	77.5	71	90	75	92	77.5	88.5	80	85	74.5
13	80	71.5	62	48.5	56.5	44	73.5	.....	71.5	62	63.5	57	79	67.5	81.5	68	87.5	76.5	91.5	77	93	80	84.5	76.5
14	85.5	75.5	75	55.5	54.5	46	64	.....	63.5	55.5	69	59	81.5	68.5	82.5	68	91	76	92.5	77.5	97.5	76.5	87.5	74.5
15	82	73.5	77	68.5	58.5	47.5	43.5	.....	73.5	61	76	59	81	68	86	68	92.4	77	93	73	100	76	79	73.5
16	82	73.5	80.5	66	64	55.5	42	.....	74	64	79	67	74	58	83.5	66	87.5	77	80	71	91	74	82	69.5
17	85	74.5	74	52	77	62	51	.....	70	59.5	79	66	69	56	81	68	86	76	84	72	91	74.5	89.5	74.5
18	77	66.5	67.5	54.5	75	63.5	68.5	.....	65.5	48	78	68.5	71.5	55	87.5	67.5	86	72	83	75	88.5	73	88	79
19	70	54.5	56	42.5	64	53	73.5	.....	73.5	61.5	77	71	74	53	89	66	86.5	78	86	74	87.5	76	83	69
20	75.5	51	70.5	48.5	59	49.5	73.5	.....	75.5	65.5	76	60	81	61	90.5	70	90	73	86	74	82.5	73	82	71
21	78	57	71.5	59.5	62	50.5	73	.....	70.5	59.5	78.5	68	76	66	88	69	89.5	78	86	77.5	88	78.5	81	70
22	82.5	54	78	67.5	56.5	43	74.5	.....	73.5	48	76	63	80	66.5	89.5	70	82	75	85	76.5	88	80	86	70
23	60.5	46	79	61.5	48.5	42	61	.....	53	39.5	70.5	56	70	50	88	71	84.5	72	91	77.5	87.5	78	86	71
24	66.5	53.5	61.5	51	49.5	40.5	61	.....	53	45	62.5	49	59.5	50	87	73	81	70	92	77.5	88	73	82	68.5
25	81	63	60.5	52	54	41.5	53.5	.....	58.5	44	63	57.5	74	54	83.5	73.5	88	70	91	79	92	78	80	72
26	81	72.5	58.5	55	62.5	42.5	61.5	51	60.5	54	71	60	78.5	60	83	72	88	76	90	78.5	92.5	78	86	73.5
27	74.5	52.5	70.5	51.5	56.5	40.5	63.5	51.5	75.5	55.5	77.5	64.5	78	63.5	88	71	88.5	76.5	93.5	77	93	78	85	74
28	59.5	49.5	60.5	48.5	62	45	62	52.5	76.5	65	79	68	78	64.5	86.5	75.5	88	76	97.5	73.5	93	77.5	80.5	66
29	59	46	63.5	47.5	71	55	63.5	47	.....	.....	80.5	68.5	69	60	82	72	91	76	93	74	93.5	78	78	65
30	64.5	54.5	75.5	60	59.5	44	63.5	52	.....	.....	80	70	76	58.5	86	75	90	76	93.5	78	96	79	78.5	66
31	66.5	58.5	.....	.....	59.5	47.5	67.5	60	.....	.....	81.5	64.5	.....	.....	86	72	.....	.....	94	78	95	78.5	.....	.....
Range	.....	.....	38°		38°		.....	.....	40°.5		31°.5		42°		34°.5		22°.4		26°.5		27°		24°.5	
Monthly means	70°.1		63°		58°.3		55°.5		58°.4		67°.3		66°.1		74°.9		81°.2		82°.3		84°.3		79°.2	

* Observer sick.

† Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

ISLAND OF SAINT PAUL, BEHRING SEA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	45	41	38	33	40	36	35	18	36	33	37	35	38	32	37	25	41	35	50	44	.....	.....	.....	.....
2	46	41	41	37	40	34	37	32	35	31	36	31	39	34	38	33	42	34	48	44	.....	.....	.....	.....
3	45	39	40	38	34	30	34	30	33	29	33	30	40	33	38	31	44	35	54	43	.....	.....	.....	.....
4	43	39	39	35	38	30	34	31	34	25	30	23	42	33	38	34	49	36	49	45	.....	.....	.....	.....
5	41	38	40	36	37	30	31	27	34	32	28	21	41	34	45	35	52	39	.....	.....	.....	.....	.....	.....
6	44	34	37	34	40	37	27	8	37	31	39	27	43	34	42	36	51	42	.....	.....	.....	.....	.....	.....
7	37	34	35	29	37	31	22	10	36	34	42	35	45	35	41	33	48	42	.....	.....	.....	.....	.....	.....
8	36	33	29	25	38	29	19	13	36	27	40	35	41	35	40	35	49	42	.....	.....	.....	.....	.....	.....
9	35	31	30	23	37	28	28	13	40	36	39	34	36	33	37	33	48	38	.....	.....	.....	.....	.....	.....
10	40	32	30	24	31	22	34	28	40	36	37	32	41	34	43	32	48	40	.....	.....	.....	.....	.....	.....
11	43	36	34	23	30	21	36	32	38	34	36	33	37	30	42	36	47	41	.....	.....	.....	.....	.....	.....
12	43	41	32	28	30	20	36	32	39	34	38	32	30	24	39	36	57	42	.....	.....	.....	.....	.....	.....
13	42	36	34	29	34	18	32	24	34	32	37	33	28	21	46	36	54	44	.....	.....	.....	.....	.....	.....
14	39	34	34	31	24	17	33	27	32	25	36	34	36	25	45	37	51	44	.....	.....	.....	.....	.....	.....
15	42	33	32	27	22	13	35	32	32	22	38	30	32	24	52	38	46	44	.....	.....	.....	.....	.....	.....
16	41	37	30	27	30	19	35	33	37	32	33	27	31	30	47	35	51	42	.....	.....	.....	.....	.....	.....
17	37	35	30	27	34	30	36	33	36	31	37	31	34	28	39	35	47	42	.....	.....	.....	.....	.....	.....
18	36	34	31	29	34	33	36	34	34	23	40	37	31	28	44	35	46	41	.....	.....	.....	.....	.....	.....
19	39	33	31	27	34	33	36	34	31	24	37	32	34	26	45	34	47	42	.....	.....	.....	.....	.....	.....
20	41	38	28	25	33	29	36	34	34	19	32	25	39	33	48	37	54	42	.....	.....	.....	.....	.....	.....
21	41	39	28	24	29	26	35	34	38	33	35	19	38	34	45	33	46	41	.....	.....	.....	.....	.....	.....
22	40	38	31	25	32	21	36	32	38	34	37	31	41	34	47	33	48	42	.....	.....	.....	.....	.....	.....
23	39	38	34	30	39	32	34	32	39	36	35	31	41	34	46	33	49	42	.....	.....	.....	.....	.....	.....
24	38	35	37	34	39	33	33	24	38	28	32	29	40	36	45	36	46	43	.....	.....	.....	.....	.....	.....
25	38	33	37	36	35	32	30	14	28	23	30	28	41	36	46	37	46	42	.....	.....	.....	.....	.....	.....
26	37	34	36	35	39	32	31	12	33	23	38	30	43	37	48	37	48	43	.....	.....	.....	.....	.....	.....
27	35	33	39	35	39	31	32	30	37	32	38	33	42	36	48	39	48	42	.....	.....	.....	.....	.....	.....
28	38	34	38	33	32	24	34	31	36	31	37	32	39	34	49	39	46	42	.....	.....	.....	.....	.....	.....
29	41	34	39	36	29	20	35	33	.....	.....	35	31	35	29	43	40	46	42	.....	.....	.....	.....	.....	.....
30	39	35	38	36	33	14	34	32	.....	.....	32	29	31	36	45	37	50	41	.....	.....	.....	.....	.....	.....
31	38	36	.....	.....	18	12	36	31	.....	.....	34	28	.....	.....	44	37	.....	.....	.....	.....	.....	.....	.....	.....
Range	15°		18°		28°		29°		21°		23°		24°		27°		23°		.....	.....	.....	.....	.....	.....
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....

Maximum, minimum, and mean temperatures—Continued

JACKSONVILLE, FLA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	74	48	76	55	85	65	82	52	96	73	86	70	90	72	83	71
2	.....	.....	.....	.....	.....	.....	.....	.....	74	60	64	53	75	60	85	58	97	74	87	70	97	74	81	72
3	.....	.....	.....	.....	.....	.....	.....	.....	67	51	70	46	69	51	86	69	95	72	87	70	94	75	85	71
4	.....	.....	.....	.....	.....	.....	.....	.....	63	45	80	53	74	46	84	68	83	72	88	69	95	76	84	70
5	.....	.....	.....	.....	.....	.....	.....	.....	62	44	79	56	72	51	76	58	91	72	92	71	86	74	86	71
6	.....	.....	.....	.....	.....	.....	.....	.....	72	54	79	57	85	57	72	56	92	75	88	75	85	70	86	69
7	.....	.....	.....	.....	.....	.....	.....	.....	65	50	81	66	86	66	77	52	93	74	85	71	89	70	87	79
8	.....	.....	.....	.....	.....	.....	.....	.....	57	45	74	51	88	66	78	54	96	74	86	71	93	70	83	72
9	.....	.....	.....	.....	.....	.....	.....	.....	60	41	71	47	84	65	79	54	98	77	88	73	96	78	89	69
10	.....	.....	.....	.....	.....	.....	.....	.....	58	40	74	43	68	51	79	61	99	77	87	72	90	73	82	66
11	.....	.....	.....	.....	.....	.....	*69	*41	65	37	72	52	64	47	80	66	97	74	90	73	93	70	81	67
12	.....	.....	.....	.....	.....	.....	68	45	69	43	67	50	71	46	80	63	91	71	89	69	100	70	85	64
13	.....	.....	.....	.....	.....	.....	57	43	75	51	67	45	74	62	76	67	92	70	93	71	95	73	83	69
14	.....	.....	.....	.....	.....	.....	60	44	77	61	62	37	78	58	77	67	88	68	88	72	89	73	87	72
15	.....	.....	.....	.....	.....	.....	56	36	68	54	69	51	84	63	85	64	90	73	86	71	90	71	87	73
16	.....	.....	.....	.....	.....	.....	46	35	76	56	81	61	86	66	87	69	92	74	88	70	85	71	91	71
17	.....	.....	.....	.....	.....	.....	44	37	72	47	86	64	79	64	86	67	92	72	90	69	84	68	92	73
18	.....	.....	.....	.....	.....	.....	55	40	56	47	85	64	78	65	87	65	89	70	89	72	87	69	91	72
19	.....	.....	.....	.....	.....	.....	67	50	55	45	85	65	85	65	79	65	87	70	87	72	85	73	89	72
20	.....	.....	.....	.....	.....	.....	71	46	67	49	84	65	87	70	87	65	87	72	83	71	89	74	91	71
21	.....	.....	.....	.....	.....	.....	74	56	81	53	84	62	89	69	91	65	84	72	86	70	90	73	89	68
22	.....	.....	.....	.....	.....	.....	77	56	77	57	85	64	89	64	81	66	83	71	92	73	93	74	85	75
23	.....	.....	.....	.....	.....	.....	77	60	80	57	76	62	89	68	85	65	82	74	90	73	95	73	85	73
24	.....	.....	.....	.....	.....	.....	69	54	70	53	64	48	91	67	91	66	91	69	86	71	93	74	83	69
25	.....	.....	.....	.....	.....	.....	57	39	73	51	66	54	80	60	95	72	96	73	86	69	90	70	80	72
26	.....	.....	.....	.....	.....	.....	56	38	60	41	72	62	78	53	95	73	95	75	88	70	83	70	83	73
27	.....	.....	.....	.....	.....	.....	67	38	70	44	78	57	81	49	98	72	95	70	87	75	82	73	83	70
28	.....	.....	.....	.....	.....	.....	69	54	72	46	83	60	84	60	88	73	83	73	89	74	83	66	79	69
29	.....	.....	.....	.....	.....	.....	58	46	.....	.....	84	63	64	49	88	69	87	72	88	74	88	67	77	56
30	.....	.....	.....	.....	.....	.....	64	42	.....	.....	84	63	76	42	94	65	81	73	90	77	94	73	80	56
31	.....	.....	.....	.....	.....	.....	71	44	.....	.....	87	63	.....	.....	94	72	.....	.....	87	74	93	73	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	44°		50°		49°		46°		31°		24°		34°		36°	
Monthly means	71°.6		59°.4		56°.4		55°.2		58°.8		66°.3		70°.3		75°.1		80°.6		79°.7		81°.5		77°.4	

* Station supplied with maximum and minimum thermometers January 11, 1874.

Maximum, minimum, and mean temperatures—Continued.

KEOKUK, IOWA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	70	45	44	24	60	36	48	37	23	20	46	39	42	24	78	53	78	61	91	72	82	69	84	61
2	69	41	57	39	65	59	47	36	30	22	59	39	43	32	65	49	77	53	92.5	71	82	63	88	66
3	63	56	46	25	37	15	65	34	31	20	54	33	57	33	50	42	86	65	98	71	82	60	71	59
4	60	51	60	40	24	11	19	10	28	13	44	26	37	24	53	43	92	64	100	75	83	61	64	56
5	62	40	46	30	26	17	24	5	29	12	46	32	36	26	67	46	78	64	101	79	81	60	76	52
6	51	32	54	30	32	24	31	10	36	28	53	42	43	27	73	49	85	64	99	80	80	63	89	62
7	61	39	62	48	38	29	38	15	33	17	37	26	42	26	78	50	86	64	99	81	83	67	89	68
8	69	44	65	34	49	26	41	27	37	26	36	19	51	31	82	60	92	74	89	70	88	67	89	73
9	75	52	58	41	32.5	22	38	30	33	12	40	29	44	28	82	65	84	67	88	68	91	69	87	67
10	71	59	55	35	43	35	38	25	46	28	37	29	59	34	72	58	83	58.5	90	72	99	78	88	67
11	69	51	52	36	43	36	21	13	47	32	40	25	65	34	74	58	71	58	82	66	99	80	89	67
12	62	39	34	25	35	23	27	11	59	29	30	20	59	31	79	63	71.5	51	85	58	96	75	88	67
13	73	46	41	22	31	19	27	11	32	20	35	15	65	49	79	59	71	56.5	87	69	86	75	81	66
14	76	49	43	21	39	22	8	− 5	44	25	39	28	58	46	80	62	70	59.5	93	72	83	64	80	53
15	73	50	64	39	46	31	8	− 8	41	33	47	37	50	36	68	54	78	64	87	71	85	65	64	45
16	70	61	53	41	50	36	27	8	43	30	48	41	40	33	71	49	81	61	83	63	90	63	70	48
17	69	56	45	35	47	35	40	21	33	28	68	48	53	33	67	55	87	64	87	64	91	65	77	54
18	55	43	33	16	37	32	41	38	37	22	61	39	61	41	67	46	88	67.5	91	64	92	68	75	66
19	51	37	26	11	29	25	33	28	42	32	45	32	53	44	78	53	90	68	97	73	94	75	67	55
20	52	35	42	20	18	8	39	29	34	19	56	35	48	43	72	54	92	70	80	68	93	76	67	46
21	59	37	48	26	28	11	41	37	33	31	50	34	51	42	70	50	93	69	74	64	96	77	70	55
22	48	32	47	30	39	24	39	26	39	29	52	32	52	37	73	52	94	72	80	63	87	67	76	55
23	49	26	35	32	39	33	24	13	21	19	32	21	44	31	80	59	95	74	91	69	77	64	79	54
24	54	36	48	30	38	35	24	1	18	− 1	41	20	54	35	92	69	94	77	92	76	79	63	76	58
25	56	37	36	31	35	34	36	16	23	10	51	35	57	41	82	63	92	76	97	80	82	63	72	65
26	45	36	55	30	34	26	47	35	37	20	47	29	56	40	86	61	94	76.5	91	71	78	61	73	58
27	40	30	29	22	26	19	44	27	41	18	38	23	54	38	92	69	94	78	80	65	72	65	61	50
28	34	24	27	13	39	16	35	21	45	35	44	27	51	34	91	69	95	74.5	79	62	76	68	69	46
29	41	23	38	23	25	19	49	33	.....	.....	47	30	59	42	87	68	84	65	86	67	83	68	75	54
30	46	27	42	25	36	15	35	19	.....	.....	48	40	76	46	91	70	88	65	91	74	79	68	69	49
31	36	20	.....	.....	44	32	25	16	.....	.....	41	28	.....	.....	84	71	.....	.....	86	69	79	61	.....	.....
Range	56°		54°		57°		73°		60°		53°		52°		50°		44°		43°		39°		44°	
Monthly means	49°.8		38°.9		32°		27°.8		29°.4		38°.3		44°.6		67°.2		78°.7		80°.5		76°.8		67°.1	

Maximum, minimum, and mean temperatures—Continued.

KEY WEST, FLA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	86	76	73	69	75	71	68	60	82	71	89	71.5	86	76	83.5	69	93	77	91	78	93.5	81.5	89	76
2	85	77	82	71	80	71	70.5	64	79.5	70.5	80	70.5	88.5	70	85	74	90	78.5	89	74	95	81	88	75
3	84	76	82	71	80	73	74	65	81	71	75.5	65.5	82	72	86.5	76	88.5	77	88	77	94	81	88	79
4	84	76	84	76	76	72	73	67	78.5	69	83	66.3	87	75	87	77	87.5	76.5	92	79	92	81	87	79
5	83	77	84	76	81	73	75	65	78	69	81.5	68	86	74.5	83	74	91	78	90	76	90	80	87	77
6	82	76	84	76	80	72	80	67	80.5	70	82	72.5	86	77	80	71	92	77	94	77	88	81	87	75
7	79	70	87	76	79	71	72	63	83	70	84	73	86	76.5	80	68.5	88	79	90	80	90	79	88	79
8	78	65	79	74	77	71	67	58.5	78	69.5	81	71	87	77	79.5	56	93	79	92	77	92	80	90	77
9	80	72	78	73	79	71	65	56	71	60.5	75.5	68	87	77	79	69	88	79	91	77	90	81	86	75
10	81	73	75	72	78	71	71	57	64	58	76.5	67	81	70	82	71	90	77	91	80	91	76	81	75
11	82	73	80	72	77	69	73	62	70	61.5	82	66.5	74.5	66	84	71	88	78	91	79	92	79	87	75
12	82	73	82	72	80	70	74	64	78.5	62.5	76	70	79.5	69	86	72	92	79	90	79	91	81	82	74
13	83	73	72	63	82	73	74	66	81.1	70.8	75	68	79	67	86	73.5	87	74	88	78	87.5	77.5	83	74
14	82	74	66	60	75	68	74	66	80.8	71	79	69	80.5	71	90	73	82	74	86	77	93	78	89	76.5
15	82	73	72	64	74	68	69	61	85.2	70	82.5	73	83	73	90	74	87	78	89	76	89	79	89	79
16	83	75	77	65	74	69	69.5	62	84.5	70	82	73	83	73	87	75	88	79	90	79	90	79	87	79
17	82	75	77	69	72	68	72	65	81.5	71	83	73	85	76	87	72.5	89	78	88	78	91	78	89.5	78
18	81	75	79	69	72	68	72	64	84	73	82.5	73	85	75.5	87	75.5	90	79	86	77	92	80	90	80
19	80	75	75	63	74	68	72	65	82	72.5	84	73	85	75	89	75	91	79	92	77	87	80	90	81
20	76	67	65	54	74	68	76	67	82	72.2	84.5	74	87	76	89.5	75	90	79	86	78	84	76	89	78
21	72	66	66	52	74	65	78.5	70	82	73	85	74	87	74	90	75.5	88	79	90	79	82	77	89	78
22	75	66	72	64	80	70	80	71	82	73	83	73	85.5	75	85.5	76	89	77	91	80	88	77	87	78
23	86	67	78	69	80	70	79	72	80	72.5	88	73	89	75	88	75.5	86	78	91	79	88	76	83	71
24	81	70	83	73	79	70	79	70	83	73	87	73	88	75	87	76	89	79	92	81	89	79	85	74.5
25	81	71	79	69	76	70	74.5	65	87	72.5	88	73	85	75	88	77	90	79	92	81	90	81	81	74
26	82	72	73	65	70	65	72	64.5	80	72.5	88	75	78	71	87	78	90	79	91	82	89	80	86.5	75
27	86	73	83	69	74	65	73	63	84	73	87	74	82	73	88	76.5	90	78	92	79	91	75	88	76
28	85	74	74	67	66	57	79.5	67	85	72	87	74	85	71	86.5	78	88	78	90	79	87	79	85	78.5
29	75	69	71	65	65	54	77	68	.....	.....	87	74	80	68	86.5	78	90	79	91	80	90	79	90	79
30	73	71	74	68	64	61	74	67	.....	.....	86	74.5	79	66	88	77	.....	.....	94	79	89	79	81	76
31	74	69	.....	.....	67	58	80.2	67	.....	.....	86	74	.....	.....	90	77	.....	.....	95	80	88	79	.....	.....
Range	21°		35°		28°		24°.2		29°		23°.5		23°		34°		19°		21°		20°		16°	
Monthly means	76°.4		72°.7		71°.4		68°.5		74°		76°.1		78°		80°		83°		83°		84°		74°.7	

Maximum, minimum, and mean temperatures—Continued.

KINGSTON, CANADA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	62	43	55	27	9	— 2	38	29	4	—17	40	20	35	10	51	33	59	47	66	52.9	77.2	62.5	83	62
2	55	41	55	35	40	— 2	38	33	7	—17	46	30	42	26	42	30	61	42	71.5	60.5	72.5	53.4	76.2	59
3	52	41	52	27	49	30	49	36	16	— 3	50	36	33	17	55	33	66	47	72.5	52.9	69.7	42.3	72.3	47.3
4	59	42	58	25	61	29	59	43	25	5	45	11	25	7	60	36	69	54	74.5	57.9	69.5	43.2	65.5	42.8
5	60	52	49	27	40	20	53	17	13	— 3	25	10	35	15	60	40	78	58	67.5	60.5	74.2	52.5	77.5	51.5
6	57	37	40	20	32	25	32	18	11	—13	27	15	37	28	53	33	72	58	78.9	58.1	75.5	56.9	73.5	58.3
7	55	31	54	31	32	18	37	25	14	3	39	18	41	30	48	28	76	57	78.5	64	74.1	62	74.3	52.9
8	65	39	49	40	42	21	37	31	23	— 7	36	27	39	27	58	37	64	52	76	58.7	77.5	64	81.5	54.6
9	68	44	51	27	44	35	38	30	29	3	30	9	41	24	70	40	70	48	81.4	61.5	81.6	61	81.3	55.7
10	66	42	31	20	42	29	39	31	25	9	22	10	39	25	63	46	70	54	69.5	64	76.3	64	81.3	63
11	67	54	41	25	40	28	34	19	24	0	17	6	35	20	65	45	60	46	71.5	59.4	79.1	66.1	81.6	64
12	60	38	47	26	41	26	25	13	29	— 6	11	3	37	13	69	47	62	49	67.4	52.9	83.5	70	79.8	56.9
13	54	36	33	18	31	13	14	7	55	29	20	5	40	25	67	46	69	48	69.5	61.9	77	59.6	77.5	54.9
14	65	52	27	13	32	4	18	4	40	19	32	14	50	25	65	49	63	48	79.5	56.9	78	51.5	81.6	66
15	60	41	34	25	37	27	10	3	40	18	30	24	53	34	75	45	69	56	76.3	61.8	75.9	61.6	77.5	59.3
16	63	47	34	23	46	30	12	— 9	37	21	45	20	40	25	72	45	66	58	71	58	76	58.4	64.6	55.2
17	57	39	27	23	42	32	23	— 7	28	10	45	33	40	30	58	44	62	55	72.5	50	79.6	65	62.3	54.4
18	63	43	31	25	42	32	35	21	22	4	49	40	42	23	55	42	72	57	75	61.5	67	62.6	68.6	57.6
19	56	42	30	17	35	17	39	17	37	11	52	32	52	32	55	43	72	57	82.4	63.5	74.5	61	74	62
20	46	36	27	14	30	11	20	2	41	25	42	24	43	32	54	44	64	53	74.5	59.9	80	65	67.5	48.1
21	62	41	27	15	25	3	37	7	38	24	49	29	42	33	54	44	71	53	73.8	57.7	70.5	56.4	67.3	42.8
22	62	47	27	15	30	18	47	31	31	19	35	26	47	32	65	40	72	55	72.3	54.4	69.5	52.1	65.5	42.8
23	61	47	27	19	35	18	46	23	39	24	26	8	45	32	60	43	74	60	78.5	59.4	68.8	48	67.5	51.9
24	61	42	27	20	32	23	27	11	32	9	26	4	40	29	73	47	68	53	82.2	65.1	71.5	48.4	69.5	54.1
25	61	32	23	11	31	18	12	— 7	29	16	38	20	49	28	62	49	67	54	82.6	66	73.5	56.4	71.5	58.3
26	50	34	15	— 3	35	19	4	—16	29	10	38	25	43	30	55	46	70	56	77.5	67	73.8	59.9	78.2	57
27	58	36	15	2	25	18	17	— 2	31	14	33	17	43	30	58	48	72	53	73.3	57.2	74.1	55.3	72.8	63.5
28	55	33	21	5	27	18	25	6	35	14	35	20	41	21	69	49	80	53.2	66.7	57.7	76.7	56.2	82.4	51.7
29	50	28	26	11	33	15	16	1	.....	.....	31	11	40	27	78	52	82	63	76.3	57.1	73.6	59.2	62.5	49.1
30	51	24	15	4	26	0	2	—15	.....	.....	38	25	48	30	71	56	68.8	55.2	79.3	53.4	77.3	57.1	55.1	40.4
31	52	29	.....	.....	35	22	6	—11	.....	.....	31	15	.....	.....	72	53	.....	.....	76.5	58.9	77.6	57.1	.....	.....
Range	44°		61°		63°		75°		72°		49°		46°		50°		40°		32°.6		41°.2		42°.6	
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

KINGSTON, JAMAICA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	77	73	86	75	84	70	82	69	.....	.....	.....	.....	83	74	81	75	.....	.....	85	76	.....	.....	88	79
2	82	75	88	73	85	70	78	69	.....	.....	.....	.....	84	72	84	74	.....	.....	86	74	.....	.....	89	79
3	83	78	87	73	85	69	81	70	.....	.....	.....	.....	85	78	83	77	.....	.....	.....	.....	.....	.....	87	80
4	85	74	90	72	83	69	85	71	.....	.....	.....	.....	83	77	85	76	.....	.....	86	76	.....	.....	87	80
5	85	75	89	72	84	71	83	70	.....	.....	.....	.....	83	74	83	76	.....	.....	84	76	.....	.....	88	76
6	85	72	89	72	82	69	85	71	.....	.....	.....	.....	78	76	84	75	.....	.....	81	76	.....	.....	89	74
7	86	76	85	73	84	70	83	70	.....	.....	.....	.....	83	77	84	76	.....	.....	86	77	.....	.....	89	75
8	86	73	84	73	86	73	82	70	.....	.....	.....	.....	83	77	.....	.....	.....	.....	85	80	.....	.....	81	75
9	86	74	83	73	85	73	82	68	.....	.....	.....	.....	80	77	83	76	.....	.....	85	79	85	74	80	74
10	85	74	86	73	87	71	84	69	.....	.....	.....	.....	83	76	.....	.....	.....	.....	86	79	84	75	80	76
11	85	72	84	72	83	69	85	68	.....	.....	.....	.....	83	77	.....	.....	.....	.....	84	82	85	75	81	76
12	86	73	88	74	83	69	82	70	.....	.....	.....	.....	83	79	.....	.....	.....	.....	90	75	85	75	.....	.....
13	84	72	83	74	81	71	85	73	.....	.....	.....	.....	79	78	.....	.....	.....	.....	85	80	81	72	86	80
14	87	73	83	72	84	67	78	70	.....	.....	.....	.....	78	76	.....	.....	88	77	85	80	84	74	80	74
15	82	74	87	75	83	66	83	72	.....	.....	.....	.....	80	77	.....	.....	83	77	84	80	82	75	88	70
16	86	72	84	74	85	72	83	68	.....	.....	.....	.....	81	79	.....	.....	89	78	84	80	81	75	88	70
17	78	75	82	71	85	70	82	68	.....	.....	.....	.....	81	75	.....	.....	90	78	84	80	85	76	89	82
18	85	70	84	71	85	68	82	73	.....	.....	.....	.....	81	77	.....	.....	90	78	85	80	83	77	81	70
19	84	72	84	77	82	69	83	72	.....	.....	.....	.....	80	73	.....	.....	85	82	92	80	85	76	81	70
20	85	71	79	72	85	70	82	71	.....	.....	.....	.....	80	78	.....	.....	.....	.....	85	76	86	76	87	70
21	85	75	84	72	85	68	85	73	.....	.....	.....	.....	82	79	.....	.....	87	75	89	80	83	77	80	70
22	87	74	81	74	83	71	83	73	.....	.....	83	74	80	75	.....	.....	87	75	81	74	80	79	81	77
23	84	73	84	71	85	69	85	72	.....	.....	83	72	83	76	.....	.....	88	81	89	76	91	81	87	71
24	89	72	82	71	81	71	85	72	.....	.....	84	73	82	78	.....	.....	89	82	84	74	91	81	.....	.....
25	85	72	84	72	82	68	83	73	.....	.....	83	73	81	79	.....	.....	89	77	85	80	89	80	.....	.....
26	83	73	84	70	84	70	80	71	.....	.....	84	74	83	77	.....	.....	88	75	.....	.....	88	76	.....	.....
27	82	70	85	71	84	71	80	73	.....	.....	78	74	84	77	.....	.....	86	81	.....	.....	88	76	.....	.....
28	84	71	87	71	83	71	80	72	.....	.....	77	74	81	75	.....	.....	86	81	.....	.....	88	76	.....	.....
29	85	71	84	70	85	71	82	69	.....	.....	80	79	82	76	.....	.....	86	74	.....	.....	87	76	.....	.....
30	85	71	86	71	80	70	83	69	.....	.....	81	77	86	76	.....	.....	85	74	.....	.....	84	78	.....	.....
31	88	72	.....	.....	82	70	83	69	.....	.....	82	74	.....	.....	.....	.....	.....	.....	.....	.....	85	79	.....	.....
Range	19°		20°		21°		17°		.....		.....		14°		.....		.....		.....		.....		.....	
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

KNOXVILLE, TENN.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1																			92	69	87	68	82	59
2																			90	69	84	67	83	62
3																			91	66	87	60	85	60
4																			95.2	67	83	63	85	61
5																			95.2	73	83	58	83	62
6																			93	70	82	67	83	66.5
7																			95	65	79	67	84.2	62.5
8																			96	71	89	71	86	63
9																			92	66	89	64	88	62
10																			87	69	84	65	83	63
11																			77	68	94	68	85	58
12																			86	65	97	71	85	58
13																			91	64	95	73	86.5	59
14																			91	67	91	70	78	65
15																			85	68	83	65	83	65
16																			89	67	85	68	84	66
17																			88	62	86	63	81.5	64
18																			90	66	88	60	84	63
19																			93	65	92	60	83	61
20																			99	65	92	66	73	57
21																			90	65	88	69	74	51
22																			89	70	86	69	78	55
23																			84	68	85	67	79	54
24																			92	72	83	67	78	57
25																			83	70	80	61	82	60
26																			89	71	83	58	80	63
27																			81	71	72	64	67	60
28																			79	67	65	60	66	56
29																	*88	*70	78	66	64	58	68	52
30																	88	67	82	53	77	61	73	51
31																	89	67	87	58	79	61		
Range																			38°		39°		37°	
Monthly means	53°.1		44°.5		42°.2		38°.9		43°.4		50°.2		54°.2		67°.5		76°.1		77°.1		73°.8		69°.2	

* Station supplied with maximum and minimum thermometers June 22, 1874.

Maximum, minimum, and mean temperatures—Continued.

LA CROSSE, WIS.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	58	31	41	15	38	29	40	23	19	− 5	46	28	48	16	58	42	77	54	82	68	77	61	81	55
2	67	32	43	26	38	30	42	22	29	7	52	28	36	26	63	38	62	52	86	61	75	56	76	60
3	62	45	40	15	32	16	57	24	34	13	44	26	31	24	56	39	67	55	95	62	70	64	67	49
4	52	42	45	29	16	− 3	24	5	26	15	28	11	36	13	63	39	81	54	99	73	80	60	66	54
5	52	39	35	18	10	− 5	22	1	28	− 4	42	20	43	20	71	45	76	56	101	72	73	60	71	52
6	51	30	45	21	19	0	31	15	32	22	37	28	46	29	74	57	66	54	100	74	80	61	83	55
7	65	33	52	33	32	10	33	8	37	24	30	14	54	22	82	41	83	56	97	70	76	63	90	66
8	71.5	44	53	27	43	28	34	15	.33	15	23	3	40	27	89	58	86	61	87	68	83	63	91	72
9	73	52	38	28	38	14	30	23	30	5	32	8	45	24	89	67	72	60	88	69	84	65	89	68
10	61	52	46	30	32	10	30	11	32	15	33	19	64	29	74	64	63	56	79	68	88	65	80	71
11	59	44	38	25	40	27	16	5	38	1	37	7	40	27	81	58	60	46	84	62	96	73	86	68
12	62	32	27	18	30	21	22	9	32	24	19	6	55	24	74	55	68	41	85	57	90	72	79	62
13	69	50	26	18	30	12	22	3	24	1	27	3	62	40	74	48	74	54	90	57	75	59	75	57
14	68	36	31	11	32	11	3	−19	41	1	43	12	50	36	63	47	68	57	97	73	77	61	68	48
15	74	49	53	25	40	12	11	−15	33	18	46	28	42	30	57	44	72	60	76	65	81	67	60	42
16	63	50	41	33	45	27	20	4	29	10	55	37	47	30	72	45	74	49	86	59	88	65	65	43
17	65	45	38	31	35	26	36	18	42	−11	59	35	61	32	60	45	92	63	87	62	79	67	68	50
18	50	40	33	11	27	12	40	30	38	16	38	32	56	40	72	47	91	64	89	69	81	58	62	52
19	53	33	19	4	26	15	33	20	40	14	37	24	47	31	75	50	90	70	90	68	92	70	55	50
20	55	32	28	9	15	1	33	16	37	3	55	23	45	30	67	50	82	70	75	63	84	71	60	41
21	55	30	38	18	19	− 4	36	24	28	14	38	21	50	30	78	49	93	67	83	58	87	67	65	45
22	47	24	34	18	34	19	24	10	28	13	40	23	46	34	76	53	89	71	86	60	70	61	73	51
23	43	18	31	20	37	30	15	− 1	18	0	23	3	41	25	86	58	97	71	83	68	77	56	76	50
24	44	26	46	22	37	33	14	− 9	7	−11	40	7	54	31	87	62	97	78	89	71	77	60	77	56
25	37	31	33	22	35	30	13	−10	13	−19	53	27	48	38	80	57	91	76	98	77	79	56	68	56
26	37	28	33	21	31	23	36	4	31	− 4	27	12	50	37	87	65	94	71	76	69	72	59	67	52
27	34	26	26	13	23	15	37	27	38	− 1	35	7	43	35	96	68	96	74	77	61	78	66	58	51
28	33	22	22	− 1	27	8	27	16	42	14	30	12	55	34	95	73	83	65	82	59	80	68	68	44
29	33	19	28	9	23	9	21	10	.....	.....	38	16	54	35	91	72	80	60	86	62	82	69	66	47
30	33	19	32	18	33	5	19	5	.....	.....	40	25	76	45	90	71	85	63	86	71	79	61	67	41
31	31	18	.....	.....	37	24	16	1	.....	.....	40	19	.....	.....	77	63	.....	.....	80	65	79	55	.....	.....
Range	56°		54°		50°		76°		61°		56°		63°		58°		49°		44°		41°		50°	
Monthly means	40°		28°.9		24°.2		20°.2		21°.3		29°.4		40°.5		64°.3		70°.8		77°.1		71°.9		62°.9	

Maximum, minimum, and mean temperatures—Continued.

LAKE CITY, FLA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1																	93	70	84	71	94	71	83	67
2																	94	72	90	71	96	74	79	71
3																	95	69	82	72	94	71	86	71
4																	85	75	89	69	95	73	85	70
5																	90	72	92	72	90	72	89	68
6																	89	74	92	76	90	69	88	69
7																	96	73	88	71	91	67	89	69
8															82	*52	95	73	89	69	94	72	84	70
9															82	56	97	74	89	71	96	75	89	66
10															82	55	93	74	79	72	92	73	83	64
11															83	60	92	74	86	72	93	67	80	59
12															72	63	91	73	90	71	99	73	85	63
13															76	65	91	69	86	70	94	71	84	66
14															80	66	88	67	96	67	92	71	86	71
15															85	65	89	72	90	70	91	70	90	72
16															85	68	92	73	91	70	89	70	90	70
17															86	64	92	73	93	69	88	67	89	70
18															86	65	84	71	92	69	86	65	93	70
19															85	66	86	70	89	70	89	71	91	72
20															89	64	89	69	84	70	91	72	90	70
21															91	62	87	69	88	69	93	72	90	67
22															89	64	86	70	92	71	94	72	87	70
23															86	65	88	69	92	70	95	72	86	66
24															91	65	92	68	90	72	92	74	84	70
25															93	68	95	72	89	72	89	72	84	71
26															95	68	94	72	90	69	86	71	84	71
27															97	67	93	71	91	74	85	66	79	67
28															92	67	77	70	83	73	85	63	78	64
29															91	67	83	72	80	72	89	65	77	55
30															93	64	88	73	88	76	95	71	79	54
31															94	73			91	73	90	69		
Range																	30°		29°		36°		37°	
Monthly means	65°.2		57°.3		54°.7		53°.9		59°.5		63°		67°.8		74°.2		78°.7		76°.5		82°.1		75°.5	

* Station supplied with maximum and minimum thermometers May 8, 1874.

Maximum, minimum, and mean temperatures—Continued.

LEAVENWORTH, KANS.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	69	41	48	28	65	37	56	36	28	21	60	32	48	20	82	58	76	66	93	65	87	72	93	67
2	73	51	62	44	67	26	56	31	30	14	63	38	46	34	79	60	85	66	95	65	85	68	84	65
3	72	57	57	34	26	10	61	18	34	16	61	32	65	32	68	43	92	66	97	69	93	62	65	53
4	69	51	63	39	26	8	18	2	44	13	43	22	48	28	65	41	99	65	100	68	97	72	70	53
5	62	44	46	33	32	21	27	2	32	17	47	36	39	29	71	42	83	62	98	67	107	76	85	52
6	53	31	65	30	32	25	37	13	42	16	50	31	48	32	76	45	92	66	95	71	94	71	92	60
7	66	35	64	44	40	30	41	13	41	7	38	25	48	33	82	47	96	72	97	75	89	69	91	69
8	75	46	75	36	45	26	44	26	41	25	42	19	57	33	85	48	94	74	103	77	85	66	82	70
9	78	52	75	39	34	16	47	33	47	10	65	38	55	26	78	61	89	72	92	68	105	72	85	72
10	76	57	69	40	42	28	41	30	46	18	40	27	68	32	71	63	88	71	90	68	102	80	84	73
11	69	49	56	39	41	36	31	16	49	22	43	22	78	47	81	54	73	50	85	62	106	84	86	69
12	69	41	42	28	36	12	37	21	51	20	41	26	69	43	82	58	76	50	85	66	102	75	79	64
13	79	52	50	27	37	9	32	7	37	16	44	17	64	43	76	59	71	56	92	69	102	75	71	62
14	80	54	58	25	46	23	14	2	50	26	44	27	58	45	77	60	70	62	97	73	87	68	70	48
15	74	54	68	45	51	28	20	2	44	26	48	38	54	34	69	56	75	62	87	76	88	71	65	42
16	75	55	59	39	54	34	37	13	49	27	50	42	46	34	78	47	86	59	88	65	91	71	71	44
17	69	53	68	37	50	28	39	28	43	34	69	49	55	32	74	60	87	62	85	71	94	66	79	58
18	55	39	42	21	43	27	44	28	42	28	55	37	57	35	75	49	90	66	92	68	94	67	87	54
19	62	35	35	12	34	19	28	17	48	30	47	31	58	39	84	55	91	66	95	71	94	67	67	49
20	59	36	54	22	26	9	37	26	42	23	60	32	51	35	77	58	92	69	96	73	92	71	69	46
21	68	37	53	25	39	19	44	24	38	20	53	35	50	35	73	51	91	70	95	74	98	71	67	56
22	54	31	43	38	42	33	28	14	27	11	59	31	54	36	82	55	93	68	93	71	88	71	75	52
23	56	22	42	34	37	33	34	7	21	5	47	24	55	33	94	57	92	70	102	74	83	66	75	56
24	57	28	54	29	36	30	31	4	19	3	46	22	63	37	94	68	90	70	101	79	96	63	73	63
25	56	42	45	30	35	29	43	19	28	7	60	36	62	45	88	66	92	73	104	81	90	63	78	65
26	50	30	58	31	36	22	45	35	41	16	52	30	69	39	94	57	93	73	86	62	90	68	71	56
27	43	26	31	22	26	11	45	24	43	26	46	23	65	45	92	67	95	70	86	62	87	72	67	49
28	36	21	33	18	46	21	46	18	46	39	47	26	65	37	88	69	83	70	88	68	97	73	74	47
29	59	24	45	22	35	18	50	34	.....	.....	47	31	69	38	84	67	86	62	92	64	91	69	82	52
30	49	27	50	28	40	11	40	18	.....	.....	47	36	83	50	91	70	87	62	96	66	87	62	75	51
31	40	19	.....	.....	47	29	26	19	.....	.....	39	27	.....	.....	85	67	.....	.....	100	73	84	58	.....	.....
Range	61°		63°		59°		59°		48°		52°		63°		53°		46°		42°		45°		51°	
Monthly means	56°.9		41°.8		31°.9		28°.4		28°.8		40°		49°		67°.3		77°.4		82°.8		81°3.		66°.8	

Maximum, minimum, and mean temperatures—Continued.

LEXINGTON, KY

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	66	45	47	22	60	40	41	33	35	25	54	35	35	25	73	41.5	75	60	90	65	83	70	81	60.5
2	74	53	60	35	57	51	51	40	39	32	55	44	48	30	69	53	78	55	88	64	79	66.5	83	64
3	75	60	52	42	65	56	60	49	34	32	60	44	53	33	64	49	80	67	87	63	77	62	85	67.5
4	71	60	46	40	57	31	65	26	36	26	57	38	48	23	62	46	87	66	97	73	79	63	85	47
5	75	53	61	44	31	22	31	25	36	29	54	32	56	33	55	41	86	67	92.5	75	80	66	82	60
6	63	36	61	36	35	22	32	30	39	28	56	46	52	31	65	44	86	66	94	73	81	68	82	62
7	54	30	56	46	48	32	31	27	38	30	54	40	56	38	65	46	90	74	98	76	81	69	86	62.5
8	66	44	57	45	63	47	39	24	39	27	43	33	52	44	75	55	92	73	99	78	83	70	88	70
9	75	52	54	38	62	36	42	30	40	25	46	28	45	32	79	58	91	77	92	78	87	69	90	68
10	77	55	47	33	48	33	40	28	42	23	50	35	48	29	82	61	93	73	84	68	85	66	85	65
11	78	58	65	34	67	45	40	25	50	31	41	23	63	35	84	70	85	72	74	66	94	73	87	67
12	68	43	47	30	68	57	37	16	59	42	38	26	53	28	85	65	75	60	78	64	97	78	89	66
13	66	42	35	24	61	29	36	26	58	37	35	20	65	40	83	67	72	53	85	66	92	74	89	71
14	71	51	42	22	41	28	32	16	50	33	44	21	70	59	81	60	83	54	90	73	86	66	85	71
15	77	57	63	32	45	32	24	2	52	36	49	32	63	50	84	64	84	67	88	74	76	60	85	68
16	75	57	58	46	50	34	23	1	51	34	52	43	52	40	69	53	75	67	82	71	84.5	62	80	65
17	76	58	46	42	54	37	36	14	35	23	71	49	44	37	69	50	81	63	84	61	87	63	72	62
18	66	45	44	31	55	43	44	29	39	25	63	57	56	35	61	45	85	68	88	68	92	71	80	65
19	59	41	34	15	51	33	47	37	53	47	64	42	60	48	62	50	89	68	91	70	93	71	74	61
20	49	37	31	6	38	24	48	33	55	42	50	35	69	50	73	55	87	70	90	78	93	71	69	57
21	48	35	45	25	38	18	65	47	71	50	60	39	58	38	63	45	91	72	81	68	89	73	68	49
22	70	42	45	32	35	28	65	50	61	45	58	40	61	44	72	50	92	69	83	65	82	73	73	55
23	60	39	52	44	37	26	54	31	58	25	52	29	52	44	65	56	94	72	85	72	83	70	78	62
24	48	35	52	34	38	30	37	25	35	21	42	19	51	35	83	65	95.5	76	91	72	78	64	78	65
25	55	34	40	30	40	28	37	20	34	22	57	29	50	42	82	70	94	76	83	69	78.5	62	81	65
26	61	46	42	24	38	30	45	25	40	20	63	46	59	42	82	66	90	73	89	73	81	64	80	66
27	62	42	48	33	34	24	49	46	44	33	50	33	55	45	85	63	91	76	83	67	73	65	71	64
28	42	26	35	28	30	18	48	32	43	38	49	27	56	35	88	66	93	74	71	60	68	64	65	52
29	42	31	39	17	37	18	47	31	.....	.....	48	34	48	28	86	70	86	72	75	60	71	62	68	48
30	49	32	40	29	33	15	53	38	.....	.....	56	34	64	40	89	67	85	67	79	60	76	63	66	47
31	42	26	.....	.....	36	19	46	26	.....	.....	48	31	.....	.....	89	71	.....	.....	83	64	80.5	64.5	.....	.....
Range	52°		59°		53°		64°		51°		52°		47°		48°		42°.5		39°		37°		43°	
Monthly means	53°.8		40°.7		39.06		36°.5		39°.2		44°.3		46°.9		63°.6		77°.9		77°.8		75°.1		73°.9	

Maximum, minimum, and mean temperatures—Continued.

LONG BRANCH, N. J.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	50	29	29	16	48	27	33	26	60	41	77	57	72	67	89	67	78	65
2	.....	.....	.....	.....	.....	.....	48	39	31	12	53	33	39	30	55	41	60	52	75	66	82	60	83	62
3	.....	.....	.....	.....	.....	.....	49	39	39	23	56	37	47	34	61	35	59	53	80	65	74	59	88.5	61
4	.....	.....	.....	.....	.....	.....	55	44	39	25	62	39	41	21	52	42	67.5	57	77	64	75	59	71	58
5	.....	.....	.....	.....	.....	.....	57	34	32	22	48	34	39	20	52	42	65	59	77	64	75	62	68	63.5
6	.....	.....	.....	.....	.....	.....	46	34	28	13	37	29	55	32	51	42	73	59	69	62	78	62	75	64.5
7	.....	.....	.....	.....	.....	.....	54	44	32	19	39	33	45	38	54	42	73	59	72	61	80	64	83	63.5
8	.....	.....	.....	.....	.....	.....	51	37	35	11	43	31	45	33	69	39	88	62	87	65	71.5	63	77	63
9	.....	.....	.....	.....	.....	.....	47	33	38	7	37	28	43	37	79	48	78	67	81	67.5	73	65	70.5	64
10	.....	.....	.....	.....	*60	36	48	36	39	21	34	23	43	35	87	61.5	77	67	78	68	86.5	64	85.5	58.5
11	.....	.....	.....	.....	52	38	43	32	32	19	38	26	54	28	69	44	68	61	82	61	77	69	83	65.5
12	.....	.....	.....	.....	64	44	37	28	39	20	36	20	54	22	51	43	78	59	72	57	77	70	72	65.5
13	.....	.....	.....	.....	57	37	36	26	50	34	29	16	44	23	65	45	86	58	82	57	77	68.5	67	65
14	.....	.....	.....	.....	39	29	32	24	54	37	41	22	63	32	73	51	79	53	89	68	70	65	70	64
15	.....	.....	.....	.....	48	32	26	11	40	34	44	27	64	44	58	48	73	55	91	69	75	63.5	72	62.5
16	.....	.....	.....	.....	62	37	27	8	48	33	39	32	58	43	62	48	70.5	59	94	71	74	64	71	68
17	.....	.....	.....	.....	62	35	27	10	41	22	47	36	44	34	71	53	78	57	78	65	72	65	68.5	62
18	.....	.....	.....	.....	54	39	37	15	37	18	49	40	43	33	57	50	79	64	77	64	88	60	68	62
19	.....	.....	.....	.....	50	38	42	34	41	28	60	40	44	32	63	45	74	58	77	67	76	65	65	64
20	.....	.....	.....	.....	43	36	42	29	45	37	57	40	42	39	65	49	63	54	83	63	92	66	67.5	61
21	.....	.....	.....	.....	44	29	44	32	45	38	52	36	55	39	64	48	76.5	59	78	63	86	74	67	55
22	.....	.....	.....	.....	40	25	57	40	43	37	53	42	51	39	65	47	80	63	78	65	77	63	72	51
23	.....	.....	.....	.....	34	30	64	40	73	35	49	24	44	40	70	46	92	68	83	63	67.5	63	72	51
24	.....	.....	.....	.....	41	31	42	29	53	32	49	18	48	37	59	51	89	67	79	63	68	64	75	55
25	.....	.....	.....	.....	42	26	31	18	38	24	51	23	44	36	62	49	86	59	75	63	67	64	77	56
26	.....	.....	.....	.....	39	34	36	14	36	24	59	42	44	32	69	49	87	66	76	66	67	60	74	60
27	.....	.....	.....	.....	42	33	47	32	40	26	56	35	53	37	67	52	70.5	65	74	66	67	61	70	57
28	.....	.....	.....	.....	41	28	49	36	40	24	47	35	43	36	66	54	87	65	75	65	69	61	64	58
29	.....	.....	.....	.....	43	28	42	29	.....	.....	68	31	39	33	66	54	90	69	72	66.5	68.5	57.5	65	58
30	.....	.....	.....	.....	33	19	39	29	.....	.....	53	31	51	31	70	54	81	69	81	62.5	74	56	64	51
31	.....	.....	.....	.....	33	19	40	25	.....	.....	53	31	.....	.....	68	55	.....	.....	84	63	73	58	.....	.....
Range	.....	.....	.....	.....	.....	.....	49°		66°		52°		43°		46°		40°		33°		36°		37°.5	
Monthly means	.....	.....	.....	.....	38.6°		36°.5		32°.8		38°.7		41°		56°.2		68°.3		71°.4		69°.9		67°.5	

* Station opened December 10, 1873.

Maximum, minimum, and mean temperatures—Continued.

LOUISVILLE, KY.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	68	45	48	27	64	38	44	24	40	29	57	37	40	29	79	54	79	61	90	63	85	71	83	64
2	75	50	60	31	60	55	56	42	40	34	56	45	53	32	75	59	80	61	88	71	81	67	84	66
3	77	52	51	42	66	51	64	42	35	30	65	41	59	35	67	52	87	66	89	66	82	63	88	71
4	69	59	59	35	35	29	63	27	36	30	54	40	52	32	67	48	92	73	98	73	86	64	87	66
5	75	49	62	39	35	26	37	24	45	30	55	36	57	34	56	43	91	69	94	79	86	65	80	73
6	60	43	58	37	37	28	33	30	39	32	60	47	52	33	69	50	91	72	97	71	87	72	82	68
7	64	31	57	42	45	28	37	28	37	33	60	42	58	42	72	47	94	77	102	75	82	71	88	71
8	68	40	60	44	60	38	40	23	41	31	48	33	54	46	81	53	95	76	94	77	85	63	89	73
9	77	46	57	45	58	37	45	29	39	28	51	30	50	32	82	63	94	76	92	77	90	68	90	68
10	79	53	57	40	56	35	57	34	48	26	54	39	52	30	86	63	95	68	84	72	91	68	88	69
11	72	57	62	36	66	46	42	29	55	36	43	27	66	39	85	62	89	67	78	68	99	77	87	61
12	62	48	51	30	66	54	51	21	62	45	41	29	54	33	88	60	74	61	79	65	102	79	89	63
13	66	41	37	25	40	32	34	29	57	39	37	23	69	42	83	65	74	54	89	66	98	77	90	70
14	74	48	47	26	42	28	29	16	48	31	44	28	76	56	84	63	83	58	93	75	85	67	88	73
15	77	49	66	27	46	28	18	4	57	35	52	38	65	54	87	64	87	70	94	77	80	67	83	66
16	78	56	60	49	52	30	24	8	49	36	53	42	54	42	64	57	82	68	81	70	87	60	70	62
17	78	62	52	42	55	34	40	12	39	30	75	52	48	38	70	53	81	66	84	63	90	70	78	64
18	61	56	42	32	50	34	47	30	42	29	66	59	61	49	64	48	87	63	90	68	94	76	83	65
19	54	43	23	19	51	35	49	38	57	30	66	42	60	40	72	48	90	73	93	72	96	77	78	61
20	52	37	36	15	35	24	43	36	53	47	52	38	65	49	78	57	90	69	92	75	95	77	70	54
21	52	39	48	33	34	20	69	40	59	46	61	41	60	40	69	48	93	70	80	73	92	81	70	49
22	71	40	47	29	40	24	68	51	59	42	61	41	63	40	72	50	91	73	83	69	90	71	76	52
23	65	32	52	29	45	29	68	32	44	26	59	33	52	43	70	54	95	75	89	72	82	71	80	54
24	51	31	54	37	43	31	39	25	38	24	45	36	50	33	88	55	93	77	94	77	80	66	79	58
25	59	52	46	34	43	30	41	22	38	23	60	47	60	44	84	72	92	76	92	73	83	64	81	65
26	62	49	49	31	40	32	51	22	45	24	67	48	61	45	84	67	92	69	100	80	85	67	78	69
27	52	42	49	34	33	28	53	39	45	33	44	32	62	47	87	63	95	78	81	69	79	67	74	60
28	49	32	34	26	34	26	50	35	47	33	48	30	54	39	91	61	100	81	74	62	72	67	64	54
29	43	27	40	22	37	22	50	30	.....	.....	51	34	54	37	85	69	88	73	80	62	75	66	73	51
30	52	39	41	26	32	17	58	30	.....	.....	57	39	69	40	88	71	86	66	82	62	79	65	69	54
31	52	29	.....	.....	41	22	41	29	.....	.....	48	34	.....	.....	91	73	.....	.....	90	67	83	65	.....	.....
Range	50°		51°		49°		65°		39°		52°		47°		48°		46°		40°		42°		41°	
Monthly means	54°		41°.5		38°.7		37°.5		39°.5		45°.6		48°.8		68°.2		80°.7		80°.7		79°.3		72°.2	

Maximum, minimum, and mean temperatures—Continued.

LYNCHBURG, VA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	72	85	70	88	67	82	55
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	62	85	72	85	66	84	56
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	57	89	70	82	62	85	58
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	60	93.5	72	80	65	84	61
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	71	93	72	80	60	84	68
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*67	*41	85	71	86	63.5	76	63	85	63
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	41	89	70	87	60	72	67	86.5	64
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	41	95	72	92	68	84	65	89	63
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	48	97	75	94.5	72	84	65	81	65
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	59	96	70	93	74	85	63	79	59
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	57	83	69	85	74	89	69	85	55
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	49	87	69	82	69	90	67	88	61
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	58	80	63	85	67	89	69	85	63
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	60	77	57	90	70	83	70	78	70
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	60	80	60	91	67	81	64	72	69
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	60	80	62	90	71	81	60	80	68
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59	37	83	66	85	67	80	60	78	68
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	56	87	65	88	65	86	61	84	65
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	48	86	65	88	67	89	64	79	70
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	52	84	63	91	64	92	65	76	58
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	52	83	64	89	72	92.5	68	71	52
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	44	88	65	83	68	87	71	71	53
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	48	93	70	84	65	72	65	74	51
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	60	93	73	86	67	70	63	73	54
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	63	95	72	82	69	75	63	76	52
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	58	84	74	75	67	72	62	78	52
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	55	81	74	76	67	70	56	73	62
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	57	94	71	73	68	72	50	68	59
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	57	95	75	75	67	73	52	66	55
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	67	85	73	80	60	68	58	66	51
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	66	.....	.....	85	59	72	60	.....	.....
Range																	40°		35°.5		42°.5		38°	
Monthly means	53°.6		42°.5		40°.4		39°.9		41°.1		47°.5		51°		66°.1		77°.4		77°.9		72°		69°	

* Station supplied with maximum and minimum thermometers May 6, 1874.

Maximum, minimum, and mean temperatures—Continued.

MARQUETTE, MICH.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	M i.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	38	65	50	60	53	82	51
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	35	63	51	65	47	67	51
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	44	74	51	69	44	65	48
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	43	69	49	75	48	67	44
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	46	85	52	64	57	64	53
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	45	83	66	73	59	75	53
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	44	80	61	72	56	87	59
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	46	70	54	89	62	97	59
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	47	76	49	89	66	87	70
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	39	70	54	84	63	91	67
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	42	70	47	88	63	84	68
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	37	82	52	66	52	75	58
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	44	85	52	63	47	56	40
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	52	93	64	63	44	67	40
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	51	79	54	75	49	66	48
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	48	72	46	82	66	76	47
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	54	79	53	78	60	85	60
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	53	81	53	74	64	79	59
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	61	88	55	81	61	73	55
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	64	77	57	75	52	56	40
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	56	77	58	71	55	67	40
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	67	88	57	67	53	66	48
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	60	78	56	68	47	76	47
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	52	79	54	69	45	85	60
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	56	88	67	72	49	79	59
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	56	73	54	80	58	73	55
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	55	72	49	81	63	60	50
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	55	70	45	78	61	68	46
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*78	*44	68	48	74	46	75	60	59	44
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	56	67	47	69	57	67	54	53	39
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	46	.....	.....	81	53	72	49	.....	.....
Range																	57°		48°		45°		58°	
Monthly means	43°		26°		26°.8		23°.4		19°.2		23°.9		30°.3		51°.3		58°.8		64°.5		62°.9		60°.2	

* Station supplied with maximum and minimum thermometers May 29, 1874.

Maximum, minimum, and mean temperatures—Continued.

MEMPHIS, TENN.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	70	90	71	96	69	88	68.5
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	69	92	71	86	74	89	69
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	69	92	72	89	70	89	69
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	70	94	72	90	69	90	69
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92.5	70	93	72	91	66	82	74
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	75	92	74	98	73.5	89	69
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93.5	76	96	76	99	77	85	74
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	73.5	97.5	76.5	95	80	86.5	71
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	74	82	72	97	77	82	74
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94.5	75.5	83	72	101	80	90	69
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92.5	74.5	85	66	100	80	89	68
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	64	89	66.5	100	80	89	67
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	58.5	91	69.5	101.5	80	90	67
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	62	92	70.5	97	76	89	71
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	60	89	70	91	72	80	67
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	68	91	73	90	71	71	63
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	68	92	73	90.5	69	80	65
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	68	93	71	92	66	89	65
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	70	94.5	72	93	67	69	65
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	69	95	74.5	95	77	72.5	56
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	70	95	78	88	74	75	53
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90.5	70.5	95	78	87.5	72	78	55
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	72	95.5	79	91.5	74	83	63
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.5	72	96	80	83.5	69	79	66
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.5	71.5	96	79	91	68	83	70
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	78.5	96	77	93.5	74	78	70
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	77	93.5	78.5	94	78	73	62
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*87	*71	95	76	83	71	86	76.5	68	52
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	70	88	75.5	82	66	89	74	73	52.5
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	72	86	66	86	71	76.5	59
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	67	85	69	.....	.....
Range																	36°.5		31°.5		35°.5		38°	
Monthly means	56°		49°		44°		45°		45°		53°		55°		72°.4		81°		82°.8		82°.9		73°.2	

* Station supplied with maximum and minimum thermometers May 29, 1874.

Maximum, minimum, and mean temperatures—Continued.

MILWAUKEE, WIS.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	46	85	62	76	62	72	52
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	44	66	57	65	58	87	64
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	45	95	56	65	57	66	53
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	52	87	59	67	54	64	52
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	49	76	58	65	62	70	56
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	49	90	67	67	62	85	58
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	76	55	91	68	78	57	94	60
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	56	81	64	82	60	89	70
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	49	75	63	82	64	82	66
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	44	84	64	82	65	83	67
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	50	65	59	98	68	90	68
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	47	67	54	85	76	88	69
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	49	86	56	70	62	69	64
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	52	95	68	68	61	84	57
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	52	88	65	70	58	59	48
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	58	67	57	79	57	61	53
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	56	86	59	89	68	67	60
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	65	90	65	73	61	71	60
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	65	91	65	95	63	68	52
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	66	66	57	80	66	64	45
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	66	75	56	80	63	69	45
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	69	77	56	64	62	74	54
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	72	86	66	67	62	77	56
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	65	79	68	67	53	79	56
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	68	92	65	71	55	71	57
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	62	84	67	72	56	79	66
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*75	53	94	63	68	56	72	66	61	47
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	55	92	70	72	56	71	66	67	48
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	55	79	60	83	61	69	67	67	51
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	64	69	55	90	64	69	63	62	43
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	51	.....	.....	85	66	66	55	.....	.....
Range	.....		.....		.....		.....		.....		.....		.....		.....		50°		41°		45°		51°	
Monthly means	46°.4		30°.9		29°.6		25°		26°.3		31°.2		36°.9		55°.8		66°.1		71°.5		68°.1		63°.6	

* Station supplied with maximum and minimum thermometers May 27, 1874.

Maximum, minimum, and mean temperatures—Continued.

MOBILE, ALA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	84	65	68	40	66	56	63	47	68	58	73	63	65	56	73	54	91	70	86	76	96	76	91	77
2	81	70	70	42	69	63	66	52	62	56	68	50	63	48	77	65	90	77	88	74	96	76	89	76
3	82	67	65	59	71	66	67	50	55	48	67	46	69	45	80	69	89	75	77	72	95	78	89	75
4	85	68	74	59	57	52	71	57	60	40	76	63	70	50	74	63	92	71	75	72	93	75	89	75
5	87	67	74	64	56	50	62	45	62	41	76	63	70	56	66	55	89	74	85	72	95	75	90	75
6	76	57	71	63	66	50	45	37	62	52	75	63	77	65	70	50	88	70	96	71	94	76	90	75
7	66	48	71	61	72	64	49	33	52	46	69	55	75	62	78	54	90	71	91	73	94	79	90	77
8	72	47	74	56	71	62	50	32	57	42	65	51	76	64	79	56	92	76	91	71	94	77	89	74
9	76	51	72	49	71	60	65	45	60	41	69	44	70	53	79	60	93	75	84	72	98	80	88	73
10	80	56	72	51	73	61	61	41	56	36	68	49	64	42	79	61	93	76	81	72	97	74	91	72
11	81	58	74	55	73	59	66	47	60	37	69	54	69	44	85	61	93	77	77	69	85	82	87	73
12	76	62	65	46	74	62	67	55	66	53	64	46	73	48	86	63	90	75	89	71	97	79	87	68
13	74	52	55	36	68	45	67	56	66	60	65	43	73	59	75	65	89	72	88	74	100	79	90	69
14	79	53	60	38	52	34	62	39	72	60	57	43	77	67	84	66	89	74	90	74	97	77	88	70
15	79	62	65	46	60	41	43	31	66	56	66	43	77	67	84	69	87	74	90	70	98	79	86	71
16	80	62	70	46	65	47	42	32	71	60	70	62	71	60	86	70	85	72	93	72	93	71	89	71
17	80	63	70	46	68	51	55	38	72	60	71	63	70	60	85	64	86	75	94	73	81	72	88	72
18	81	61	62	44	64	49	53	45	62	47	76	66	67	64	84	64	87	72	91	75	77	72	90	75
19	72	54	46	36	60	49	66	48	68	43	75	66	73	64	79	62	86	72	92	75	86	73	88	72
20	63	44	49	30	56	39	67	55	69	59	76	67	78	62	82	60	87	72	94	75	90	75	82	74
21	67	44	61	43	53	39	65	57	75	64	76	67	81	59	86	71	85	70	92	75	92	75	84	65
22	75	55	64	51	64	46	67	59	75	65	82	68	79	67	88	68	79	72	93	76	90	79	87	64
23	72	66	69	51	53	47	66	55	67	46	69	49	83	65	90	66	86	73	93	76	90	77	87	64
24	70	63	72	58	49	45	60	48	51	44	63	48	65	54	88	72	91	72	91	77	90	74	88	72
25	74	60	66	47	45	38	56	36	53	45	68	48	68	51	88	68	90	75	93	77	90	74	85	76
26	78	65	59	46	51	33	58	43	60	38	69	57	77	53	88	69	88	77	95	79	92	74	79	74
27	73	58	63	49	50	35	65	50	71	47	73	59	78	62	88	70	91	71	93	80	89	75	83	70
28	58	43	66	52	44	28	65	53	72	50	75	64	75	56	90	70	91	71	89	79	90	75	78	60
29	52	34	65	47	52	30	60	42	.....	.....	73	57	66	48	91	71	89	72	93	76	93	77	77	54
30	58	34	67	48	48	38	63	38	.....	.....	75	58	71	45	90	77	92	77	94	74	86	78	79	55
31	68	43	.....	.....	53	31	67	44	.....	.....	78	66	.....	.....	88	70	.....	.....	94	73	93	74	.....	.....
Range	53°		38°		46°		40°		39°		39°		41°		41°		23°		27°		29°		37°	
Monthly means	65°.2		57°.7		54°.1		53°.3		56°.7		63°.3		64°.3		73°.6		80°.1		80°.8		83°.8		77°.9	

Maximum, minimum, and mean temperatures—Continued.

MONTGOMERY, ALA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. Sep te . Max.	1874. Sep te . Min.
1	78	59	66	35	69	46	61	37	64	56	61	56	66	54	78	51		73	87.5	73	95	73	87	72
2	78	64	70	35	73	58	68	51	62	47	65	51	57	42	81.5	58	94	75	88	74	93	73	87	72
3	81	57	70	35	73	58	70	50	55	45	72	47	67	42	83	64	89	73	80.5	73	90	73	88	68
4	85	62	65	58	71	46	77	53	57	36	80	63	73	46	74	58	91	72	83.5	72	94	72	86	73
5	(*)	.....	72	58	53	45	62	53	60	38	79	60	76	49.5	59	53	86	72	90.5	71.5	92	70.5	87	72.5
6	.....	.....	73	59	55	45	57	36	55	44	72	58	82	65	74.5	52	81	74.5	97	73.5	91	74.5	89	73
7	.....	.....	70	61	59	45	45	34	52	44	71	52	72	59	80	54	90	73	92.5	76	95	75	86	73
8	.....	.....	72	55	58	50	50	32	49	41.5	62.5	44.5	77	60.5	82.5	55	91	74	80.5	71.5	96	77	90	72.5
9	.....	.....	75	45	64	52	62	40	57.5	40.5	66	41.5	76	47	84.5	58	95.5	74.5	87	68	100	78	90	73
10	.....	.....	75	46	71	56	66	38	55	32	67	50	60	43	84	62.5	94	76.5	84	70	97.5	75	90	69.5
11	.....	.....	76	54	74	58	68	42	60	32	64	50	68	43	86	60	92	71.5	74	71	100	80	85	65.5
12	76	59	76	42	75	58	60	50	68	49	62	40	75	46	86	61	90	73	88	71	101.5	74	86	67
13	75	49	52	34	68	38	60	48	70	57	59	41.5	70	56	75.5	65.5	89.5	71	85.5	71	103	78.5	87	67
14	81	52	62	34	52	32	53	35	70	57	58	41	77	63	85	63.5	88	72	88.5	71	99.5	75	85	69
15	81	64	68	39	54	38	40	27	71	50	51	46	76	61	88	67	88.5	74	93	69.5	96	74.5	88	72
16	80	55	67	49	62	37	43	29	71	61.5	62	49.5	70	61.5	84	68.5	83.5	72.5	95	71.5	88.5	74	87	68
17	80	60	57	49	67	37	47	33	71	54	67	57	76	62	83.5	59.5	80	73	95	72.5	81	72	88	69.5
18	81	53	58	42	69	46	54	39	55	46	78.5	61	66.5	59	83	61	88	71	93.5	73.5	84	72	89	72
19	60	49	42	32	61	46	65	42	49	44	80.5	66.5	78.5	60	80.5	54	89.5	72.5	91.5	73	89.5	73	89.5	72
20	60	42	46	26	61	36	72	56	72	48.5	83.5	69	79	65	86	60	93.5	72	90.5	72	92	75	86	71
21	65	45	58	36	51	31	72	49	78	59	83.5	68	78	58	87	66.5	91.5	73.5	90	73	94	76	84	57.5
22	77	39	60	42	50	45	73	59	79	64	80	64	67	58.5	83	60	85	71.5	95	74	93	75	86	64
23	72	39	66	54	52	41	69	50	67	49	64	46	75	62	90	62	87	72.5	91.5	77	93	74	84.5	66
24	69	62	70	53	47	43	56	41	50	42	60	43.5	63	54	95	69.5	91.5	72	93	74.5	89	72.5	86.5	67.5
25	73	59	60	43	48	39	53	32	49	41	63	43.5	63	49	95	71.5	94	74	93	74	92.5	71	84	73
26	80	50	60	37	45	32	56	41	56.5	33	70	52	75.5	49.5	93	68.5	90.5	74	93	75.5	88.5	69.5	83.5	72.5
27	70	48	58	46	47	32	67	41	64	46	78	54	81	50.5	95	74	95	71.5	92	73	79.5	69.5	77.5	68.5
28	68	39	58	43	41	26	63	48	64	51	79	62	67	50	95	73.5	93	71	91.5	77	89	71	77	58
29	52	32	55	42	45	27	57	38	.....	.....	68	58	64	43	95.5	74.5	88.5	70.5	87	72	91	75	76	55
30	59	31	65	44	48	32	61	35	.....	.....	71	55	73	43.5	92	71.5	93	71	91	70	92	75	84	53
31	65	36	.....	.....	47	23	66	39	.....	.....	81	61	.....	.....	91	70	.....	.....	92	70	90	70.5	.....	.....
Range	.....		50°		52°		50°		47°		43°.5		40°		44°.5		25°		29°		33°.5		37°	
Monthly mean	64.°4		54°.2		50°.2		51°.3		54°.5		61°		62°.4		73°.3		79°.7		79°.9		82°.6		76°.2	

* Observer sick.

Maximum, minimum, and mean temperatures—Continued.

MONTREAL, CANADA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	63.7	42.6	46.2	33	.....	.....	.....	.....	1	10.5	42	18	25.2	0.4	39.9	31	59.7	47.8	77.3	57.3	72	61	76.4	57.7
2	65.6	42	44.2	35	.....	.....	.....	.....	—2.5	-18	46.8	32.5	42.9	9.2	45	30.9	67.6	47.3	68.6	54.6	65	54.2	77.2	60.2
3	54.7	39.8	44.8	41	.....	.....	.....	.....	16	— 4.6	48.4	35.3	36.4	20.6	63.1	40.2	70	51.7	64.1	58.7	62	53.5	70.2	51
4	56.7	39.7	55	22.5	.....	.....	.....	.....	21	3	45.7	15	21.4	6.3	61.7	43.5	65	54.9	72	59.5	73.4	54.1	68.2	48.5
5	64.2	46	47	27	.....	.....	.....	.....	5	—10.5	20.8	6.8	34.3	12.6	55.5	36.4	81.2	61.2	72.8	59.5	75.8	56.2	71	51.7
6	52.2	46	41.3	25	.....	.....	.....	.....	7	— 5.6	20.3	8.7	37.8	27.4	45.3	31.8	67	58.3	76	59.9	74	57.5	71.4	62.5
7	59.8	40	47	25.1	.....	.....	.....	.....	9	— 7.3	31.4	10	44.8	29.7	50.5	29.7	71.6	58	84.4	65.6	72.3	59	70	57.8
8	68.4	39.2	41.1	36	.....	.....	.....	.....	21	— 2	38	25	36.1	28.8	51.2	36.3	67.8	58.8	81.1	66.5	76.3	63.4	73.5	57.4
9	72.2	43.7	35.8	35	.....	.....	.....	.....	18	3	31	16	38	25.6	48.5	39.8	66.4	51.2	76.7	62.4	79.8	64	75.8	53.5
10	74.4	42.8	49.8	26.2	.....	.....	.....	.....	24	3	17.5	9	30.3	23.9	47.3	41.5	63.8	51.3	73.9	61.5	84	64	84.2	63.3
11	81.1	48.6	32.1	21.8	.....	.....	.....	.....	18	1	13.8	5.7	39.7	19.8	59.1	39.1	59	44.7	76	59.8	83.9	64.1	67.5	57.5
12	55.6	49	33.3	28.4	.....	.....	.....	.....	12	0	10.6	— 3	31.2	10.4	64.5	42.9	65.7	51.6	67.4	53.5	84	67.5	64.9	49.1
13	47.7	39.7	29.4	24.6	.....	.....	.....	.....	42	8	17	3	38.6	18.6	77.8	49.3	59.6	49.1	76.6	61.5	72.3	60.7	73.5	47.2
14	65.4	45.2	31.9	16.8	.....	.....	.....	.....	42	24	24	12	51.8	29.5	69.5	48.5	66.8	50.6	81.2	59.6	70.5	54.3	77.6	60
15	61.1	40.6	24.2	14.4	.....	.....	.....	.....	36	21	29.8	15.3	50.3	37.5	68	41.6	76	56	85.8	67.2	78.8	55.7	77	61
16	75	46.7	.....	.....	.....	.....	.....	.....	34.8	26.7	32.5	11.7	41.2	25	66	52.2	68.1	60.7	74	63.5	78.4	57.9	66.3	52.6
17	63.6	39.6	.....	.....	.....	.....	.....	.....	27	7	40.2	20	33	27	63.5	47.7	74.6	61.2	73.9	59.6	80.8	58.9	59.5	50.7
18	66.8	38.3	.....	.....	.....	.....	.....	.....	18	4	52	40	46.5	26.5	59	44.2	66	59.4	76.8	60.9	77	63.6	59.7	55.2
19	51.5	50.2	.....	.....	.....	.....	.....	.....	32	0.5	49	37.5	50.9	31	54	41	63.5	54.5	87	63.1	72.5	56.5	69.8	55.5
20	45	43.1	.....	.....	.....	.....	.....	.....	41	25	38.6	18.5	39.9	30	59	39.2	63.3	51.7	74.1	61.5	79.7	59.7	64.1	52.7
21	70.4	46.7	.....	.....	.....	.....	.....	.....	26	13.5	42.8	25.6	37	32	67.5	46.2	74.2	54	75	58.1	68	58.1	56.8	46.3
22	57.3	45.6	.....	.....	.....	.....	.....	.....	24.6	17.3	33.8	21.6	43.3	29.3	56	39.3	80.8	62	75.3	60.1	68.1	50.5	62.0	42.5
23	71.2	45.9	.....	.....	.....	.....	.....	.....	37.6	19.5	28.1	2.4	44.6	29.8	68.8	42.3	77.2	62.6	80.3	59	66.5	48.5	66.8	53.2
24	70	49	.....	.....	.....	.....	.....	.....	29.8	4.5	19.9	— 1.2	43	29.5	62.8	43.4	68	50.9	82.8	63.5	68.7	51.4	68.3	50.2
25	66.4	38.3	.....	.....	.....	.....	.....	.....	21.8	6	37.9	12.7	46.5	28.2	63.8	49.7	66.9	55.4	82.2	66.2	70.5	50.9	76.5	58.5
26	46	40	.....	.....	.....	.....	.....	.....	22.5	16.7	34.8	21.1	38	31	57.5	48.7	71.1	53.6	81.7	67.3	75.3	56	78.4	60.1
27	53	43.5	.....	.....	.....	.....	.....	.....	27.3	11.7	30.2	11	44.2	33.9	68.4	52	80.7	59	73.7	61	76	57	74.8	58.7
28	52	35.5	.....	.....	.....	.....	.....	.....	27.6	7	32.7	18.8	42.5	25	84	50.2	82	63.6	64	58.4	79.7	57	70.5	57.2
29	44	34.5	.....	.....	.....	.....	.....	.....	.....	.....	26	5.8	34.1	29	70	53.3	85	60.6	68.7	58.3	79.2	63	63.8	56.0
30	46.6	25.5	.....	.....	.....	.....	.....	.....	.....	.....	37.7	18.9	38.2	26.9	75	53	70.7	59.5	78.4	63	77.7	62.6	57.4	44.2
31	55.3	29.4	.....	.....	.....	.....	.....	.....	.....	.....	27	8.3	.....	.....	75.4	54.3	.....	.....	69	61.6	75	59	.....	.....
Range	55°.6		.....	.....	.....	.....	.....	.....	60°		57°.8		51°.4		54°.3		40°.3		33°.5		35°.5		41°.7	
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Maximum, minimum, and mean temperature—Continued.

MORGANTOWN, W. VA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	84	37	56	23	44	31	43	28	34	22	56	25	45	31	42	23	76	58	87	58	76	68	80	51
2	68	39	51	29	62	42	51	39	41	27	60	29	47	34	52	44	79	48	87	66	75	62	83	52
3	79	38	58	23	70	51	65	49	36	29	64	35	49	36	60	41	69	60	80	58	72	53	84	56
4	67	44	61	35	69	37	73	49	33	25	61	30	42	22	52	44	86	65	94	58	74	55	77	63
5	76	44	49	29	38	30	49	31	33	27	53	26	59	23	60	43	87	66	77	66	76	51	85	64
6	56	39	52	30	35	24	48	34	38	26	58	38	53	39	58	36	89	68	85	56	77	62	84	66
7	44	35	54	40	42	31.5	53	41	42	28	62	42	58	42	57	32	90	69	94.5	62	77	61	84	59
8	64	35	57	40	61	40.5	42	32	33	21.5	42	31	67	42	75	40	91	74	97	70	75	62	89	61
9	69	35	50	31	61	38	50	31	39	20	38	25	46	36	81	56	92	71	94	66	80	58	79	60
10	73	43	59	33	46	35	45	31	39	22	44	28	43	33	84	51	89	69	84	71	80	59	81	53
11	74	47	54	37	62	35	41	31	47	35	38	27	60	27	85	51	84	68	76	54	87	59	84	55
12	55	33	43	31	64	54	32	22	62	34	34	22	41	20	86.5	55	74	64	80	66	92	69	89	59
13	57	33	30	18	58	34	36	20	62	52	27	17	70	26	85	56	68	52	82	63	85	66.5	90	62
14	68	40	35	17	39	29.5	29	19	62	34	36	24	72	53	81	56	76	48	88	61	76	63	87	61
15	75	40	55	34	46	32	19	10.5	60	30	53	21	65	48	85	55	86	56	89	65	76	56	75	67
16	74	44	56	34	49	28	20	6	49	36	52	41	48	36	78	59	78	67	80	64	80	52	69	67
17	75	51	44	32	52	24	32	−1	36	22	69	45	52	37	71	53	74	62	75	56	82	58	74	65
18	82	51	44	33	53	36	49	12	47	19	73	43	56	36	56	46	82	61	88	57	87	58	80	59
19	48	45	40	25	48	36	51	38	61	33	67	50	63	39	65	37	81	51	89	65	89.5	64	83	64
20	43	35	31	18	36	27	47	35	56	38	53	38	78	50	66	47	83	53	88	66	90	65	70	56
21	45	35	49	15	33	21	65	46	75	48	57	32	59	41	48	46	84	57	73	64	91	63	64	45
22	68	42	48	25	35	15.5	70	55	68	54	52	38	61	43	65	37	90	56	80	59	80	68	70	43
23	69	41	50	27	40	29	57	32	68	34	48	24	51	43	72	42	92	63	86	58	69	64	75	45
24	71	37	54	39	40	22	36	22	34	25.5	35	22	53	37	78	52	89	69	87	66	70	62	77	52
25	54	35	39	32	43	26	25	11.5	38	25	57	22.5	51	39	80	64	92	66	86	71	74	59	80	53
26	64	41	33	26	39	21	43	10	38	24	61	42	49	38	75	55	81	69	86	72	74	60	79	50.5
27	53	36	52	28	36	30	41	40	43	30	58	32	58	32.5	79	46	83	67	78	67	73	58	71	60
28	48	29	39	29	34	27	54	34	46	25	48	34	48	33	88	50	91.5	63	75	64	72	47	65	54
29	49	26	36	20	34	25	43	32	.....	.....	45	29	46	28.5	89	55	93	67	73	59	73	46	63	51
30	55	34	35	19	25	11	54	33	.....	.....	53	31	44	34	88	60	81	65	77	53	78	50	56	49
31	57	29	.....	.....	32	12	55	23	.....	.....	38	31	.....	.....	90	65	.....	.....	82	58	77	53	.....	.....
Range	58°		46°		59°		74°		56°		56°		58°		58°		45°		40°.5		46°		41°	
Monthly means	38°.2		38°.2		38°.7		38°.5		38°.9		42°.1		45°.7		63°		74°.2		74°.1		69°.5		66°.9	

Maximum, minimum, and mean temperatures—Continued.

MOUNT WASHINGTON, N. H.

Day of month.	1873. October.		1873. November.		1873. December.		1874. January.		1874. February.		1874. March.		1874. April.		1874. May.		1874. June.		1874. July.		1874. August.		1874. September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	30	18	34	11	− 2	−18	20	7	− 3	−17	24	3	13	−16	14	8	42	23	.....	31	.....	41	42	31
2	29	18	28	16	23	− 2	30	19	10	− 6	31	19	24	8	16	7	34	20	.....	40	.....	36	47	34
3	29	19	27	2	38	23	36	28	22	− 4	33	24	17	2	25	14	47	32	.....	39	.....	28	54	29
4	37	19	28	1	41	15	41	34	16	−10	36	7	15	4	26	22	48	35	.....	38	.....	30	46	25
5	43	34	21	− 1	15	− 2	41	5	− 8	−28	8	1	12	−18	23	15	56	45	.....	38	.....	36	53	41
6	39	32	7	0	2	1	30	15	1	−25	25	0	17	8	21	9	53	48	.....	40	.....	37	56	40
7	39	28	21	0	12	− 7	42	30	4	− 5	27	18	24	9	16	5	53	49	.....	43	.....	38	43	36
8	42	28	31	18	22	11	41	19	7	− 6	22	10	22	14	21	11	50	38	.....	46	.....	45	42	34
9	48	29	21	3	32	11	25	14	18	6	17	− 3	25	13	42	19	51	34	.....	43	.....	45	56	38
10	51	41	4	− 1	11	− 5	24	9	14	− 6	12	− 6	22	8	40	33	46	27	.....	46	.....	43	54	40
11	58	44	12	0	20	− 4	16	7	− 5	−16	25	4	14	0	34	19	43	25	.....	47	.....	49	49	35
12	51	29	30	12	20	14	7	−10	21	− 7	6	−15	0	−17	46	29	48	34	.....	47	.....	49	47	33
13	29	15	15	3	22	13	6	− 6	32	15	18	−11	25	− 6	47	38	35	26	.....	49	.....	47	53	36
14	31	19	7	− 5	22	− 2	7	− 2	32	1	15	0	42	24	43	31	39	29	.....	38	.....	46	61	48
15	33	21	19	− 7	19	−12	− 1	−20	20	2	28	13	40	25	52	35	49	34	.....	49	.....	40	59	48
16	45	21	21	14	34	13	−20	−27	19	5	38	23	26	4	44	35	49	41	.....	44	.....	38	54	48
17	36	17	18	12	27	20	0	−25	6	−16	33	23	21	12	44	32	49	42	.....	38	.....	43	52	39
18	39	25	32	1	23	14	30	9	22	−16	39	30	21	10	40	33	45	38	.....	40	.....	40	42	36
19	44	35	10	− 2	21	13	29	16	23	13	39	25	23	11	37	24	40	33	.....	47	.....	35	50	41
20	47	42	9	1	16	−11	19	0	27	15	26	− 2	25	12	36	23	44	34	.....	46	.....	40	51	46
21	47	27	11	− 1	− 3	−18	25	5	36	15	21	− 2	26	8	31	25	46	40	.....	40	.....	38	46	24
22	31	21	14	3	10	− 6	40	22	32	25	17	4	12	3	28	23	53	43	.....	39	.....	29	39	23
23	43	27	18	4	15	6	40	4	37	12	8	−19	24	7	31	16	55	44	.....	40	.....	28	39	31
24	43	25	25	13	14	6	11	− 7	13	−13	−11	−31	20	6	40	28	48	27	.....	44	.....	28	44	33
25	28	14	22	− 2	18	3	11	−31	11	−11	18	−12	26	5	42	34	43	27	.....	46	.....	33	47	39
26	27	14	− 2	−20	22	5	−14	−43	9	− 7	25	13	14	8	38	32	50	32	.....	47	.....	35	55	42
27	41	19	11	−15	23	15	30	−15	6	−10	25	− 6	26	7	52	32	57	47	.....	50	.....	36	51	42
28	28	18	10	−15	18	− 7	37	3	5	−13	15	4	25	6	61	48	61	46	.....	49	.....	39	54	40
29	24	12	− 6	−12	12	− 1	7	− 9	.....	.....	5	−13	29	14	56	48	(*)	52	.....	42	53	43	50	43
30	24	8	− 7	−22	5	−18	7	−31	.....	.....	15	2	16	2	51	47	.....	38	.....	40	49	43	44	23
31	36	8	.....	.....	9	− 5	4	−12	.....	.....	10	−15	.....	.....	59	41	.....	.....	.....	40	50	39	.....	.....
Range	50°		56°		59°		85°		65°		70°		60°		56°		.....		.....		.....		38°	
Monthly means	32°.1		8°.6		10°.7		11°.2		6°.3		12°.8		14°.2		32°.5		42°.9		48°.5		43°.9		43°.4	

* Maximum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

NASHVILLE, TENN.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*91	*72	94	74	93	74	84	67
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	70	94	74	88	72	87	70
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	72	94	70	90	69	86	67
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	70	97	70	89	68	83	65
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	70	98	77	87	67	83	72
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	73	100	78	81	72	86	67
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	74	101	73	91	72	86	70
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	96	78	101	78	92	76	88	67
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95	74	95	75	91	69	90	67
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	75	92	73	102	76	91	68
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95	77	82	70	104	79	86	67
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	67	86	68	102	73	88	64
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	60	92	71	106	78	87	67
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	60	93	74	96	77	88	71
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	72	93	75	91	72	86	70
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	83	70	90	75	87	70	76	67
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	63	90	70	90	68	80	69
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	66	91	72	92	67	87	67
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	66	93	71	94	69	78	65
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	72	94	75	95	75	72	53
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	67	95	73	87	78	75	50
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	71	88	74	92	75	78	57
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	73	84	74	92	73	74	62
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	96	76	96	77	87	73	80	64
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93	74	96	77	87	67	85	65
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	96	72	97	79	81	66	76	66
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	98	78	88	76	75	69	74	58
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	99	82	82	70	76	68	65	52
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95	80	84	65	87	67	71	49
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94	72	86	62	80	68	74	52
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92	64	84	66	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39°		39°		40°		42°	
Monthly means	56°.8		47°.1		44°.6		42°.3		44°.5		51°.7		54°.7		72°		83°.5		83°.4		81°.5		73°.4	

* Station supplied with maximum and minimum thermometers June 1, 1874.

Maximum, minimum, and mean temperatures—Continued.

NEW HAVEN, CONN.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	60	38	46.5	36	22	11	43	24	16	5	46	23	36	20	57	37	72	53	78	58	82	64	76	61
2	62	45	53	31.5	28	10	43	35	14	−3	50	30	43	26	54	38	63	49	77	62	79	62	81	60
3	63	44	56	36	48	28	44	35	32	11	53	30	49	34	59	36	65	52	78	63	70	56	84	60
4	66	47	49	27	59	48	52	41	33	23	60	34	40	20	65	41	67	54	76	57	71	57	67	52
5	72	59	53	33.5	49	31	52	30	25	12	42	26	40	16	58	47	72	57	68	61	75	(*)	70	52
6	72	53	46	30	35.5	27	34	29	23	5	36	26	55	33	61	40	71	56	72	59	77	.....	76	66
7	53	42	49	27	32	21	51	31	24	11	33	28	46	33	51	37	77	63	75	59	80	.....	75	60
8	63	38	56	41	41	22	52	40	29	12	43	31	51	32	58	36	85	62	83	66	76	65	78	56
9	60	43	49	38	49	40	45	32	30	10	33	23	45	37	76	42	80	63	84	70	70	63	73	58
10	63	38	38	27	43	32	48	25	30	23	27	16	43	33	70	40	80	64	82	67	82	63	80	58
11	67	40	40.5	28	43	32	45	32	35	17	30	20.5	55	26	56	44	67	57	83	70	81	64	85	64
12	63	42	45	37	49	40	32.5	27	33	14	29	16	32	19	59	34	75	56	81	71	79	69	74	62
13	53	41	41	29	45	37	35	21	48	29	26	15	44	21	72	44	67	52	82	70	81	70	69	59
14	67	40	31	23	37	26	28	24	49	33	36	19	57	33	78	55	75	49	85	63	72	62	72	56
15	66	43	38	21	43	32	25	15	41	25	41	21	59	43	65	51	79	56	88	68	76	61	74	66
16	64	40	33	29	47	30	21	10	42	29	44	27	57	40	58	48	75	62	88	66	76	56	74	64
17	62	48	37	28	39	30	26	7	34	18	47	32	45	30	68	47	76	64	78	61	73	58	68	62
18	60	40	37	30	42	28	34	11	37	14	56	43	47	29	59	50	72	62	88	61	83	52	65	58
19	69	59	37	28	42	30	43	23	40	16	56	43	55	36	66	45	69	54	81	69	78	59	66	57
20	66	63	32	20	42	31	38	20	50	39	56	33	46	38	65	48	65	52	82	68	87	61	68	56
21	66	47	35	20	31	17	37	19	47	39	50	20	49	35	60	50	71	57	78	67	85	73	65	53
22	60	41	40	23	31	19	47	36	42.5	37	48	38	52	36	66	48	80	60	79	61	76	60	63	45
23	62	39	40	21	28	21	58	39	60	36	41	21	45	36	69	45	91	66	81	59	69	50	68	46
24	65	50	45.5	35	40	23	38	28	47	26	30	10	54	34	68	50	76	63	81	65	71	54	71	50
25	56	40	37	26	40	29	32	15	26	22	49	22	43	33	63	55	81	55	78	59	70	56	74	57
26	55	32	26	20	34	29	25	7.5	35	19	55	38	45	33	68	53	77	63	79	63	69	50	76	56
27	62	47	28	17	30	26	39	25	38	25	47	30	51	37	71	47	74	61	80	70	71	49	65	55
28	65	40	31	16	38	28	46	31	40	20	43	32	45	34	73	53	86	61	80	62	72	52	67	49
29	47	34	34	17	38	26	37	26	.....	.....	40	30	39	33	76	56	89	69	78	68	72	51	65	60
30	47	30	30	18	31	15	35	14	.....	.....	54	28	51	32	73	55	85	63	80	62	73	51	64	51
31	44	35	.....	.....	35	14	19	9	.....	.....	38	30	.....	.....	71	56	.....	.....	80	58	77	54	.....	.....
Range	40°		40°		39°		51°		63°		50°		43°		44°		42°		31°		.....		40°	
Monthly means	52°.7		34°		32°.6		32°.1		28°.3		35°		39°.8		56°.8		67°.4		72°.2		67°.9		64°.8	

* Minimum th rmemeter broken.

Maximum, minimum, and mean temperatures—Continued.

NEW LONDON, CONN.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	21	56	41	69	54	78	60	80	66	76.5	62
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	38	50	39	59	52	70	61	78	64	80	57
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	31	65	37	60	50	76	61	72	58	82	61.
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41	20	63	42	67	53	68	58	72	54	70	55
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37	19	56	47	67	55	67	60	77	56	64	49
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	33	61	43	72	57	71	56	77	60	70	61
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	35	55	41	69	59	71	55	79	62	75	58
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43	35	55	39	84	59	77	63	70	65	79	56
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	35	70	44	76	66	83	67	77	65	74	57
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44	34.5	82	41	75.5	60	76	64	81.5	62	78	58
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	32	55	42	69.5	56	81	68	79	64	86	63
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39	27	53	36	69	54	76	67	76	67	72	62
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49	24	70	44	69	53	78	66	79	69	65	56
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	36	75	54	71.5	49	82	63	70	60	68	52
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	45	60	50	77	57	87	67	76	60	70	55
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	44	58	47	69.5	58	85	70	76	59	70	64
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	32	66	52	71.5	62	80	63	72	58	68	62
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	32	61	49	71	59	82	61	79	57	63	57
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	36	64	48	71	52	80	66	78	61	67	58
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49	39	60	45	62	51.5	79	66	83	66	67	58
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	36	56	49	67	55	79	67	85	72	68	54
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53.5	35	65	49	76	56	80.5	60	74	62	64	47
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	39	66	46.5	85	63	79	61	67	52	69.5	45.5
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	37.5	66	50	76	64	80	64	71	56	71	51
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	34	60	52	68	63	74	60	69	52.5	75	57
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*53	*39	45	34	70	50	70	62	75	65	70	51	76	56
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	34	56	38	67	53	75	61	75	66	72	48	66.5	54.5
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.5	33	49	35	67	53	80	67	74	62	73	51	67	50
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	32	41	34	67	54	84	69	75	67	73	51	67	60
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49	30	50	33	67	55	85	65	80	64	74	52.5	66	53
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41	31	.....	.....	71	55	.....	.....	78	60	74	55	.....	.....
Range													38°		45°		36°		32°		34°		40°.5	
Monthly means	52°.7		34°.6		34°.2		33°.4		29°.5		34°.6		39°.7		55°.5		65°.5		70°.9		67°.7		64°.5	

* Station supplied with maximum and minimum thermometers March 26, 1874.

Maximum, minimum, and mean temperatures—Continued.

NEW ORLEANS, LA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	62	66	56	72	59	90	76	90	78	90	78	87	77.5
2	.....	.....	.....	.....	.....	.....	.....	.....	*62	*54	69	55	61	50	78	63	88	77	87	78	91	78	85	75
3	.....	.....	.....	.....	.....	.....	.....	.....	55	48	75	54	66	53	82.5	72	88	76	81	74	93	79	85	77
4	.....	.....	.....	.....	.....	.....	.....	.....	57	45	79	68	69	51	75	64	88	75	76	73	93	80	80	75
5	.....	.....	.....	.....	.....	.....	.....	.....	59	46	78	67	69	59.5	69	58	90.5	75	83	73	94	80	86	76
6	.....	.....	.....	.....	.....	.....	.....	.....	66	52	78	66	76.5	68	70.5	58	89	76	86	75	93	81	86	75
7	.....	.....	.....	.....	.....	.....	.....	.....	54	48	71	61	79	62	75	59	89	77	89	78	92	80	85	79
8	.....	.....	.....	.....	.....	.....	.....	.....	57	44	64	53	77	66	77	61	89	72	89	78	91	79.5	87	78
9	.....	.....	.....	.....	.....	.....	.....	.....	58	46	68	51	70	53	78	62	88	78	81	74	94	80	83	78
10	.....	.....	.....	.....	.....	.....	.....	.....	57	42	74	56	62	48	79	63	88	78	85	74	96	80	87	76
11	.....	.....	.....	.....	.....	.....	.....	.....	65	43	69	57	64	48	79	62	88	78	79	72	94	82	88	70
12	.....	.....	.....	.....	.....	.....	.....	.....	70	51	64	51	68	52.5	83	66	89	79	87	73	93	82	85	75
13	.....	.....	.....	.....	.....	.....	.....	.....	72	63	65	50	74	58.5	83	68	86	74	85	76	96	81	84	75
14	.....	.....	.....	.....	.....	.....	.....	.....	68	61	61	52	77	65	82	70	86	76	85	73	95	81	82	73
15	.....	.....	.....	.....	.....	.....	.....	.....	70	57	72	61	78	68	85	71	85	74	85	75	96	81	85	74
16	.....	.....	.....	.....	.....	.....	.....	.....	71	62	74	68	73	60	83	70	84	73	85	74	91.5	75	85	75
17	.....	.....	.....	.....	.....	.....	.....	.....	75	64	75	68	66	62	83	72	83	73	86	75	85	76	87	75
18	.....	.....	.....	.....	.....	.....	.....	.....	62	51	78	69	74	65	85	68	84.5	75	85	76	82	76	88	78
19	.....	.....	.....	.....	.....	.....	.....	.....	73	51	78	68	74	66	81	70	85	75	86	76	82	76	86	77
20	.....	.....	.....	.....	.....	.....	.....	.....	75	66	78	69	76	62	85	69	85	73	88	76	85	76	86	77
21	.....	.....	.....	.....	.....	.....	.....	.....	76	68	79	68.5	75	64	90	73	83.5	75	88	77	86	78	84	72
22	.....	.....	.....	.....	.....	.....	.....	.....	76	67	81	70	78	68.5	88	72	85	75	88	76	84	77	86	74
23	.....	.....	.....	.....	.....	.....	.....	.....	71	49	73	51	76	67.5	89	74	86.5	75	86	78	86	77	85	76.5
24	.....	.....	.....	.....	.....	.....	.....	.....	53	45	65	52	68	56	88	74	87	77.5	87	78	86	77	86	75
25	.....	.....	.....	.....	.....	.....	.....	.....	55	46	65	51	67	52.5	85	69	86	79	90	78	89	78	83	76
26	.....	.....	.....	.....	.....	.....	.....	.....	55	45	71	59.5	77	59	85	73	89	78	90	77	91.5	78	83	75.5
27	.....	.....	.....	.....	.....	.....	.....	.....	66	44	77	60	76	62	85	75	90	78	91	77	90	78	85	73.5
28	.....	.....	.....	.....	.....	.....	.....	.....	77	48	76	65	77	63	85	74	89	77.5	93	80	88	77	85	68
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73.5	61	65	52	86	74	90	78	91	78	89	78	74	63
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	62	71	56	89	74	91	79	91	79	83	72	79	66
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	63	.....	.....	88	76	.....	.....	91	79	88	75	.....	.....
Range											31°		31°		32°		19°		21°		24°		25°	
Monthly means	68°.2		61°.2		56°.6		56°		59°.1		66°.2		65°.6		75°.7		81°.3		81°.4		83°.9		78.9	

* Station supplied with maximum and minimum thermometers February 2, 1874.

Maximum, minimum, and mean temperatures—Continued.

NEW YORK, N. Y.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	61	48	49	33	29	17	40	29	22	9	45	26	34	23	60	40	74	57	78	68	85	67	82	64
2	54	43	56	34	38	16	42	35	23	4	54	21	45	29	57.5	40	66	50	76	66	80	65	85	64
3	69	54	58	36	49	31	47	38	32	17	57	39	47	35	65	36	60	53	79	63	75	58	86	64
4	69	58	51	33	64	47	58	42	35	24	63	36	42	21	58	47	66	57	78	63	75	56	68	57
5	71	60	55	40	49	33	47	32	32	19	54	31	38	20	65	45	73	62	71	63	77	60	72	61
6	70	50	50	35	43	29	31	31	25	15	38	26	58	35	58	44.5	75	61.5	74	61	80	62	76	61
7	52	43	52	30	37	20	58	39	24	13	36	28	48	37	55	40	79	64	78	61	78	64	82	64
8	68	44	54	45	41	30	55	32	32	14	37	28	52	39	70	42	88	66	87	66	73	65	80	62
9	60	51	53	39	48	38	47	31	32	11	41	25	45	37	76.5	52.5	79	69	85	72	75	64	77	64
10	66	51	41	30	46	35	46	31	33	22	41	21	45	35	86	60	83	70	88	69	84	66	87	60
11	69	50	43	29	43	32	42	32	32	20	36	24	54.5	26	60	44	74	59	85	69	83	70	88	68
12	64	49	49	39	59	40	38	26	36	22	35	21	39	22	55	41	79	58	82	68	81.5	68	74	62
13	60	44	49	22	48	35	33	24	48	30	35	15	40	25	72	41	70	60	81	68	84	68	70	60
14	68	44	38	22	39	26	32	24	48	37	40	21	60.5	32	75	55	67	52	86	68	72	66	72	64
15	68	51	41	27	48	32	24	13	29	28	44	21	61	49.5	68	48	76	51	90	68	78	63	75	64
16	68	52	49	36	51	33	25	9	48	30	42	31	58	40	67	47	76	56	88	69	78	65	71	68
17	66	54	43	31	50	29	29	13	38	19	49	33	50	33	68	55	78	65	91	64	77	64	68	65
18	62	51	40	31	52	35	35	14	32	17	52	42	47.5	32.5	58	52	78	65	84	65	87	61	69	62
19	70	60	39	30	50	35	40	29	43	24	61	49	50	36	68	46	72	59	82	68	80	65	68	60
20	70	54	35	20	44	33	38	25	44	35	60	40	45	40	64	31	65	52	86	66	90	65	67	61
21	59	49	35	20	35	24	40	25	53	39	60	35	55	40	62	50	78	58	77	71	90	74	68	54
22	70	47	47	27	33	22	58	36	46	39	50	39	50	38	68	48	81	62	81	65	79	62	85	64
23	66	47	41	30	34	26	62	40	69	34	43	23	47	40	68	49	88	67	81.5	65	69	53	86	64
24	64	(*)	50	30	43	25	42	.....	51	31	33	17	56	39	63	53	81	68	80	63	71	63	73	57
25	73	43	44	30	41	32	28	17	31	22	47	24	48	35	64	54	87	60	78	64	70	61	75	59
26	55	41	32	22	36	32	26	12	36	21	58	40	45	33	66	54	85	66	77	67	70	58	79	61
27	64	50	39	25	39	30	42	24	40	23	52	32	55	38	74	52	84	64	79	68	70	57	70	61
28	56	40	36	21	40	29	50	.....	38.5	23	49	34	45	34	74	55	84	64	79	68	73	59	67	55
29	52	38	36	24	38	20	38	28	.....	.....	44	31	41	32	75	57	93	70	73	69	73	58	63	55
30	58	36	34	25	32	17	38	19	.....	.....	52	31	51	32	74	59	85	70	82	63	75	57	63	50
31	49	40	.....	.....	33	17	28	15	.....	.....	43	30	.....	.....	75	55	.....	.....	82	63	77	61	.....	.....
Range	37°		38°		47°		53		60°		48°		41°		55°		43°		30°		37°		38°	
Monthly means	55°.6		37°.9		36°.9		34°.7		31°.5		38°.3		41°.6		58°.6		70°.4		73°.9		70°.8		67°.2	

* Minimum thermometer out of order.

Maximum, minimum, and mean temperatures—Continued.

NORFOLK, VA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	.....	.....	.....	.....	.....	.....	50	29	43	31.5	53	38	43	39	79	51	86	68	95	72	92.5	67.5	79	60
2	.....	.....	.....	.....	.....	.....	60	48	44	32	52	42.5	44.5	39	67	52	66	55	84	69	84	73	81	64
3	.....	.....	.....	.....	.....	.....	67	42	39	32	70	44.5	59	37	56	44	69	58	83	72	79.5	67	88	63
4	.....	.....	.....	.....	.....	.....	70	49	41	31	70	47	62.5	39	61	43	87	57	91	69	79	66	83	66
5	.....	.....	.....	.....	.....	.....	68	42	38	29	47	39	47	33	57	47	89	72	88	72	75	65	82	61
6	.....	.....	.....	.....	.....	.....	61	42	45	33	53	43	80	51	62.5	47.5	89	72	72	63.5	79	65	82	66
7	.....	.....	.....	.....	.....	.....	65	52	45	30	69	46	72	50	61	49	93	71.5	83	63	84.5	65	82	66
8	.....	.....	.....	.....	.....	.....	55	40	34	29	57	39	55	45	78	47	99	75	92	68	81	66	86	66
9	.....	.....	.....	.....	.....	.....	55	34	34	31	48	37.5	57	44	85	45	102	77	93	67	84	66	76	66
10	.....	.....	.....	.....	.....	.....	55.5	40.5	41	29	55	37	61	42	89	62.5	99.5	73.5	94.5	69	90	66	73.5	66
11	.....	.....	.....	.....	*55	50	56	40	51	35	50	38	61	38	81	51	92	72	93	74	82	70.5	82	62
12	.....	.....	.....	.....	71	50	44	34	59	35	48	33	51	32	58	50.5	92	69	91	72	86	70	88	66
13	.....	.....	.....	.....	73	40	42	36	65	46	38	28	56	32	77	51	86.5	66.5	87.5	72	85	73	81.5	68
14	.....	.....	.....	.....	45	35	43	32	62	43	44	28	69.5	40	77.5	51.5	74.5	62	90	71	79	70	78	68.5
15	.....	.....	.....	.....	51.5	35	28.5	22	47	39.5	45.5	30	77	59	69	61	76	62	96	72	77	68	82	71
16	.....	.....	.....	.....	56.5	40	26	15	64	40.5	51	38	63.5	41.5	82.5	61	89	63	95	65	76	66	81	71.5
17	.....	.....	.....	.....	60	48	30.5	20	47	36	57	50	55	44	70	60	87	72	80	70	76	67	78	68.5
18	.....	.....	.....	.....	62	45	48.5	28	37.5	30	73	51	49	42	69	60	90	69	83	67	84	66	80	68
19	.....	.....	.....	.....	59	40	53.5	38	54.5	34	78	60.5	57	44	69	51	80	69	84	65.5	91.5	67	81	69
20	.....	.....	.....	.....	49	39	57	34	64	42	70	43	77	55	78.5	53.5	76	64	92	67	94	73	80.5	64
21	.....	.....	.....	.....	41	35	53	42.5	73	46	59	39.5	70	52	68	54	80	62	93	72	96.5	74	69	61.5
22	.....	.....	.....	.....	41	32	70	45.5	75	54	63	47	60	46	69	51.5	92	63	78	67	89	73	70	58
23	.....	.....	.....	.....	41.5	33	73	47.5	77	62	58	39	68	50	79	55	97	68	79	62	79	71	71.5	57
24	.....	.....	.....	.....	40	30	51	37	70	34	42	28	54	46	79	55	95	73.5	79	64	73	66	73	58
25	.....	.....	.....	.....	41	32	34.5	26.5	40	33	56.5	31	69	45	91	61	95	71	86	65	73	65	77	59
26	.....	.....	.....	.....	41	32	37.5	23	42	32	58	48	59	46	81.5	66	95	71	91	69	73	63	77.5	58
27	.....	.....	.....	.....	42	35	50.5	32	49	34	58	49	63	44	69	59	89	73	88	71	69	61	80	60.5
28	.....	.....	.....	.....	44	33	60.5	32	46	36	60	46	76	49.5	82.5	56	93	73.5	82	69	70	60	75	61
29	.....	.....	.....	.....	50	31	52.5	36	.....	.....	51.5	41	63	38	82	62	95	75	85	69	72	60	69	60
30	.....	.....	.....	.....	32.5	24	55	34	.....	.....	65	39	64	36.5	74.5	61	91	71	86	67	73	58.5	69	54
31	.....	.....	.....	.....	40.5	20	60	40	.....	.....	58	42	.....	.....	81	60	.....	.....	86	64	68	58	.....	.....
Range	.....		.....		.....		58°		48°		50°		48°		48°		47°		34°		38°.5		34°	
Monthly means	57°.6		47°.2		44°.5		45°.2		43°.1		48°.9		52°.2		64°.1		77°.7		76°.9		73°.2		70°.4	

* Station supplied with maximum and minimum thermometers December 11, 1873.

Maximum, minimum, and mean temperatures—Continued.

OMAHA, NEBR.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	68	39	49	22	44	32	44	29	25	16	49	26	45	21	80	59	76	59	90	65	81	62	90	65
2	73	52	55	31	39	14	47	30	29	12	52	35	44	28	66	53	80	62	92	66	81	60	64	56
3	62	52	59	26	10	7	47	6	29	18	40	22	50	32	53	39	82	60	94	68	90	64	58	49
4	70	49	51	31	22	3	17	−2	26	9	42	18	38	22	59	40	78	60	96	72	89	65	63	52
5	58	34	47	23	21	5	32	7	31	16	45	35	40	26	66	43	79	62	97	69	95	75	84	52
6	51	25	59	32	27	16	39	12	30	19	39	28	44	29	73	43	81	64	92	69	82	70	92	56
7	70	38	58	41	35	24	42	19	34	5	29	15	47	24	83	50	88	61	99	76	86	68	91	68
8	74	48	70	34	37	15	42	25	37	22	29	10	46	31	89	61	85	69	102	74	86	68	84	66
9	86	56	69	39	26	10	43	28	33	7	41	16	50	24	79	63	74	55	92	72	94	70	78	71
10	68	48	62	36	36	12	36	17	39	17	32	19	69	34	76	58	80	56	84	66	105	74	78	70
11	66	44	55	34	36	25	27	13	40	18	32	12	68	44	76	45	64	48	84	61	93	75	85	66
12	68	37	36	25	27	8	32	18	34	13	27	11	65	36	73	48	75	48	84	67	88	69	68	55
13	72	55	46	20	31	5	28	−3	27	7	37	11	57	48	65	50	65	58	92	69	89	69	69	52
14	81	51	36	23	36	13	5	−4	44	18	40	37	57	41	73	58	75	59	100	77	80	71	65	45
15	71	45	64	36	42	20	16	−7	41	15	46	38	51	30	66	50	76	56	85	67	88	69	62	36
16	65	52	52	40	41	24	33	12	44	25	47	41	51	35	76	43	84	56	85	57	92	70	67	45
17	63	44	59	35	38	18	36	30	42	24	52	40	59	31	68	52	85	60	92	70	84	69	68	56
18	48	35	36	18	34	21	39	13	37	28	40	34	66	37	75	47	87	68	97	69	91	66	62	48
19	60	31	32	11	28	10	22	5	38	17	44	30	48	32	82	57	89	70	85	75	97	75	62	44
20	59	33	47	23	14	2	34	22	39	12	57	34	56	32	75	55	81	63	80	62	92	71	60	41
21	63	40	49	24	35	6	35	12	34	4	43	30	45	35	69	54	89	68	79	65	94	73	68	52
22	47	28	46	33	40	34	13	5	14	5	45	29	52	34	78	51	88	70	89	69	70	65	72	51
23	52	23	40	31	36	32	15	−3	9	1	32	19	42	29	89	59	91	69	96	71	80	64	75	53
24	45	27	53	28	34	26	24	−9	11	−6	49	21	64	37	88	70	88	70	103	77	80	64	75	55
25	44	36	40	25	38	26	33	6	23	−1	54	33	59	41	84	58	92	82	105	77	84	64	74	62
26	39	25	56	23	39	18	42	22	28	12	29	20	61	40	89	60	90	72	80	62	84	65	68	56
27	37	24	27	13	18	5	38	18	41	12	39	21	54	42	90	68	93	74	73	57	86	73	65	47
28	31	18	31	10	37	11	42	13	45	27	40	23	57	40	87	69	76	64	87	58	87.	72	74	42
29	51	22	44	22	29	12	41	22	.....	.....	44	26	72	41	84	70	85	57	95	66	84	67	76	50
30	44	23	49	28	35	13	22	6	.....	.....	45	32	85	51	87	66	86	66	97	73	81	57	71	44
31	41	17	.....	.....	42	26	22	5	.....	.....	37	23	.....	.....	87	64	.....	.....	100	73	83	55	.....	.....
Range	69°		60°		42°		56°		51°		47°		64°		50°		45°		48°		50°		56°	
Monthly means	48°.5		38°.5		25°.2		22°.3		23°.4		33°.8		45°.1		66°.6		73°.2		80°		77°.3		63°	

Maximum, minimum, and mean temperatures—Continued.

OSWEGO, N. Y.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max	Min.	June. Max.	Min.	July. Max.	Min.	August. M	Min.	September. Max.	Min.
1	60	42	45.5	31	24	14	43	35	13	1	47	25	41	22.5	47	37	55	48	79	53	74	65	73	55.8
2	56	44	52	35	41	19	42	35	17	0	56	37.5	44	32	46	33	65	47	72	59	69	61	78	62
3	52	44	50	35	51	39	52	42	29	16	59	41	39	26	53.5	38	70	57	76	57	67	52	77	52
4	63	50	55	32	62	37	64	39	25	20	64	27	27	13	52	40	77	58	67	59	70	51	65	46.9
5	61	53	44	32	38	30	40	24	24	8	27	19	40	26	57	41	83	62	72	58	77	52	79	54
6	57	43	36	31	33.5	30	39	26	20	7	47	25	40	32.5	50	32	75	54	86	60	78	54	75	61.5
7	59	51	49	31	33	26.5	39	34	24	9	40	31	42	34	51	36	86	59	89	68	79	64.5	75	61.5
8	59	43	47	41.5	39	26.5	50	34	27	7	39	28	46	34	59	45	71	55	80	67.5	75	65	76	57
9	59	44	43	31	47	39	45	31	32.5	13	31	16	35.5	31	77	50	81	55	77	62	79.5	63.5	79	55
10	69	46	33	27.5	40	33	41	33	30	21	24	14	40	30	71	45	69	54	77	65.5	77	62	78	57.7
11	70	50	49	32	44	35	36	28	26	20	24	18	36	24	69	44	62	55	73	64	85.5	63	80	65.3
12	55	43	45	31	42	32	30	23	40	12	22	12	34	21	78	52	66	51	68.5	60	93	71.5	73	64.6
13	54	42	31	25.5	34	24	30	24	48	35	22	10	46	25	74	53	59	47	75	58	72	65.5	81	62
14	59	50	31	24	35	24	32	21	46	25	31	20.5	61	41	61	46	75	51	86	60	76	61.5	86	64
15	59	42	35	28	40	32	21	8	43	24	32	22	53.5	36	83	50	72	58	89	70	73.5	58	83	66.5
16	74	50	51	30	45	30	19	7	40	28	44	26	38	32	76	48	75	59	79	60	77	56.5	67	58.3
17	56	44	34.5	30	44	31	24	11	28	16	50	34	40	32	63	45	72	52	74	56	85	62	70	59
18	64	53	34	29	44	37	36	20	25	12	59	44	50	33	55	43	58	51	84	59	75	68	71	59.4
19	55	44	31	28	42	27	44	25	40	21	60	32	50	33	62	43	67	53	88	65	76	60.5	75	59.4
20	46	41	34	23	36	22	26	13	40	35	37	32	51	43	58	46	63	53	79	61.5	78	67.8	67	56
21	54	46	32.5	25	33	23	40	23	43	29	50	33	48	32	47	43	69	51	71	59	74	60.5	61	49.5
22	57	45	38	28	32	23	55	40	32	29	42	29	52	37	54	44	85	55	82	55	67	50	68	45
23	66	48	41	30	35	22	54	28	46.5	31.5	30	15	48	38	69	46	83	62	88	57	67	50.7	67	52
24	50	41	41	27	38	21	39	18	32	16	27.5	15	43	34	69	55	68	55	86	67.5	73	53	72	55
25	48	39	30	19	36	29	19	8	32	20	51	21	47	33	72	52	68	54	90	69.5	72	51	77.5	55
26	55	37	23	13	40	33	21	0	29.5	22	47	28	43	32	52	45	65	57	85	70.5	74	54	79	56
27	54	44	28	17	40	33	45	21	32	24	37	25	41	35	72	48	79	54	78	62.5	73	54.6	80	61
28	53	37	27	19	34	24	40	20	36.5	26	36	27	38	34	86	56	94	62	65	58.5	76	56	69	59
29	42	30	31	24	36	25	36	13	.....	.....	37	20	39	32	70	52	84	64	71	58.5	72	57.8	60	56
30	46	34	30	14	28	13	15	0	.....	.....	38	25	42	34	83	54	69	56	76	61	75	58.5	58	45.5
31	50	32	.....	.....	36	26	15	7	.....	.....	31	23	.....	.....	83	54	.....	.....	75	61.5	75.5	58	.....	.....
Range	44°		42°		49°		64°		48°		49°		48°		53°		47°		37°		43°		41°	
Monthly means	50°.9		32°.3		33°.3		28°.7		25°.9		32°.5		36°.7		53°.7		62°.1		69°.8		67°.5		65°.4	

Maximum, minimum, and mean temperatures—Continued.

OTTAWA, CANADA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	36.7	22.2	0.1	−16.9	44.7	12.9	31.2	0.5	43.2	31.2	62.7	45.8	84.7	55.6	77.7	61	81.7	53
2	.....	.....	.....	.....	.....	.....	31.7	16.5	3.5	−22.9	45.7	23.7	41.9	13.1	48.7	30.7	71.5	43.8	80.7	58	69.9	55	85.7	53.4
3	.....	.....	.....	.....	.....	.....	40.7	29.4	17.6	0.5	49.7	35.7	36.7	16 8	64.7	30.7	72.7	47.8	72.7	58	67.7	48.6	69.7	46.8
4	.....	.....	.....	.....	.....	.....	59.5	39.2	19.6	3.3	35.7	10.1	21.7	4.7	65.1	30.7	71.7	56	78.7	53	79.5	50.6	68.7	41.4
5	.....	.....	.....	.....	.....	.....	22.7	12.9	8.6	−12.4	22.7	4.7	37.7	9.9	57.9	33.7	82.7	54	84.7	61	83.7	49.8	75.1	45.6
6	.....	.....	.....	.....	.....	.....	27	12.1	7.6	−16.9	25.7	5.7	42.7	25.4	42.7	29.4	74.7	58	79.7	59	82.7	52.6	74.9	62
7	.....	.....	.....	.....	.....	.....	34.2	27.4	12.6	0.1	27.7	20.2	43.7	25.4	54.9	25.4	72.7	54.2	91	58	81.7	57	76.9	57.4
8	.....	.....	.....	.....	.....	.....	31.7	32.7	21.2	− 6.9	45.7	26.4	37.7	24.2	57	35.5	72.7	58	85.7	62	84.7	60.8	80.7	53.2
9	.....	.....	.....	.....	.....	.....	37.9	25.4	24.9	2.5	18.6	11.7	37.7	23.2	62.1	38.7	81.7	53	82.7	60.2	92.5	58	82.7	53
10	.....	.....	.....	.....	.....	.....	37.9	30.7	24.7	1.5	16.6	6.9	42.7	28.4	56.7	35.7	72.1	52.4	78.7	59	90.7	62	88.9	62
11	.....	.....	.....	.....	.....	.....	31.7	14.1	21.2	4	11.6	1.5	38.7	18.8	62.7	40.8	62.7	43.8	75.3	57.8	87.7	63	77.7	61.5
12	.....	.....	.....	.....	.....	.....	15.7	3.5	21.5	−12.9	7.6	− 2.7	33.7	11.3	71.7	40.8	69.7	47.8	74.3	53	97.7	65	69.9	54.5
13	.....	.....	.....	.....	.....	.....	11.6	0.1	41.9	14.4	17.6	1.5	43.7	15	79.7	49.8	68.9	46.8	74.7	57.8	78.9	61.2	79	48.8
14	.....	.....	.....	.....	.....	.....	18.6	7.2	38.7	21.2	25.7	11.9	56.7	27.4	62.7	44.8	78.7	47.8	89.7	56	80.7	58.8	87.5	59
15	.....	.....	.....	.....	.....	.....	11.6	0	39.5	9.6	34.7	10.9	60	29.2	72.7	43.8	84.7	53.8	93.2	57	81.7	52.4	83.7	58.8
16	.....	.....	.....	.....	.....	.....	5.6	1.1	39.7	18.8	45.9	12.9	41.7	22.2	73.7	52	65.7	58	74.7	59.7	84.7	54	66.7	51.8
17	.....	.....	.....	.....	.....	.....	16.4	− 8.4	20.7	7.9	36.7	23.2	37.9	25.4	66.7	44.8	73.7	61.8	79.7	61	88.7	54.4	66.7	49.6
18	.....	.....	.....	.....	.....	.....	30.9	6.7	14.6	− 2.7	48.7	33.9	47.9	20.2	56.7	44.2	70.7	58	81.7	56	86.7	61.4	66.9	55
19	.....	.....	.....	.....	.....	.....	35.7	11.7	31.9	− 1.2	51.7	32.7	49.7	29.4	63.7	40.8	75.7	56	94	58.4	78.7	50.4	72.7	56
20	.....	.....	.....	.....	.....	.....	26.9	− 4.7	41.7	17.5	50.7	13	39.7	29.8	65.7	47.8	71.7	53.8	78.5	58	81.9	59.6	67.1	53.2
21	.....	.....	.....	.....	.....	.....	24.2	0.8	29.5	16.8	49.7	17	38.1	28.6	54.7	40.8	80.7	51	80.7	48.8	67.7	55.8	66.7	42.8
22	.....	.....	.....	.....	.....	.....	42.5	13.9	31.7	12.3	34.7	23.2	46.7	27.4	61.9	43.5	91.7	63	83.7	56.2	67.7	51.4	68.5	34.5
23	.....	.....	.....	.....	.....	.....	40.7	17	39.2	20.3	19.6	2.5	44.7	32.7	71.7	45.8	82.7	65	85.7	53	69.3	45.8	68.7	51
24	.....	.....	.....	.....	.....	.....	26.7	6.7	22.7	3.7	22.7	1.5	43.7	24.2	72.7	49.8	72.7	47.2	89.7	59	74.7	45.2	71.9	49
25	.....	.....	.....	.....	.....	.....	26.7	−10.9	21.7	− 2.9	40.7	4.7	48.1	22.4	69.7	52	67.1	56	91.7	64	74.9	51	80.1	51
26	.....	.....	.....	.....	.....	.....	9.6	−20.9	22.7	3.6	36.7	12.9	45.7	26.4	60.7	45.8	80.7	54	85.9	69.4	81.7	54.8	78.7	51.2
27	.....	.....	.....	.....	.....	.....	7.6	− 8.3	22.2	3.6	31	8.7	46.9	27.4	74.7	45.8	85	48.2	78.7	62	83.7	53	79.5	55
28	.....	.....	.....	.....	.....	.....	21.5	4.7	27.7	− 4.5	33.7	13.9	46.7	23.2	91.7	48.8	90.3	48	73.7	55.2	85.7	52.8	69.7	51
29	.....	.....	.....	.....	.....	.....	12.6	− 1.9	.....	.....	29.9	2.5	39.9	25.4	81.7	55	90.7	65	80.7	57.2	81.9	53	64.7	52
30	.....	.....	.....	.....	.....	.....	0.5	−16.1	.....	.....	36.7	17	47.1	27.4	83.7	53	80.9	58	85.7	57.8	86.9	50.6	51.7	43.8
31	.....	.....	.....	.....	.....	.....	3.3	−14.9	.....	.....	22.7	7.7	.....	.....	77.7	61	.....	.....	76.7	60.2	77.9	58.4	.....	.....
Range	.....	.....	.....	.....	.....	.....	80°.4		64°.8		54°.4		59°.5		66°.3		47°.9		45°.2		52°.5		54°.4	
Monthly means	.....	.....	.....	.....	.....	.....	.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

PECK'S BEACH, N. J.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	45	30	27	20	43	30	36	30	65	33	78	56	75	63	74	66	75	59
2	.....	.....	.....	.....	.....	.....	46	40	36	22	45	28	43	32	54	45	62	53	78	65	77	63	81	54
3	.....	.....	.....	.....	.....	.....	48	40.5	36	29	51	38	51	36	51	34	62	54	78	63	78	55	81	63
4	.....	.....	.....	.....	.....	.....	48	41	37	26	65	38	48	25	52	40	74	56	86	63	72	53	74	65
5	.....	.....	.....	.....	.....	.....	50	38	36	21	42	29	46	20	50	44	70	60	79	59	75	53	73	66
6	.....	.....	.....	.....	.....	.....	48	38	30	16	40	33	64	43	60	40	72	64	67	60	77	58	76	63
7	.....	.....	.....	.....	.....	.....	52	47	31	22	51	37	56	42	55	39	73	62	70	58	76	65	85	63
8	.....	.....	.....	.....	.....	.....	48	31	34	13	45	32	44	38	67	42	90	62	72	64	72	67	88	62
9	.....	.....	.....	.....	.....	.....	43.5	30	34	12	37	27	44.5	40	78	47	87	67	78	66	79	66	77	62
10	.....	.....	.....	.....	*56	26	45	37	59	23	44	27	47	37	84	52	84	66	78	61	83	63	76	52
11	.....	.....	.....	.....	48	26	45	29	42	22	40	26	52	32	65	45	87	64	75	66	78	63	81	60
12	.....	.....	.....	.....	65	48	38	21	40	23	39	24	42	23	53	42	85	66	70	68	79	66	78	66
13	.....	.....	.....	.....	54	41	36	21.5	46	38	28	19	41	21	62	48	76	55	84	61	78	68	70	68
14	.....	.....	.....	.....	40	29	38	27	54	34	40.5	22	53	21	60	51	72	48	79	60	75	67	72	68
15	.....	.....	.....	.....	45	29	25	13	42	31	43	26	62	46	52	47	74	58	77	61	74	63	78	68
16	.....	.....	.....	.....	47	33.5	24	12	55	34	42	22	58	42	70	51	72	63	89	62	77	57	71	68
17	.....	.....	.....	.....	46	30	29	10.5	37	24	47	39	43	36	64	50	81	55	74	62	74	57	70	66
18	.....	.....	.....	.....	55	35	38	13	31	15	55	42	42	35	65	51	83	64	79	60	84	55	76	68
19	.....	.....	.....	.....	52	35	41	35	42	31	53	44	49	38	68	44	74	59	81	63	78	63	70	67
20	.....	.....	.....	.....	44	33	42	30	51	39	55	36	55	38	59	53	69	50	76	65	86	70	72	62
21	.....	.....	.....	.....	37	20	42	36	49	38	46	31	61	42	65	52	74	54	75	64	87	72	68	53
22	.....	.....	.....	.....	34	16	47	39	52	43	56	39	49	35	67	48	82	60	74	62	82	65	64	50
23	.....	.....	.....	.....	35	29	63	40	61	43	46	27	49	43	61	44	90	65	78	56	72	66	68	48
24	.....	.....	.....	.....	40	22	40	27	43	31	36	17	51	40	56	53	89	64	77	61	71	60	71	54
25	.....	.....	.....	.....	37.5	22	28	19	35	30	44	24	45	41	65	52	84	56	79	64	70	66	73	59
26	.....	.....	.....	.....	40	28	32	11	36	23	48	40.5	47	35	72	53	88	69	79	69	68	52	71	63
27	.....	.....	.....	.....	44	34	42	32	39	30	45	37	57	31	70	44	75	67	79	69	68	51	73	59
28	.....	.....	.....	.....	41	30	51	39	39	21	53	31	46	40	73	54	75	65	80	66	70	58	67	65
29	.....	.....	.....	.....	40	31	46	29	.....	.....	47	33	45	34	67	54	82	69	78	67	74	50	72	58
30	.....	.....	.....	.....	35	21	38	29	.....	.....	50	34	54	32	68	54	82	67	81	59	72	54	64	50
31	.....	.....	.....	.....	36	21	44	26	.....	.....	45	28	.....	.....	66	55	.....	.....	81	60	78	57	.....	.....
Range	.....	.....	.....	.....	.....	.....	52°.5		49°		48°		44°		51°		40°		33°		37°		40°	
Monthly means	.....	.....	.....	.....	36° 5		35°.7		33°.4		38°.7		42°.7		55°.4		69° 1		70°.2		69°.2		67°.5	

* Station opened December 10, 1873.

Maximum, minimum, and mean temperatures—Continued.

PEMBINA, DAK.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	42.5	30	34	15.5	14	−3	26	12	15	1	39	21	30	16	61	42	68	42	69	47	71	.....	69	54
2	38	23	28	−4	13	−6	28	16	16	3	31	5	26	3	55	33	68	50	77	51	80	.....	63	44
3	41	20.5	41	−6	0	−11	16	−20	7	0	5	−19	16	−2	57	34	74	49	83	63	83	.....	75	36
4	52.5	35.5	22	1.5	−2	−14	−9	−31	11	−1	12	−21	30	−1	63	25	65	49	83	56	78	.....	74	44
5	34.5	23	25	2	−9	−31.5	17	−19	13	0	30	5	32	16	67	32	64	40	82	64	81	.....	72	44
6	63	17.5	38	23	8	−22	19	0	15	4	15	−4	25	0	66	26	62	40	87	55	79	.....	86	53
7	72	35	19	13	25	5	30	9	23	4	6	−4	32	15	78	37	69	53	84	54	82	.....	85	54
8	72	41	27	13	29	10	31	5	19	−2	4	−21	27	1	96	56	56	37	85	62	86	.....	87	56
9	65.5	40	33.5	12	12	−6	5	−8	15	−10	13	−10	46	22	75	52	66	32.5	80	56	89	.....	83	69
10	59	37.5	34	15	13	−11	4	−6	7	−6	10	−15	32	14	80.5	42	62	48	72	51	84	.....	71	59
11	56	32	34	12.5	15.5	−5	−1	−8	23	−6	3	−17	35	8	49	37	65	46	81	47	70	.....	63	43
12	63	31	20.5	2	14	−7.5	−6	−12	14	0	6	−27	50	25	59	33	63	39	82	65	70	.....	65	40
13	55.5	37	20	−5	16.5	−7	−20	−35	6	−13	25	−18	49	34	62	29	73	41	80	60	68	.....	68	45
14	55	25	32.5	9	22	−1	−15	−27	1	−27	35	20	34	18	62	36.5	80	48	81	59	77	.....	52	34
15	43	33.5	43	15	23	2	−1	−15	12	−13	37	20	40	13	64	32	79	54	80	50	85	.....	61	24
16	54	22	40	32.5	24	3	18	−3	10	−15	40	34	44	26	57	35	84	50	81	63	73	.....	53	50
17	45	36	32	12	21	−2	31	6	23	−5	38	24	35	14	60	30	92	55	85	51	70	46	57	49
18	42.5	34	14	−2	19	8.5	6	−21	32	19	25	15	25	8	72	39	87	60	89	(*)	72	46	54	47
19	48	30	16.5	−2	11	−11.5	0	−36.5	22	−17.5	23	10	34	15	61	38	89	54	70.5	.....	75	57	53	40
20	60	29	25	6	−2	−24	24	−8	6	−14	19	8	39	18	62	37	86	54	85	.....	71	54	54	40
21	51	32.5	26	12	19	−12	21	−18	−4	−33	33	6	37	20	68	55	83	63	87	.....	78	56	65	40
22	33	20	23	8	22	8	−10	−30	5	−20	16	−4	35	12	77	53	73	56	87.5	.....	76	45	69	36
23	33.5	17	30.5	15	20	0	−10	−29	−8	−24	18	−8	48	19	67	49	81	51	79	.....	69	60	69	44
24	31	22	34	15	16	−9	12	−4	−4	−32	43	6	54	35	73	56	91	70	91	.....	77	50	82	39
25	30	21	15	−4	31.5	10	−19	−44	11	−25	20	−2	38	21	72	41	67	63	63	.....	82	54	81	53
26	35	13	14	6	19	−5	12	−4	15	−22	18	−5	40	18	88	57	79	60	69	.....	68	62	58	45
27	25	19	10	−11	18	−11	6	−1	8	−8	13	1	44	29	69	53	71	64	78	.....	70	56	68	38
28	30	5	0	−21	25	5	0	−6	27	−16	21	−1	56	34	69	49	64	54	75	.....	71	65	67	34
29	35	22.5	1.5	−27	14	−6	−4	−26	.....	.....	31	6	70	41	70	58	72	49	75	.....	74	59	63	30
30	16	13	7	−5	14	−5	−9	−30	.....	.....	20	−1	70	39	70	47	64	59	85	.....	76	47	80	33
31	26	10	.....	.....	32	2	5	−30	.....	.....	36	1	.....	.....	62	38	.....	.....	70	.....	75	61	.....	.....
Range	67°		70°		63°.5		75°		65°		70°		72°		71°		59°.5		.....		.....		63°	
Monthly means	35°.4		16°.1		6°.6		−3°		2°.6		11°.9		29°.4		55°.3		64°.4		69°.9		67°		56°.2	

* Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

PHILADELPHIA, PA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	62.5	46	60	31	32	23.5	43.5	32	29.5	17	50	29.5	35	27.5	65	43.5	75	56	85	65	87	67	81	66
2	63.5	51	61	31	38	23.5	47.5	36.5	27	11	58	34	44.5	31	55	42	69	51	81	68	81	66	83	62
3	70	54	59	43	57	34	61	39.5	35	20	65	37	50	36.5	62	36.5	66.5	51.5	81	66	75	60	88	62.5
4	72	52	58.5	33.5	70	50	66	50.5	36.5	27	67	37	45.5	25	59.5	44.5	73	52	86	71	76	59	70	59
5	70.5	65	55.5	44	51	31.5	61.5	34	31	23	52	29	37.5	22	59	43.5	83.5	61.5	76	66	78	59	74	63
6	73.5	59	56	34.5	38	30.5	45	32	26	17.5	42	31	58	33.5	63.5	44.5	78	70	75	61	81	64	76.5	63
7	73	40	49	35	34.5	29	62	55.5	24.5	16.5	40.5	32	48.5	42	54.5	44	86.5	68.5	80	60	77	65	84	(*)
8	62	41	52	41	44.5	33	56.5	36.5	30.5	20.5	44.5	31.5	54.5	36	70	41	91	73	88	66	72	64	86	.....
9	69.5	49	54.5	42	50.5	41	51.5	34.5	31	17	34	29.5	46	38.5	83	53.5	94	77	91	78	82	65	77	.....
10	64	45	37.5	32	45	37	49.5	36.5	31.5	25.5	42	21	45	36	87.5	56.5	83	72	91	71.5	86	66	85	.....
11	65	46.5	44	31	47	33	43.5	33	39	27	38	27	58	28	70	45	73.5	65	87	68	85	64	90	.....
12	69	51	45	37	66	46.5	35.5	27	37.5	21	36.5	24	40	17.5	65	42	85	65	86	69	87	68	87	.....
13	62	42	37.5	28.5	59	39	32.5	25	51	27.5	28.5	19	46.5	28	74	49	71	61.5	84	69	84	68	72	.....
14	69	44	34	24.5	40.5	31.5	35	25	53.5	37	39	23	62	34.5	80	57	72	56	89	71	75	66	70	.....
15	69	46.5	44	26.5	47	31.5	28.5	12	44.5	30	48	28	64	35	68	51.5	79	61.5	90	72	80	65	78	.....
16	70	45.5	56	32	52	34	25	10.5	54.5	33.5	44	30.5	59.5	43	66	50.5	79	59.5	88	72	82	65	70	.....
17	70	53.5	43	33.5	55.5	34.5	31	14	38.5	22	54	37	47.5	36	72	56	80	66	80	65	80	60	69	.....
18	67	55.5	40	31.5	54.5	38.5	33	14.5	37.5	18.5	59.5	46	49	34.5	66	52.5	82	63	86	62	87	63	75	.....
19	73.5	58	37	29	47.5	34	38	27.5	45	25.5	66	48	50	37	68	46	74	64	89	71	84	66	69	.....
20	74.5	49	34	20.5	45	34.5	41.5	27	46	37.5	63	43	46.5	42	64	51	67	57	89	62	93	67	71	.....
21	70	45	37.5	21	35	27.5	44.5	27	68	39	53.5	37	58	43	62	52	76	58	80	70	95	72	68	.....
22	57	43	42.5	30.5	38	25	63	41	61	40	53	40	56.5	40	68	47	87.5	64	81	64	79	65	69	.....
23	66	43.5	40.5	37.5	31.5	27	66	39	75	37	47.5	26.5	48.5	40	70	49	92	68	83	66	70	60	74	.....
24	67	48	47.5	37	41	26	44	27.5	51.5	32.5	36	19.5	56.5	40.5	60.5	53.5	86	70	83	64	72	60	74	.....
25	64	42	43	34	41	26.5	30	20	34	24	50	25	56.5	37.5	80	54	87	62.5	82	62	71	62	77	.....
26	58	40	35.5	26	37	31	29	15	40	23.5	59.5	40.5	46	35.5	69.5	55.5	87	73	85	67	71	57	83	.....
27	64	52	49	22.5	38	33.5	43	29	40	26	53.5	31.5	56	39	72	54.5	81.5	70	83	70	72	55	80	.....
28	63.5	44	41	28	42	30.5	54.5	39	42.5	28	50	38	49.5	35.5	80	55	89	66	85	68	74	55.5	69	.....
29	57	32	36.5	27	40.5	29.5	43.5	32.5	.....	.....	48.5	31.5	43.5	29	85	57	97	72	75	68	75	56	55	.....
30	46	31	33.5	26	37	23	41.5	23	.....	.....	57	34.5	55	33.5	81	59	87	74	81	62.5	80	57.5	64.5	.....
31	53	38	.....	.....	37	19.5	33	22	.....	.....	49.5	30.5	.....	.....	83	60	.....	.....	84	65	80	61	.....	.....
Range	43°.5		41°.5		50°.5		55°.5		64°		48°		46°.5		51°		46°		37°		40°		.....	
Monthly means	54°.7		38°.3		38°.3		36°.7		33°.2		40°		42°.5		59°.9		73°		74°.7		71°.1		68°	

* Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

PIKE'S PEAK, COL. TER.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	(*)	.....	15	6	20	4	2	−11	15	− 2	15	− 6	27	14	28	20	47	31	56	33.8	52.1	32.2
2	.....	.....	21	.....	6	− 1	15	9	4	− 7	13	3	9	− 6	14	− 2	35	19	52	32	51	33.2	37	28
3	.....	.....	26	12	− 1	−26	13	−23	14	−10	8	− 3	19	− 6	14	1	38	23	52	34	50.3	32.8	30	21
4	.....	.....	26	9	2	−13	1	−25	9	1	4	− 5	15	3	28	4	38	25	57	36	48.4	32.2	37	20.3
5	.....	.....	30	10	9	0	11	− 1	6	−11	4	− 9	14	1	35	14	38	26	52	38	51.8	33.8	47	23
6	.....	.....	26	9	8	2	15	− 2	10	−10	− 3	−15	14	0	40	19	37	27	52	35	48	33.9	50	27.6
7	.....	.....	27	9	10	0	15	5	13	0	7	−12	12	− 6	33	22	43	30	52	37	54	33.5	50	31.3
8	.....	.....	28	12	6	− 2	10	4	8	− 5	12	− 3	7	− 8	28	14	42	32	49	38	53	34	41.2	32
9	.....	.....	30	15	7	− 5	16	4	20	− 1	14	2	13	− 1	14	5	41	31	54	38	51.5	35	49.3	31
10	.....	.....	27	12	9	2	16	7	18	4	14	5	24	8	20	5	37	22	55	36	51	30	44	28
11	.....	.....	21	12	9	− 5	15	4	11	2	14	1	15	9	24	10	33	18	56	37	48	30	47	27.3
12	.....	.....	23	10	− 2	−12	14	2	10	−10	18	3	16	7	21	14	38	21	54	39	54	31	39	21
13	.....	.....	27	14	8	− 6	14	1	3	−16	17	4	13	2	22	15	40	27	54	37	50	33	29.7	20
14	.....	.....	28	14	11	− 1	23	6	5	− 4	9	− 2	14	− 1	26	13	31	20	50	35	54.5	32.2	35.6	20
15	.....	.....	24	10	16	8	13	5	15	3	7	− 2	1	− 7	28	13	36	19	42	34	49	35.9	44	24
16	.....	.....	30	15	10	2	23	1	15	5	8	− 6	10	− 9	38	18	45	25	48	35	47.5	35.8	37.9	22
17	.....	.....	32	10	7	− 4	20	4	16	4	7	− 6	7	−11	42	24	46	28	50	36	42.3	33.7	36.2	19
18	.....	.....	15	− 1	0	−11	14	4	9	3	6	−12	14	− 6	40	23	50	30	49	35	53	32.8	27.2	15.5
19	.....	.....	20	7	7	− 6	10	2	10	0	3	−15	10	− 1	43	25	50	30	45	36	54.9	35	36.2	13
20	.....	.....	20	8	14	− 5	10	− 4	12	−10	10	− 3	11	1	41	20	56	33	48	34	54	34	40	15.2
21	.....	.....	20	7	8	1	4	− 9	− 9	−18	16	− 4	19	6	38	27	57	36	53	35	50.5	33	38.2	21.7
22	.....	.....	12	− 1	11	2	10	−18	−15	−26	19	1	9	− 5	42	26	51	37	46.5	34.4	46.7	34	28.8	22
23	.....	.....	10	− 6	6	− 7	8	−18	− 8	−26	20	6	5	− 8	45	28	53	35	42	36	47	23	25	17
24	.....	.....	18	5	14	− 9	9	− 9	− 8	−22	18	6	14	− 3	42	28	55	33	54.9	35	44	31	29	17
25	.....	.....	21	11	18	6	21	1	1	−20	17	4	20	9	38	26	53	33	57.2	36	39	31	34	19
26	.....	.....	18	6	7	− 8	21	5	3	− 9	20	4	23	11	45	27	53	35	40.5	32.5	45.5	32.8	32	21
27	.....	.....	11	4	19	4	7	− 5	14	− 5	17	6	24	6	41	27	48	29	38.6	32	48	31.3	38	26
28	.....	.....	16	6	22	12	15	− 1	10	2	17	8	30	13	31	18	45	25	48.2	30.9	53.2	28.3	37.2	27.1
29	.....	.....	23	7	16	10	15	2	.....	.....	17	9	32	17	32	23	50	24	53.3	33.7	40.5	30	45.5	27.2
30	.....	.....	21	12	22	11	8	0	.....	.....	13	4	35	17	31	26	47	30	59	38.8	49.3	33	40.2	21.2
31	.....	.....	.....	.....	22	8	5	− 6	.....	.....	17	2	.....	.....	31	25	.....	.....	55	36.3	52.4	31.7	.....	.....
Range	.....	.....	.....	.....	48°		48°		46°		35°		46°		47°		39°		28°.1		33°		25°.1	
Monthly means	.....	.....	15°.9		4°.5		6°.1		0°.5		4°.8		7°.7		23°.6		35°		42°		39°.5		29°.6	

* Station opened November 1, 1873.

Maximum, minimum, and mean temperatures—Continued.

PITTSBURGH, PA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1																				*55		65	85	54
2																				63		59	89	56
3																				55		51	89	61
4																				61	†76	51	72	60
5																				65	76	53	88	61
6																				57	81	59	85	63
7																				65	85	62	87	59
8																				70	74	64	91	62
9																				70	87	58	83	62
10																				71	85	63	82	54
11																				66	92	65	90	55
12																				65	97	(‡)	93	60
13																				62	85		97	62
14																				65	80		90	67
15																				70	81		81	69
16																				62	86		71	65
17																				54	89		74	64
18																				59	88	62	82	59
19																				69	92	61	88	66
20																				74	95	69	70	54
21																				63	96	68	69	45
22																				52	75	64	74	45
23																				58	69	60	80	48
24																				65	74	62	83	53
25																				71	75	58	85	55
26																				70	78	57	83	55
27																				65	77	57	69	62
28																				63	78	51	62	54
29																				61	79	51	65	53
30																				55	82	50	54	49
31																				64	82	56		
Range																							52°	
Monthly means	57°.3		35°.8		37°.1		35°.5		34°.4		39°.3		43°.3		61°.9		73°.9		74°.7		70°.4		67°.6	

* Station supplied with minimum thermometer July 1, 1874. † Station supplied with maximum thermometer August 4, 1874. ‡ Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

PORTLAND, ME.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35	12	45	34	62	50	79	57	77	60	75	58
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	21	45	35	60	47	65	56	75	59	78	56
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	30	57	36	66	52	65	56	70	55	82	54
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33	16	65	40	59	51	61	52	70	50	65	47
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41	15	56	41	65	52	59	52	75	57	66	47
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	30	60	39	67	57	68	54	71	55	70	56
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	32	49	34	61	54	67	53	73	56	70	59
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	32	53	34	82	55	89	65	65	61	71	52
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43	33	51	35	67	54	82	66	64	60	69	58
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	38	30	55	42	74	52	70	59	83	63	86	54
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*34	11	44	30	59	39	60	51	75	61	78	63	79	59
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	10	34	18	60	40	54	50	68	57	78	58	75	49
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29	8	38	19	81	45	65	50	67	55	71	62	67	47
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35	18	52	30	73	54	77	49	86	63	63	57	67	47
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	18	59	41	60	46	77	53	92	67	77	58	69	57
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	31	51	35	50	45	73	57	87	70	75	57	71	60
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49	33	40	28	68	46	70	58	82	64	71	56	70	55
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	38	47	26	56	45	72	58	81	61	81	56	(†)	.....
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	47	60	35	66	48	66	48	75	60	74	61	.....	.....
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	29	45	33	65	43	57	47	77	62	81	60	61	50
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	28	47	31	57	45	72	53	80	63	78	63	66	50
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43	30	51	32	61	45	74	56	77	60	71	57	63	45
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39	16	42	34	68	44	84	61	76	57	65	48	64	43
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35	3	50	35	59	47	72	59	79	60	72	52	63	47
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	16	42	30	53	45	77	55	76	62	67	52	62	52
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	38	35	30	69	45	75	53	73	60	71	48	61	49
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47	27	48	30	70	53	75	51	73	59	71	51	59	50
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43	27	50	30	77	51	91	57	76	61	75	50	65	48
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36	24	42	34	66	54	75	54	68	59	70	59	63	58
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	22	38	30	64	53	67	53	80	62	72	57	65	49
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44	16	.....	.....	72	53	.....	.....	76	61	76	56	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48°		47°		44°		40°		.....	.....	.....	.....
Monthly means	50°.5		29°.2		26°.3		24°.9		24°		32°.7		36°.7		52°.5		61°.7		67°.2		64°.6		60°.3	

* Station supplied with maximum and minimum thermometers March 11, 1874.

† Observer sick.

Maximum, minimum, and mean temperatures—Continued.

PORTLAND, OREGON.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1																			71		72	58	77	44
2																			71		72	53	83.5	53
3																			68		76	48	88.5	53
4																			75		78	52	79	49
5																			77		75	56	73	49
6																			76		71	56	69	57
7																			71		70	53	67	54
8																			79		74	54	65	51
9																			86.5		72	58	66	50
10																			88		69	57	63	49
11																			73		69	54	68	47
12																			75		74	56	68	49
13																			72		68	58	69	49
14																	*89	45	81		71	49	69	57
15																	82	49	74		71	49	70	53
16																	67	48	79		84	49	68	45
17																	62	45	72		83	59	68	54
18																	66	46	80		72	48	73	43
19																	72	49	85		78	48	72	49
20																	70	48	84		73	56	76	51
21																	70	46	80		72	57	82	49
22																	64	43	82		80	46	78	45
23																	62	45	77	66	79	60	65	45
24																	69	47	76	55	71	59	69	51
25																	73	46	81	53	74	57	69	46
26																	67	45	86	52	74	56	79	49
27																	50	22	84	54	72	56	71	52
28																	71	50	71	58	73	48	70	44
29																	71	57	73	55	79	48	70	44
30																	76	(†)	79	51	68	52	70	42
31																			75	50	65	50		
Range																					38°		46.°5	
Monthly means	49°.9		47°.4		37°		42°.9		43°.7		45°.1		53°.9		59°.7		60°.2		68°.3		64°.7		61.°4	

* Station supplied with maximum and minimum thermometers June 14, 1874. † Minimum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

PORT STANLEY, CANADA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1																	64	45	76	44	82	61	77.5	67
2															52	31	67	42	73.8	53	74	52	79	50.2
3															53	25	66	56	76	51	74.5	46.2	75	49.2
4															53	44	74	56.8	87.5	61.5	75.4	46.4	70.5	41.2
5															60	37	74	56.8	82	50.5	73	47.7	76	60.1
6															55	32	74	58	82	52.8	75	52.7	76	55.2
7															49	24	77	60	83.5	63	82	61.6	78	55.2
8															62	35	73	54	82.8	62	85	61.1	89	67.5
9															61	35	84	54	82	61	81	58.7	80.8	58.7
10															65	47.5	74	56	76	65.5	81	63.6	80	55.2
11															64	48.5	68	53	77	60	84.5	69.1	81.2	58.2
12															65	48.5	64	51	65	56	93	67.1	82.5	52.7
13															66	50.5	66	47	75	56	77	60.1	82.2	57.2
14															66	42	70	51.2	82	56	80	54.2	83	61.1
15															71	45.5	70	51	79	66	85	51.2	78	51.7
16															64	48.5	64.8	59	71	51	79	50.2	70	47.4
17															52	40	76	57	74.8	46	82	59.2	68	59.2
18															62	38	79	54	81	56	82	56.7	76	65.1
19															56	34.5	75	52	83	58	83.4	50.2	81	59.2
20															55	45	75	55	74.8	56	85	69.9	64	46.7
21															61	42.5	74	60	79.8	51	80.5	62.1	68	39.2
22															67	40	77	62	80	50	77	57.6	67	41.7
23															64	46	88	67	80.5	50.5	78	56	74	44.2
24															68	48.5	77	59	83.5	57	74.8	50.2	77.4	49.4
25															69	55	80	37	80	70	77	51.2	75.2	49.2
26															63	50	75	61	75.5	69	76	48.2	78	56.2
27															66	40	77	61	71.5	61	78	51.2	70	53.7
28															73	46	88	65	74	61	77.8	60.1	64	50.2
29															78	61	85	63	79	55	77	53.7	69.5	40.7
30															77	58	85	50	78	50	77	48.2	53	43.2
31															78	58			87	67	80	49.6		
Range																	51°		43°.5		46°.8		48°.3	
Monthly means																								

Maximum, minimum, and mean temperatures—Continued.

PUNTA RASSA, FLA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	(*)	76	.....	59	.....	67	70	49	75	65	78	70	85	72	82	60	88	71	86	72	87	75	.....	75
2	.....	76	.....	66	.....	64	73	55	76	62	74	65	84	71	82	68	89	73	83	72	86	81	.....	79
3	.....	74	.....	67	.....	65	76	59	74	68	70	55	84	62	84	74	86	75	87	73	87	81	.....	77
4	.....	74	.....	71	.....	67	69	62	72	63	73	55	84	61	83	72	84	74	89	75	90	82	.....	76
5	.....	74	.....	71	.....	67	72	62	76	59	82	63	85	67	79	70	86	74	85	71	90	74	.....	76
6	.....	70	.....	71	.....	67	70	61	76	65	81	66	87	66	71	63	87	74	88	72	88	74	.....	76
7	.....	63	.....	73	.....	65	68	58	77	68	82	68	85	71	79	59	88	74	88	72	87	75	.....	73
8	.....	59	.....	69	.....	64	59	49	71	62	78	65	84	72	82	64	88	74	80	72	89	75	.....	72
9	.....	64	.....	63	.....	68	60	42	64	55	75	55	84	71	84	65	90	72	87	78	89	77	.....	73
10	.....	68	.....	62	.....	65	67	58	63	52	76	55	73	67	82	65	90	75	91	71	88	76	.....	72
11	.....	66	.....	62	.....	64	70	56	70	50	77	67	76	55	81	67	90	74	88	70	91	76	.....	72
12	.....	67	.....	64	.....	64	74	58	73	55	72	65	79	57	78	70	88	75	88	71	90	78	.....	72
13	.....	68	.....	52	.....	69	75	61	74	64	72	56	81	64	79	71	88	73	88	74	89	72	.....	74
14	.....	70	.....	46	.....	57	69	60	75	65	75	55	83	65	78	72	90	70	87	72	87	75	.....	75
15	.....	71	.....	51	.....	53	67	49	76	67	79	60	80	64	80	72	89	75	85	71	89	76	.....	77
16	.....	70	.....	53	.....	59	56	47	75	66	79	65	81	69	82	71	90	74	86	71	90	71	.....	76
17	.....	69	.....	61	.....	59	68	54	77	67	81	65	81	68	84	71	89	74	88	73	88	72	.....	75
18	.....	71	.....	63	.....	59	73	56	78	69	81	66	86	76	81	72	89	74	82	72	89	75	.....	76
19	.....	71	.....	52	.....	59	71	55	77	62	80	66	82	70	85	69	89	73	86	73	88	76	87	75
20	.....	61	.....	44	.....	58	72	54	82	65	80	66	83	71	88	69	89	74	82	71	81	72	88	76
21	.....	57	.....	42	.....	50	79	61	83	66	83	65	86	70	84	70	91	72	85	74	90	74	85	75
22	.....	58	.....	53	.....	61	74	65	82	66	83	71	84	72	84	69	88	71	88	78	88	74	87	73
23	.....	61	.....	62	.....	65	77	65	82	66	82	66	84	71	87	69	85	73	85	79	87	75	86	74
24	.....	66	.....	66	.....	62	77	65	84	69	83	66	83	71	88	70	89	72	83	73	88	78	87	75
25	.....	68	.....	62	.....	69	71	56	80	68	84	66	81	71	87	71	88	75	88	72	86	79	84	74
26	.....	67	.....	55	.....	57	68	52	79	62	83	68	73	64	87	73	89	77	87	76	(†)	72	82	74
27	.....	67	.....	61	.....	56	71	53	80	62	85	70	81	62	90	70	88	81	86	75	.....	72	80	74
28	.....	66	.....	57	56	46	71	59	80	61	83	69	83	64	90	72	89	72	89	75	.....	73	81	76
29	.....	57	.....	56	62	40	71	58	.....	.....	84	68	75	64	89	72	81	70	88	79	.....	73	78	71
30	.....	60	.....	61	62	45	75	58	.....	.....	85	70	82	55	87	72	80	73	88	79	.....	73	77	67
31	.....	59	.....	.....	66	45	76	61	.....	.....	84	70	.....	.....	84	74	.....	.....	87	82	.....	77	.....	.....
Range	.....		.....		.....		37°		34°		30°		32°		31°		21°		21°		.....		.....	
Monthly means	72°.8		66°.9		65°.6		63°.3		69°.1		72°.1		74°.3		76°.1		79°.9		79°.7		83°.7		79°.2	

* Maximum thermometer out of order. † Maximum thermometer broken.

Maximum, minimum, and mean temperatures—Continued.

ROCHESTER, N. Y.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	61	41	43	27	18	10	40	34	14	6	47	26	36	19	51	35	64	52	80	53	76	75	80	57
2	58	39	54	33	43	18	41	36	21	−5	58	37	48	27	45	33	66	45	78	62	67	57	82	54
3	53	40	50	29	58	43	57	42	30	21	60	41	35	22	55	38	69	54	77	55	67	54	72	55
4	64	44	56	27	63	32	69	34	25	20	55	23	23	15	55	41	80	59	73	60	69	50	68	50
5	61	52	49	29	32	24	34	25	23	9	27	20	33	16	57	42	85	66	77	59	74	50	85	57
6	48	40	38	28	31	25	35	24	16	9	33	20	37	30	50	35	77	60	85	60	78	53	75	60
7	50	38	52	26	31	18	38	33	20	11	46	33	44	34	52	32	87	62	94	69	78	65	77	58
8	61	41	48	41	43	24	39	34	25	5	34	24	40	31	60	45	71	61	84	70	80	65	76	62
9	65	40	41	29	53	37	40	32	28	11	24	15	34	31	77	51	82	60	79	65	84	61	82	55
10	74	46	31	26	38	34	39	31	25	18	25	14	41	28	80	51	71	58	74	67	75	64	88	59
11	72	52	36	27	49	33	36	26	26	18	25	18	35	24	60	42	59	50	73	63	88	62	89	67
12	47	40	33	29	44	34	37	23	43	10	20	8	34	20	82	53	66	52	64	59	96	72	75	64
13	55	40	31	22	34	22	27	21	48	38	18	7	49	20	77	58	66	49	73	59	72	62	90	62
14	63	50	28	19	32	19	27	15	39	26	29	18	66	43	62	49	73	49	87	59	74	58	90	67
15	63	42	36	23	36	30	15	6	43	24	32	16	59	34	79	47	77	56	89	72	78	52	83	65
16	74	51	41	29	45	33	15	5	39	24	47	25	35	29	73	51	70	66	75	64	81	56	65	58
17	60	40	33	29	46	33	25	10	24	16	53	35	35	30	60	47	69	60	75	53	86	62	70	58
18	69	55	33	29	41	36	39	20	24	15	63	45	49	32	50	43	73	58	85	60	82	64	74	59
19	54	41	30	25	37	29	42	27	42	19	60	39	51	37	60	42	75	55	91	69	79	53	77	62
20	44	40	29	21	34	24	27	12	40	36	39	31	62	38	53	45	67	55	80	64	83	72	69	53
21	49	40	28	20	26	20	45	12	38	31	50	31	50	34	71	45	72	52	75	57	79	61	61	46
22	58	39	35	26	28	19	59	41	31	28	41	23	50	34	60	43	87	58	78	55	66	60	68	46
23	68	47	37	25	30	15	48	26	45	28	24	14	48	37	69	43	86	70	84	59	69	50	73	52
24	49	38	40	28	35	17	33	18	29	19	25	13	41	31	74	54	70	58	90	62	70	56	75	58
25	48	36	30	18	35	31	18	10	28	20	49	22	44	29	76	53	81	53	90	70	73	49	80	56
26	53	34	22	14	36	−29	28	5	25	15	46	27	43	31	54	47	72	55	79	72	75	50	83	56
27	54	41	34	14	35	30	40	28	31	16	36	23	41	30	75	49	79	57	74	62	76	55	80	63
28	45	32	27	15	33	25	40	24	58	23	35	25	35	31	87	56	92	62	65	59	75	53	66	55
29	38	30	28	20	32	23	34	19	.....	.....	35	19	38	30	72	59	85	66	74	61	78	54	63	50
30	43	29	20	14	24	11	19	1	.....	.....	38	28	47	32	86	59	73	55	79	57	80	55	55	46
31	48	28	.....	.....	35	20	14	2	.....	.....	29	20	.....	.....	85	64	.....	.....	81	73	80	58	.....	.....
Range	46°		42°		53°		68°		63°		56°		50°		55°		47°		41°		46°		44°	
Monthly means	48°.6		30°.3		31°.6		28°.9		25°		31°.5		35°.7		56°.5		65°.6		70°.7		68°		63°.5	

Maximum, minimum, and mean temperatures—Continued.

SALT LAKE CITY, UTAH.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1																			98	64	81	63	72	60
2																			98	66	90	61	66	52
3																	*81	56	98	74	91	63	69	51
4																	81	49	85	68	90	66	76	48
5																	71	59	91	64	88	69	84	50
6																	76	55	88	66	91	71	90	58
7																	71	61	95	67	88	69	89	62
8																	72	51	92	68	88	63	88	61
9																	65	47	91	65	94	65	77	53
10																	62	43	92	63	82	65	74	42
11																	72	45	93	66	82	57	58	44
12																	76	50	88	69	90	63	65	43
13																	70	53	94	64	90	62	67	44
14																	74	48	89	67	91	62	72	46
15																	83	51	90	67	90	65	82	48
16																	91	55	93	67	88	65	74	48
17																	83	62	86	68	90	68	63	47
18																	75	50	87	65	82	68	60	41
19																	88	56	87	67	77	59	69	41
20																	94	59	85	70	86	60	67	53
21																	89	72	90	65	80	66	70	51
22																	85	68	88	68	86	60	71	50
23																	78	55	87	56	91	64	74	47
24																	84	52	77	67	88	67	76	50
25																	86	63	79	65	77	59	76	50
26																	83	59	82	63	76	62	75	49
27																	76	60	85	60	75	56	79	50
28																	79	54	92	64	80	61	79	49
29																	83	53	92	67	87	63	81	53
30																	90	55	90	67	85	65	81	54
31																			85	64	84	62		
Range																			42°		38°		49°	
Monthly means											33°.1		48°.2		61°.6		68°.1		78°.2		74°.7		62°.6	

* Station supplied with maximum and minimum thermometers June 3, 1874.

Maximum, minimum, and mean temperatures—Continued.

SAN ANTONIO, TEX.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	83.5	69	67	58	73	63	76	48	46	33	74	62	65	38	89	64	87	70	91	74	97.5	76	93.5	73
2	87	66	78	64	77	64	78	50	58	34	79	61	78	36	94	68	90	71	86	72	98.5	75.5	95	72
3	93	66	60	54	86	45	77	60	61	32	88	66	79	41	86	62	91	69	88	72	98.5	76.5	94	74
4	93	75	71	55	56	38	52	39	56.5	46	76	60	80	49	78	52	92	70	91	72	97.5	76.5	86	74
5	93.5	66.5	70	56	60	51	46	30	70	54	89	58	89	67	82	57	94	71	89	74	98.5	73	81	73
6	80	54	73	53	72	55	63	25	58	43	80	55	88	72	84	51	96	72	91	73	99	69.5	74	72
7	79	48.5	76	46	80	63	65	30	68	32	70	40	92	68	83	53	95	72	92	74	97	73	89	74
8	82.5	46.5	80	48	80.5	68	74	32	75	32	65	54	69	49	83	58	94	73	93	72	95.5	74.5	88	76
9	86.5	54.5	80	49	78	67	73	44	64	40	76.5	63	67	43	84	66	94	75	93	74	96.5	75	85	76
10	90	58	84	47	78	66	78	35	68	40	81	57	75	33	78	68	96	75	94	75	96.5	77	88	75
11	86.5	66	83	47	77	67	78	51	79	52	64	44	73	34	85	69	96	70	93	73	98	76	80	75
12	91	60.5	64	38	69	44	67	54	77	59	64	46	75	56	83	63	94	71	94	73	95	74	89	71
13	92	58	66	34	59	34	80	50	76	53	56	53	89	67	82	66	93	72	94	73	96	77.5	87	68
14	87	70	74	44	57	32	42	32	80	46	63	56	85	69	89	64	95	73	94	74.5	101.5	75	87	70
15	89	68	73	64	65	32	36	31	71	58	80	56	89	66	89	65	93	73	92	75	103.5	74	76	68
16	88	69	87	58.5	75	40	42	31	73	60	86	66	74	56	88	62	94	67	80	74	94.5	75	86	64
17	85	69	82	47	76	59	57	30	71	47	89	68	64	50	90	57	90	67	86	74	101	73	86	71
18	78	53	63	44	80	54	71	50	74	36	85	69	60	49	92	57	84	70	84	74	94.5	73	85	76
19	76	47.5	65	31.5	64	41	63	55	82	66	74	63	73	46	95	60	89	69	84	73	94	73	80	73
20	80	46.5	71	37	56	38	77	61	70	56	57	54	86	46	95	58	90	69	88	73	85	74	86	68
21	83	54	79	46.5	54	41	81	65	80	44	76	60	84	60	94	65	86	69	89	73	94	75	82	72
22	77	45	74	63	59	40	74	52	62	44	69	58	91	55	93	69	88	67	89	71	95	74	83	73
23	67	42.5	71	50	49	36	66	47	51	31	60	54	55	46	92	66	83	70	91	71	97.5	74	74	68
24	73	42	65	46	49	42	54	44	56	31	61	49	62	48	88	70	74	69	94	73	86	74	81	67
25	80	69	65	47	60	32	49	41	54	35	66	50	85	40	88	65	86	71	95	73	91	73	77	69
26	86	57	73	47	65	32	48	43	71	49	82	59	87	45	90	65	89	74	95	75	93	74	84	70
27	67	48	72	49	63	31	76	40	63	55	79	65	87	55	88	67	90	73	97.5	74	94	75	82	60
28	65	42	60	40	65	29	73	45	79	66	70	64	84	56	93	73	90	74	99.5	68.5	96	75	77	56
29	66	37	65	36	72	38	75	34	.....	.....	81	66	82	52	81	70	90	74	103	68	97	73	82	54
30	74	47.5	75	52	54	35	76	39	.....	.....	84	72	84	56	83	72	89	74	101	70	102	76	84	58
31	69.5	57	.....	.....	66	36	56	43	.....	.....	77	42	.....	.....	86	70	.....	.....	97.5	73	101	70	.....	.....
Range	56° 5		55°.5		57°		56°		51°		49°		59°		44°		29°		35°		34°		41°	
Monthly means	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

SANDY HOOK, N. J.

Day of month.	1873						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	*44	*21	21	11	48	26	32	22	60	38	72	53	78	61	85	63	80	64
2	.....	.....	.....	.....	.....	.....	44	33	24	10	52	30	40	28	58	38	65	50	79	63	85	63	84	61
3	.....	.....	.....	.....	.....	.....	49	36	30	13	48	33	48	31	63	33	62	49	80	63	76	56	85	65
4	.....	.....	.....	.....	.....	.....	61	41	32	21	62	33	40	18	56	38	68	64	82	62	75	57	68	54
5	.....	.....	.....	.....	.....	.....	47	31	28	15	44	27	36	12	56	41	74	54	72	61	77	67	71	60
6	.....	.....	.....	.....	.....	.....	44	31	22	12	38	25	57	34	57	38	75	57	74	58	87	67	76	63
7	.....	.....	.....	.....	.....	.....	53	41	23	13	37	28	44	33	57	35	78	58	79	57	82	63	80	62
8	.....	.....	.....	.....	.....	.....	52	34	29	9	44	28	46	32	70	35	82	66	91	63	73	63	77	63
9	.....	.....	.....	.....	.....	.....	46	30	29	12	33	22	43	35	80	48	83	64	84	64	75	63	75	61
10	.....	.....	.....	.....	.....	.....	48	29	29	18	33	17	44	33	89	56	81	64	90	66	83	64	84	59
11	.....	.....	.....	.....	.....	.....	43	28	31	18	34	21	56	25	72	43	71	58	86	67	82	66	86	65
12	.....	.....	.....	.....	.....	.....	36	25	33	18	33	17	38	19	53	41	80	56	84	64	82	67	76	62
13	.....	.....	.....	.....	.....	.....	32	22	47	27	27	12	45	21	77	42	70	55	83	67	85	69	70	62
14	.....	.....	.....	.....	.....	.....	32	21	52	31	38	18	65	30	73	50	75	55	89	66	71	64	75	62
15	.....	.....	.....	.....	.....	.....	27	9	38	28	42	18	64	42	55	45	79	55	93	69	76	61	77	60
16	.....	.....	.....	.....	.....	.....	22	7	49	30	42	25	59	39	63	45	77	58	84	68	80	62	72	63
17	.....	.....	.....	.....	.....	.....	24	11	36	16	43	33	40	32	75	51	77	64	83	62	76	61	69	60
18	.....	.....	.....	.....	.....	.....	36	12	30	14	51	36	50	31	62	49	76	62	85	62	83	60	70	61
19	.....	.....	.....	.....	.....	.....	38	29	39	28	61	36	50	30	69	44	70	54	84	66	83	65	66	60
20	.....	.....	.....	.....	.....	.....	38	24	43	35	67	37	44	37	67	43	69	52	89	65	89	65	70	58
21	.....	.....	.....	.....	.....	.....	40	26	48	33	52	31	54	36	63	46	82	57	80	67	88	71	67	53
22	.....	.....	.....	.....	.....	.....	61	34	44	34	51	37	52	35	68	46	86	61	83	63	79	65	65	52
23	.....	.....	.....	.....	.....	.....	63	36	71	34	38	23	45	34	70	43	85	65	84	63	69	58	72	52
24	.....	.....	.....	.....	.....	.....	38	24	47	26	32	12	53	36	66	46	80	64	82	62	75	61	74	56
25	.....	.....	.....	.....	.....	.....	31	13	31	21	52	16	45	36	63	49	87	59	81	61	72	60	76	57
26	.....	.....	.....	.....	.....	.....	24	8	35	19	60	36	45	32	63	52	86	63	82	62	71	55	77	61
27	.....	.....	.....	.....	.....	.....	43	21	38	22	51	30	56	36	75	48	78	61	81	66	72	56	70	58
28	.....	.....	.....	.....	.....	.....	48	32	39	22	48	32	44	30	70	53	87	62	82	64	74	59	64	54
29	.....	.....	.....	.....	.....	.....	38	23	.....	.....	47	28	40	31	74	53	97	68	77	66	73	57	65	55
30	.....	.....	.....	.....	.....	.....	38	18	.....	.....	54	28	62	30	68	53	89	67	82	61	76	58	64	47
31	.....	.....	.....	.....	.....	.....	32	12	.....	.....	42	27	.....	.....	73	52	.....	.....	85	63	79	60	.....	.....
Range	.....	.....	.....	.....	.....	.....	56°		62°		55°		53°		56°		48°		36°		34°		39°	
Monthly means	.....	.....	.....	.....	.....	.....	32°.6		28°.6		34°.8		38°.2		54°.1		66°.3		73°.1		70°.2		67°.2	

* Station supplied with maximum and minimum thermometers January 1, 1874.

Maximum, minimum, and mean temperatures—Continued.

SAN DIEGO, CAL.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	59	77	64	71	64
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	60	75	64	72	63
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	60	74	65	73	62
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	63	74	65	73	61
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	62	74	62	72	64
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*70	57	73	62	73	64	71	63
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	60	74	60	73	62	71	58
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	59	75	61	75	65	71	58
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	57	75	65	75	63	70	62
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	57	75	64	73	65	71	57
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	57	77	62	71	63	74	57
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	58	74	64	74	61	74	58
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	59	73	64	76	61	75	56
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	55	73	64	83	61	74	58
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	59	74	63	81	65	74	57
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	59	73	65	81	65	74	61
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	58	74	64	75	64	71	60
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	59	75	65	71	61	70	61
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	57	74	65	71	62	69	57
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	76	57	75	65	71	63	69	58
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	61	73	67	75	60	70	61
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	53	77	68	75	61	68	54
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	55	78	68	77	63	69	59
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	52	72	65	74	63	68	62
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	57	71	62	71	62	68	59
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	57	72	65	71	62	68	60
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	55	72	63	71	50	77	58
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	56	79	62	72	63	78	59
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	56	79	63	75	62	75	61
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	58	75	65	73	66	71	62
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	64	71	65	.....	.....
Range	.....		.....		.....		.....		.....		.....		.....		.....		.....		20°		33°		24°	
Monthly means	62°		60°.2		54°.6		54°.8		52°.2		52°		56°		61°		63°.5		68°.7		68°.2		65°.3	

* Station supplied with maximum and minimum thermometers June 6, 1874.

Maximum, minimum, and mean temperatures—Continued.

SAN FRANCISCO, CAL.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	52	65	52	83	52
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*63	49	66	52	65	52	87	56
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	48	66	51	65	52	65	55
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	49	65	52	63	52	68	55
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	48	65	51	66	51	67	58
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	51	65	51	65	54	65	56
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	53	65	52	71	53	66	57
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	64	52	73	54	68	52	65	54
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	51	68	54	67	52	67	53
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	59	63	52	63	53	69	53
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	55	62	51	63	53	72	54
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	53	63	51	66	55	73	53
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	58	64	53	68	56	80	57
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	55	62	52	64	54	89	61
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	52	64	51	67	55	75	57
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	51	61	51	61	53	73	55
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	51	62	52	62	54	74	56
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	50	61	52	64	54	62	52
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	50	60	50	60	53	60	52
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	51	60	49	61	54	63	53
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	53	60	50	70	52	64	53
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	54	60	51	65	53	64	53
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	52	63	52	66	54	62	52
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	51	63	52	65	55	62	51
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	51	66	54	71	54	78	50
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	52	66	56	66	55	64	52
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	52	66	54	65	56	62	54
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	53	63	53	64	54	62	53
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	52	65	54	62	52	67	52
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	51	65	53	61	53	67	52
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	64	53	64	52	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24°		49°		49°	
Monthly means	59°.1		57°.4		50°.6		48°.9		50°.9		50°.6		54°.7		57°.7		59°.2		57°.7		58°.7		60°.8	

* Station supplied with maximum and minimum thermometers June 2, 1874.

Maximum, minimum, and mean temperatures—Continued.

SANTA FÉ, N. M.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	67	46	61	39	55	31	50	25	39	20	44	20	45	19	71	45	73	45	86	54	87.5	61	82	52
2	73	48	58	28	48	28	56	32	37	10	52	29	50	30	55	33	46	45	83	52	89	61	69.5	58
3	75	48	60	30	32	6	42	15	41	23	44	28	62	32	59	30	82	53	83	52	84.5	60	65	52
4	71	46	57	39	32	12	23	4	38	23	44	23	63	36	66	28	82	48	83	56	83.7	66	69.5	44
5	77	40	57	30	47	24	31	2	32	11	40	20	62	33	73	44	82	48	85	56	84	60	76.5	48
6	68	36	63	32	39	26	42	13	36	9	36	15	62	30	76	45	83	52	90	57	81	57	78	50
7	75	46	64	36	43	24	46	22	46	16	45	19	47	27	77	51	88	52	81	56	85	52.5	78	49
8	69	42	60	36	43	16	48	24	46	21	48	19	46	21	70	48	87	52	83	57	87	62	81	51
9	73	46	64	36	44	39	46	23	47	22	58	32	54	25	50	30	87	52	87	57	84.5	61	81	52
10	76	42	64	35	43	35	42	20	49	25	56	36	61	32	58	28	82	48	82	62	82.5	53	79.5	49
11	69	43	66	33	40	20	42	21	46	26	50	27	60	35	66	36	69	44	82	61	77.5	53	78.5	54
12	73	45	50	23	26	13	46	29	44	28	56	30	54	31	64	44	74	48	87	55	85	57.5	72	56
13	71	39	58	26	38	10	46	30	42	21	56	37	56	32	72	44	81	50	88	59	81	56.5	72	52
14	70	49	64	32	42	14	47	24	44	26	50	26	56	35	74	40	80	48	88	60	84.5	56	70	42.5
15	65	43	62	38	44	20	45	20	42	32	47	27	49	25	68	38	79	50	79	57	83	55	71	41
16	65	40	56	35	47	22	52	37	41	28	37	23	36	23	74	45	84	53	78	56	87.5	55	74	47
17	58	33	60	35	40	20	48	35	42	22	41	20	35	22	79	43	79	46	80	57	85	56	73	43
18	56	30	52	22	34	17	51	37	36	32	38	23	34	22	78	50	85	54	83	56	84.5	49	72	44
19	60	28	54	27	42	15	38	33	36	18	37	14	53	24	82	50	86	55	78	56	86	60	68	37
20	67	33	52	26	34	18	42	25	38	16	41	21	53	32	83	52	89	61	78	58	84	55	75	46
21	63	35	48	27	43	13	36	20	30	11	47	21	51	29	85	52	88	58	80	56	85	57	77.5	50
22	47	30	47	31	40	10	30	13	25	2	44	21	36	22	86	52	88	58	83	58	82.5	55	64.5	42
23	54	18	42	23	33	18	34	15	28	14	42	30	42	21	79	51	82	58	85	59.5	80.5	62	64	37
24	63	36	48	23	37	10	37	11	24	3	45	27	54	21	75	50	82	55	85	57.5	70.5	52	66	42
25	56	41	57	30	45	18	42	14	37	0	50	32	65	29	71	48	86	55	85	52.5	70	54	71.5	41
26	50	23	53	27	50	18	42	22	47	15	56	28	70	37	74	50	85	59	79.5	54	71	55	74.5	45
27	47	20	52	28	46	15	40	32	36	26	58	31	70	37	78	48	82	55	75	55	72.5	52	74	41
28	58	27	52	24	49	21	44	19	44	24	62	34	73	41	75	45	82	49	78	57.7	73.5	50	76	43
29	56	29	56	27	50	21	48	25	.....	.....	62	37	78	45	75	48	81	62	82.5	59.5	78.5	54	75	47
30	66	33	60	32	53	23	54	29	.....	.....	51	34	78	42	72	48	86	48	87.7	62.5	80.5	49	75	47
31	55	31	.....	.....	52	25	36	24	.....	.....	45	26	.....	.....	73	46	.....	.....	88	59.5	79.5	53	.....	.....
Range	59°		44°		49°		54°		49°		47°		59°		58°		44°		36°		40°		45°	
Monthly means	51°		41°.1		25°.8		31°		27°.8		36°.2		42°.1		59°.8		69°.3		71°.1		69°.9		60°.6	

Maximum, minimum, and mean temperatures—Continued.

SAUGEEN, CANADA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	.....	.....	.....	.....	22	4	39	23	18	2	42	25	31	1	44	31	52	43	82	47	70	54	73	44
2	.....	.....	49	23	46	7	40	32	15	0	46	32	33	19	40	31	59	32	63	49	63	54	82	53
3	.....	.....	.....	16	55	36	68	39	23	12	48	32	29	12	58	24	75	53	71	44	64	35	77	41
4	.....	.....	.....	18	55	20	55	24	24	14	36	16	22	6	67	33	71	49	71	57	68	42	73	38
5	.....	.....	.....	14	30	12	25	17	20	4	36	15	36	7	55	33	70	56	68	48	73	44	79	56
6	.....	.....	.....	14	34	12	28	17	21	10	38	24	42	21	41	25	68	56	80	55	76	55	71	50
7	.....	.....	46	20	21	8	32	26	27	8	42	30	36	20	46	24	75	51	86	58	75	55	82	49
8	.....	.....	.....	26	46	15	39	22	28	3	37	22	39	22	59	35	64	46	76	56	74	49	75	55
9	.....	.....	37	27	46	22	34	24	30	19	27	16	35	22	82	58	65	49	79	52	79	54	81	56
10	.....	.....	38	28	43	21	35	29	25	9	26	16	36	16	74	53	65	42	76	58	80	59	82	60
11	.....	.....	36	20	38	19	32	22	28	8	25	13	37	17	74	52	72	52	68	50	89	56	82	57
12	.....	.....	37	15	35	21	24	16	45	17	21	4	31	11	72	45	65	42	66	56	82	59	86	58
13	.....	.....	29	5	31	11	23	12	48	25	24	5	57	24	64	40	62	40	72	55	71	50	86	60
14	.....	.....	27	1	37	16	23	9	32	20	26	7	57	43	58	34	69	47	87	61	71	42	84	59
15	.....	.....	34	15	36	20	10	4	44	23	41	10	51	26	65	43	70	50	84	57	71	44	80	54
16	.....	.....	36	16	45	22	19	5	34	19	49	24	35	24	50	38	74	55	62	44	75	45	65	42
17	.....	.....	38	22	46	22	25	11	24	4	46	33	46	24	45	35	60	47	72	41	86	59	69	41
18	.....	.....	33	17	44	23	40	19	30	3	56	36	56	24	45	34	65	41	81	60	74	48	74	60
19	.....	.....	26	10	41	29	38	12	38	18	57	24	45	29	53	30	74	44	89	59	83	50	84	58
20	.....	.....	22	7	32	18	23	3	30	17	37	25	57	31	52	38	71	52	65	41	79	60	65	47
21	.....	.....	26	8	25	18	40	31	32	18	44	24	41	29	48	36	76	57	68	39	68	57	61	40
22	.....	.....	37	13	29	22	41	31	35	23	38	5	44	24	59	31	82	59	75	47	72	49	65	47
23	.....	.....	38	17	39	21	32	22	40	18	24	9	35	24	63	40	76	57	79	53	70	48	73	47
24	.....	.....	36	19	37	29	27	13	23	8	27	10	37	20	73	59	70	53	81	62	68	43	76	53
25	.....	.....	30	7	39	29	17	5	18	2	40	24	57	28	78	32	79	55	84	67	72	45	75	54
26	.....	.....	25	2	36	30	30	6	25	0	42	19	46	30	50	40	69	52	80	54	74	45	78	59
27	.....	.....	24	4	37	25	37	27	28	15	30	15	33	24	75	39	75	51	68	54	76	52	71	52
28	.....	.....	34	12	29	24	34	19	38	16	20	12	35	27	78	53	91	63	72	53	83	53	65	50
29	.....	.....	28	10	29	17	30	8	.....	.....	31	12	35	21	63	51	81	43	67	47	80	52	66	46
30	.....	.....	23	5	30	12	11	— 4	.....	.....	39	15	41	27	81	50	64	47	80	45	78	50	61	43
31	.....	.....	.....	.....	32	25	16	— 4	.....	.....	19	8	.....	.....	71	44	.....	.....	73	58	67	49	.....	.....
Range	.....	.....	.....	.....	51°		72°		48°		53°		56°		57°		59°		59°		54°		48°	
Monthly means	.....	.....	.....	.....	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

SAVANNAH, GA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	60	36	69	48	56	52	75	66	80	52	95	73	86	75	92	73	77	72
2	.....	.....	.....	.....	.....	.....	62	43	57	50	63	49	71	56	81	58	94	75	87	75	96	76	83	69
3	.....	.....	.....	.....	.....	.....	66	53	54	41	68	49	68	50	83	58	89	75	83	70	92	75	84	71
4	.....	.....	.....	.....	.....	.....	70	59	55	39	76	53	75	49	75	61	86	76	85	70	89	72	83	70
5	.....	.....	.....	.....	.....	.....	66	58	53	37	66	53	67	52	71	56	85	74	94	73	84	70	85	70
6	.....	.....	.....	.....	.....	.....	71	60	67	45	75	51	82	59	69	51	90	76	83	68	84	72	84	68
7	.....	.....	.....	.....	.....	.....	59	40	56	49	79	62	82	65	74	55	90	75	83	69	87	72	85	70
8	.....	.....	.....	.....	.....	.....	51	35	50	37	64	47	82	64	79	59	92	76	83	71	84	70	87	70
9	.....	.....	.....	.....	.....	.....	59	35	55	36	67	43	75	65	78	58	93	75	87	73	86	73	90	69
10	.....	.....	.....	.....	.....	.....	61	45	56	36	70	48	65	54	78	60	95	79	88	73	89	73	80	67
11	.....	.....	.....	.....	.....	.....	68	46	61	38	62	47	64	46	77	63	89	75	87	73	95	72	77	66
12	.....	.....	.....	.....	.....	.....	56	46	63	38	60	43	69	47	70	63	92	74	85	70	95	77	83	67
13	.....	.....	.....	.....	.....	.....	54	46	71	52	59	43	64	49	71	63	80	69	85	71	88	70	82	72
14	.....	.....	.....	.....	.....	.....	54	45	64	57	57	37	75	58	74	66	80	70	87	75	87	74	84	72
15	.....	.....	.....	.....	.....	.....	46	34	61	50	58	47	78	64	81	66	80	71	87	73	85	70	88	73
16	.....	.....	.....	.....	.....	.....	41	31	67	51	73	55	83	65	87	63	86	74	92	71	84	72	87	72
17	.....	.....	.....	.....	.....	.....	41	29	61	44	76	63	78	67	84	65	91	73	92	74	83	69	90	70
18	.....	.....	.....	.....	.....	.....	61	38	48	40	82	60	70	62	83	63	88	66	89	74	84	69	90	70
19	.....	.....	.....	.....	.....	.....	63	43	53	39	80	63	80	63	74	63	88	66	81	73	87	76	87	73
20	.....	.....	.....	.....	.....	.....	71	45	72	48	83	63	83	68	80	62	91	73	82	72	88	75	87	73
21	.....	.....	.....	.....	.....	.....	64	51	75	57	83	65	84	67	88	67	87	73	85	73	89	76	81	70
22	.....	.....	.....	.....	.....	.....	72	55	74	55	83	64	82	61	74	65	86	72	90	74	93	76	81	66
23	.....	.....	.....	.....	.....	.....	73	59	78	62	74	58	84	61	79	62	88	73	89	74	93	73	81	64
24	.....	.....	.....	.....	.....	.....	69	46	68	46	61	49	83	67	89	65	95	72	84	72	85	76	78	64
25	.....	.....	.....	.....	.....	.....	53	36	50	42	60	46	79	58	95	71	99	75	86	70	82	71	81	68
26	.....	.....	.....	.....	.....	.....	50	35	51	38	64	58	74	53	95	71	96	73	83	74	82	66	82	67
27	.....	.....	.....	.....	.....	.....	63	36	61	43	74	56	74	54	89	72	96	72	85	72	79	67	82	68
28	.....	.....	.....	.....	*47	*30	68	52	66	55	82	59	78	60	85	67	88	72	86	73	75	66	75	64
29	.....	.....	.....	.....	53	32	55	39	.....	.....	78	61	63	48	88	69	89	74	88	70	76	65	75	57
30	.....	.....	.....	.....	48	33	64	35	.....	.....	79	65	71	46	94	70	88	74	85	74	84	71	78	57
31	.....	.....	.....	.....	47	26	67	43	.....	.....	86	63	.....	.....	87	72	.....	.....	86	74	81	71	.....	.....
Range	.....	.....	.....	.....	.....	.....	44°		42°		49°		38°		44°		33°		26°		31°		33°	
Monthly means	63°.4		55°.3		51°.8		52°.4		53°.3		62°.2		66°		72°.2		80°.7		79°		79°		75°.3	

* Station supplied with maximum and minimum thermometers December 28, 1873.

Maximum, minimum, and mean temperatures—Continued.

SHREVEPORT, LA.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1																			92	74	94	76	94	71
2																			92	72	96	78	94	70
3																	*94	*71	94	73	95	79	94	74
4																	90	70	87	72	97	76	90	71
5																	91	71	86	71	97	77	85	72
6																	93	72	88	74	98	78	83	70
7																	90	73	94	72	99	79	88	74
8																	93	72	97	71	97	79	87	73
9																	92	75	92	74	97	80	87	74
10																	94	74	81	73	101	79	84	72
11																	94	74	91	73	97	78	88	70
12																	83	63	92	72	100	80	90	71
13																	89	63	93	72	100	77	89	67
14																	90	72	86	72	98	77	88	69
15																	90	72	86	70	99	77	82	71
16																	90	73	88	68	97	76	81	68
17																	91	72	90	69	95	76	86	66
18																	90	74	91	72	90	71	90	70
19																	88	70	92	74	87	71	77	68
20																	90	73	93	74	86	74	78	60
21																	92	71	93	74	91	75	80	56
22																	89	69	93	76	94	78	80	59
23																	90	72	94	76	97	73	84	68
24																	90	71	95	76	89	72	80	69
25																	92	72	94	78	92	76	82	70
26																	95	75	95	76	94	76	85	69
27																	95	75	96	73	95	76	78	63
28																	96	74	94	76	95	71	86	56
29																	92	74	88	73	95	78	79	56
30																	96	75	90	66	97	75	85	57
31																			92	68	93	70		
Range																			31°		31°		38°	
Monthly means	62°.6		56°.5		49°.9		50°.4		51°.6		60°.5		61°		75°.2		82°.7		82°.5		86°		75°.4	

*Station supplied with self-registering maximum and minimum thermometers June 3, 1874.

Maximum, minimum, and mean temperatures—Continued.

SQUAN BEACH, N. J.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	25	.....	45	22	35	29	62	37	77	54	72	62	90	65	76	58
2	.....	.....	.....	.....	.....	.....	.....	.....	31	.....	45	24	38	32	55	40	60	43	75	63	83	64	78	52
3	.....	.....	.....	.....	.....	.....	.....	.....	34	.....	48	32	50	34	55	30	59	54	77	63	76	51	90	56
4	.....	.....	.....	.....	.....	.....	(‡)	.....	32	.....	67	35	50	22	55	35	67	57	76	57	71	51	70	60
5	.....	.....	.....	.....	.....	.....	45	.....	29	.....	41	29	40	15	50	43	65	58	77	61	74	54	72	63
6	.....	.....	.....	.....	.....	.....	46	.....	25	.....	38	30	60	38	50	37	73	60	69	58	76	52	73	61
7	.....	.....	.....	.....	.....	.....	51	.....	27	.....	40	36	43	37	53	37	72	59	70	56	78	63	86	58
8	.....	.....	.....	.....	.....	.....	47	.....	32	.....	45	30	42	32	70	35	91	58	78	63	71	62	76	56
9	.....	.....	.....	.....	.....	.....	45	.....	32	.....	37	25	43	35	82	46	78	67	80	65	73	63	74	61
10	.....	.....	.....	.....	*50	30	49	.....	30	.....	37	17	45	34	88	64	78	66	73	65	85	59	82	52
11	.....	.....	.....	.....	50	21	45	.....	32	.....	38	25	57	27	69	44	68	63	78	58	80	66	80	60
12	.....	.....	.....	.....	75	35	40	.....	37	.....	36	20	41	22	49	42	83	63	73	54	78	67	75	63
13	.....	.....	.....	.....	60	36	36	.....	44	.....	28	16	37	20	64	42	71	53	84	55	78	67	69	63
14	.....	.....	.....	.....	42	23	35	.....	51	.....	40	21	54	33	70	61	73	44	80	58	70	64	71	65
15	.....	.....	.....	.....	45	20	21	.....	39	.....	37	20	61	43	70	47	74	47	85	65	74	59	76	65
16	.....	.....	.....	.....	49	28	22	.....	52	.....	40	24	58	39	60	48	70	58	91	63	77	55	72	68
17	.....	.....	.....	.....	50	28	27	.....	35	.....	45	25	44	35	70	53	81	59	73	61	74	59	70	65
18	.....	.....	.....	.....	54	26	37	.....	31	.....	47	40	41	32	60	44	80	60	77	57	89	61	70	65
19	.....	.....	.....	.....	48	25	41	.....	41	.....	57	40	45	30	68	41	74	55	76	60	79	56	69	66
20	.....	.....	.....	.....	45	25	36	.....	44	.....	49	40	42	40	62	46	65	54	81	62	94	65	69	60
21	.....	.....	.....	.....	35	15	40	.....	50	.....	47	31	60	38	62	49	68	61	78	60	84	69	69	52
22	.....	.....	.....	.....	34	10	51	.....	48	.....	55	39	50	33	69	45	75	57	75	58	78	60	65	46
23	.....	.....	.....	.....	39	20	62	.....	75	.....	50	24	44	36	70	38	93	64	80	54	70	67	70	45
24	.....	.....	.....	.....	50	26	40	.....	38	.....	35	15	47	35	64	49	86	58	78	56	72	61	74	49
25	.....	.....	.....	.....	50	25	29	.....	32	.....	52	15	43	38	61	49	86	59	77	54	68	65	79	53
26	.....	.....	.....	.....	55	36	27	.....	33	.....	57	36	46	36	71	50	86	68	77	65	66	61	73	54
27	.....	.....	.....	.....	55	35	42	.....	36	.....	45	32	56	35	65	47	70	63	74	63	69	62	71	51
28	.....	.....	.....	.....	(†)	.....	52	.....	39	.....	49	32	42	38	64	53	75	58	77	63	70	56	65	60
29	.....	.....	.....	.....	.....	.....	40	.....	.....	.....	41	31	40	32	66	50	84	68	74	64	70	51	66	55
30	.....	.....	.....	.....	.....	.....	37	.....	.....	.....	55	31	53	30	60	53	81	66	82	58	71	48	66	49
31	.....	.....	.....	.....	.....	.....	40	.....	.....	.....	41	30	.....	.....	66	55	.....	.....	82	56	73	53	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52°		46°		58°		48°		37°		42°		45°	
Monthly means	.....	.....	.....	.....	37°.6		34°		31°		36°.7		40°		54°.2		67°.2		69°.2		68°.8		66°.4	

* Station opened December 10, 1873. † Maximum and minimum thermometers not in position. ‡ Minimum thermometer out of order.

Maximum, minimum, and mean temperatures—Continued.

STAYNER, CANADA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	40	25	20	9	38	20	.....	.....	.....	.....	24	4	51	35	64	36	81	43	70.1	53.2	76.1	44.2
2	.....	.....	.....	.....	43	10	38	25	13	—10	51	26	40	29	50	26	67	33	69	51	.....	.....	84.1	49.7
3	.....	.....	38	23	51	35	50	35	21	9	47	35	20	10	.....	.....	75	50	77	44	66.1	42.2	73.1	44.2
4	.....	.....	50	24	55	23	.....	.....	25	15	36	13	22	— 4	60	36	75	55	65	53	71.1	43.2	74.1	39.3
5	.....	.....	33	23	25	20	62	20	18	5	35	12	.....	.....	53	30	76	55	.....	.....	78.1	44.2	77.1	52.2
6	.....	.....	39	21	30	15	24	18	18	0	30	10	40	20	41	23	80	56	88	56	82.1	50.2	.....	.....
7	.....	.....	44	25	.....	.....	33	21	28	— 6	38	19	41	21	43	31	.....	.....	90	60	75.1	57.2	84.1	55.2
8	.....	.....	45	28	43	19	35	22	.....	.....	.....	.....	45	20	56	40	79	52	94	60	80.1	51.2	81.4	48.2
9	.....	.....	(*)	.....	48	31	34	20	31	15	26	12	33	20	87	57	76	55	88	55	.....	.....	86.1	57.2
10	.....	.....	.....	.....	34	30	34	19	26	10	26	10	38	21	.....	.....	70	50	82	62	80.6	52.2	82.1	57.2
11	.....	.....	.....	.....	40	29	.....	.....	20	1	20	5	38	13	69	47	56	52	70	50	92.1	55.2	90.1	57.2
12	.....	.....	.....	.....	35	29	24	10	32	— 1	16	— 8	.....	.....	81	46	59	43	.....	.....	90.1	62.2	88.1	55.2
13	.....	.....	.....	.....	31	19	20	7	43	28	20	—17	53	13	76	45	70	44	76	50	69.1	55.2	.....	.....
14	.....	.....	.....	.....	.....	.....	22	5	39	19	30	8	60	38	56	38	.....	.....	91	68	73.1	45.2	91.1	57.2
15	.....	.....	.....	.....	36	19	21	3	.....	.....	.....	.....	49	20	76	33	70	45	88	65	81.1	46.2	75.1	58.2
16	.....	.....	.....	.....	44	28	13	— 2	39	19	45	23	32	20	61	38	74	57	67	49	.....	.....	64.1	48.2
17	.....	.....	31	26	41	23	24	3	20	0	46	23	40	24	.....	.....	72	51	80	43	90.1	54.2	61.1	43.2
18	.....	.....	30	23	39	30	.....	.....	24	— 5	59	39	55	21	53	34	72	46	90	62	72.1	44.2	74.1	59.2
19	.....	.....	24	18	34	30	36	11	38	14	50	28	.....	.....	55	33	80	49	.....	.....	82.1	56.2	79.1	49.2
20	.....	.....	24	7	30	18	15	— 7	37	21	35	22	50	22	58	34	80	50	80.1	45.2	79.1	61.2	.....	.....
21	.....	.....	28	9	.....	.....	37	13	35	19	44	23	45	21	60	40	.....	.....	72.1	41.2	66.1	59.2	59.1	38.2
22	.....	.....	32	9	29	12	48	35	.....	.....	.....	.....	48	26	63	33	90	58	82.1	48.2	72.1	48.2	64.1	41.2
23	.....	.....	.....	.....	37	19	32	20	39	20	13	5	36	25	75	37	79	59	84.1	53.2	.....	.....	73.1	48.2
24	.....	.....	35	25	35	24	24	7	20	8	25	9	44	20	.....	.....	66	53	90.1	57.2	71.1	44.2	77.6	51.2
25	.....	.....	25	17	36	26	.....	.....	20	10	42	22	45	22	65	41	79	55	91.1	62.2	75.1	43.2	78.1	53.2
26	.....	.....	28	10	34	29	26	2	25	— 2	41	19	.....	.....	60	34	70	52	.....	.....	71.1	45.2	78.1	59.2
27	.....	.....	21	7	35	25	37	19	27	9	32	14	34	22	87	34	90	49	71.1	56.2	83.1	55.2	.....	.....
28	.....	.....	25	10	.....	.....	34	17	40	9	32	10	36	26	93	51	.....	.....	74.1	58.2	80.1	44.2	64.1	45.2
29	.....	.....	24	10	31	15	30	— 2	.....	.....	.....	.....	38	20	79	53	81	56	75.1	54.2	83.6	45.2	65.1	43.2
30	.....	.....	.....	.....	25	7	30	— 6	.....	.....	35	18	45	36	88	53	70	47	85.1	47.2	.....	.....	65.1	38.7
31	.....	.....	.....	.....	32	23	14	— 9	.....	.....	20	9	.....	.....	.....	.....	.....	.....	76.1	60.2	78.1	46.2	.....	.....
Range	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* No observations taken. No observations taken on Sundays.

Maximum, minimum, and mean temperatures—Continued.

SAINT LOUIS, MO.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max.	Min.	Max.	Min.	Max.	Min.
1	66	48	50	26	63	43	49	37	31	27	46	39	43	27	81	44	80	67	89	72	82	70	83	61
2	72	47	52.5	44	64	58	54	38	31	26	60	38	48	33	76	66	84	62	90	71	82	66	83	66
3	74	59	49	33	62	26	65	54	34	25	70	43	68	32	77	50	88	67	93	73	83	65	77	64
4	68	57	60	37	31	13	63	17	32	29	48	33	45	30	57	44	91	71	97	75	85	65	76	60
5	67	44	55	37	32	25	28	11	35	25	49	36	39	34	65	44	94	68	98	78	78	65	76	62
6	51	36	58	33	33	28	35	20	38	31	63	47	43	32	71	49	93	72	100	79	88	68	87.5	64.5
7	59	39	63	45	39	33	40	21	38	24	54	36	50	33	77	52	95	76	100	79	85.5	73	87	69.5
8	68	44	65	42	58	38	51	32	42	27	43	25	53	39	83	60	94	74	90	75	85	71	86	70.5
9	77	50	61	41	50	32	45	36	37	21	55	32	45	31	82	59	94	75	82	72	89.5	70	86	71.5
10	80	56	59	40	44	29	44	35	52	28	49	35	58	33	82	61	90	69	89	72	100	70	88	72
11	72	57	53	43	67	42	36	21	61	41	43	29	75	43	74	59	74	62	84	66.5	101	79	89	71
12	62	45	43	29	62	30	32	17	62	48	40	28	64	37	76	62	74	55	85	64	98	82	90	70
13	71	46	45	25	34	22	37	22	58	26	39	19	65	51	81	63	76	57	92	72	92	78	88	67
14	77	49	45	23	43	27	23	6	47	27	46	29	74	54	81	62	85	62	94.5	74.5	83	64	87	71
15	76	53	71	40	49	31	13	−1	62	39	47	39	57	41	75	62	78	67	91	70	85	68	68	52
16	71	61	60	45	52	33	26	10	50	32	53	42	49	35	68	51	81	64	83	68	89	65.5	71	51
17	73	62	50	38	54	40	43	19	40	30	71	49	52	34	67	56	87	66.5	81.5	68	90	68	78	62
18	58	47	48	22	54	35	47	40	38	25	77	58	59	42	66	52	87	68	88	69.5	92	73	85	63.5
19	51	37	25.5	13.5	37	28	50	35	55	35	61	30	61	48	75	51	90	68	93	74	94	74	77	56
20	53	37	44	20	29	18	51	33	50	35	54	38	62	45	75	58	90	71	93	75	93	77	67	51.5
21	60	36	47	33	30	10	65	51	41	37	62	44	55	40	68	52	92	69	86	71	93	78	66	54.5
22	62	37	47	35	34	25	53	41	41	33	58	33	50	44	75	52	95	72	84	67	93	73	74	54.5
23	45	32	50	36	42	32	41	22	39	16	46	28	47	37	86	60	94	72	93	76	78	69	79	57
24	53	33	48	33	39	30	35	14	30	11	40	21	50	37	92	69	94	77	97	81	81	64	69	64.5
25	58	37	47	34	37	33	41	23	30	22	62	33	61	37	82	70	92.5	77	99	80.5	84	65	75	66
26	55	40	57	32	38	28	50	35	50	24	53	35	58	42	85	65	94	76	97	81	82	67	79.5	63.5
27	50	32	32	29	30	24	49	40	42	28	35	27	66	50	90	70	95	79	82	72	81	67	68.5	53.5
28	36	26	33	19	39	19	40	21	46	35	43	26	55	32	89	74	96	71	79	62	80	70	68	49.5
29	45	26	28	18.5	34.5	21	59	33	.....	.....	43	32	58	32	83	70	83	70	83	64.5	82	70	77	51
30	53	33	48	19	36	17	50	27	.....	.....	53	37	79	43	87	70	86	68	89	69	77	66	70	52.5
31	38	25	.....	.....	44	27	29	21	.....	.....	43	31	.....	.....	93	73	.....	.....	81	72	72	63	.....	.....
Range	55°		57°.5		57°		66°		51°		58°		52°		49°		41°		38°		38°		40°.5	
Monthly means	52°.3		41°.8		37°.2		35°.5		36°.6		43°.1		47°.6		69°.5		79°.2		81°.5		78°.3		70°.2	

Maximum, minimum, and mean temperatures—Continued.

SAINT PAUL, MINN.

Day of month.	1873. October.		November.		December.		1874. January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	52	30	38	11	35	25	39	20	20	1	43	15	46	15	55	43	74	50	79	60	79	55	85	58
2	57	35	34	17.5	35	21	43	25	25	9	46	30	28	12	64	40	64	55	79	61	75	57	74	55
3	44.5	39	42	10	21	8	38	6.5	24	10	38	14	24	17	62	37	71	53	94	66	74	56	67	44
4	51	38	29	19	8	—8	6.5	—8	22	9	22	6	25	7	62	31	79	55	94	71	79	61	66	51
5	35	42	27	14	2	—14	22	1.5	23	—3	31	18	36	19	70	37	73	51	96	70	78	62	74	48
6	47	25	41.5	20	15.5	—11	30	14	28	15	31	26	38	23	71	41	73	56	99	67	82	63	88	55
7	67	35	42	28	28	15	37	10	26	12	29	10	45	17	80	43	72	56	90	68	86	62	92	64
8	71	44	44	25	35.5	23	34	18	26	10	22	0	38	24	90	54	81	63	88	69	86	61	91	67
9	66	50	34	29	23	29	32	13	23	—3	26	6	43	18	88	65	69	55	85	65	88	66	86	68
10	63	47	41	31	29.5	1	14	7	26	8	25	16	57	28	77	62	58	47	76	61	90	65	77	69
11	56	42	34.5	27	30	16	10	2	29	3	20	2	43	23	70	54	56	47	80	57	91	71	85	64
12	60	33	20	14	17.5	9	15.5	—1	27.5	13	16	—5	51	23	62	45	71	42	82	61	81	66	73	54
13	65	42	21	14	20	1	15.5	—11	13	—6	23	—5	53	28	68	38	72	51	89	64	77	55	72	45
14	62	34	36	12	26.5	6.5	—8	—23	21	—1	34	12	47	32	60	44	62	52	91	70	76	60	64	45
15	73	52	47.5	24	39	16	2.5	—16.5	22	9	38	30	44	26	49	44	69	56	75	60	85	65	61	38
16	50	45	39	33	31.5	20.5	20	2.5	25	—1	46	35	49	25	61	38	76	56	84	55	93	64	65	43
17	63	49	35	30	25	11	33	18.5	28	—4	43	36	53	30	59	47	88	61	89	65	77	61	65	50
18	44.5	35	19	7	22	7	34	20	28	10	37	29	42	29	70	39	87	64	86	67	82	56	60	46
19	52	30	17	—1	20	3	20	—0.5	30	4	34	21	49	24	74	52	90	64	80	72	91	65	53	47
20	55	30	24	10	4.5	—12	28.5	10	27	—11	43	22	49	30	66	44	86	61	78	57	78	65	60	37
21	57	31	36	17	17	—10	30	5	19	—1	33	17	47	28	73	51	90	64	85	53	70	62	62	46
22	37	22	27	13	36	16.5	6	—6	13	5	30	9.5	40	23	62	52	90	70	88	60	68	57	72	49
23	35	18	32.5	13	36	34	6	—9.5	12	—3	17	0	43	21	88	53	94	73	86	68	77	51	76	45
24	30.5	24	39	21	34	31	3.5	—18	3	—18	38	5	57	29	68	59	92	71	90	63	79	62	79	52
25	34	28	28	23	33	26	7.5	—13	10	—15	40	25	50	39	77	53	90	66	93	67	83	58	68	55
26	34	29	27	21	28	18.5	33	7.5	24	3	25	8	50	28	90	54	86	66	75	61	75	59	64	52
27	31	23	21	2	18.5	10	34	24	36	4	27	11	44	40	94	64	91	65	77	53	75	62	57	47
28	29	20	15.5	—5	28	9	20	5	33	7	22	7	53	34	92	70	81	60	88	59	75	66	71	42
29	29.5	18	23	10	23.5	5	14	8	.....	.....	32	10	60	37	90	67	82	53	87	63	76	65	65	45
30	29	18	26	17	28	3.5	10	4	.....	.....	30	19	71	40	82	67	80	62	88	62	75	54	67	37
31	26	17	.....	.....	34	19	15	—4	.....	.....	25	11	.....	.....	78	53	.....	.....	86	65	81	54	.....	.....
Range	56°		52°.5		53°		61°		54°		51°		64°		63°		52°		46°		42°		55°	
Monthly means	41°.3		25°.6		18°.6		13°.8		14°.4		23°.7		37°.5		62°.2		68°.7		74°.7		70°.5		60°.9	

Maximum, minimum, and mean temperatures—Continued.

SYDNEY, C. B.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	.....	.....	24.6	9	30.8	4.3	11.2	− 8	16.3	−23	26.3	9.5	49.8	32.4	49.4	36	48.6	42.8	66.4	50.5	74	55.3
2	.....	.....	.....	.....	26.6	16.4	38.2	17	7.7	− 8	31.8	− 4.4	30.4	16.4	51.5	31.5	41.8	28.8	60.6	44.8	76.4	59.3	60	57
3	.....	.....	.....	.....	41	13.3	39.4	33.3	18.5	−11.5	43.2	− 7	33.4	24.4	40.4	29.4	65.8	27.2	64.1	43.7	72	56	66.5	56.4
4	.....	.....	.....	.....	55.4	39.6	44.3	33	35	18.5	47.8	36.2	38.3	18.3	49.9	31.5	67.9	47.5	54.2	43	70	50.2	62	44
5	.....	.....	.....	.....	55	32.7	48.5	31.2	18.8	0	47	27.8	26.1	12.6	49.8	28	73.3	49.2	56.3	43.4	69	49.6	71	42.6
6	.....	.....	.....	.....	32.7	21	32.4	19.2	0	− 8.5	28	20.5	39.3	13.5	44	25.5	68.3	46.2	55.5	46.5	61	52	71	48
7	.....	.....	.....	.....	28.3	19.5	40.8	25	3.9	− 8	34.5	24.3	43.7	31	54	22	59.2	46	69.8	45.4	68	54	65	59
8	.....	.....	.....	.....	23.9	11.9	48	32.2	16	− 2	36.4	29.8	42	30.5	54	32.5	71.7	43.2	69.2	49.4	75.5	52.8	63.7	49.5
9	.....	.....	.....	.....	38.8	16.6	51.3	34.5	26.6	14.8	35.6	30.2	37	27.8	58.2	35	54	43	75.2	52.6	71	57.4	62	44.6
10	.....	.....	.....	.....	39	15	39.4	31.6	28.7	2	36.8	19.4	29.7	24.5	45.5	30.5	55	39	71.4	48.4	73	59	64.9	46
11	.....	.....	.....	.....	20.3	13	38.4	31	27.7	21.4	38.2	25.1	31.9	19.5	45.5	30.5	52.3	37.2	77.4	47.6	75.4	58.6	57	44.3
12	.....	.....	.....	.....	34.2	17	36.8	7.4	23.2	13	35.2	27	39.6	21.3	51.8	28.6	59	36	73.7	50.1	82.8	59.9	53.6	47.3
13	.....	.....	.....	.....	29.9	21.7	28	18.6	25.9	6.5	30	21.7	28.4	10	68.5	27.5	50.9	41.5	73.3	51.4	80.7	57	59.8	34.4
14	.....	.....	.....	.....	29.3	19	29.8	15	45.5	24.5	39.9	21	40	8	67.6	42.4	54.7	35	79.8	54.4	62	56	69.6	31.9
15	.....	.....	.....	.....	19.9	9	33.8	8.7	38.7	20.3	37.4	26.5	51.6	28.5	50	30.4	65.6	34.4	79	60.1	63.6	56.6	72	54.6
16	.....	.....	35.4	21	29.7	14	22.8	4.5	32	22.3	44.3	18.2	49.5	31.5	60	25.7	66.7	40.6	87.9	61.6	66.5	47.2	70	52.4
17	.....	.....	36.2	27.2	37	27.7	20.4	5.6	35	26.2	50	23.7	35.5	27.5	62.7	37	54.7	41.2	66.5	54.6	72.8	43	58.7	49.4
18	.....	.....	55.9	31.2	36.4	31.5	27	4	26	17.5	44.3	20	42.8	24.8	59.5	45.5	52	43.6	73	45	74.8	55.4	53.3	46.5
19	.....	.....	54.2	41.8	34.3	24.8	38.1	24.6	33.3	8.6	52.2	32.2	49.3	23.5	57.3	42	44.6	41.5	78.8	41.8	69.9	48	55.5	47.4
20	.....	.....	41.8	31.4	33.2	23.4	39.2	15	40.9	23.5	52.4	24.5	38.4	27.3	70.6	44	45.3	40.4	76.6	53.2	70.4	43	68.8	53.6
21	.....	.....	34.5	31.2	32.9	13	19.1	3	36	26.7	27.4	18.2	31.9	25.5	65	45	51.3	41	71.7	56.2	68.6	56	71	57.4
22	.....	.....	41	22	16.4	11	36.2	14.4	38.1	19	37.3	18.9	37	25.5	59.5	43.4	67.6	45.4	72.4	49.4	68.8	46.2	63	37.8
23	.....	.....	40.8	23.5	21.7	9	46.4	35.5	24.8	12	29.9	13.5	41	20.5	59.4	40.4	78.4	51.5	71.6	42.6	64	42.4	57.3	35.4
24	.....	.....	27.1	22.5	27.9	7.9	45.5	16.9	32	11.3	23.3	9.4	38.3	13	60.3	31.4	57.7	46	78	43.2	67.7	42.2	59.3	33.2
25	.....	.....	42.9	24	31.5	15.6	20.7	12.8	15.6	6.4	26.7	6	51.6	23.8	62.8	28.8	57.7	38.7	81	51.4	67	39.1	63	32.2
26	.....	.....	35	27.6	20.6	6.5	20.6	−11	15	− 2.3	43.5	24.8	38.8	25	46.3	36.3	53.5	36.5	80.3	54.3	62	44	65.7	34.3
27	.....	.....	33.7	26	28.2	14.0	6	−10.6	25.4	− 8.6	38.8	22	30.9	28.2	68.7	45.3	69.6	36	77	47.6	63.2	50	65.0	32.0
28	.....	.....	39.3	24.2	39.3	10.5	44	5.3	16.4	−12.5	32	16	39.3	27	75.8	47.3	60.8	49	81.8	65	66	45.4	60.2	33.1
29	.....	.....	33	19.8	34.4	20.7	44.4	11.7	.....	.....	35.3	14	51.5	23.3	55	34	63.5	45	75	64	69	55	65.4	58.3
30	.....	.....	20.6	11	37.4	21	22	0	.....	.....	33.3	9.5	48.6	31.8	61.2	30.6	52.9	45	73	61.5	72	61.3	69.0	55.6
31	.....	.....	.....	.....	22.9	5.5	9.4	− 6	.....	.....	36.8	14.6	.....	.....	46	28.4	.....	.....	76	53.6	76	57	.....	.....
Range	.....	.....	.....	.....	49°.9		62°.3		58°		75°.4		43°.6		53°.8		51°.2		46°.1		43°.7		42°.1	
Monthly means	.....	.....	.....	.....	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	

Maximum, minimum, and mean temperatures—Continued.

TOLEDO, OHIO.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1	62	44	42	28	36	28	44	19	21	15	53	36	41	17	57	35	64	54	85	61	80	67	77	55
2	61	41	48	26	56	35	46	37	27	10	56	33	47	29	54	39	64	47	79	61	76	58	83	57
3	72	50	46	32	60	54	60	44	28	19	57	43	42	26	48	38	79	58	78	59	72	57	71	57
4	64	57	58	34	59	24	63	27	34	25	44	30	32	14	47	41	87	65	93	68	70	54	69	52
5	64	47	47	31	30	21	32	19	30	23	36	27	34	24	59	42	86	65	77	60	72	54	74	63
6	48	36	43	26	29	20	33	27	25	20	38	33	44	26	57	39	81	67	92	60	75	60	79	56
7	57	30	55	34	37	27	36	29	28	18	47	29	49	33	63	33	88	70	97	74	79	63	88	64
8	68	42	52	43	54	34	40	28	30	13	29	24	49	34	80	46	75	64	90	76	79	62	91	66
9	67	44	46	34	55	32	40	32	33	19	36	24	37	29	83	62	86	61	85	70	84	63	86	66
10	77	51	41	32	40	35	36	28	39	15	39	22	50	25	84	63	71	58	85	70	86	70	83	63
11	65	50	41	34	55	36	33	23	32	25	40	19	45	25	83	50	81	61	75	60	93	69	86	60
12	50	38	38	25	47	36	31	21	53	26	30	18	40	25	86	51	65	52	76	58	92	77	88	61
13	61	36	32	22	38	29	30	20	53	36	29	15	63	32	81	59	69	44	83	59	78	66	90	62
14	66	50	38	18	38	27	27	12	41	28	38	20	74	54	63	47	71	51	90	69	75	54	87	62
15	72	49	51	29	44	30	18	6	50	33	42	29	58	35	66	49	73	60	89	71	77	55	77	57
16	76	57	51	36	46	34	21	2	44	21	43	33	45	31	61	59	76	66	75	59	79	57	65	47
17	67	55	46	35	50	35	32	12	25	19	65	35	47	34	62	41	78	60	78	57	87	57	70	58
18	66	47	42	30	45	32	42	29	33	19	66	48	56	35	59	41	78	61	83	63	78	65	78	63
19	52	40	32	22	40	35	43	25	42	32	60	36	48	38	66	41	79	66	91	63	91	64	80	59
20	47	32	27	17	36	27	36	22	44	37	48	34	58	38	65	41	85	66	79	67	93	71	67	51
21	40	32	35	22	39	23	56	32	38	23	56	38	53	36	64	44	88	65	74	64	92	66	66	43
22	58	36	43	27	41	20	60	39	35	29	52	32	52	37	67	44	90	72	76	56	72	62	73	47
23	58	35	38	33	40	24	45	30	38	24	47	21	45	34	72	57	93	71	85	60	72	62	75	49
24	52	30	37	32	42	27	34	12	32	21	40	17	46	34	75	55	81	72	87	70	72	58	78	49
25	52	35	37	27	38	27	24	12	27	21	51	29	43	37	74	59	88	70	78	69	72	53	81	57
26	52	39	32	22	38	30	44	18	36	12	56	30	53	39	74	53	85	66	87	74	74	51	79	63
27	51	36	37	28	37	32	44	28	39	29	41	27	45	31	82	53	79	62	75	60	74	59	70	58
28	38	31	33	17	32	26	44	30	49	31	42	27	42	30	88	62	94	70	72	58	74	60	67	51
29	40	28	28	11	34	20	44	28	.....	.....	45	27	47	25	83	69	83	68	76	54	73	58	69	45
30	45	34	33	20	30	18	30	11	.....	.....	49	33	56	33	87	65	73	60	77	59	75	59	59	44
31	43	26	.....	.....	36	20	21	12	.....	.....	41	21	.....	.....	86	64	.....	.....	87	67	74	57	.....	.....
Range	51°		47°		42°		61°		43°		51°		57°		55°		50°		43°		42°		48°	
Monthly means	50°		35°.7		35°.8		32°.4		31°.1		37°.5		40°.8		62°.1		72°.1		74°.7		72°		67°.5	

Maximum, minimum, and mean temperatures—Continued.

TORONTO, CANADA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	59.8	39.1	47	25.2	16	6.4	39.2	25	12	3.5	43	21	32	12.5	55	30	62.8	51	76.2	44.4	79	60.2	77	55.5
2	54	34.6	46	31	39.8	15.3	38.8	34	28	0.4	46	28.8	44.8	22	46.2	36	65	44.2	73	50.8	67	50	81.8	55
3	54.8	37.5	42.6	24.8	48.2	38	48.2	36	31.4	15.7	48.8	33	31.8	15	54.2	31.8	69	51	79	52.5	69.8	48	68	47.8
4	57.2	45.5	51.4	30	50	26.1	57.5	28.3	24.8	13.2	46.2	15.5	26	9.5	50	38.5	73.5	54	70.8	57	72.8	50.8	64.2	46
5	58.5	49.5	38.2	26.3	27.8	21	30.2	23.5	20	1.2	27	15.7	33	14.2	57	39.8	80	52.4	78.2	56.4	75.2	53	72.8	54
6	47	31.9	37	20.3	32.2	19.5	31.2	20	20	5	33.5	25.8	37.8	24.2	47.6	30	71	58.5	80	57.5	73.5	55	78.5	56.2
7	53.5	28.3	46.2	31.2	32.4	22.2	33	22	20.8	9.2	39.1	29	41	27.3	52.2	25.3	77.5	53.5	83.5	61	80	58.8	75	51
8	61.4	36	46.6	37.6	39.4	24.8	35	28.5	24.2	3.4	38	24.7	36.2	26	60.2	33	70.2	53	82.4	65	82.4	58.2	76.5	58
9	61	43.5	38	26	46.2	36	36.2	24	28	7.1	26	17.4	37.2	27	86	39.5	80	54	75.8	65.5	83.8	57.8	80.2	52.5
10	63	44.2	33.8	20.5	36.4	31	35	29.3	25.5	8.5	28	13.8	44.2	29	80.4	50.5	69	55.5	74.8	63	81	61.4	88.6	60.5
11	61	46.5	39	24.8	40.8	29	32	22	25.8	4.2	27.5	15.2	35.8	20.8	63	43.8	57.8	47.2	75	59.8	80	60.5	85.8	64
12	50	37.2	34	25	37	32.5	27	15.8	38.7	4	20.2	5.5	37	18	64.2	44.8	63	47	66	56.5	95	64.5	73.2	59.2
13	55	36	26	14.2	34	17.8	26	12.5	42	31	22	7	41.2	21	74.5	49.5	69.2	47	76	55	74.5	59	76	58
14	67	41.6	29	10.5	32	9.5	23	12.4	33	20.4	35	18.7	60.8	35.5	60.5	42	70.2	46.8	82.6	56.5	75	56.5	84.8	60
15	62	36	36.5	24.6	31.5	25	12.8	3.8	39	20.5	33.2	19	54	29.8	64.2	42	67	51.5	83	66.5	80	51	79	60
16	69.2	37.8	39	29	39.8	19.8	15.1	1.5	38.5	22.5	38.2	26	39	25.8	69	44.5	63.2	56	69.5	53.5	80	54.2	66.6	54.6
17	52.4	44.5	34	27	39	17.2	26.8	3.0	22	10.2	40.4	33.5	37	30	53.2	39	74.8	54.2	72.2	45.5	84	57	66.2	55
18	59	47.7	32	25	38.8	30	36	16	27.2	8.5	49.2	38	44	29.2	52.4	36.2	75	53.5	81	53.5	78.8	56.4	74.2	59.8
19	52.6	43	29	22	37.2	27.8	36	15.7	38.8	26	57	30	50.2	28.3	63.5	39.5	75.8	53	83.2	58.4	76.2	49	78	63
20	43	33	28	17	33.2	20.3	26.8	6.5	38.2	28.5	38.8	28.3	43.2	35	55.2	45	65.2	52.2	75	55.3	86	65.5	63	48
21	47.5	40	27	16	25.2	13	38.2	24.4	34	26.8	50.8	31	44	31.8	61	44.2	70	51.7	76	47.5	73	60	63.4	41.4
22	54.2	39.4	34	15	29.4	10.2	45.6	34.5	32	27.8	45	23.8	48	29.5	63	40	88	53	76.2	50	71.5	51.8	66	42.8
23	56	43	.....	.....	30.2	14.2	39.5	23.5	39.2	25	22.5	14.7	46.2	28.5	66	39.5	87.5	66.2	79.4	52.5	68.4	54	69.2	46.8
24	50	31.2	.....	.....	35	19.6	30	12.5	30.5	16.2	29	12.7	41	22.8	62.2	48.8	73.2	57	80	53.5	73	52.8	73	49.2
25	48.4	32.5	.....	.....	34	27	15.1	8.5	27	15.3	43.8	25	39	28.3	72	47.5	69.5	53	83.2	63	74.8	51	77	52
26	49	35.2	.....	.....	36.2	32	25	7.8	26.4	3	46	23	51	33	58.8	46.5	62.2	54.8	79	67.2	75	55	73.2	55.8
27	49	37	.....	.....	35	29	36.5	17.2	32	16.7	36.5	18.2	42.2	25	66.2	38	75.8	56.5	71.2	62	77.2	55.4	69	61
28	42.8	32	.....	.....	31	21.8	35	21	37	20.3	36.2	18	40	28.3	77.8	45	86.2	56	67.5	59	76	54	62.8	55
29	35	24.2	.....	.....	35.2	15.7	32	6.6	.....	.....	36.4	16.9	36.8	26	69	53.5	82.2	56.7	78	54.2	77.8	57	67.5	48.8
30	46	27.5	17.2	13.8	25.8	8.8	7.2	— 4	.....	.....	39.8	23.5	52	27	78.2	51	76.4	49.5	79.2	53.5	77.8	55.8	56.2	39.5
31	47.5	27.8	.....	.....	34	18	14.6	— 0.5	.....	.....	29.7	15.5	.....	.....	79	57.5	.....	.....	82	63	81	61.4	.....	.....
Range	45°		.....	.....	41°.8		61°.5		41°.6		51°.5		51°.3		60°.7		43°.8		39°.1		47°		47°.2	
Monthly means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Maximum, minimum, and mean temperatures—Continued.

TYBEE ISLAND, GA.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1																				76		76	78	73
2																				75.5		74	81	71
3																				70		75	81	75
4																				70		71	81	71
5																				73		72	81	73
6																				68		75	82	72
7																				75		74	83	75
8																				74		69	86	71
9																				75		71	89	69
10																				76		71	80	70
11																				67		71	78	69
12																				69		74	81	75
13																				71	84	71	80	72
14																				75.5	85	75	82	72
15																				75	84	71	89	73
16																				72	82	76	85	70
17																				76.5	80	73	87	73
18																				72	84	73	87	74
19																				72	88.5	77	88	75
20																				74	88	74	86	74
21																		*72		71	86	75	78	72
22																		77		74	90	74	78	70
23																		75		71	89	73	78	69
24																		71		71	88	75	78	71
25																		74		75	80	73	80.5	69
26																		75		77	80	70	82	74
27																		71		74	77	71	81	73
28																		76		71	75	69		65
29																		75		72	77	66		52
30																		74		72	84	71		60
31																				76	80	72		
Range																								
Monthly means																			78°.5		79°.		75°.8	

* Station opened June 21, 1874.

Maximum, minimum, and mean temperatures—Continued.

VICKSBURG, MISS.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	46	76	52	93	73	95	76	91.5	72	93	73
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	41	82	57	93	71	95	68	95	74	93	74
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	45	84	69	89	69	89	68	94	80.5	92	73
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	46	70	59	92	69	82	68	96	77	91	71
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77	57	67	55	93	72	75	69	5	72	85	71.5
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79	66	74	54	92	72	89	68	94.5	72	88	72
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	57	81	54	90	73	94	66	94	75	90	73
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	59	83	56	90	74	94	70	95	78	87	74
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	44	82	59	91	72	81	70	95	78	83	71
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	43	82	60	91	74	81	69	97	79	90	72
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	43	85	63	91	75	86	71	96.5	80	90	71
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	47	86	63	91	73	86	70	96	73	90	68
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	54	86	65	90	69	90	72	99	80	90	70
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	56	87	65	93	70	87	68	98	76	87	68.5
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	59	89	66	94	70	86	67	95.5	77	86	68
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	60	82	66	90	70	88	66	96	75.5	84	71
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	54	85	60	90	70	82	73	90	69	88	67
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	50	88	62	89	67	92	72	86	71	90	71
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	61	81	60	90	70	92	73	91	72	84	70
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	55	90	61	92	71	93	74	91.5	72	80	66
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	50	92	72	92	70	94	73	92	73	80	56
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	61	87	68	81	70	92	74	94	70.5	84	57
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*52	*45	65	53	92	68	92	70	94	76	91	79	89	65
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	41	55	47	91	71	91	71	96	75	87	72	85.5	70
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	41	68	46	91	70	92	72	94	77	93	75	85.5	70
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	57	76	55	90	70	92	75	92	76	94.5	76	84	69
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	57	81	57	90	69	92	77	96.5	77	92	77	76	63
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	56	68	45	84	72	92	75	93	74	91	74	71	53
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59	50	65	47	91	72	90	75	87	71	92	70	75	54
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	53	71	45	93	73	94	75	90	66	94	78	83	57
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	61	.....	.....	95	73	.....	.....	92	70	91	72	.....	.....
Range	.....		.....		.....		.....		.....		.....		40°		43°		27°		36°.5		29°		40°	
Monthly means	63°		57°		52°.4		52°.2		54°		62°.5		57°.7		75°.4		81°.9		81°.1		84°.6		77°	

* Station supplied with maximum and minimum thermometers March 23, 1874.

Maximum, minimum, and mean temperatures—Continued.

VIRGINIA CITY, MONT.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	45	22	31	16	39	23	28	11	37	22	44	27	46	33	60	44	89	52	69	50	48	39
2	.....	.....	52	28	20	−15	36	13	29	17	27	16	50	23	46	31	64	46	88	60	75	43	57	34
3	.....	.....	53	32	− 3	−18	13	1	21	6	30	13	50	27	54	33	64	47	90	55	84	47	72	47
4	.....	.....	49	32	12	−10	26	8	25	12	23	8	39	27	65	35	62	45	81	62	83	50	74	44
5	.....	.....	52	28	12	− 2	29	16	32	13	21	5	36	27	72	40	60	47	80	50	80	55	79	46
6	.....	.....	45	29	29	8	33	12	44	29	24	5	38	22	72	46	56	42	83	51	79	49	80	43
7	.....	.....	54	39	31	15	32	17	25	14	26	18	43	24	68	46	52	34	84	52	79	52	81	52
8	.....	.....	58	36	18	− 1	38	22	28	5	28	15	48	30	62	43	48	33	80	54	74	47	81	50
9	.....	.....	59	32	6	− 4	41	36	36	12	26	2	55	28	44	30	48	34	81	51	83	48	45	36
10	.....	.....	54	34	17	6	33	21	39	20	28	5	56	30	48	36	57	38	83	53	62	49	51	33
11	.....	.....	44	32	14	− 2	30	11	30	16	40	11	59	36	51	36	62	38	81	61	56	44	50	34
12	*60	40	49	23	14	− 2	26	13	26	6	44	21	43	31	44	37	50	43	84	53	79	45	61	33
13	39	29	56	28	19	1	3	− 3	29	12	30	24	33	28	50	38	55	42	86	53	84	49	59	35
14	26	21	43	28	29	11	37	7	28	6	30	10	38	25	57	38	67	44	77	46	85	49	64	36
15	30	21	45	20	29	17	41	21	32	20	23	18	35	20	66	37	74	46	85	50	80	50	53	43
16	29	24	54	25	29	11	43	30	37	10	26	12	36	28	70	43	72	54	86	54	71	50	53	38
17	41	27	54	25	29	16	36	26	33	14	25	11	43	22	74	46	69	43	87	57	81	49	44	35
18	46	21	36	18	25	7	28	12	24	15	22	11	51	37	75	53	65	37	83	53	76	53	50	30
19	57	29	42	21	20	11	29	17	26	− 3	30	11	43	27	77	50	80	48	75	55	72	50	48	38
20	55	32	41	22	27	12	27	8	26	1	29	19	28	20	70	50	72	53	83	54	72	49	52	38
21	24	19	40	30	30	12	13	− 6	16	− 4	32	8	33	15	65	48	82	50	87	57	67	43	58	33
22	29	14	33	23	28	18	8	− 5	6	− 2	39	21	44	16	71	57	81	52	87	60	75	43	68	37
23	25	10	42	23	20	7	15	− 3	− 1	−12	40	25	52	35	65	50	71	53	85	58	83	48	72	41
24	12	4	49	28	35	8	24	1	9	−18	44	21	61	43	75	44	70	48	83	53	82	59	72	44
25	21	− 3	49	38	35	15	33	13	11	− 2	42	27	56	40	79	50	61	48	64	53	75	56	60	44
26	32	18	45	18	23	7	36	24	25	− 3	35	13	45	33	57	41	67	48	80	46	77	50	66	34
27	42	31	23	4	30	7	31	19	31	4	41	27	60	29	47	39	60	45	82	50	69	50	76	43
28	48	27	29	5	37	23	37	17	39	13	35	23	68	37	43	33	69	43	79	53	70	49	78	46
29	48	29	31	6	32	15	38	29	.....	.....	32	19	71	40	55	39	64	44	83	54	80	47	78	48
30	43	28	43	29	39	23	31	17	.....	.....	29	19	60	42	60	36	47	43	85	50	81	52	77	49
31	43	25	.....	.....	39	28	24	9	.....	.....	41	15	.....	.....	61	47	.....	.....	83	54	71	49		
Range	.....		55°		57°		49°		62°		42°		56°		49°		49°		44°		45°		51°	
Monthly means	35°.8		35°.6		16°.7		23°.1		18°.4		24°.1		38°.4		51°.1		53°.9		67°.7		61°.8		50°.2	

* No observations taken from August 3 to October 12, 1873.

Maximum, minimum, and mean temperatures—Continued.

WASHINGTON, D. C.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	67	46	51	32.5	35	31	47.5	35	32.5	24	55.5	27.5	35	29	72	48	79	64	90	66	88	71.5	83.5	61
2	71	50.5	60	29	41	32	58	43.5	27	17	60	29	51	32	59	46	74	53	89	73	83.5	68	86	58
3	74	49	60	41	63	36	63.5	39.5	35	24.5	64	36	57	37	63.5	40	64.5	56.5	88	68	81	60.5	90	62.5
4	69.5	50	59	31	73	50	66.5	58.5	36.5	28	69	41	44	29	48	40.5	82	59	93.5	64.5	80	60.5	77	66
5	75	59	63	43	50	30	62	35	35	22	57.5	32	59	24	56	42	92	65	78	68	81	57	85	65
6	64	46	47	38	38	32	56.5	33.5	30	20	45	36	65	42	63	41	88	69	82.5	61	84	62.5	87	66
7	55	42	50	38	38	32	68	53.5	28.5	20	47.5	35	63	47	62	42	94.5	71	88	68	74	68.5	87	66
8	71	43	58	43.5	44	32.5	60	38	33	21	49	33.5	61.5	44	76	44	95	77	94	69	81.5	70	87	67
9	68	50	56	42	61	42	52	32.5	36	15	39	27	59	40	85.5	57.5	102.5	74	92.5	75.5	87	66	80	64
10	69	42	42	36.5	46	35	53	38.5	39	24.5	48	30.5	47	38	92.5	61	92	74	95	75	87	67	82	58
11	71	42	50	32	58	33	45.5	32	49	24	43	32	67	34	84.5	49	83	69	87	74.5	91	63	90	58
12	62	50	50	36	71	53.5	35.5	27	45	28	41	27	45	24.5	70	43	89	69	82	74.5	92	66	94	68
13	61	40	39.5	27	65	41	33.5	25	58	35	30	21	59	26	78	52	73	58	89.5	72	90	70.5	79	68
14	73	43	35	24	46	33	34.5	25	60	38	40	24	61	43	86	60.5	82.5	52	94.5	72	82	65	77	69
15	73	45	51	25	54.5	36.5	27.5	11.5	51	32	54	26	72	58	72	58	82	57	98	74	83	64	81	67
16	73	48	63	33.5	54	33	22.5	11	58	40	43	36	62	44	75	54	81	64	88	74.5	85	59	72	66.5
17	76	49	45	33	56	28.5	30.5	11	42	29	62	38	47	40	78	56.5	83	68	83	64	85.5	59	69	65
18	72	62	40	34	56.5	34	36.5	9	35.5	20.5	67	52	50.5	39	66	52	87.5	64.5	90	62	92.5	59	81.5	62.5
19	74	51	40.5	32	54.5	38.5	43.5	31	44	23.5	75	51	49	44	71	45	83	69	91	67	93	71	80.5	60.5
20	53	44	33	25	43	35	43.5	35	60.5	39	63	43	64	43	67	55	79	63	94	71	100.5	70	77	59.5
21	54	41.5	44	21.5	36	27	51	34.5	71.5	48	60	38	61	46	65	52	85	64.5	82	67.5	99.5	71	68	51.5
22	62	38.5	46	27	39.5	20	63	46	77	60	57	44	63	43	70	47	95	69	81.5	63	85	66	71.5	51
23	66	40.5	47	27	33.5	27	71	40	78	49	55	29	52	45	73	45	98	72	86	62	71	61.5	74.5	50
24	69	50	54	39.5	43.5	25	47.5	27	49	32	37.5	20.5	63.5	40	71	62	92	77	86	70	66	59	76	57
25	60	43.5	49	37	39.5	27	29	18	33	24	58	25	56.5	40	86.5	61	94	65	89	71	70.5	62	78.5	60
26	60	37.5	40.5	30	36	30	37	15	42	22	63.5	47	52	38	76	60	91	74	84	73	74.5	55	80.5	57
27	66	50	57	34	44	32	46.5	36.5	42	28	64.5	43	61	38	73	50	82	71	75.5	71	72.5	54	80.5	59
28	59	36	40.5	32	40.5	33	57.5	37	48	25	57.5	41	55	38	89	58	95	75	81.5	71	74	50	74	61.5
29	47	33	38.5	27	49	30	53	33.5	.....	.....	52	40	45	30	91.5	58	101	77.5	75.5	67	78	59	61.5	57
30	52	26	39	22.5	38	21.5	43	30	.....	.....	65.5	34	59	34.5	86	62	84	69	82	61	80	51	62	52
31	59	31	.....	.....	44	18	39.5	21	.....	.....	48	32	.....	.....	89	63.5	.....	.....	88.5	61	77.5	63	.....	.....
Range	50°		41°.5		55°		62°		63°		54°.5		48°		52°.5		49°		37°.5		50°.5		44°	
Monthly means	55°.3		41°.1		40°.9		40°.5		36°.4		44°.6		47°.8		64°.3		77°.2		78°.4		73°.2		70°.4	

Maximum, minimum, and mean temperatures—Continued.

WILMINGTON, N. C.

Day of month.	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.....	.....	.....	.....	.....	.....	62	33	55.5	42	53	47	69	50	79	56	95	70	92	76	91	69	81	62
2	.....	.....	.....	.....	.....	.....	67	46	44.5	39	60.5	44	62	43	78	64.5	78	67	88	76	92	72	85	62
3	.....	.....	.....	.....	.....	.....	72	42	50	39	71.5	47	67	46	69.5	55	87	63.5	86	69	91	72	86	65
4	.....	.....	.....	.....	.....	.....	71	54	52	39	71	54	73	50	73	54	90	74	89	70	84	68	89	65
5	.....	.....	.....	.....	.....	.....	69.5	53	47	31.5	59	45	68.5	42	63.5	49	82	73	91	72	83	63	85	67
6	.....	.....	.....	.....	.....	.....	66	62	62.5	39	67.5	45	79	61	71.5	48	86	72.5	85	70	86	67	87	66
7	.....	.....	.....	.....	.....	.....	65.5	44	48	40.5	74.5	63	82	63	73	49	89	70	85	64	87	70	90	66
8	.....	.....	.....	.....	.....	.....	48.5	38.5	43.5	33	61	46.7	77	65.5	78	54	92.5	76	90	71	83	73	90	71
9	.....	.....	.....	.....	.....	.....	56.5	37	43	32.5	60	40	73	69	81	60	97.5	76.5	89	75	90	69	85	67
10	.....	.....	.....	.....	.....	.....	59	45	49	32.5	68	45	71	50	82	64	96	77	88	77	92	67	74	63
11	.....	.....	.....	.....	.....	.....	67	47	60	37.5	56.5	43	66	.....	81	58	90	78	88	75	94	73	89	67
12	.....	.....	.....	.....	.....	.....	52	44	64	40.5	57.5	34	58	41	74.5	58	89	72	85	73	92	74	84	68
13	.....	.....	.....	.....	.....	.....	48	37.5	66	55	47	34	61	34	79	61	85	67	82	70	92	72	85	71
14	.....	.....	.....	.....	.....	.....	51	37.5	66	46	53.5	31	73	52	73	60	81.5	63	91	73	90	67	78	73
15	.....	.....	.....	.....	.....	.....	38	30	48.5	41.5	57	38	76	62	78	66	85	66	91	70	86	67	81	71
16	.....	.....	.....	.....	.....	.....	32.5	19	65.5	46	63	44.5	77.5	65.5	85	64	84	67	91	73	90	67	87	73
17	.....	.....	.....	.....	.....	.....	41.5	22	53	44	67	57	70	60	83	66	86.5	75	92	72	84	63	85	71
18	.....	.....	.....	.....	*66.5	48.5	61	34	44	35	67	53	62	52	83.5	65	93.5	73.5	87	70	91	68	85	70
19	.....	.....	.....	.....	68	50.5	66.5	41.5	55	37	76.5	60	69	56	76	57	94	70	81	71	90	74	86	70
20	.....	.....	.....	.....	52.5	37	63	45.5	64	45	75	55	76	66	81	58	92	70	89	69	92	73	85	70
21	.....	.....	.....	.....	52	32	61	44	72	54.5	62	53	79	55	81	65	85	70	90	73	93	75	78	60
22	.....	.....	.....	.....	43	34.5	71	53	73	59.5	76.5	58.5	73	61.5	78	57.5	88	71	88	74	92	71	77	56
23	.....	.....	.....	.....	46	38	73	60	74	62	66.5	55	82	62	81.5	57	90.5	70.5	84	69	92	71	77	59
24	.....	.....	.....	.....	51	35	60.5	46	63.5	38	55	42	70	57	84	69	97	73	88	65	90	72	80	61
25	.....	.....	.....	.....	41.5	40.5	43.5	31	49	38.5	61.5	42	75	55	87.5	72	96	73	88	68	79	67	81	64
26	.....	.....	.....	.....	44.5	39.5	45.5	26	50.5	35.5	68	57	67	52	91	70	95	74	89	69	79	59	82	62
27	.....	.....	.....	.....	49.5	40.5	60	34.5	61.5	39	73.5	52	71	48	84	64	94	71	83	70	79	58	81	62
28	.....	.....	.....	.....	47	30.5	63	48	57	42	80.5	56.5	74	58.5	84	63	91.5	74	80	70	79	56	81	62
29	.....	.....	.....	.....	52	32	56	36	.....	.....	72	54.5	61	43	91.5	66	89	73	84	69	73	62	71	59
30	.....	.....	.....	.....	46.5	29	62	37.5	.....	.....	77.5	57	66	41	90	70.5	89	75	84	69	73	62	72	55
31	.....	.....	.....	.....	44.5	18.5	66.5	42	.....	.....	80.5	63	.....	.....	85	67	.....	.....	89	68	79	65	.....	.....
Range	.....	.....	.....	.....	.....	.....	54°		42°.5		49°.5		48°		43°.5		34°.5		28°		38°		35°	
Monthly means	.....	.....	.....	.....	.....	.....	50°.1		48°.1		57°.3		62°.8		70°.1		80°.1		79°.1		76°.7		74°.1	

* Station supplied with maximum and minimum thermometers December 18, 1873.

Maximum, minimum, and mean temperatures—Continued.

WOOD'S HOLE, MASS.

Day of month.	1873. October. Max.	1873. October. Min.	1873. November. Max.	1873. November. Min.	1873. December. Max.	1873. December. Min.	1874. January. Max.	1874. January. Min.	1874. February. Max.	1874. February. Min.	1874. March. Max.	1874. March. Min.	1874. April. Max.	1874. April. Min.	1874. May. Max.	1874. May. Min.	1874. June. Max.	1874. June. Min.	1874. July. Max.	1874. July. Min.	1874. August. Max.	1874. August. Min.	1874. September. Max.	1874. September. Min.
1	.....	.....	49	43	24	14	48	39	21	11	41	30	31	22	50	43	61	50	75	60	75	65	76	62
2	.....	.....	53	44	42	18	46	43	25	13	47	35	43	28	51	38	49	48	70	60	78	61	75	62
3	.....	.....	59	33	50	40	47	38	37	28	55	37	46	33	60	38	62	50	75	59	70	58	73	62
4	.....	.....	52	47	58	42	56	46	36	22	47	40	43	19	59	43	60	53	69	60	72	55	68	52
5	.....	.....	57	36	46	34	49	35	23	14	42	28	38	17	52	41	60	55	71	57	76	59	66	52
6	.....	.....	57	37	40	39	45	32	20	11	37	22	50	38	56	40	65	58	66	55	75	60	70	61
7	.....	.....	57	35	39	24	53	48	27	14	36	30	43	33	50	37	74	59	64	53	75	64	77	62
8	.....	.....	56	46	40	24	54	39	31	12	43	33	39	33	54	42	72	58	68	61	67	66	73	61
9	.....	.....	52	39	47	38	45	34	35	12	39	23	39	36	59	42	76	59	80	63	71	63	71	57
10	.....	.....	36	31	43	28	45	41	32	23	30	20	40	34	65	46	74	56	70	65	78	63	74	60
11	.....	.....	39	29	46	27	46	36	31	20	24	16	45	30	52	40	64	54	71	65	80	65	83	64
12	.....	.....	56	39	50	42	37	28	35	21	26	13	54	23	58	40	66	54	73	66	76	64	66	53
13	.....	.....	41	30	47	32	31	20	46	33	25	11	41	21	59	44	68	55	72	66	76	67	67	52
14	.....	.....	34	24	39	28	35	21	47	29	41	20	47	35	59	47	70	53	79	64	71	60	69	55
15	.....	.....	36	29	42	30	24	16	43	28	37	21	50	44	57	46	73	59	75	65	66	58	74	60
16	.....	.....	47	35	48	38	20	10	39	30	43	30	50	38	57	47	68	58	75	65	77	59	71	65
17	.....	.....	47	35	43	33	25	11	35	18	43	33	40	32	60	47	65	60	79	63	71	56	71	62
18	.....	.....	48	34	46	32	38	23	34	14	54	43	43	32	68	50	70	59	76	66	78	62	61	60
19	.....	.....	38	25	42	32	46	38	41	19	45	39	47	35	62	47	67	52	78	64	76	64	65	58
20	.....	.....	34	26	43	31	36	23	44	37	44	32	42	40	65	46	59	50	73	65	74	66	71	60
21	.....	.....	45	27	29	18	42	27	44	37	46	29	49	38	63	46	64	50	74	64	80	65	68	53
22	.....	.....	45	32	34	22	46	39	47	38	45	35	50	38	60	45	71	57	78	61	65	56	65	50
23	.....	.....	45	29	38	26	48	38	47	34	36	18	45	37	67	49	77	62	76	63	69	53	69	52
24	.....	.....	56	31	39	30	39	28	39	27	27	12	48	36	60	48	73	62	74	65	70	55	72	59
25	.....	.....	40	26	37	31	23	12	31	24	40	25	40	35	57	54	71	59	74	62	69	52	70	61
26	*54	49	30	20	41	33	18	5	32	18	47	40	44	35	62	53	70	57	74	66	69	54	75	58
27	63	53	46	18	38	28	41	19	36	29	48	34	49	35	65	49	70	59	75	65	70	52	74	54
28	52	45	35	23	35	29	45	39	35	18	41	32	49	35	67	53	66	60	77	65	73	53	67	57
29	46	39	35	25	40	32	36	25	.....	.....	39	27	50	35	69	51	72	61	78	67	73	55	67	60
30	45	38	35	20	34	18	35	14	.....	.....	44	29	46	33	67	53	80	64	79	64	72	56	66	52
31	63	48	.....	.....	39	21	34	15	.....	.....	42	28	.....	.....	66	55	.....	.....	77	66	77	61	.....	.....
Range	.....		41°		44°		51°		36°		44°		33°		32°		32°		27°		28°		33°	
Monthly means	54°		38°		36°		34°.7		30°		34°.9		38°.2		51°.3		61°.8		67°.8		66°.2		63°.8	

* Station supplied with maximum and minimum thermometers October 26, 1873.

Maximum, minimum, and mean temperatures—Continued.

WYTHEVILLE, VA.

Day of month.	1873. October. Max.	Min.	November. Max.	Min.	December. Max.	Min.	1874. January. Max.	Min.	February. Max.	Min.	March. Max.	Min.	April. Max.	Min.	May. Max.	Min.	June. Max.	Min.	July. Max.	Min.	August. Max.	Min.	September. Max.	Min.
1																	79	58	84	63	77	60	79	54
2																	78	49	83	64	77	61	80	47
3																	66	59	85	58	78	54	79	48
4																	85	60	91	55	74	56	82	48
5																	76	62	84	62	79	48	80	48
6																	83	60	85	53	81	56	81	51
7																	85	62	89	55	75	61	82	57
8																	91	66	91	59	79	60	83	53
9																	95	65	86	59	79	55	82	58
10																	91	65	80	61	79	55	77	47
11																	84	63	80	64	85	61	85	45
12																	78	55	76	64	92	63	83	47
13																	75	51	83	58	89	64	82	50
14																	78	44	87	57	83	58	71	57
15																	79	51	85	61	81	57	70	63
16																	74	59	80	62	80	52	81	60
17																	78	59	81	61	81	48	69	64
18																	82	51	81	58	86	48	79	64
19																	84	58	86	54	89	50	77	65
20																	83	49	87	56	90	50	66	50
21																	85	51	80	61	86	59	70	41
22																	88	54	83	66	86	58	70	47
23																	88	58	75	62	78	66	72	44
24																	89	65	84	61	73	63	72	47
25																	86	64	74	65	74	59	72	48
26																	78	62	72	64	74	59	73	50
27																	85	65	77	64	63	56	64	57
28															91	62	93	59	75	66	64	54	57	52
29															89	53	84	65	70	55	61	56	59	50
30															86	55	87	63	79	49	60	55	63	47
31															85	56			82	51	77	54		
Range							35°.8		37°.9		42°.3		48°.1		60°.1		51°		42°		44°		42°	
Monthly means																	70°		69°.9		66°.5		61°.9	

* Station supplied with maximum and minimum thermometers May 28, 1874.

Maximum, minimum, and mean temperatures—Continued.

YANKTON, DAKOTA.

	1873.						1874.																	
	October.		November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	73	31	54	28	32	24	52	23	29	9	59	27	60	25	85	58	68	56	87	57	84	52	89	64
2	76	38	46	31	28	7	52	38	29	8	51	34	50	23	59	48	73	60	95	70	78	57	66	54
3	65	45	66	27	5	3	43	−1	25	12	35	15	47	24	48	38	76	58	90	73	87	61	62	48
4	76	45	53	27	11	−4	20	−10	25	9	42	13	31	16	65	35	78	59	97	74	90	64	64	52
5	57	31	48	21	10	−9	38	12	22	14	45	28	53	23	75	40	78	61	96	75	85	69	87	45
6	63	25	63	31	21	10	43	25	27	2	34	22	50	29	78	44	78	63	95	72	85	66	94	51
7	79	31	64	39	32	20	43	27	35	5	27	13	61	23	80	50	83	60	97	73	87	66	95	69
8	75	50	66	34	35	10	49	25	30	8	34	7	51	27	90	64	77	63	97	80	90	66	86	66
9	81	51	66	37	19	4	38	26	43	−2	42	17	64	21	76	61	67	54	95	70	93	67	78	68
10	74	48	60	30	29	9	32	13	33	15	36	14	77	31	75	48	64	48	87	65	94	67	78	65
11	69	52	51	28	31	10	22	12	47	8	37	12	63	35	67	45	65	44	86	58	92	67	84	62
12	77	50	39	22	17	−1	35	12	41	10	33	8	70	35	67	41	76	48	90	73	87	60	70	53
13	73	46	47	18	31	9	12	−8	23	3	31	11	59	44	53	48	74	59	91	65	90	60	74	41
14	86	39	66	24	45	6	0	−12	24	8	39	31	56	34	65	48	65	58	89	74	82	69	64	41
15	74	58	62	32	41	24	12	−12	43	8	45	34	56	22	70	48	68	57	81	59	90	65	69	30
16	58	48	54	41	32	18	36	8	44	20	51	42	60	27	78	45	84	57	87	58	101	72	71	46
17	51	40	52	31	43	12	40	28	43	19	43	37	61	34	70	45	85	64	88	63	78	57	70	49
18	46	35	31	17	27	15	36	2	34	28	37	31	56	36	79	52	86	70	96	71	92	58	56	50
19	62	33	35	11	20	0	19	−8	35	11	44	28	55	25	79	55	88	71	88	66	95	78	62	43
20	66	32	49	20	15	10	30	8	43	10	51	30	56	33	76	49	83	64	67	57	93	68	57	37
21	58	36	50	23	37	10	30	3	19	−4	47	31	48	34	68	53	80	70	74	60	86	66	71	51
22	38	24	41	27	38	25	12	−3	11	4	41	28	54	32	82	53	91	74	87	67	75	62	77	50
23	51	21	42	26	37	22	11	−8	12	−3	35	18	60	24	91	60	90	71	88	73	88	53	82	45
24	36	24	52	28	32	14	23	−20	11	−3	53	22	68	40	82	63	87	69	93	67	87	58	79	54
25	38	29	35	20	42	13	24	−8	12	−3	46	26	63	36	84	55	94	73	93	66	86	57	74	54
26	34	21	49	19	37	11	48	4	37	−2	30	12	53	35	89	64	91	72	76	60	77	64	72	54
27	33	20	26	13	22	3	36	12	47	14	42	19	54	40	92	71	91	71	75	55	86	66	71	44
28	32	11	32	10	35	15	48	7	58	20	27	20	70	34	87	70	76	60	90	54	85	65	87	37
29	42	18	32	19	22	4	33	10	.....	.....	42	8	80	45	88	67	84	57	90	61	82	59	76	41
30	42	21	45	21	33	14	10	−10	.....	.....	45	28	89	52	78	62	86	62	92	70	83	50	80	37
31	37	14	.....	.....	45	25	20	−4	.....	.....	46	21	.....	.....	78	61	.....	.....	80	63	83	58	.....	.....
Range	75°		56°		54°		72°		62°		52°		73°		57°		5 °		43°		51°		65°	
Monthly means	46°.1		35°.9		18°.1		15°.6		18°.8		30°.6		44°.4		62°.1		70°.7		78°.2		74°.2		61°.7	

PAPER 10.—*Monthly and annual amounts of rain-fall, in inches, from October, 1873, to September, 1874, inclusive.*

Stations.	1873.			1874.									
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	Annual amounts.
Albany, N. Y				3.61	2.90	1.97	4.97	2.32	4.71	6.78	1.94	4.01	
Alpena, Mich	4.71	2.74	0.89	2.34	0.85	1.83	0.75	4.16	2.05	2.06	1.77	3.86	28.01
Atlantic City, N. J				3.22	2.72	1.77	5.92	1.86	3.01	1.56	1.23	5.37	
Augusta, Ga	2.58	4.70	2.66	3.44	7.22	7.78	6.23	3.88	3.29	5.35	6.81	5.85	59.79
Baltimore, Md	6.21	4.05	0.97	2.22	3.18	1.41	6.65	1.92	1.11	4.30	3.47	4.83	40.32
Barnegat, N. J				5.33	2.96	3.01	12.84	3.69	2.97	3.30	2.57	9.29	
Bismarck, Dak												0.64	
Boston, Mass	5.33	6.34	5.64	4.32	3.41	1.60	7.99	3.71	3.94	3.47	6.67	2.05	56.47
Breckinridge, Minn	1.25	1.04	0.48	1.74	0.57	2.21	0.55	2.08	8.21	1.23	7.27	1.43	28.06
Buffalo, N. Y	6.34	3.89	4.56	5.61	2.42	1.08	2.44	3.04	1.50	4.64	0.46	3.39	39.37
Burlington, Vt	5.87	1.59	1.01	3.44	0.82	1.34	3.19	4.21	3.85	7.15	1.07	4.21	37.75
Cape Hatteras, N. C												7.43	
Cape Henry, Va				3.92	7.34	5.15	7.24	4.47	2.83	4.79	3.69	3.24	
Cairo, Ill	5.28	3.04	4.25	3.11	7.38	6.68	8.12	1.55	2.20	0.52	2.79	3.14	48.06
Cape May, N. J	4.92	3.08	2.44	3.55	3.90	2.08	6.66	2.93	4.16	4.42	2.08	6.71	46.93
Charleston, S. C	2.07	5.08	4.94	3.51	10.45	3.45	2.95	5.50	2.29	13.74	7.06	6.66	67.70
Cheyenne, Wyo	0.70	0.17	0.08	0.11	0.11	0.74	0.61	1.50	1.34	1.87	0.44	0.93	8.60
Chicago, Ill	2.43	1.61	4.44	3.47	1.51	2.15	2.67	2.07	3.25	0.58	3.15	3.76	31.09
Cincinnati, Ohio	2.79	2.50	6.47	3.95	5.91	3.65	4.06	1.38	2.58	3.42	1.03	2.33	40.07
Cleveland, Ohio	3.38	1.65	5.50	5.16	3.18	1.47	1.87	1.83	3.98	4.06	1.82	4.66	38.56
Colorado Springs, Colo				0.06	0.54	0.50	3.55	5.90	0.20	0.81	0.91	3.37	
Corinne, Utah	1.62	0.39	1.88	1.04	0.99								
Corsicana, Tex												3.34	
Davenport, Iowa	1.48	0.63	3.84	4.34	0.74	1.34	2.64	3.45	5.37	3.10	3.68	7.86	38.47
Denver, Colo	0.73	0.16	0.53	0.84	0.53	0.49	1.70	2.43	1.21	3.35	0.68	1.34	13.99
Detroit, Mich	2.60	1.03	4.69	5.16	2.00	1.55	1.39	1.93	4.53	3.65	2.11	0.67	31.31
Dodge City, Kans												0.94	
Dubuque, Iowa	2.07	0.77	2.07	2.45	0.36	1.28	1.54	1.08	3.30	3.34	2.13	7.68	28.07
Duluth, Minn	2.31	1.59	0.66	0.58	0.61	1.82	0.49	1.81	10.89	2.62	5.62	5.59	34.59
Eastport, Me	7.38	5.32	1.36	2.70	2.36	3.02	3.09	4.71	6.82	3.27	5.13	3.67	48.83
Erie, Pa	5.87	3.58	4.89	5.54	4.01	1.09	1.52	1.94	3.76	7.03	1.99	4.43	45.65
Escanaba, Mich	3.27	0.62	1.30	0.50	0.54	0.54	0.47	3.95	5.63	3.58	3.74	3.94	28.18
Fort Benton, Mont	0.19	0.86	0.12	0.67	0.10	0.64	0.43	2.98	2.13	0.10	1.17	0.49	9.88
Fort Gibson, Ind. Ter	2.89	1.97	3.66	3.69	3.44	2.91	5.83	3.54	3.38	1.99	1.54	4.41	39.16
Fort Sully, Dak	0.56	0.15	0.08	0.09	0.17	0.92	0.21	5.05	6.24	0.67	0.57	0.18	14.89
Galveston, Tex	2.26	8.91	2.53	1.37	3.11	3.09	3.38	5.80	1.68	9.31	7.19	5.84	54.49
Grand Haven, Mich	2.50							2.23	5.70	4.19	1.19	5.05	
Indianapolis, Ind	5.27	2.46	5.90	3.75	4.17	5.79	4.12	4.03	2.25	3.53	2.90	2.09	46.26
Indianola, Tex	2.42	3.35	3.53	1.18	2.92	4.30	0.74	0.18	6.80	5.76	1.25	12.89	45.32
Jacksonville, Fla	5.65	2.88	3.38	0.82	7.33	2.13	1.60	5.38	5.92	7.48	6.89	7.07	56.53

Monthly and annual amount of rain-fall, in inches &c.—Continued.

Stations.	1873.			1874.									
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	Annual amounts.
Keokuk, Iowa	4.69	1.43	8.56	3.66	0.89	1.14	2.40	1.65	4.01	4.54	3.87	7.92	44.76
Key West, Fla	1.13	2.30	3.42	2.90	1.73	0.11	1.55	2.78	4.54	3.03	3.77	7.42	34.68
Knoxville, Tenn	3.75	4.86	4.83	5.14	2.73	3.96	17.32	2.35	5.11	3.13	7.89	2.43	63.50
La Crosse, Wis	1.92	1.81	1.13	1.59	0.67	1.51	2.12	3.07	6.51	2.31	3.41	4.99	31.04
Lake City, Fla	0.29	4.79	2.31	0.72	7.49	1.37	4.26	2.27	7.80	3.96	0.89	4.00	40.15
Leavenworth, Kans	1.56	0.89	5.24	3.14	1.35	3.05	2.80	1.60	4.96	3.23	1.72	5.50	35.04
Lexington, Ky	5.47	2.09	4.41	5.41	4.89	5.90	6.81	0.79	3.55	6.26	1.57	2.89	50.04
Louisville, Ky	3.26	2.19	6.99	2.39	5.18	6.63	6.01	1.17	2.95	2.71	3.23	0.62	43.33
Long Branch, N. J	.....	.....	.....	5.15	1.83	2.45	11.37	3.49	2.42	3.41	2.22	10.99	.....
Lynchburgh, Va	2.65	2.83	1.87	4.13	3.66	1.94	8.33	1.35	6.80	3.89	3.61	3.68	44.74
Marquette, Mich	2.94	1.54	0.99	0.98	0.36	0.44	0.23	2.54	3.22	2.43	2.26	3.39	21.32
Memphis, Tenn	5.95	3.87	3.18	2.88	4.10	6.61	10.16	0.63	2.22	0.47	4.60	4.72	49.39
Milwaukee, Wis	1.96	1.72	2.81	3.46	0.66	2.64	2.02	3.00	3.40	3.86	1.79	4.63	31.95
Mobile, Ala	1.85	3.23	2.97	2.48	2.72	10.57	10.92	1.23	5.69	10.21	3.79	2.54	58.20
Montgomery, Ala	.....	4.58	2.61	3.69	6.57	10.66	9.45	2.03	4.31	3.87	1.25	0.39	.....
Morgantown, W. Va	5.76	3.53	3.00	3.17	2.17	3.45	7.20	1.25	4.55	5.75	2.16	5.05	47.04
Mount Washington, N. H	9.23	5.50	5.95	4.40	2.47	6.71	5.74	6.53	13.44	7.97	9.51	5.52	82.97
Nashville, Tenn	4.26	4.36	5.94	5.22	9.23	5.26	11.84	1.49	2.87	2.65	3.52	3.12	59.76
New Haven, Conn	7.18	4.75	4.44	4.29	3.86	1.34	7.89	4.92	3.41	4.90	12.99	4.07	64.04
New London, Conn	5.62	5.52	2.65	2.65	2.85	2.96	10.85	5.26	3.63	4.84	16.44	2.08	65.35
New Orleans, La	1.89	5.95	1.79	1.68	3.68	7.57	13.62	0.22	9.62	12.93	4.82	4.21	67.98
New York, N. Y	2.47	4.01	2.24	4.69	2.41	1.85	7.02	2.16	2.87	3.22	2.53	7.16	42.63
Norfolk, Va	3.64	4.13	5.30	2.09	4.79	4.26	5.97	3.97	3.49	8.81	5.04	3.78	55.27
North Platte, Nebr	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.85	.....
Omaha, Nebr	1.82	0.19	0.93	0.32	0.92	1.49	2.01	1.24	6.93	0.54	2.08	7.18	25.65
Oswego, N. Y	6.57	1.78	3.34	5.60	1.87	1.64	2.26	2.08	4.98	7.62	0.29	3.19	41.22
Pembina, Dak	0.40	0.42	0.18	0.06	0.06	0.44	0.15	1.51	3.45	1.40	3.02	1.70	12.79
Philadelphia, Pa	5.20	5.10	1.38	4.58	2.46	2.16	9.76	2.75	2.02	2.25	5.65	6.01	49.32
Pike's Peak, Colo	.....	0.30	0.55	1.32	1.16	1.21	5.20	2.98	0.58	6.00	3.72	2.31	.....
Peck's Beach, N. J	.....	.....	.....	3.84	4.41	2.59	7.25	2.45	1.84	3.10	1.73	9.08	.....
Pittsburgh, Pa	6.21	1.72	3.71	2.90	3.15	2.94	7.20	2.37	1.84	7.68	1.98	2.56	44.26
Port Huron, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.23	1.89	.....
Portland, Me	6.15	3.36	1.80	3.13	2.13	1.14	4.03	3.86	3.14	5.47	5.29	2.73	42.23
Portland, Oreg	3.86	4.33	5.15	9.46	4.28	5.15	3.68	2.38	2.68	0.19	0.83	1.70	43.69
Punta Rassa, Fla	3.90	2.83	1.57	2.05	2.50	0.08	0.41	1.27	11.94	8.06	5.11	4.73	44.45
Rochester, N. Y	8.67	3.24	4.59	5.72	3.35	2.90	4.99	2.98	2.79	4.37	0.84	2.73	47.17
Salt Lake City, Utah	.....	.....	.....	.....	.....	.....	0.90	2.84	0.74	2.42	1.03	0.20	.....
Sandy Hook, N. J	.....	.....	.....	5.03	1.31	2.48	12.55	3.52	2.97	1.99	1.91	11.30	.....
San Diego, Cal	.00	0.77	5.46	3.11	3.73	1.20	0.35	0.32	.00	0.12	.00	.04	15.10
San Francisco, Cal	0.83	1.16	9.73	5.66	2.21	3.36	0.90	0.66	0.14	.00	.00	0.02	24.67
Santa Fé, N. Mex	0.07	0.38	0.83	1.39	1.60	1.51	1.71	0.70	0.54	3.92	1.73	1.42	15.80
Savannah, Ga	1.09	5.74	3.68	2.07	9.71	2.85	2.69	4.85	4.85	10.14	6.58	8.89	63.14

Shreveport, La	*4.15*	*8.35*	*4.93*	*3.51*	*7.58*	*9.27*	*10.64*	*1.19*	*1.35*	*5.59*	*0.19*	*6.33*	*63.08*
Saint Louis, Mo	*3.27*	*1.64*	*5.10*	*3.04*	*3.66*	*4.36*	*3.43*	*3.70*	*2.00*	*5.71*	*4.70*	*2.32*	*42.93*
Saint Paul, Minn	*2.57*	*0.79*	*0.38*	*0.49*	*1.07*	*2.24*	*0.95*	*1.65*	*11.67*	*1.95*	*3.90*	*5.76*	*33.42*
Saint Paul's Island, Alaska	*3.89*	*3.60*	*5.59*	*3.23*	*5.23*	*2.97*	*.84*	*.58*	*2.91*	.....	.....	.....	.....
Squan Beach, N. J.	.....	.....	.....	*4.57*	*1.69*	*2.40*	*10.34*	*4.14*	*2.49*	*2.33*	*4.36*	*11.69*	.....
Toledo, Ohio	*3.30*	*2.08*	*5.32*	*3.53*	*2.78*	*1.39*	*3.14*	*1.61*	*4.06*	*2.09*	*2.43*	*.80*	*32.53*
Tybee Island, Ga.	.....	.....	.....	.....	.....	.....	.....	.....	.....	*4.555*	*3.68*	.....	.....
Vicksburg, Miss	*2.20*	*2.91*	*2.05*	*5.27*	*3.47*	*9.86*	*22.24*	*0.16*	*3.43*	*7.39*	*0.06*	*6.20*	*65.24*
Virginia City, Mont	.....	*0.09*	*0.06*	*0.11*	*0.06*	*0.14*	*0.10*	*4.18*	*3.58*	*1.10*	*3.11*	*1.46*	.....
Washington, D. C	*5.62*	*3.02*	*0.97*	*1.89*	*1.84*	*2.06*	*5.65*	*2.82*	*3.47*	*2.34*	*1.71*	*7.84*	*39.23*
Wilmington, N C	2.79	3.18	4.69	5.14	6.54	3.72	2.88	5.07	2.81	5.81	4.04	9.35	56.02
Wood's Hole, Mass	5.54	9.05	6.23	3.92	2.73	1.10	9.32	3.45	4.47	2.26	3.80	2.03	53.90
Wytheville, Va	1.92	2.62	2.83	2.65	2.89	2.98	5.85	1.16	3.54	6.06	2.58	5.58	40.66
Yankton, Dak	1.49	0.03	0.52	0.57	0.65	0.79	0.24	2.59	6.65	3.84	4.05	1.74	23.16

PAPER 11.—*Statement showing the number of times the wind was observed blowing from the eight cardinal points of the compass during each month and season of the year ending September 30, 1874, compiled from the local observations taken at the several stations of observation at 7 a. m., 2 p. m., and 9 p. m., (local time.)*

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Albany, N. Y. *	N.	....	....	....	12	6	2	8	3	11	6	16	6	13	33	....	18
	N. W.	....	....	....	21	24	40	32	26	22	10	12	14	98	44	....	45
	W.	....	....	....	4	4	9	8	16	8	6	3	5	33	17	....	8
	S. W.	....	....	....	1	0	5	2	1	0	3	1	2	8	4	....	1
	S.	....	....	....	36	8	19	13	21	27	40	17	28	53	84	....	44
	S. E.	....	....	....	1	4	4	9	5	0	2	3	8	18	5	....	5
	E.	....	....	....	1	0	0	0	0	0	1	1	1	0	2	....	1
	N. E.	....	....	....	3	2	0	5	2	5	4	9	1	7	18	....	5
	Calm.	....	....	....	14	36	14	13	19	17	21	31	28	46	69	....	50
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	0
Alpena, Mich	N.	10	7	6	2	5	3	9	7	6	6	9	3	19	21	20	13
	N. W.	11	15	8	17	11	29	23	26	15	18	23	20	78	56	46	36
	W.	17	32	25	27	20	19	15	9	15	12	7	14	43	34	63	72
	S. W.	18	11	20	10	11	14	7	2	6	11	5	8	23	22	37	41
	S.	12	3	12	18	6	4	4	6	8	7	3	4	14	18	19	36
	S. E.	10	3	11	9	10	10	13	15	22	22	24	31	38	68	44	30
	E.	5	3	2	2	9	7	10	11	8	8	8	3	28	24	11	13
	N. E.	2	6	2	3	7	2	3	9	2	5	6	1	14	13	9	12
	Calm.	8	10	7	5	5	5	6	8	8	4	8	6	19	20	24	17
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atlantic City, N. J. †	N.	....	....	....	4	9	4	5	0	1	3	10	2	9	14	....	....
	N. W.	....	....	....	11	19	16	15	13	16	8	11	9	44	35	....	....
	W.	....	....	....	23	18	22	11	12	9	3	6	6	45	18	....	....
	S. W.	....	....	....	13	5	10	9	19	23	18	6	14	38	47	....	....
	S.	....	....	....	23	11	18	12	26	18	40	22	10	56	80	....	....
	S. E.	....	....	....	4	4	9	10	4	9	8	4	13	23	21	....	....
	E.	....	....	....	7	6	9	7	7	7	6	13	25	23	26	....	....
	N. E.	....	....	....	7	12	3	21	11	6	6	19	10	35	31	....	....
	Calm.	....	....	....	1	0	2	0	1	1	1	2	1	3	4	....	....
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
Augusta, Ga	N.	3	6	13	6	7	7	3	10	2	2	12	7	20	16	16	26
	N. W.	6	6	7	12	15	17	6	10	3	4	11	9	33	18	21	34
	W.	15	20	11	6	8	16	18	12	5	6	3	9	46	14	44	25
	S. W.	1	11	8	11	3	11	15	9	18	4	15	5	35	37	17	22
	S.	9	4	8	9	9	13	16	13	23	13	9	3	42	45	16	26
	S. E.	2	2	2	5	3	0	8	4	6	24	5	1	12	85	5	10
	E.	5	0	4	3	7	7	2	8	11	5	4	13	17	20	18	14
	N. E.	9	2	14	14	13	9	12	8	6	18	22	21	29	46	32	41
	Calm.	43	39	26	27	19	13	10	19	16	17	12	22	42	45	104	72
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baltimore, Md	N.	12	4	10	6	4	7	7	9	11	10	24	14	23	45	30	20
	N. W.	14	19	19	24	26	30	19	15	12	7	13	10	64	32	43	69
	W.	4	22	10	9	6	10	3	14	14	10	3	7	27	27	33	25
	S. W.	15	9	14	19	9	11	14	11	8	23	10	8	36	41	32	42
	S.	5	6	4	7	4	1	2	8	15	22	15	11	11	52	22	15
	S. E.	13	5	9	10	8	12	14	20	18	9	4	14	46	31	32	27
	E.	2	3	1	3	3	4	6	6	5	6	11	8	16	22	13	7
	N. E.	9	9	14	9	18	10	22	5	6	3	9	15	37	18	33	41
	Calm.	19	13	12	6	6	8	3	5	1	3	4	3	16	8	35	24
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnegat, N. J. †	N.	....	....	....	7	4	8	5	2	6	8	5	3	15	19	....	....
	N. W.	....	....	....	18	23	33	19	5	13	1	12	8	57	26	....	....
	W.	....	....	....	10	10	4	7	20	13	9	9	9	31	31	....	....
	S. W.	....	....	....	22	9	17	12	12	13	14	4	12	41	31	....	....
	S.	....	....	....	15	4	5	4	15	9	28	10	4	24	47	....	....
	S. E.	....	....	....	6	4	6	7	12	22	20	16	16	25	58	....	....
	E.	....	....	....	2	9	7	15	10	5	7	6	18	32	18	....	....
	N. E.	....	....	....	9	18	8	13	9	8	5	28	19	30	41	....	....
	Calm.	....	....	....	4	3	5	8	8	1	1	3	1	21	5	....	....
	Blank	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
Bismarck, Dak. ‡	N.	....	....	....	....	0	0	1	5	....	....	3	11	6	....	....	....
	N. W.	....	....	....	....	26	30	26	22	....	....	15	5	78	....	....	....
	W.	....	....	....	....	11	17	8	4	....	....	25	12	29	....	....	....
	S. W.	....	....	....	....	12	13	16	11	....	....	14	8	40	....	....	....
	S.	....	....	....	....	5	3	6	4	....	....	7	5	13	....	....	....
	S. E.	....	....	....	....	11	13	14	23	....	....	9	10	50	....	....	....
	E.	....	....	....	....	2	3	4	5	....	....	10	20	12	....	....	....
	N. E.	....	....	....	....	17	14	14	18	....	....	10	13	46	....	....	....
	Calm.	....	....	....	....	0	0	1	1	....	....	0	6	2	....	....	....
	Blank.	....	....	....	....	0	0	0	0	....	....	0	0	0	....	....	....

Observations began December 23, 1873. † Observations began December 10, 1873.
Observations began February 1, 1874. (June and July, 1874, incomplete.)

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Boston, Mass.	N.	14	18	10	4	7	2	4	3	4	4	8	10	9	16	42	21
	N. W.	12	34	32	21	32	48	23	31	35	17	28	23	102	80	69	85
	W.	12	16	21	26	22	14	16	14	6	12	7	4	44	25	32	68
	S. W.	10	9	10	10	3	9	6	14	3	23	7	10	29	33	29	23
	S.	8	2	2	13	5	4	6	1	3	9	6	12	11	18	22	20
	S. E.	5	1	1	4	3	3	4	12	16	9	16	4	19	41	10	8
	E.	16	6	4	6	5	8	16	14	12	10	13	17	38	35	39	15
	N. E.	10	2	5	6	6	1	13	4	9	9	6	8	18	24	20	17
	Calm.	6	2	8	3	1	4	2	0	2	0	2	2	6	4	10	12
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Breckinridge, Minn.	N.	15	19	9	17	10	18	15	22	11	22	11	7	55	44	41	36
	N. W.	21	18	20	22	13	32	19	13	8	9	6	16	64	23	55	55
	W.	13	6	15	5	9	6	3	0	5	1	3	8	9	9	27	29
	S. W.	4	5	3	3	3	5	3	3	5	4	7	5	11	16	14	9
	S.	7	11	2	5	6	4	6	8	19	26	18	30	18	63	48	13
	S. E.	18	14	33	32	32	24	28	27	24	14	19	19	79	57	51	97
	E.	2	9	4	0	2	2	4	9	6	1	2	0	15	9	11	6
	N. E.	13	4	0	1	1	1	7	9	9	4	7	3	17	20	20	2
	Calm.	0	4	7	8	8	1	5	2	3	12	20	2	8	35	6	23
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buffalo, N. Y.	N.	10	6	3	5	4	4	12	6	5	5	11	4	22	21	20	12
	N. W.	6	14	6	7	5	12	9	5	4	11	6	4	26	21	24	18
	W.	15	29	31	25	20	25	15	14	20	17	13	16	54	50	60	76
	S. W.	21	12	18	24	16	26	23	30	33	29	22	22	79	84	55	58
	S.	13	4	12	11	10	5	4	6	5	12	5	11	15	22	28	33
	S. E.	13	6	4	2	3	4	3	2	2	1	1	8	9	4	27	9
	E.	6	13	12	11	16	10	6	10	11	1	16	8	26	28	27	39
	N. E.	9	4	3	6	7	2	14	10	6	9	8	6	26	23	19	16
	Calm.	0	2	4	2	3	5	4	10	4	8	11	11	19	23	13	9
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burlington, Vt.	N.	30	36	27	26	28	18	27	34	34	25	32	28	79	91	94	81
	N. W.	17	8	3	8	4	21	14	8	7	2	5	3	43	14	22	15
	W.	1	5	6	4	3	6	5	5	3	2	6	7	16	11	13	13
	S. W.	9	1	3	3	2	5	5	9	12	5	2	10	19	19	20	8
	S.	24	25	35	41	24	32	31	29	30	42	30	32	92	102	79	100
	S. E.	0	3	1	2	0	2	2	3	1	3	2	4	7	6	7	3
	E.	6	5	2	3	3	1	0	0	1	1	5	4	1	7	15	8
	N. E.	3	5	5	5	5	3	5	0	0	6	7	2	8	13	10	15
	Calm.	3	2	11	1	15	5	1	5	2	7	4	2	11	13	7	27
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cape Hatteras, N. C.*	N.	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....
	N. W.	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....
	W.	....	....	....	....	....	....	....	....	....	....	....	7	....	....	....	....
	S. W.	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....
	S.	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....
	S. E.	....	....	....	....	....	....	....	....	....	....	....	12	....	....	....	....
	E.	....	....	....	....	....	....	....	....	....	....	....	7	....	....	....	....
	N. E.	....	....	....	....	....	....	....	....	....	....	....	49	....	....	....	....
	Calm.	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....
	Blank.	....	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....
Cape Henry, Va.†	N.	....	....	....	11	15	8	10	7	4	2	11	11	25	17	....	....
	N. W.	....	....	....	17	15	18	15	11	8	6	7	6	44	21	....	....
	W.	....	....	....	4	7	9	4	6	8	3	5	4	19	16	....	....
	S. W.	....	....	....	18	13	12	8	11	21	20	10	8	31	51	....	....
	S.	....	....	....	15	4	5	11	11	18	17	11	6	27	46	....	....
	S. E.	....	....	....	14	11	15	11	24	15	19	12	16	50	46	....	....
	E.	....	....	....	5	1	9	12	6	7	5	12	25	27	24	....	....
	N. E.	....	....	....	6	16	9	13	10	9	21	25	10	32	55	....	....
	Calm.	....	....	....	3	2	8	6	7	0	0	0	4	21	0	....	....
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
Cairo, Ill.	N.	14	8	6	7	13	9	18	9	5	2	13	17	36	20	39	26
	N. W.	12	20	21	15	17	15	14	8	5	5	2	5	37	12	37	53
	W.	4	7	8	5	1	1	1	2	4	6	4	4	4	14	15	14
	S. W.	12	13	17	10	2	7	11	21	25	29	9	3	39	63	28	29
	S.	20	12	14	22	16	12	17	10	14	9	17	14	39	40	46	52
	S. E.	11	4	4	10	2	9	7	9	5	6	8	8	25	19	23	16
	E.	1	5	3	3	10	9	3	14	8	7	12	12	26	27	18	16
	N. E.	10	16	16	18	18	26	19	15	17	22	20	12	60	59	38	52
	Calm.	9	5	4	3	5	5	0	5	7	7	8	15	10	22	29	12
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Observations began September 1, 1874. † Observations began December 15, 1873.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Cape May, N J	N.	11	15	13	8	11	5	12	5	7	3	12	5	22	22	31	32
	N. W.	19	31	26	24	25	32	13	19	19	4	10	12	64	33	62	75
	W.	8	9	7	9	5	9	7	5	5	3	5	6	21	13	23	21
	S. W.	11	11	15	9	0	8	5	10	12	9	10	8	23	31	30	24
	S.	16	6	12	25	19	16	12	25	26	51	16	15	53	93	37	56
	S. E.	13	5	4	6	1	10	10	6	9	9	14	9	26	32	27	11
	E.	6	4	5	4	6	8	15	13	8	4	11	20	36	23	30	15
	N. E.	8	6	6	8	16	5	13	5	3	5	13	9	23	21	23	30
	Calm.	1	3	5	0	1	0	3	5	1	5	2	6	8	8	10	6
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Charleston S. C	N.	25	11	26	23	14	10	4	6	2	3	5	6	20	10	42	60
	N. W.	7	11	8	6	9	5	7	6	4	2	1	4	18	7	22	25
	W.	11	19	9	10	4	19	9	11	11	7	6	5	39	24	35	38
	S. W.	5	14	10	10	10	27	34	22	40	27	21	7	83	88	26	34
	S.	4	3	4	8	11	5	9	7	11	19	5	3	21	35	10	15
	S. E.	3	4	2	7	2	5	5	8	7	6	16	16	18	29	23	13
	E.	16	7	3	12	7	8	14	20	14	14	12	22	42	40	45	22
	N. E.	16	5	5	13	20	12	5	10	1	12	23	21	27	36	42	33
	Calm	6	16	16	4	7	2	3	3	0	3	4	6	8	7	28	36
	Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheyenne, Wyo	N.	13	7	8	3	6	10	9	9	11	10	9	14	28	30	34	17
	N. W.	12	17	14	5	9	10	17	11	15	10	11	13	38	36	42	28
	W.	30	40	33	51	36	27	29	18	16	17	30	26	74	63	96	120
	S. W.	11	6	12	15	15	6	6	4	6	2	13	11	16	21	28	42
	S.	8	8	9	10	7	20	8	13	17	25	18	16	41	60	32	26
	S. E.	4	0	2	4	3	5	6	12	7	6	4	6	23	17	10	9
	E.	0	2	2	2	3	1	6	9	10	5	5	1	16	20	3	7
	N. E.	1	0	0	1	0	7	1	7	1	6	0	2	15	7	3	1
	Calm	14	10	13	2	5	7	8	10	7	12	3	1	25	22	25	20
	Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chicago, Ill	N.	9	2	5	11	7	12	18	16	4	12	16	7	46	32	18	23
	N. W.	14	20	12	18	7	14	3	2	5	4	4	8	19	13	42	37
	W.	6	14	19	9	9	15	7	3	10	7	3	12	25	20	32	37
	S. W.	31	25	21	16	19	22	14	17	21	20	9	20	53	50	76	56
	S.	15	5	21	20	15	4	4	14	12	16	8	18	22	36	38	56
	S. E.	4	12	9	8	5	6	9	11	12	5	14	12	26	31	28	22
	E.	4	0	4	3	9	10	12	6	14	10	14	8	28	38	12	16
	N. E.	9	11	2	7	12	9	20	23	11	18	25	5	52	54	25	21
	Calm	1	1	0	1	1	1	3	1	1	1	0	0	5	2	2	2
	Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cincinnati, Ohio	N.	5	5	10	11	6	14	16	17	7	10	10	16	47	27	26	27
	N. W.	18	10	10	16	18	22	15	15	16	8	6	3	52	30	31	44
	W.	9	20	10	13	12	11	4	11	10	14	3	6	26	27	35	35
	S. W.	13	15	12	10	6	5	10	6	12	10	12	13	21	34	41	28
	S.	14	12	19	24	13	13	9	13	13	18	12	21	35	43	47	56
	S. E.	22	10	16	9	6	8	2	7	3	5	13	7	17	21	39	31
	E.	6	6	4	2	9	12	15	8	10	11	18	8	35	39	20	15
	N. E.	3	10	11	8	14	6	15	9	10	11	14	12	30	35	25	33
	Calm	3	2	1	0	0	2	4	7	9	6	5	4	13	20	9	1
	Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleveland, Ohio	N.	15	8	5	8	6	2	16	15	17	14	19	13	33	60	36	9
	N. W.	7	20	11	15	12	22	7	17	12	12	5	9	46	29	36	38
	W.	7	9	9	9	10	23	8	10	11	5	8	6	41	24	22	28
	S. W.	23	28	24	14	13	13	10	10	10	8	15	6	33	33	57	51
	S.	17	7	17	24	5	10	7	10	10	15	4	14	27	29	38	46
	S. E.	12	13	16	13	16	17	13	16	17	17	19	29	46	53	54	45
	E.	10	0	4	0	5	2	10	3	5	3	5	3	15	13	13	9
	N. E.	2	5	7	9	17	3	19	11	8	9	16	10	33	33	17	33
	Calm	0	0	0	1	0	1	0	1	0	0	2	0	2	2	0	1
	Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colorado Springs, Col.*	N.	....	....	28	10	23	22	25	15	6	0	0	31	62	6	....	61
	N. W.	....	....	17	20	8	4	9	6	9	34	35	13	19	78	....	45
	W.	....	....	4	6	7	5	4	5	6	7	5	3	14	18	....	17
	S. W.	....	....	4	6	2	2	2	5	4	7	18	2	9	20	....	12
	S.	....	....	3	3	4	13	5	14	34	19	31	4	32	84	....	10
	S. E.	....	....	9	18	12	20	12	9	13	12	0	33	41	25	....	39
	E.	....	....	1	0	2	4	0	4	1	5	0	0	8	6	....	3
	N. E.	....	....	3	2	1	4	7	5	4	5	0	1	16	9	....	6
	Calm.	....	....	24	26	21	19	26	30	13	4	4	3	75	21	....	71
	Blank.	....	....	0	2	4	0	0	0	0	0	0	0	0	0	....	6

Observations began November 12, 1873.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Corinne, Utah*	N.	23	27	30	25	39	....	....	....	....	....	....	....	....	....	....	94
	N. W.	14	11	12	9	18	....	....	....	....	....	....	....	....	....	....	39
	W.	1	4	0	4	2	....	....	....	....	....	....	....	....	....	....	6
	S. W.	9	9	4	7	1	....	....	....	....	....	....	....	....	....	....	12
	S.	20	12	9	21	12	....	....	....	....	....	....	....	....	....	....	42
	S. E.	4	2	6	7	0	....	....	....	....	....	....	....	....	....	....	13
	E.	3	2	2	4	0	....	....	....	....	....	....	....	....	....	....	6
	N. E.	5	7	7	3	5	....	....	....	....	....	....	....	....	....	....	15
	Calm.	14	16	23	13	7	....	....	....	....	....	....	....	....	....	....	43
	Blank.	0	0	0	0	0	....	....	....	....	....	....	....	....	....	....	0
Davenport, Iowa	N.	14	6	6	3	7	9	18	14	3	7	9	7	41	19	27	16
	N. W.	15	22	23	15	11	29	8	11	8	12	5	9	48	25	46	49
	W.	12	15	18	18	15	10	8	5	18	11	3	12	23	32	39	51
	S. W.	18	12	17	13	11	14	15	22	19	24	18	22	51	61	52	41
	S.	7	6	9	9	5	4	5	14	10	12	6	9	23	28	22	23
	S. E.	7	10	3	5	8	8	5	9	9	8	7	11	22	24	28	16
	E.	6	10	9	9	10	11	14	13	17	8	33	8	38	58	24	28
	N. E.	5	3	3	12	12	6	14	4	1	7	10	9	24	18	17	27
	Calm.	9	6	5	9	5	2	3	1	5	4	2	3	6	11	18	19
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Denver, Col	N.	19	7	7	8	6	19	8	11	6	16	12	13	38	34	39	21
	N. W.	8	5	4	15	7	5	16	16	7	7	8	2	37	22	15	26
	W.	4	7	3	4	1	5	4	5	3	4	5	3	14	12	14	8
	S. W.	0	1	7	2	3	9	5	8	6	7	4	4	22	17	5	12
	S.	25	37	28	21	27	10	16	18	19	29	37	30	44	85	92	76
	S. E.	7	12	8	9	9	13	14	19	20	12	8	12	46	40	31	26
	E.	4	2	4	5	7	6	5	4	9	4	9	10	15	22	16	16
	N. E.	10	8	9	10	8	13	11	12	18	14	9	15	36	41	33	27
	Calm.	16	11	23	19	16	13	11	0	2	0	1	1	24	3	28	58
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detroit, Mich	N.	10	11	8	8	5	10	12	5	6	9	14	6	27	29	27	21
	N. W.	17	22	15	13	16	27	9	18	11	4	2	12	54	17	51	44
	W.	29	23	29	20	16	23	10	12	12	9	4	11	45	25	63	65
	S. W.	13	8	17	25	12	16	11	17	23	28	6	20	44	57	41	54
	S.	7	5	7	5	3	2	7	10	8	15	10	19	19	33	31	15
	S. E.	6	6	2	6	4	3	9	3	8	4	10	6	15	22	18	12
	E.	6	7	11	6	19	12	12	13	20	8	27	6	37	55	19	36
	N. E.	4	5	4	10	8	0	17	13	2	15	19	7	30	36	16	22
	Calm.	1	3	0	0	1	0	3	2	0	1	1	3	5	2	7	1
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dubuque, Iowa	N.	6	8	14	12	4	7	11	4	1	4	10	3	22	15	17	30
	N. W.	25	27	14	14	12	19	15	13	6	7	9	12	47	22	64	40
	W.	5	1	9	3	5	20	7	2	7	7	3	5	29	17	11	17
	S. W.	3	3	7	11	8	8	9	3	11	8	4	7	20	23	13	26
	S.	11	10	10	11	5	7	5	11	12	14	9	18	23	35	39	26
	S. E.	8	9	6	3	5	7	5	13	6	6	9	9	25	21	26	14
	E.	2	1	1	2	6	3	4	5	5	5	9	6	12	19	9	9
	N. E.	3	2	3	7	5	4	13	7	5	4	12	0	24	21	5	15
	Calm.	30	29	29	30	34	18	21	35	37	38	28	30	74	103	89	93
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Duluth, Minn	N.	4	6	2	4	2	5	10	7	2	2	9	3	22	13	13	8
	N. W.	19	28	19	13	13	27	11	9	9	19	5	22	47	33	69	45
	W.	8	8	6	5	5	14	4	2	2	8	1	5	20	11	21	16
	S. W.	27	26	44	33	28	18	20	9	6	14	9	19	47	29	72	105
	S.	6	1	1	4	2	0	1	1	1	1	1	4	2	3	11	7
	S. E.	3	3	0	2	0	0	0	0	2	2	2	6	0	6	12	2
	E.	3	2	1	3	1	1	4	1	2	2	1	1	6	5	6	5
	N. E.	18	6	6	8	19	22	33	46	59	32	51	13	101	142	37	33
	Calm.	5	10	14	21	14	6	7	18	7	13	14	17	31	34	32	49
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eastport, Me	N.	11	22	23	18	27	28	25	12	12	6	14	18	65	32	51	68
	N. W.	6	27	12	12	14	13	4	9	3	2	1	5	26	6	38	38
	W.	4	6	7	6	7	6	12	1	4	3	4	0	19	11	10	20
	S. W.	9	8	25	22	7	10	5	9	4	5	9	12	24	18	29	54
	S.	28	8	0	6	3	20	25	40	27	43	26	21	85	96	57	9
	S. E.	6	5	0	5	2	2	1	2	0	1	0	0	5	1	11	7
	E.	3	4	8	6	10	5	2	4	8	10	5	12	11	23	19	24
	N. E.	19	8	13	9	9	0	10	3	21	5	14	8	13	40	35	31
	Calm.	7	2	5	9	5	9	6	13	11	18	20	14	28	49	23	19
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Station removed to Salt Lake City, Utah, March 9, 1874.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Erie, Pa	N.	4	4	3	3	5	4	3	1	6	2	6	8	8	14	16	11
	N. W.	8	16	15	21	13	27	16	18	16	17	6	10	61	39	34	49
	W.	14	8	12	6	9	18	11	13	12	12	7	7	42	31	29	27
	S. W.	8	18	20	22	12	16	9	17	11	18	10	3	42	39	29	54
	S.	29	19	23	25	17	14	7	10	12	8	10	32	31	30	80	64
	S. E.	17	7	7	1	4	1	5	4	6	3	20	15	10	29	39	12
	E.	2	0	1	7	8	1	7	3	2	3	12	2	11	17	4	16
	N. E.	8	11	1	7	10	5	29	22	22	26	22	11	56	70	30	18
	Calm.	3	7	12	1	6	7	3	5	3	4	6	2	15	7	12	19
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Escanaba, Mich	N.	14	21	14	12	12	15	18	13	13	28	33	8	46	74	43	38
	N. W.	13	18	23	31	13	25	7	6	12	7	1	10	38	20	41	67
	W.	18	25	18	6	4	5	6	3	4	2	5	9	14	11	52	28
	S. W.	9	4	18	15	10	9	8	6	16	10	5	18	23	31	31	43
	S.	24	5	8	13	12	7	17	18	17	36	27	20	42	80	49	33
	S. E.	3	0	6	6	9	12	9	13	16	3	12	16	34	31	19	21
	E.	4	5	0	2	3	5	5	5	4	2	2	2	15	8	11	5
	N. E.	8	7	6	6	14	14	20	28	7	5	5	3	62	17	18	26
	Calm.	0	5	0	2	7	1	0	1	1	0	3	4	2	4	9	5
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fort Benton, Mont	N.	15	5	5	19	11	17	16	14	9	9	10	8	47	28	28	35
	N. W.	2	6	6	6	2	8	2	6	3	2	1	8	16	6	16	14
	W.	15	17	20	12	14	11	14	13	17	29	17	4	38	63	36	46
	S. W.	18	15	17	20	23	12	18	15	21	11	20	32	45	52	65	60
	S.	4	7	9	2	9	2	6	4	17	9	5	6	12	31	17	20
	S. E.	6	3	0	1	0	2	2	4	0	2	3	1	8	5	10	1
	E.	5	3	3	9	3	9	5	22	9	12	21	5	36	42	13	15
	N. E.	3	6	4	8	4	5	9	5	6	7	6	2	19	19	11	16
	Calm.	25	28	29	16	18	27	18	10	8	12	10	24	55	30	77	63
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fort Gibson, Ind. T.	N.	1	0	2	5	6	14	27	11	5	7	6	11	52	18	12	13
	N. W.	13	15	11	13	15	14	9	1	2	2	1	7	24	5	35	39
	W.	9	15	18	11	10	6	4	6	3	3	2	2	16	8	26	39
	S. W.	2	6	1	5	2	3	5	5	6	6	13	4	13	25	12	8
	S.	2	5	1	3	1	6	11	20	27	23	20	11	37	70	18	5
	S. E.	18	10	11	16	7	12	13	24	28	28	17	24	49	73	52	34
	E.	21	20	28	24	18	21	9	14	11	12	25	19	44	48	60	70
	N. E.	2	2	1	7	7	12	9	1	3	5	3	2	22	11	6	15
	Calm.	25	17	20	9	18	5	3	11	5	7	6	10	19	18	52	47
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fort Sully, Dak	N.	7	7	0	3	5	11	16	18	14	19	11	6	45	44	20	8
	N. W.	27	22	35	31	13	17	18	10	16	13	10	20	45	39	69	79
	W.	14	15	3	5	3	14	6	7	10	3	7	5	27	20	34	11
	S. W.	1	3	0	5	0	4	3	1	5	4	1	12	8	10	16	5
	S.	4	1	3	0	4	3	4	8	10	10	5	12	15	25	17	7
	S. E.	6	16	13	18	14	14	13	24	22	28	36	20	51	86	42	45
	E.	11	3	4	12	5	13	14	10	4	11	12	4	37	27	18	21
	N. E.	7	6	1	1	9	4	5	7	5	3	11	3	16	19	16	11
	Calm.	16	17	34	18	31	13	11	8	4	2	0	8	32	6	41	83
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Haven, Mich.	N.	9	11	7	9	3	8	9	9	2	6	5	5	26	13	25	19
	N. W.	12	15	13	12	14	26	13	14	8	9	13	7	53	30	34	39
	W.	19	12	13	14	7	10	11	11	21	12	4	11	32	37	42	34
	S. W.	15	14	23	8	15	17	18	24	14	18	16	19	59	48	48	46
	S.	6	2	9	16	6	2	3	9	11	21	1	14	14	33	22	31
	S. E.	9	13	9	6	8	13	6	2	8	3	13	6	21	24	28	23
	E.	5	8	7	5	11	3	12	6	9	2	6	7	21	17	20	23
	N. E.	6	9	3	12	6	9	12	5	2	12	17	5	26	31	20	21
	Calm.	12	6	9	11	14	5	6	13	15	10	18	16	24	43	34	34
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Galveston, Tex	N.	25	19	16	14	19	4	15	7	7	2	5	11	26	14	55	49
	N. W.	4	12	7	7	7	2	10	7	1	5	6	4	19	12	20	21
	W.	1	3	1	1	1	1	1	6	0	4	2	2	8	6	6	3
	S. W.	3	5	2	5	2	3	6	11	10	18	9	1	20	37	9	9
	S.	15	13	10	17	15	26	31	26	50	30	32	11	83	112	39	42
	S. E.	19	22	30	27	19	27	15	30	16	17	28	25	72	61	66	76
	E.	17	4	7	4	8	16	4	2	2	8	7	15	22	17	36	19
	N. E.	7	7	18	15	7	10	6	2	3	9	4	18	18	16	32	40
	Calm.	2	5	2	3	6	4	2	2	1	0	0	3	8	1	10	11
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Indianapolis, Ind.	N.	6	5	9	4	5	3	11	8	4	11	10	4	22	25	15	18
	N. W.	16	23	9	16	15	32	22	19	10	4	7	13	73	21	52	40
	W.	13	12	13	13	9	10	4	4	6	9	6	9	18	21	34	35
	S. W.	10	13	14	11	6	11	10	9	20	17	13	9	30	50	32	31
	S.	27	9	10	17	4	11	5	15	7	17	11	17	31	35	53	40
	S. E.	3	5	6	14	14	6	3	10	11	8	16	5	19	35	13	34
	E.	2	7	2	5	7	7	8	5	4	2	8	3	20	14	12	14
	N. E.	3	4	6	6	12	6	18	5	3	11	16	8	29	30	15	24
	Calm.	13	12	15	7	12	7	9	18	25	14	6	22	34	45	47	34
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indianola, Tex.	N.	18	28	15	13	17	9	19	11	1	6	0	9	39	7	55	45
	N. W.	2	6	3	6	3	2	4	1	1	2	3	0	7	6	8	12
	W.	1	3	1	3	1	0	2	1	0	1	5	0	3	6	4	5
	S. W.	5	8	3	10	4	3	5	3	0	6	4	0	11	10	13	17
	S.	13	15	16	21	17	26	30	31	50	49	42	22	87	141	50	54
	S. E.	16	14	18	15	11	23	15	39	26	18	24	21	77	68	51	44
	E.	24	4	12	8	11	12	3	2	2	5	10	19	17	17	47	31
	N. E.	9	4	21	16	18	16	11	3	3	4	3	16	30	10	29	55
	Calm.	0	8	4	1	2	2	1	2	7	2	2	3	5	11	11	7
	Blank.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Jacksonville, Fla.	N.	16	12	23	18	12	6	4	6	1	2	10	5	16	13	33	53
	N. W.	20	18	14	16	7	12	10	7	2	4	0	3	29	6	41	37
	W.	6	7	7	4	4	10	8	9	3	1	5	6	27	9	19	15
	S. W.	4	22	11	9	3	20	16	16	19	10	10	6	52	39	32	23
	S.	4	6	5	12	14	9	19	8	18	19	8	3	36	45	32	31
	S. E.	4	4	9	6	7	14	18	10	17	9	3	10	42	29	18	22
	E.	6	2	0	3	9	2	4	10	8	16	16	19	16	40	27	12
	N. E.	32	14	18	21	22	13	8	23	11	18	30	31	44	59	77	61
	Calm.	1	5	6	4	6	7	3	4	11	14	11	7	14	36	13	16
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keokuk, Iowa	N.	1	12	4	6	15	21	15	10	10	8	14	6	46	32	9	23
	N. W.	20	27	20	14	15	13	13	8	5	2	2	11	34	9	58	49
	W.	11	12	18	13	8	10	8	5	11	11	3	5	23	25	28	39
	S. W.	14	13	11	13	9	11	9	12	15	15	12	13	32	42	40	33
	S.	16	7	12	15	10	7	6	20	17	16	6	22	33	39	45	37
	S. E.	9	6	9	8	10	9	6	11	11	8	17	14	26	36	29	27
	E.	4	14	8	6	7	14	13	11	9	8	17	6	38	34	24	21
	N. E.	3	5	6	8	7	5	15	9	3	17	12	5	29	32	13	21
	Calm.	15	4	5	10	3	3	5	7	9	8	10	8	15	27	27	18
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Key West, Fla.	N.	18	21	19	6	8	10	8	15	0	8	8	6	33	16	45	33
	N. W.	8	7	6	9	4	5	7	8	0	9	11	1	20	20	16	19
	W.	6	5	2	3	1	3	3	3	0	3	10	5	9	13	16	6
	S. W.	0	4	1	0	5	3	0	7	3	7	6	3	10	16	7	6
	S.	0	5	2	1	1	4	3	3	5	9	6	1	10	20	6	4
	S. E.	1	2	2	1	16	14	22	12	22	13	10	11	48	45	14	19
	E.	15	17	23	17	32	35	37	28	55	30	25	51	100	110	83	72
	N. E.	44	28	37	51	12	12	7	14	5	12	11	12	33	28	84	100
	Calm.	1	1	1	5	5	7	3	3	0	2	6	0	13	8	2	11
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knoxville, Tenn.	N.	13	11	12	11	14	25	11	18	8	12	15	6	54	35	30	37
	N. W.	5	4	12	10	5	6	9	7	1	5	2	8	22	8	17	27
	W.	14	23	7	6	6	13	8	8	11	11	1	3	29	23	40	19
	S. W.	20	21	17	18	19	21	16	20	22	21	20	9	57	63	50	54
	S.	9	5	13	13	12	8	14	9	12	6	4	7	31	23	21	38
	S. E.	5	1	3	3	0	2	2	5	4	5	4	3	9	13	9	6
	E.	4	5	7	10	18	4	8	16	11	15	10	13	18	36	22	22
	N. E.	14	13	13	18	5	12	17	15	14	8	21	22	44	43	49	49
	Calm.	9	7	9	4	0	2	5	5	7	10	16	19	12	33	35	18
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
La Crosse, Wis.	N.	14	21	20	13	17	8	12	18	4	10	19	8	38	33	43	50
	N. W.	14	13	18	14	12	27	19	8	7	13	4	14	54	24	41	44
	W.	8	5	9	3	7	17	9	6	7	5	3	5	32	15	18	19
	S. W.	12	11	7	12	12	7	10	8	17	17	9	5	25	43	28	31
	S.	20	17	22	25	18	18	11	33	35	31	25	40	62	91	77	65
	S. E.	10	14	9	9	4	4	8	5	6	8	14	3	17	28	27	23
	E.	0	1	1	4	2	3	3	4	3	2	5	2	10	10	3	7
	N. E.	2	8	7	12	10	7	12	11	9	3	6	3	30	18	13	29
	Calm.	13	0	0	1	2	2	6	0	2	4	8	10	8	14	23	3
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Lake City, Fla	N.	11	11	13	10	11	13	7	12	1	1	6	10	32	8	32	34
	N. W.	6	13	7	8	12	10	9	7	1	4	3	7	26	8	26	27
	W.	5	13	4	5	4	9	9	9	7	1	4	4	27	12	22	13
	S. W.	5	12	13	9	15	28	23	24	25	15	19	5	75	59	22	37
	S.	4	1	6	7	7	10	14	4	15	14	4	3	28	33	8	20
	S. E.	6	7	5	9	10	2	12	3	16	18	7	6	17	41	19	24
	E.	17	9	17	20	12	6	10	13	11	18	20	18	29	49	44	49
	N. E.	33	13	23	22	8	11	4	17	11	19	26	32	32	56	78	53
	Calm.	6	11	5	3	5	4	2	4	3	3	4	5	10	10	22	13
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leavenworth, Kans.	N.	16	28	23	20	19	25	27	18	6	13	17	9	70	36	53	62
	N. W.	15	12	11	13	14	3	8	6	11	1	6	9	17	18	36	38
	W.	3	2	0	2	3	0	2	1	1	0	2	1	3	3	6	5
	S. W.	3	9	7	4	3	6	5	3	13	6	4	2	14	23	14	14
	S.	32	21	22	37	23	11	12	34	31	43	22	25	57	96	78	82
	S. E.	12	2	11	3	4	22	8	9	12	9	15	13	39	36	27	18
	E.	1	2	2	2	4	7	5	4	2	5	8	7	16	15	10	8
	N. E.	4	8	2	8	10	15	13	8	3	5	4	1	36	12	13	20
	Calm.	6	6	15	4	4	4	10	10	11	11	15	23	24	37	35	23
	Blank.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Lexington, Ky	N.	16	4	2	6	1	15	10	11	6	10	6	3	36	22	23	9
	N. W.	6	8	1	16	15	14	16	18	7	10	5	11	48	22	25	32
	W.	10	21	21	8	11	19	8	10	17	9	5	7	37	31	38	40
	S. W.	18	17	18	13	8	6	9	14	19	16	14	18	29	49	53	39
	S.	22	13	25	32	15	16	11	17	17	16	11	17	44	44	52	72
	S. E.	10	7	8	5	7	5	4	9	4	5	17	18	18	26	35	20
	E.	7	6	3	4	10	12	11	8	7	6	11	5	31	24	18	17
	N. E.	3	12	14	7	14	5	20	5	12	17	22	10	30	51	25	35
	Calm.	1	2	1	2	3	1	1	1	1	4	2	1	3	7	4	6
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long Branch, N. J.*	N.	....	....	....	7	11	4	6	3	7	4	12	2	13	23	....	....
	N. W.	....	....	....	26	27	42	26	20	26	13	18	13	88	57	....	....
	W.	....	....	....	5	5	4	5	6	6	1	2	7	15	9	....	....
	S. W.	....	....	....	27	17	15	17	30	15	37	22	16	62	74	....	....
	S.	....	....	....	13	4	9	8	14	16	24	6	10	31	46	....	....
	S. E.	....	....	....	3	4	6	3	8	9	9	14	21	17	32	....	....
	E.	....	....	....	2	4	5	10	6	8	1	12	14	21	21	....	....
	N. E.	....	....	....	11	11	7	13	6	3	3	7	6	26	13	....	....
	Calm.	....	....	....	0	1	1	2	0	0	1	0	1	3	1	....	....
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
Louisville, Ky	N.	12	8	10	9	6	6	12	5	8	4	8	7	23	20	27	25
	N. W.	10	14	4	13	15	15	18	13	8	16	19	5	46	43	29	32
	W.	10	14	10	12	8	15	11	9	7	7	3	13	35	17	37	30
	S. W.	13	9	8	6	4	5	3	10	13	7	2	3	18	22	25	18
	S.	16	12	15	26	15	11	10	9	11	8	9	8	30	28	36	56
	S. E.	0	5	18	5	2	9	10	19	17	14	11	23	38	42	28	25
	E.	1	7	2	6	3	6	3	2	2	2	6	1	11	10	9	11
	N. E.	6	2	9	5	15	7	7	6	6	5	9	1	20	20	9	29
	Calm.	25	19	17	11	16	19	16	20	18	30	26	29	55	74	73	44
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lynchburg, Va	N.	3	3	1	2	4	6	4	8	6	5	8	3	18	19	9	7
	N. W.	14	16	11	14	12	19	9	16	11	1	3	5	44	15	35	37
	W.	8	11	19	7	7	16	4	7	12	8	6	8	27	26	27	33
	S. W.	4	16	13	11	13	2	17	16	13	15	14	5	35	42	25	37
	S.	10	6	8	11	10	13	8	9	16	27	6	8	30	49	24	29
	S. E.	9	1	0	3	1	4	4	5	4	15	7	5	13	26	15	4
	E.	2	3	1	2	6	7	10	11	14	8	13	12	28	35	17	9
	N. E.	3	7	9	10	16	6	22	12	8	6	23	12	40	37	22	35
	Calm.	40	27	31	33	15	20	12	9	6	8	13	32	41	27	99	79
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marquette, Mich	N.	10	8	3	4	7	10	16	10	4	6	9	3	36	19	21	14
	N. W.	20	31	28	31	23	33	21	30	15	14	13	14	84	42	65	82
	W.	18	18	22	17	10	8	10	4	5	12	7	14	22	24	50	49
	S. W.	10	11	10	5	6	13	8	12	7	18	5	17	33	30	38	21
	S.	10	6	7	16	12	4	8	6	4	9	15	17	18	28	33	35
	S. E.	10	6	11	6	8	3	7	10	13	11	9	11	20	33	27	25
	E.	6	1	1	2	4	2	8	7	9	9	8	6	17	26	13	7
	N. E.	3	2	2	4	5	5	2	5	6	3	10	2	12	19	7	11
	Calm.	6	7	9	8	9	15	10	9	27	11	17	6	34	55	19	26
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Observations began December 10, 1873.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Memphis, Tenn.	N.	16	6	1	3	1	5	2	2	1	4	0	4	9	5	26	5
	N. W.	18	19	25	22	20	20	22	21	11	16	13	16	63	40	53	67
	W.	6	6	0	0	0	0	4	3	1	5	1	0	7	7	12	0
	S. W.	15	20	13	15	15	8	18	27	26	25	24	9	53	75	44	43
	S.	10	13	7	4	0	8	1	4	8	7	5	1	13	20	24	11
	S. E.	4	9	19	26	13	21	16	13	15	9	8	11	50	32	24	58
	E.	9	3	1	3	3	1	3	0	0	0	0	1	4	0	13	7
	N. E.	8	13	22	18	31	28	24	11	20	13	12	7	63	45	28	71
	Calm.	7	1	5	2	1	2	0	12	8	14	30	41	14	52	49	8
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Milwaukee, Wis.	N.	4	9	3	5	2	2	6	3	0	3	4	2	11	7	15	10
	N. W.	15	27	30	35	26	39	17	9	11	7	4	16	65	22	58	91
	W.	23	14	7	6	10	9	5	2	17	13	3	7	16	33	44	23
	S. W.	17	15	32	27	18	18	15	24	11	23	13	31	57	47	63	77
	S.	5	2	4	5	2	0	2	7	8	3	0	3	9	11	10	11
	S. E.	9	8	8	7	11	11	17	15	22	20	23	20	43	65	37	26
	E.	10	0	1	1	6	6	1	10	5	4	5	2	17	14	12	8
	N. E.	4	7	5	7	7	8	27	22	16	18	40	9	57	74	20	19
	Calm.	6	8	3	0	2	0	0	1	0	2	1	0	1	3	14	5
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mobile, Ala.	N.	35	16	23	21	19	19	17	18	11	11	6	18	54	28	69	63
	N. W.	2	10	5	5	4	2	9	12	5	7	5	6	23	17	18	14
	W.	2	3	1	1	0	0	3	5	7	7	11	5	8	25	10	2
	S. W.	1	7	1	1	4	2	6	8	22	22	18	5	16	62	13	6
	S.	11	10	13	23	22	36	27	32	22	16	26	16	95	64	37	58
	S. E.	5	7	12	12	8	5	7	1	6	11	6	14	13	23	26	32
	E.	2	5	4	2	1	1	2	5	12	11	7	18	8	30	25	7
	N. E.	13	7	16	16	11	14	8	9	5	5	14	8	31	24	28	43
	Calm.	22	25	18	12	15	14	11	3	0	3	0	0	28	3	47	45
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Montgomery, Ala.	N.	5	3	8	7	26	8	5	13	4	6	10	6	26	20	11	41
	N. W.	19	13	16	21	12	22	15	14	6	7	12	11	51	25	40	49
	W.	8	17	6	6	3	5	11	8	16	10	5	2	24	31	26	15
	S. W.	0	4	4	8	2	7	10	11	8	6	8	2	28	22	5	14
	S.	7	7	7	6	8	14	19	8	10	11	8	1	41	29	15	21
	S. E.	4	25	12	25	15	12	10	10	11	13	16	6	32	40	34	52
	E.	10	17	15	7	3	6	9	11	18	21	14	34	26	53	54	25
	N. E.	6	4	10	4	3	5	3	4	12	2	5	9	12	19	17	17
	Calm.	22	20	15	9	11	14	8	14	5	17	15	18	36	37	58	35
	Blank.	12	0	0	0	1	0	0	0	0	0	0	1	0	0	13	1
Morgantown, W. Va.	N.	11	14	4	5	5	5	20	9	9	12	8	12	34	29	37	14
	N. W.	8	18	4	8	7	17	18	11	8	12	7	9	46	27	35	19
	W.	13	17	21	13	12	20	4	9	4	6	4	5	33	14	35	46
	S. W.	19	16	16	19	13	18	16	13	16	9	12	10	47	37	45	48
	S.	15	2	15	23	13	9	12	14	15	17	13	12	35	45	29	51
	S. E.	0	3	2	9	7	8	6	2	7	8	9	8	16	24	11	18
	E.	0	4	2	1	2	1	3	2	0	1	8	0	6	9	4	5
	N. E.	0	4	4	7	13	5	9	9	4	4	9	7	23	17	11	24
	Calm.	27	12	25	8	12	10	2	24	27	24	23	27	36	74	66	45
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mount Washington, N. H.	N.	3	3	1	0	0	7	14	8	8	11	18	26	29	37	32	3
	N. W.	32	63	72	52	40	57	43	56	50	37	46	33	156	133	128	173
	W.	16	6	7	14	12	12	10	10	15	15	6	4	32	36	26	33
	S. W.	21	5	3	21	13	9	5	6	7	16	4	6	20	27	32	37
	S.	4	0	3	0	2	2	4	6	1	10	4	4	12	15	8	5
	S. E.	9	9	3	3	3	1	3	2	1	0	1	13	6	2	31	9
	E.	2	4	0	0	0	0	7	1	0	1	6	1	8	7	7	0
	N. E.	6	0	1	1	1	0	2	2	6	2	5	0	4	13	6	3
	Calm.	0	0	3	2	2	5	2	2	2	1	3	3	9	6	3	7
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nashville, Tenn.	N.	6	1	2	9	6	14	13	6	2	4	5	5	33	11	12	17
	N. W.	12	13	6	13	15	14	15	8	8	5	9	7	37	22	32	34
	W.	9	15	7	7	6	7	4	12	12	4	7	1	23	23	25	20
	S. W.	4	6	3	1	2	4	6	1	14	12	6	0	11	32	10	6
	S.	13	9	16	21	11	10	9	10	5	6	2	3	29	13	25	48
	S. E.	4	1	5	6	6	9	9	4	7	7	7	6	22	21	11	17
	E.	6	3	1	1	7	8	2	4	8	6	12	10	14	26	19	9
	N. E.	4	3	2	5	9	3	6	6	2	8	4	3	15	14	10	16
	Calm.	35	39	51	30	22	24	26	42	32	41	41	55	92	114	129	103
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
New Haven, Conn...	N.	21	12	16	7	21	12	16	9	12	11	19	7	37	42	40	44
	N. W.	9	23	15	13	17	26	21	11	12	7	0	10	58	29	42	45
	W.	7	24	10	12	7	11	11	8	7	5	0	7	30	18	38	29
	S. W.	14	7	9	15	4	13	13	14	8	18	14	11	40	40	32	28
	S.	15	2	4	12	4	11	8	24	24	35	15	12	43	74	29	20
	S. E.	8	0	1	0	3	3	1	7	3	2	4	6	11	9	14	4
	E.	2	1	1	2	1	0	1	1	3	0	3	8	2	6	11	4
	N. E.	8	13	16	13	18	8	18	7	8	7	18	22	33	33	43	47
	Calm.	9	8	21	19	9	9	1	12	13	8	4	7	22	25	24	49
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New London, Conn..	N.	32	19	12	6	10	4	11	4	5	6	14	13	19	25	64	28
	N. W.	8	38	27	24	32	39	25	19	21	10	18	17	83	49	63	83
	W.	3	14	15	10	16	11	6	3	6	3	3	7	20	12	24	44
	S. W.	18	7	10	24	7	15	21	25	15	20	18	9	61	53	34	41
	S.	5	0	6	11	5	10	6	5	12	16	9	6	21	37	11	22
	S. E.	14	2	2	5	6	3	3	17	14	25	8	10	23	47	26	13
	E.	1	1	2	2	2	5	2	3	5	2	6	5	10	13	7	6
	N. E.	7	8	4	6	5	0	14	11	7	2	14	14	25	23	29	15
	Calm.	5	1	12	5	1	6	2	6	5	9	3	9	14	17	15	18
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Orleans, La	N.	15	3	15	8	10	6	9	4	3	4	2	12	19	9	30	33
	N. W.	20	23	9	12	12	5	9	14	8	12	13	6	28	33	49	33
	W.	3	10	4	3	2	2	5	5	23	19	13	6	12	55	19	9
	S. W.	3	7	5	10	8	15	7	10	16	10	13	5	32	39	15	23
	S.	5	6	8	16	8	17	15	10	5	2	7	3	42	14	14	32
	S. E.	16	17	16	18	19	21	18	30	14	20	18	12	69	52	45	53
	E.	17	12	19	9	9	8	7	6	9	15	11	27	21	35	56	37
	N. E.	10	10	14	15	15	12	13	9	5	10	8	18	34	23	38	44
	Calm.	4	2	3	2	1	7	7	5	7	1	8	1	19	16	7	6
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New York, N. Y	N.	10	2	5	7	15	5	7	19	0	6	7	4	12	13	16	27
	N. W.	19	29	24	14	27	26	21	15	21	13	19	14	66	53	62	65
	W.	12	31	15	18	10	24	11	16	12	6	6	9	50	24	52	43
	S. W.	14	8	14	16	7	14	16	12	12	16	20	11	46	48	33	37
	S.	13	3	5	18	2	7	6	15	12	22	6	11	25	40	27	25
	S. E.	11	1	1	2	3	6	5	6	14	20	9	7	26	43	19	6
	E.	5	3	3	4	6	4	7	9	7	3	4	18	17	14	26	13
	N. E.	6	9	20	9	12	7	17	1	10	5	19	12	33	34	27	41
	Calm.	3	4	6	5	2	0	0	0	2	2	3	4	1	7	11	13
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norfolk, Va.....	N.	16	11	11	9	16	12	14	12	7	6	6	9	38	19	36	36
	N. W.	12	11	10	13	12	11	4	7	6	0	10	3	32	16	26	35
	W.	2	7	4	4	1	9	6	3	7	1	4	6	18	12	15	9
	S. W.	8	18	21	15	10	12	15	15	30	38	16	3	42	84	29	46
	S.	20	13	7	28	15	9	9	12	13	11	6	13	30	30	46	50
	S. E.	13	7	8	4	2	12	8	15	10	15	13	18	35	38	38	14
	E.	7	7	5	2	5	8	12	13	9	8	7	11	33	24	25	12
	N. E.	9	11	17	15	20	16	16	14	8	8	30	15	46	46	35	52
	Calm.	6	5	10	3	3	4	6	2	0	6	1	12	12	7	23	16
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Omaha, Nebr.....	N.	9	8	8	16	14	27	23	18	9	13	16	20	68	38	37	38
	N. W.	32	29	22	19	14	14	5	7	16	1	3	9	26	20	60	55
	W.	9	7	8	8	2	3	4	4	5	0	1	2	11	6	18	18
	S. W.	9	4	5	3	6	5	8	4	7	27	7	0	17	41	22	14
	S.	20	20	22	25	16	7	12	25	35	27	19	25	44	81	65	63
	S. E.	9	8	4	8	5	11	8	13	9	8	15	11	32	32	28	17
	E.	2	2	3	0	7	5	6	5	3	4	2	1	16	9	5	10
	N. E.	3	1	4	3	4	6	9	4	1	5	0	3	19	15	7	11
	Calm.	10	11	17	11	16	15	15	13	5	8	21	10	43	34	31	44
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oswego, N. Y.....	N.	6	8	2	3	1	9	5	9	7	3	8	12	23	18	26	6
	N. W.	22	27	13	18	25	36	33	19	24	18	20	11	88	62	60	56
	W.	8	6	13	7	6	11	6	24	16	12	5	4	41	33	18	26
	S. W.	10	9	13	7	3	11	5	6	7	11	11	4	22	29	23	23
	S.	20	12	20	25	14	6	9	11	12	20	22	29	26	54	61	69
	S. E.	12	19	23	20	20	16	16	8	9	10	8	18	40	27	49	63
	E.	1	5	1	3	1	1	1	0	1	3	2	2	2	6	8	5
	N. E.	8	4	8	9	10	2	14	10	7	13	13	7	26	33	19	27
	Calm.	6	0	0	0	4	1	1	6	7	3	4	3	8	14	9	4
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Peck's Beach, N. Y.*	N.	....	....	....	5	19	6	9	4	10	2	7	6	19	19	....	....
	N. W.	....	....	....	11	13	25	14	18	8	4	7	5	57	19	....	....
	W.	....	....	....	20	13	12	8	17	16	5	3	11	37	24	....	....
	S. W.	....	....	....	12	2	12	11	16	16	20	16	9	39	61	....	....
	S.	....	....	....	26	16	15	7	10	14	27	8	6	32	49	....	....
	S. E.	....	....	....	6	3	11	7	12	5	10	8	17	30	23	....	....
	E.	....	....	....	5	7	6	14	12	15	8	23	31	32	46	....	....
	N. E.	....	....	....	8	10	4	20	4	5	6	17	4	28	28	....	....
	Calm.	....	....	....	0	1	2	0	0	1	2	4	1	2	7	....	....
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
Pembina, Dak.	N.	0	6	0	1	0	0	0	1	0	0	0	0	1	0	6	1
	N. W.	49	30	38	43	30	48	42	38	22	37	24	27	128	83	106	111
	W.	0	1	0	0	0	4	1	0	0	2	0	0	5	2	1	0
	S. W.	9	3	4	4	5	8	7	2	7	6	8	13	17	21	25	13
	S.	6	1	1	1	0	0	0	0	0	1	0	0	0	1	7	2
	S. E.	17	22	40	35	41	22	24	23	31	33	36	32	69	100	71	116
	E.	0	0	0	0	0	0	2	1	1	0	0	0	3	1	0	0
	N. E.	4	10	2	5	3	6	9	24	17	6	6	2	39	29	16	10
	Calm.	8	17	8	4	5	5	5	4	12	8	19	16	14	39	41	17
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philadelphia, Pa.	N.	20	7	11	5	13	12	11	10	11	14	17	10	33	42	37	29
	N. W.	11	32	22	23	20	26	14	10	11	4	7	8	50	22	51	65
	W.	11	16	12	11	9	12	7	24	15	12	7	9	43	34	36	32
	S. W.	20	10	19	23	7	21	17	17	16	25	12	8	55	53	38	49
	S.	10	2	2	6	5	5	3	13	11	21	7	7	21	39	19	13
	S. E.	4	2	1	1	1	1	4	1	6	3	5	6	6	14	12	3
	E.	7	5	9	13	13	7	18	11	9	6	14	22	36	29	34	35
	N. E.	9	14	14	9	15	9	15	7	8	5	15	7	31	28	30	38
	Calm.	1	2	3	2	1	0	1	0	3	3	9	13	1	15	16	6
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pike's Peak, Colo.†	N.	....	20	18	7	13	2	34	17	2	7	3	18	53	12	....	38
	N. W.	....	19	20	36	15	14	9	14	9	5	8	13	37	22	....	71
	W.	....	28	26	35	28	29	18	25	34	7	17	17	72	58	....	89
	S. W.	....	12	23	13	23	46	18	12	32	23	31	20	76	86	....	59
	S.	....	1	1	0	2	2	5	13	8	17	20	4	20	45	....	3
	S. E.	....	0	1	1	1	0	3	4	4	6	4	3	7	14	....	3
	E.	....	0	2	0	0	0	0	4	1	8	6	4	4	15	....	2
	N. E.	....	7	1	0	0	0	2	2	0	19	3	11	4	22	....	1
	Calm.	....	3	1	1	2	0	1	2	0	1	1	0	3	2	....	4
	Blank.	....	0	0	0	0	0	0	0	0	0	0	0	0	0	....	0
Pittsburgh, Pa.	N.	9	8	2	2	8	8	11	13	14	15	14	15	32	43	32	12
	N. W.	21	20	20	18	21	26	24	26	26	21	14	12	76	61	53	59
	W.	14	20	15	14	16	17	11	14	6	8	7	9	42	21	43	45
	S. W.	11	13	9	12	9	13	6	8	12	21	8	11	27	41	35	30
	S.	16	5	16	15	4	8	9	7	8	8	6	6	24	22	27	35
	S. E.	7	5	2	5	7	4	2	5	4	1	11	4	11	16	16	14
	E.	4	5	11	7	4	7	10	4	8	5	6	11	21	19	20	22
	N. E.	1	8	12	17	13	9	17	8	7	6	23	12	34	36	21	42
	Calm.	10	6	6	3	2	1	0	8	5	8	4	10	9	17	26	11
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Huron, Mich.‡	N.	....	....	....	....	....	....	....	....	....	....	16	7	....	....	....	....
	N. W.	....	....	....	....	....	....	....	....	....	....	6	9	....	....	....	....
	W.	....	....	....	....	....	....	....	....	....	....	0	9	....	....	....	....
	S. W.	....	....	....	....	....	....	....	....	....	....	9	10	....	....	....	....
	S.	....	....	....	....	....	....	....	....	....	....	5	31	....	....	....	....
	S. E.	....	....	....	....	....	....	....	....	....	....	12	9	....	....	....	....
	E.	....	....	....	....	....	....	....	....	....	....	6	2	....	....	....	....
	N. E.	....	....	....	....	....	....	....	....	....	....	27	6	....	....	....	....
	Calm.	....	....	....	....	....	....	....	....	....	....	12	7	....	....	....	....
	Blank.	....	....	....	....	....	....	....	....	....	....	0	0	....	....	....	....
Portland, Me.	N.	19	13	4	21	13	5	8	8	5	2	5	9	21	12	41	38
	N. W.	10	19	23	16	27	35	20	14	10	6	16	12	69	32	41	66
	W.	7	11	14	7	10	11	13	7	13	8	6	4	31	27	22	31
	S. W.	12	14	13	17	8	15	16	13	12	26	21	18	44	59	44	38
	S.	18	2	6	9	6	12	10	10	13	18	7	13	32	38	33	21
	S. E.	7	1	1	0	2	1	4	14	6	8	9	8	19	23	16	3
	E.	3	2	6	0	2	2	1	2	5	5	3	7	5	13	12	8
	N. E.	2	8	6	3	5	1	11	9	11	10	9	5	21	30	15	14
	Calm.	15	20	20	20	11	11	7	16	15	10	17	14	34	42	49	51
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0.	0	0	0	0

* Observations began December 10, 1873. † Observations began November 1, 1873.
‡ Observations began July 25, 1874.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Portland, Oreg	N.	1	3	5	3	4	11	9	14	15	38	15	11	34	68	15	12
	N. W.	30	16	21	7	8	12	14	15	23	28	17	20	41	68	66	36
	W.	12	10	0	0	3	6	2	6	3	2	4	0	14	9	22	3
	S. W.	2	1	4	6	6	8	12	4	7	3	8	4	24	18	7	16
	S.	1	4	15	53	37	30	25	21	19	6	14	17	76	39	22	105
	S. E.	15	18	11	5	8	5	5	3	0	1	3	3	13	4	36	24
	E.	7	9	25	4	6	9	2	4	1	0	0	3	15	1	19	35
	N. E.	3	5	3	0	2	1	0	2	0	0	2	2	3	2	10	5
	Calm.	22	24	9	15	10	11	21	24	22	15	30	30	56	67	76	34
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Punta Rassa, Fla.	N.	21	13	12	7	6	11	6	10	1	1	9	1	27	11	35	25
	N. W.	2	9	11	7	5	6	10	13	6	9	5	7	29	20	18	23
	W.	1	6	3	5	5	15	6	21	8	6	16	4	42	30	11	13
	S. W.	6	11	6	3	8	11	6	10	14	16	15	8	27	45	25	17
	S.	0	6	6	12	21	17	22	8	11	9	3	3	47	23	9	39
	S. E.	4	2	5	4	8	7	10	4	9	11	3	7	21	23	13	17
	E.	24	11	30	19	17	17	20	12	33	18	11	38	49	62	73	66
	N. E.	34	28	18	35	13	8	9	13	7	20	24	20	30	51	82	66
	Calm.	1	4	2	1	1	1	1	2	1	3	7	2	4	11	7	4
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rochester, N. Y.	N.	4	3	3	1	0	1	5	7	9	9	11	8	13	29	15	4
	N. W.	13	27	15	15	16	27	18	19	10	12	11	9	64	33	49	46
	W.	22	21	28	19	22	30	23	28	28	20	11	11	81	59	54	69
	S. W.	24	18	22	21	11	16	10	9	16	28	24	20	35	68	62	54
	S.	12	5	10	17	5	6	6	8	5	4	3	15	20	12	32	32
	S. E.	10	13	6	10	17	9	11	4	8	5	9	11	24	22	34	33
	E.	1	3	7	4	9	1	10	7	6	4	6	3	18	16	7	20
	N. E.	6	0	2	6	4	3	7	10	6	9	13	10	20	28	16	12
	Calm.	1	0	0	0	0	0	0	1	2	2	5	3	1	9	4	0
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salt Lake City, Utah.*	N.	....	....	....	....	....	....	9	13	7	5	5	7	....	17	....	....
	N. W.	....	....	....	....	....	....	16	11	18	23	8	26	....	49	....	....
	W.	....	....	....	....	....	....	1	6	1	1	0	1	....	2	....	....
	S. W.	....	....	....	....	....	....	3	7	2	4	7	0	....	13	....	....
	S.	....	....	....	....	....	....	16	16	12	9	10	5	....	31	....	....
	S. E.	....	....	....	....	....	....	10	12	17	11	17	10	....	45	....	....
	E.	....	....	....	....	....	....	10	3	7	7	11	3	....	25	....	....
	N. E.	....	....	....	....	....	....	15	19	22	14	14	16	....	50	....	....
	Calm.	....	....	....	....	....	....	10	6	4	19	21	22	....	44	....	....
	Blank.	....	....	....	....	....	....	0	0	0	0	0	0	....	0	....	....
San Diego, Cal.	N.	15	21	15	13	9	14	10	12	9	3	7	19	36	19	55	37
	N. W.	22	13	16	12	7	10	9	7	15	14	17	16	26	46	57	35
	W.	17	13	13	11	15	32	30	28	19	29	25	17	90	73	47	39
	S. W.	5	5	3	2	7	5	3	13	18	15	15	5	21	48	15	12
	S.	4	4	10	12	8	1	7	15	10	24	15	3	23	49	11	30
	S. E.	7	5	5	3	3	2	3	2	4	0	1	1	7	5	13	11
	E.	4	10	5	8	10	4	5	3	1	0	0	5	12	1	19	23
	N. E.	13	11	20	16	18	5	6	2	3	1	2	2	13	6	26	54
	Calm.	6	8	6	16	7	20	17	11	11	7	11	22	48	29	36	29
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandy Hook, N. J.†	N.	....	....	....	2	3	2	3	2	3	7	9	7	7	19	....	....
	N. W.	....	....	....	31	35	40	27	22	19	6	7	7	89	32	....	....
	W.	....	....	....	10	6	4	1	3	18	11	13	15	8	42	....	....
	S. W.	....	....	....	17	5	21	16	20	5	19	10	5	57	34	....	....
	S.	....	....	....	8	1	1	2	5	7	14	8	8	8	29	....	....
	S. E.	....	....	....	7	7	3	10	22	19	27	18	22	35	64	....	....
	E.	....	....	....	5	7	4	8	3	6	1	5	15	15	12	....	....
	N. E.	....	....	....	9	18	7	16	8	7	4	23	9	39	34	....	....
	Calm.	....	....	....	4	2	11	7	8	6	4	0	2	26	10	....	....
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
San Francisco, Cal.	N.	8	5	9	12	14	3	4	0	0	0	0	0	7	0	13	35
	N. W.	10	17	6	24	11	6	4	4	0	0	0	4	14	0	31	41
	W.	4	2	2	6	11	30	36	17	13	4	21	9	83	38	15	19
	S. W.	40	33	20	10	18	30	29	58	67	87	67	62	117	221	135	48
	S.	0	0	3	6	3	11	4	1	2	1	2	0	16	5	0	12
	S. E.	8	11	21	9	8	2	1	6	1	0	0	0	9	1	19	38
	E.	0	0	2	0	0	0	0	0	1	0	0	0	0	1	0	2
	N. E.	6	10	23	15	5	6	6	2	4	0	0	0	14	4	16	43
	Calm.	17	14	7	11	14	5	6	5	2	1	3	15	16	6	44	32
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Observations began March 15, 1874.

† Observations began December 10, 1873.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Santa Fé, N. M.	N.	11	18	32	24	13	16	9	6	7	15	17	4	31	39	33	69
	N. W.	9	9	10	16	14	5	13	10	7	3	10	4	28	20	22	40
	W.	4	4	10	4	1	7	7	8	7	2	4	9	22	13	17	15
	S. W.	13	12	6	12	16	20	9	14	16	8	16	11	43	40	36	34
	S.	12	5	6	5	8	8	8	12	8	13	6	8	28	27	25	19
	S. E.	10	4	12	8	11	11	11	14	20	19	14	12	36	53	26	31
	E.	14	17	8	8	12	10	19	19	11	19	12	25	48	42	56	28
	N. E.	5	7	3	8	3	7	5	3	6	7	7	12	15	20	24	14
	Calm.	15	14	6	8	6	9	9	7	8	7	7	5	25	22	34	20
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Savannah, Ga	N.	10	2	16	14	8	7	3	4	2	8	12	18	14	22	30	38
	N. W.	32	26	31	21	16	14	8	8	7	9	6	5	30	22	63	68
	W.	4	17	9	13	6	17	16	11	4	1	4	5	44	9	26	28
	S. W.	11	15	10	3	7	14	9	15	20	11	17	6	38	48	32	20
	S.	3	5	4	13	11	16	28	14	17	16	8	4	58	41	12	28
	S. E.	8	3	4	7	11	6	10	8	21	20	8	12	24	49	23	22
	E.	4	4	9	9	7	3	5	7	6	9	10	13	15	25	21	25
	N. E.	18	8	8	10	9	11	10	20	9	11	22	19	41	42	45	27
	Calm.	3	10	2	3	9	5	1	6	4	8	6	8	12	18	21	14
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shreveport, La.	N.	15	11	8	10	8	14	9	8	7	9	5	10	31	21	36	26
	N. W.	11	14	9	7	9	9	12	7	7	2	3	5	28	12	30	25
	W.	3	7	3	5	7	6	8	8	5	3	5	5	22	13	15	15
	S. W.	6	10	7	7	9	2	5	8	9	10	9	0	15	28	16	23
	S.	6	14	19	24	7	13	29	15	18	20	18	6	48	56	26	50
	S. E.	18	10	9	5	10	12	9	16	19	12	14	4	37	45	32	24
	E.	8	6	14	13	13	16	8	11	7	21	7	26	35	35	40	40
	N. E.	14	8	11	14	14	19	10	4	2	6	6	6	33	14	28	39
	Calm.	12	10	13	8	7	2	9	16	16	10	26	28	27	52	50	28
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Squan Beach, N. J. *	N.	....	....	....	6	6	3	1	1	2	3	12	7	5	17	....	....
	N. W.	....	....	....	14	29	30	22	6	18	11	13	4	58	42	....	....
	W.	....	....	....	21	9	8	6	7	7	6	7	9	21	20	....	....
	S. W.	....	....	....	10	5	15	8	25	15	17	5	7	48	37	....	....
	S.	....	....	....	16	5	5	8	5	6	33	14	7	17	53	....	....
	S. E.	....	....	....	5	5	14	5	24	19	14	2	24	43	35	....	....
	E.	....	....	....	3	4	2	7	3	7	3	7	12	12	17	....	....
	N. E.	....	....	....	13	16	11	21	16	12	4	26	19	48	42	....	....
	Calm.	....	....	....	5	5	5	12	7	4	2	7	4	24	13	....	....
	Blank.	....	....	....	0	0	0	0	0	0	0	0	0	0	0	....	....
Saint Louis Mo	N.	13	8	4	11	15	26	26	16	10	21	16	12	68	47	33	30
	N. W.	13	19	11	14	15	13	10	12	5	4	7	6	35	16	38	40
	W.	9	14	19	11	10	6	6	2	5	8	5	4	14	18	27	40
	S. W.	7	6	8	3	2	4	7	13	16	13	4	3	24	33	16	13
	S.	28	13	26	25	17	14	4	25	29	26	19	27	43	74	68	68
	S. E.	8	11	5	15	10	11	13	14	11	3	14	24	38	28	43	30
	E.	5	10	8	2	4	14	10	8	7	5	16	9	32	28	24	14
	N. E.	4	5	7	7	9	3	13	2	4	11	11	3	18	26	12	23
	Calm.	6	4	5	5	2	2	1	1	3	2	1	2	4	6	12	12
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saint Paul, Minn	N.	11	9	1	8	5	8	19	20	8	7	12	7	47	27	27	14
	N. W.	19	27	18	18	14	24	18	12	9	19	9	16	54	37	62	50
	W.	7	10	9	11	8	20	11	7	6	6	3	5	38	15	22	28
	S. W.	12	7	18	5	12	13	4	5	6	9	6	13	22	21	32	35
	S.	10	7	13	11	5	4	9	16	16	12	5	17	29	33	34	29
	S. E.	16	8	18	29	18	16	12	14	26	22	31	21	42	79	45	65
	E.	10	14	15	7	11	4	4	8	11	6	15	4	16	32	28	33
	N. E.	7	6	0	0	2	1	9	9	5	3	7	2	19	15	15	2
	Calm.	1	2	1	4	9	3	4	2	3	9	5	5	9	17	8	14
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saint Paul's Island, Alaska.	N.	16	22	13	10	5	15	18	18	7	....	....	....	51	....	....	28
	N. W.	25	17	10	5	6	7	11	11	10	....	....	....	29	....	....	21
	W.	16	7	12	10	16	15	0	6	20	....	....	....	21	....	....	38
	S. W.	4	6	18	10	12	11	5	9	14	....	....	....	25	....	....	40
	S.	6	7	23	21	22	12	3	6	21	....	....	....	21	....	....	66
	S. E.	3	11	8	7	10	9	22	8	7	....	....	....	39	....	....	25
	E.	15	14	4	20	8	16	18	16	4	....	....	....	50	....	....	32
	N. E.	6	5	2	9	5	7	13	19	5	....	....	....	39	....	....	16
	Calm.	2	1	3	1	0	1	0	0	2	....	....	....	1	....	....	4
	Blank.	0	0	0	0	0	0	0	0	0	....	....	....	0	....	....	0

* Observations began December 10, 1874.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Toledo, Ohio	N.	4	5	5	7	4	4	11	11	7	18	11	12	26	36	21	16
	N. W.	7	12	6	8	10	13	9	5	1	0	2	6	27	3	25	24
	W.	17	12	21	12	21	35	12	25	27	15	9	10	72	51	39	54
	S. W.	30	26	25	24	10	19	9	2	2	4	7	13	30	13	69	59
	S.	17	12	10	25	7	4	1	15	13	25	13	20	20	51	49	42
	S. E.	6	7	5	7	1	1	3	7	3	7	5	7	11	15	20	13
	E.	7	8	9	3	15	11	21	10	16	9	8	9	42	33	24	27
	N. E.	4	4	7	6	15	6	19	17	17	10	31	12	42	58	20	28
	Calm.	1	4	5	1	1	0	5	1	4	5	7	1	6	16	6	7
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tybee Island, Ga*	N.	....	....	....	....	....	....	....	....	....	1	9	....	....	....	....	....
	N. W.	....	....	....	....	....	....	....	....	....	3	2	....	....	....	....	....
	W.	....	....	....	....	....	....	....	....	....	6	11	....	....	....	....	....
	S. W.	....	....	....	....	....	....	....	....	....	6	7	....	....	....	....	....
	S.	....	....	....	....	....	....	....	....	....	28	14	....	....	....	....	....
	S. E.	....	....	....	....	....	....	....	....	....	17	6	....	....	....	....	....
	E.	....	....	....	....	....	....	....	....	....	16	23	....	....	....	....	....
	N. E.	....	....	....	....	....	....	....	....	....	14	21	....	....	....	....	....
	Calm.	....	....	....	....	....	....	....	....	....	2	0	....	....	....	....	....
	Blank.	....	....	....	....	....	....	....	....	....	0	0	....	....	....	....	....
Vicksburg, Miss	N.	25	8	12	18	16	15	9	7	6	6	4	12	31	16	45	46
	N. W.	9	15	3	6	9	5	11	13	8	9	17	12	29	34	36	18
	W.	1	4	4	1	6	3	5	10	1	2	1	0	18	4	5	11
	S. W.	3	10	14	5	6	7	10	8	14	13	18	6	25	45	19	25
	S.	7	8	14	16	14	15	18	17	12	16	19	1	50	37	16	44
	S. E.	14	18	15	9	7	12	14	16	20	7	13	6	42	40	38	31
	E.	6	5	8	12	10	15	8	9	7	12	4	18	32	23	29	30
	N. E.	10	2	13	21	8	15	8	3	3	12	7	12	26	22	24	42
	Calm.	18	20	10	5	8	6	7	10	19	16	20	23	23	55	61	23
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Virginia City, Mont.†	N.	....	0	2	0	2	1	1	4	6	0	....	....	6	....	....	4
	N. W.	....	2	1	5	1	4	5	11	16	6	....	....	20	....	....	7
	W.	....	15	2	16	14	7	10	7	10	11	....	....	24	....	....	32
	S. W.	....	17	6	31	12	18	8	13	15	14	....	....	39	....	....	49
	S.	....	3	1	6	1	7	14	8	6	12	....	....	29	....	....	8
	S. E.	....	2	13	7	14	11	11	13	7	11	....	....	35	....	....	34
	E.	....	19	23	1	1	4	4	10	3	5	....	....	18	....	....	25
	N. E.	....	1	1	2	3	8	12	3	1	5	....	....	23	....	....	6
	Calm.	....	31	44	25	36	33	25	24	26	29	....	....	82	....	....	105
	Blank.	....	0	0	0	0	0	0	0	0	0	....	....	0	....	....	0
Washington, D. C.	N.	8	6	9	7	10	6	8	7	7	12	12	11	21	31	25	26
	N. W.	2	18	22	22	24	35	25	21	17	9	16	14	81	42	53	68
	W.	7	19	17	10	4	8	3	3	6	5	4	10	14	15	36	31
	S. W.	11	2	7	8	7	6	13	15	10	9	9	4	34	28	17	22
	S.	25	16	17	29	15	14	8	25	26	46	13	19	47	85	60	61
	S. E.	5	0	2	4	1	4	6	5	6	4	7	7	15	17	12	7
	E.	3	2	2	0	2	4	6	6	6	2	7	7	16	15	12	4
	N. E.	2	15	12	10	12	8	20	7	10	4	20	13	35	34	30	34
	Calm.	11	12	5	3	9	8	1	4	2	2	5	5	13	9	28	17
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wilmington, N. C	N.	14	6	21	10	8	13	6	4	1	3	13	3	23	17	23	39
	N. W.	10	20	13	10	14	12	7	6	4	5	7	6	25	16	36	37
	W.	4	14	4	5	5	14	5	10	9	7	9	2	29	25	20	14
	S. W.	7	15	19	23	12	19	29	22	41	37	16	6	70	95	28	54
	S.	4	1	3	5	7	5	13	8	11	9	5	7	26	25	12	15
	S. E.	11	2	3	13	4	9	8	14	8	9	7	22	31	24	35	20
	E.	5	4	7	6	6	8	10	10	10	6	3	12	28	19	21	19
	N. E.	21	17	15	12	19	10	10	10	1	13	26	22	30	40	60	46
	Calm.	17	11	8	9	9	3	2	9	5	4	7	10	14	16	38	26
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wood's Hole, Mass	N.	10	9	13	7	13	1	6	2	8	3	14	9	9	23	28	38
	N. W.	10	44	31	28	34	44	25	9	16	8	10	13	78	34	67	93
	W.	7	13	5	6	6	4	6	6	7	1	2	2	16	10	22	17
	S. W.	19	9	12	21	4	24	18	38	31	56	23	14	80	110	42	37
	S.	7	0	4	11	5	6	6	7	5	14	10	11	19	29	18	20
	S. E.	14	8	8	10	5	11	5	12	7	5	4	15	28	16	37	23
	E.	8	1	6	0	7	1	10	4	6	0	6	9	15	12	18	13
	N. E.	13	5	8	9	9	2	11	8	3	3	13	12	21	19	30	26
	Calm.	5	1	6	1	1	0	3	7	7	3	11	5	10	21	11	8
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

* Observations began June 21, 1874.

† October incomplete.

Table showing how many times the wind was observed blowing, &c.—Continued.

Station.	Wind.	October, '73.	November.	December.	January, '74.	February.	March.	April.	May.	June.	July.	August.	September.	Spring.	Summer.	Autumn.	Winter.
Wytheville, Va.	N.	4	2	0	0	1	1	4	8	15	1	9	3	13	25	9	1
	N. W.	18	22	13	13	15	23	14	18	7	6	3	10	55	16	50	41
	W.	16	23	23	19	12	19	17	30	20	22	20	8	66	62	47	54
	S. W.	1	7	0	8	2	5	4	7	11	7	3	0	16	21	8	10
	S.	5	0	4	5	5	2	3	0	4	5	0	5	5	9	10	14
	S. E.	7	3	1	4	3	4	10	9	8	7	10	9	23	25	19	8
	E.	5	8	11	7	12	3	12	7	5	9	12	13	22	26	26	30
	N. E.	1	0	2	3	1	0	2	1	3	0	2	2	3	5	3	6
	Calm.	36	25	39	34	33	36	24	13	17	36	34	40	73	87	101	106
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yankton, Dak.	N.	7	4	3	5	7	7	8	8	2	5	6	2	23	13	13	15
	N. W.	29	37	41	26	24	28	17	13	15	10	10	20	58	35	86	91
	W.	16	5	9	9	4	8	6	7	7	4	1	2	21	12	23	22
	S. W.	10	9	18	14	7	9	9	10	9	22	5	11	28	36	30	39
	S.	9	2	1	9	5	4	6	20	15	7	6	11	30	28	22	15
	S. E.	8	8	8	10	15	17	13	8	23	16	27	16	38	66	32	33
	E.	2	1	1	7	10	5	7	9	8	9	15	7	21	32	10	18
	N. E.	9	18	4	4	5	13	18	16	10	16	17	9	47	43	36	13
	Calm.	3	6	8	9	7	2	6	2	1	4	6	12	10	11	21	24
	Blank.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PAPER 12.—FORM 2.

WAR DEPARTMENT, SIGNAL-SERVICE UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Telegraphic report of observations received at Washington, D. C., September 30, 1874, *at* 8 *a. m.*

NEW YORK AND SAVANNAH.

Savannah.	Cup.	Flesh.	Tragic.	Brash.	
Beech.	Race.	Earth.	Sky.	0	Gloat.
Jacksonville.	Cup.	Fling.	Traitor.	Blush.	
Buchu.	Race.	Earth.	Sky.	0	Glitter.
Lake.	Cup.	Flint.	Traffic.	Boyle.	
Aral.	Damage.	Earth.	Sky.	0	Glass.
Rassa.	Cup.	Floss.	Trend.	Body.	
Anna.	Deacon.	Hawk.	Sky.	0	Goff.
Charleston.	Cup.	Fleet.	Trailing.	Bride.	
Cherry.	Race.	Earth.	Fog.	0	Globe.
Augusta.	Cup.	Fling.	Town.	Brown.	
Aral.	Rage.	Earth.	Sky.	0	Glance.
Orleans.	Cup.	Foal.	Treble.	Blush.	
Eliza.	Damp.	Moon.	Smoke.	0	Gobble.
Indianola.	Cup.	Folks.	Treble.	Buchu.	
Amy.	Dance.	Pallas.	Aut-	0	Gobble.
Corsicana.	Cup.	Foist.	Traduce.	Brandish.	
Danube.	Damage.	Earth.	Sky.	0	Blank.
Galveston.	Cup.	Foist.	Treble.	Brandish.	
Aral.	Rank.	Neptune.	Sky.	0	Gobble.
Mobile.	Cup.	Foal.	Trade.	Box.	
Agnes.	Raid.	Earth.	Sky.	0	Gleam.
Montgomery.	Cup.	Flute.	Town.	Brad.	
Aral.	Raft.	Earth.	Sky.	0	Glance.
Wilmington.	Cup.	Flap.	Traffic.	Book.	
Aral.	Raid.	Earth.	Sky.	0	Gleam.
Norfolk.	Cup.	Filial.	Trade.	Brandish.	
Danube.	Rank.	Mars.	Sky.	0	Glass.
Washington.	Cup.	Fillet.	Trade.	Bowl.	
Huron.	Ranche.	Peach.	Smoke.	0	Gladly.
Knoxville.	Cup.	Fleet.	Total.	Bring.	
China.	Ranche.	Petrel.	Sky.	0	Give.

Lynchburg.	Cup.	Finger.	Traffic.	Botch.	
Danube.	Dale.	Earth.	Sky.	0	Gladden.
Baltimore.	Cup.	File.	Trade.	Box.	
Huron.	Rank.	Duck.	Sky.	0	Glance.
Philadelphia.	Cup.	Fight.	Trade.	Bloom.	
Baltic.	Flesh.	Calf.	Sky.	0	Blank.
May.	Cup.	Filch.	Tragic.	Boyle.	
Danube.	Rebate.	Earth.	Sky.	Aden.	Gloat.
York.	Cup.	Fiddle.	Town.	Brain.	
Danube.	Deceit.	Mars.	Smoke.	Abide.	Glance.
Albany.	Cup.	Ferrule.	Towel.	Bring.	
Caspian.	Rage.	Hidden.	Wales.	Aglow.	Glad.
Oswego.	Cup.	Few.	Towel.	Bread.	
Caspian.	Rattle.	Hidden.	Wales.	0	Glance.
Rochester.	Cup.	Fiddle.	Total.	Bread.	
Garden.	Decrease.	Hidden.	Three.	Abide.	Glad.
Buffalo.	Cup.	Fifth.	Torpid.	Book.	
Caspian.	Ready.	Hidden.	Wales.	Abbot.	Gird.
Erie.	Cup.	Filch.	Toulon.	Bow.	
Caspian.	Reach.	Hidden.	Nine.	Actor.	Gladden.
Cleveland.	Cup.	Finding.	Touch.	Brain.	
Caspian.	Rebuke.	Hidden.	Wales.	0	Glad.
Toledo.	Cup.	Flag.	Topaz.	Blush.	
Aral.	Rat.	Earth.	Sky.	0	Gensing.
Detroit.	Cup.	Fiscal.	Tone.	Brandish.	
Aral.	Rapping.	Earth.	Sky.	0	Gingham.
Haven.	Cup.	Flesh.	Topeka.	Boyle.	
Grace.	Rapid.	Hidden.	Bug.	0	Gird.
Huron.	Cup.	Finland.	Topaz.	Box.	
Baltic.	Decide.	Pear.	Sky.	0	Gensing.
Alpena.	Cup.	Fixing.	Token.	Bridal.	
Caspian.	Rank.	Hidden.	Wales.	Absent.	Gin.
Eastport.	Cup.	Feeble.	Tragic.	By.	
Grant.	Deem.	Hidden.	Clover.	Akin.	Gleam.
Portland.	Cup.	Fatling.	Tragic.	Build.	
Malta.	Data.	Hidden.	Fife.	Allude.	Gloat.
Burlington.	Cup.	Fern.	Tooth.	Buff.	
Java.	Ranche.	Hidden.	Six.	Astral.	Giving
London.	Cup.	Festive.	Trade.	Box.	
Danube.	Rations.	Petrel.	Sky.	Abide.	Glance.
Boston.	Cup.	Feline.	Traduce.	Box.	
Baltic.	Ready.	Earth.	England.	Absent.	Gloat.
Chicago.	Cup.	Fling.	Topaz.	Brash.	
Aral.	Rake.	Earth.	Smoke.	0	Gensing.
Milwaukee.	Cup.	Flue.	Tone.	Brief.	
Aral.	Ranche.	Earth.	Haze.	0	Gingham.
Escanaba.	Cup.	Flint.	Token.	Bridal.	
Caspian.	Daub.	Hidden.	Bug.	0	Gimp.
Breckenridge.	Cup.	Flurry.	Tinker.	Brute.	
Adam.	Raid.	Earth.	Sky.	0	Ghost.
Bismarck.	Cup.	Fiscal.	Tone.	Bluff.	
Mabel.	Damage.	Earth.	Haze.	0	Gingham.
Duluth.	Cup.	Flute.	Tonic.	Bluff.	
Beech.	Race.	Earth.	Sky.	0	Gingham.
Pembina.	Cup.	Flesh.	Toddy.	Breathe.	
Andrew.	Ranche.	Neptune.	Ant.	0	Giddy.
Francisco.	Cup.	Firewood.	Towel.	Brown.	
Italy.	Raid.	Hidden.	Bug.	0	Gladly.
Oregon.	Cup.	Flue.	Topaz.	Budge.	
Cedar.	Race.	Hidden.	Fog.	0	Gipsy.
Salt.	Cup.	Flinching.	Town.	Benzine.	
Beech.	Race.	Earth.	Sky.	0	Glass.
Cheyenne.	Cup.	Focus.	Toddy.	Better.	
Danube.	Ranche.	Earth.	Sky.	0	Gig.
Denver.	Cup.	Told.	Topaz.	Bengal.	
Cowper.	Daisy.	Earth.	Sky.	0	Gensing.
Pikes.	Cup.	Forest.	Tiger.	Beadle.	
Eliza.	Deaf.	Earth.	Sky.	0	General.
Santa.	Cup.	Flagrant.	Total.	Bat.	
Flora.	Damp.	Horse.	Haze.	0	Gird.

Saugeen.	Cup.	Finger.	Tone.	Brief.	
Anna.	Rapping.	Hidden.	Six.	Abyss.	Gensing.
Stanley.	Cup.	Finder.	Topaz.	Brief.	
Baltic.	Rapping.	Nickel.	Sky.	Abed.	Gingham.
Dover.	Cup.	Film.	Topeka.	Boyle.	
Baltic.	Rations.	Silver.	Sky.	0	
Toronto.	Cup.	Filbert.	Tonic.	Brad.	
Caspian.	Decide.	Grouse.	Yellow.	0	Gingham.
Kingston.	Cup.	Fiddle.	Topic.	Bird.	
Caspian.	Data.	Hidden.	Wales.	Adieu.	Give.
Ottawa.	Cup.	Fetid.	Tooth.	Bread.	
Garden.	Data.	Hidden.	Sky.	0	Giving.
Montreal.	Cup.	Fern.	Torpid.	Buff.	
Lomond.	Debar.	Hidden.	Six.	Amen.	Give.
Quebec.	Cup.	Fault.	Toulon.	By.	
Clara.	Dice.	Hidden.	Six.	Actor.	
Father.	Cup.	Feeble.	Topeka.	Brunt.	
Maud.	Rapid.	Hidden.	Haze.	Abase.	
Rosier.	Cup.	Few.	Touch.	By.	
Potomac.	Raft.	Hidden.	Fog.	Abyss.	Girl.
Chatham.	Cup.	Forum.	Trammel.	By.	
Maud.	Ralph.	Hidden.	Hub.	Affix.	Globe.
Sydney.	Cup.	Fig.	Trash.	Burst.	
Grant.	Deceit.	Hidden.	Hay.	Abed.	Gloat.
Halifax.	Cup.	Fete.	Traitor.	Brunt.	
Bacon.	Rapping.	Hidden.	Hay.	Approve.	Gloom.
Marquette.	Cup.	Flinching.	Tonic.	Brash.	
Caspian.	Rank.	Hidden.	France.	0	Gipsy.

WASHINGTON AND CINCINNATI.

Pittsburgh.	Cup.	Financial.	Total.	Brad.	
Anna.	Rauche.	Hidden.	Bug.	Abed.	Giving.
Cincinnati.	Cup.	Fledge.	Touch.	Bless.	
Agnes.	Ralph.	Earth.	Sky.	0	Giving.
Indianapolis.	Cup.	Fleet.	Torpid.	Brave.	
Beech.	Race.	Earth.	Smoke.	0	Gird.
Saint.	Cup.	Flown.	Towel.	Bow.	
Agnes.	Raft.	Earth.	Smoke.	0	Gladly.
Gibson.	Cup.	Floss.	Towel.	Breathe.	
Mabel.	Raft.	Earth.	Sky.	0	Gladden.
Cairo.	Cup.	Flinching.	Traduce.	Brew.	
Agnes.	Data.	Earth.	Sky.	0	Gloat.
Leavenworth.	Cup.	Flurry.	Toulon.	Bread.	
Beech.	Race.	Earth.	Sky.	0	Gladden.
Keokuk.	Cup.	Flown.	Toulon.	Brain.	
Beech.	Race.	Earth.	Sky.	0	Giving.
Shreveport.	Cup.	Flock.	Traffic.	Brew.	
Assist.	Damp.	Hidden.	Fog.	0	Gloat.
Vicksburg.	Cup.	Fold.	Traffic.	Brown.	
Beech.	Race.	Mars.	Smoke.	0	
Memphis.	Cup.	Flinching.	Tragic.	Brew.	
Aral.	Raid.	Earth.	Sky.	0	Gloom.
Nashville.	Cup.	Fleet.	Traduce.	Brew.	
Beech.	Race.	Earth.	Smoke.	0	Gladly.
Louisville.	Cup.	Fledge.	Town.	Bowl.	
Cherry.	Race.	Earth.	Fog.	0	Glass.
Platte.	Cup.	Finch.	Toulon.	Brain.	
Adam.	Raid.	Earth.	Sky.	0	Glad.
Omaha.	Cup.	Focus.	Topaz.	Brief.	
Beech.	Race.	Earth.	Smoke.	0	Gensing.
Davenport.	Cup.	Focal.	Tone.	Bride.	
Agnes.	Rapping.	Earth.	Smoke.	0	Gensing.
Paul.	Cup.	Flute.	Toga.	Buchu.	
Beech.	Race.	Earth.	Haze.	0	Giggle.
Yankton.	Cup.	Food.	Tithe.	Brim.	
Eliza.	Rack.	Earth.	Sky.	0	Giggle.
LaCrosse.	Cup.	Foist.	Tomb.	Bride.	
Dublin.	Daisy.	Hidden.	Fog.	0	Gin.

SIGNAL LINE.

Branch.	Cup.	Fiasco.	Traduce.	Brash.	Light.
China.	Rebut.	Earth.	Sky.	Abide.	SE. Gladly.
Hook.	Cup.	Fickle.	Trace.	Brain.	Heavy.
Huron.	Depth.	Earth.	Blue.	0	East. Gladly.
Squan.	Cup.	Fife.	Trace.	Bowl.	Heavy.
Danube.	Decide.	Earth.	Sky.	Abed.	S. E. Gladden.
Barnegat.	Cup.	Fidget.	Traduce.	Body.	Heavy.
Danube.	Reach.	Earth.	Haze.	Act.	East. Blank.
Atlantic.	Cup.	Figment.	Traduce.	Brash.	Heavy. Glass.
Huron.	Raven.	Petrel.	Sky.	0	East.
Peck's.	Cup.	Filed.	Traduce.	Brandish.	Heavy.
Huron.	Ready.	Lark.	Ant.	0	S. E. Glance.
Henry.	Cup.	Filial.	Trammel.	Book.	Light.
Danube.	Debate.	Earth.	Sky.	0	North. Glass.

PAPER 13.—FORM 2.

WAR DEPARTMENT, SIGNAL-SERVICE, UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Telegraphic report of observations received at Washington, D. C., on September 30, 1874, *at* 5 *p. m.*

NEW YORK AND SAVANNAH.

Savannah.	Gust.	Flail.	Trick.	Beat.	
China.	Dance.	Earth.	Sky.	0	
Lake.	Gust.	Flat.	Trim.	Belfast.	
Aral.	Damage.	Earth.	Sky.	0	
Jacksonville.	Gust.	Flat.	Trim.	Betel.	
China.	Damp.	Earth.	Sky.	0	
Rassa.	Gust.	Fleet.	Trick.	Bluff.	
Huron.	Data.	Magpie.	Haze.	0	
Charleston.	Gust.	Fixing.	Tribune.	Benzine.	
China.	Rally.	Earth.	Sky.	0	
Augusta.	Gust.	Flagrant.	Trifle.	Betel.	
China.	Rally.	Earth.	Sky.	0	
Montgomery.	Gust.	Flap.	Truant.	Beak.	
Danube.	Rank.	Earth.	Sky.	0	
Orleans.	Gust.	Flock.	Trim.	Belfast.	Rid.
Aral.	Dark.	Neptune.	Smoke.	0	Habit.
Mobile.	Gust.	Flesh.	Trifle.	Bless.	
Cowper.	Daub.	Earth.	Sky.	0	
Wilmington.	Gust.	Firewood.	Tribune.	Beard.	
Danube.	Rapping.	Earth.	Sky.	0	
Norfolk.	Gust.	Finder.	Treble.	Beat.	
Baltic.	Deceit.	Petrel.	Sky.	0	
Washington.	Gust.	Finely.	Traffic.	Bilge.	
Baltic.	Decrease.	Earth.	Turkey.	0	
Galveston.	Gust.	Flue.	Tribe.	Blithe.	
Grace.	Dan.	Solar.	Trunk.	0	
Indianola.	Gust.	Foal.	Trifle.	Bind.	
Flora.	Damp.	Calf.	Ant.	0	
Corsicana.	Gust.	Flue.	Trot.	Beast.	
Dickens.	Rally.	Earth.	Tick.	0	
Knoxville.	Gust.	Fixing.	Trepan.	Beauty.	
Aral.	Rattle.	Mica.	Sky.	0	
Lynchburg.	Gust.	Finger.	Transit.	Beale.	
Aral.	Deaf.	Earth.	Sky.	0	
Baltimore.	Gust.	Final.	Traduce.	Book.	
Java.	Deaf.	Comet.	Spain.	Abide.	
Philadelphia.	Gust.	File.	Trace.	Bloom.	
Caspian.	Decide.	Hidden.	Brown.	Abase.	
May.	Gust.	Filed.	Tragic.	Blight.	
Baltic.	Rebuke.	Quail.	Sky.	0	
York.	Gust.	Fifth.	Traduce.	Blot.	
Caspian.	Rank.	Wolf.	Sky.	0	
Eastport.	Gust.	Felix.	Trace.	Breathe.	
Italy.	Reach.	Wolf.	Sky.	Abed.	
Portland.	Gust.	Fenian.	Tragic.	Bilge.	
Huron.	Rattle.	Petrel.	Sky.	0	

Boston.	Gust.	Fetid.	Traitor.	Bloom.	
Caspian.	Rank.	Pigeon.	Yellow.	0	
Burlington.	Gust.	Feudal.	Torpid.	Brim.	
Java.	Rally.	Hidden.	Spain.	Acute.	
London.	Gust.	Fibs.	Tragic.	Bluff.	
Baltic.	Deadly.	Petrel.	Sky.	0	
Mount.	Gust.	Fertile.	Tiger.	By.	
Caspian.	Ductile.	Hidden.	Fog.	Admit.	
Albany.	Gust.	Feudal.	Total.	Bray.	
Como.	Deem.	Pigeon.	Yellow.	Affix.	
Oswego.	Gust.	Fight	Tooth.	Book.	
Java.	Rattle.	Hidden.	Spain.	Ache.	
Rochester.	Gust.	Filch.	Torpid.	Bloom.	
Caspian.	Debris.	Silver.	Sky.	Act.	
Buffalo.	Gust.	Final.	Topic.	Boyle.	
Caspian.	Rapping.	Hidden.	Wales.	Abide.	
Erie.	Gust.	Finely.	Touch.	Brad.	
Como.	Rebuke.	Earth.	Wales.	Abed.	
Cleveland.	Gust.	Finish.	Town.	Blithe.	
Caspian.	Rattle.	Silver.	Sky.	0	
Toledo.	Gust.	Fixing.	Trade.	Belfast.	
Agnes.	Rat.	Pear.	Sky.	0	
Detroit.	Gust.	Fishing.	Towel.	Bengal.	
Baltic.	Deal.	Plum.	Sky.	0	
Haven.	Gust.	Fledge.	Touch.	Bless.	
Aral.	Rapping.	Peach.	Sky.	0	
Huron.	Gust.	Fit.	Total.	Bison.	
Caspian.	Rattle.	Silver.	Sky.	0	
Alpena	Gust.	Fixing.	Topeka.	Body.	
Caspian.	Deceit.	Nickel.	Turkey.	0	
Milwaukee.	Gust.	Fleet.	Trade.	Bold.	
Adam.	Deacon.	Earth.	Sky.	0	
Breckenridge.	Gust.	Finger.	Trifle.	Beadle.	
Dickens.	Rat.	Petrel.	Sky.	0	
Bismarck.	Gust.	Fiddle.	Truth.	Bauble.	
China.	Rake.	Earth.	Haze.	0	
Garry.	Gust.	Final.	Trench.	Bluff.	
Caspian.	Damp.	Nickel.	Spain.	0	
Pembina.	Gust.	Figurehead.	Trip.	Botch.	
Andrew.	Ready.	Dish.	Sky.	0	
Duluth.	Gust.	Fixing.	Travel.	Beat.	
China.	Ranch.	Grouse.	Sky.	0	
Marquette.	Gust.	Fled.	Tooth.	Botch.	
Amy.	Data.	Mica.	Sky.	0	
Escanaba.	Gust.	Flap.	Total.	Blown.	
Agnes.	Deceit.	Earth.	Sky.	0	
Chicago.	Gust.	Fled.	Trade.	Bloom.	
Mabel.	Rake.	Earth.	Sky.	0	
Salt.	Gust.	Flesh.	Trip.	Baby.	
Aral.	Rapping.	Saturn.	Sky.	0	
Francisco.	Gust.	Fitful.	Traitor.	Brash.	
Geneva.	Ready.	Planet.	Sky.	0	
Diego.	Gust.	Fled.	Trench.	Bow.	
Geneva.	Deaf.	Pants.	Yellow.	0	
Diego.	Cup.	Flail.	Transit.	Brunt.	
Grant.	Raid.	Hidden.	Bug.	0	Glow.
Oregon.	Gust.	Flax.	Trench.	Bled.	
Agnes.	Raid.	Mars.	Sky.	0	
Cheyenne.	Gust.	Florid.	Triplet.	Balsam.	
Adam.	Raid.	Neptune.	Sky.	0	
Denver.	Gust.	Florid.	Trot.	Banish.	
Mary.	Damp.	Magpie.	Ant.	0	
Pikes.	Gust.	Forbid.	Tipton.	Beak.	
Amy.	Raft.	Earth.	Bug.	0	
Santa.	Gust.	Finland.	Trend.	Banish.	
Huron.	Rally.	Horse.	Haze.	0	
Saugeen.	Gust.	Finland.	Tonic.	Bowl.	
Anna.	Rapping.	Hidden.	Six.	Abbot.	
Stanley.	Gust.	Fishing.	Topaz.	Brief.	
Java.	Debate.	Hidden.	Spain.	Acid.	
Dover.	Gust.	Finish.	Torpid.	Bloom.	

Baltic.	Rations.	Silver.	Sky.	0	
Kingston.	Gust.	Figurehead.	Topaz.	Brake.	
Jordan.	Damp.	Hidden.	White.	Abide.	
Toronto.	Gust.	Find.	Topic.	Blithe.	
Caspian.	Debris.	Hidden.	Spain.	0	
Ottawa.	Gust.	France.	Topeka.	Bilge.	
Caspian.	Deaf.	Hidden.	Spain.	0	
Montreal.	Gust.	Fetid.	Tonic.	Brunt.	
Java.	Debris.	Hidden.	Red.	Afraid.	
Quebec.	Gust.	Fay.	Topic.	Bray.	
Milan.	Devote.	Hidden.	Horn.	Allude.	
Father.	Gust.	Fashion.	Total.	Buff.	
Jordan.	Dance.	Calf.	Haze.	Adult.	
Chatham.	Gust.	Feast.	Trailing.	Build.	
Grant.	Death.	Hidden.	Clover.	Abbot.	
Sydney.	Gust.	Fear.	Trash.	Build.	
Grant.	Deaf.	Hidden.	Hay.	Ache.	
Halifax.	Gust.	Festa.	Traduce.	Bride.	
Italy.	Rapping.	Hidden.	Horn.	Abase.	

WASHINGTON AND CINCINNATI.

Pittsburgh.	Gust.	Firewood.	Touch.	Bluff.	River.
Caspian.	Deceit.	Hidden.	Wales.	Adult.	Helm.
Cincinnati.	Gust.	Flax.	Trammel.	Beat.	River.
Agnes.	Deaf.	Earth.	Sky.	0	Legend.
Indianapolis.	Gust.	Flat.	Transit.	Beaver.	
Aral.	Deaf.	Earth.	Sky.	0	
Saint.	Gust.	Floss.	Tremor.	Bask.	Wander.
Agnes.	Rake.	Earth.	Sky.	0	Landing.
Keokuk.	Gust.	Flinching.	Treble.	Beast.	River.
Aral.	Damage.	Earth.	Haze.	0	Liberal.
Gibson.	Gust.	Flat.	True.	Boy.	
Danube.	Dance.	Earth.	Sky.	0	
Leavenworth.	Gust.	Fleet.	Tribe.	Beadle.	River.
Adam.	Dale.	Earth.	Sky.	0	Lager.
Dodge.	Gust.	Financial.	Trust.	Bathe.	
China.	Ranche.	Earth.	Sky.	0	
Dodge.	Nude.	Fillet.	Traitor.	Both.	
China.	Rack.	Earth.	Sky.	0	
Dodge.	Cup.	Find.	Town.	Brake.	
Cowper.	Rack.	Earth.	Sky.	0	Gladden.
Cairo.	Gust.	Flock.	Trial.	Baste.	River.
Aral.	Damp.	Earth.	Sky.	0	Hanger.
Shreveport.	Gust.	Flap.	True.	Bauble.	River.
Danube.	Ranche.	Earth.	Sky.	0	Huge.
Vicksburg.	Gust.	Flown.	Trophy.	Bench.	River.
China.	Ralph.	Mars.	Sky.	0	Honest.
Memphis.	Gust.	Flint.	Tribune.	Bind.	River.
Aral.	Ranche.	Neptune.	Sky.	0	Hoist.
Nashville.	Gust.	Fledge.	Trepid.	Bay.	Oath.
Agnes.	Dan.	Earth.	Sky.	0	Hold.
Louisville.	Gust.	Flap.	Tremor.	Beadle.	River.
Danube.	Death.	Earth.	Sky.	0	Hebe.
Dubuque.	Gust.	Fleet.	Tray.	Bay.	River.
Aral.	Rally.	Earth.	Sky.	0	Hoff.
Davenport.	Gust.	Flock.	Tray.	Beale.	River.
Aral.	Ranche.	Earth.	Sky.	0	Hiding.
Omaha.	Gust.	Flap.	Trench.	Benzine.	River.
Cowper.	Ranche.	Earth.	Sky.	0	Legend.
Platte.	Gust.	Feudal.	Trophy.	Balm.	
Adam.	Rank.	Earth.	Sky.	0	
La Crosse.	Gust.	Fledge.	Trash.	Baste.	River.
Baltic.	Raft.	Mars.	Haze.	0	Horn.
Paul.	Gust.	Flag.	Tray.	Belt.	River.
Cowper.	Ralph.	Earth.	Haze.	0	Hoard.
Yankton.	Gust.	Fishing.	Trip.	Beak.	Wafer.
Cowper.	Rattle.	Earth.	Sky.	0	Labor.

SIGNAL LINE.

Branch.	Gust.	Fidus.	Traduce.	Boyle.	Light.
Caspian.	Defeat.	Hidden.	White.	0	S. E.

Hook.	Gust.	Findings.	Traduce.	Book.	Short.
Jordan.	Dexter.	Hidden.	White.	Abbot.	N. E.
Squan.	Gust.	Fig.	Town.	Bowl.	Light.
Jordan.	Data.	Pigeon.	Sky.	0	S. E.
Barnegat.	Gust.	Fielding.	Traduce.	Bloom.	Heavy.
Italy.	Rations.	Wolf.	Sky.	0	East.
Pecks.	Gust.	File.	Traduce.	Box.	Heavy.
Jordan.	Debris.	Lily.	Wasp.	0	S. E.
Atlantic.	Gust.	Filch.	Traffic.	Bloom.	Heavy.
Jordan.	Rapping.	Quail.	Sky.	0	East.

PAPER 14.—FORM 2.

WAR DEPARTMENT, SIGNAL-SERVICE UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Telegraphic report of observations received at Washington, D. C., September 30, 1874, at 12 midnight.

NEW YORK AND SAVANNAH.

Savannah.	Nut.	Fledge.	Tray.	Book.
China.	Damp.	Earth.	Sky.	0
Rassa.	Nut.	Florid.	Trial.	Bowl.
Baltic.	Dance.	Solar.	Sky.	0
Lake.	Nut.	Fling.	Traitor.	Bride.
China.	Rack.	Earth.	Sky.	0
Jacksonville.	Nut.	Flinching.	Travel.	Brain.
China.	Raid.	Earth.	Sky.	0
Charleston.	Nut.	Flax.	Tremor.	Bread.
China.	Damp.	Earth.	Sky.	0
Augusta.	Nut.	Flat.	Transit.	Bride.
Beech.	Race.	Earth.	Sky.	0
Montgomery.	Nut.	Fleet.	Trench.	Brandish.
Beech.	Race.	Earth.	Sky.	0
Orleans.	Nut.	Floss.	Trepan.	Bow.
China.	Raft.	Earth.	Smoke.	0
Corsicana.	Nut.	Flue.	Trepid.	Blew.
Cowper.	Raid.	Earth.	Sky.	0
Indianola.	Nut.	Focal.	Trepid.	Brace.
Cherry.	Race.	Earth.	Bee.	0
Galveston.	Nut.	Flue.	Trepid.	Bow.
Ida.	Damage.	Earth.	Bug.	0
Mobile.	Nut.	Flint.	Treble.	Boyle.
China.	Raid.	Earth.	Sky.	0
Wilmington.	Nut.	Flagon.	Travel.	Book.
Geneva.	Raid.	Mica.	Sky.	0
Norfolk.	Nut.	Flail.	Traffic.	Bilge.
Amy.	Rapping.	Petrel.	Sky.	0
Washington.	Nut.	Fixing.	Touch.	Bow.
Danube.	Ranche.	Earth.	Sky.	0
Knoxville.	Nut.	Flesh.	Toulon.	Bring.
Beech.	Race.	Earth.	Sky.	0
Lynchburg.	Nut.	Flat.	Towel.	Blush.
Aral.	Dale.	Earth.	Sky.	0
Baltimore.	Nut.	Fishing.	Towel.	Bowl.
Jordan.	Data.	Hidden.	France.	0
Philadelphia.	Nut.	Finny.	Touch.	Bless.
Caspian.	Decrease.	Platina.	Bug.	0
May.	Nut.	Finland.	Town.	Body.
Caspian.	Ready.	Hidden.	France.	0
York.	Nut.	Final.	Total.	Bold.
Italy.	Data.	Hidden.	Trumpet.	0
Eastport.	Nut.	Fever.	Total.	Brad.
Danube.	Deacon.	Earth.	Sky.	0
Portland.	Nut.	Fever.	Torpid.	Brace.
Huron.	Dance.	Grouse.	Sky.	0
Burlington.	Nut.	Fidget.	Topeka.	Brace.
Jordan.	Rally.	Hidden.	France.	Adieu.
London.	Nut.	Fight.	Toulon.	Blush.
Baltic.	Ranche.	Pigeon.	Sky.	0

Boston.	Nut.	Folding.	Touch.	Brad.
Caspian.	Ranche.	Silver.	Sky.	0
Albany.	Nut.	Fig.	Tonic.	Brief.
Caspian.	Rebuke.	Hidden.	White.	0
Oswego.	Nut.	Final.	Topic.	Book.
Baltic.	Rattle.	Earth.	Wales.	0
Rochester.	Nut.	Finder.	Topaz.	Blush.
Caspian.	Range.	Hidden.	France.	Abase.
Buffalo.	Nut.	Firkin.	Tonic.	Bowl.
Jordan.	Rattle.	Hidden.	France.	Abed.
Erie.	Nut.	Fitful.	Troth.	Book.
Java.	Deceit.	Hidden.	Spain.	Blank.
Toledo.	Nut.	Flax.	Total.	Blown.
Jordan.	Dale.	Iron.	Sky.	0
Cleveland.	Nut.	Firewood.	Towel.	Blight.
Jordan.	Deaf.	Silver.	Sky.	0
Detroit.	Nut.	Flake.	Topic.	Body.
Baltic.	Raid.	Plum.	Sky.	0
Chicago.	Nut.	Flat.	Touch.	Brad.
Cowper.	Rally.	Earth.	Sky.	0
Milwaukee.	Nut.	Fledge.	Torpid.	Brave.
China.	Damp.	Earth.	Sky.	0
Escanaba.	Nut.	Flagrant.	Toil.	Bridal.
Adam.	Daisy.	Cobalt.	Sky.	0
Marquette.	Nut.	Fitful.	Told.	Bride.
Dickens.	Damp.	Pigeon.	Sky.	0
Garry.	Nut.	Firkin.	Topic.	Brute.
Aral.	Rank.	Earth.	Sky.	0
Pembina.	Nut.	Finny.	Touch.	Brad.
Baltic.	Rattle.	Neptune.	One.	0
Breckenridge.	Nut.	Firewood.	Toulon.	Bread.
Huron.	Rage.	Pigeon.	Sky.	0
Duluth.	Nut.	Final.	Trade.	Betel.
Geneva.	Ranche.	Dog.	Bee.	0
Saugeen.	Nut.	Firkin.	Topic.	Brim.
Chloe.	Rank.	Hidden.	Six.	Abase.
Stanley.	Nut.	Flail.	Tonic.	Buff.
Java.	Raid.	Hidden.	Spain.	Abbot.
Dover.	Nut.	Flail.	Tomb.	Brandish.
Danube.	Ralph.	Earth.	Sky.	0
Toronto.	Nut.	Fiscal.	Told.	Brave.
Danube.	Rage.	Earth.	Sky.	0
Kingston.	Nut.	Financial.	Toil.	Boyle.
Mohawk.	Raid.	Grouse.	Sky.	0
Ottawa.	Nut.	Fight.	Topeka.	Box.
Como.	Deadly.	Gold.	Sky.	0
Montreal.	Nut.	Fickle.	Tonic.	Bring.
Jordan.	Debate.	Hidden.	Haze.	Abase.
Quebec.	Nut.	Fence.	Toil.	Bridal.
Italy.	Defy.	Hidden.	Horn.	Abase.
Father.	Nut.	Federal.	Tone.	Brunt.
Italy.	Debris.	Weasel.	Haze.	Abase.
Chatham.	Nut.	Fellow.	Town.	Brave.
Dickens.	Debar.	Shoe.	Barley.	0
Halifax.	Nut.	Fidget.	Trace.	Brim.
Japan.	Rank.	Earth.	Sky.	0
Haven.	Nut.	Fled.	Told.	Brandish.
Agnes.	Rally.	Earth.	Sky.	
Huron.	Nut.	Flail.	Tonic.	Bowl.
Danube.	Ralph.	Saturn.	Sky.	
Alpena.	Nut.	Flag.	Toddy.	Brew.
Danube.	Rally.	Earth.	Blue.	0
Francisco.	Nut.	Flagrant.	Trace.	Buff.
Italy.	Rapping.	Hidden.	Bug.	
Diego.	Nut.	Flinching.	Transit.	Bray.
Jordan.	Raid.	Hidden.	Bug.	0
Oregon.	Nut.	Flail.	Tragic.	Bridal.
Cherry.	Race.	Ursa.	Haze.	0
Salt.	Nut.	Flax.	Trammel,	Bathe.

Eliza.	Rack.	Earth.	Sky.	0
Denver.	Nut.	Flown.	Tragic.	Beat.
Cowper.	Dance.	Petrel.	Sky.	0
Pike's.	Nut.	Forbid.	Tindall.	Brown.
Agnes.	Rally.	Earth.	Sky.	0
Santa.	Nut.	Fitful.	Towel.	Beaver.
Mabel.	Raid.	Earth.	Sky.	0
Cheyenne.	Nut.	Flue.	Trace.	Balsam.
Danube.	Raid.	Earth.	Sky.	0

WASHINGTON AND CINCINNATI.

Pittsburgh.	Nut.	Flagrant.	Total.	Book.
Caspian.	Rank.	Hidden.	Bug.	0
Cincinnati.	Nut.	Flock.	Town.	Bilge.
Eliza.	Data.	Earth.	Sky.	0
Indianapolis.	Nut.	Flesh.	Touch.	Brain.
Beech.	Race.	Earth.	Sky.	0
Saint.	Nut.	Florid.	Traitor.	Both.
Agnes.	Daisy.	Earth.	Sky.	0
Keokuk.	Nut.	Fled.	Trade.	Brew.
Beech.	Race.	Earth.	Sky.	0
Leavenworth.	Nut.	Flax.	Traduce.	Brash.
Beech.	Race.	Earth.	Sky.	0
Cairo.	Nut.	Flown.	Tragic.	Bridal.
Beech.	Race.	Earth.	Sky.	0
Vicksburg.	Nut.	Flurry.	Trend.	Brandish.
Beech.	Race.	Earth.	Sky.	0
Shreveport.	Nut.	Flat.	Tray.	Brief.
Beech.	Race.	Earth.	Sky.	0
Memphis.	Nut.	Floss.	Trammel.	Bray.
Beech.	Race.	Earth.	Sky.	0
Nashville.	Nut.	Florid.	Trade.	Brash.
Beech.	Race.	Earth.	Fog.	0
Louisville.	Nut.	Fling.	Trace.	Bold.
Beech.	Race.	Earth.	Sky.	0
Platte.	Nut.	Fibs.	Trammel.	Bevy.
Adam.	Rat.	Earth.	Sky.	0
Omaha.	Nut.	Flag.	Trailing.	Both.
Cowper.	Rally.	Earth.	Sky.	0
Davenport.	Nut.	Flesh.	Towel.	Bread.
Beech.	Race.	Earth.	Sky.	0
La Crosse.	Nut.	Flap.	Touch.	Bread.
Cowper.	Ranche.	Earth.	Sky.	0
Sully.	Nut.	Film.	Trench.	Bail.
Aral.	Rattle.	Earth.	Sky.	0
Yankton.	Nut.	Finny.	Tray.	Blame.
China.	Ranche.	Earth.	Sky.	0
Paul.	Nut.	Finger.	Town.	Bowl.
Dickens.	Raid.	Globe.	Haze.	0
Gibson.	Nut.	Fledge.	Traitor.	Brace.
Adam.	Rage.	Earth.	Sky.	0

SIGNAL LINE.

Branch.	Nut.	Filed.	Total.	Bread.	Light.
Caspian.	Decide.	Hidden.	White.	0	S. E.
Hook.	Nut.	Film.	Toulon.	Blown.	Short.
Caspian.	Depth.	Hidden.	Wales.	0	N. E.
Squan.	Nut.	Finch.	Tooth.	Botch.	Light.
Jordan.	Ranche.	Quail.	Sky.	0	S. E.
Barnegat.	Nut.	Filial.	Tooth.	Brave.	Heavy.
Italy.	Ready.	Hidden.	France.	0	E.
Peck's.	Nut.	Firewood.	Tooth.	Buff.	Light.
Jordan.	Rapping.	Jupiter.	Ant.	0	S. E.
Atlantic.	Nut.	Finger.	Total.	Book.	Short.
Jordan.	Rapping.	Quail.	Sky.	0	East.

PAPER 15.—(Form 3 A.)

DAILY BULLETIN.

WAR DEPARTMENT, SIGNAL-SERVICE UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

Meteorological record, Washington, September 30, 1874—7.35 a. m.

Observations taken at the same moment of time at all stations.

Place of observation.	Height of barometer.	Change in last eight hours.	Thermometer.	Change in last twenty-four hours.	Relative humidity, per cent.	WIND. Direction.	WIND. Velocity, miles per hour.	WIND. Pressure, pounds per square foot.	WIND. Force reduced to Beaufort scale.	CLOUDS. Amount of upper clouds.	CLOUDS. Upper clouds moving from the—	CLOUDS. Amount of lower clouds.	Rain-fall in last eight hours.	Change in river for last twenty-four hours + or −	State of weather.
Albany, N. Y	29.39	.00	54	− 5	86	N. W.	3	.04	Gentle	.....	.....	4 S.	.35	.....	Cloudy.
Alpena, Mich	29.91	+.08	41	− 5	82	N. W.	10	.50	Fresh	.....	.....	4 S.	.06	.....	Cloudy.
Augusta, Ga	30.04	+.09	55	− 5	87	N. W.	3	.04	Gentle	0	0	0	0	.....	Clear.
Baltimore, Md	29.70	+.09	57	− 4	69	W.	10	.50	Fresh	2 C.	W.	0	0	.....	Fair.
Bismarck, Dak	29.87	−.03	44	+ 4	60	E.	3	.04	Gentle	0	0	Haze.	0	.....	Clear.
Boston, Mass	29.27	−.01	58	− 3	69	N. W.	20	2.00	Brisk	0	0	2 S.	.06	.....	Fair.
Breckenridge, Minn	30.12	+.01	31	− 4	89	S. E.	4	.08	Gentle	0	0	0	0	.....	Clear.
Buffalo, N. Y	29.63	−.01	49	− 6	64	N. W.	20	2.00	Brisk	.....	.....	4 S.	.02	.....	Cloudy.
Burlington, Vt	29.37	−.15	50	−11	93	N. W.	8	.32	Fresh	.....	.....	4 N.	1.19	.....	Light rain.
Cairo, Ill	30.03	+.05	58	+ 5	81	N.	8	.32	Fresh	0	0	0	0	.....	Clear.
Cape Rosier,	29.51	−.14	52	.....	100	W.	2	.02	Light	.....	.....	Fog.	.07	.....	Heavy rain.
Cape May, N. J	29.69	+.13	60	− 9	70	W.	21	2.20	Brisk	0	0	0	.15	.....	Clear.
Charleston, S. C	30.01	+.07	61	+ 1	83	0	0	0	Calm	0	0	Fog.	0	.....	Fair.
Chatham,	29.40	−.25	63	− 2	100	E.	7	.24	Fresh	.....	.....	4 S.	.25	.....	Cloudy.
Cheyenne, Wyo	30.16	.00	38	− 5	45	W.	8	.32	Fresh	0	0	0	0	.....	Clear.
Chicago, Ill	30.04	+.12	46	− 6	76	N. W.	5	.12	Gentle	0	0	Smoke.	0	.....	Clear.
Cincinnati, Ohio	30.00	+.09	52	0	53	N.	7	.24	Fresh	0	0	0	0	.....	Clear.
Cleveland, Ohio	29.60	−.13	52	− 7	73	N. W.	24	2.88	Brisk	.....	.....	4 S.	0	.....	Cloudy.
Corsicana, Tex	30.17	+.05	58	+ 4	75	W.	3	.04	Gentle	0	0	0	0	.....	Clear.
Davenport, Iowa	30.15	+.11	44	− 9	82	N.	12	.72	Fresh	0	0	Smoke.	0	.....	Clear.
Denver, Colo	30.18	+.02	46	− 1	43	S.	1	.01	Light	0	0	0	0	.....	Clear.
Detroit, Mich	29.87	+.07	44	− 3	75	N. W.	12	.72	Fresh	0	0	0	0	.....	Clear.
Duluth, Minn	30.13	+.06	45	+ 1	60	0	0	0	Calm	0	0	0	0	.....	Clear.
Eastport, Me	29.24	−.33	60	+ 2	100	S.	22	2.42	Brisk	.....	.....	4 S.	.40	.....	Cloudy.

Erie, Pa	29.69	+.01	53	−7	67	N. W.	18	1.62	Brisk			4 S.	.12		Cloudy.
Escanaba, Mich	30.05	+.07	41	−6	82	N. W.	9	.40	Fresh			4 S.	0		Cloudy.
Father Point, Can	29.24	−.34	47	+1	88	E.	11	.60	Fresh			Hazy.	0		Cloudy.
Fort Gibson, C. N	30.08	+.06	54	+4	80	E.	2	.02	Light	0	0	0	0		Clear.
Grand Haven, Mich	30.02	+.10	47	−3	70	N. E.	11	.60	Fresh			4 S.	0		Cloudy.
Galveston, Tex	30.17	+.05	69	+2	75	N. W.	10	.50	Fresh	1 Ci.	0	0	0		Fair.
Halifax, Nova Scotia	29.47	−.24	62		88	S. E.	12	.72	Fresh			4 N.	.92		Cloudy.
Havana, Cuba															
Indianapolis, Ind	*30.01*	+.09	49	−2	77	0	0	0	Calm	0	0	Smoke.	0		Clear.
Indianola, Tex	30.19	+.04	69	+2	90	N.	6	.18	Fresh	2 Ci.	0	1 S.	0		Fair.
Jacksonville, Fla	30.04	+.06	62	+1	61	0	0	0	Calm	0	0	0	0		Clear.
Keokuk, Iowa	30.09	+.12	53	−5	73	0	0	0	Calm	0	0	0	0		Clear.
Ottawa,	29.48	−.17	50	−5	79	N. W.	8	.32	Fresh			0	0		Threatening.
Kingston, Canada	29.56	−.08	48	−6	91	N. W.	8	.32	Fresh			4 S.	.16		Cloudy.
Knoxville, Tenn	30.61	+.02	51	−4	86	S. W.	8	.32	Fresh	1 C.	W.	0	0		Clear.
La Crosse, Wis	30.17	+.08	43	−2	83	S. W.	1	.01	Light			Fog.	0		Foggy.
Lake City, Fla	30.05	+.06	59	0	70	N. W.	3	.04	Gentle	0	0	0	0		Clear.
Leavenworth, Kans	30.12	+.12	53	−1	79	0	0	0	Calm	0	0	0	0		Clear.
Louisville, Ky	30.00	+.09	55	+4	68	0	0	0	Calm	0	0	Fog.	0		Fair.
Lynchburgh, Va	29.81	+.04	59	0	65	W.	2	.02	Light	0	0	0	0		Clear.
Marquette, Mich	30.03	+.03	45	−2	76	N. W.	10	.50	Fresh			4 S.	0		Cloudy.
Memphis, Tenn	30.03	−.02	60	+6	81	N. W.	4	.08	Gentle	0	0	0	0		Clear.
Milwaukee, Wis	30.10	−.06	44	−8	84	N. W.	8	.12	Fresh	0	0	Hazy.	0		Clear.
Mobile, Ala	30.14	+.08	57	0	69	N.	4	.08	Gentle	0	0	0	0		Clear.
Montgomery, Ala	30.13	+.08	55	−1	72	N. W.	2	.02	Light	0	0	0	0		Clear.
Montreal, Canada	29.37	−.15	49	−7	93	N. W.	19	1.80	Brisk			4 N.	.65		Heavy rain.
Nashville, Tenn	30.01	.00	58	+6	81	0	0	0	Calm	0	0	Smoke.	0		Clear.
New London, Conn	29.45	+.21	57	−6	69	W.	15	1.12	Brisk	1 C.	W.	0	.04		Clear.
New Orleans, La	30.14	+.06	69	+4	61	N. E.	4	.08	Gentle	1 Ci.	0	Smoke.	0		Clear.
New York, N. Y	29.56	+.10	55	−8	73	W.	16	1.28	Brisk	Hazy.	0	Smoke.	.04		Clear.
Norfolk, Va	29.72	−.04	57	−9	75	W.	10	.50	Fresh	Hazy.	0	0	0		Clear.
North Platte, Neb	29.77	+.05	53	+10	79	S. E.	4	.08	Gentle	0	0	0	0		Clear.
Omaha, Nebr	30.16	+.10	46	−7	84	0	0	0	Calm	0	0	Smoke.	0		Clear.
Oswego, N. Y	29.51	−.07	54	−4	79	N. W.	16	1.28	Brisk			4 S.	0		Cloudy.
Pembina, Dak	30.02	+.01	38	+8	80	S. E.	8	.32	Fresh	1 Ci.	0	1 S.	0		Fair.
Philadelphia, Pa	29.65	+.15	57	−4	57	N. W.				2 Ci.	S. W.	0	0		Fair.
Pike's Peak, Col. Ter	30.25	−.02	27	0	30	N. E.	12	.72	Fresh	0	0	0	0		Clear.
Pittsburgh, Pa	29.76	+.04	51	−5	72	N.	8	.32	Fresh			4 S.	.03		Cloudy.
Port Dover, Canada	29.74	−.01	47	0	70	N. W.	15	1.12	Brisk	3 C.	N. W.	0	0		Fair.
Port Huron, Mich	29.84	.00	46	+2	69	N. W.	17	1.44	Brisk	2 C.	E.	0	0		Fair.
Port Stanley, Canada	29.79	−.01	46	+2	84	N. W.	12	.72	Fresh	2 C.	N. W.	0	.03		Fair.
Portland, Me	29.65	−.25	60	−1	94	S. W.	8	.32	Fresh			4 S.	.50		Threatening.
Portland, Oreg	30.10	+.02	46	−5	92	0	0	0	Calm			Fog.	0		Foggy.
Punta Rassa, Fla	30.08	+.03	71	−7	62	N.	10	.50	Fresh	4 Ci.	W.	0	0		Cloudy.
Quebec, Canada	29.08	−.49	53	−3	100	N.	42	8.82	Gale			4 N.	.12		Heavy rain.
Rochester, N. Y	29.56	−.04	51	−5	79	N. W.	18	1.62	Brisk			4 S.	.04		Threatening.
Salt Lake City, Utah	30.03	+.03	55	−2	44	0	0	0	Calm	0	0	0	0		Clear.
San Francisco, Cal	29.85	+.01	54	−1	87	S. W.	4	.08	Gentle			4 S.	0		Cloudy.
Santa Fé, N. Mex	29.93	+.01	51	+3	22	N. E.	4	.08	Gentle	2 Ci.	S. W.	Hazy.	0		Fair.
Saugeen, Canada	29.81	+.10	44	−2	84	N.	12	.72	Fresh			4 N.	.07		Cloudy.
Savannah, Ga	30.02	+.07	60	−1	76	0	0	0	Calm	0	0	0	0		Clear.
Shreveport, La	30.06	+.07	59	+3	81	N. W.	4	.08	Gentle			Fog.	0		Foggy.

Meteorological record, Washington, September 30, 1874, 7.35 *a. m.*—Continued.

Place of observation.	Height of barometer.	Change in last eight hours.	Thermometer.	Change in last twenty-four hours.	Relative humidity, per cent.	WIND.				CLOUDS.			Rain-fall in last eight hours.	Change in river for last twenty-four hours + or —	State of weather.
						Direction.	Velocity, miles per hour.	Pressure, pounds per square foot.	Force reduced to Beaufort scale.	Amount of upper clouds.	Upper clouds moving from the—	Amount of lower clouds.			
Saint Louis, Mo	30.09	+.16	54	+ 1	67	N.	2	.02		0	0	Smoke.	0	.....	Clear.
Saint Paul, Minn	30.13	+.08	39	− 8	90	0	0	0		0	0	Hazy.	0	.....	Clear.
Sydney, C. B	29.64	−.20	65	.....	98	S.	16	1.28	Brisk	.....	.....	4 N.	.03	.....	Cloudy.
Toledo, Ohio	29.92	+.08	46	− 3	61	N. W.	14	.98	Fresh	0	0	0	0	.....	Clear.
Toronto, Canada	29.68	.00	45	− 6	72	N. W.	17	1.44	Brisk	1 Ci.	W.	3 S.	0	.....	Cloudy.
Vicksburg, Miss	30.18	+.05	59	+ 1	87	0	0	0	Calm	Hazy.	0	Smoke.	0	.....	Fair.
Washington, D. C	29.73	+.06	57	− 3	68	W.	8	.32	Fresh	1 C.	N.	Smoke.	0	.....	Fair.
Wilmington, N. C	29.96	+.08	59	− 3	64	N. W.	4	.08	Gentle	0	0	0	0	.....	Clear.
Yankton, Dak	30.21	+.07	37	− 4	85	N. E.	1	.01	Li	0	0	0	0	.....	Clear.

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NOTE.—Barometer corrected for temperature and elevation. Reports are received over circuits arranged at the War Department with the Western Union, Atlantic and Pacific, Franklin, North Western, and Southern and Atlantic Telegraph Companies, and are furnished gratuitously to such newspapers as desire to publish them for the benefit of their readers.

PAPER 16.—(Form 3 A.)

DAILY BULLETIN.

WAR DEPARTMENT, SIGNAL-SERVICE UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

Meteorological record, Washington, September 30, 1874—4.35 p. m.

Observations taken at the same moment of time at all stations.

Place of observation.	Height of barometer.	Change in last eight hours.	Thermometer.	Change in last twenty-four hours.	Relative humidity, per cent.	WIND. Direction.	WIND. Velocity, miles, per hour.	WIND. Pressure, pounds, per square foot.	WIND. Force reduced to Beaufort scale.	CLOUDS. Amount of upper clouds.	CLOUDS. Upper clouds moving from the—	CLOUDS. Amount of lower clouds.	Rain-fall in last eight hours.	Change in river for last twenty-four hours, + or —.	State of weather.
Albany, N. Y	29.49	+.10	51	— 9	78	N. W.	22	2.42	Brisk	2 C.	W.	1 S.	.25	+ 2	Clearing.
Alpena, Mich	29.91	.00	47	8	62	N. W.	16	1.28	Brisk	4 C.	N. W.	0	0	.....	Cloudy.
Augusta, Ga	29.93	—.11	78	+ 3	46	S. W.	6	.18	Fresh	0	0	0	0	.....	Clear.
Baltimore, Md	29.75	+.05	58	— 4	64	N. W.	12	.72	Fresh	1 Ci.	0	3 N.	.04	.....	Light rain.
Bismarck, Dak	29.56	—.31	89	+11	17	S. W.	5	.12	Gentle	0	0	Hazy.	0	.....	Clear.
Boston, Mass	29.48	+.21	62	+ 1	57	N. W.	10	.50	Fresh	2 C.	W.	2 S.	0	.....	Cloudy.
Breckenridge, Minn	29.81	—.31	78	+13	30	S.	14	.98	Fresh	1 C.	W.	0	0	.....	Clear.
Buffalo, N. Y	29.75	+.12	48	—14	70	N. W.	12	.72	Fresh	.....	.....	4 S.	.04	.....	Cloudy.
Burlington, Vt	29.49	—.12	49	— 9	85	N. W.	6	.18	Fresh	.....	.....	4 N.	.13	.....	Light rain.
Cairo, Ill	30.06	+.03	74	— 2	27	N. W.	4	.08	Gentle	0	0	0	0	+ 3	Clear.
Cape May, N. J	29.71	+.02	60	— 5	56	N. W.	24	2.88	Brisk	3 C.	W.	0	0	.....	Fair.
Charleston, S. C	29.91	—.10	76	+ 1	44	S. W.	6	.18	Fresh	0	0	0	0	.....	Clear.
Chatham, Can	29.19	.....	61	— 8	94	S.	14	.98	Fresh	.....	.....	4 S.	.02	.....	Cloudy.
Cheyenne, Wyo. T	30.07	.....	81	— 8	8	S. E.	4	.08	Gentle	1 Ci.	0	0	0	.....	Clear.
Chicago, Ill	29.99	—.05	57	— 5	57	E.	5	.12	Gentle	0	0	0	0	.....	Clear
Cincinnati, Ohio	29.98	—.02	63	— 9	36	N.	12	.72	Fresh	0	0	0	0	— 1	Clear.
Corsicana, Tex	30.10	—.07	82	0	35	S.	6	.18	Fresh	0	0	2 S.	0	.....	Fair.
Cleveland, Ohio	29.83	.....	55	—12	56	N. W.	16	1.28	Brisk	4 C.	N. W.	0	0	.....	Cloudy.
Davenport, Iowa	30.06	—.09	67	— 4	32	N. W.	8	.32	Fresh	0	0	0	0	0	Clear.
Denver, Colo	30.07	—.11	82	+ 1	75	E.	4	.08	Gentle	2 Ci.	W.	1 S.	0	.....	Fair.
Detroit, Mich	29.88	+.01	54	—13	43	N. W.	13	.84	Fresh	3 C.	N.	0	0	.....	Fair.
Dodge City, Kan	29.76	—.02	88	+ 3	28	S. W.	8	.32	Fresh	0	0	0	0	.....	Clear.
Dubuque, Iowa	30.01	.....	67	— 2	29	N. W.	6	.18	Fresh	0	0	0	0	.....	Fair.
Duluth, Minn	28.91	.00	66	— 2	36	S. W.	8	.32	Fresh	1 Ci.	W.	0	0	.....	Clear.
Eastport, Me	29.28	+.04	56	— 1	80	S. W.	18	1.62	Brisk	4 C.	S. W.	0	.03	.....	Cloudy.
Erie, Pa	29.80	+.11	52	—13	72	N. W.	24	2.88	Brisk	0	0	4 S.	.03	.....	Cloudy.

Meteorological record, Washington, September 30, 1874—4.35 *p. m.*—Continued.

Place of observation.	Height of barometer.	Change in last eight hours.	Thermometer.	Change in last twenty-four hours.	Relative humidity, per cent.	WIND. Direction.	WIND. Velocity, miles, per hour.	WIND. Pressure, pounds, per square foot.	WIND. Force reduced to Beaufort scale.	CLOUDS. Amount of upper clouds.	CLOUDS. Upper clouds moving from the—	CLOUDS. Amount of lower clouds.	Rain-fall in last eight hours.	Change in river for last twenty-four hours, + or —.	State of weather.
Escanaba, Mich	29.96	—.09	51	.....	59	N.	16	1.28	Brisk	0	0	0	0	.....	Clear.
Father Point, Can	28.94	—.30	51	+ 2	93	W.	6	.18	Fresh	2 Ci.	S. W.	Hazy.	.22	.....	Fair.
Fort Garry, Manitoba	29.75	.00	70	+ 9	60	N. W.	4	.08	Gentle	2 C.	N. W.	2 N.	0	.....	Cloudy.
Fort Gibson, Ind. T	29.97	—.11	44	+ 4	100	W.	6	.18	Fresh	0	0	0	0	.....	Clear.
Galveston, Tex	30.10	—.07	75	+ 3	56	N. E.	5	.12	Gentle	2 Ci.	0	2 S.	0	.....	Cloudy.
Grand Haven, Mich	30.00	—.02	52	— 5	53	N. W.	12	.72	Fresh	1 C.	N.	0	0	.....	Clear.
Halifax, Nova Scotia	29.43	—.04	58	— 3	83	S. W.	12	.72	Fresh	.....	.....	4 N.	.01	.....	Cloudy.
Indianapolis, Ind	29.97	—.04	64	— 7	38	N. W.	12	.72	Fresh	0	0	0	0	.....	Clear.
Indianola, Tex	30.14	—.05	78	+ 2	49	N. E.	4	.08	Gentle	2 C.	S. W.	1 S.	0	.....	Fair.
Jacksonville, Fla	29.97	—.07	79	+ 2	46	S. W.	4	.08	Gentle	0	0	0	0	.....	Clear.
Keokuk, Iowa	30.03	—.06	69	— 5	35	N. W.	3	.04	Gentle	0	0	0	0	0	Clear.
Kingston, Canada	29.67	+.11	46	—14	74	W.	4	.08	Gentle	.....	.....	4	.04	.....	Cloudy.
Knoxville, Tenn	29.91	—.10	72	+ 5	37	N. W.	16	1.28	Brisk	1 C.	N. W.	0	0	.....	Clear.
La Crosse, Wis	30.00	—.17	65	+ 1	27	N. W.	2	.02	Light	Hazy.	0	Hazy.	0	0	Fair.
Lake City, Fla	29.97	—.08	79	+ 3	40	.....	3	.04	Gentle	0	0	0	0	.....	
Leavenworth, Kans	30.01	—.11	75	— 6	30	S. E.	2	.02	Light	0	0	0	0	— 1	Clear.
Louisville, Ky	29.99	—.04	68	— 4	30	W.	11	.98	Fresh	0	0	0	0	0	Clear.
Lynchburg, Va	29.81	.00	64	0	32	N. W.	12	.72	Fresh	0	0	0	0	.....	Clear.
Marquette, Mich	29.99	—.09	50	— 9	65	N.	8	.32	Fresh	1 C.	N. W.	0	0	.....	Clear.
Memphis, Tenn	30.05	+.02	76	+ 4	49	N. W.	8	.32	Fresh	1 Ci.	0	0	0	+ 3	Clear.
Milwaukee, Wis	30.01	—.04	57	0	63	S. E.	10	.50	Fresh	0	0	0	0	.....	Clear.
Mobile, Ala	30.02	—.12	78	+ 2	53	S.	9	.40	Fresh	0	0	0	0	.....	Clear.
Montgomery, Ala	29.96	—.17	84	+ 9	31	W.	10	.50	Fresh	0	0	0	0	.....	Clear.
Montreal, Canada	29.48	+.11	45	—13	88	N. W.	20	2.00	Brisk	.....	.....	4 N.	.26	.....	Light rain.
Mount Washington, N. H	29.42	.....	27	—19	100	N. W.	84	35.28	Hurricane	.....	.....	Fog.	.18	.....	Cloudy.
Nashville, Tenn	30.00	—.01	73	+ 3	29	N.	5	.12	Gentle	0	0	0	0	+ 3	Clear.
New London, Conn	29.54	+.09	60	+ 6	60	N. W.	11	.60	Fresh	1 Ci.	W.	0	0	.....	Fair.
New Orleans, La	30.06	—.08	79	+ 5	40	N. W.	7	.24	Fresh	1 Ci.	0	Smoky.	0	3	Clear.
New York, N. Y	29.63	+.07	58	— 4	58	N. W.	10	.50	Fresh	3 C.	S. W.	0	0	.....	Fair.
Norfolk, Va	29.79	+.07	69	+ 6	36	N. W.	16	1.28	Brisk	1 C.	W.	0	0	.....	Clear.
North Platte	29.49	—.28	83	+ 1	21	S. E.	10	.50	Fresh	0	0	0	0	.....	Clear.
Omaha, Neb	29.96	—.20	70	— 6	44	S. W.	8	.32	Fresh	0	0	0	0	.....	Clear.
Oswego, N. Y	29.65	—.14	50	—10	64	N. W.	16	1.28	Brisk	.....	.....	4 N.	.08	.....	Light rain.
Ottawa, Canada	30.36	—.04	47	—15	48	N. W.	12	.72	Fresh	.....	.....	4 N.	0	.....	Cloudy.
Pembina, Dak	29.67	—.35	80	+18	65	S. E.	20	2.00	Brisk	2 Ci.	S. E.	0	0	.....	Fair.

Philadelphia, Pa	29.70	—.05	56	—6	57	N. W.	17	1.44	Brisk	.....	.....	4 S.	.01	.....	Light rain.
Pike's Peak, Col. Ter	30.24	+.01	35	—2	31	N.	2	.02	Light	0	0	3 S.	0	.....	Fair.
Pittsburgh, Pa	29.85	+.09	52	—13	60	N. W.	16	1.28	Brisk	.....	.....	4 S.	.22	.....	Cloudy.
Port Dover, Canada	29.83	+.09	49	—13	57	N. W.	15	1.12	Brisk	3 C.	N. W.	0	0	.....	Fair.
Port Huron, Mich	29.89	+.05	51	—11	50	N. W.	16	1.28	Brisk	4 C.	N. W.	0	0	.....	Cloudy.
Port Stanley, Canada	29.88	+.09	46	—18	84	N. W.	15	1.12	Brisk	.....	.....	4 N.	.09	.....	Light rain.
Portland, Me	29.33	+.28	60	0	48	W.	16	1.28	Brisk	1 C.	W.	0	0	.....	Fair.
Portland, Oreg	29.98	—.12	70	.....	52	N.	4	.08	Gentle	Hazy.	0	0	0	.....	Clear.
Punta Rassa, Fla	30.01	—.07	77	+1	60	W.	8	.32	Fresh	2 Ci.	W.	Hazy.	0	.....	Fair.
Quebec, Canada	29.13	+.05	48	—12	78	S. W.	36	6.48	High	.....	.....	4 N.	.50	.....	Light rain.
Rochester, N. Y	29.69	+.13	49	—8	57	N. W.	20	2.00	Brisk	4 C.	N. W.	0	.10	.....	Cloudy.
Salt Lake City, Utah	30.02	—.01	80	0	18	N. W.	12	.72	Fresh	1 C.	0	0	0	.....	Clear.
San Diego, Cal	29.99	+.05	70	—5	67	S. W.	12	.72	Fresh	1 C.	S.	2 S.	0	.....	Fair.
San Francisco, Cal	29.90	+.05	62	+1	76	S. W.	20	2.00	Brisk	3 Ci.	0	0	0	.....	Fair.
Santa Fé, N. Mex	29.84	—.09	71	—1	75	W.	6	.18	Fresh	2 Ci.	S. W.	Hazy.	0	.....	Fair.
Saugeen, Canada	29.84	+.03	45	—12	68	N.	12	.72	Fresh	.....	.....	4 N.	.02	.....	Cloudy.
Savannah, Ga	29.94	—.08	77	+2	36	S. W.	6	.18	Fresh	0	0	0	0	.....	Clear.
Shreveport, La	29.96	—.10	85	+6	17	W.	8	.32	Fresh	0	0	0	0	+11	Clear.
Saint Louis, Mo	30.08	—.01	68	—9	26	N.	5	.12	Gentle	0	0	0	0	—3	Clear.
Saint Paul, Minn	29.92	—.21	67	+3	41	S.	7	.24	Fresh	0	0	0	0	+1	Clear.
Sydney, C. B	29.17	—.47	65	+4	94	S.	12	.72	Fresh	.....	.....	4 N.	.08	.....	Cloudy.
Toledo, Ohio	29.91	—.01	57	—11	40	N.	14	.98	Fresh	2 C.	N.	0	0	.....	Fair.
Toronto, Canada	29.78	+.10	48	—14	56	N. W.	20	2.00	Brisk	.....	.....	4 N.	0	.....	Cloudy.
Vicksburg, Miss	30.09	—.09	83	+8	42	S. W.	7	.24	Fresh	Hazy.	0	0	0	+2	Clear.
Washington, D. C	29.80	—.07	59	0	48	N. W.	18	1.62	Brisk	0	0	2 S.	0	.....	Fair.
Wilmington, N. C	29.85	—.11	76	+6	34	W.	12	.72	Fresh	0	0	0	0	.....	Clear.
Yankton, Dak	29.88	—.33	80	+4	31	S.	16	1.28	Brisk	0	0	0	0	—1	Clear.

PUBLISHED BY ORDER OF THE WAR DEPARTMENT.

NOTE.—Barometer corrected for temperature and elevation. Reports are received over circuits arranged at the War Department with the Western Union, Atlantic and Pacific, Franklin, North Western, and Southern and Atlantic Telegraph Companies, and are furnished gratuitously to such newspapers as desire to publish them for the benefit their readers.

PAPER 17.—(Form 3, A.)

DAILY BULLETIN.

WAR DEPARTMENT, SIGNAL-SERVICE UNITED STATES ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

Meteorological record, Washington, September 30, 1874—11 *p. m.*

(Observations taken at the same moment of time at all stations.)

Place of observation.	Height of barometer.	Change in last eight hours.	Thermometer.	Change in last twenty-four hours.	Relative humidity, per cent.	WIND. Direction.	WIND. Velocity, miles per hour.	WIND. Pressure, pounds per square foot.	WIND. Force reduced to Beaufort scale.	CLOUDS. Amount of upper clouds.	CLOUDS. Upper clouds moving from the—	CLOUDS. Amount of lower clouds.	Rain-fall in last eight hours.	Change in river for last twenty-four hours, + or —.	State of weather.
Albany, N. Y	29.64	+.15	45	— 9	84	N. W.	24	2.88	Brisk			4 S.	0		Cloudy.
Alpena, Mich	29.92	+.01	38	— 5	81	W.	6	.18	Fresh	0	0	2 S.	0		Fair.
Augusta, Ga	29.97	+.04	64	+ 3	83	0	0	0	Calm	0	0	0	0		Clear.
Baltimore, Md	29.88	+.13	54	— 5	68	W.	8	.32	Fresh			4 S.	0		Cloudy.
Boston, Mass	29.59	+.11	52	—10	72	N. W.	8	.32	Fresh	4 C.	N. W.	0	0		Cloudy.
Breckenridge, Minn	29.76	—.05	53	+ 9	79	W.	3	.04	Gentle	2 C.	W.	0	0		Fair.
Buffalo, N. Y	29.86	+.11	45	— 9	68	W.	16	1.28	Brisk			4 S.	.03		Cloudy.
Burlington, Vt	29.57	+.08	47	— 7	77	W.	6	.18	Fresh			4 S.	.16		Cloudy.
Cairo, Ill	30.09	+.03	60	— 2	82	0	0	0	Calm	0	0	0	0		Clear.
Cape May, N. J	29.84	+.13	55	— 5	62	N. W.	20	2.00	Brisk			4 S.	0		Cloudy.
Charleston, S. C	29.98	+.07	68	— 1	79	S. W.	4	.08	Gentle	0	0	0	0		Clear.
Chatham, Can	29.29	+.10	55	— 8	77	S.	19	1.80	Brisk	2 C.	S.	1 S.	0		Fair.
Cheyenne, Wyo	30.10	+.03	56	+ 1	8	W.	4	.08	Gentle	0	0	0	0		Clear.
Chicago, Ill	29.97	—.02	52	— 2	72	S.	6	.18	Fresh	0	0	0	0		Clear.
Cincinnati, Ohio	30.06	+.08	55	— 9	48	N. E.	8	.32	Fresh	0	0	0	0		Clear.
Cleveland, Ohio	29.85	+.02	54	— 7	55	W.	12	.72	Fresh	4 C.	N. W.	0	0		Cloudy.
Corsicana, Tex	30.10	.00	73	+15	54	S.	4	.03	Gentle	0	0	0	0		Clear.
Davenport, Iowa	30.02	—.04	54	— 1	79	0	0	0	Calm	0	0	0	0		Clear.
Denver, Colo	30.09	+.02	60	— 3	41	S.	6	.18	Fresh	1 C.	W.	0	0		Clear.
Detroit, Mich	29.95	+.07	48	— 5	62	N. W.	4	.08	Gentle	3 C.	N.	0	0		Fair.
Duluth, Minn	29.75	—.16	57	+ 7	46	S. W.	8	.32	Fresh	Hazy	S. W.	2 S.	0		Fair.
Eastport, Me	29.50	+.22	51	— 7	72	W.	10	.50	Fresh	0	0	0	0		Clear.
Erie, Pa	29.90	+.10	50	—11	64	N. W.	16	1.28	Brisk			4 N.	0		Light rain.
Escanaba, Mich	29.93	—.03	40	— 2	82	S. E.	1	.01	Light	1 Ci.	N. W.	0			Clear.
Father Point, Can	29.23	+.29	44	— 3	88	S. W.	20	2.00	Brisk	4 C.	S. W.	Hazy	.01		Cloudy.

Fort Garry, Manitoba	29.86	+.11	48	+4	89	N.W.	10	.50	Fresh	0	0	0	0		Clear.
Fort Gibson, Ind. Ter	30.00	+.03	62	+1	71	S.E.	3	.04	Gentle	0	0	0	0		Clear.
Fort Sully, Dak	29.74		70	+7	20	N.W.	16	1.28	Brisk	0	0	0	0		Clear.
Galveston, Tex	29.99	−.01	42	−14	75	N.	7	.24	Fresh	0	0	0	0		Clear.
Grand Haven, Mich	30.10	.00	73	+2	67	N.E.	3	.04	Gentle	0	0	4 S.	0		Cloudy.
Halifax, Nova Scotia	29.57	+.14	56	−3	85	S.W.	10	.50	Fresh	0	0	1 S.	0		Clearing.
Indianapolis, Ind	30.02	+.05	52	−6	73	0	0	0	Calm	0	0	0	0		Clear.
Indianola, Tex	30.15	+.01	73	0	71	0	0	0	Calm	0	0	2 S.	0		Fair.
Jacksonville, Fla	30.03		66	+2	73	S.W.	4	.08	Gentle	0	0	0	0		Clear.
Keokuk, Iowa	29.99	−.04	57	−4	81	0	0	0	Calm	0	0	0	0		Clear.
Kingston, Canada	29.76	+.09	40	−13	70	W.	4	.08	Gentle	1 Ci.	W.	0	0		Fair.
Knoxville, Tenn	30.02	+.11	53	0	86	0	0	0	Calm	0	0	0	0		Clear.
La Crosse, Wis	29.96	+.04	52	0	79	S.	8	.32	Fresh	0	0	0	0		Clear.
Lake City, Fla	30.04	+.07	62	+1	83	S.W.	1	.01	Light	0	0	0	0		Clear.
Louisville, Ky	30.04	+.08	56	−6	63	0	0	0	Calm	0	0	0	0		Clear.
Lynchburg, Va	29.97	+.16	54	−1	61	N.W.	2	.02	Light	0	0	0	0		Clear.
Marquette, Mich	29.90	−.09	42	−5	83	S.	4	.08	Gentle	2 C.	W.	0	0		Fair.
Memphis, Tenn	30.08	+.03	63	0	78	0	0	0	Calm	0	0	0	0		Clear.
Milwaukee, Wis	30.00	−.01	49	−5	77	S.W.	4	.08	Gentle	0	0	0	0		Clear.
Mobile, Ala	30.05	+.03	69	+7	70	S.W.	4	.08	Gentle	0	0	0	0		Clear.
Montgomery, Ala	30.01		70	+7	75	0	0	0	Calm	0	0	0	0		Clear.
Montreal, Canada	29.55	+.07	45	−11	86	W.	24	2.88	Brisk			Hazy	.01		Cloudy.
Nashville, Tenn	30.07	+.07	57	−2	76	0	0	0	Calm	0	0	0	0		Clear.
New London, Conn	29.65	+.11	53	−11	61	N.W.	8	.32	Fresh	2 C.	W.	0	0		Fair.
New Orleans, La	30.08	+.02	72	+2	67	S.W.	2	.02	Light	0	0	Smoke.	0		Clear.
New York, N. Y	29.75	+.12	51	−7	63	S.W.	8	.32	Fresh			4 S.	0		Cloudy.
Norfolk, Va	29.94	+.15	59	−1	48	N.	12	.72	Fresh	1 C.	W.	0	0		Fair.
North Platte, Nebr	29.54		63		47	S.E.	14	.98	Fresh	0	0	0	0		Clear.
Omaha, Nebr	29.92	−.04	61	+4	66	S.	6	.18	Fresh	0	0	0	0		Clear.
Oswego, N. Y	29.75	+.10	48	−10	64	N.W.	16	1.28	Brisk	0	0	4 S.	0		Fair.
Ottawa, Canada	29.65	−.17	47	−6	69	N.W.	11	.60	Fresh	2 Ci.	N.W.	0	0		Fair.
Pembina, Dak	29.82	+.15	52	+10	72	S.W.	16	1.28	Brisk	1 Ci.	0	1 S.	0		Fair.
Philadelphia, Pa	29.82	+.12	52	−7	53	N.W.	18	1.62	Brisk	1 Ci.	N.W.	3 S.	0		Cloudy.
Pike's Peak, Col. Ter	30.24	.00	29	0	87	N.	6	.18	Fresh	0	0	0	0		Clear.
Pittsburgh, Pa	29.93	+.08	51	−2	64	N.W.	10	.50	Fresh	0	0	0	0		Clear.
Port Dover, Canada	29.94	+.11	43	−10	75	W.	7	.24	Fresh	0	0	0	0		Clear.
Port Huron, Mich	29.94	+.05	45	−7	68	W.	8	.32	Fresh	0	0	0	0		Clear.
Portland, Me	29.50	+.17	49	−10	71	W.	6	.18	Fresh	1 Ci.	W.	0	0		Fair.
Portland, Oreg	29.94	−.04	60	+3	82	0	0	0	Calm	2 C.	0	Hazy	0		Fair.
Port Stanley, Canada	29.94	+.06	45	−6	93	N.W.	4	.08	Gentle			4 N.	.02		Light rain.
Punta Rassa, Fla	30.07	+.06	74	+3	68	N.W.	6	.18	Fresh	2 Ci.	0	0	0		Fair.
Quebec, Canada	29.32	+.19	40	−15	82	S.W.						4 N.	.01		Cloudy.
Rochester, N. Y	29.79	+.10	46	−8	61	N.W.	9	.40	Fresh			4 S.	.01		Cloudy.
Salt Lake City, Utah	29.98	−.04	63	−3	28	N.E.	1	.01	Light	0	0	0	0		Clear.
San Diego, Cal	30.03	+.06	64	−2	78	W.	4	.08	Gentle			4 S	0		Cloudy.
San Francisco, Cal	29.93	+.03	56	+1	93	S.W.	12	.72	Fresh			4 S.	0		Cloudy.
Santa Fé, N. Mex	29.90	+.06	54	−1	38	E.	4	.08	Gentle	0	0	0	0		Clear.
Santiago de Cuba															
Saugeen, Canada	29.86	+.02	48	−1	85	N.	10	.50	Fresh			4 N.	.01		Light rain.
Savannah, Ga	30.00	+.06	67	+3	64	S.W.	4	.08	Gentle	0	0	0	0		Clear.

Meteorological record, Washington, September 30, 1874—11 p. m.—Continued.

Place of observation.	Height of barometer.	Change in last eight hours.	Thermometer.	Change in last twenty-four hours.	Relative humidity, per cent.	WIND. Direction.	WIND. Velocity, miles per hour.	WIND. Pressure, pounds per square foot.	WIND. Force reduced to Beaufort scale.	CLOUDS. Amount of upper clouds.	CLOUDS. Upper clouds moving from the—	CLOUDS. Amount of lower clouds.	Rain-fall in last eight hours.	Change in river for last twenty-four hours, + or —.	State of weather.
Shreveport, La	29.97	+.01	67	+ 3	84	0	0	0	Calm	0	0	0	0	.....	Clear.
Saint Louis, Mo	30.07	—.01	62	— 3	66	N.	1	.01	Light	0	0	0	0	.....	Clear.
Saint Paul, Minn	29.81	—.11	55	+ 5	68	S.	4	.08	Gentle	2 Ci.	0	Haze	0	.....	Fair.
Toledo, Ohio	29.98	+.07	51	— 3	59	W.	2	.02	Light	4 Ci.	N. W.	0	0	.....	Cloudy.
Toronto, Canada	29.87	+.09	42	— 7	77	W.	3	.04	Gentle	0	0	0	0	.....	Clear.
Vicksburg, Miss	30.12	+.03	71	+ 7	75	0	0	0	Calm	0	0	0	0	.....	Clear.
Virginia City, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington, D. C	29.91	+.11	52	— 5	67	W.	8	.32	Fresh	0	0	0	0	.....	Clear.
Wilmington, N. C	29.92	+.08	66	+ 3	64	S. W.	4	.08	Gentle	1 C.	N. W.	0	0	.....	Fair.
Yankton, Dak	29.82	—.06	67	+18	51	S. W.	8	.32	Fresh	0	0	0	0	.....	Clear.

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NOTE.—Barometer corrected for temperature and elevation. Reports are received over circuits arranged at the War Department with the Western Union, Atlantic and Pacific, Franklin, Northwestern, and Southern and Atlantic Telegraph Companies, and are furnished gratuitously to such newspapers as desire to publish them for the benefit of their readers.

PAPER 18.

BULLETIN OF INTERNATIONAL METEOROLOGICAL OBSERVATIONS TAKEN SIMULTANEOUSLY, ON JANUARY 13, 1874, AT—

7:35 a. m. Washington mean time.	0:53 p. m. Paris mean time.	1:26 p. m. Christiania mean time.	1:49 p. m. Vienna mean time.
0: 6 p. m. Lisbon mean time.	1 : 1 p. m. Brussels mean time.	1:33 p. m. Copenhagen mean time.	2:39 p. m. Constantinople mean time.
0:28 p. m. Madrid mean time.	1 : 4 p. m. Utrecht mean time.	1:33 p. m. Rome mean time.	2:44 p. m. St. Petersburg mean time.
0:43 p. m. Greenwich mean time.	1 : 8 p. m. Geneva mean time.	1:37 p. m. Berlin mean time.	

ALGERIAN SERIES.

[Furnished by co-operation of M. Charles St. Claire Deville, inspector-general of Meteorological Establishments, Ministry of Public Instruction, Paris, and M. le Général Farre, Commandant Supérieur du Génie en Algérie.]

Place of observation.	Barometer. Observed. Inches.	Barometer. Observed. Millimeters.	Barometer. Reduced to sea-level. Inches.	Barometer. Reduced to sea-level. Millimeters.	Thermometer. Degrees Fahrenheit.	Thermometer. Degrees centigrade.	Relative humidity. Per cent.	Wind. Direction from—	Wind. Velocity (miles per hour.)	Wind. Force, (scale from 0 to 10.)	Clouds. Scale from 0 to 5.	Rain. Inches.	Rain. Millimeters.	State of weather.	Observer.
Algiers															
Aumale															
Batna															
Biskra															
Constantine															
Djelfa															
Larache, (or El Arish)															
Geriville															
La Calle															
Laghouat															
Medeah															
Nemours															
Oran															
Saida															
Tebessa															
Toniet elhad															

Reports for this date not received; reports commenced July 1, 1874.

NOTE.—The originals do not give the relative humidity, which is here supplied by Guyot's tables; they give the force of the wind on a scale of 0 to 7, the cloudiness on a scale of 0 to 10, and the weather by the general French notation.

Bulletin of international meteorological observations, &c.—Continued.

AUSTRIAN SERIES.

[Furnished by co-operation of Professor Carl Jelinek, Director of the Imperial and Royal Central Meteorological Institute at Vienna.]

Place of observation.	BAROMETER. Observed. Inches.	BAROMETER. Observed. Millimeters.	BAROMETER. Reduced to sea-level. Inches.	BAROMETER. Reduced to sea-level. Millimeters.	THERMOMETER. Degrees Fahrenheit.	THERMOMETER. Degrees centigrade.	RELATIVE HUMIDITY. Per cent.	WIND. Direction from—	WIND. Velocity, (miles per hour.)	WIND. Force, (scale from 0 to 10.)	CLOUDS. Scale from 0 to 5.	RAIN. Inches.	RAIN. Millimeters.	State of weather]	Observer.
Agram			30.221	767.6	25.5	− 3.6	95	S. W.		1	1	0	0	Fair	Ivan Stozir.
Aracow			29.969	761.2	33.4	0.8	66	W.		3	5	0	0	Cloudy	I. R. Observatory.
Eperies			30.123	765.1	20.3	− 6.5	92	S.		4				Foggy	Julius Mikolik.
Gratz			30.154	765.9	22.3	− 5.4	82	S.		2.5	0	0	0	Clear	Andreas Rospini.
Hermannstadt			30.316	770.0	− 4.7	−20.4	100	E.		1	5	0	0	Cloudy	Prof. Ludw. Reisenberger.
Kremsmünster			30.138	765.5	37.7	3.2	83	W.		1	4	0	0	Cloudy	Prof. Wagner.
Lemberg			29.914	759.8	24.6	− 4.1	89	S. W.		4	4.5	0	0	Cloudy	Dr. Stanecki.
Nyir Egyhaza			30.193	766.9	20.1	− 6.6	89	S. W.		2	5			Snow	Habzsuda Daniel.
Pola			30.146	765.7	41.5	5.3	78	W. N. W.		1	0.5	0	0	Clear	Naval Observatory.
Szegedin			30.186	766.7	20.5	− 6.4	90	W.		2	5	0	0	Cloudy	Karl Stancel.
Triest			30.146	765.7	40.3	4.6	68	N. W.		0	0	0	0	Clear	Dr. Farolfi.
Vienna			30.095	764.4	25.9	− 3.4	89	E.		1	5	0	0	Clear	Central Observatory.
Buda															
Laibach															

NOTE.—The originals give the wind-direction to 32 points of the compass, the force of wind and the cloudiness on a scale of 0 to 10, and the weather by the Vienna symbols.

BELGIAN SERIES.

[Furnished by co-operation of Professor E. Quetelet, Director of the Royal Observatory at Brussels.]

Brussels	29.910	759.7			44.1	6.7	71	W. S. W.			3.5	.074	1.90	Cloudy	Royal Observatory.

NOTE.—The originals give the wind-force in kilogrames per square foot, the cloudiness on a scale of 0 to 10, and the weather in general notes.

BRITISH SERIES.

[Furnished by co-operation of Robert H. Scott, esq., Director of the Meteorological Office, London.]

Aberdeen			29.55	750.56	36.4	2.4	62	S.		2	4.5			Misty	William Boswell.
Ardrossan	29.82	757.41			44	6.7	92	S. W.		5	4			Light rain	William McNeil.
Annanhill															W. H. Dunlop
Armagh Observatory			29.90	759.45	43.5	6.4	93	S. S. W.	24		5			Threatening	Stillman Call.
Banbridge	29.72	754.87			43	6.1	89	S. W.		3	4.5			Fair	John Smyth, jr
Battersea															Rev. J. P. Faunthorpe.
Barnstaple	30.17	766.30			48	8.9	74	S.		2	0			Clear	William Knill.
Bidston, the Liverpool Observatory			30.01	762.24	45.1	7.3	67	W. S. W.		3	5			Cloudy	The Liverpool Observatory.
Prospect, Bermuda															James Freeman.
Birr Castle			30.01	762.24	47.1	8.4	95	W. S. W.		0.5	5			Cloudy	Ralph Copeland.
Bradford			29.95	760.72	42.1	5.6	74	S. W.		2	5			Cloudy	J. Mc. Landsborough.
Bywell	29.75	755.64			44	6.7	60	N. W.		3	1			Fair	John Dawson.
Cambridge Observatory			30.08	764.02	40.5	4.7	78	S. W.		1	1.5			Fair	Henry Todd.
Cardington															John McLaren.
Carlisle															T. Bell for J. Cartwell.
Cape Town, Cape of Good Hope															The Royal Observatory.
Cochyfoel Farm			30.04	763.00	45	7.2	88	S. W.		4	5			Cloudy	W. Jones.
Donaghadee	29.90	759.45			42	5.6	91	S. S. W.			5			Cloudy	J. MacGowan, jr.
Dover	30.14	765.54			43	6.1	75				1			Fair	J. Costello.
Dublin			29.94	760.46	46	7.8	86	W. S. W.		4	3.5				J. W. Moore.
Dartmoor			30.06	763.51	40.5	4.7	78	W.		2	3			Cloudy	R. E. Power.
Durham Observatory			29.86	758.43	41.6	5.3	72	W. S. W.		2	5			Cloudy	John J. Plummer.
Eccles			30.03	762.75	42.5	5.8	77	W.		1	5			Cloudy	Thomas Mackereth.
Falmouth Observatory															The Falmouth Observatory.
Gibraltar, (Mediterranean Sea)															J. Brewster.
Glasgow Observatory			29.74	755.38	42.7	5.9	83	S. W.		3	3.5			Threatening	James Gray.
Gloucester, the Gloucester Company Asylum															E. Toller.
Greenwich Royal Observatory	30.00	761.99			43.3	6.3	70	W.	6		0			Clear	The Royal Observatory.
Guernsey			30.19	766.81	47	8.3	81	N. N. W.		1	3.5			Clearing	Dr. S. E. Hoskins.
Great Yarmouth	30.08	764.02			40	4.4	91	W.		3	1.5			Fair	G. T. Watson.

Bulletin of international meteorological observations, &c.—Continued.

BRITISH SERIES—Continued.

Place of observation.	Barometer. Observed. Inches.	Barometer. Observed. Millimeters.	Barometer. Reduced to sea-level. Inches.	Barometer. Reduced to sea-level. Millimeters.	Thermometer. Degrees Fahrenheit.	Thermometer. Degrees centigrade.	Relative humidity. Per cent.	Wind. Direction from—	Wind. Velocity (miles per hour.)	Wind. Force, (scale from 0 to 10.)	Clouds. Scale from 0 to 5.	Rain. Inches.	Rain. Millimeters.	State of weather.	Observer.
Galway	29.97	761.22			47	8.3	92	W.		3	5			Misty	B. G. Clare.
Helston			30.19	766.81	50	10.0	79	W.		2	0			Clear	W. Moyle.
Holyhead	29.95	760.72			47	8.3	85	S. W.		4	3.5			Misty	John Tilston.
Hull Park															Edward Peak.
Kew Observatory			30.13	765.29	42.5	5.8	73	W. by S.		2	0.5			Fair	Kew Observatory.
Kingstown	30.05	763.26			48	8.9	85	W.			4			Cloudy	George Mitchell.
Leicester			30.01	761.73	43	6.1	75	S.		2	4.5			Cloudy	William J. Harrison.
Llandudus	29.94	760.46			46.8	8.2	78	W. S. W.		1	3.5			Cloudy	James Nicol.
Stornoway, Lews Castle	29.37	745.98			42	5.6	91	W. S. W.		3	4.5			Light rain	John Smith.
Malta, (Mediterranean Sea)															E. Dowling.
Marlborough College			30.14	765.54	39.8	4.3	76	W.		0.1	5			Cloudy	T. A. Preston.
Moorside	29.53	750.05			39.8	4.3	84	W. S. W.		2	5			Cloudy	L. J. Crossley.
Moville	29.78	756.40			43	6.1	100	S. W.		5	5			Threatening	James McSladery.
Saint Ann's Head			30.10	764.53	48	8.9	78	W. S. W.		3	5			Cloudy	John C. Walker.
Markree	29.81	757.16			45.5	7.5	98	S. W.		3	5			Cloudy	Robert Smith.
Lampete	29.71	754.62			48	8.9	74	W.		0.3	4			Cloudy	Eliezer James.
Nairn	29.58	751.32			44	6.7	84	W.		3	3			Cloudy	William D. Penny.
Nottingham			30.05	763.26	44.1	6.7	84	W.		2	4.5			Threatening	E. J. Lowe.
Osborne, New Barn Cottage			30.15	765.80	44	6.7	76	W. S. W.	3		1.5			Fair	J. R. Mann.
North Shields	29.79	756.65			43	6.1	67	W. S. W.		3	3.5			Cloudy	John William Irvine.
Oscott			30.06	763.51	41	5.0	82	S. W.		3	5			Misty	Stephen Whitty.
Oxford, the Radcliffe Observatory	29.92	759.96?			49	9.4	93	S. W.		1	5			Misty	Radcliffe Observatory.
Plymouth	30.14	765.54			46	7.8	84	S. W.		3	2.5			Foggy	John Merrifield.
Portishead	30.09	764.27			48	8.9	100				4			Cloudy	W. Sandford.
Roche's Point	30.10	764.53			50	10.0	93	W. S. W.		3	5			Misty	W. Kennedy.
Orkney, Sandwick Manse															Rev. Charles Cloustin.
Scarborough	29.84	757.92			41	5.0	83	W. S. W.		3	4			Cloudy	F. Heard.
Scutari, Turkey															W. H. Lyne.

Sheffield															W. F. Cooper.
Streatley Vicarage			30.15	765.80	43.5	6.4	78	W.		1	4.5			Cloudy	Rev. John Slatter.
St. Helier, Jersey	30	767.07			46.2	7.9	92	N. E.		1	5			Foggy	A. P. Amy.
Sidmouth	.20		30.15	765.80	46.7	8.2	82	W.		0	3			Cloudy	J. Ingleby Mackenzie.
Silloth Rectory															Rev. C. J. Stewart.
Somerleyton	29.85	758.18			44	6.7	82	S. W.		5	5	.035	.89	Light rain	Francis Redford.
Strathfield Turgiss			30.03	762.75	42	5.6	83	S. W.		1	0.5			Clear	Charles H. Griffith.
Sumburgh Head, Shetland Islands	30.12	765.03			43.5	6.4	70	W.		3	0			Clear	William Lawrence.
Stonyhurst Observatory	29.27	743.44			34	1.1	100	S.		1	5			Snow	Stonyhurst Observatory.
Taunton College	29.59	751.57			41.8	5.4	74	S. W.		2	5			Threatening	Rev. W. Tuckwell.
Thurso			30.14	765.54	47	8.3	67	W.		1	5			Cloudy	John Trotter.
Truro Royal Institution	29.48	748.78			42	5.6	74	S. W.		2	1			Fair	William Newcombe.
Wisbech			30.13	765.29	52	11.1	53	W.		3	2			Fair	S. H. Miller.
Worthing	30.02	762.49			41.8	5.4	81	S. S. W.		0.4	2			Fair	William J. Harris.
Wick			30.13	765.29	43.4	6.3	76	W.		3.5				Cloudy	James Sinclair.
York	29.52	749.79			35	1.7	90	S.		2	5			Snow	C. Wakefield.

NOTE.—The originals generally omit the relative humidity, which is here supplied by means of Guyot's Tables; they give the wind and weather on the Beaufort scales and the cloudiness on a scale of 0 to 10.

DANISH SERIES.

[Furnished by co-operation of Captain N. Hoffmeyer, Director of the Royal Danish Meteorological Institute at Copenhagen.]

Copenhagen			29.666	753.5	35.2	1.8	82	W.		5	1			Fair	
Fano			29.705	754.5	38.7	3.7	75	W. N. W.		7	4			Cloudy	
Thorshavn, (Faro)			29.044	737.7				W.		2	5			Cloudy	
Vestervig			29.544	750.4	36.9	2.7	84	W. N. W.		8	4			Rain and hail	
Stykkisholm, (Iceland)			29.697	754.3	0.1	−17.7	78	N. E.		3	0			Aurora	

NOTE.—The originals give the force of the wind on a scale of 0 to 6, the cloudiness on a scale of 0 to 10, and the weather in the Vienna symbols.

Bulletin of international meteorological observations, &c.—Continued.

FRENCH SERIES.

[Furnished by co-operation of M. Charles St. Claire Deville, Inspector-General of Meteorological Establishments, and MM. Marie Davy, E. Renou, Dr. Fines, Dr. Berigny, Beaumier, etc.]

Place of observation.	BAROMETER. Observed. Inches.	BAROMETER. Observed. Millimeters.	BAROMETER. Reduced to sea-level. Inches.	BAROMETER. Reduced to sea-level. Millimeters.	THERMOMETER. Degrees, Fahrenheit.	THERMOMETER. Degrees, Centigrade.	RELATIVE HUMIDITY. Per cent.	WINDS. Direction from—	WINDS. Velocity, (miles per hour.)	WINDS. Force, (scale from 0 to 10.)	CLOUDS. Scale from 0 to 5.	RAIN. Inches.	RAIN. Millimeters.	State of weather.	Observer.
Goree															M. Lascal.
Montsouris, (near Paris)			30.190	766.8	45.5	7.5	93	S. S. W.			5	.039	1.0	Rain	Montsouris Observatory.
Saint Maur, (near Paris)			30.193	766.9	45.3	7.4	96	S.		1	5	.063	1.6	Rain	M. E. Renou.
Versailles, (near Paris)															Dr. Ad. Berigny.
Mont-Louis															M. Falguere.
Perpignan															Dr. Fines.
Mogador, (Marocco)															M. Beaumier.

Full arrangements at this date not yet completed. Full reports to commence on October 10, 1874.

NOTE.—The originals give the cloudiness on a scale of 0 to 10, the wind force on a scale of 0 to 7, and the weather in general terms; the wind velocity is given by Montsouris in kilometres per hour, but by Mont-Louis and Perpignan in metres per second.

GERMAN SERIES.

[Furnished by co-operation of Professor Carl Bruhns, Director of the Royal Observatory, Leipsig.]

Reports for this date not received. Reports commenced September 1, 1874.

ITALIAN SERIES.

[Furnished by co-operation of Professor Giovanni Cantoni, Professor at the Royal University, Pavia, and M. P. F. Denza, Director of the Observatory of the Royal Carl Albert College, Moncalieri.]

Ancona														
Bologna														
Catania, (Sicily)														
Cosenza														
Domodossola														
Empoli														
Florence														
Genoa														
Leghorn														
Lodi														
Milan														
Moncalieri														
Naples														
Padua														
Palermo														
Pavia														
Placentia														
Rome														
Stelvio Pass														
Tolmezzo														
Turin														
Urbino														
Valdobbia														
Venice														
Velletri														
Vesuvius														
Vicenza														

Reports for this date not received. Reports commenced February 1, 1874.

NOTE.—The originals give the force of the wind on a scale of 0 to 5 (?) and in some cases the velocity in kilometres per hour; the cloudiness is given on a scale of 0 to 10; the weather is given in various general terms.

NETHERLAND SERIES.

[Furnished by co-operation of Professor Buys Ballot, Director of the Royal Meteorological Institute of the Netherlands at Utrecht.]

Groningen															
Helder			29.989	761.7	43.0	6.1		W. S. W.							
Utrecht			30.028	762.7	43.7	6.5	78	W.							
Flushing			30.138	765.5	43.2	6.2		W.							

NOTE.—The originals give the force of the wind in kilogrammes per square metre, and the cloudiness on a scale of 0 to 10.

Bulletin of international meteorological observations, &c.—Continued.

NORWEGIAN SERIES.

[Furnished by co-operation of Professor H. Mohn, Director of the Royal Norwegian Meteorological Institute at Christiania.]

Place of observation.	Barometer. Observed. Inches.	Barometer. Observed. Millimeters.	Barometer. Reduced to sea-level. Inches.	Barometer. Reduced to sea-level. Millimeters.	Thermometer. Degrees, Fahrenheit.	Thermometer. Degrees, Centigrade.	Relative humidity. Per cent.	Winds. Direction from—	Winds. Velocity, (miles per hour.)	Winds. Force, (scale from 0 to 10.)	Clouds. Scale from 0 to 5.	Rain. Inches.	Rain. Millimeters.	State of weather.	Observer.
Bergen			29.308	744.4	36.5	2.5	73	N.		7	5	0	0	Cloudy	
Christiania			29.103	739.2	37.4	3.0	44	S. W.	12	6?	1	0	0	Fair	
Tromso			28.544	725.0	29.8	− 1.2	74	S. S. E.		2	5			Cloudy	

NOTE.—The originals give the velocity of the wind in metres per second and its force on a scale of 0 to 6; the cloudiness on a scale of 0 to 10, and the weather in special terms.

PORTUGUESE SERIES.

[Furnished by co-operation of M. Fradessa da Silveira, Director of the Observatory of the Royal Polytechnic School at Lisbon.]

Place of observation.	Barometer. Observed. Inches.	Barometer. Observed. Millimeters.	Barometer. Reduced to sea-level. Inches.	Barometer. Reduced to sea-level. Millimeters.	Thermometer. Degrees, Fahrenheit.	Thermometer. Degrees, Centigrade.	Relative humidity. Per cent.	Winds. Direction from—	Winds. Velocity, (miles per hour.)	Winds. Force, (scale from 0 to 10.)	Clouds. Scale from 0 to 5.	Rain. Inches.	Rain. Millimeters.	State of weather.	Observer.
Lisbon															

Reports for this date not received. Reports commenced June 1, 1874.

NOTE.—The originals give the wind-velocity in kilometres per hour and the cloudiness on a scale of 0 to 10.

RUSSIAN SERIES.

[Furnished by co-operation of Professor H. Wild, Director of the Imperial Russian Central Physical Observatory at St. Pertersburg.]

Archangel			29.272	743.5			95	S.	17		5			Cloudy	Ogorodnikof.
Astrakhan			30.434	773.0			65	S. E.	4						Sebastianof.
Barnaul			30.339	770.6			85	S. W.	17		5			Snow	Meteorological Observatory.
Dorpat			29.304	744.3			91	S.	13		4			Snow	Physical Cabinet.
Ekaterinburg			30.473	774.0			82	S. W.	8		5			Cloudy	Meteorological Observatory.
Yeniseisk			29.890	759.2			82	W.	17		0			Clear	Marks
Irkutsk															Uselzef.
Kasaly			30.445	773.3			84	E.			5			Cloudy	Bobrof.
Kasan			30.260	768.6			82	S.	13		1			Fair	Physical Cabinet.
Kertch															Lagorio.
Kieff			29.965	761.1			92	S. W.	17		5			Cloudy	Physical Cabinet.
Lugan			30.052	763.3			80	S. E.	6		4.5			Cloudy	Meteorological Observatory.
Moscow			29.894	759.3			65	S. W.	6		5			Cloudy	Meteorological Observatory.
Nertchinsk			29.953	760.8			82	Calm.	0		1			Fair	Meteorological Observatory.
Nikolaiev			30.099	764.5			96	E.	4		5			Cloudy	Kurdakof.
Nikolaievsk															
Orenburg															Tschernischef.
Peking, (China)			30.213	767.4			71	Calm.	0		0			Clear	Physical Observatory.
St. Petersburg			29.280	743.7			78	S.	13		5			Cloudy	Physical Observatory.
Taschkend			30.512	775.0			89	Calm.	0		3			Cloudy	Michelson.
Tiflis			30.162	766.1			57	S. W.	6		3.5			Cloudy	Physical Observatory.
Oorga			30.024	762.6			94	Calm.	0		0			Clear	Mossin.
Vladivostck															
Warsaw			29.741	755.4			98	W.	8		5			Cloudy	Astronomical Observatory.
Wilna			29.560	750.8			95	S. E.	13		5			Snow	Astronomical Observatory.

NOTE.—The originals give the velocity of the wind in metres per second; the cloudiness on a scale of 0 to 10, and the weather according to the Vienna system of symbols.

SCOTTISH SERIES.

[Furnished by co-operation of Mr. Alexander Buchan, Secretary of the Scottish Meteorological Society, Edinburgh.]

Calf of Man, (Isle of Man)														
Kestalrig Park, (Edinburgh)														
Monach Light-house, (Hebrides)														
North Unst, (Shetland)														

Reports for this date not received. Reports commenced February 1, 1874.

NOTE.—The originals give the force of the wind on a scale of from 0 to 10; the cloudiness on a scale of 0 to 6, and the weather by the Beaufort notation.

Bulletin of international meteorological observations, &c.—Continued.

SPANISH SERIES.

[Furnished by co-operation of M. A. Aguilar, Director of the Royal Observatory at Madrid.]

Place of observation.	BAROMETER. Observed. Inches.	BAROMETER. Observed. Millimeters.	BAROMETER. Reduced to sea-level. Inches.	BAROMETER. Reduced to sea-level. Millimeters.	THERMOMETER. Degrees, Fahrenheit.	THERMOMETER. Degrees, Centigrade.	RELATIVE HUMIDITY. Per cent.	WINDS. Direction from—	WINDS. Velocity, (miles per hour.)	WINDS. Force, (scale from 0 to 10.)	CLOUDS. Scale from 0 to 5.	RAIN. Inches.	RAIN. Millimeters.	State of weather.	Observer.
Madrid															

Reports for this date not received. Reports commenced April 1, 1874.

NOTE.—The originals give the velocity of the wind in kilometres per hour; the cloudiness from 0 to 10, and the weather in general terms.

SWISS SERIES.

[Furnished by co-operation of Professor E. Plantamour, Director of Geneva Observatory, Geneva.]

Geneva															

Reports for this date not received. Reports commenced September 1, 1874.

NOTE.—The originals give the force of the wind on a scale of 0 to 4; the cloudiness from 0 to 10, and the weather in general terms.

TURKISH SERIES.

[Furnished by co-operation of A. Coumbary, Effendi, Director of the Central Observatory at Constantinople.]

Beirut, (Syria)														
Constantinople			30.099	764.5	37.8	3.2	84	N.	13					Cloudy
Fao, (Persian Gulf)			30.489	774.4	58.1	14.5		N.W.		2				Clear
Salonika														
Avlona			30.008	762.2	49.6	9.8		N.E.	0					Clear
Varna														

NOTE. The originals give the velocity of the wind in metres per second, and its force on a scale of 0 to 6; the weather and cloudiness are given in general terms.

UNITED STATES SERIES.

[Furnished by the co-operation of Bvt. Brig. Gen. Albert J. Myer, Chief Signal-Officer, U. S. A.]

Place of observation.	Barometer, (inches.)	Barometer, (millimeters.)	Thermometer, (degrees Fahrenheit.)	Humidity—per cent.	WIND. Direction from the—	WIND. Velocity per hour, (English miles.)	CLOUDS. Amount of lower. (Scale from 0 to 4.)	CLOUDS. Amount of upper. (Scale from 0 to 4.)	CLOUDS. Direction of upper, from the—	Rain-fall in last 8 hours, (inches.)	State of weather.
Albany, N. Y	30.45	773.42	20	86	Calm	0	1	0			Fair.
Alpena, Mich	30.40	772.15	16	83	S. W.	5	1	0			Fair.
Augusta, Ga	30.30	769.61	41	91	N. E.	4	4			.04	Light rain.
Baltimore, Md	30.47	773.92	29	50	N. E.	4	2	1			Fair.
Boston, Mass	30.48	774.18	20	77	N.W.	6	Hazy	0			Fair.
Breckinridge, Minn	30.69	779.51	—20	64	N.W.	22	0	0		.04	Clear.
Buffalo, N. Y	30.44	773.16	20	85	Calm	0	2	Hazy			Fair.
Burlington, Vt	30.52	775.19	16	66	N.	4	2	0			Fair.
Cairo, Ill											
Cape May, N. J	30.46	773.67	26	75	N.	8	0	Hazy			Fair.
Charleston, S. C	30.28	769.10	45	75	N. E.	10	4				Cloudy.
Cheyenne, W. T	30.00	761.99	16	83	Calm	0	Fog				Foggy.
Chicago, Ill	30.19	766.81	30	78	S. E.	12	4				Cloudy.
Cincinnati, Ohio	30.25	768.34	30	78	N. E.	4	4				Cloudy.
Cleveland, Ohio	30.32	771.11	23	60	S.	8	4				Cloudy.
Corinne, Utah	30.10	764.53	25	87	S.	1	4				Cloudy.
Davenport, Iowa	30.22	767.57	26	87	Calm	0	4				Cloudy.
Denver, Col	30.13	765.29	20	70	N.	10	4				Cloudy.
Detroit, Mich	30.39	771.89	20	55	S. E.	4	4				Cloudy.
Dubuque, Iowa	30.21	767.32	21	79	Calm	0	4			.04	Heavy snow.
Du Luth, Minn	30.35	770.88	1	71	W.	16	2	Hazy	W.	.04	Fair.
Eastport, Me	30.30	769.61	14	64	N.	4	0	2	N.		Fair.
Erie, Pa	30.39	771.89	20	78	S.	2	4				Cloudy.
Escanaba, Mich	30.24	768.08	14	91	N.W.	8	4				Cloudy.
Fort Benton, Mont											
Fort Gibson, Ind. T											
Fort Saint Michael, Alaska											
Fort Sully, Dak											
Grand Haven, Mich	30.29	769.35	25	37	E.	5	4				Cloudy.
Galveston, Tex	30.04	763.00	61	100	S.	7	Fog				Foggy.
Indianapolis, Ind	30.17	766.30	30	59	E.	6	4				Cloudy.
Indianola, Tex											
Island of Saint Paul, Behring Sea											
Jacksonville, Fla	30.20	767.07	52	79	N.	4	4				Cloudy.
Keokuk, Iowa	30.21	767.32	26	88	N.W.	2	4				Cloudy.
Key West, Fla	30.12	765.03	67	84	N. E.	8	0	1	E.		Fair.
Knoxville, Tenn	30.10	764.53	35	95	N. E.	1	4			.07	Cloudy.
La Crosse, Wis	30.31	769.86	21	79	S.	4	4				Cloudy.
Lake City, Fla	30.18	766.56	50	93	N. E.	4	Fog				Foggy.
Leavenworth, Kans	30.20	767.07	32	78	N.	4	4				Threatening.
Louisville, Ky	30.16	766.05	32	79	E.	8	4				Threatening.
Lynchburgh, Va	30.44	773.16	31	64	N. E.	4	4				Cloudy.
Marquette, Mich	30.23	767.83	19	84	Calm	0	4				Cloudy.
Memphis, Tenn	30.12	765.03	35	100	N.W.	8	4			.05	Cloudy.
Milwaukee, Wis	30.25	768.34	28	83	S. E.	7	4				Cloudy.
Mobile, Ala	30.11	764.78	57	93	Calm	0	3	0		.01	Cloudy.
Montgomery, Ala	30.16	766.05	48	92	S. E.	8	4			.05	Threatening.
Mount Washington, N. H	30.03	762.75	— 1	68	N.W.	18	1	1			Fair.
Nashville, Tenn	30.11	764.78	38	90	Calm	0	4			.02	Light rain.
New London, Conn	30.49	774.43	25	62	N.W.	4	0	Hazy			Clear.
New Orleans, La	30.07	763.76	59	82	S.W.	4	1	2			Fair.
New York, N. Y	30.50	774.69	27	70	N. E.	6	1	2	W.		Fair.
Norfolk, Va	30.42	772.65	30	72	E.	4	0	2			Fair.
Omaha, Neb	30.40	772.15	8	89	N.W.	21	4				Cloudy.
Oswego, N. Y	30.48	774.18	25	87	S.	3	4				Cloudy.
Pembina, Dak											
Philadelphia, Pa	30.51	774.94	25	68	N. E.	8	4				Cloudy.
Pike's Peak, Colo											
Pittsburgh, Pa	29.39	771.89	20	85	N. E.	6	Fog		S. E.		Foggy.
Portland, Me	30.41	772.40	5	75	N.W.	4	0	0			Clear.
Portland, Oreg											
Punta Rassa, Fla	30.16	766.05	61	88	N. E.	9	2	6			Fair.
Rochester, N. Y	30.46	773.67	22	79	W.	4	4				Cloudy.
San Diego, Cal											
San Francisco, Cal	30.09	764.27	42	74	N.W.	8	4				Cloudy.
Santa Fé, N. Mex											

NOTE.—The cloudiness is estimated by fourths by the Army Signal-Office.

UNITED STATES SERIES—Continued.

[Furnished by the co-operation of Bvt. Brig. Gen. Albert J. Myer, Chief Signal-Officer, U. S. A.]

Place of observation.	Barometer, (inches.)	Barometer, (millimeters.)	Thermometer, (degrees Fahrenheit.)	Humidity—per cent.	WIND. Direction from the—	WIND. Velocity per hour, (English miles.)	CLOUDS. Amount of lower. (Scale from 0 to 4.)	CLOUDS. Amount of upper. (Scale from 0 to 4.)	CLOUDS. Direction of upper, from the—	Rain-fall in last 8 hours, (inches.)	State of weather.
Savannah, Ga	30.25	778.34	48	71	N. E.	4	4				Cloudy.
Shreveport, La											
Saint Louis, Mo	30.05	763.26	30	89	N. E.	5	4			.01	Cloudy.
Saint Paul, Minn	30.29	769.35	8	89	N.W.	12	4			.02	Light snow.
Toledo, Ohio	30.35	770.88	24	73	E.	4	4				Cloudy.
Vicksburg, Miss	30.06	763.51	50	100	N.W.	2	4			.55	Light rain.
Virginia City, Mont											
Washington, D. C	30.48	774.69	26	74	N. E.	4	2	1	S.W.		Fair.
Wilmington, N. C	30.30	769.61	40	78	N. E.	7	4			.01	Cloudy.
Yankton, Dak	30.94	780.78	— 4	64	N.W.	26	4			.03	Light snow.

NOTE.—The cloudiness is estimated by fourths by the Army Signal-Office.

UNITED STATES SUBSERIES—WEST INDIES.

[Telegraphed and furnished daily by agents of the United States.]

Barbados											
Guadaloupe											
Havana											
Kingston, Jamaica											
Point de Santiago de Cuba											
St. Thomas											

NOTE.—The cloudiness is estimated by fourths by the Army Signal-Office.

WEST INDIAN SERIES.

[Furnished by co-operation of L'Abbe Marchesi, Almoner of the Military Hospital, St. Pierre, Martinique.]

Place of observation.	BAROMETER. Obser'd. Inches.	BAROMETER. Obser'd. Millimeters.	BAROMETER. Reduced to sea-level. Inches.	BAROMETER. Reduced to sea-level. Millimeters.	THERMOME'R. Degrees, (Fahrenheit.)	THERMOME'R. Degrees, (Centigrade.)	RELATIVE HUMIDITY. Per cent.	WINDS. Direction from.	WINDS. Velocity, (miles per hour.)	WINDS. Force, (scale from 0 to 10.)	Clouds. Scale from 0 to 5.	RAIN. Inches.	RAIN. Millimeters.	State of weather.	Observer.
St. Pierre, Martinique															

Reports for this date not received; reports commenced July 18, 1874.

NOTE.—The originals give the force of wind on a scale of 0 to 6, and cloudiness on a scale of 0 to 4.

CANADIAN SERIES.

[Furnished by co-operation of Prof. G. T. Kingston, Director of the Magnetic Observatory, Toronto, and Superintendent of the Meteorological Office of the Dominion of Canada, telegraphed to the Office of the Chief Signal-Officer daily, by arrangement.]

Place of observation.	Barometer, (inches.)	Barometer, (millimeters.)	Thermometer, (degrees Fahrenheit.)	Humidity, per cent—	WIND. Direction from the—	WIND. Velocity per hour, (English miles.)	CLOUDS. Amount of lower. (Scale from 0 to 4.)	CLOUDS. Amount of upper. (Scale from 0 to 4.)	CLOUDS. Direction of upper, from the—	Rain fall in last eight hours, (inches.)	State of weather.
Brockville, Canada	30.56	776.21	4	....	Calm.	0	0	1	.....	....	Fair.
Cape Roziere, Canada	30.22	767.57	9	68	W.	3	1	1	N. W.	....	Fair.
Chatham, New Brunsw'k	30.40	772.15	8	89	W.	6	0	1	S. W.	....	Clear.
Father Point, Canada	30.40	772.15	7	52	N. W.	7	4	....	.....	....	Cloudy.
Fort Garry, Manitoba	.....	.....	....	....	.....	....	....	....	.....	....	
Halifax, Nova Scotia	30.44	770.62	19	71	N. W.	5	4	....	.....	....	Cloudy.
Kingston, Canada	30.54	775.70	9	72	N. E.	5	0	2	E.	....	Fair.
Montreal, Canada	.....	.....	....	....	.....	....	....	....	.....	....	
Ottawa, Canada	.....	.....	....	....	.....	....	....	....	.....	....	
Port Dover, Canada	30.43	772.92	15	82	N.	7	0	4	.....	....	Cloudy.
Port Stanley, Canada	30.44	773.16	6	95	N.	1	4	....	.....	....	Cloudy.
Quebec, Canada	.....	.....	....	....	.....	....	....	....	.....	....	
Saugeen, Canada	30.45	773.42	15	82	Calm.	0	4	....	.....	....	Cloudy.
Sydney, Canada	30.25	768.84	23	72	W.	9	1	....	.....	....	Cloudy.
Toronto, Canada	30.44	773.16	15	87	N. E.	2	4	4	W.	....	Cloudy.

NOTE.—The cloudiness is estimated by fourths by the Army Signal-Office.

Collated at the Office of the Chief Signal-Officer of the Army, Washington, D. C.

The records which appear in this bulletin are copied from the regular exchanges of this Office, made in each instance in compliance with an especial request, and are published for the uses of the co-operating observers.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assgd.,) Chief Signal-Officer U. S. A.

PAPER 20.

SMITHSONIAN INSTITUTION,
Washington, D. C., December 5, 1873.

DEAR SIR: About a year ago I made a proposition to you in regard to the transfer to your charge of the meteorological system of this institution, which I now beg leave to renew.

The abolition of the Franking privilege, and the loss which the Institution has suffered by the suspension of the First National Bank of this city, renders it necessary that other means than those of the Smithson income be obtained, if the system in question is to be continued. I dislike making an appeal to Congress for the purpose, since it might interfere with the appropriations that will be asked for on account of the system under your charge; but I think the Smithsonian system too valuable to be discontinued for want of a small appropriation for its support.

I have the honor to be, very truly yours,

JOSEPH HENRY,
Secretary Smithsonian Institution.

General A. J. MYER,
Chief Signal-Officer, U. S. A.

PAPER 21.

SMITHSONIAN INSTITUTION,
Washington, D. C., February 2, 1874.

To the Voluntary Meteorological Observers who have reported to the Smithsonian Institution:

It has been from the first a part of the policy of this institution to devote its energies to no field of research which can be as well cultivated by other means; and the United States Government having established a system of meteorological observations,

and having made appropriation for its support, we have thought it for the best interest of the science to transfer the system of meteorological observations which has been so long continued by the Institution to that of the War Department, under the Chief Signal-Officer, General Myer.

The propriety of this transfer will be evident from the fact that the Institution has not the means of paying for printing blanks, postage, and the calculations and monthly publication of the results, and that the assistance which has heretofore been rendered in this way, by the Department of Agriculture, is now discontinued; furthermore, General Myer can combine these observations with those made with standard instruments now under his charge, and out of the whole form a more extended and harmonious system than any at present in existence.

We trust this transfer will meet the approbation of the observers generally, and we hope they will continue their voluntary co-operation—not with the expectation of being fully repaid for their unremitted labor, in many cases for a long series of years, but from the gratification which must result from the consciousness of having contributed to increase the sum of human knowledge. We trust also that the observers will continue to cherish an interest in the welfare and progress of the Smithsonian Institution, while, on our part, we shall in all cases, and at all times, be pleased to continue to answer any communication which may be addressed to us by them on scientific subjects.

We shall retain, for the present, all the records of observations which have been accumulating at the Institution during the last twenty-five years, and continue the work of their reduction and discussion up to the end of the year 1873.

The investigations relative to the rain up to 1866 have been published, and a supplement will be published giving the results since that time.

The temperature investigations are nearly finished, and those relative to the winds will be completed in the course of a month or two. The publication of the results will be made as rapidly as the means at our command will warrant. It is scarcely necessary to say that copies of these works will be distributed to all observers who have contributed the materials upon which these researches are based.

Very respectfully, your obedient servant,

JOSEPH HENRY,
Secretary Smithsonian Institution.

PAPER 22.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE,
Washington, D. C., February 16, 1874.

To the Voluntary Meteorological Observers who have reported to the Smithsonian Institution:

With the approval of the Secretary of War, and at the very courteous suggestion of the distinguished Secretary of the Smithsonian Institution, Prof. Joseph Henry, this Office has assumed such charge of the system of Meteorological Observations hitherto conducted by that Institution as may be found consistent with the interests of the public service. The voluntary Observers heretofore reporting to the Smithsonian Institution are therefore invited to continue their labors, reporting to this Office. Stamped Envelopes, Blank Forms, Instructions, &c., will be supplied upon application.

In assuming this care, the Chief Signal-Officer expresses the hope that the cordial and effective co-operation, so long had on the part of the Observers with the Smithsonian Institution, may be extended to this Office; and he is instructed to say that whatever of aid can be properly given by the War Department to facilitate their researches will be cheerfully tendered.

In recognition of their assistance it is proposed to furnish such Observers as may, by this arrangement, become correspondents of the Office, copies of papers from time to time published by it. The monthly Record Sheets of Observations made since January 1, 1874, in the form as hitherto addressed to the Smithsonian Institution, may hereafter be mailed addressed to the Chief Signal-Officer of the Army, Washington, D. C.

Very respectfully, your obedient servant,

ALBERT J. MYER,
Brig. Gen., (Bvt. Assgd.,) Chief Signal-Officer U. S. A.

PAPER 23. See p. 89

EXPLANATION OF THE COLUMNS. (Form E, See p. 291).

Instructions to Coop Observers transferred to the Signal Corps from the Smithsonian:

BAROMETER.

Observed height.—Under this head are entered the records of observations made on the barometer at three hours daily—7 a. m., 2 p. m., and 9 p. m., (local time)—and, under the proper head, the daily mean will be given opposite the 7 a. m. observation.

Thermometer attached to Barometer.—Under this head are the records of the thermometer attached to the barometer, observations of which are necessary to correct the barometer for variations in height of the mercury on account of difference of temperature.

Barometer corrected for Temperature and Instrumental Error.—In this space are placed the figures which indicate the observations of the barometer reduced to 32° Fahrenheit by means of a table furnished by the Signal-Office; also corrected for the instrumental error, where this is known.

HYGROMETER.

Under this head are entered the records of the dry and wet bulb thermometers, from which the "Relative Humidity" is obtained by means of tables furnished by this Office.

RELATIVE HUMIDITY, OR FRACTION OF SATURATION.

The quantity of water in a state of vapor which a given space can contain depends on the temperature. When a given space has as much water as it can hold at a given temperature, it is said to be saturated with vapor. If the temperature be lowered, a portion of the vapor will be condensed into water, but the space will still be saturated. If the temperature be raised and no more vapor be admitted, the space will only be partially saturated. The numbers under the head of "Relative Humidity," therefore, denote the percentage of saturation, full saturation being indicated by 1.00 and half saturation by 0.50.

STATE OF WEATHER.

In this column will be given the state of the weather at each observation.

EXPOSED THERMOMETER.

This is intended for the register of the thermometer and for the daily mean or average of the three observations. The daily mean, with the maximum and minimum, will be entered in the proper columns and opposite the morning observation.

RAIN AND SNOW.

Under this head are entered the times of beginning and ending of the fall of rain or snow, and the amount, in inches and hundredths, of rain or melted snow collected in a gauge at the surface of the ground; also the depth of the snow. Rain to be indicated by R. and snow by S. When there is no rain or snow, mark 0.

CLOUDS.

Under this head are entered three daily observations on the aspect of the sky, &c.: 1st. The "Amount of cloudiness," designated by figures, 10 being entire cloudiness; 5, half-cloudiness; 0, entire clearness; and intermediate numbers in proportion; 2d. "Motion of the higher clouds," which pass directly over the head of the observer, as given to eight points of the compass. The direction *from* which they move is to be given. This observation is important, as the course of the *higher clouds* is sometimes different from that of the *surface-wind*, which is given in another column. 3d. The "Velocity," or rate of motion, 10 being the highest and 0 apparent rest. 4th. The description or "Kind of clouds," to be entered by means of the following abbreviations: *St., stratus; Cu., cumulus; Cir., cirrus; Nim., nimbus; Cir. st., cirro-stratus; Cu. st., cumulo-stratus; Cir. cu., cirro-cumulus.*

WINDS.

This is for the record of the direction *from* which the wind is blowing, as indicated by a vane, and its force by estimation. The direction is entered in eight points of the

compass: N., N. E., E., S. E., S., S. W., W., N. W. The force is to be estimated and registered by figures from 1 to 10, as in the first column of the following table. The figures in the last column, expressing the number of miles per hour, are *not to be used* in the register.

		Miles per hour.
1.	Very light breeze	2
2.	Gentle breeze	4
3.	Fresh breeze	12
4.	Strong wind	25
5.	High wind	35
6.	Gale	45
7.	Strong gale	60
8.	Violent gale	75
9.	Hurricane	90
10.	Most violent hurricane	100

GENERAL REMARKS AND DIRECTIONS.

PRESSURE OF THE ATMOSPHERE.

The barometer may be conveniently placed within doors, in a room not subjected to sudden changes of temperature, in a good light, but shaded from the direct rays of the sun. It should be secured in a vertical position by means of a plumb-line applied to the front and side. Its height above the surface of the ground and also above the level of the sea ought to be ascertained.

To observe the barometer, first note the degree of the attached thermometer, because the heat of the body may affect this. Next, adjust the cistern until the mercury just touches the ivory point. Then gently tap the case, so as to lessen the adhesion of the mercury to the tube, and measure the height of the column. To do this, lower the vernier until the plane passing through the two lower opposite edges of it is exactly tangent to the surface of the convex top of the column. Lastly, read the vernier, and enter the results in the proper column.

TEMPERATURE.

Heat of all kinds readily passes through the air; and, as all bodies are continually radiating it, a thermometer exposed to a clear sky, which reflects back no rays, will fall several degrees below the temperature of the air; hence, when the object of meteorologists is to obtain the temperature of the air, the thermometer ought not to be exposed to any portion of the sky. Also, from the fact that heat of low intensity does radiate through glass, the thermometer may be placed on the outside of a double window without being materially affected by the heat within.

MOISTURE.

Another important meteorological element is the amount of moisture in the air. This, with the amount and distribution of heat, are elements most essential to the agriculturist, since they principally determine the capability of different districts for the production of vegetable life.

Different views have been entertained as to the manner in which moisture is contained in the air. According to Saussure and the older meteorologists, it was considered as dissolved in the atmosphere, and that the solvent power of the latter for the former increased with the temperature. According, however, to later meteorologists, the vapor in the atmosphere exists in an independent state. Dalton, who first advanced this hypothesis, proved conclusively that water in a vacuum gives off a new portion of vapor which is forced into the same space at every increase of heat, and that, consequently, the density and elastic force of vapor in free space depend entirely on the temperature to which the water is submitted.

RAIN AND SNOW.

Another element of meteorology is the amount of rain which falls on different parts of the earth. The simplest method of determining this would be to expose a cylindrical or square vessel freely to the rain, and to measure the depth of the water which is caught in it after each storm or shower. Greater precision, however, is obtained by employing a rain-gauge, which consists of a circular or square funnel, with a jug below to receive the water and a measuring-vessel to estimate the quantity. If the area of the orifice of the funnel be one hundred times that of the measuring vessel, each inch of the latter

will indicate a hundredth of an inch of rain falling on the earth adjacent. The gauge should be placed so that it may not be sheltered in any direction by buildings or trees from the oblique descent of the rain. The whole apparatus should be sunk in the earth in a cask provided with a wooden cover, with the mouth of the funnel a few inches above the surface of the ground. Care should be taken that the rain does not rebound from the surface into the funnel; to prevent this, the surrounding space may be covered with old carpet or cloth.

To ascertain the amount of water produced from snow, a column of the depth of the fall of snow, and of the same diameter as the amount of the gauge, should be melted and measured as so much rain. As a general average, it will be found that about ten inches of snow will make one of water.

CONCLUSION.

The above directions are applicable to full sets of standard instruments. But few of the observers are furnished with these, and, therefore, results of a very precise character are not, in most instances, to be expected. The observer ought, however, in all cases, to render his results as accurate as possible, and not to consider them of little value even though they should fall far below his ideal standard of perfection. Though the barometer may not give the absolute pressure of the atmosphere, yet it may serve to indicate the time of maximum and minimum pressure, and its oscillations may be comparable with each other, and thus be of value in ascertaining the law of transmission of atmospheric waves. So, also, the thermometer, though its scale may not be entirely correct in every part, yet the probability is that, in the course of the year, the errors will compensate each other and the mean temperature of the place be made known. This may also be the case, although the instrument has sometimes indicated too high and sometimes too low a temperature, on account of its proximity to buildings or other large objects less liable to be suddenly affected by heat or cold.

NOTE.—The Chief Signal-Officer requests that, wherever practicable, observers will make their observations correspond in local time with those made at regular stations, viz: 7.35 a. m., 4.35 p. m., and 11 p. m., Washington mean time. If it is found impracticable to make *all* of the observations at these hours, it is suggested that at least *one* may be made without inconvenience, and, in this case, that at 7.35 a. m. (Washington time) is preferred.

CASUAL PHENOMENA.

Note observations of the following:

Thunder-storms.—Time of occurrence and direction of motion.

Tornadoes.—Time of occurrence, width and direction of path, effects produced, and whether attended by electricity or hail.

Lightning at a distance.—Time of occurrence, direction from observer, whether zigzag, forked, or diffuse. Objects struck by lightning, as trees, buildings, &c.

Hail-storms.—Time of occurrence, direction and width of path, size and quantity of stones, and amount of injury.

Aurora borealis.—Time of appearance and disappearance, time of the formation of arch, beams, and corona, and whether there is a dark cloud below the arch.

Direction and time of occurrence of *meteors, shooting-stars, solar and lunar halos, parhelia,* and *paraselenes.*

Time of early and late *frosts,* particularly first and last.

Depth of ground frozen, in feet and inches; disappearance of frost from the ground.

Time of closing and opening of *rivers, lakes, canals, and streams,* and their extreme rise and fall.

Temperature of wells and springs at least once each season.

Earthquakes.—Time of occurrence, direction of impulse, number of shocks, and effects produced.

Hazy or smoky appearance of the atmosphere.—Time of occurrence and intensity.

(Form E.)

WAR DEPARTMENT, SIGNAL-SERVICE UNITED STATES ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

Meteorological record for the month of ——, 187–.

Date of observation.	Time of observation.	Observed reading of barometer.	THERM.		Barometer corrected for temperature and instrumental error.	HYGROM.		Relative humidity.	WIND.		LOWER CLOUDS		UPPER CLOUDS.			RAIN OR SNOW.		Amount of rain or melted snow, (inches.)	Maximum and minimum thermometers.	DAILY MEAN.		Weather.	Remarks.
			Attached to barometer.	Exposed, (open air.)		Dry bulb.	Wet bulb.		Direction from which it blows.	Force.	Kind.	Amount, scale of 10.	Kind.	Amount.	Direction, (moving from—)	Time commenced	Time ended.			Barometer.	Thermometer.		
A. M..																							
P. M..																							
M..																							
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Meteorological record for the month of ——, 187-.—Continued.

Date of observation.	Time of observation.	Observed reading of barometer.	THERM.		Barometer corrected for temperature and instrumental error.	HYGROM.		Relative humidity.	WIND.		LOWER CLOUDS		UPPER CLOUDS.			RAIN OR SNOW.		Amount of rain or melted snow, (inches.)	Maximum and minimum thermometers.	DAILY MEAN.		Weather.	Remarks.
			Attached to barometer.	Exposed, (open air.)		Dry bulb.	Wet bulb.		Direction from which it blows.	Force.	Kind.	Amount, scale of 10.	Kind.	Amount.	Direction, (moving from—)	Time commenced.	Time ended.			Barometer.	Thermometer.		
A. M..																							
P. M..																							
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Monthly means .....

——— ———, *Observer.*

Station, ———.
Latitude, ———.
Longitude, ———.

Number of barometer used during month, ———.
Instrumental error, ———.
Elevation of surface of mercury in cistern of barometer above sea-level, ——— feet.

PAPER 24.

METEOROLOGICAL REGISTER.

Station, ——. *Latitude,* ——. *Longitude,* ——. *Altitude of barometer above sea,* —— *feet.*

187—. Month.	Thermometer.				Self-registering thermometer.			Movements of atmosphere.									Amount of cloudiness.			Rain and melted snow.			Remarks.
								7 a. m.			2 p. m.			9 p. m.									
								Winds.		Motion of clouds.	Winds.		Motion of clouds.	Winds.		Motion of clouds.							
	7 a. m.	2 p. m.	9 p. m.	Dailymean.	Maximum.	Minimum.	Mean.	D.	F.		D.	F.		D.	F.		7 a. m.	2 p. m.	9 p. m.	Began.	Ended.	Quantity.	

SUMMARIES OF WINDS AND WEATHER.

N.		N. E.		E.		S. E.		S.		S. W.		W.		N. W.	
Number.	Force.	Number.	Force.	Number.	Force.	Number.	Force.	Number.	Force.	Number.	Force.	Number.	Force.	Number.	Force.

Average cloudiness. } Number of days of rain and hail. } Number of days of snow. }

——, *Surgeon U. S. Army.*

PAPER 24—Continued.

187—.	Dry and wet bulb thermometer.													Remarks.
Month.	7 a. m.		2 p. m.		9 p. m.		Month.	7 a. m.		2 p. m.		9 p. m.		
	Dry-bulb.	Wet-bulb.	Dry-bulb.	Wet-bulb.	Dry-bulb.	Wet-bulb.		Dry-bulb.	Wet-bulb.	Dry-bulb.	Wet-bulb.	Dry-bulb.	Wet-bulb.	
1							17							
2							18							
3							19							
4							20							
5							21							
6							22							
7							23							
8							24							
9							25							
10							26							
11							27							
12							28							
13							29							
14							30							
15							31							
16														
Monthly mean														

187—.	Barometer and thermometer attached.						Remarks.
Month.	7 a. m.		2 p. m.		9 p. m.		
	Bar.	Ther.	Bar.	Ther.	Bar.	Ther.	
1							
2							
3							
4							
5							
6							
7							
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PAPER 28.

[Circular No. 7.]

WAR DEPARTMENT, OFFICE CHIEF SIGNAL-OFFICER,
Washington, D. C., March 10, 1874.

The following rules will be observed in addition to those contained in General Orders No. 28, War Department, Office Chief Signal-Officer, dated Washington, September 1, 1873:

The officer or assistant in charge of the preparation of facts, &c., for publication, will, in addition to his other duties, determine the percentage of verification of the current probabilities in accordance with the following instructions:

1. The blank forms already prepared to facilitate this work will be used with the following modifications: The column of the blank headed "Wind velocity" will not be used. The percentage of verifications of predictions referring to wind will be determined by considering only that portion of the predictions which refers to the direction of the wind. Predictions referring to the velocity of the wind are of decided importance, and should be frequently made, but the limited number of stations now reporting will not justify the consideration of such predictions as an independent element of verifications.

2. The sixth column of the blank will be used for special predictions, and so designated. Three blanks will be used for each month's percentages, and will be numbered, respectively, 1, 2, and 3; blank No. 1 referring to New England, Middle States, South Atlantic States, and Eastern Gulf States; blank No. 2, referring to the Lower Lakes, Upper Lakes, Tennessee, and Ohio Valley, and Western Gulf States; blank No. 3 referring to Upper Mississippi Valley, Lower Missouri Valley, the Northwest, and the Pacific States.

3. The probabilities made up from each report will be carefully compared with the facts as obtained from the three succeeding tri-daily reports unless the prediction applies to a definite time, in which case the prediction will determine the facts with which it is to be compared.

4. In estimations of percentages it will be determined whether the conditions announced as to prevail in each district named have prevailed over geographical sections of that district to the amount of one-fourth, one-half, three-fourths, or the whole of the extent of the district. All predictions which are found to be more than three-fourths verified will be considered completely verified, and represented by 100, or one hundred per cent., in that column of the blank to which the prediction refers. Predictions which are not wholly verified will be represented in the proper column of the blank by 75 per cent., 50 per cent., or 25 per cent., as the facts may warrant. Predictions which fall below 25 per cent. in verification will be rated as not verified, and represented by 000 in the proper column.

5. If in the probabilities for any particular district any class of prediction is not referred to, such omission will be represented by a dash (—).

6. The percentage of verifications of a single class of predictions will be determined by dividing the sum of the percentages of that class for the month by the number of predictions of that particular class. The percentage of verifications of probabilities for any district will be determined by dividing the sum of the percentages of the several classes of predictions by the number of classes. The percentage of verifications of probabilities for the United States will be determined by dividing the sum of the percentage of verifications of probabilities by the number of districts.

7. A maximum percentage of verifications can only be obtained when the four elements under each district are named in the probabilities of the entire month.

8. The percentage of failures to predict for any element will be determined by dividing the number of failures to predict for that particular element by the entire number of tri-daily reports during the month.

PAPER 29.

PERCENTAGE OF VERIFICATION OF PROBABILITIES.

No. 1.—*For September*, 1874.

September, 1874.	New England States.					Middle States.					South Atlantic States.					Eastern Gulf States.				
	Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.	
1	100	100	100	75	....	100	100	100	100	..	75	100	100	100	..	100	100	100	75	..
	100	75	0	50	....	100	50	100	50	..	100	100	100	25	..	75	100	100	100	..
	100	75	25	75	....	100	25	100	0	..	75	75	75	75	..	75	100	100	75	..
2	100	75	—	25	....	100	100	100	—	..	100	75	100	75	..	100	100	100	25	..
	75	25	50	100	....	100	50	75	100	..	100	100	100	100	..	75	100	100	100	..
	75	75	25	50	....	100	50	75	75	..	100	100	100	75	..	—	50	50	25	..
3	100	75	50	25	....	75	75	100	75	..	100	25	100	100	..	75	50	100	75	..
	0	50	—	.....	....	25	100	—	—	..	100	100	100	0	..	100	75	100	25	..
	100	75	100	100	....	75	75	100	100	..	100	50	75	100	..	50	75	75	100	..
4	100	75	100	75	....	100	75	100	25	..	100	100	100	100	..	100	75	100	0	..
	100	100	100	100	....	100	100	100	100	..	50	75	50	100	..	100	100	—	100	..
	100	100	100	25	....	100	100	—	0	..	100	75	100	0	..	100	100	0	50	..
5	25	100	100	100	....	75	100	100	100	..	75	75	75	50	..	100	100	75	100	..
	100	100	100	100	....	100	100	100	100	..	75	100	50	75	..	25	100	—	—	..
	75	100	100	100	....	100	100	75	75	..	100	100	50	100	..	50	50	100	100	..
6	50	75	—	100	....	50	75	75	100	..	75	75	50	100	..	50	100	100	100	..
	100	100	75	0	....	100	100	50	100	..	50	50	100	0	..	75	75	100	25	..
	100	75	75	100	....	190	100	50	100	..	100	100	100	100	..	50	100	100	100	..
7	100	75	100	25	50	100	100	75	100	..	75	75	100	100	..	100	100	—	100	..
	100	75	75	75	....	75	75	100	0	..	100	50	100	100	..	100	100	100	100	..
	100	50	100	100	....	50	75	100	50	..	75	25	100	0	..	100	100	100	0	..
8	50	75	100	100	....	25	75	100	100	..	75	100	100	100	..	75	100	100	100	..
	50	100	—	0	....	50	100	—	25	..	75	50	50	100	..	25	100	100	100	..
	100	75	100	100	....	0	75	25	100	..	75	75	100	100	..	50	100	100	0	..
9	100	25	100	50	....	100	75	25	190	..	75	100	50	100	..	25	100	100	0	..
	100	100	100	0	....	100	25	75	100	0	25	100	0	50	..	100	100	100	0	..
	100	50	100	100	....	100	50	100	100	..	75	100	50	0	..	100	100	100	25	..
10	100	100	100	100	....	100	25	25	100	..	75	100	50	100	..	100	75	100	100	..
	75	100	50	25	....	100	50	75	100	..	100	75	100	0	..	75	100	100	100	..
	100	100	100	100	....	100	75	50	75	..	100	75	100	0	..	75	100	100	100	..
11	100	100	25	100	....	100	100	100	75	..	50	100	50	50	..	100	100	100	100	..
	100	100	0	100	....	100	50	50	0	..	100	100	100	100	..	100	100	0	0	0
	100	100	100	100	....	100	100	75	25	..	100	100	100	100	..	100	100	100	100	..

PERCENTAGE OF VERIFICATION OF PROBABILITIES—Continued.

No. 1.—*For September*, 1874.

September, 1874.	New England States.				Middle States.				South Atlantic States.				Eastern Gulf States.			
	Weather.	Wind, direction.	Temperature.	Barometer.	Weather.	Wind, direction.	Temperature.	Barometer.	Weather.	Wind, direction.	Temperature.	Barometer.	Weather.	Wind, direction.	Temperature.	Barometer.
12	100	75	100	75	100	75	50	0	100	100	—	100	100	100	50	100
	75	100	100	0	100	100	50	0	75	100	100	50	100	100	100	75
	100	100	100	—	75	100	100	100	100	100	100	100	100	100	100	100
13	75	100	100	50	75	100	50	50	100	100	100	100	100	100	100	100
	100	50	100	100	100	100	100	100	75	75	—	50	100	100	100	100
	100	100	100	100	75	100	50	100	50	50	100	25	100	50	75	100
14	75	100	100	100	75	100	50	100	100	75	100	100	100	100	75	100
	100	100	50	100	100	75	50	100	100	100	50	100	100	50	100	75
	100	100	100	100	100	50	50	100	75	50	—	100	75	75	—	100
15	100	100	100	100	100	100	50	100	100	50	100	100	100	25	50	100
	100	75	25	0	25	0	100	25	50	50	0	100	100	75	50	0
	100	75	75	100	0	25	100	50	50	50	25	0	25	25	50	0
16	100	100	25	0	50	100	—	100	50	—	100	50	100	25	25	0
	100	50	100	100	25	25	50	50	75	50	75	100	100	75	0	25
	100	50	100	100	0	50	—	25	75	25	25	100	100	25	100	75
17	100	75	100	100	100	100	100	75	75	100	100	100	0	100	100	100
	100	100	100	0	50	75	50	0	100	100	100	0	75	100	100	0
	100	100	100	50	75	50	75	100	100	100	100	100	75	100	100	100
18	100	75	100	75	75	50	100	100	75	100	100	100	75	100	100	0
	100	75	75	100	75	100	75	100	75	100	50	100	100	50	75	100
	100	100	75	100	100	100	50	50	75	100	25	50	100	50	100	75
19	100	75	75	100	100	100	100	100	75	100	50	100	100	25	75	100
	100	100	75	100	75	75	25	75	75	100	100	25	100	100	100	100
	100	75	100	75	75	75	25	75	75	25	—	100	100	0	—	100
20	100	75	75	100	100	50	100	100	75	100	75	100	100	100	100	100
	25	0	100	0	100	100	100	100	100	25	100	100	100	100	50	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0
21	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	75
	100	100	75	100	100	75	100	100	100	100	100	100	100	100	50	50
	100	100	75	100	100	75	75	100	100	100	100	0	100	100	100	100
22	100	100	100	100	100	100	75	100	100	100	25	50	100	100	50	100
	100	100	75	75	100	100	100	100	100	100	75	75	100	100	100	75
	100	100	75	50	100	100	100	100	100	100	100	75	100	100	100	100
23	75	100	100	50	100	100	100	100	100	100	100	100	75	100	100	100
	100	100	100	75	100	100	100	100	75	100	100	25	50	75	100	100
	100	100	75	100	100	100	100	0	75	100	100	0	50	100	50	50

24	100	100	100	75	....	100	100	100	100	..	100	100	50	50	..	50	100	100	0	..
	100	100	100	100	....	100	100	100	100	..	25	100	25	75	..	100	100	100	75	..
	100	100	100	100	....	100	75	100	100	..	50	100	100	75	..	100	100	100	50	..
25	100	100	100	100	....	100	100	100	100	..	100	100	100	100	..	100	100	100	100	..
	100	100	50	100	....	100	100	100	100	..	50	75	100	0	..	100	50	25	50	..
	100	100	100	100	....	100	100	100	100	..	50	—	50	0	..	100	100	50	0	..
26	100	100	100	100	....	100	100	100	100	..	75	100	100	100	..	100	100	100	50	..
	50	100	0	100	....	75	100	25	100	..	25	100	100	100	..	50	100	100	0	..
	100	50	50	100	....	100	100	100	100	..	100	100	25	0	..	0	100	100	0	..
27	50	100	25	100	....	50	75	50	100	..	100	100	—	100	..	100	100	—	100	..
	100	100	100	75	....	75	50	—	100	..	100	75	100	100	..	25	100	0	100	..
	75	100	50	100	....	100	50	100	100	..	100	75	75	75	..	100	100	100	100	..
28	100	75	100	100	....	100	75	100	100	..	100	100	—	100	..	100	100	100	100	..
	100	100	100	100	....	100	75	100	100	..	100	100	75	100	..	100	100	100	100	..
	100	100	100	100	....	100	75	100	50	..	100	100	50	100	..	100	100	50	100	..
29	100	75	100	100	....	75	100	100	100	..	100	100	100	100	..	100	100	100	100	..
	75	0	100	50	0	100	100	100	100	..	100	100	100	100	..	100	100	100	100	..
	100	100	100	—	100	50	75	100	100	..	100	100	100	100	..	100	75	100	100	..
30	75	100	100	100	....	75	100	100	100	..	100	100	100	100	..	100	100	100	50	..
	100	75	75	100	....	100	100	100	50	..	100	75	25	100	..	100	100	100	100	..
	100	75	75	75	....	100	75	100	50	..	100	75	50	100	..	100	100	50	100	..
Total percentages	8,225	7,600	7,100	6,825	150	7,625	7,275	6,850	6,975	0	7,550	7,475	6,675	6,625	..	7,550	7,875	7,150	6,375	0
Number of failures to predict	0	0	4	3	....	0	0	6	2	..	0	2	6	0	..	1	0	6	1	..
Number of predictions	90	90	86	87	3	90	90	84	88	1	90	88	84	90	0	89	90	84	89	1
Percentage of verifications	91.388	84.444	82.558	78.448	50	84.727	80.833	81.547	79.261	0	83.888	84.943	79.464	73.611	..	84.831	87.500	85.119	71.629	0
Percentage of failures	0	0	.0444	.0333	....	0	0	.0666	.0222	..	0	.0222	.0666	0	..	.0111	0	.0666	.011	..

PERCENTAGE OF VERIFICATION OF PROBABILITIES.

No. 2.—*For September*, 1874.

September, 1874.	Western Gulf States.					Tennessee and Ohio Valley.					Lower Lake region.					Upper Lake region.				
	Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.	
1	100	100	100	100	....	100	100	100	100	..	100	50	100	100	..	100	100	100	100	..
	100	—	100	0	....	100	50	100	0	..	100	25	100	100	..	100	100	75	—	..
	75	100	75	50	....	100	50	100	0	..	100	100	—	0	..	25	50	—	100	..
2	100	100	100	50	....	100	75	100	0	..	75	100	100	100	..	100	50	—	50	..
	100	75	75	50	....	75	75	50	50	..	25	100	100	100	..	100	50	100	100	..
	—	50	50	25	....	100	50	25	25	..	100	75	100	100	..	100	50	100	75	..
3	0	25	50	0	....	0	75	25	25	..	100	75	100	100	..	100	50	100	50	..
	100	50	75	100	....	75	75	75	100	..	25	100	—	—	..	75	100	100	100	..
	25	75	100	50	....	100	25	50	0	..	100	100	100	0	..	25	100	100	100	..
4	75	75	100	50	....	75	100	100	75	..	100	100	100	0	..	25	100	100	100	..
	100	100	—	100	....	50	100	75	0	..	25	100	100	100	..	100	75	100	75	..
	75	75	100	50	....	100	100	25	25	..	100	50	100	100	..	100	25	100	50	..
5	100	100	0	50	....	100	100	25	0	..	100	100	100	75	..	75	100	50	25	..
	100	75	—	100	100	100	25	100	0	..	100	100	75	100	..	100	75	100	50	..
	100	75	100	50	....	100	100	100	100	..	100	100	50	100	..	100	50	100	50	..
6	100	75	100	100	....	50	100	100	0	..	100	100	50	100	..	75	100	100	100	..
	100	100	100	100	....	100	100	100	0	..	100	50	100	75	..	100	100	100	100	..
	25	100	100	100	....	100	100	75	50	..	100	75	75	100	..	50	100	100	100	..
7	100	100	—	100	....	100	100	75	100	..	75	100	—	50	..	100	100	—	100	..
	75	100	—	100	....	0	50	100	100	..	100	50	100	100	..	0	25	100	0	..
	100	100	100	25	....	100	75	100	0	..	100	100	100	100	..	100	100	100	100	..
8	100	100	100	50	....	100	100	100	0	..	100	100	100	100	..	100	50	100	100	..
	100	100	100	100	....	0	75	100	100	..	50	50	—	50	..	75	100	100	75	..
	100	100	100	0	....	0	100	25	100	..	100	100	75	100	..	100	100	50	100	..
9	100	100	100	100	....	50	75	100	100	..	100	75	75	100	..	50	100	25	100	..
	100	100	100	100	....	75	100	100	100	..	100	50	100	0	..	50	100	100	75	..
	100	100	100	0	....	50	50	0	100	..	100	100	100	100	..	100	100	50	100	..
10	100	75	100	0	....	100	100	50	50	..	50	75	75	100	..	100	100	100	100	..
	100	100	100	100	....	75	100	50	25	..	50	100	100	100	..	75	50	75	100	..
	100	100	100	100	....	100	75	100	100	..	100	75	75	100	..	100	75	50	100	..
11	100	100	100	100	....	100	100	75	100	..	75	100	75	100	..	100	100	50	100	..
	100	100	50	0	....	100	50	100	0	..	100	100	75	100	..	100	50	75	75	..
	100	100	75	100	0	100	100	100	100	..	100	25	50	100	..	75	75	75	100	..

12	100	100	75	100	75	—	50	100	100	100	100	0	75	75	100	100		
	100	100	100	100	100	25	75	100	75	100	100	50	75	100	100	100		
	100	100	100	100	100	50	100	100	100	75	50	100	75	100	75	100		
13	100	100	100	100	100	25	75	25	75	50	100	100	75	75	100	75		
	100	100	100	100	100	75	50	100	100	75	50	100	100	50	50	75		
	100	100	0	100	100	100	75	100	100	100	100	100	100	25	50	75		
14	75	100	0	75	75	100	75	100	100	100	100	100	100	75	100	100		
	100	75	50	0	100	100	100	100	100	75	100	50	100	100	100	100		
	50	100	100	100	100	100	100	100	100	100	100	50	100	75	100	100		
15	100	75	100	100	100	—	100	100	100	25	0	25	100	75	100	100		
	100	100	25	0	0	100	100	75	25	100	100	100	100	100	100	100		
	100	50	25	0	25	100	100	50	75	100	100	100	100	100	75	50		
16	100	50	25	0	100	100	100	0	75	75	75	75	100	100	100	100		
	75	50	100	100	100	100	—	50	0	100	25	0	75	75	75	75		
	100	50	25	100	100	100	0	50	50	100	—	100	50	100	100	100		
17	0	75	100	25	100	100	100	25	100	75	100	100	100	100	—	100		
	100	100	50	50	100	100	0	25	25	75	50	50	100	100	100	100		
	75	100	50	0	100	100	100	50	100	100	50	50	75	100	100	100		
18	100	100	75	50	100	25	100	100	100	50	100	100	25	100	100	0		
	100	75	50	0	100	50	50	75	100	50	50	100	100	50	100	75		
	50	50	100	0	75	25	0	50	100	75	—	100	75	75	100	100		
19	100	100	100	100	75	75	100	75	100	100	100	75	75	100	100	100		
	100	75	25	100	100	100	75	100	100	100	100	100	100	100	75	100		
	100	100	100	100	100	100	100	100	100	100	0	100	100	100	100	100		
20	100	50	50	100	100	25	100	100	100	100	0	100	100	50	100	100		
	100	50	50	25	25	25	—	—	100	75	100	100	100	75	100	100		
	100	100	100	0	100	100	100	100	100	100	100	75	75	0	75	100		
21	100	100	100	0	100	100	100	100	100	100	75	75	75	100	100	100		
	75	100	75	100	100	75	0	100	50	100	100	100	50	75	100	50		
	75	100	100	100	100	100	100	100	75	100	100	100	75	75	25	50		
22	100	100	100	100	100	100	100	100	100	100	—	100	75	75	75	100		
	100	100	—	100	100	100	100	100	100	50	0	75	100	0	100	25		
	75	100	100	100	75	75	100	100	100	25	100	100	100	75	100	50		
23	100	100	100	100	100	100	100	100	100	75	100	100	100	75	100	100		
	100	75	—	0	100	100	50	50	0	25	25	50	50	50	100	0		
	100	100	100	25	75	75	100	0	75	75	100	75	75	75	100	50		
24	100	100	100	0	75	100	100	50	100	100	100	100	75	75	100	75		
	75	75	50	100	75	50	100	50	100	75	25	100	75	100	75	100		
	50	100	50	100	75	50	—	100	100	100	100	0	50	100	100	100		
25	50	100	100	100	100	100	100	75	100	100	100	0	75	100	100	0		
	75	100	25	50	25	100	100	100	100	100	100	100	100	50	—	75		
	100	25	75	100	75	100	—	0	100	100	25	100	100	100	75	75		
26	100	50	—	100	100	75	0	100	100	100	75	100	100	100	100	100		
	100	100	100	75	50	25	50	50	100	100	50	100	50	100	100	100		
	100	100	100	100	100	100	100	25	25	100	100	100	100	75	100	100		
27	100	100	100	100	100	100	100	0	50	100	25	100	100	100	100	100		
	100	50	100	100	100	100	0	50	25	50	100	100	100	100	25	100		
	100	100	100	100	75	100	100	75	25	100	100	100	100	100	100	100		
28	100	100	100	100	75	100	0	75	50	100	100	100	100	100	75	100		
	100	100	75	100	75	100	100	0	25	75	100	100	100	25	25	25		
	100	75	75	0	100	75	25	100	75	75	100	75	100	100	100	100		

PERCENTAGE OF VERIFICATION OF PROBABILITIES—Continued.

No. 2.—*For September*, 1874.

September, 1874.	Western Gulf States.					Tennessee and Ohio Valley.					Lower Lake region.					Upper Lake region.				
	Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.	
29	100	75	75	100	....	100	75	0	75	..	50	75	100	25	..	100	100	75	100	..
	100	50	100	100	....	100	75	75	100	..	50	100	100	100	..	100	75	25	75	..
	100	75	100	100	....	100	75	50	100	..	50	100	100	100	..	100	100	25	75	..
30	100	100	100	50	....	100	100	50	100	..	100	100	100	100	..	100	75	100	75	..
	100	100	100	100	....	100	50	100	0	..	75	50	0	0	..	75	75	100	75	..
	75	100	100	100	....	100	100	100	100	..	50	100	0	0	..	75	100	100	100	..
Total percentages	7,050	7,700	6,825	6,225	100	7,570	7,125	6,425	5,650	..	7,300	7,475	6,450	6,925	..	7,675	7,225	7,050	7,450	..
Number of failures to predict	1	1	7	0	....	0	2	4	1	..	0	0	7	1	..	0	0	5	1	..
Number of predictions	89	89	83	90	2	90	88	86	89	..	90	90	83	89	..	90	90	85	89	..
Percentage of verifications	79.214	86.518	82.229	69.167	50	84.111	80.963	74.709	63.483	..	81.111	83.055	77.711	77.809	..	85.277	80.287	82.941	83.708	..
Percentage of failures	.0111	.0111	.0777	0	....	0	.0222	.0444	.0111	..	0	0	.0777	.0111	..	0	0	.0555	.0111	..

PERCENTAGE OF VERIFICATION OF PROBABILITIES.

No. 3.—*For September*, 1874.

September, 1874.	Upper Mississippi Valley.					Lower Missouri Valley.					The Northwest.					Pacific States.				
	Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.	
1	100	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	75	50	—	50	....	75	100	—	100	....	100	100	—	100	....	....	....	....	....	....
	75	100	—	100	....	75	100	—	100	....	100	100	—	100	....	....	....	....	....	....
2	25	100	—	100	....	75	100	100	100	....	75	100	100	100	....	....	....	....	....	....
	50	100	75	100	....	50	75	100	100	....	75	50	50	75	....	....	....	....	....	....
	75	75	75	75	....	50	25	50	50	....	100	25	25	50	....	....	....	....	....	....
3	100	75	100	75	....	75	25	100	25	....	100	25	100	50	....	....	....	....	....	....
	50	75	100	—	....	25	75	100	—	....	50	100	100	—	....	....	....	....	....	....
	25	75	75	100	....	50	100	100	100	....	50	100	75	100	....	....	....	....	....	....
4	25	100	50	100	....	75	100	100	100	....	75	100	100	100	....	....	....	....	....	....
	0	50	100	100	....	0	100	100	100	....	0	100	100	100	....	....	....	....	....	....
	100	100	100	75	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
5	100	50	100	25	....	50	100	100	50	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	50	....	100	100	100	50	....	75	50	100	100	....	....	....	....	....	....
6	75	100	100	50	....	75	100	100	75	....	100	100	100	75	....	....	....	....	....	....
	100	100	100	50	....	100	100	100	50	....	75	100	100	100	....	....	....	....	....	....
	50	100	100	50	....	50	100	100	25	....	100	100	100	100	....	....	....	....	....	....
7	100	100	100	50	....	100	100	100	25	....	50	100	100	50	....	....	....	....	....	....
	0	100	100	25	....	—	—	—	—	....	100	100	100	25	....	....	....	....	....	....
	100	100	100	100	....	75	100	100	75	....	25	100	100	0	....	....	....	....	....	....
8	—	—	—	—	....	75	75	100	100	....	100	100	100	25	....	....	....	....	....	....
	75	75	0	100	....	100	50	50	100	....	100	50	100	50	....	....	....	....	....	....
	25	100	100	100	....	100	50	100	100	....	100	50	50	100	....	....	....	....	....	....
9	25	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	0	....	75	100	100	25	....	100	75	100	100	....	....	....	....	....	....
	50	100	50	50	....	100	100	50	100	....	75	50	75	0	....	....	....	....	....	....
10	75	50	75	50	....	100	50	100	0	....	50	50	50	100	....	....	....	....	....	....
	75	100	100	100	....	50	100	100	100	....	75	50	100	75	....	....	....	....	....	....
	50	75	—	25	....	50	75	—	100	....	25	50	75	100	....	....	....	....	....	....
11	100	100	100	25	....	100	75	75	50	....	25	100	—	50	....	....	....	....	....	....
	100	25	0	50	....	100	25	0	0	....	100	50	50	50	....	....	....	....	....	....
	75	100	100	100	....	75	100	100	100	....	100	50	25	50	....	....	....	....	....	....
											100	100	100	100	....	....	....	....	....	....

PERCENTAGE OF VERIFICATION OF PROBABILITIES—Continued.

No. 3.—*For September*, 1874.

September, 1874.	Upper Mississippi Valley.					Lower Missouri Valley.					The Northwest.					Pacific States.				
	Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.		Weather.	Wind, direction.	Temperature.	Barometer.	
12	100	100	100	100	....	100	100	100	100	....	100	75	100	100	....	....	....	....	....	....
	75	75	100	100	....	75	50	100	100	....	100	25	100	100	....	....	....	....	....	....
	100	100	100	0	....	100	100	100	0	....	100	100	100	0	....	....	....	....	....	....
13	100	100	100	100	....	50	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	25	50	50	....	100	25	25	50	....	100	100	25	25	....	....	....	....	....	....
	100	25		50	....	75	25		25	....	75	0		25	....	....	....	....	....	....
14	100	75	100	75	....	75	50	100	25	....	50	50	100	50	....	....	....	....	....	....
	100	75	75	100	....	100	75	25	75	....	100	25	50	50	....	....	....	....	....	....
	100	75	100	100	....	100	25	100	50	....	100	25	100	25	....	....	....	....	....	....
15	100	50	50	100	....	100	75	25	100	....	100	75	0	50	....	....	....	....	....	....
	100	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	100	....	75	100	75	100	....	75	100	75	100	....	....	....	....	....	....
16	100	100	100	100	....	100	100	75	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	100	....	100	100	100	75	....	100	100	100	100	....	....	....	....	....	....
	50	100	75	100	....	100	50	50	50	....	100	75	25	75	....	....	....	....	....	....
17	100	100	100	100	....	100	75	50	50	....	100	50	0	50	....	....	....	....	....	....
	0	50	75	100	....	25	75	100	100	....	25	100	100	50	....	....	....	....	....	....
	0	25	100	0	....	25	50	75	50	....	25	25	100	50	....	....	....	....	....	....
18	100	100	100	100	....	100	75	100	100	....	100	100	100	100	....	....	....	....	....	....
	75	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
19	100	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	100	....	75	50	25	100	....	100	75	100	100	....	....	....	....	....	....
	100	75	100	0	....	75	75	100	100	....	100	75	100	100	....	....	....	....	....	....
20	100	100	100	100	....	50	75	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	50	....	75	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	75	100	100	....	75	50	100	100	....	75	50	100	100	....	....	....	....	....	....
21	100	100	100	100	....	100	75	100	100	....	100	75	100	100	....	....	....	....	....	....
	25	100	100	100	....	0	100	100	100	....	0	100	100	100	....	....	....	....	....	....
	100	100	50	100	....	100	100	25	75	....	100	100	0	50	....	....	....	....	....	....
22	100	75	25	100	....	100	75	50	50	....	100	75	50	50	....	....	....	....	....	....
	100	25	100	100	....	100	50	100	100	....	100	50	100	100	....	....	....	....	....	....
	100	50	100	100	....	100	100	100	100	....	100	75	100	75	....	....	....	....	....	....
	100	50	100	50	....	100	100	100	100	....	100	75	100	50	....	....	....	....	....	....

23	100	75	100	50	....	100	100	100	100	....	100	75	100	75	....	....	....	....	....	....
	50	100	50	—	....	50	100	100	—	....	0	100	100	—	....	....	....	....	....	....
	100	50	100	100	....	100	75	100	100	....	100	75	100	100	....	....	....	....	....	....
24	100	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	100	....	100	100	75	100	....	100	50	25	100	....	....	....	....	....	....
	25	100	100	100	....	50	100	100	100	....	75	100	100	100	....	....	....	....	....	....
25	100	100	100	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	75	50	50	100	....	25	25	50	100	....	75	25	0	100	....	....	....	....	....	....
	100	100	0	100	....	100	100	0	100	....	100	100	0	100	....	....	....	....	....	....
26	75	100	—	100	....	100	100	100	100	....	100	100	100	100	....	....	....	....	....	....
	75	100	100	50	....	100	100	100	75	....	100	100	100	100	....	....	....	....	....	....
	50	100	0	100	....	100	100	50	100	....	100	100	50	100	....	....	....	....	....	....
27	75	100	100	100	....	100	75	50	100	....	100	100	75	100	....	....	....	....	....	....
	100	100	100	75	....	100	50	100	50	....	100	75	100	75	....	....	....	....	....	....
	100	100	100	100	....	100	100	100	50	....	100	100	100	50	....	....	....	....	....	....
28	100	100	100	100	....	100	100	100	25	....	100	100	100	75	....	....	....	....	....	....
	100	25	50	25	....	100	50	50	75	....	100	25	0	50	....	....	....	....	....	....
	100	100	75	100	....	100	100	50	100	....	100	100	100	100	....	....	....	....	....	....
29	100	100	100	100	....	100	75	100	100	....	100	100	100	100	....	....	....	....	....	....
	100	100	100	50	....	100	0	75	50	....	100	25	100	0	....	....	....	....	....	....
	100	100	100	75	....	100	50	100	25	....	100	50	100	0	....	....	....	....	....	....
30	100	100	50	100	....	100	100	75	100	....	100	100	100	100	....	....	....	....	....	....
	100	50	100	50	....	100	75	75	50	....	100	25	25	25	....	....	....	....	....	....
	100	25	50	100	....	100	25	0	25	....	100	50	0	50	....	....	....	....	....	....
Total percentages	7,125	7,425	7,025	6,875	....	7,300	7,000	6,975	6,700	....	7,775	6,900	6,975	6,750	....	....	....	....	....	....
Number of failures to predict	2	1	8	4	....	2	2	6	4	....	0	0	4	2	....	....	....	....	....	....
Number of predictions	88	89	82	86	....	88	88	84	86	....	90	90	86	88	....	....	....	....	....	....
Percentage of verifications	80.965	83.428	85.671	79.941	....	82.953	79.545	83.033	79.905	....	86.390	76.666	81.103	76.603	....	....	....	....	....	....
Percentage of failures	.6222	.0111	.0888	.0444	....	.0222	.0222	.6666	.0444	....	0	0	.0444	.0222	....	....	....	....	....	....

PERCENTAGE OF VERIFICATION OF PROBABILITIES.

No. 4.—For September, 1874.

	Percentages of--					Verifications.			Percentage of failures to predict.									
	Weather.	Wind, direction.	Temperature.	Barometer.	Specials.	Totals, (except specials.)			Weather.	Wind, direction.	Temperature.	Barometer.	Total.	Weather.	Wind, direction.	Temperature.	Barometer.	
New England	91.388	84.444	82.558	78.448	50	.....	84.2095	.....	0	0	.0444	.0333	.0194	.....	.....	.....	.....	.....
Middle States	84.727	80.833	81.547	79.261	0	.....	81.5920	.....	0	0	.0666	.0222	.0222	.....	.....	.....	.....	.....
South Atlantic States	83.888	84.943	79.464	73.611	....	.....	80.4765	.....	0	.0222	.0666	0	.0222	.....	.....	.....	.....	.....
Eastern Gulf States	84.831	87.500	85.119	71.629	0	.....	82.2697	.....	.0111	0	.0666	.0111	.0222	.....	.....	.....	.....	.....
Western Gulf States	79.214	86.518	82.229	69.167	50	.....	79.2820	.....	.0111	.0111	.0777	0	.0249	.....	.....	.....	.....	.....
Tennessee and Ohio Valley	84.111	80.963	74.709	63.483	....	.....	75.8165	.....	0	.0222	.0444	0	.0166	.....	.....	.....	.....	.....
Lower Lake Region	81.111	83.055	77.711	77.809	....	.....	79.9215	.....	0	0	.0777	.0111	.0222	.....	.....	.....	.....	.....
Upper Lake Region	85.278	80.287	82.941	83.708	....	.....	83.0585	.....	0	0	.0555	.0111	.0166	.....	.....	.....	.....	.....
Upper Mississippi Valley	80.965	83.428	85.671	79.941	....	.....	82.5012	.....	.0222	.0111	.0888	.0444	.0416	.....	.....	.....	.....	.....
Lower Missouri Valley	82.953	79.545	83.033	79.905	....	.....	81.3590	.....	.0222	.0222	.0666	.0444	.0388	.....	.....	.....	.....	.....
Northwest	86.390	76.666	81.103	76.703	....	.....	80.2155	.....	0	0	.0444	.0222	.0166	.....	.....	.....	.....	.....
Total	924.85	908.18	896.08	833.66	....	.....	890.6969	.....	.....	.....	.....	.....	.2633	.....	.....	.....	.....	.....
Percentages	84.078	82.562	81.462	75.788	....	.....	80.9724	.....	.....	.....	.....	.....	.0239	.....	.....	.....	.....	.....

PAPER 30.

List of Agricultural Societies which, on September 30, 1874, had appointed permanent committees to confer with the Chief Signal-Officer of the Army.

Name of Organization and State.	Committee.	Post-office address.
Monroe County Agricultural Society, Indiana.	T. H. Mallow	Bloomington, Ind.
Muskingum County Agricultural Society, Ohio.	R. S. Mershon	Zanesville, Ohio.
Louisville and Jefferson Counties Agricultural Society, Kentucky.	L. Young	Louisville, Ky.
Schuyler County Agricultural and Mechanical Society, Missouri.	John B. Glaze	Glenwood, Mo.
Highland County Agricultural Society, Ohio.	J. S. Bell	Hillsboro', Ohio.
	J. W. Ellis	
Arkansas State Agricultural and Mechanical Society, Arkansas.	Albert Cohen	Little Rock, Ark.
Bertie County Agricultural Society, North Carolina.	S. J. Wheeler	Windsor, N. C.
	J. B. Cheney	Do.
	D. E. Tayloe	Do.
Geauga County Agricultural Society, Ohio.	Dexter Witter	Burton, Ohio.
	George H. Ford	Do.
	Luther Russell	Do.
Otsego County Agricultural Society, New York.	G. Pomeroy Keese	Cooperstown, N. Y.
	H. M. Hooker	Do.
	Elisha Finney	Do.
Crawford County Agricultural Society, Pennsylvania.	A. P. Foster	Conneautville, Pa.
	Col. F. Manton	Do.
	Prof. W. H. Armstrong	Do.
Berrien County Agricultural Society, Michigan.	J. B. Fitzgerald	Niles, Mich.
	D. O. Woodruff	Do.
	William Bort	Do.
Greene County Agricultural Society, Missouri.	Dr. J. E. Tafft	Springfield, Mo.
	A. W. McPherson	Do.
	Rev. J. E. Worth	Do.
Tolland County Agricultural Society, Connecticut.	George H. Kingsbury	Rockville Conn.
	J. C. Hammond, jr.	Do.
Burlington County Agricultural Society, New Jersey.	G. C. Brown	Mount Holly, N. J.
	M. S. Pancoast	Do.
	James Lippincott	Do.
Agricultural and Mechanical Society of Western Alabama, Alabama.	W. S. Bird	Eutaw, Ala.
	H. G. Webb	Do.
	A. T. Lupton	Tuscaloosa, Ala.
Crawford County Agricultural Society, Ohio.	G. Keller	Bucyrus, Ohio.
	E. R. Reamley	
	H. M. Scroggs	
	Josiah Koller	
Saratoga County Agricultural Society, New York.	R. S. Robinson	Greenville Centre, N. Y.
Martin County Agricultural Society, Minnesota.	H. A. Munger	Fairmount, Minn.
California State Board of Agriculture, California.	J. N. Hoag	Sacramento, Cal.
	C. F. Reed	Do.
	F. M. Logan	Do.
Macon County Fruit-Growers' Association, Illinois.	Prof. E. A. Gastman	Decatur, Ill.
	Theo. Hildebrandt	
	J. B. R. Sherrick	
Missouri State Board of Agriculture, Missouri.	John H. Tice	Saint Louis, Mo.
	Rev. Charles Peabody	Do.
	Hon. G. W. Kinney	Snow Hill, Mo.
Jackson County Agricultural Society, Ohio.	Davis Mackley	Jackson Court-House, O.
	J. E. Ferree	Do.
	Jacob Dungan	Do.
Pike County Agricultural Society, Georgia.	J. S. Pope	Zebulon, Ga.
	J. H. Mitchell	Do.
	H. Green	Do.

List of agricultural societies, &c.—Continued.

Name of organization and State.	Committee.	Post-office address.
Greene County Agricultural Society, New York.	A. P. Jones	Catskill, N. Y.
	G. C. Mott	Do.
York County Agricultural Society, Pennsylvania.	John Evans	York, Pa.
	G. A. Heckert	Do.
	W. S. Roland	Do.
Allamakee County Agricultural Society, Iowa.	Hon. Charles Paulk	Waukon, Iowa.
	A. M. May	Do.
	D. W. Read	Do.
Bay State Horticultural Society of California, California.	F. A. Miller	San Francisco, Cal.
	Prof. H. N. Bolender	San Francisco, Cal.
Maine Board of Agriculture, Maine	M. C. Fernald	Orono, Me.
	Prof. G. L. Goodale	Bowdoin College, Brunswick, Me.
	Prof. C. E. Hamlin	Colby University, Waterville, Me.
	C. T. Brackett	Bowdoin College, Brunswick, Me.
	Hon. S. F. Perley	Naples, Me.
Tuscola County Agricultural Society, Michigan.	C. C. Stoddard	Caro, Mich.
	Townsend North	Do.
	Dr. William Johnson	Do.
Central Iowa District, Agricultural Association, Iowa.	P. H. Bristow	Des Moines, Iowa.
	M. W. Robinson	Do.
	D. V. Cole	Do.
South Carolina Agricultural and Mechanical Society, South Carolina.	Dr. F. P. Porcher	Charleston, S. C.
	Dr. T. T. Robertson	Winnsborough, S. C.
	Col. J. P. Thomas	Columbia, S. C.
Connecticut State Agricultural Society, Connecticut.	Hon. E. H. Hyde	Stafford, Conn.
	Hon. Thos. H. Butler	Norwalk, Conn.
	H. S. Collins	Collinsville, Conn.
Connecticut State Board of Agriculture, Connecticut.	Prof. W. H. Brewer	New Haven, Conn.
	W. H. Yeomans	Columbia, Conn.
	T. S. Gold	West Cornwall, Conn.
Terre Haute Horticultural Society, Indiana.	Joseph Gilbert	Terre Haute, Ind.
	J. F. Soule	Do.
	John Weir	Do.
	Rev. — Stimson	Do.
Middlesex County Farmers' Club, New Jersey.	G. H. Lambert	New Brunswick, N. J.
	G. W. Thompson	Do.
Farmers' Club, Beaver City, Utah	D. Tyler	Beaver City, Utah.
	Wm. Fotheringham	Do.
	J. L. Smith	Do.
Indiana State Board of Agriculture, Indiana.	T. C. Johnson	New Albany, Ind.
	Thomas Dowling	Terre Haute, Ind.
	J. D. G. Nelson	Fort Wayne, Ind.
Rhode Island Society for the Encouragement of Domestic Industry, Rhode Island.	Dr. J. W. Sawyer	Providence, R. I.
	J. T. Smith	Do.
	Dr. W. F. Channing	Do.
Washington County Agricultural Society, New York.	M. Ingalsbe	South Hartford, N. Y.
	R. W. Pratt	Do.
Farmers and Fruit-Growers' Association of Illinois, Illinois.	D. W. West	Belleville, Ill.
	F. H. Pieper	Do.
	E. W. West	Do.
Iowa State Horticultural Society, Iowa.	Prof. Charles E. Bessey	State Agricultural College, Ames, Iowa.
	Hon. John Scott	Nevada, Iowa.
	G. B. Brackett	Denmark, Iowa.
Addison County Agricultural Society, Vermont.	Prof. E. Brainerd	Middlebury College, Middlebury, Vt.
	Prof. W. H. Parker	Do.
	Prof. H. M. Seely	Do.
Orleans County Agricultural and Mechanical Society, Vermont.	D. M. Camp	Newport, Vt.
	T. H. Haskins	Do.
	Z. E. Jameson	Irasburgh, Vt.

List of agricultural societies, &c.—Continued.

Name of organization and State.	Committee.	Post-office address.
Bradley County Agricultural Society, Tennessee.	T. L. Cate	Cleveland, Tenn.
	J. C. Morgan	Do.
	Dr. G. A. Long	Do.
Iowa State Agricultural Society, Iowa.	Peter Melendy	Cedar Falls, Iowa.
	S. B. Hewitt, jr	Eagle Grove, Iowa.
	J. M. Shaffer	Fairfield, Iowa.
Carroll and Choctaw Counties Agricultural Society, Mississippi.	A. M. Rafter	Winona, Miss.
	T. J. Blackmoore	Do.
	O. J. Moore	Do.
Belmont Farmers' Club, Mississippi.	A. M. Rafter	Winona, Miss.
	W. W. Dabney	Do.
	James Thompson	Do.
Broome County Agricultural Society, New York.	E. G. Crafts	Binghamton, N. Y.
	T. F. Roberts	Do.
	Arch. Stone	Do.
	P. Van Vredenberg	Do.
Bureau County Agricultural Society, Illinois.	George W. Stone	Princeton, Ill.
	A. Bryant, jr	Do.
	H. L. Baltwood	Do.
Essex County Agricultural Society, Massachusetts.	Charles P. Preston	Danvers, Mass.
	William Sutton	Salem, Mass.
	A. N. Dodge	Do.
Kokomo Horticultural Society, Indiana.	L. J. Templin	Kokomo, Ind.
	L. W. Leach	Do.
	C. S. Boggs	Do.
Jo Daviess, La Fayette, and Stephenson Union Agricultural Society, Illinois.	A. M. Jones	Warren, Ill.
Marshall County Agricultural Society, Iowa.	Byron Webster	Marshalltown, Iowa.
	John Turner	Do.
	S. P. Kinsley	Do.
Coles County Agricultural Society, Illinois.	D. C. M. Evans	Charleston, Ill.
	Charles Penatel	Do.
Rock County Agricultural Society, Wisconsin.	Dr. J. B. Whiting	Janesville, Wis.
Waupaca Agricultural Society, Wisconsin.	H. C. Mead	Waupaca, Wis.
	W. Scott	Do.
	E. Cooledge	Do.
Ingham County Agricultural Society, Michigan.	Allen Rowe	Mason, Mich.
	A. M. Chapin	Eden, Mich.
	William Rayner	Mason, Mich.
Fillmore and Mower Counties Agricultural Society, Minnesota.	Dr. A. T. Whitman	Spring Valley, Minn.
	H. S. Hart	Do.
	W. L. Kellogg	Do.
	B. F. Farmer	Do.
	William McNee	Do.
	E. S. Bumstead	Do.
	George W. Farmer	Do.
	W. Allen	Do.
	D. Rathbun	Do.
Marion County Agricultural Society, Ohio.	H. M. Ault	Marion, Ohio.
	H. A. True	Do.
	J. K. Newcomer	Do.
Humphreys County Farmers' Club, Tennessee.	Rev. A. A. Wilson	Waverly, Tenn.
	T. U. Harris	Do.
	W. A. Hollinger	Do.
	A. R. Lankford	Johnsville, Tenn.
Luzerne County Agricultural Society, Pennsylvania.	Steuben Jenkins	Wyoming, Pa.
	Rev. Abel Parker	Do.
	Dr. J. M. Lewis	Do.
	Dr. J. B. Crawford	Wilkesbarre, Pa.
	Dr. C. R. Gorman	Pittston, Pa.
	Dr. B. H. Throop	Scranton, Pa.
	Dr. R. H. Tubbs	Kingston, Pa.

List of agricultural societies, &c.—Continued.

Name of organization and State.	Committee.	Post-office address.
Atlanta Union Central Agricultural Society, Illinois.	S. D. Fisher	Atlanta, Ill.
	William P. Hunt	Do.
	Daniel McFarland	McLean, Ill.
Howard County Agricultural Society, Iowa.	H. D. Noble	Cresco, Iowa.
	Stephen Rodford	Chester, Iowa.
	C. S. Thurber	Cresco, Iowa.
Outagamie County Agricultural Society, Wisconsin.	W. H. P. Bogan	Appleton, Wis.
	Edwin Nye	Freedom, Wis.
	N. B. Clark	Ellington, Wis.
	Louis Perrott	Greenville, Wis.
Lawrence County Agricultural and Industrial Association, Ohio.	Dr. G S. B. Hempstead	Hanging Rock, Ohio.
	Cyrus Ellison	Ironton, Ohio.
	Hiram Campbell	Do.
	H. W. Gillett	Quaker Bottom, Ohio.
	Samuel Burke	Arabia, Ohio.
Miami County Agricultural Society, Ohio.	W. W. Crane	Tippecanoe City, Ohio.
Michigan State Pomological Society, Michigan.	A. T. Linderman	Grand Rapids, Mich.
	C. L. Whitney	Muskegon, Mich.
	Edward Bradfield	Ada, Mich.
Lamoille County Agricultural Society, Vermont.	George Wilkins	Stowe, Vt.
	H. H. Powers	Morrisville, Vt.
	G. L. Waterman	Hyde Park, Vt.
Sheboygan County German Agricultural and Trades Association, Wisconsin.	Ferdinand Stoesser	Sheboygan, Wis.
	Frederick Must	Do.
	Fred. Zimmerman	Do.
	Albert Mohlendorf	Do.
	Thomas Blackstock	Do.
Walworth County Agricultural Society, Wisconsin.	Peter Golder	Elk Horn, Wis.
	David Williams	Darien, Wis.
	Charles E. Buhre	Geneva, Wis.
Floyd County Agricultural Society, Iowa.	E. C. Chapin	Charles City, Iowa.
Edgar County Agricultural Society, Illinois.	Walter Booth	Paris, Ill.
	B. Halcomb	Do.
	D. P. Elliott	Do.
Perry County Agricultural and Mechanical Association, Indiana.	I. F. Patterson	Rome, Ind.
	I. I. Wheeler	Do.
	Ad. Ackerman	Do.
Davis County Agricultural Society, Iowa.	Howard Willey	Bloomfield, Iowa.
	William J. Hamilton	Do.
	T. A. Walker	Do.
	A. Rankin	Belknap, Iowa.
	William Hill	Bloomfield, Iowa.
Utah County Agricultural and Home Manufacturing Society, Utah.	Hon. George Bean	Provo, Utah.
	C. D. Evans	Springville, Utah.
	Daniel Graves	Provo, Utah.
Ontario County Agricultural Society, New York.	Cooper Sayre	Oak's Corners, N. Y.
	John S. Coe	Canandaigua, N. Y.
Washington County Agricultural and Mechanical Association, Virginia.	Rev. George R. Barr	Abingdon, Va.
	J. L. White	Do.
	Thomas Cosby	Do.
Otoe County Agricultural Society, Nebraska.	J. W. Pearman	Nebraska City, Nebr.
	W. W. Wardell	Do.
Lake County Agricultural Society, Ohio.	D. W. Mead	Painesville, Ohio.
	C. C. Jennings	Do.
	George Blish	Do.
Page County Agricultural Society, Iowa.	S. H. Kiddlebaugh	Clorinda, Iowa.
	S. W. Petterson	Do.
	J. L. Barrett	Do.
King's Creek Valley Farmers' Club, Ohio.	Thomas Cowgill	Kennard, Ohio.
Cerro Gordo County Agricultural Society, Iowa.	George R. Miller	Mason City, Iowa.
	T. G. Emsley	Do.

List of agricultural societies, &c.—Continued.

Name of organization and State.	Committee.	Post-office address.
Cerro Gordo County Agricultural Society, Iowa—Continued.	A. Wilson	Owen's Grove, Iowa.
	Henry Martin	Mason City, Iowa.
	C. W. Tenney	Plymouth, Iowa.
Northumberland County Agricultural Society, Pennsylvania.	Dr. E. H. Horner	Turbotville, Pa.
	William A. Dean	Do.
	Thomas Barr	Do.
Johnson County Agricultural and Mechanical Association, Kansas.	John M. Giffen	Olathe, Kans.
	Henry McBride	Do.
	J. M. Hadley	Do.
Albany County Agricultural and Industrial Society, New York.	Hon. Geo. A. Tweddle	Albany, N. Y.
	J. Winne	Bethlehem Centre, N. Y.
	J. H. Farrell	Albany, N. Y.
Pike County Agricultural Sociey, Mississippi.	M. D. Pound	Magnolia, Miss.
Warren County Agricultural Society, New York.	Charles W. Osborn	Warrensburgh, N. Y.
Shenandoah Valley Agricultural Society, Virginia.	Edmund Pendleton	Winchester, Va.
	Dr. W. J. Best	Brucetown, Va.
	J. C. Baker	Winchester, Va.
	Jarvis Jennings	Millwood, Va.
	Edwin S. Baker	Winchester, Va.
Wabaunsee County Central Agricultural Society, Kansas.	William Coleman	Eskridge, Kan.
	William Rinehart	Do.
	George Reynolds	Do.
Oswego County Agricultural Society, New York.	Henry L. Davis	Oswego, N. Y.
	P. M. Newton	Sandy Creek, N. Y.
	Hiram Walker	Union Square, N. Y.
	Thomas H. Austin	New Haven, N. Y.
	Henry Palmer	Paris, N. Y.
Tennessee Central Fair Association, Tennessee.	W. P. Henderson	Murfreesborough, Tenn.
Jersey County Agricultural Society, Illinois.	Dr. J. O. Hamilton	Jerseyville, Ill.
	George H. Jackson	Do.
	William Shepard	Do.
Steuben County Agricultural Society, New York.	R. E. Robie	Bath, N. Y.
Watonwan County Agricultural Society, Minnesota.	W. W. Murphy	Medelia, Minn.
Moultrie County Agricultural and Horticultural Society, Illinois.	G. W. Vaughan	Sullivan, Ill.
	E. W. Mills	Do.
Rome Agricultural and Mechanical Fair Association, Georgia.	Thomas J. Perry	Rome, Ga.
	Thos. W. Alexander	Do.
West Virginia Central Agricultural and Mechanical Society, Virginia.	Lee Haymond	Clarksburgh, W. Va.
	R. T. Lowndes	Do.
	Thomas S. Spates	Do.
	Dr. W. M. Late	Brideport, W. Va.
	Henry Bassell	Brown's Creek, W. Va.
Hall County Agricultural Society, Georgia.	Dr. M. Stephenson	Gainesville, Ga.
	J. E. Redwine	Do.
Portage County Agricultural Society, Ohio.	H. Y. Beebe	Ravenna, Ohio.
	E. R. Wart	Do.
	John Meharg	Do.
Chickasaw County Agricultural Society, Iowa.	L. J. Young	Chickasaw, Iowa.
	H. M. Mixer	New Hampton, Iowa.
	Buel Sherman	Fredericksburgh, Iowa.
Virginia State Agricultural Society, Virginia.	F. G. Ruffin	Richmond, Va.
	Col. William C. Knight	Do.
	Dr. Wm. T. Walker	Dover Mines, Goochland, Va.
Agricultural and Mechanical Society of Alleghany County, of Maryland, West Virginia and Pennsylvania.	Charles C. Shriver	Cumberland, Md.
	J. B. H. Campbell	Do.
	R. L. Gross	Do
Central Farmers' Club, Delaware	M. Hayes	Dover, Del.
	J. H. Bateman	Do.
	C. H. B. Day	Do.

List of agricultural societies, &c.—Continued.

Name of organization and State.	Committee.	Post-office address.
Madison County Agricultural Society, Indiana.	I. R. Holston	Anderson, Ind.
	William Crun	Do.
	James Halzlett	Do.
	M. G. Walker	Pendleton, Ind.
	N. G. Tomlinson	Alexandria, Ind.
	Thomas Beckworth	Perkinsville, Ind.
Convention of Pomologists, Michigan.	H. S. Clubb	Grand Haven, Mich.
	Samuel B. Peck	Muskegon, Mich.
	C. L. Whiting	Do.
State Pomological and Horticultural Society of Michigan, Michigan.	W. K. Kedzie	Lansing, Mich.
Champaign County Agricultural Society, Ohio.	W. A. Humes	Urbana, Ohio.
Buchanan County Agricultural Society, Iowa.	Lyman J. Curtis	Independence, Iowa.
	Dr. George Worne	Do.
	Jed. Lake	Do.
New Hampshire State Agricultural Society, New Hampshire.	Hon. Samuel N. Bell	Manchester, N. H.
	Hon. Frederick Smyth	Do.
	Gen. Nathaniel Head	Hooksett, N. H.
Republic County Agricultural Society, Kansas.	O. A. A. Gardner	Belleville, Kans.
Doylestown Farmers' Club, Pennsylvania.	T. W. Trego	Doylestown, Pa.
	H. T. Darlington	Do.
	D. E. Brower	Do.
Franklin County Agricultural Society, Maine.	D. H. Knowlton	Farmington, Me.
	L. F. Green	East Wilton, Me.
	P. P. Tufts	Farmington, Me.
Oxford County Agricultural Society, Maine.	Howard D. Smith	Norway, Me.
	A. C. T. Smith	South Paris, Me.
Iowa County Agricultural Society, Iowa.	J. Root, jr	Marengo, Iowa.
	J. C. Clark	Foote, Iowa.
	A. H. Simpson	Victor, Iowa.
Ephratah Agricultural and Scientific Society, Pennsylvania.	W. H. Spera	Ephratah, Pa.
Warsaw Horticultural Society, Illinois.	B. Whitaker	Warsaw, Ill.
	J. W. Hollowbush	Do.
	Charles Hay	Do.
State Grange of Patrons of Husbandry, South Carolina.	John B. Moore	Edgefield, S. C.
	D. W. Aiken	Cokesbury, S. C.
	Benjamin Allston	Georgetown, S. C.
Illinois State Board of Agriculture, Springfield, Illinois.	Jonathan Pariam	Springfield, Ill.
	William H. Russell	Do.
	A. M. Garland	Do.
Fayette County Agricultural Society, West Union, Iowa.	Frank McClintock	West Union, Iowa.

PAPER 31.

WASHINGTON, D. C., *September* 26, 1874.

GENERAL: The following is submitted as my report upon the Mississippi River, in connection with the establishment by you of a "danger-line" to life and property along its entire extent. In carrying out your instructions as regards the collection of such information as may be of value in forecasting rises, and for other kindred purposes, great care has been used in placing before you such data only as appear reliable.

It is a matter of regret that time has been lacking in which to more carefully prepare the appendices, and properly arrange and elaborate my report.

Although my orders carried me only as far north as Le Claire, Iowa, it was thought requisite to a proper elucidation of the question to collate as many data as possible in regard to the upper river.

Gauge-readings at Saint Paul for six years show the following stages of the river During January, February, most of March, and December, the river is closed by ice.

Breaking up late in March, the river during early April uniformly rises, generally reaching its maximum yearly height, and falls gradually late in the month. During May it remains at a stand, or gradually falls. June and July the fall continues slowly, with slight fluctuations. In August it is generally at a stand, followed by a very gradual fall, which extends through September.

October at a stand, and gradual fall, generally reaching its lowest mean stage during that month.

November, generally at a stand, with light rise at the end of the month and commencement of December, closing by ice early in the latter month.

Owing to the peculiar formation of the banks at Saint Paul, no damage has been done to the city, but the rise overflows considerable ground in the bottom-lands between the city and La Crosse. Fourteen feet and six inches is fixed on as the point at which water commences to damage the crops and houses in the lower grounds. The water has exceeded this height as follows: 1867, April, eight days; June, thirteen days; and July, sixteen days; 1869, April, one day; September, eleven days; and October, four days; 1873, April, nine days; May, two days; and June twelve days. The gauge-records at Rock Island indicate that similar height was reached during 1861, 1862, and 1870.

The lowest water is stated to have occurred in 1861, with 2 feet in channel, and the highest in 1850, it then standing 21.85 feet above low water.

From an examination of the Rock Island records, it is evident that low water must have occurred in 1864, the water standing 1.15 feet lower in 1864 than 1861, and averaging for September 0.83 foot below the lowest water of 1861.

General Warren's observer also used low water of 1864 as zero. The high water of the Upper Mississippi is placed by steamboat-men in 1851 or 1852; 1851 is doubtless the year, as the water reached a height at Saint Louis that year only surpassed by 1844.

At Prescott the Saint Croix River empties into the Mississippi, and on the west side, as far down as Red Wing, Minn., in 1851, the county was overflowed some six miles inland, and to a depth equal to six or eight feet, opposite Fountain City, Wis.; in that year the country was covered with six feet of water. Winona, Minn., was overflowed, excepting a few squares, and all the low land between that place and Saint Louis was under water.

Concerning La Crosse and Dubuque nothing more is known than that already learned by the office, giving the La Crosse range at 15.50 feet, and Dubuque at 21.83 feet. The range at La Crosse will probably prove greater when a longer record has been obtained. Between La Crosse and Dubuque a considerable portion of bottom-lands must suffer, during unusual floods, in common with other parts of the river. At Clinton, Iowa, the range of water is 19.75 feet, from low water of 1864 to high water of 1870.

At Le Claire, Iowa, owing to its being at the end of Rock Island rapids, the range of the river decreases, being but 13.08 feet. The highest water occurred April, 1870, and the lowest in 1864. Ten feet above zero backs up Wapsipinicon River and damages farms. Eleven feet overflows some roads. Thirteen feet is determined as being the danger-line. Thirteen and a half would carry away four flouring-mills, located in and near the town. Twelve feet has been reached only twice since 1857, twelve feet two inches in 1862, and thirteen feet one inch in 1870. The subject of interest at Le Claire is low, and not high water, as navigation suffers seriously from low water. From this point to Davenport, fifteen miles below, pilots are invariably used, owing to the nature of the channel, the great slope causing shallow water during the most of the year.

At low water in 1864, there were 22 inches on "Campbell's chain," and 21 inches on "Rock Island chain," of the rapids. Both have been improved, and at zero there is probably 24 inches on the shallowest chain of the rapids. At Davenport, the foot of the Rock Island rapids, observations for fifteen years have been taken, and they give an exceedingly good mean of the river.

These observations are incorporated in this report, having been obtained through the courtesy of Gen. John N. Macomb, United States Engineer Corps. Nine years are reduced from a hydrograph, and there may be chance errors, but certainly not enough to effect the general means.

At Rock Island the river generally falls until near the end of February, when a rise follows, continuing until the middle of March. From then until the middle of April, sharp rises and falls occur, the rise prevailing and continuing to about the middle, the maximum of the year usually occurring between April 23 and May 15.

The river generally falls from the maximum to the end of September, when occasional rises are followed by a falling river to the middle of December, when a rise follows for the rest of the year. The range of the water is 16.96 feet, from 0.25 foot below zero in November, 1864, to 16.71 feet above in April, 1870.

Ice-gorges are frequent in the late winter, and the water rises very high at such times for several hours, doing or threatening considerable damage. On March 10, 1868, the water rose at Rock Island bridge, where the gauge is located, from 12.2 feet

to 20.8 feet, when the gorge broke; 15 feet on the gauge is determined as the danger-line. The water has been above that height seven days in 1862, four days in 1866, and thirteen days in 1870.

Scarcely any damage is done by that amount of water at Davenport, but considerable occurs below. A distillery three miles below Rock Island, in Illinois, discontinued working in 1870, and another foot would have carried the building away. In that year all bottom-land between Davenport and Keokuk was overflowed. At Buffalo, Iowa, part of the town was flooded and a saw-mill was overflowed, and a few inches more of water would have swept it away.

Muscatine, Iowa, was partly overflowed in that year. Of the five mills there located two were flooded and discontinued work, and one the water just reached; two south of the town are on high ground.

Keithsburgh, Ill., was partly flooded, and one saw-mill was overflowed and a grist-mill was barely touched.

At Burlington, Iowa, the range of water is 15.0 feet, the maximum being reached in 1870. The low water is probably that of 1864. In 1870 no great damage was done to the city, only some few buildings being flooded.

At Keokuk, Iowa, the range of water is 21.48 feet, from low water of November, 1873, to high water of 1851.

Owing to the slope of the river and the configuration of the banks no harm comes to Keokuk from any floods. At 14.5 feet the river is liable to injure the Government dams and improvements by back water and washing over. The river has been above this point one day in 1868, one day in 1869, and twenty-seven days in 1870.

The stage of low water at this point is of peculiar interest to the steamboat-men, as during very low water all freight has to be transshipped over the rapids, at the foot of which Keokuk is located.

The low water of 1864 showed 4½ feet in the Keokuk Channel, and 16 inches at the shallowest point on the rapids.

The rise on the rapids is about two-thirds of that experienced at Keokuk. The range of the water is 13 feet in the middle of the rapids against 21.48 feet at Keokuk. Through the courtesy of Major A. Stickney, Corps of Engineers, records of the river at Keokuk from 1868 to date are incorporated in these appendices.

The Des Moines River joins with the Mississippi three miles below Keokuk, and just above Warsaw, Ill. At Warsaw, Ill., there is a range of 21.92 feet from low water, November 29, 1873, to high water of 1851. At 18 feet the water overflows some bottom-land, which is increased in extent very considerably by another foot of water. No flood has ever injured the town, which is on a considerable bluff. Alexandria, Iowa, a mile below Warsaw, would suffer considerably from water above 19 feet. The water which would probably do the greatest damage would be a flood from the Des Moines in conjunction with that of the Mississippi, and could scarcely be predicted with accuracy.

At Quincy, Ill., sixty miles below Warsaw, the water ranges from low water 1867 to high water 1851, 20 feet. Damage from high water is suffered only by merchandise on the river-banks. Sixteen feet would probably damage farms and property in the bottom-grounds above and below the city. The water was above this point five days in 1869 and twelve days in 1870. The high water of 1869 appears to have been the result of a freshet from the Des Moines River on the very top of the rise of the Upper Mississippi, and was of very short duration. At Hannibal, Mo., thirty miles below Quincy, the river has a range of 22.25 feet from low water of 1867, and of November 30, 1872, to high water 1851. Eighteen feet probably damages farms and other property in the bottoms, while any sudden rise endangers merchandise on the banks. The water has been above this point in 1851, 4 feet; 1858, 2.5 feet, and very probably in 1869 and 1870. At Louisiana, twenty miles below, the river ranges 20.5 feet from low water, 1867 to high water 1851. There is a large area of low land in this vicinity which suffers from overflow at 12 feet 6 inches on the Louisiana gauge. Such stage overflows all but the very highest ridges, which are all overflowed at 18 feet. A levee is now in course of construction, whose level is equal to the high water of 1851, which will protect the greater part of land now inundated. The low portions now have but few houses, and are but little cultivated, being chiefly of value and use as ranges for cattle. Sixty-nine miles below Louisiana is the Illinois River, and twenty-three miles below the Illinois, the Missouri and Mississippi unite. The Missouri affects greatly the Mississippi, as is shown by the range at Saint Louis, which is 41.39 feet, ranging from low water of 1863 to high water of June 1844. This range closely agrees with that of the Missouri, which at Saint Charles is 40 feet, and between the same years. An examination of the records for the past fifteen years shows that during this time the flood of the year has come entirely from the Missouri; eleven years including the very heavy freshets of 1867 and 1870; in 1869 it came from the Des Moines, Illinois, and Missouri; in 1871 from the Illinois and Missouri; and in 1872 from Missouri and upper river.

It seems evident that, with only an ordinary stage of water in the Missouri, no flood from the upper river can create a freshet below the mouth of the Mississippi. In 1862,

1866, 1867, and 1870 a rise from the upper river kept the Mississippi at a stand a little below the maximum height for a short time.

At Saint Louis no ordinary flood damages any property except articles of merchandise on the levee by very sudden rises. In 1844, however, a large portion of the most valuable part of the city used for business purposes was overflowed, as is shown by the inclosed map, (Appendix, No. 19,) whereon the submerged district is inclosed by a blue line. The water-works, elevator, depot, and all the tracks of the Iron Mountain Railway to the city boundary are on ground then overflowed. Thirty feet is about the point where the water commences to damage the buildings in the city proper. The water was above that point 10 days in 1862, 46 days in 1851, 59 days in 1844, and a number of days in 1828 and 1845, occurring four times in fifty years, and for a period of about 120 days. From Saint Louis down to the mouth of the Kaskaskia River there is a strip of land subject to overflow in high floods. The country between the Kaskaskia and Mississippi, from Evansville, Ill., south to the junction, is most subject to overflow. The danger-point at Saint Louis is applicable to this point.

Between Cape Girardeau and Commerce is a narrow strip of land, over which, during high water, an immense volume pours into the Saint Francis bottom-lands. The water probably commences running in at 29 feet on the Saint Louis gauge. From this point down the Humphreys and Abbot map has been copied as being the standard authority, and, for convenience of reference, to show the country liable to overflow.

At Cairo, Ill., the junction of the Ohio with the Mississippi increases the range of the river to 51.97 feet from low water of 1871 to high water of 1867.

At 39 feet the water overflows the country gravel road in Kentucky so that wagons cannot use it; 41 feet begins to overflow the country generally; and 45 feet will cover the country from 2 to 10 feet deep from twenty miles up the river down to Columbus, Ky., generally extending three miles back from the river.

The country in rear of Cairo, from Mound City, below Cache River to Commerce, at 40 feet is overflowed. At 47 the water commences to overflow the Missouri side, and is considered as being dangerous to the levees standing around Cairo. The water has been above this height 18 days in 1858, 4 days in 1859, 13 days in 1865, 39 days in 1867, and 8 days in 1874.

The highest water, 51.97 feet, overflowed three-fourths of the country south of Vienna; and from Big Bay Creek to Cache River the strip of country directly east of Cache River over which the Illinois Central runs, Metropolis, and New Liberty were above overflow. The Ohio during lowest stage of water is 12.05 feet deep at Cairo; 6.23 feet at mouth Cache River, and 3.57 feet at Mound City. The depth from Cairo to Memphis is about 5 feet in extreme low water.

The most severe flood from Cairo to Memphis was that of 1867, being at Cairo 17 inches higher than ever before known. Point Pleasant, Mo., which is situated at the foot of the high land known as Big Prairie, was overflowed about a foot in that year.

Osceola, Ark., was overflowed almost completely in 1867, the first stories of the houses being completely under water, as they nearly were in 1874.

All of Pecan Point was submerged in 1867, but a few thousand acres escaped in 1874.

The danger-point for this country on the Cairo gauge is placed at 43 feet. At Memphis 34 feet is the danger-line. Any rise above this point is certain to overflow the Saint Francis country directly opposite Memphis.

The first water in 1874 that troubled the Memphis and Little Rock Railroad was April 23, when the Memphis gauge stood at 34.7 feet. The water stood at or above 34 feet for 27 days in 1858; 42 days in 1859; about 43 days in 1867; 9 days in 1869; 19 days in 1871; and 36 days in 1874.

At Helena the danger-line is 40 feet, above which point the levees of the surrounding country begin to show signs of weakness. The water has stood above this point 72 days in 1858, 87 days in 1859, about 16 days in 1861, —— in 1862, about 60 days in 1867, and 78 days in 1874. The water which has overflowed the banks of the Mississippi at Cape Girardeau and below New Madrid into the Saint Francis Swamp, is here forced back into the river and returns in time to prolong the dangerous stage of water beyond the period it is usually experienced in other localities.

On March 13 Bass Crevasse, just below Lake Providence, 3,000 feet wide and 6 feet deep, formed, the water being 41.60 feet at Helena and 37.10 at Lake Providence. This was followed on March 15, 1874, the water being 41.85 feet at Helena, 41.20 feet at mouth of White River, and 37.20 feet at Lake Providence, by the levee at Bolivar Landing, Bolivar County, Mississippi, about twenty-five miles below White River, which broke, forming a crevasse 1,900 feet wide, which was not closed. Crevasses followed in the order named: On March 20, Cook's Crevasse, Mississippi, four miles above Bolivar Landing, 1,600 feet wide; it was not closed during high water; Hushpuckana, one hundred and forty miles below Helena, April 8; Bell's, Bolivar County, 232 feet wide, not closed April 30; Connelly's, Catfish Point, April 28, 700 feet wide, 3 to 12 feet deep; Ashton, La., date unknown, 17,000 feet wide; Maynard's, 450 feet wide; Miller's, (small,) both near Friar's Point, fifteen miles below Helena, on May 10; Friar's Point, two places, (small,) May 10; Apparson's, above Helena, 200 feet wide, May 18.

At Jacksonport, Ark., on the White River, the range of water is 33.93 feet from low water of 1872 to high water of 1867. The high water of this year failed to reach the maximum by 2.88 feet. At Little Rock, Ark., on the Arkansas River, the range of water is 32.30 feet, from low water 1872, to high water 1857.

The junction of the Arkansas and White, a few miles from the mouth of the White, pours out their entire flood through that channel, giving the whole rise to the White River gauge.

At mouth of White River the range of the river is slightly increased, being 46.80 feet, from low water of 1872 to high water of 1867.

The water of this year reached to within 0.20 foot of 1867, and probably would have exceeded it but for Hushpuckana and other crevasses. At Lake Providence, Miss., the range is 44.72 feet from low water of 1872 to high water of 1862.

At Vicksburg the range of water is 52.40 feet from low water of 1872 to high water of 1862.

The danger to the levees commences at 41 feet. The water has been above this height 138 days in 1858, 113 days in 1859, in 1862, in 1867, 27 days in 1873, and 90 days in 1874. If the levees were all in good condition the "danger-line" should be one foot higher. The Northern Louisiana and Texas Railway, from Delta to Monroe, ceased running March 16, water on Vicksburg gauge 42.85 feet, being the result of Bass crevasse, fifty miles above.

On March 17, 1874, the water being at 43.05 feet at Vicksburg, the levee opposite Grand Gulf, thirty miles below, broke, forming the Hard Times crevasse, 1,500 feet wide and 5 feet deep.

On March 28, water 44.10 feet at Vicksburg and 41.15 feet at Natchez, Glass Cock's Crevasse, about thirty miles below Natchez, made, 4,000 feet wide and 3 feet deep.

In April, dates unknown, crevasses at Diamond Lake Bend 6,000 feet wide and 8 feet deep; at Buckbridge, above Hard Times, 800 feet wide and 5 feet deep, and at Waterproof, April 17, 2,000 feet wide and 12 feet deep, made between Vicksburg and Red River. During this time the water stood at Vicksburg from 44.10 feet to 46.90 feet.

At Natchez the range of water increases slightly, being 52.70 feet from low water of 1855 to high water of 1859. The "danger-line" is 40 feet. The water has been above this point 143 days in 1851, 220 days in 1858, in 1859, 1862, 1867, 1868, 1869, 1870, 1871, and 69 days in 1874. No injury results to Natchez short of 46 feet, and even then only a few buildings in the lower town are inundated, but damage is done at an earlier stage to levees below the city.

In case the levees were in good condition the "line" would be placed 2 feet higher. That it probably remains thus low is evident from the Glass Cock Crevasse, twenty miles below, 4,000 feet wide and 3 feet deep, which made on March 29, the water height 41.20 feet at Natchez. At Red River Landing the range of the river is 47.05 feet from low water of 1872 to high water of 1874, the range being increased 0.72 foot this year, caused by the unprecedented flood of the Red and Ouachita in conjunction with that of the Ohio River. At Baton Rouge the range of the river is 35.95 feet from low water of 1854 to high water of 1874, being increased this year 0.27 foot from the same causes that produced the extraordinary water at Red River Landing.

The "danger-line" is 29 feet on the gauge at Baton Rouge. The water has been above that point 70 days in 1851, 97 days in 1852, 17 days in 1853, 11 days in 1872, 26 days in 1873, and 90 days in 1874. If the levees were in good condition the "danger-line" would be placed at 30 feet.

The crevasse opposite Port Hudson, thirty miles above, 10,000 feet wide and 4 feet deep, occurred April 5 with 33.73 feet water at Baton Rouge and 40.70 at Red River Landing. McCullom's, 7 feet deep, two miles below Baton Rouge, followed on April 12, 43 feet water at Baton Rouge.

Bonnet Carre Crevasse, 1,600 feet wide and 15 feet deep, occurred April 11, with 42.65 water at Baton Rouge and zero at New Orleans.

On April 16, Grand Levee at Morganza, sixty miles above, broke, the water being at its maximum (44.05 feet) at Red River Landing, and 36.15 feet at Baton Rouge, making a crevasse 6,000 feet wide and 10 feet deep.

Hickey's, 1,800 feet wide and 10 feet deep, opposite Baton Rouge, occurred the same day.

At Carrollton, La., the range of the river is 16.55 feet from low water of 1870 to high water of 1874, by which the range was increased 0.55 foot.

At New Orleans the range is 16.07 feet from low water of 1872 to high water of 1874; the range was this year increased by 0.67 foot.

The danger-line is placed at 2.50 feet below high water of 1871. The water has been above this point 124 days in 1849, 60 days in 1851, 34 days in 1858, 52 days in 1859, 58 days in 1871, 15 days in 1873, and 67 days in 1874.

Belle Chasse, Greenwood, and Point A'La Hache crevasses occurred about April 13, with water 0.4 foot above high water of 1871. Any rise above the "danger-line," occasions considerable anxiety, while one foot above it occasions serious alarm. The levees

are carefully watched, and preparations made for the certain danger which follows such a stage of water. An idea as to the extent of country generally covered by these floods, the source whence they spring, and the amount of damage done, can be best conveyed though imperfectly, by outlining the flood of this year, which has proved one of the most remarkable on record. It resulted from a conjunction of the freshets of the Upper Ohio, the Red, Arkansas, White, and Ouachita, a combination considered by Generals Humphreys and Abbot as almost impossible. In regard to the flood of the Mississippi and Arkansas, they say (page 380, Report on Mississippi River,) "The union of the greatest floods in both rivers is of course possible, but so highly improbable as to amount to a practical impossibility."

The year opened with the Upper Mississippi and Missouri at or below their average depth, a condition which most fortunately continued until late in June. The Ohio at Cairo, in January, rose to 18 inches above its mean monthly stage, an excess which was increased to 5½ feet in February, 6⅛ in March, and 8 feet in April. Only the water of the Upper Ohio to March 31 injuriously affected the Mississippi below the White River. This excess of water came almost entirely from the Upper Ohio, the Tennessee and Cumberland remaining at or below their mean stage. A rise in the Cumberland of 28 feet from March 18 to 23, contributed, however, to the flood.

At Cincinnati the river stood 8 feet above the average in January, 3 feet in February, and was at its normal mean stage during March. During January the White River was 3 feet above its mean monthly depth. It fell to its normal condition by February 20, when the unusually heavy rains of that date caused a raise at Jacksonport of 12 feet in two days, carrying the river to a dangerous stage, which was maintained with slight fluctuations until the last of March, the mean depth of that month being 23.38 feet, 13 feet in excess of its normal mean. The excessive rains of April 7 and 8 again caused the river to rise rapidly, and continued rain-fall afterward slowly carried it to its maximum yearly height, 31.05 feet, on April 23.

The Arkansas ranged at about a foot above its normal stage until February 20, when the same storm which affected the White, then caused a rise of 11 feet in two days, leaving it at a very high stage, from which it only fell to its average depth late in March, then to be raised by the long-continued rains of April to its flood height, 23.00 feet, on the 25th of that month.

At the mouth of the White River the river stood in January 4 feet, in February 1 foot, in March 5 feet, and in April 9 feet above the monthly mean stages. The Red River stood in January 7 feet above the mean depth, in February 3½ feet, in March 9½ feet, and in April 10¾ feet. The most remarkable feature about this rise was its steady manner and long duration. The river rose constantly from February 2 to April 4, sixty-two days, and in but one did the rise equal a foot, and in forty subsequent days the entire range was but 2 feet.

It is more than probable that even a part of this small range was due to the Wilson Crevasse, a short distance below Alexandria, and minor breaks which occurred April 11.

The maximum was reached May 8-10, 34.90 feet. The Ouachita was also extremely high during the same months, attaining its maximum at Monroe, Louisiana, on April 28, standing then one foot higher than was ever before known.

The experience in the Yazoo River was the same as in the others named, the stage of the river during freshets always depending on the amount of water obtained by overflow from the Mississippi.

The stage of water commenced to cause anxiety at Memphis on March 9, and at Vicksburg on March 12, the stage of water, together with the conditions of the tributaries of the Mississippi, giving promise of high water.

Alarm commenced at Greenville, Miss., the last of February, when the floods of that month from Arkansas and White Rivers were felt. By March 10 the conditions of the river at the State line was sufficiently serious to cause an extended and thorough inspection of the levees by Gen. M. Jeff. Thompson, state engineer of Louisiana.

On March 13 Bass Crevasse, Louisiana, 3,000 feet wide and 6 feet deep, formed, followed March 15 by Bolivar Landing, 1,900 feet wide; Cook's, (four miles above Bolivar,) 232 feet wide, March 20; and Glass Cock's, Louisiana, 4,000 feet wide and 3 feet deep, March 29.

Before this time, however, the condition of affairs had become alarming. Small crevasses forming everywhere, from Mouth of White River to New Orleans, with thousands of acres under water contiguous to the crevasses named.

By April 1 it was evident that the freshet would equal, if not exceed, in extent and damage any ever before experienced, a large extent of country being already inundated, with rises that day of 21 inches at Cincinnati; at Nashville, 6 inches; Saint Louis, 9 inches; and at a stand at Shreveport. In addition, the unusual rains of March 27 to 31 rendered a continued rise certain. A very slight fall gave renewed hope early in April to the inhabitants from Cairo to White River that the worst was past. From the White to the Red, danger continued, while from the Red to New Orleans the danger daily increased, culminating on April 16 from Red River Landing to New Orleans.

During April, crevasses had followed each other with unusual rapidity.

The extent of country under water probably has not been equaled during the past thirty years.

Greenwood, Miss., was entirely submerged; the water being higher than in 1867, the standard high water. As this place is located on ground considerably higher than the ordinary level of the Yazoo bottom, and near the outlying bluffs, it is certain that the whole bottom was covered.

As regards the comparative height of the flood, it appears that from Cairo to Memphis the water varied from 43 inches lower at Cairo to 11 inches lower at Memphis. This difference appears on first sight to be an extraordinary one. It is evident on consideration that of the water above 46 feet on the Cairo gauge fully two-thirds overran the right bank into the Saint Francis bottom. Indeed, during 1867, the river for some seventy miles was said to have been from ten to fifteen miles wide. From Memphis to Helena, the variation from 1867 was very slight; the stage of water being the same at Helena in 1867 and 1874.

At Helena, however, in 1862, the water was 7 inches higher than in 1874. At Jacksonport, Ark., the water was 21 inches below that of 1867. At Little Rock, Ark., the water was 6.70 feet below that of 1857 as compared with 1867; the variation is unknown.

At the mouth of White River, this year's freshet was practically the same as 1867; being reported as only 0.20 foot lower.

From White River down, reliable information has been obtained from Mr. Samuel D. McVernon, chief engineer of levees for Bolivar and counties, Mississippi, to the effect that at the mouth of White River the water was lower than 1862; but from there to the end of Catfish Point, Bolivar County, the water was higher than ever before known, being 22 inches higher on the point. The height of the water grew less until at Ben Lomond, opposite Lake Providence, it was 5 feet lower. The gauge at Lake Providence shows it to have been 3.89 feet lower at that point. He states that this was caused by all the levees on the opposite side of the river having been broken in this and former years; giving free egress for the river into Bayou Macon and Tensas River, Louisiana. This data positive. At Vicksburg the water of this year was 5.40 feet below 1862, and 2.02 feet below that of 1867; the difference being accounted for by facts given above. At Natchez the difference between this year and 1859 fell to 3.84 feet below 1859, and 1.11 feet below that of 1867. This diminution is attributable to the high ground above and below Natchez, and to the fact that the levees near were in good condition, so that no considerable crevasse occurred near there.

At Munroe, La., on the Ouachita, the river was one foot higher than ever before known. At Shreveport, La., the water of this year was 2.75 feet below that of 1859.

At River Landing, this year exceeded the freshet of 1867 by 0.72 foot, which diminished at Baton Rouge to 0.27 foot through the numerous crevasses between the two points.

At Carrollton, the water of 1871 was 0.55 foot below this year, and at New Orleans 0.67 foot below.

In order that forecasts for future floods can be correctly made, attention is called to certain peculiarities in the rise and fall induced by the immense reservoirs—the Saint Francis and Yazoo bottoms. In 1858, the highest stage of the river was reached at Cairo, on June 21 and 22, 50.56 feet, when the river fell steadily. The stage at Memphis closely followed that at Cairo; attaining its maximum on the 23d. Helena is seventy miles below, and the maximum would naturally be expected June 24; the river, however, rose steadily from 43.1 feet on the 23d to 49.00 feet on July 2, where it stood until July 7. By July 5 the water stood at 31.46 feet, a fall of 17.54 feet.

In 1859, at Cairo, the record is wanting to March 21, when the river stood at 44.26, rising after that. The maximum was evidently attained a week or more before, as the maximum was reached at Helena on March 22. At Cairo, the water rose steadily from March 21 to April 1, (36.2,) while Helena as steadily fell until April 7; Helena rose steadily from May 9 to May 22, while Cairo had experienced in corresponding time a decline of 11.67 feet. In 1861, the highest water at Helena occurred May 2, 41.86 feet, against 44.16 feet at Cairo on April 24. Cairo, in the mean time, had fallen 2.42 feet. In 1872, Cairo received its maximum water, 40.20 feet, April 19 and 20, while Helena's was on April 26, 39.03 feet. In 1873 the Cairo high water was April 12, 41.60 feet; that at Helena April 20-22, 39.70 feet, when Cairo had declined 2.4 feet. In 1874, the maximum stage occurred at Cairo, April 26, 48.37 feet; while that at Helena followed only on May 11, 45.82 feet; Cairo then having fallen 2.39 feet. Due allowance in these statements has been made for the time necessary for the water to travel from Cairo to Helena, three days for the three hundred and eighteen miles.

The lateness of the Helena high water depends on the stage of the river, being in these instances three days later for 40 feet at Cairo; five to six days for 43 feet; twelve days for 48 feet and above. In other words, the amount of overflow from the river into Saint Francis Swamp determines the date. For the first ten miles west from Memphis, in 1867, the bottom averaged 5.6 deep, while from west of the ridge at the end of

the tenth mile of the Memphis and Little Rock Railway, to Madison, forty miles, the depth was much greater, as indicated by the high water-marks of 1871 and 1874. There was probably an average depth of 7 feet from Memphis to Madison in 1874. Vicksburg gauge was similarly, although less affected, by the Yazoo bottom. In 1858, the high water was probably nine days late; in 1872, three days; in 1873, two days; and in 1874, four days later. The date of high water in 1858 is so complicated by crevasses that it could be exactly determined only by more time than can be spared to the question. Crevasses also affect somewhat the rise and fall. The crevasse at Bolivar Landing, March 15; Cook's, March 20; and Point Lookout, March 13, affected the readings of the Lake Providence gauge, there being a rise of only 0.27 foot in eight days, against 1.80 feet at mouth of White River; the exact fluctuations are unfortunately wanting, owing to the lack of gauge-reading for six days at mouth of White River, which had to be arbitrarily interpolated.

The fall of 1.35 feet at Baton Rouge on April 17, against a rise of 0.50 foot at Red River Landing, of the day previous, shows the marked effects of Morganza, Hickey, McCulloch, and Port Hudson crevasses.

The crevasse of Belle Chasse, April 9; Bonnet Carre, April 11; Greenwood, April 11, and other minor ones, caused a fall of one inch at New Orleans, May 8, and a stand for four subsequent days.

Although correct forecasts for the river will be productive of most happy results, yet the dissemination of speedy and correct information as regards the stage of water in the various rivers will yet prove a far greater good, as every intelligent man along the river is able to estimate the rise at his own plantation when this general information is added to his local knowledge and experience. A knowledge as to range of the river is almost entirely unknown among those really most concerned in possessing it; save a few educated gentlemen who have investigated the subject, and a small proportion of the steamboat-men, but little knowledge is had on this point. This need has been constantly recognized by the office in the publication of the New Orleans river stage below high-water mark. The real knowledge desired during high water is the proximity of the water to some well-known high-water mark.

The office is able to extend in a continued permanent form, at no additional expense, this information by adding it to the river-bulletin which is issued, so that whenever it is placed in the hands of any person all needful data will be before him. If adopted, New Orleans should report from low water, which will obviate the necessity of any special note on that station.

The establishment of any fixed "line" cannot meet the many and varying conditions of the river; but such reliable data will enable parties interested to base their calculations on this information, and conform its position to their particular locality, whether above or below the general level of the country. Appendix No. 21 shows the form and kind of data referred to. The old zeros at Davenport, Keokuk, and Warsaw are retained, as being so well known to every river-man in the country.

Accompanying the report are transmitted the gauge reports of twenty-eight stations, from 1866 to 1874, so arranged as to show readily the constitution of any rise or fall from its commencement to its termination.

It is more than probable that errors of some kind have crept into the report through possibly incorrect data or hasty and imperfect conclusions. In many, indeed most cases, conflicting information was received, which had to be duly weighed and valued at its proper worth. The lack of positive data outside of the regular signal-service and engineer stations is surprising. Acknowledgment is due to the city engineers of Saint Louis and Memphis for valuable information extended, as well as to the several observers of the Engineer Corps at gauge-stations. To Colonel J. Shaler Smith, Engineer Baltimore Bridge-Company, is due thanks for the reading at Saint Charles, Mo., which shows so clearly the actual effect of the Missouri on the Mississippi.

From Colonel Tayler, Cairo Improvement Company, Cairo, Ill., was obtained a series of river-observations at that point, extending, with few breaks, from 1858 to 1868, which, although not continuous, proved most valuable. It is the best and most extensive individual record on the river. Mr. James B. Miles, of Helena, who has devoted his leisure for years to the study of the river, contributed data in regard to the floods at that point, which will prove valuable to any person interested in elucidating the question of the effect of the Saint Francis Swamp as a reservoir for preventing future disastrous floods. Free use has been made of the materials contained in the standard work on this question, Humphreys and Abbot's most valuable report, as also of data in the various official reports of minor importance. The establishment of a gauge at the point where the Cairo and Fulton Railway crosses the White River, a little below Jacksonport, and also at Chattanooga, Tenn., will furnish, together with present reports, much valuable information during dangerous seasons. The rise which proved injurious this year from Cairo to mouth of White River was carried to its greatest height by an unexpected addition from the Tennessee, when the danger seemed past. Readings should be made on the White River from February 1 to April 1,

and on the Tennessee from February 1 to April 15. Reports from Chattanooga during the low-water season would also prove valuable to commercial interests, and are recommended.

In regard to the depth of water at low-water mark on the Lower Mississippi, or indeed scarcely any point, nothing definite can be given, as the depth is never the same for two consecutive weeks.

I am, respectfully, yours,

A. W. GREELY,
First Lieutenant Fifth Cavalry, A. S. O. and Inspector.

The CHIEF SIGNAL-OFFICER OF THE ARMY.

PAPER 32.

SAINT LOUIS, MO., *July* 7, 1874.

GENERAL: I have to submit the following report concerning the "danger-line" proposed to be established on the Missouri River:

At Omaha, the river becomes dangerous to property when it attains a level of 16 feet above the zero in use, the low-water mark of 1867. Between Omaha and Plattsmouth, the property first to be injured consists of the farms on the bottom-lands, which are mainly on the east side of the river. On the map, inclosure No. 1, inclosed in red lines, (broken when the exact line of bluffs is not definitely known to the inspector,) is shown the country covered by the flood of June, 1844, which covered the whole country from bluff to bluff, except the small sections blocked out in red ink. On the west side of the river, the Burlington and Missouri River Railroad, in Nebraska, has been lately built over considerable ground covered by the flood of April, 1867.

The ground covered during 1867 is shown, where definitely known, by blue lines. A large extent, which was probably covered, is omitted as being unauthenticated by careful observers. The difference between the height of the floods of 1844 and 1867 could not here be determined, accounts varying from 1 to 10 feet. Probably the flood of 1844 was 3 feet higher until the mouth of the Kaw, or Kansas, was reached.

At Plattsmouth, the danger-line may be fixed at 11 feet 6 inches above the present zero, an imaginary low-water mark.

It is recommended that the zero of the gauge be set at low-water mark of December 6, 1873, 5 feet 1 inch below the present zero.

On November 10, 1865, a simultaneous gorging of the Missouri and Platte Rivers carried the river down to 7 feet 10 inches below zero, but it lasted but about an hour.

The damage from high water between Plattsmouth and Saint Joseph would be confined almost entirely to the east side of the river, consisting of farms, and a portion of the Hannibal and Saint Joseph Railway. The blocks marked out in red ink in this district show sections never yet overflowed.

The Platte River, which unites with the main river at Plattsmouth, is a most important and large contributor to the floods. The river at times rises very rapidly, swelling the Missouri 4 and 5 feet at times in a day. A special observer at Fort Kearney, two hundred and fifty miles from the mouth, would insure the earliest premonitions of a rise. Telegraphic facilities are ample at Kearney.

At Saint Joseph, the danger-line can be fixed at 15 feet 6 inches above the present zero, or at 95.70 feet of the bridge-gauge. It is recommended that the zero be changed to low water of December 11, 1873, 3.45 feet below the present zero, 76.75 feet of the bridge-gauge.

Between Saint Joseph and Leavenworth, the same kind of property is liable to injury from high water—farms in the bottoms, and the railways in isolated places.

The danger-line at Leavenworth is 15 feet 8 inches above the zero of the present gauge, or 24 feet of the fort-gauge. The present zero marks no definite point, and is determined from a number of comparative readings to be 5 feet 4 inches above the zero of the fort-gauge, which is low water of November 30, 1871. The present gauge is not correctly scaled, owing to changes from its original position. The zero should be changed, and the gauge properly scaled during the low water of this year.

Between Leavenworth and Kansas City, the amount of land subject to overflow is very small, and the property endangered almost entirely farms.

At Kansas City the danger-line is 21 feet above the present zero. The lowest water known was January 6, 1874, 1 inch below the present zero. Opposite Kansas City, as shown on map, (enclosed, number 1,) a considerable strip of land was overflowed through a slough, ranging in slough from 4 feet to 10 feet deep, and on other ground up to 4 feet. A similar overflow of less extent prevailed in 1873. Between Kansas City and Lexington, farms only suffer from high water. There is but little land subject to such overflow until Camden is reached, when from 18 feet up (of K. C. gauge)

the country commences to overflow, reaching, by 20 feet, Crooked River. Not much land is covered until over 20 feet is reached, owing to the peculiar configuration of the country.

The Saint Joseph and Lexington Railway, lately built, would suffer from 21 feet upward.

At Lexington, the danger-line is 21 feet above the present zero, and 24 feet 6 inches would drive out all settlers between Camden and Crooked River. The zero of the gauge is low water of 1861. Between Lexington and Brunswick, there is considerable bottom-land farms, which 22 feet and above would overflow.

At Brunswick, the zero is an assumed point, and its reference to the high or low water of any year is unknown.

Probably 12 feet would equal the high water of 1867, which covered considerable country between Brunswick and Booneville, as shown on the map. (Enclosed, 1.)

Eleven feet is fixed on as the point above which damage to farms will ensue.

At Booneville, the danger-line is fixed at 23 feet above the present zero, low water of December 1, 1872.

Between Booneville and Jefferson City, a moderate amount of country is subject to overflow, the property to be affected consisting of farms.

At Jefferson City, the danger-line is fixed at 22 feet above the zero, low water of 1867.

No country to any amount has been overflowed since June, 1844; the bluffs approaching near the river and the bottom-lands being much higher than above.

At Herman, the danger-line is fixed at 16 feet above the zero, low water of January 21, 1874.

Along the whole river, the inspector could learn of no property, other than farms and road-beds of railways, as being in danger of injury from floods.

It is recommended that a special river-station be opened at or east of Fort Riley, where the Republican, the most considerable of its tributaries, empties into the Kaw.

The inspector was desirous of analyzing, as far as practicable, the proportion of water coming from each river; but the task would require much more time than he believes the Office would think needful.

It is firmly believed that at least half the water above low-water mark of the Missouri is received below Omaha, and that the probable rise can be predicated from the amount of rain-fall in each section. It is recommended that a rain-gauge be furnished each special observer, and the amount of rain-fall reported with the river.

Nothing has been said in regard to the depth of the river at low water; the channel and depth are continually changing, and nothing reliable can be furnished by any one.

I am, respectfully, yours,

A. W. GREELY,
First Lieutenant Fifth Cavalry, A. S. O. and Inspector.

The CHIEF SIGNAL-OFFICER OF THE ARMY.

PAPER 33.

BOSTON, MASS., *October* 19, 1874.

GENERAL: I have the honor to submit the following report upon the "danger-line" of the Ohio River from Cincinnati to Paducah, Ky.

At Cincinnati it is placed at 50 feet above the zero ordinarily used, that of the gauge at the city water-works. At that point, the water commences overflowing the lower part of the city; the area increasing but slowly as the water rises.

Observations taken at 6 a. m. and 6 p. m. each day since June 1, 1858, are enclosed, having been obtained from the city water-works of Cincinnati.

From them it appears that the water has attained a height of 50 feet or more, as follows: 1859, nine days, (February 7, April 1, May 1;) 1862, nine days, (January 7, April 2;) 1865, nine days, (March 6, May 3;) 1867, nineteen days, (February 7, March 12;) 1870, seven days, (all January;) making, in all, fifty-three days in sixteen years.

Damage is occasionally done to merchandise on the levees by sudden rises of 10 feet or more in twenty-four hours. Such have occurred in sixteen years as follows: 1859, February 17–18, 29 feet 5 inches to 39 feet 11 inches; September 20–21, 3 feet 3 inches to 15 feet 7 inches, (7 feet 3 inches occurring in 12 hours;) December 6–7, 25 feet 1 inch to 35 feet 2 inches; 1860, April 11–12, 23 feet 6 inches to 34 feet 9 inches; November 1–2, 10 feet to 23 feet 4 inches, (9 feet 8 inches of it in 12 hours;) 1861, September 29–30, 8 feet 5 inches to 29 feet 5 inches, (11 feet 1 inch in 12 hours and 26 feet 2 inches in 36 hours;) 1862, April 9–10, 29 feet 10 inches to 42 feet 5 inches; 1864, May 17–18, 21 feet 1 inch to 31 feet 5 inches; 1865, February 25–26, 25 feet; 4 inches to 36 feet; May 26–27, 29 feet 1 inch to 39 feet 11 inches, (8 feet 1 inch in

12 hours;) December 21–22, 22 feet 11 inches to 34 feet 2 inches, (6 feet 8 inches in 21 hours;) 1866, March 12–13, 17 feet 4 inches to 30 feet 10 inches, (7 feet 5 inches in 12 hours;) July 25–26, 9 feet to 19 feet 5 inches, (6 feet 1 inch in 12 hours;) 1867, February 14–15, 29 feet 8 inches to 40 feet; 1868, January 6–7, 24 feet 10 inches to 35 feet 2 inches; June 17–18, 13 feet 7 inches to 24 feet 1 inch; 1870, April 20–21, 27 feet 3 inches to 38 feet 4 inches; 1871, January 17–18, 10 feet 7 inches to 20 feet 10 inches; 1872, April 9–10, 20 feet to 37 feet 5 inches, (14 feet 3 inches in 12 hours;) 1873, February 6–7, 18 feet 4 inches to 28 feet 9 inches; in all, twenty times.

The most notable continued rise was from September 29 to October 1, 1861, 11 feet 1 inch in 12 hours, 21 feet in 24 hours, 26 feet 2 inches in 36 hours, 30 feet 1 inch in 48 hours, and 32 feet 1 inch in 60 hours. This is followed in importance by those of January 19 to 20, 1859, 21 feet 9 inches in 60 hours; January 15 to 17, 1870, 21 feet 5 inches in 60 hours; and May 25 to 27, 1865, 17 feet 1 inch in 48 hours.

At Louisville, Ky., the range of water is 39.66 feet from low water of 1856 to high water of 1832.

The "danger-line" is fixed at 24 feet, although the amount of property injured by 25 feet is very small.

The river has stood at 24 feet or more, 19 days in 1859; 33 days in 1867; and 3 days in 1874; in all, three times, and 55 days, in the last sixteen years.

Enclosure No. 2 is a map of Louisville, whereon, in red figures, is marked the height, with reference to the city-datum, which is identical with the zero of the river or canal gauge, from which can be seen the amount of territory which would be flooded by any particular height of water. The data were furnished through the courtesy of Mr. Thomas P. Shanks, City Engineer of Louisville.

At Evansville, Ind., the range of water is 49 feet from low water of 1856 to high water of 1832.

The "danger-line" is placed at 34 feet. The water has stood at or above such point in 1832, 1847, 1856, 1859, 1867, 1870, 3 days in December, 1873, and 36 days in 1874.

This height (34 feet) injures corn-crops either in field or crib. The corn is usually in crib from December to February, sometimes longer. The bottom-lands are very level, and extend back, in many places, from twelve to fifteen miles, both above and below Evansville.

Forty-two feet would damage a great many dwellings along the river. Forty-four feet would flood all the bottom-lands between Evansville and Paducah, and would submerge 2 or 3 feet many of the houses in Leavenworth. At Evansville, there is always a large amount of freight on the levee; but the merchants are better informed by private telegrams than they can be by official ones, as dispatches are received every evening from all quarters that can in any manner seriously affect the river at that point. The Wabash, which empties into the Ohio some twenty miles below Evansville, sometimes affects the river very greatly. In 1867, the river at Evansville reached its height, March 16, 11 inches below the high-water mark of 1832; at Shawneetown it was reported 8 inches higher than the flood of 1832.

At Evansville, the river opposite Locust street was 6 feet deep at low water 1867, and opposite Main street 3 feet deep. Changes are constantly occurring in the bed of the river, and no standard figures can be given for depth in channel.

At Paducah, Ky., the range increases to 53 feet through the Wabash, Cumberland, and Tennessee Rivers, from low water of 1857 to high water of 1867. The line of high water has been marked on the gauge at 51 feet, through an error of the painter, who promised the observer that he would correct it.

The "danger-line" is fixed at 40 feet on the present gauge. The water has been above that point twenty-nine days during the present year. The injury done is mainly to farms and crops in the low-lands.

The importance of a station on the Tennessee River for the portion of the Ohio between Paducah and Cairo has been pointed out in my report on the Mississippi River. Attention is called to the remarks therein made.

I am, respectfully, yours,

A. W. GREELY,
First Lieutenant Fifth Cavalry, A. S. O. and Inspector.

The CHIEF SIGNAL-OFFICER OF THE ARMY.

PAPER 44.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE,
Washington, D. C., Saturday, May 30, 1874.

SPECIAL RIVER REPORT.

During the past twenty-four hours the Mississippi has fallen at all reporting stations from La Crosse to Helena, and remained unchanged at Saint Paul and New Orleans. The greatest change has been at Helena, where it is 19 inches.

The Missouri has fallen from Yankton to its mouth.

The Ohio has fallen 4 inches at Pittsburgh, risen 6 inches at Marietta and 1 at Cincinnati; remained stationary at Louisville and fallen thence to Cairo.

The Red, Arkansas, Cumberland, Alleghany, and Monongahela have fallen slightly at all stations.

The rain-fall in the watersheds of the several rivers has been: In the Mississippi, seven hundredths of an inch at Cairo; in the Cumberland, seventeen hundredths at Nashville; and in the Red, two hundredths at Shreveport.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 45.—FORM 31.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

Report of observations on temperature of water at ——— *for the week ending Saturday,* ———, 187–.

Day and date.	Time of observation.	Temperature of air.	Temperature of water at surface.	Temperature of water at bottom.	Depth of water.	Remarks
Sunday						
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						

———, ———,
Observer.

PAPER 46.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE,
Washington, D. C., Saturday, December 27, 1873—1 a. m.

SYNOPSIS FOR THE PAST TWENTY-FOUR HOURS.

The storm which was central off the Middle Atlantic coast this morning, moved to the northeastward, with brisk and high northeasterly to northwesterly winds and heavy snow and rains in the Middle and East Atlantic States.

From these districts westward over the Lake region, the Ohio Valley, and the Northwest, cloudy weather and snow, and light to brisk variable winds are reported.

Partly cloudy or clear weather, with increased pressure and light winds, now prevails in the South Atlantic and Gulf States.

The temperature has fallen decidedly in the extreme Northwest and slightly in the Upper Lake region.

PROBABILITIES.

For New England, and thence westward over the northern portion of the Middle States and the Lower Lake region, generally cloudy weather with snow, and light to fresh variable winds, will prevail.

For the southern portion of the Middle States, and thence southward over the South Atlantic States, partly cloudy and foggy weather, with light to fresh southwesterly to northwesterly winds, increasing pressure and slight changes of temperature.

For the Ohio Valley, and thence northward over the Upper Lake region, increasing pressure, lower temperature, with generally cloudy weather and snow, followed by cloudy weather in the afternoon.

For the Northwest, cloudy weather and light snow in the river valleys, followed by clearing and cold weather and fresh to brisk northerly winds during the afternoon.

For the Gulf States, and thence northward over Tennessee, increasing pressure, with lower temperature, northerly winds and clearing weather.

For the canal region of New York, the temperature will fall below freezing during Saturday night.

Published by co-operation of the War and Post-Office Departments.

ALBERT J. MYER,
Brig. Gen., (Brt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 47.

WEEKLY WEATHER CHRONICLE.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE,
Washington, D. C., August 27, 1874.

GENERAL SUMMARY FOR THE WEEK ENDING THURSDAY, AUGUST 27, 1874.

An area of low barometer moved from the northwest eastward over the Saint Lawrence Valley and New Brunswick, on Thursday of the past week. A second moved from Kansas and Northern Missouri slowly southeastward across the country to the South Atlantic coast during Saturday, Sunday and Monday, causing extensive and, in many places, heavy rains in the Middle and Southern States. A third depression is apparently central this morning in Nebraska, while an area of high barometer, with low temperature, covers the northeastern sections of the country.

The rain-fall for the past week averages about as follows in the districts mentioned: Saint Lawrence Valley, 0.1 inch; New England, 0.75; Middle Atlantic States, 0.95; South Atlantic States, 1.0; Eastern Gulf States, 1.0; Western Gulf States, 1.5; Lower Lake region, 0.55; Upper Lake region, 0.5; Ohio Valley, 0.6; Tennessee, 1.75; Upper Mississippi Valley, 0.65; Lower Missouri Valley, 0.5; Minnesota, 1.0.

Thursday, 20.—Threatening and rainy weather continued in the Gulf States and partly cloudy weather, with areas of rain, prevailed in Indian Territory, the Upper Mississippi Valley, Dakota, Minnesota, and the northern portion of the Upper Lake

region. Clear or fair weather was reported from the remaining districts, attended by a decided rise of temperature in the Middle States, the thermometer reaching 100° at Washington during the afternoon.

Friday, 21.—Increasing cloudiness, with cool northerly winds and rain, prevailed in the Lake region, the Saint Lawrence Valley, New York and New England. High temperatures and clear weather continued in the southern portion of the Middle States. Warm, partly cloudy weather, with occasional rain-areas, was reported from the Southern States, the Ohio Valley and the Northwest, except in Minnesota, where falling temperature was experienced.

Saturday, 22.—Cool, clear or clearing weather prevailed in the Lower Lake region, New York, New England, the Saint Lawrence Valley and the Eastern British provinces. Cloudy or rainy weather was reported from nearly all stations in the remaining sections east of the Rocky Mountains.

Sunday, 23.—Threatening and rainy weather continued all day in the Middle Atlantic States, heavy rains falling in Virginia and Maryland. Cool, clear, or partly cloudy weather was reported from the Saint Lawrence Valley, New England, New York and the Lake region, and partly cloudy weather, with occasional rain, from the South Atlantic and Gulf States, the Ohio Valley, Tennessee and the Northwest.

Monday, 24.—Cloudy and rainy weather continued in Eastern Tennessee, the South and Middle Atlantic States and on the Gulf coast. Clear or fair weather was reported from the remaining districts east of the Rocky Mountains. The temperature remained low all day throughout the Lake region and thence eastward to New England and New Brunswick.

Tuesday, 25.—Partly cloudy or clearing weather, with northeasterly winds, continued in the Atlantic States from New Jersey to Florida, heavy rains falling in the northeastern portion of the latter State. Clear or fair weather prevailed elsewhere east of the Rocky Mountains, with continued low temperatures throughout the Lake region and thence to the middle and east Atlantic coasts.

Wednesday, 26.—Falling barometer, fresh and brisk southeasterly winds, increasing cloudiness and rain, prevailed in the Northwest, extending thence southward and southeastward to Indian Territory, Arkansas and Tennessee. Clear or fair weather was reported from the Gulf and Atlantic States, the Lake region and the British Provinces, with continued low temperature in the northeastern sections and brisk northeasterly winds on the Atlantic coast from New Jersey to Florida.

Thursday, 27.—The morning reports show clear, cool weather throughout the Lake region, the British Provinces, New England and the northern portion of the Middle States, and warm, clear or fair weather in Florida and the Gulf States. Cloudy weather prevails in the remaining districts east of the Rocky Mountains, with areas of rain from Tennessee northwestward to Minnesota.

RIVERS.

During the past week the Red River has fallen 5 inches at Shreveport. The Cumberland has risen slightly at Nashville. A freshet wave, about 3 feet in height, is at present passing down the Missouri, its crest being now between Omaha and Leavenworth. The Mississippi has fallen slightly between La Crosse and Saint Louis, 1 foot at Cairo, 15 inches at Memphis, 3 feet at Vicksburg, and 4 inches at New Orleans, but has risen 1 foot at Saint Paul. The Ohio has fallen 2½ feet at Cincinnati and 2 at Louisville, but has risen 3 feet at Pittsburgh.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

Paper 49 is on page 374.

PAPER 48.[1]

MONTHLY WEATHER REVIEW, OCTOBER, 1873.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

STORMS.

During this month fourteen well-defined areas of low barometer have been indicated on the tri-daily weather-maps of the Signal-Service, some of which have, however, passed over the extreme limits of the territory covered by our stations. Besides these, there have been several indefinite barometric depressions, accompanied by rain and cloud. In detail the storms have been as follows:

No. I. *October* 3, 4, 5, 6, 7, *and* 8.—This was a severe cyclone that was first recognized as existing some distance southwest of Cuba; it passed over Florida on the 6th, and continued its course northeastward parallel to the Atlantic seaboard. Numerous disasters were caused by it at sea, and the settlement of Punta Rassa, Florida, was entirely destroyed, a hurricane velocity of ninety miles having been recorded at that place. It struck Lake City very suddenly October 6, at 6.10 p. m. Reports of damages have been received from Jacksonville, Saint Augustine, and Charleston. The wind was not severely felt at Savannah. Destructive gales were also felt off Cape Henry. A severe norther was induced by the extensive area of low pressure, and was felt along the entire coast of Texas and Louisiana as far as Mobile. This cyclone appears to have passed over the Shetland Islands on the 10th and 11th.

No. II. *October* 3, 4, *and* 5.—Produced a very general rain in the Lake region.

No. II*. *October* 4 *and* 5.—This kept to the north of the Lake region, and on the 5th apparently united with No. II as the latter passed down the Saint Lawrence Valley. The barometer fell with unusual rapidity at Eastport, where the wind velocity rose to thirty-two miles on the 5th.

No. III. *October* 6 *and* 7.—This may be regarded as a disturbance subsidiary to Nos. I, II, and III. It arose in the Middle Atlantic States, and as it slowly moved northeastward was accompanied by heavy rains on the Atlantic coast. Violent lightning was reported at New Haven on the 6th, and a heavy blow, with rain, at Cape May.

No. IV. *October* 6 *and* 7.—This storm-center kept so far to the northward that it only produced strong southwest winds and cloudy weather on Lake Superior.

No. V. *October* 5, 6, 7, 8, 9, 10, 11, *and* 12.—The rains and barometric depression prevailing over the California coast on the 4th, 5th, and 6th of the month re-appeared on the 7th as an incipient storm-center in Utah, which, after extending northeastward over Dakota and Manitoba, turned to the east and southeast into Minnesota and the Upper Lake region; it then disappeared in Canada, but re-appeared after inducing a small center of disturbance, No. V*, on the lower lakes, which latter moved eastward over New England, joining No. V in Nova Scotia. Violent thunder-storms were reported at Indianapolis and La Crosse.

No. VI. *October* 12.—This was but a slight barometric depression moving northeastward across Minnesota. High winds prevailed at Yankton.

No. VII. *October* 14 *and* 15.—This disturbance appears first in Kansas, although there is reason to suspect its existence two days earlier in Northern Arizona. In its passage toward Lake Superior it seems to have lost most of its intensity, a change due possibly to the presence of the more extensive disturbance. No. VIII, far to the north and northeastward.

No. VIII. *October* 16 *and* 17.—This barometric depression became first recognizable as such in the valley of the Saginaw, having probably pursued its previous course far to the northward. On the 16th, it moved rapidly southeastward over Nova Scotia, and then turned to the east. Brisk winds prevailed over Massachusetts and the Bay of Fundy.

No. IX. *October* 16, 17, *and* 18.—This storm originated as a general rain on the morning of the 16th, extending from Northern Texas to Nebraska, and was probably produced by the cooling of the mass of air that was then being forced from the Gulf of Mexico and the Mississippi Valley northwestward up the slopes of the western plains. The consequent area of low pressure gradually closed in on all sides, losing its very extended elliptical form until on the afternoon of the 17th, its center appeared as a small oval in Minnesota, attended by high winds and an extended area of rain. A severe gale was reported at Breckinridge on the 17th, and high winds at Saint Paul. The storm-center moved northeastward, and the gale of the night of the 17th and 18th on Lakes Superior and Michigan was, according to the reports from Milwaukee, one of the severest on record, while Alpena reports a gale of forty-four miles per hour from the south. The barometer at Marquette fell to 28.59 inches. Brisk southwest winds and rain prevailed on the lower lakes on the 18th and 19th.

No. X. *October* 18, 19, 20, 21, *and* 22.—This began as a slight depression in the western Gulf States and moving eastward was followed by a severe norther on the Texas coast, while itself increasing in intensity; on reaching the Atlantic coast the depression turned its course to the northeast and developed into a severe storm in the Middle Atlantic States on the 19th and 20th. It then turned to the northwest and held on this extraordinary course until the 21st at midnight, when it had reached the Strait of Mackinaw, being recorded as the severest storm since 1859 on Lakes Huron, Erie, and Ontario, and continuing for forty-eight hours at most places. Its severity is especially commented upon in reports from Cleveland, Oswego, and Buffalo, while the winds on the 20th at Portland, Me., and Saint John's, New Brunswick, were the severest of the month.

No. XI. *October* 20.—This depression was attended by a gale in Manitoba, but passed so far to the northward as not to seriously affect the upper lakes. Reports from Fort Benton, when they come to hand, will probably throw some light on its previous course.

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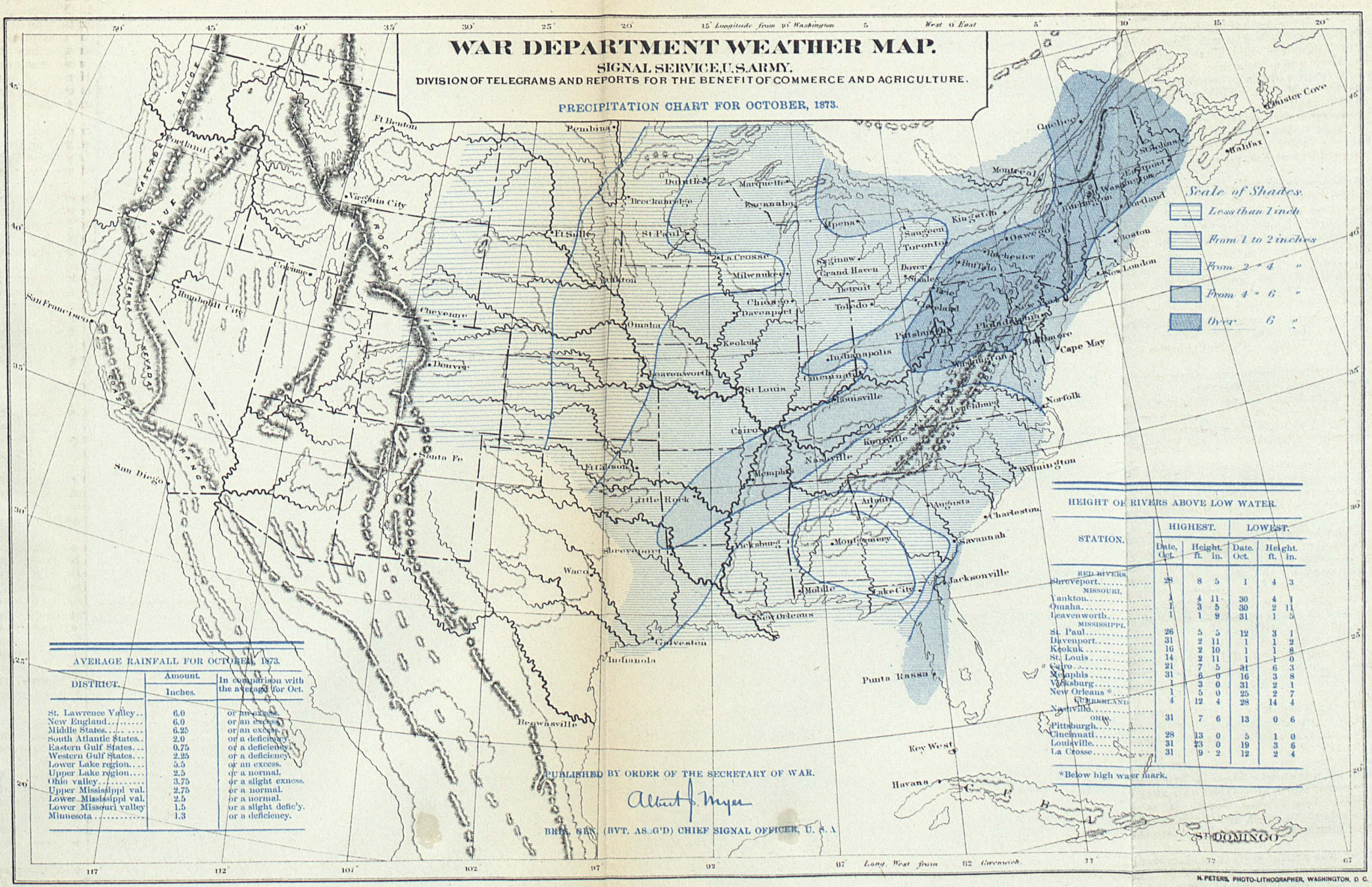
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR OCTOBER, 1873.



AVERAGE RAINFALL FOR OCTOBER, 1873.

DISTRICT.	Amount. Inches.	In comparison with the average for Oct.
St. Lawrence Valley	6.0	or an excess.
New England	6.0	or an excess.
Middle States	6.25	or an excess.
South Atlantic States	2.0	or a deficiency.
Eastern Gulf States	0.75	or a deficiency.
Western Gulf States	2.25	or a deficiency.
Lower Lake region	5.5	or an excess.
Upper Lake region	2.5	or a normal.
Ohio valley	3.75	or a slight exness.
Upper Mississippi val.	2.75	or a normal.
Lower Mississippi val.	2.5	or a normal.
Lower Missouri valley	1.5	or a slight defic'y.
Minnesota	1.3	or a deficiency.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. AS G'D) CHIEF SIGNAL OFFICER, U. S. A.

HEIGHT OF RIVERS ABOVE LOW WATER.

STATION.	HIGHEST. Date, Oct.	HIGHEST. Height. ft.	HIGHEST. Height. in.	LOWEST. Date. Oct.	LOWEST. Height. ft.	LOWEST. Height. in.
RED RIVER.						
Shreveport	28	8	5	1	4	3
MISSOURI.						
Yankton	1	4	11	30	4	1
Omaha	1	3	5	30	2	11
Leavenworth	1	1	9	31	1	5
MISSISSIPPI.						
St. Paul	26	5	5	12	3	1
Davenport	31	2	11	1	1	2
Keokuk	16	2	10	1	1	8
St. Louis	14	2	11	1	1	0
Cairo	21	7	5	31	6	3
Memphis	31	6	0	16	3	8
Vicksburg	1	3	0	31	2	1
New Orleans *	1	5	0	25	2	7
CUMBERLAND.						
Nashville	4	12	4	28	14	4
OHIO.						
Pittsburgh	31	7	6	13	0	6
Cincinnati	28	13	0	5	1	0
Louisville	31	23	0	19	3	6
La Crosse	31	9	2	12	2	4

*Below high water mark.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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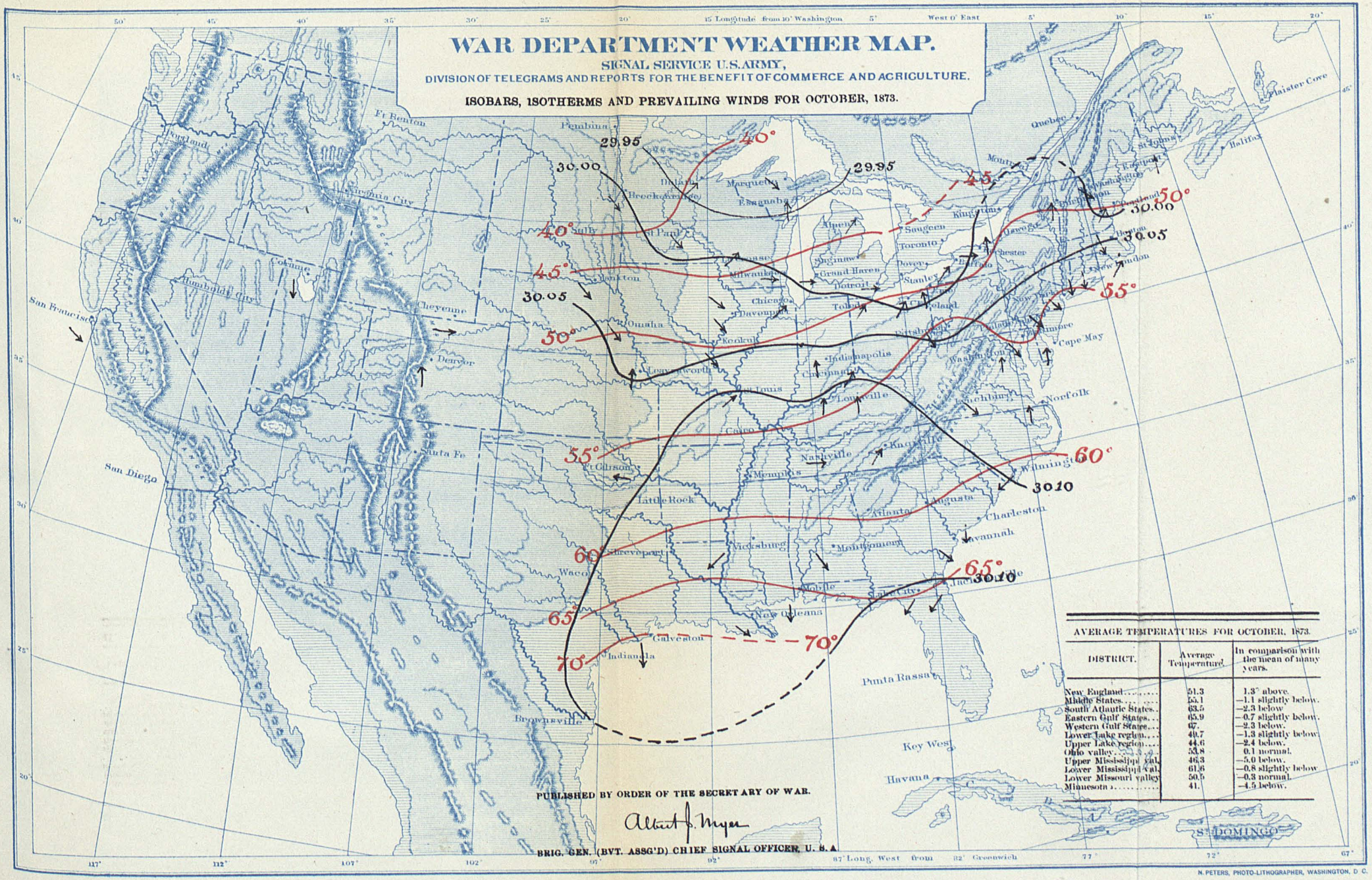
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR OCTOBER, 1873.



AVERAGE TEMPERATURES FOR OCTOBER, 1873.

DISTRICT.	Average Temperature.	In comparison with the mean of many years.
New England	51.3	1.3° above.
Middle States	55.1	—1.1 slightly below.
South Atlantic States	63.5	—2.3 below.
Eastern Gulf States	65.9	—0.7 slightly below.
Western Gulf States	67.	—2.3 below.
Lower Lake region	49.7	—1.3 slightly below.
Upper Lake region	44.6	—2.4 below.
Ohio valley	53.8	0.1 normal.
Upper Mississippi val.	46.3	—5.0 below.
Lower Mississippi val.	61.6	—0.8 slightly below.
Lower Missouri valley	50.5	—0.3 normal.
Minnesota	41.	—4.5 below.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

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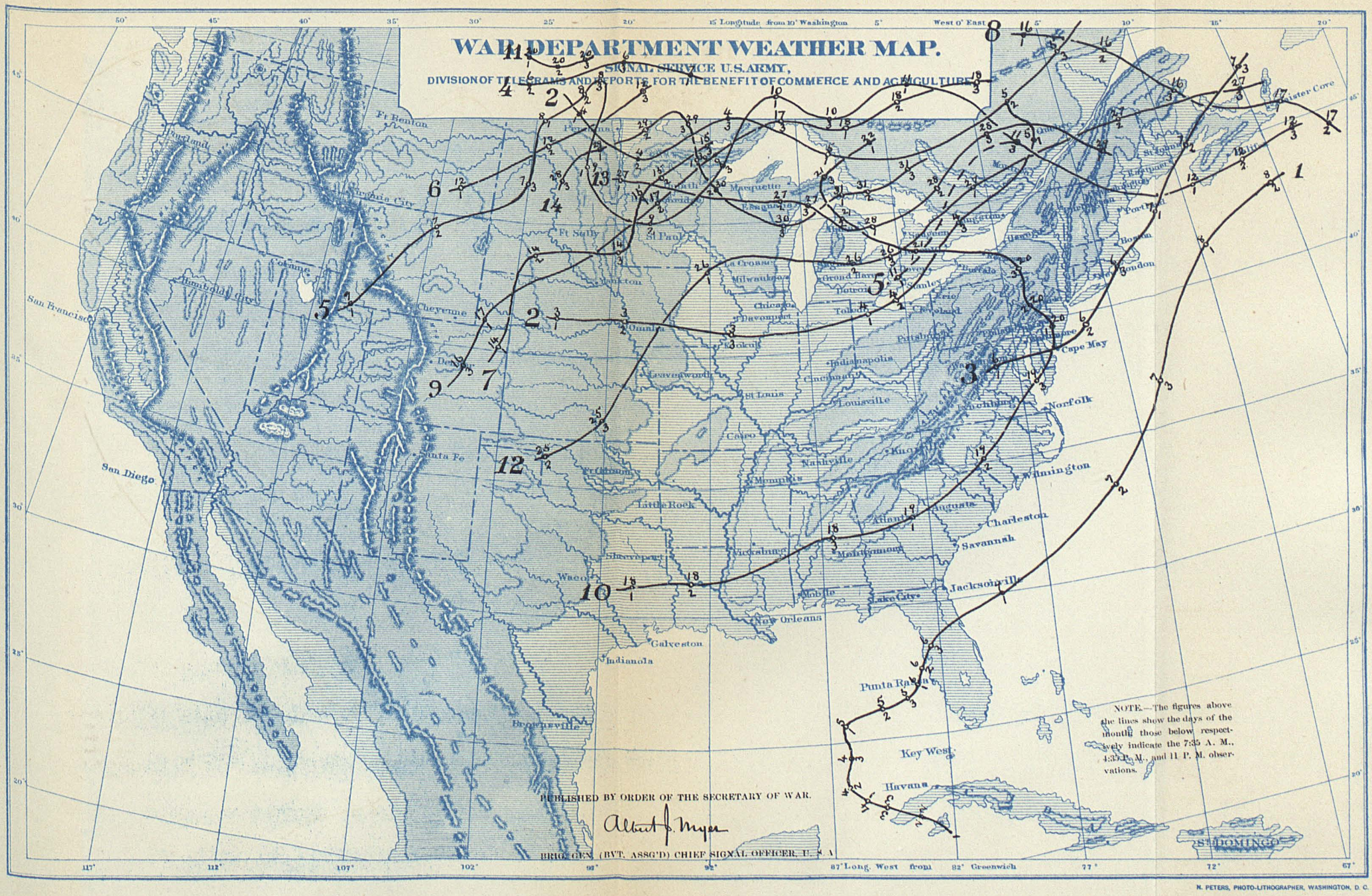
TRACK OF STORM-CENTRES FOR OCTOBER. 1873.



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

No. XII. *October* 25, 26, *and* 27.—This storm may probably be traced in Northern Texas on the 24th, but came within the cognizance of our stations on the 25th, when it was apparently central in Indian Territory. At that time snow was falling throughout the Northwest and extreme Northwest, being very heavy, with high winds at Yankton. The barometric disturbance was of minor importance, until the 26th, while the snow and rain were increasing in amount; on the latter day the storm-center passed over the lower lakes, and heavy lightning was seen to the northwest of Vicksburg in the evening. On the night of the 27th and 28th the storm was central in New Brunswick, while a southeasterly gale prevailed on the coast of Maine. This was reported as the heaviest storm of the season at Eastport, Portland, Me., Wood's Hole and New Haven.

No. XIII. *October* 27, 28, *and* 29.—This low barometer was formed over the upper lakes, following closely in the wake of No. XII, and in some sense connected with it. The snow and fog that prevailed on the lakes, united with the high wind, made the night of the 28th and 29th one of the wildest description, and numerous disasters were reported from Milwaukee. A southeast gale of forty-four miles velocity prevailed at Alpena. The disturbance disappeared over New Brunswick.

No. XIV. *October* 28, 29, 30, *and* 31.—This storm, after passing slowly eastward, turned southeast to Lake Huron and the lower lakes, accompanied by snow and followed by brisk northwest winds. On the afternoon of the 31st a westerly gale prevailed at Buffalo.

TEMPERATURE.

On Map No. 2 will be found a table of the average mean temperature for the different districts for this month.

For the Middle States, the Eastern Gulf States, the Lower Lake region, the Lower Mississippi Valley, the Ohio Valley, and the Lower Missouri Valley, it will be seen that the temperature averages about the same as for many years past.

The average temperature for New England is about the normal value; while for the South Atlantic States, the Western Gulf States, the Upper Lake region, the Upper Mississippi Valley, and Minnesota, the temperature during the past month, especially in the latter sections, is decidedly below the average of previous years.

RAIN-FALL.

Map No. 3 gives approximately the rain-fall for the country east of the Rocky Mountains, and the table printed therewith shows the excess or deficiency for the various geographical subdivisions.

It will be seen that the region of heaviest rain was over the northern and eastern sections of the country, the quantity diminishing very regularly as we proceed thence south and west. Droughts are reported from Denver, Lake City, and Savannah.

RIVERS.

Upon Map No. 3 will be found a table showing the highest and lowest waters at the principal river-stations. It will be seen that the rivers have generally ranged lower than during September, and at some stations have been reported as lower than usual at this season of the year.

EARLY FROSTS.

The first frosts of the season were reported at the following stations:

October 1. Lexington, slight; Wytheville, light; Oswego light. 6. Toledo, heavy; Detroit, heavy; Saint Paul, severe; Leavenworth, heavy. 7. Saint Louis, heavy; Cincinnati, heavy; Lexington, heavy; Milwaukee, heavy; Detroit, heavy; Vicksburg, light. 8. Charleston, heavy; Vicksburg, light. 13. Wytheville, heavy. 19. Milwaukee; Duluth, heavy. 20. Milwaukee; Lake City, heavy; Vicksburg, heavy. 21. Baltimore, light; Jacksonville, light; La Crosse, heavy; Nashville, heavy. 24. Louisville, heavy. 26. Buffalo, heavy. 29. Baltimore, heavy; Jacksonville, slight; Milwaukee, light; Mobile, light; Knoxville, heavy; Nashville, heavy; Vicksburg, heavy. 30. Mobile, heavy. 31. Mobile, heavy; Nashville, heavy.

ICE IN RIVERS AND LAKES.

The first ice of the season has been reported in the rivers and bays at the following places: Lexington, October 7; Toledo, October 6; Mobile, October 30; Yankton, October 27 and 31; Marquette, October 19.

EARLY SNOWS.

The first snow-falls were reported as follows: Detroit, October 20th and 21st; Chicago, 20th; Denver, 8th, (on the mountains;) on the 16th, (in the city;) this ended a drought of forty days; and on the 25th, heavy snow; Dubuque, 22d; Louisville, 28th; Lynchburg, 20th; Nashville, 28th; Rochester, 21st, light snow, and on the 28th heavy snow; Saint Paul, 25th, 27th, and 29th; Yankton, 24th and 25th; New York, 28th; Duluth, 19th; Leavenworth, 25th; Escanaba, 21st; Davenport. 27th.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Ass'g'd,) Chief Signal-Officer, U. S. A.

PAPER 48[a].

MONTHLY WEATHER REVIEW, NOVEMBER, 1873.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

STORMS.

During the month of November twelve storms traversed the Territory of the United States; the storm-centers of all these, with one exception, moving within the region covered by the Signal-Office Observations.

The following brief notices give the main facts of each storm:

No. I. Approached from the neighborhood of Pembina, on the 1st of November, and, after moving to the southern shore of Lake Superior, preserved an easterly course, reaching the Atlantic Ocean, north of Nova Scotia, on the evening of the 3d. Its mean progressive velocity was therefore from twenty-five to thirty miles per hour, although its cyclonic winds were not very dangerous.

No. II. Followed nearly the same track, but attained somewhat higher velocity. It arrived in Northern Minnesota on the afternoon of the 3d of November, and reached the Saint Lawrence valley on the evening of the 4th. It was accompanied by rain and light snow on the lakes and eastward.

No. III. Coming from the Red River valley on the 6th, and crossing the Lakes, reached Kingston, Canada, on the morning of the 8th, and thence moved northeastwardly.

No. IV. Originated in the western part of the Gulf of Mexico, and moved along the Gulf and Atlantic coasts all the way to Nova Scotia. It started upon this track on the morning of the 6th, and reached Plaister Cove, Nova Scotia, on the morning of the 9th, averaging about thirty-two miles an hour. It was accompanied by fresh wind and rain on the seaboard, and on reaching the Maine coast it was marked by high and dangerous winds in its front. As usual with cyclones taking this track, as it neared Nova Scotia, the barometric depression increased and the cyclonic winds became more violent than when the meteor was moving on lower parallels of latitude.

No. V. Probably originated in Colorado, near the eastern slope of the Rocky Mountains, but was first seen in Kansas on the afternoon of the 10th, and moved first northward to Saint Paul, Minn.; thence on the 11th toward Milwaukee, sweeping eastward with destructive force over the Lakes, and thence to the northeastward. At Milwaukee the gale rose to thirty-two miles an hour, accompanied by high winds and heavy snow on Lake Michigan; and snow and rain on the other Lakes.

No. VI. November 16, commenced its southeastwardly progress from Lake Superior (nearly due southeast) to Boston, passing over the latter place on the evening of the 16th, with heavy snow.

No. VII. Was perhaps the most remarkable continental cyclone of which the Signal-Office observations furnish any details. It was generated about mid-day of the 16th in Northern Georgia, and at once assumed a threatening aspect. During the night of the 16th and morning of the 17th, it steadily advanced to the vicinity of Wilmington, making about two hundred and forty miles in twelve hours, or about twenty miles an hour. Its course was thence northeastward along the inshore margin of the Gulf Stream, which it tenaciously followed to latitude 43° north, whence it struck off into the Bay of Fundy, and thence to the mouth of the Saint Lawrence River. All along its track was marked, from Norfolk to Halifax and Father Point, by fierce gales, and the incoming vessels reported fearful seas off the coast. At Norfolk the barometer fell to 28.86 inches, with rapidly shifting northeast, north, and northwest winds of high

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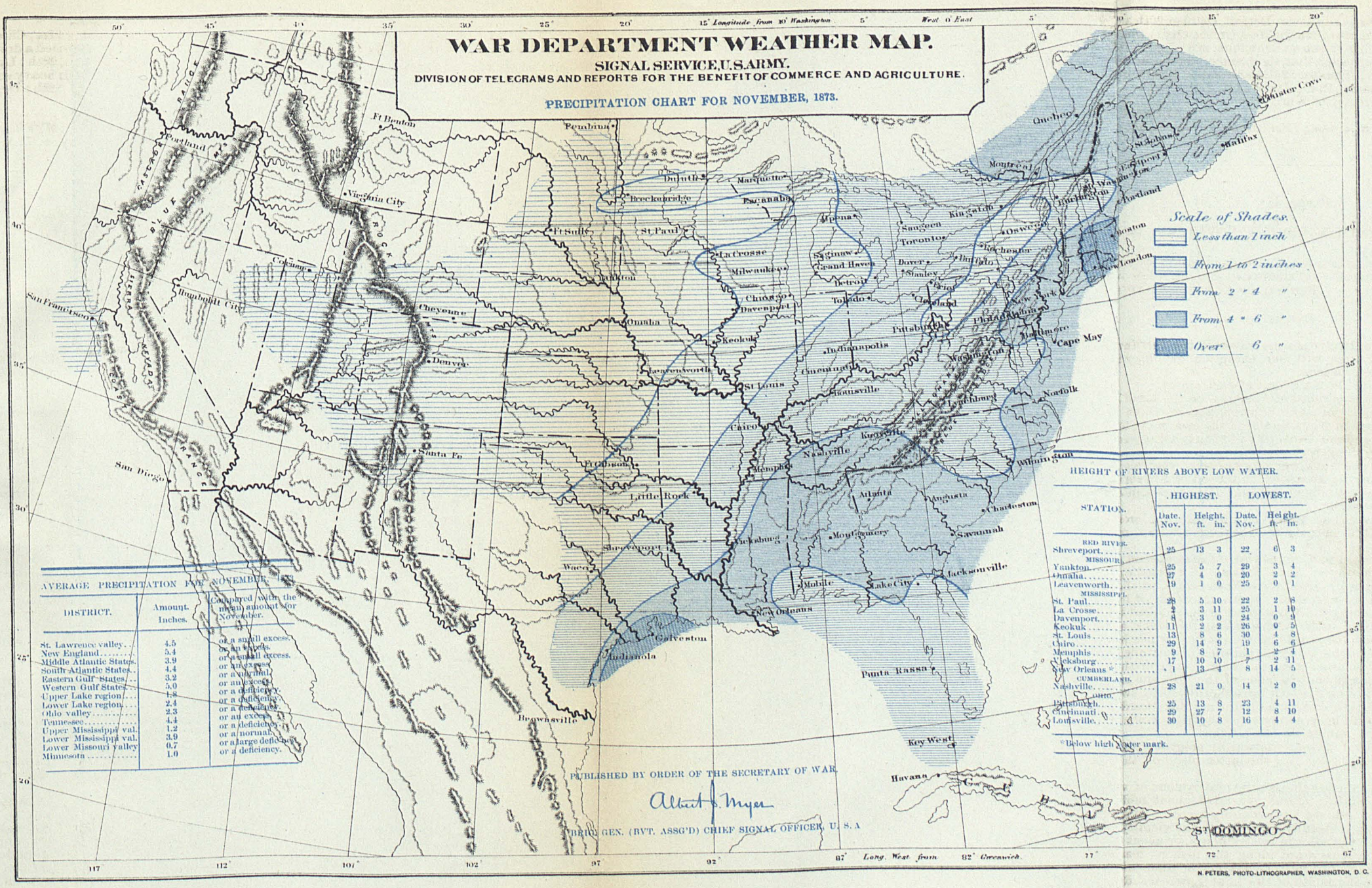
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR NOVEMBER, 1873.



AVERAGE PRECIPITATION FOR NOVEMBER, 1873.

DISTRICT.	Amount. Inches.	Compared with the mean amount for November.
St. Lawrence valley	4.5	or a small excess.
New England	5.4	or an excess.
Middle Atlantic States	3.9	or a small excess.
South Atlantic States	4.4	or an excess.
Eastern Gulf States	3.2	or a normal.
Western Gulf States	5.0	or an excess.
Upper Lake region	1.8	or a deficiency.
Lower Lake region	2.4	or a deficiency.
Ohio valley	2.3	or a deficiency.
Tennessee	4.4	or an excess.
Upper Mississippi val.	1.2	or a deficiency.
Lower Mississippi val.	3.9	or a normal.
Lower Missouri valley	0.7	or a large deficiency.
Minnesota	1.0	or a deficiency.

HEIGHT OF RIVERS ABOVE LOW WATER.

STATION.	HIGHEST. Date. Nov.	HIGHEST. Height. ft.	HIGHEST. Height. in.	LOWEST. Date. Nov.	LOWEST. Height. ft.	LOWEST. Height. in.
RED RIVER.						
Shreveport	25	13	3	22	6	3
MISSOURI.						
Yankton	25	5	7	29	3	4
Omaha	27	4	0	20	2	2
Leavenworth	19	1	0	25	0	1
MISSISSIPPI.						
St. Paul	28	5	10	22	2	8
La Crosse	2	3	11	25	1	10
Davenport	8	3	0	24	0	9
Keokuk	11	2	2	26	0	5
St. Louis	13	8	6	30	4	8
Cairo	29	14	9	19	6	6
Memphis	9	8	7	1	2	4
Vicksburg	17	10	10	7	2	11
New Orleans *	1	13	4	8	14	5
CUMBERLAND.						
Nashville	28	21	0	14	2	0
OHIO.						
Pittsburgh	25	13	8	23	4	11
Cincinnati	29	27	7	12	8	10
Louisville	30	10	8	16	4	4

* Below high water mark.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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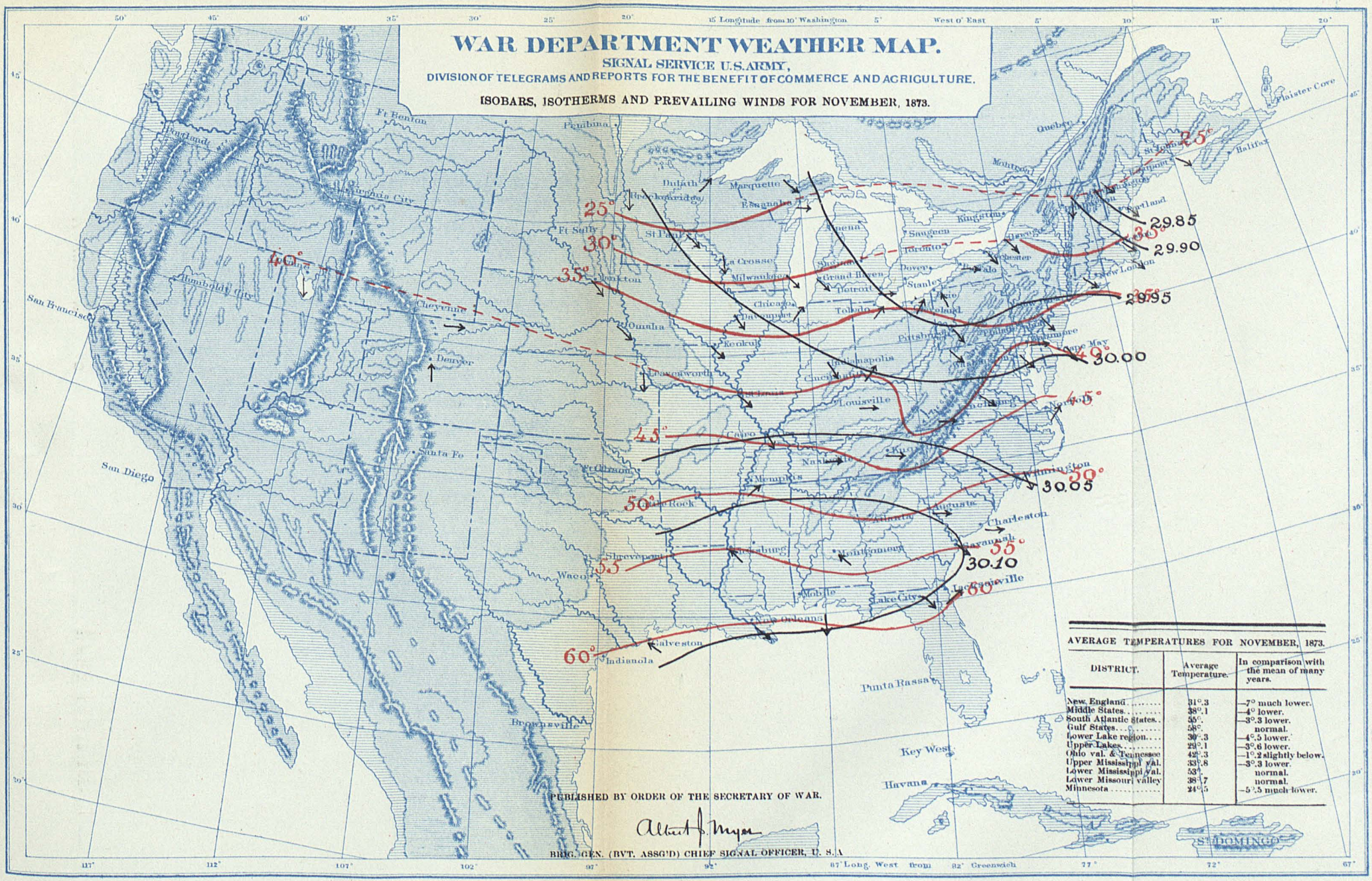
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S.ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR NOVEMBER, 1873.



AVERAGE TEMPERATURES FOR NOVEMBER, 1873.

DISTRICT.	Average Temperature.	In comparison with the mean of many years.
New England	31°.3	—7° much lower.
Middle States	38°.1	—4° lower.
South Atlantic states	55°.	—3°.3 lower.
Gulf States	58°.	normal.
Lower Lake region	30°.3	—4°.5 lower.
Upper Lakes	29°.1	—3°.6 lower.
Ohio val. & Tennessee	42°.3	—1°.2 slightly below.
Upper Mississippi val.	33°.8	—3°.3 lower.
Lower Mississippi val.	53°.	normal.
Lower Missouri valley	38°.7	normal.
Minnesota	24°.5	—5°.5 much lower.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

6

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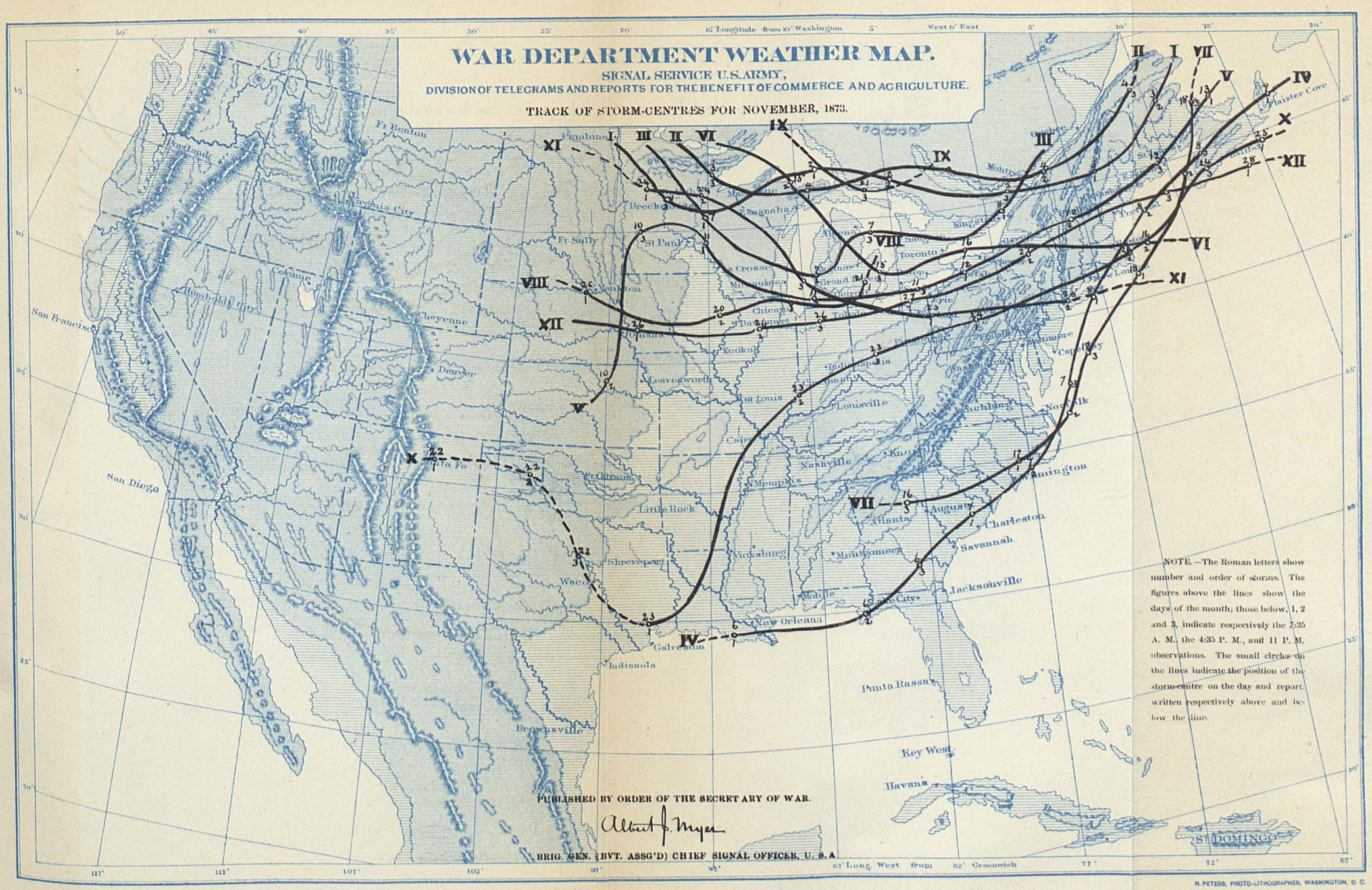
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACK OF STORM-CENTRES FOR NOVEMBER, 1873.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.

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velocity on the 17th. Chimneys and fences were blown down, and the shipping in the harbor in many instances dragged their anchors. In the Chesapeake Bay it was extremely severe. At Cape May the wind rose to forty miles, and the barometer fell to 28.76, with very heavy sea, reported by pilots from outside the worst gale known for years. At New Haven, on the morning of the 18th, the barometer fell to 28.72, (with increasing storm,) and at Wood's Hole to 28.60, and 28.61 at Boston, and 28.49 at Portland, Me.—the lowest observed barometers at the last-named points since they became signal-stations. At Eastport, Me., at about 6 a. m., on the 18th, the cyclone attained terrific force, its wind blowing sixty-four miles an hour. Its progress over the Canadian districts to the northward and eastward was equally violent. Its whole course was marked by heavy rain and snow, and its cyclonic indraught extended from the Middle Atlantic coast to the Upper Lakes.

No. VIII. First appeared in the Middle Missouri Valley on the 20th, and moved east to Toledo, whence its course was northeastward, and it soon disappeared.

No. IX. Was also of minor importance, having begun in Northern Lake Superior, and soon disappearing to the northeastward.

No. X. Appears to have been generated near Santa Fé on the 22d, and thence moved toward Western Texas, from which locality, on the 23d, it advanced into the Lower Ohio Valley. Its course thence was in nearly a straight line to Halifax, where it is lost sight of. It was preceded by much rain and snow on the Lakes, and high winds on the New England coast.

Nos. XI and XII. First appeared in the Northwest, on the 23d and 26th of November, respectively, and moved first southeastwardly to Michigan and the Lower Lakes, and thence northeastwardly, with brisk but not very high winds, and frequent rains and snows.

ANTI-CYCLONIC AREAS.

There have been eight decided areas of high barometer passing over the United States during the past month. These anti-cyclonic areas have first appeared in the Rocky Mountain region, and advanced southeastwardly. It is observable that as the season progressed they have selected pathways of higher latitude; and, moreover, their intensity has increased. As these barometric waves have advanced and spread out from the Northwest and West toward the Alleghanies, the pressure rather increased than diminished. Their front has been distinguished as well by low temperatures, heavy snows, and rains, as by high barometer readings, and generally they have given rise to high northerly winds in their front and high southerly winds in their rear, the atmospheric mass drawing around the crest in the direction of the hands of a clock. The very high pressure of the 27th–30th of November, while in the Northwest, by retarding the advance of the storm-center, on its western side, until the pressure over the Rocky Mountains could accumulate, apparently explains the violence of the storm that has since passed over the Lakes. The course of these waves may be discerned on Map No. 2 by the isobaric lines.

TEMPERATURE.

The November temperature has been much lower than usual in New England, and generally lower over the whole country east of the Rocky Mountains. In the Lower Mississippi, the Lower Missouri valleys, and the Gulf States the normal temperature has prevailed. The variation from the normal in the Ohio valley and Tennessee has been very little—1° 2′ below. The thermometric means will be found on Map No. 2, which gives the isothermal lines. The lowest temperature reported (except from mountain stations) was —22° at Pembina.

PRECIPITATION.

Map No. 3 gives approximately the rain-fall for the different sections this side of the Rocky Mountains. The marginal table on the map explains where there has been abnormal excess or deficiency. The official report from Yankton, Dak., shows that there has been hardly any appreciable rain-fall in that section during the entire month. The greatest precipitation was in Southeastern Massachusetts and near Galveston.

RIVERS.

The Red River was highest above low-water mark on the 25th, when its rise was 13 feet 3 inches. The Missouri reached its highest between the 20th and 27th; the Upper Mississippi on the 28th, when it was 5 feet above low-water mark at Saint Paul, and 8 feet 6 inches at Saint Louis. At Cairo, on the 29th, the Mississippi maximum was 14.9

above low water. At New Orleans, on the 1st, it was 13 feet and 4 inches below high-water mark. The Cumberland, at Nashville, and the Ohio, at Cincinnati, on the 28th, were over 20 feet above low water.

The lowest fall of the Ohio was on the 12th, when at Cincinnati it was 8 feet; that of the Mississippi, on the 19th, at Cairo, 6 feet 6 inches; that of the Red River, on the 20th, at Shreveport, 6 feet 3 inches.

PECULIAR PHENOMENA.

The display of auroras in the Lake region does not seem to have been as frequent or as brilliant as usual; nor have the November cyclonic disturbances been as numerous or as marked as usual during the past month. At New York, on the 22d, the peculiar arrangement of cirrus clouds, known as the "Polar Bands," was reported by the Observer, the "Bands" extending from the southwest to the northeast, covering nearly the entire sky, and apparently converging at the two points mentioned; and the whole attenuated mass was moving rapidly to the northeastward. On the 29th two "mock suns" were observed, one on either side of the sun, at an altitude of about 5°. At Buffalo, on the 1st, the unusual phenomenon of a vivid flash of "blue light" was observed over the Lake, accompanied by a loud report as of a cannon, supposed by the observer to be a "lightning-ball." During the storm of the 17th, the Lake City, Fla., observer reports the electric phenomena very protracted and persistent toward the southeast, showing its connection with the Gulf Stream off the Florida coast. The Nashville observer, on the nights of the 13th and 14th, kept up meteoric observations and saw a number of shooting stars. The Marquette observer, during this month, has conducted an interesting investigation to ascertain what, if any, connection exists between barometric fluctuations and the rise and fall of the water in Lake Superior. The Saint Paul observer, on the 3d, reported the "Bands" of fine cirri at 10.30 p. m., extending from west to east, through which the moon appeared surrounded with two rings, showing the prismatic colors very distinctly. The Lexington, Ky., observer reports unusual smokiness in his section, a phenomenon which has largely extended over the lakes and is a characteristic of the Indian summer.

The first ice at Savannah was formed on the 20th of November. On the 17th the barometer fell .167 of an inch at Leavenworth, and read 29.33, the lowest reading given since last April. The observer at Leavenworth reports first ice floating in the river on the 29th. The enormous rain-fall of 6.35 inches in forty-eight hours, on the 24th, was reported by the observer at Shreveport.

STORM-WARNING SIGNALS.

Seventy-seven cautionary signals were displayed during the month at ports in the United States and forty-four at Canadian ports. The Office has no returns to show how many of the signals displayed at Canadian points were justified. Out of the seventy-seven storm-warnings displayed at United States ports there were four whose justification was doubtful; but the number known to have been *actually justified* was 62. This gives as the percentage of verification 80.51.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[3].

MONTHLY WEATHER REVIEW, DECEMBER, 1873.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

STORMS.

During this month twelve storms, of greater or less severity, have prevailed along or within the borders of the United States. (See Storm Track Chart, No. 1.) Of this number, six have come from the southwest and the region of the Gulf of Mexico, and six from the Northwest and Upper Lake region. The most violent have come from the Southwest and Gulf, and have moved in every instance in a northeastwardly course, four of them keeping to the west of the Alleghany Mountains, and two making their way on the eastern side of this range.

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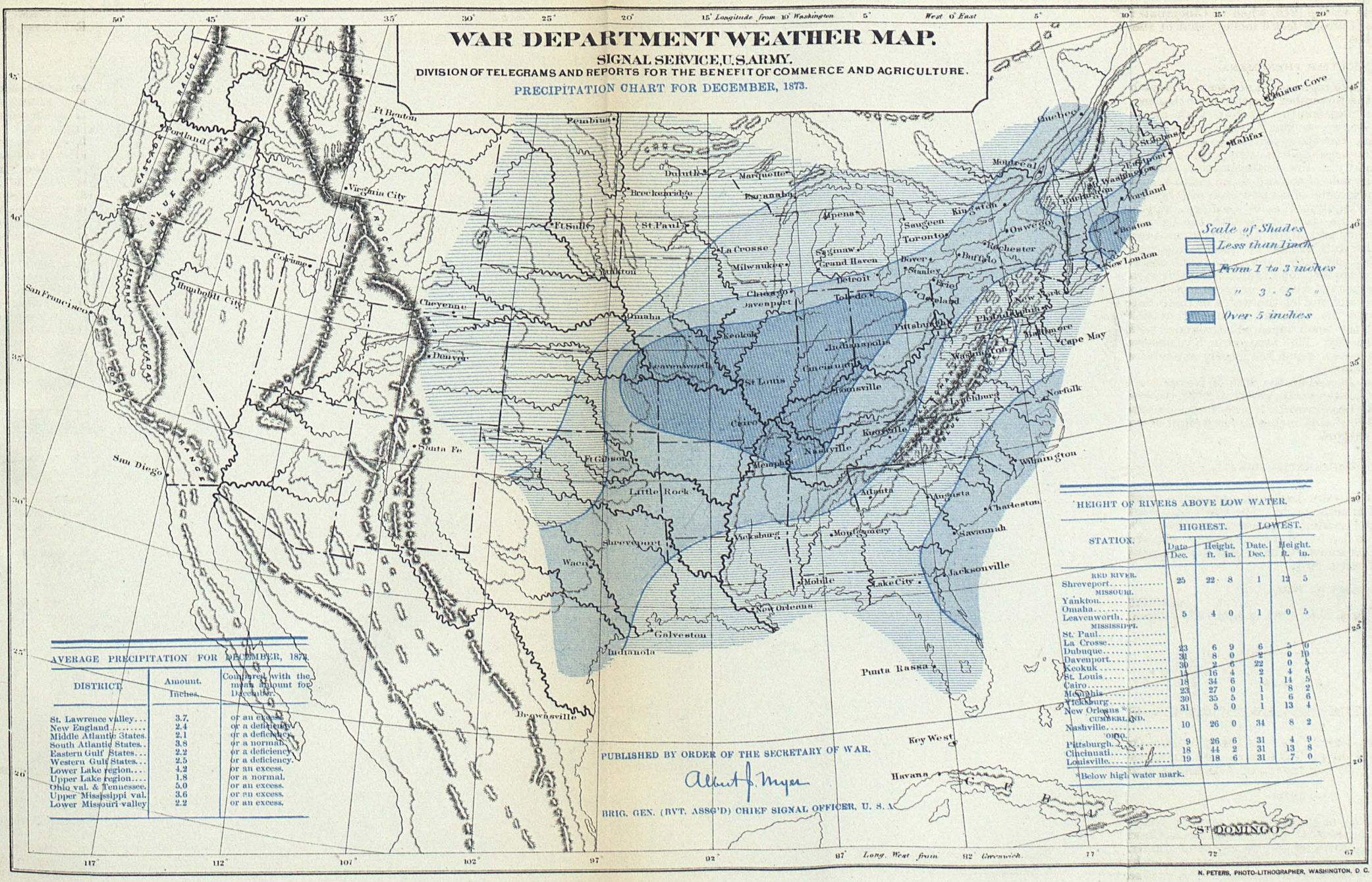
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR DECEMBER, 1873.



AVERAGE PRECIPITATION FOR DECEMBER, 1873.

DISTRICT.	Amount. Inches.	Compared with the mean amount for December.
St. Lawrence valley...	3.7.	or an excess.
New England.....	2.4	or a deficiency.
Middle Atlantic States.	2.1	or a deficiency.
South Atlantic States..	3.8	or a normal.
Eastern Gulf States...	2.2	or a deficiency.
Western Gulf States...	2.5	or a deficiency.
Lower Lake region....	4.2	or an excess.
Upper Lake region....	1.8	or a normal.
Ohio val. & Tennessee.	5.0	or an excess.
Upper Mississippi val.	3.6	or an excess.
Lower Missouri valley	2.2	or an excess.

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Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

HEIGHT OF RIVERS ABOVE LOW WATER.

STATION.	HIGHEST. Date Dec.	HIGHEST. Height ft.	HIGHEST. Height in.	LOWEST. Date Dec.	LOWEST. Height ft.	LOWEST. Height in.
RED RIVER.						
Shreveport.....	25	22	8	1	12	5
MISSOURI.						
Yanktou.....						
Omaha.....	5	4	0	1	0	5
Leavenworth.....						
MISSISSIPPI.						
St. Paul.....						
La Crosse.....						
Dubuque.....	23	6	9	6	5	6
Davenport.....	31	8	0	2	0	10
Keokuk.....	30	2	6	22	0	3
St. Louis.....	11	16	4	2	4	6
Cairo.....	18	34	6	1	14	5
Memphis.....	23	27	0	1	8	2
Vicksburg.....	30	35	5	1	6	6
New Orleans *.....	31	5	0	1	13	4
CUMBERLAND.						
Nashville.....	10	26	0	34	8	2
OHIO.						
Pittsburgh.....	9	26	6	31	4	9
Cincinnati.....	18	44	2	31	13	8
Louisville.....	19	18	6	31	7	0

* Below high water mark.

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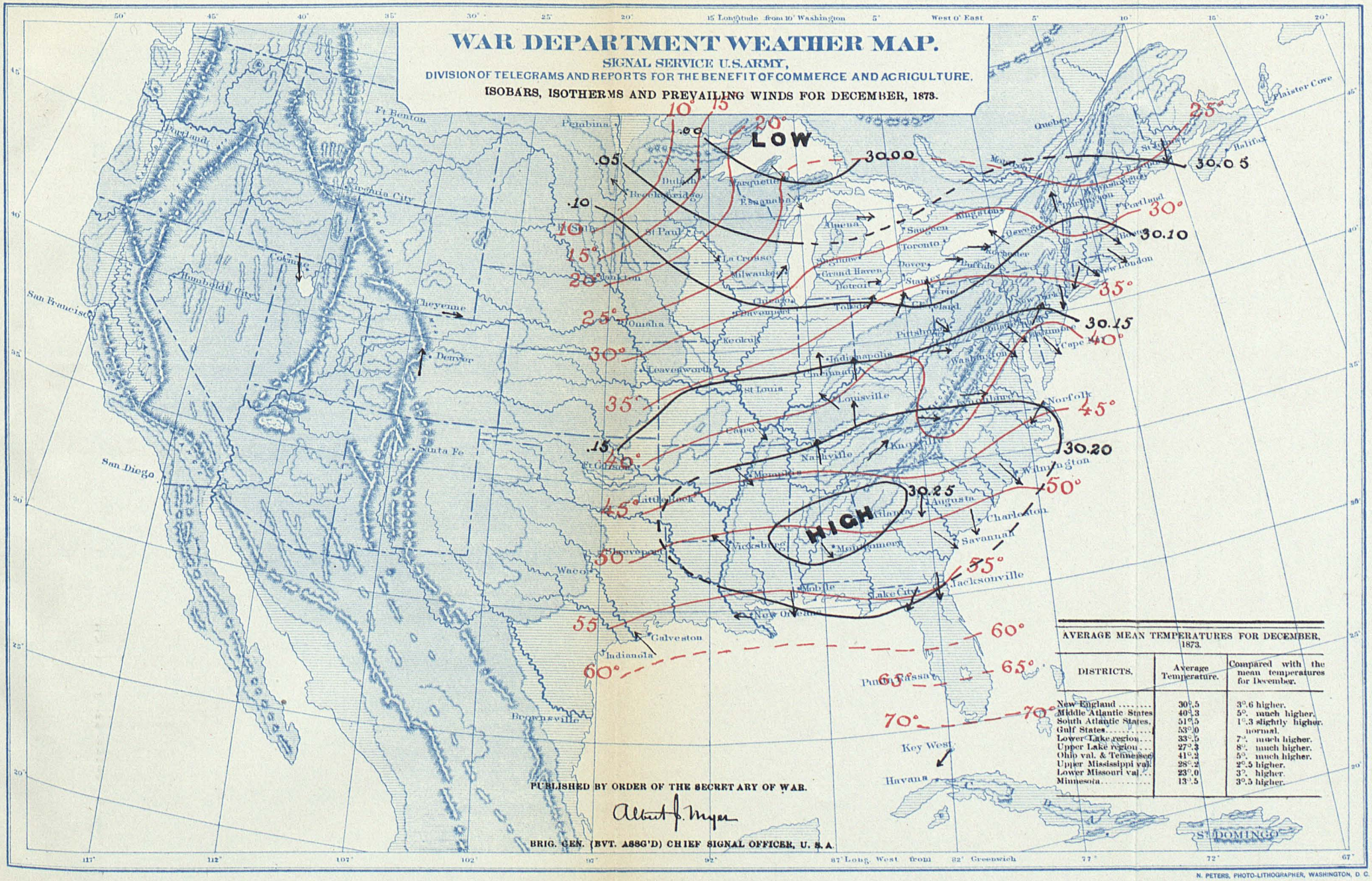
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR DECEMBER, 1873.



AVERAGE MEAN TEMPERATURES FOR DECEMBER, 1873.

DISTRICTS.	Average Temperature.	Compared with the mean temperatures for December.
New England	30°.5	3°.6 higher.
Middle Atlantic States	40°.3	5°. much higher.
South Atlantic States	51°.5	1°.3 slightly higher.
Gulf States	53°.0	normal.
Lower Lake region	33°.5	7°. much higher.
Upper Lake region	27°.3	8°. much higher.
Ohio val. & Tennessee	41°.2	5°. much higher.
Upper Mississippi val.	28°.2	2°.5 higher.
Lower Missouri val.	23°.0	3°. higher.
Minnesota	13°.5	3°.5 higher.

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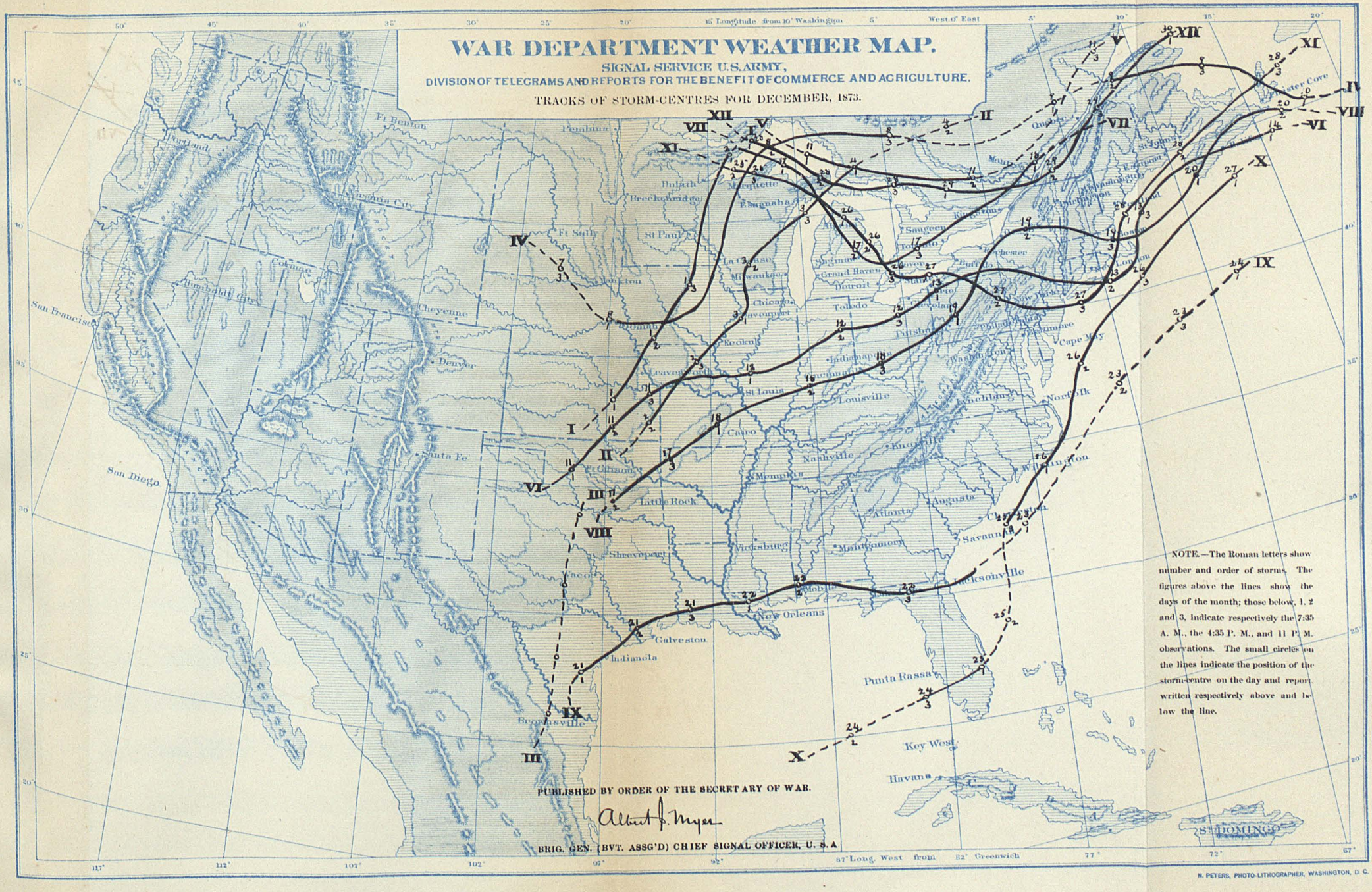
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF STORM-CENTRES FOR DECEMBER, 1873.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report written respectively above and below the line.

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N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

The paths of the storms which approached from the Northwest lie in a southeasterly direction till they attain the eighty-fifth meridian, and then are deflected northeastwardly toward the Saint Lawrence Valley and New England. In discussing these December storms, it should be noted that the intensity of cyclonic action and the amount of barometric depression are strikingly connected with the *progressive* velocity of the storm-centre.

These twelve storms were not all of marked or important features. The following facts are most worthy of notice:

No. I. Apparently originated in Kansas, and advanced northeastwardly over western Lake Superior, with, however, no very high winds or heavy precipitation.

No. II. Rapidly followed No. I, if indeed it was not the main cyclone from which its predecessor was an offshoot. This extensive storm originated in Kansas, on the morning of the 2d of December, and progressed slowly toward Lake Michigan, which it crossed on the morning of the 4th, and thence moved over Lake Huron, attended in its destructive course by winds, having velocities ranging from forty-five to sixty miles per hour. Since 1844, (unless perhaps the "gale" of 1865 be excepted,) no severer storm has been felt over the Lakes. Simultaneously, snow-storms prevailed westward to California, with unusual cold. It would therefore appear that cold northerly winds pressed hard upon the rear of this cyclone, and covered the whole of the trans-Mississippi country. Indeed, the beginning of the widespread disturbance was premonished by a *heavy sand-storm*, December 1, at Yuma; and all along the Gila River, on the night of that day, heavy condensation took place. This storm moved in a northeastward direction, after passing over Lake Huron, and hence it disappeared from beneath the Signal-Service observations.

No. III. Originated, so far as the office observations can decide, in southern Texas, on the 5th, and after approaching the Indian Territory, on the 6th, disappears. It was a very feeble storm.

No. IV. Originated in the Upper Missouri valley, on the afternoon of the 7th, and moved during the evening and night to Omaha, whence it passed in a northeastwardly course to Lake Superior. After reaching this Lake, its track lies in a direction almost due east toward the Lower Saint Lawrence Valley.

No. V. First appeared at midnight of the 10th near Duluth, and with a slight southeastwardly deflection of its course, moved toward the Lower Saint Lawrence Valley.

No. VI. Began in New Mexico, and, during the night of the 10th and the forenoon of the 11th, advanced eastward to the central Arkansas Valley, and thence moved northeastwardly over Missouri and Illinois on the 12th. It passed eastward over New York, and reached the Atlantic coast the night of the 13th, and on the morning of the 14th its centre was near Halifax, Nova Scotia.

No. VII. Confined its course very closely to the Lake frontier of the United States. It commenced on the 17th, in the Upper Lake region, and disappeared in Canada on the 18th.

No. VIII. Began simultaneously in the Southwest, and advanced slowly in a direction almost due northeast over the Ohio Valley. It was attended by heavy precipitation and high winds, disappearing near Nova Scotia on the 20th.

No. IX. Commenced on the 21st, near the mouth of the Rio Grande river, and skirting the Gulf coast crossed over northern Florida on the night of the 22d, thence making its pathway along the main axis of the Gulf Stream.

No. X. Began in the Gulf, and on the night of the 24th passed over southern Florida and thence along the Atlantic seaboard. It reached the Nova Scotia coast on the 27th. This gale was followed by heavy snow-storms in New England, the snow falling two feet deep in some places.

No. XI. Began in the extreme Northwest on the 25th, and after pursuing a southeastward course to Lake Erie and New York, bore away in the direction of Nova Scotia.

No. XII. Is first seen on the morning of the 28th on Lake Superior, whence it coursed nearly due eastward along the Lake frontier, but with no very marked effects.

ANTI-CYCLONIC AREAS.

There were eight areas of decided high pressure, which traversed the country during the month. They originated mostly in the Northwest, and preserved a course nearly southeastward toward the South Atlantic States. The only noticeable feature in the anti-cyclonic areas is their variety, their smallness and inferior barometric intensity, as compared with the very remarkable anti-cyclones of December, 1872.

TEMPERATURE.

There has been no deficiency of temperature in any section of the United States furnishing weather reports. On the contrary, (except in the Gulf States, where it was normal,) the thermometer has everywhere ranged from 1°.3 to 8° Fahrenheit above its

usual December height. The greatest excess of warm weather has been in the Upper and Lower Lake regions. The mean excess in all the sections (see Chart No. 3, Table of Temperatures,) is nearly 4° for the month—an excess much more potential, in its climatic effect, than would appear from the figures.

PRECIPITATION.

The precipitation in the United States for December was decidedly in excess of the usual amount. In the Lower Lake region, the Upper Mississippi Valley, the Ohio and the Lower Missouri Valleys, the excess is most palpable. Elsewhere, save in the Gulf and Middle States, the normal precipitation is reported. Chart No. 2 explains itself. The rain-fall deficiency in the Southwest will not be felt, agriculturally, inasmuch as an excess of rain fell in November.

PECULIAR PHENOMENA AND FACTS.

The observer at Cape May reported on the 19th of December, "at 6 p. m., in the southwest, a flash of lightning, which had the appearance of the explosion of a ball or bomb;" also a great amount of "sheet-lightning." The observer at Pike's Peak, among other interesting observations, notes the peculiar effect of sunset, in these words: "In the distance, to the northeast, a heavy mist was overhanging the plains. On this mist was depicted a perfect shadow and profile of our peak by means of the setting sun. The image is so realistic that one could hardly credit that it was merely a shadow, and not a lofty peak, rising abruptly from the prairie. This continued for the space of fifteen minutes, when it gradually melted away in the mist, as the sun was setting behind the gigantic peaks of the 'Snowy Range.'" At Cape Henry, during the night of December 21, the brig Mary Rice, from Rio Janeiro bound to Baltimore, was wrecked within sight of the new Coast Signal Station. The observer, by promptly telegraphing to Norfolk, procured help, and the entire cargo was secured and the ship saved. At Lexington, Ky., a "Lunar rainbow," with the prismatic colors, was seen on the night of the 1st. In the storm of the 4th, at Toledo, the river was nearly emptied of water by the wind, and buildings were damaged to the extent of $75,000. Auroral displays have been rare during the month and very faint. A "Mock Sun" was observed at Saint Paul, Minn., on the 4th, and a beautiful "Parhelic circle" on the morning of the 29th. Much lightning and thunder were reported from the Upper Mississippi valley, showing the presence of the great equatorial air-current.

The amount of fog which prevailed in the United States in December was very great, and is probably due to the fact that neither the great equatorial nor the broad polar current has been established over the country, but, rather, both currents brought into juxtaposition on its eastern side.

In the latter part of November, vast prairie-fires occurred in the far West, and several *dust-storms*, filling the air with fine and impalpable particles, which are known to remain suspended in the air for many days, and sometimes are finally precipitated with water, forming the celebrated "*black rain.*"

The hail-storm at Nashville on the 18th was so sudden in its approach that none suspected it, and the streets were lined and thronged. The hail-stones were about the size of almonds, and generally very smooth and even in form, and covered the ground to a depth of an inch. The hail-storm originated with a smooth sheet of stratus cloud, supplanting a low-moving scud, and a sudden shift of wind from south to northwest.

THE RIVERS.

These will be seen in the table on the precipitation chart, (No. 2,) right side. It will be observed there was an extraordinary rise in the Mississippi, at Cairo, Memphis, and Vicksburg, from the 18th to the 30th of December. This was caused by the enormous floods in the Ohio and its tributaries from the 9th to the 18th ultimo, on which last-named day the Ohio was 44 feet and 2 inches above the low-water mark. It will be seen from the table that all the Western water-courses have been full during the past month—a fact which gives promise for the next season's agricultural yield.

The excessive rains which found their way early in December to the Upper Ohio, were probably due to the projection of the cold polar current in the rear of the great storm of December 3 and 4, already described. The cold current served to condense the vast floating reservoirs of vapor which the cyclone had drawn to its eastern side and front from the Gulf of Mexico.

CAUTIONARY SIGNALS.

During the month of December, there were hoisted at American ports sixty-three cautionary signals, and for Canadian ports thirty-four storm premonitions were telegraphed.

The display of Cautionary Signals on the Lakes was suspended after the 10th of December, by which time navigation was entirely closed.

Out of the whole number of storm-warnings displayed at all American ports, four are doubtfully justified, but the number known to have been *actually justified* is forty-seven, which gives as the percentage of verification 73.43. The office has no returns to show how many were verified at the Canadian ports.

The display of these Signals at the various ports was generally respected; and the confidence in their accuracy may be seen by the reports of their reception, of which a few specimens may be given: Thus at Alpena, Michigan, when on the 1st a storm-signal was displayed, "steamers in port delayed going out till morning of the 2d." At Boston, Mass., December 26, after signal was displayed, "all shipping remained in port." At New Haven, December 23, "the warning attracted considerable attention in the city, owing to the subsequent snow." At Wilmington, N. C., December 26, "the signal was generally heeded by mariners and those engaged in shipping-business." Similar reports frequently come from Chicago and other sea-ports.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[4].

MONTHLY WEATHER REVIEW, JANUARY, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

A general summary of the Meteorological Observations taken under the direction of the Signal Service suring the month of January, 1874, is presented in the accompanying Charts and Tables.

In reviewing the meteorological condition therein indicated, the most noticeable feature is the excess of mean temperature throughout almost the entire country over that of the corresponding period in previous years, the most marked difference being between the mean temperature of January, 1873, and that of January, 1874.

This average temperature in the several districts, together with the excess, may be found by reference to the table accompanying Chart No. 2, where it will be seen that the excess is greatest near the region of mean low barometer, apparently central over Lower Canada. The area of mean high barometer being central off the South Atlantic coast, the prevailing winds to the west of it were therefore southerly, bearing the aqueous vapor from the Gulf of Mexico and Atlantic coast toward the region of low barometer. An excessive humidity in the atmosphere was therefore produced over the greater portion of the United States east of the Mississippi River. The unusual supply of vapor thus diffused over the country prevented a great loss of heat by terrestrial radiation, and tended to increase the mean temperature for the month.

STORMS.

The movements of those areas of low barometer which produced a definite cyclonic condition of the atmosphere are traced on Chart No. 1, and are numbered in the order in which they occurred. Although treated of under the general title of storms, the atmospheric disturbance, in several instances, was not sufficiently violent to warrant the use of this term.

The first storm that occurred during the month is of particular interest, as it has been traced directly from the Upper Missouri Valley to the Atlantic coast. This storm was preceded by gales on the Pacific coast during the 30th and 31st days of December, and the approach of the atmospheric disturbance was indicated by the rapid fall of the barometer, with heavy rain, at Portland, Oreg., and San Francisco. The southerly winds which prevailed upon the coast show that the center of the disturbance passed to the eastward north of Vancouver's Island.

The midnight report of January 1st announced an area of low barometer in the Upper Missouri Valley, as noted on the chart. From this point the direction of the storm was southeastward, following the course of the Missouri River as far south as latitude 45°; after which its general course was eastward over the mean latitude of 47°. It was accompanied by rain and snow from the Mississippi River to the Atlantic coast, north of the Ohio Valley, from the 2d to the 4th of the month. As this area of disturbance

passed to the eastward, its velocity increased, with a gradual rise of the barometer—conditions which do not usually obtain in storms in this latitude.

It was followed by decidedly cold weather, first in the northwest and a "Norther" on the coast of Texas, the temperature at Fort Gibson falling from 73° to 15°, and the barometer rising 0.9 of an inch during the night of the 3d. This "Norther" continued, with snow and freezing weather, until the 6th.

II. This storm was first defined in the Gulf of Mexico, its approach being indicated by the general direction of the isothermal lines in the Southern States.

It appears to have had an equatorial origin, and to have described the northern half of its parabolic track within the limits of our observation. The general course of the center of disturbance was parallel to the coast-line, and the region of precipitation extended from the Atlantic coast to the Mississippi Valley, and from the Gulf to British America. It was this storm which produced the snow and sleet in the Lake region and Ohio Valley on the 6th and 7th of the month, and severed the telegraphic communication between the East and West. The form of the area of least pressure during the 7th of the month, and while the storm was passing from North Carolina to Western Pennsylvania, was that of an ellipse, with the major axis in the direction of progression. This feature is noted, for the reason that several attempts have been made to show that these storms are *always* elliptical in form, and that the major axis is *always* perpendicular to the course of the storm, whereas, in the present instance, the center of depression became circular in form as it passed into the Saint Lawrence Valley, from which region it passed to the northeast over the mean line of atmospheric progression for the eastern portion of the United States.

III. Passed to the north of the United States, and was at no time wholly within the limits of our observation. The center of depression was approximately marked on each of the tri-daily reports from the afternoon of the 8th to the morning of the 11th, during which time the southern half of this disturbance extended as far south as the Ohio Valley and the Middle States, producing rain or snow in these regions and the Northeast.

IV. Originated in the Mississippi Valley, and was first marked as central in Missouri on the morning of the 13th. It moved to the eastward with a mean velocity of 50 miles per hour, without producing high winds, except on the eastern coast.

During the 15th and 16th of the month a severe storm prevailed on the Pacific coast, extending from Central California to the west coast of British America, and the barometer fell to the unusual reading of 29.06 inches at Portland, Oreg.

Reports received from vessels in the Pacific previous to the above dates indicate that this storm existed as a severe northerly gale in latitude 30° 18′ N., longitude 145° W., January 13, and as a northeasterly gale in latitude 37° 15′ N., longitude 156° 26′ W., on January 14, when the barometer fell to 29.46 inches. This storm is not traced upon the chart, because it passed to the north of the United States without any unusual disturbance, except in the Upper Lake region and north of Minnesota, the barometer at Fort Garry falling to 29 inches, the lowest reading noted during the month.

V, VI, VII and VIII developed west of the Mississippi River and moved eastward, accompanied by rain or snow, without producing high winds, the last named presenting the unusual condition of developing and wholly disappearing within the limit of our stations, notwithstanding the atmosphere had assumed a definite cyclonic movement.

WINDS.

The mean direction of winds at the several stations is represented on Chart No. 2 by the arrows, and it will be observed is generally toward the area of low barometer.

Apart from the storms already described, no high winds were reported except almost continuous gales at Pike's Peak. During the month of January thirty-five Cautionary Signals were ordered on the Atlantic coast, embracing those stations between Eastport and Wilmington, and five telegraphic warnings of the approach of storms were sent to Canadian ports. Out of the whole number of signals ordered at the American ports, twenty-eight have been justified by the occurrence of dangerous winds at or within one hundred miles of the station at which the signal was ordered.

The observer at Norfolk reports that no vessel attempted to leave the port during the display of signals.

The observer at New Haven reports that the signal on the 7th attracted general attention, as it was ordered twenty-four hours before the dangerous winds occurred.

The signals ordered at Eastport were not verified by the occurrence of winds; but dense fogs prevailed, rendering navigation dangerous.

TEMPERATURE.

The general distribution of temperature throughout the United States is indicated by the isothermal lines on Chart No. 2.

The table will show that there has been an excess in all the districts, except Minnesota, where it has been normal. The greatest excess has been in the regions of greatest

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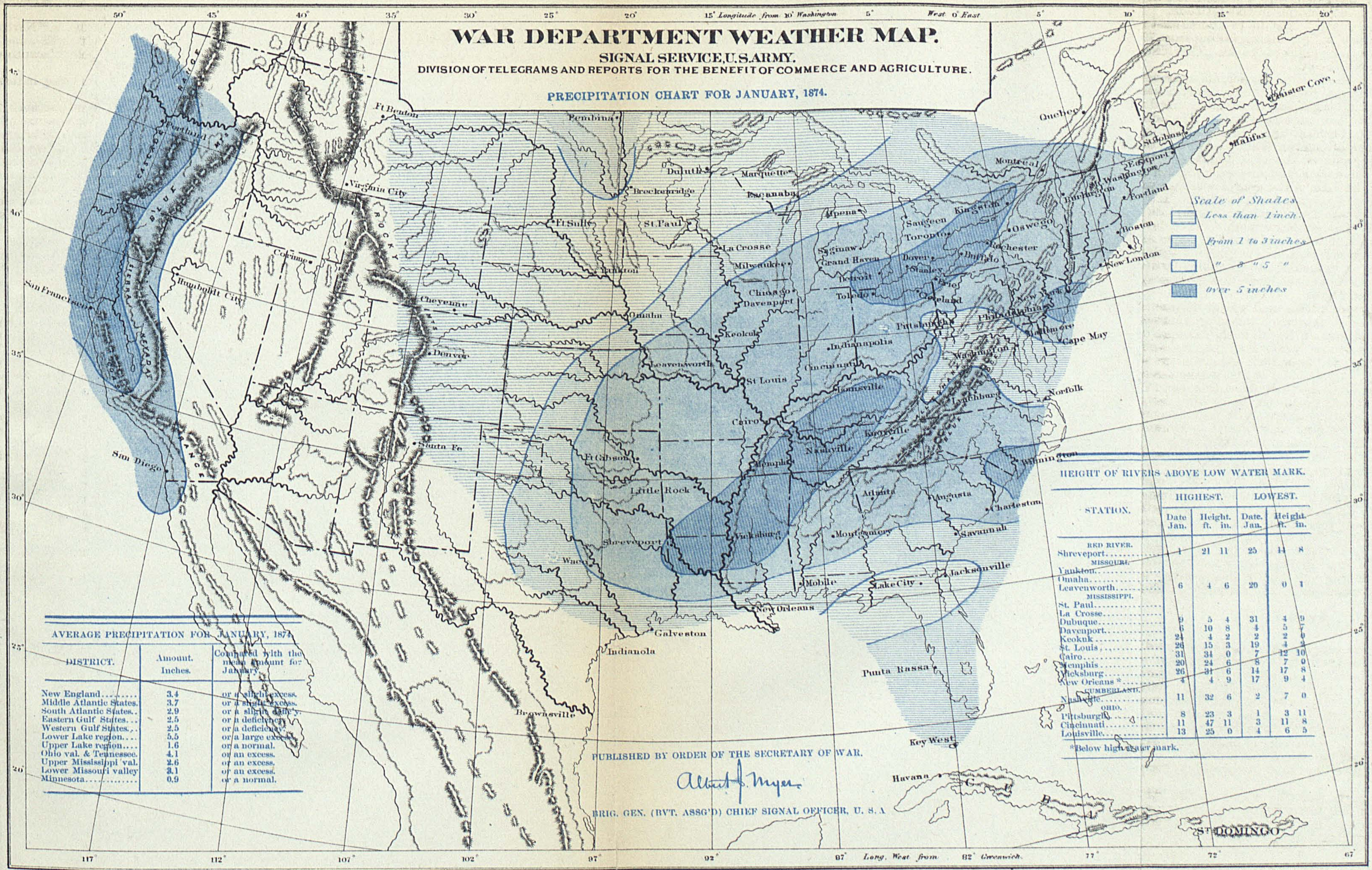
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U. S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR JANUARY, 1874.



AVERAGE PRECIPITATION FOR JANUARY, 1874.

DISTRICT.	Amount. Inches.	Compared with the mean amount for January.
New England	3.4	or a slight excess.
Middle Atlantic States	3.7	or a slight excess.
South Atlantic States	2.9	or a slight defic'y.
Eastern Gulf States	2.5	or a deficiency.
Western Gulf States	2.5	or a deficiency.
Lower Lake region	5.5	or a large excess.
Upper Lake region	1.6	or a normal.
Ohio val. & Tennessee	4.1	or an excess.
Upper Mississippi val.	2.6	or an excess.
Lower Missouri valley	3.1	or an excess.
Minnesota	0.9	or a normal.

HEIGHT OF RIVERS ABOVE LOW WATER MARK.

STATION.	HIGHEST.			LOWEST.		
	Date Jan.	Height. ft.	in.	Date. Jan.	Height. ft.	in.
RED RIVER.						
Shreveport	1	21	11	25	14	8
MISSOURI.						
Yankton						
Omaha						
Leavenworth	6	4	6	20	0	1
MISSISSIPPI.						
St. Paul						
La Crosse						
Dubuque	9	5	4	31	4	9
Davenport	6	10	8	4	5	7
Keokuk	24	4	2	2	2	0
St. Louis	26	15	3	19	4	2
Cairo	31	34	0	7	12	10
Memphis	20	24	6	8	7	0
Vicksburg	26	31	6	14	17	8
New Orleans *	4	4	9	17	9	4
CUMBERLAND.						
Nashville	11	32	6	2	7	0
OHIO.						
Pittsburgh	8	23	3	1	3	11
Cincinnati	11	47	11	3	11	8
Louisville	13	25	0	4	6	5

*Below high water mark.

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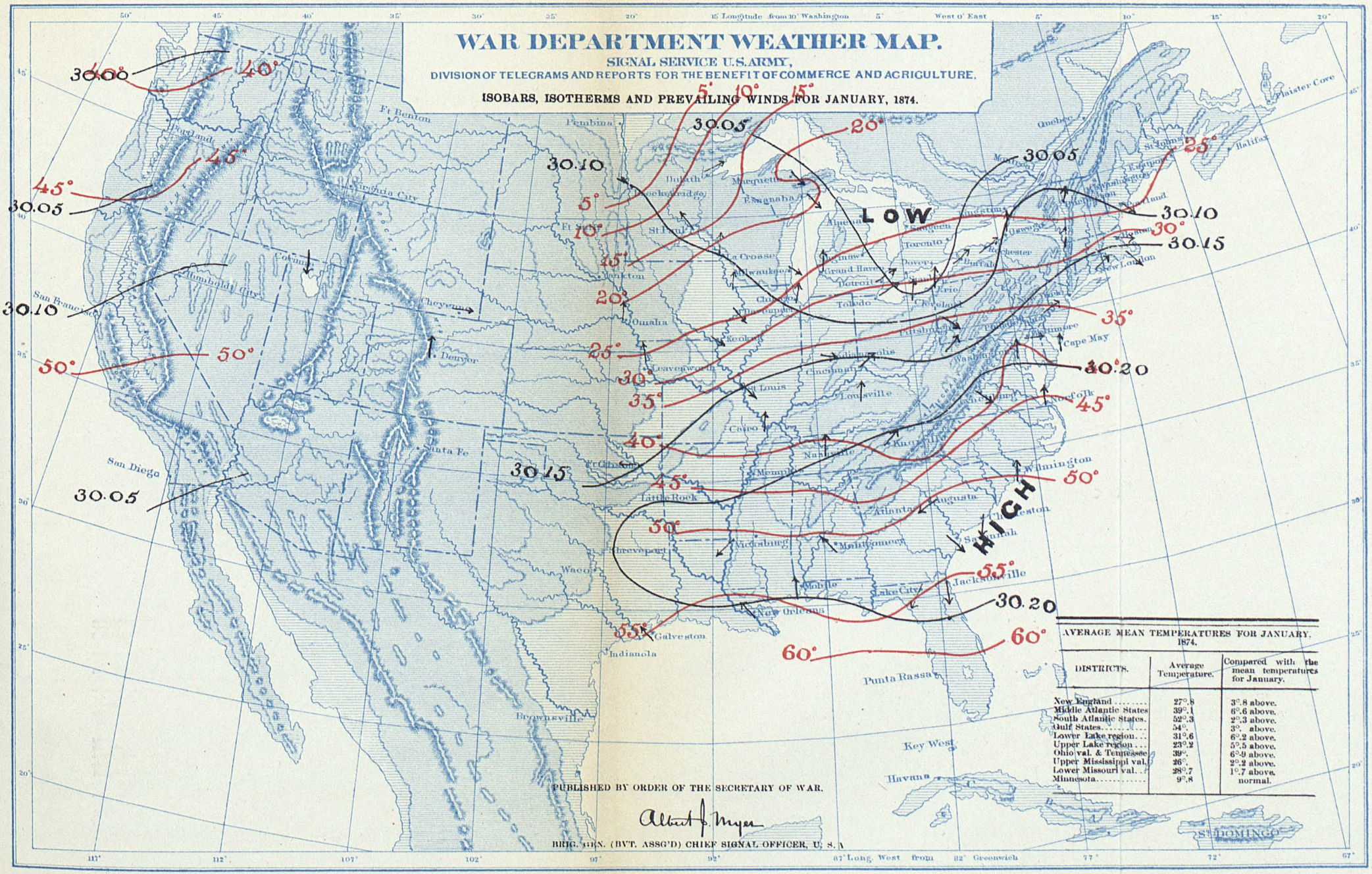
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR JANUARY, 1874.



AVERAGE MEAN TEMPERATURES FOR JANUARY, 1874.

DISTRICTS.	Average Temperature.	Compared with the mean temperatures for January.
New England	27°.8	3°.8 above.
Middle Atlantic States	39°.1	6°.6 above.
South Atlantic States.	52°.3	2°.3 above.
Gulf States	54°.	3°. above.
Lower Lake region	31°.6	6°.2 above.
Upper Lake region	23°.2	5°.5 above.
Ohio val. & Tennessee	39°.	6°.9 above.
Upper Mississippi val.	26°.	2°.2 above.
Lower Missouri val.	28°.7	1°.7 above.
Minnesota	9°.8	normal.

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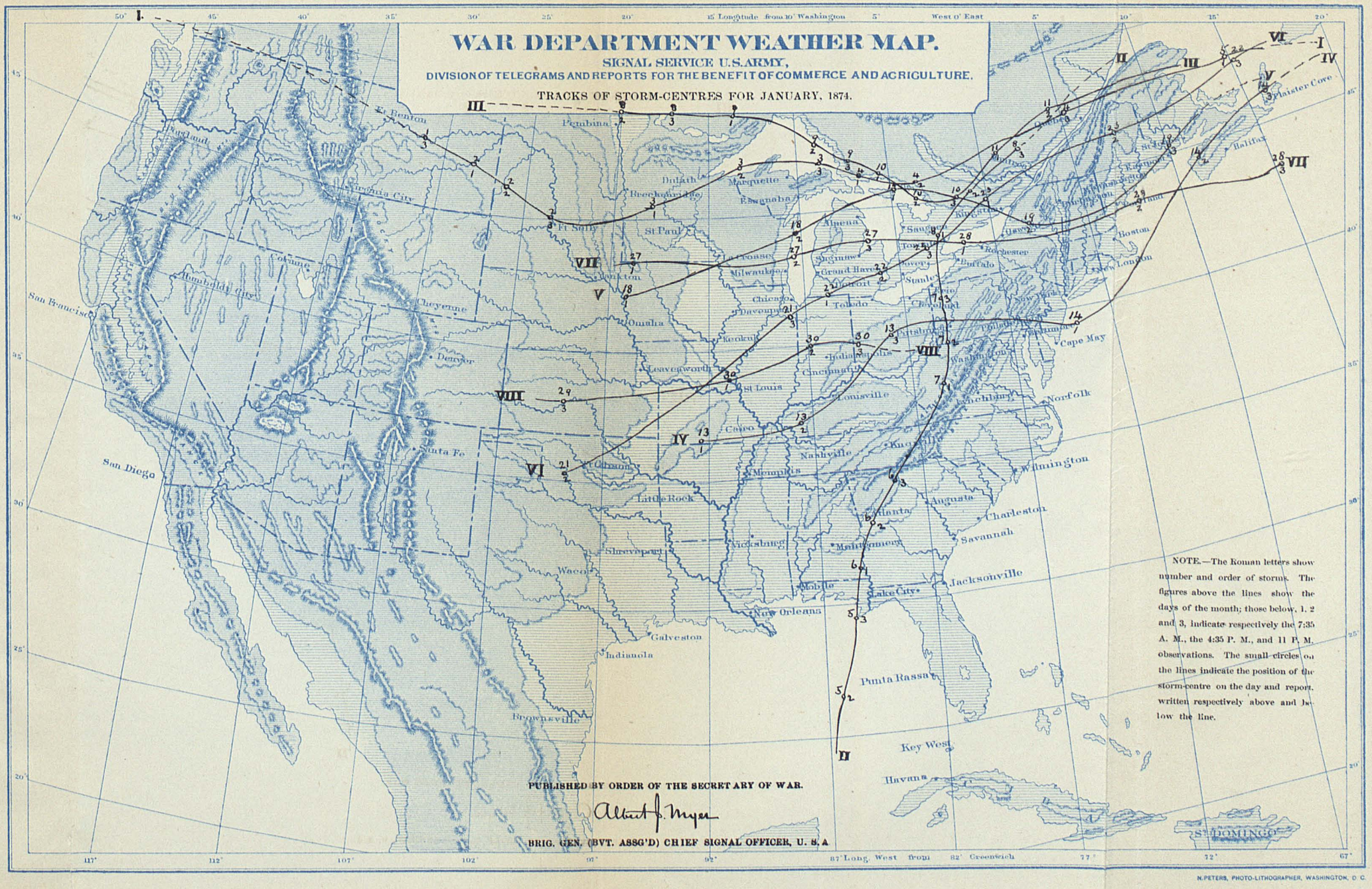
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF STORM-CENTRES FOR JANUARY, 1874.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.

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precipitation. The range of temperature has been greater than usual in the Southern States. On the precipitation chart will be found the lines marking the southern limit of snow and freezing weather. The mean temperature, as calculated from the observations made at the three stations on the Pacific coast, is but slightly in excess of the mean for the same period in previous years.

PRECIPITATION.

Chart No. 3 is a graphical representation of the precipitation in the several districts. The local nature of rain-fall, together with the limited number of stations, renders this Chart only approximately correct. Probably the most interesting feature is the excess of rain-fall on the Pacific coast, and its influence on the agricultural interests of that section.

A comparison of the annual wheat-crop with the annual-rain-fall shows that the yield has been largest in those seasons in which rains have been most abundant. The amount of rain-fall for the past six months is largely in excess of the average, and would appear to indicate a bountiful harvest for 1874.

RIVERS.

Freshets and floods have been reported in the rivers draining the Appalachian Chain, and in those of New England and the Middle States during the 8th, 9th, and 10th days of the month. The Ohio River has been unusually high at Cincinnati and Louisville, but has been open during the entire month. Fluctuations, without any decided high waters, have occurred in the Mississippi and Missouri Rivers. The latter has been closed during the entire month above Leavenworth. The Mississippi River was filled with floating ice at Keokuk from the 5th to the 13th, was closed from the 14th to the 15th. Ice disappeared on the 19th, and re-appeared again on the 28th.

At Saint Louis the river was closed from the 11th to the 15th, opened on the 18th, and ice disappeared on the 27th.

At Saint Paul it remained closed during the entire month.

Heavy freshets, causing great loss of property, have been reported from Buffalo.

FACTS AND METEOROLOGICAL PHENOMENA.

Meteorological observations have been continued at Pike's Peak during the month of January, the station being situated about 14,000 feet above the level of the sea. The monthly means, determined from the three daily observations, taken, respectively, at 7 a. m., 2 and 9 p. m., are as follows:

Barometer,	29.80,	mean.	30.16.	highest.	27.32,	lowest.
Temperature,	6°.1	"	23°	"	—25°	"
Relative humidity,	.53.					

In comparing the oscillations of the barometer with the changes of temperature, it has been found that the temperature rises with an increase of pressure.

The observer reports peculiar bands of cirri at 4 p. m. on the 10th a little north of the zenith, extending from WNW. to SSE., converging near the horizon, and having a breadth of 5°. These remained stationary for about an hour, and were finally obscured by fine cirro-stratus clouds or haze.

Numerous auroral displays have been reported from stations north of the fortieth parallel of latitude, the time of occurrence being generally between 8 and 10 p. m. The frequency of these displays apparently depends upon the position of the station in the auroral zone. Those occurring at Boston, New York, Alpena, Duluth, and Breckinridge, between the 15th and 20th, are especially noted as peculiar and brilliant. The observer at Detroit reports evidences of the atmosphere having been charged with electricity on January 21st, the telegraphic instrument working with the batteries disconnected. The observer at Long Branch reports the appearance, at 2.10 p. m., on the 4th, of a well-defined "Fog-bow" in the North. He says: "This bow was larger than the usual rainbow, and was perfectly white. It occupied the same position in the horizon that a rainbow would at that hour of the day." The observer at Boston reports that on the 15th light snow fell from a cloudless sky.

The lowest temperature reported from any station during the month was —33°, at Breckinridge, Minn., on the 24th. The highest barometric reading telegraphically reported during the month was 30.98 inches, at Pembina, Dak., January 29; and the lowest, 29.00, at Fort Garry, Manitoba, on the 17th.

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ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[5].

MONTHLY WEATHER REVIEW, FEBRUARY, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

The atmospheric changes during the month of February appear to have been controlled to an unusual degree by the influence of the nightly radiation, especially that between the midnight and morning reports. Illustrations of this are found in the rapidity with which areas of rain and snow have extended during those hours, and of which a striking instance is found in the heavy snow-fall of the morning of Wednesday, February 25. At the preceding midnight, rain apparently prevailed from Norfolk to Cairo and southward, while cloudy weather extended over the Middle and Atlantic States. The northern limit of the area of rain had moved northward 250 miles between 4.35 p. m. and 11 p. m. of the 24th, but by 7.35 a. m. of the 25th an area of snow prevailed for about 350 miles further northeast, and extended again another 350 miles by 4.35 p. m. of the same day. This rapid extension northward was apparently the consequence of direct radiation during the night, in consequence of which a feeble barometric depression was caused in the Ohio Valley, while storm No. XII was drawn all the more rapidly northwestward toward the Middle Atlantic coast.

STORMS.

An unusually large number, namely, twenty-two, of barometric depressions have been noted during February, but of these only the following twelve have seemed worthy of representation on the storm-map—most of the others being subsidiary to these, or only appearing on the extreme limits of the weather-map. It will be seen that the (for February) unusual number of four important storms, of which two were violent hurricanes, have moved up the Atlantic coast, while three have also pursued a parallel course on the west side of the Alleghanies, and but three have been traced directly eastward over the extreme Northwestern Territories and the Lake region.

The storms peculiar to the Gulf Stream would seem to have pursued tracks lying, on the average, somewhat west of their usual course.

This distribution of the storm-tracks is a sufficient indication of the peculiar character of the weather for this month, and the study of the reports received by mail from the Bermudas, as well as of the logs of vessels, shows the extreme importance of these islands as an outpost for the anticipation of such storms as advance northward upon the New England coast.

I. This storm was apparently in Texas on the 31st of January, and on the 1st of February was in Louisiana, and was already followed by the customary cold weather on the Texas coast. In its advance northeastward to the Lower Lakes, it was preceded by a high barometer and cold northeast wind in the Middle and East Atlantic States. This mass of cold air seems to have underrun and uplifted the warmer air of the South Atlantic States, and extended as a cold northeast rain southward to Florida by the evening of February 2d. While this low barometer was; on the 2d, in the Ohio Valley, another storm-centre existed between the Atlantic coast and the Bermudas.

II. This developed on the 2d, in consequence of the heavy precipitation in Georgia and Florida, caused by the north winds previously alluded to. After passing eastward off the land, it followed the trend of the coast, as shown by the Bermuda reports, until t passed near Nova Scotia on the 4th. The amount of barometric depression at its centre appears to have slowly increased in the course of its progress.

III and IV. This disturbance appears first in Southwestern Texas, and may have owed its origin to the westward flow, up the slope of the plains of Texas and Northern Mexico, of the surface air forced from the Gulf of Mexico by the high pressure then existing in the Gulf and Southern States. Throughout the 3d and 4th instant slowly increasing cloudiness was reported from the western gulf coast, while, as usual, the upper clouds moved toward the centre of higher pressure. There are no reports to show whether there also existed on the west of the Mexican Cordilleras any area of low pressure that would further intensify the action going on in Texas. The storm-centre, having in its eastward course left Texas on the 5th, was immediately followed by a moderate "Norther," and while itself passing rapidly northward to the Ohio Valley, gave rise on the 6th to southerly winds and heavy rain or snow in the South and Middle Atlantic States, over which there also appeared several temporary barometric depressions—one of which developed by midnight of the 7th to a well-marked storm on the coast of Virginia.

The growth of No. IV was attended by the gradual disappearance of the original storm-centre. Southwest winds prevailed at the Bermudas while it was near Cape Hatteras; northerly winds, with rain, prevailed before and after.

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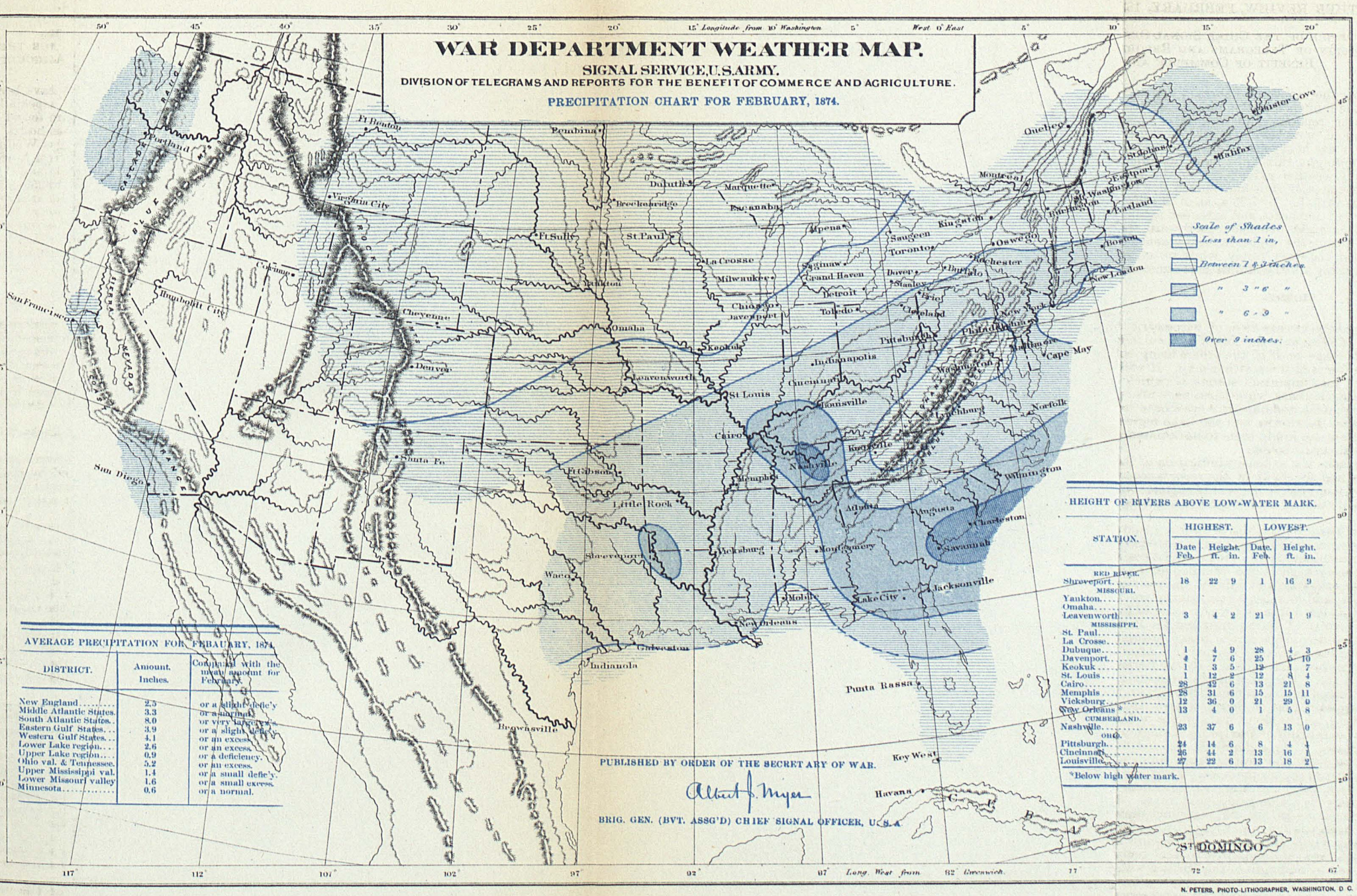
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR FEBRUARY, 1874.



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Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U.S.A.

AVERAGE PRECIPITATION FOR FEBRUARY, 1874.

DISTRICT.	Amount. Inches.	Compared with the mean amount for February.
New England	2.5	or a slight defic'y
Middle Atlantic States	3.3	or a normal.
South Atlantic States	8.0	or very large excess.
Eastern Gulf States	3.9	or a slight defic'y.
Western Gulf States	4.1	or an excess.
Lower Lake region	2.6	or an excess.
Upper Lake region	0.9	or a deficiency.
Ohio val. & Tennessee	5.2	or an excess.
Upper Mississippi val.	1.4	or a small defic'y.
Lower Missouri valley	1.6	or a small excess.
Minnesota	0.6	or a normal.

HEIGHT OF RIVERS ABOVE LOW-WATER MARK.

STATION.	HIGHEST.			LOWEST.		
	Date Feb.	Height. ft.	in.	Date. Feb.	Height. ft.	in.
RED RIVER.						
Shreveport	18	22	9	1	16	9
MISSOURI.						
Yankton						
Omaha						
Leavenworth	3	4	2	21	1	9
MISSISSIPPI.						
St. Paul						
La Crosse						
Dubuque	1	4	9	28	4	3
Davenport	4	7	6	25	5	10
Keokuk	1	3	5	12	1	7
St. Louis	1	12	2	12	8	4
Cairo	28	42	6	13	21	8
Memphis	28	31	6	15	15	11
Vicksburg	12	36	0	21	29	0
New Orleans*	13	4	0	1	5	8
CUMBERLAND.						
Nashville	23	37	6	6	13	0
OHIO.						
Pittsburgh	24	14	6	8	4	4
Cincinnati	26	44	2	13	16	1
Louisville	27	22	6	13	18	2

*Below high water mark.

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WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

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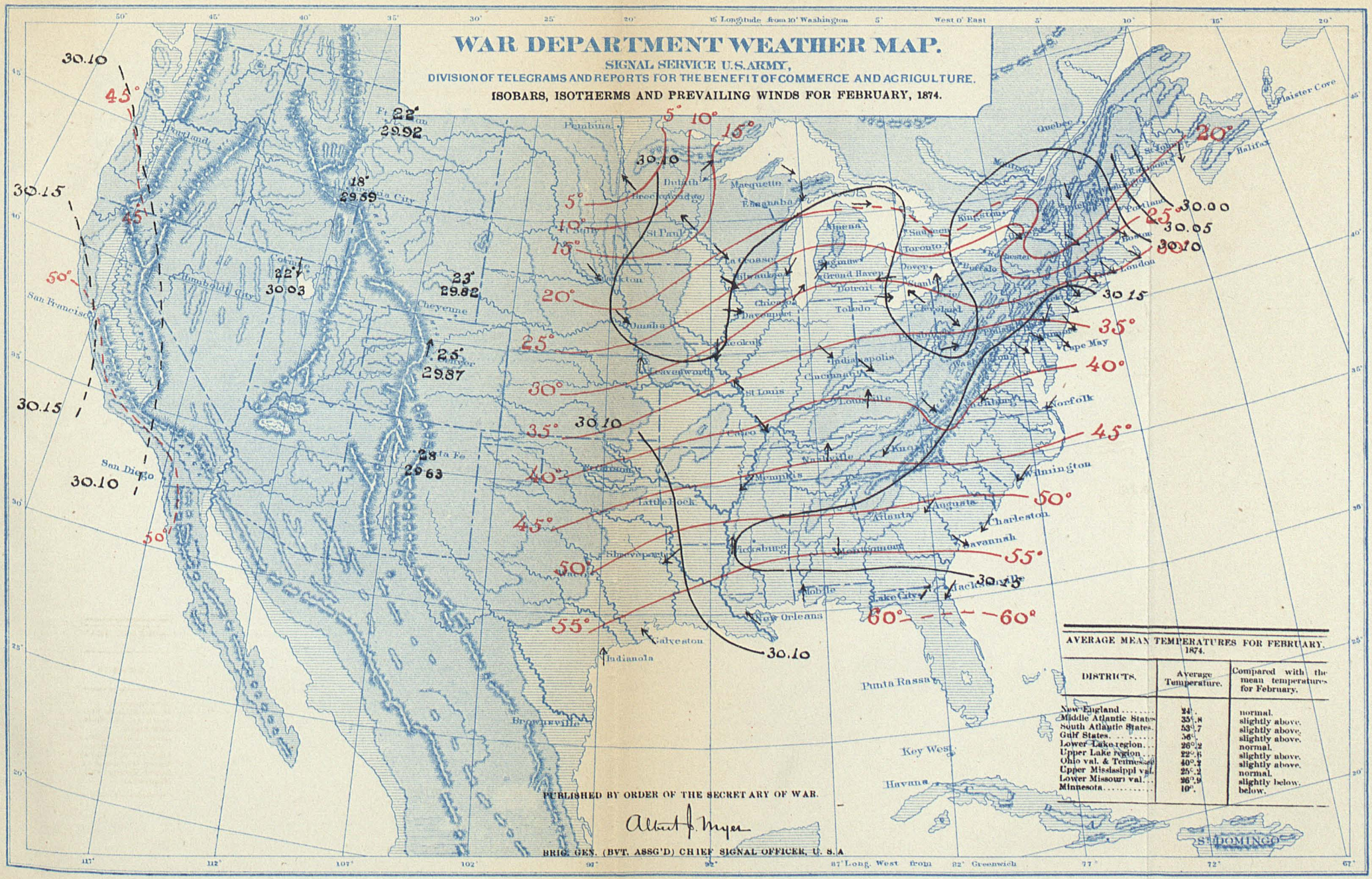
ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR FEBRUARY, 1874.



AVERAGE MEAN TEMPERATURES FOR FEBRUARY, 1874.

DISTRICTS.	Average Temperature.	Compared with the mean temperatures for February.
New England	24°.	normal.
Middle Atlantic States	35°.8	slightly above.
South Atlantic States	53°.7	slightly above.
Gulf States	56°.	slightly above.
Lower Lake region	26°.2	normal.
Upper Lake region	22°.6	slightly above.
Ohio val. & Tennessee	40°.2	slightly above.
Upper Mississippi val.	25°.2	normal.
Lower Missouri val.	26°.9	slightly below.
Minnesota	10°.	below.

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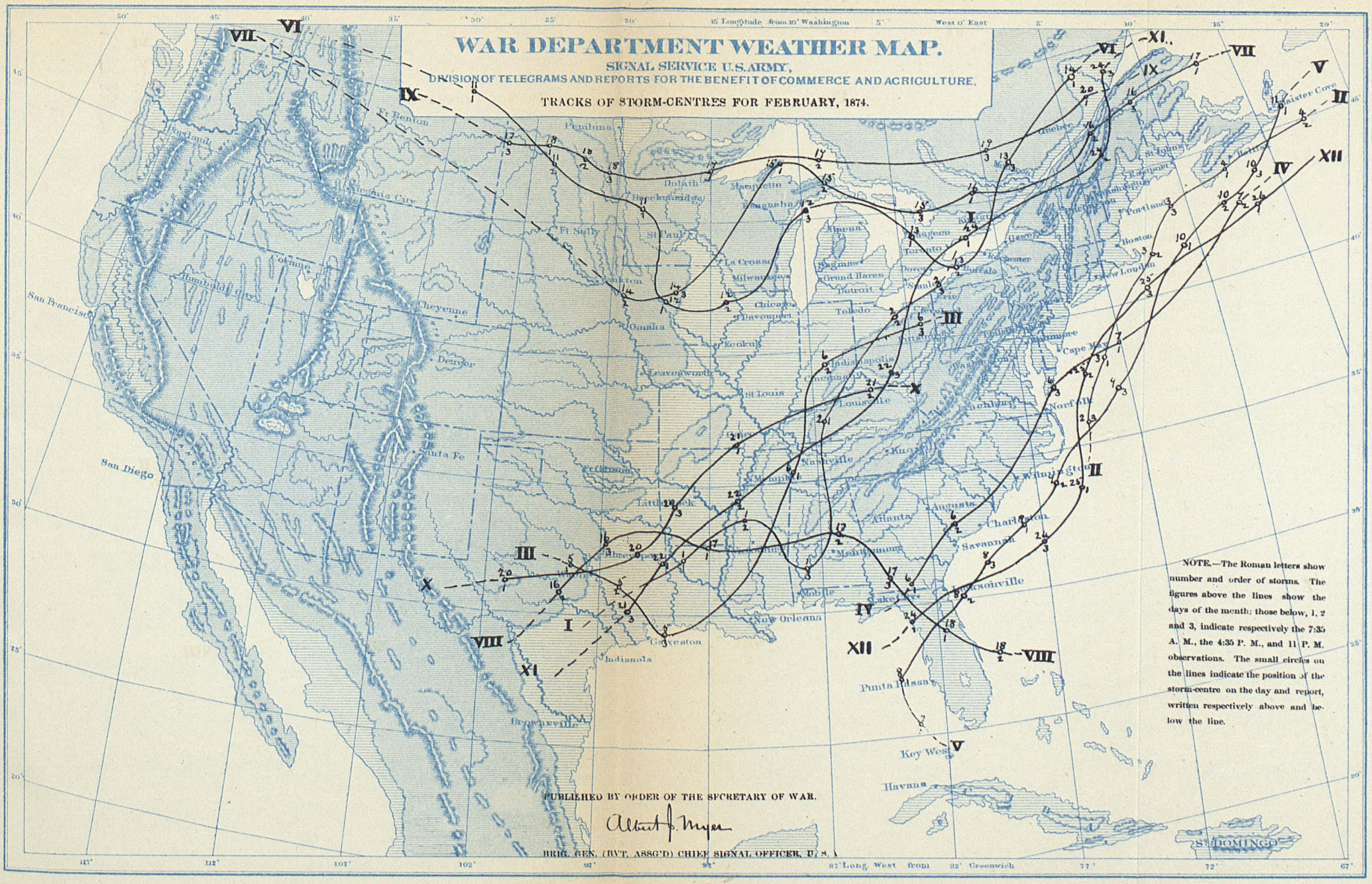
WAR DEPARTMENT WEATHER MAP.
SIGNAL SERVICE U.S. ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.
TRACKS OF STORM-CENTRES FOR FEBRUARY, 1874.
NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.
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V. This storm first appears on the map as a region of rain on the 7th of February, southwest of Florida. There was at this time a cold northerly current flowing over Louisiana and Northern Florida, and it seems not improbable that this contributed to the formation in the southeastern part of the Gulf of Mexico of the rainy area attending the development there of the low barometer. After crossing the peninsula of Florida the storm-centre moved northeastward, not far from the South Atlantic coast, preceded by a northeast gale at Capes Henry and Hatteras. On the morning of the 11th this storm-centre appears quite near to Cape Breton, where the barometer was at that time reported 28.78, being the lowest that has occurred during the month. This cyclone was productive of great destruction upon the sea, as shown by the reports that have come to hand, of over one hundred vessels, collated from the columns of the New York Herald. Of these, the following give the approximate places in which they met the storm:

On the 8th—

S. S. Morro Castle, E. of Frying-Pan Shoals.
Schr. Ricardo, lat. 31°, lon. 79°.
Brig E. H. Flynn, lat. 29°, lon. 79° 20′.
S. S. Ætna, 200 miles S. of Hatteras.

On the 9th—

Bark Saide, lat. 32°, lon. 70°.
Brig Hail Columbia, lat 33° 48′, lon. 73° 16′.
Bark La Platte, lat. 32° (?), lon. 67° 15′.
S. S. Montgomery, S. of Cape Hatteras.
Sch. Jos. W. Wilson, lat. 31° 15′, lon. 79° 20′.
Brig Isabel Cain, lat. 34° 30′, lon. 69° 30′; barometer fell to 28.80.

On the 10th and 11th—

Bark Jason, lat. 38°, lon. 68°.

On the 11th and 12th—

S. S. Weser, lat. 43°, lon. 56°.

On the 12th—

S. S. Maas, lat. 45°, lon. 48° 40′.

On the 13th—

S. S. Wyoming, 2 days W. of Liverpool, February 1 to the 13th.
S. S. City of Montreal, 2 days W. of Liverpool, February 11 to the 13th.

VII. During the evening of the 11th and morning of the 12th the barometer fell, with light rain, in California and Oregon. This was followed on the 12th by rapid fall, with southeast winds throughout the country immediately east of the Rocky Mountains, and the formation of a long elliptical area or trough of low pressure which soon broke up into three or more circular areas, of which the most important has been indicated as No. VI. The pressure in Oregon, however, continued quite low and falling, showing that the main depression was moving slowly northeastward toward British Columbia. By the evening of the 13th, this had finally passed into Montana, but appears not to have had there the characteristics of a severe disturbance. It was central on Lake Superior on the morning of the 15th, and on the Gulf of Saint Lawrence on the 17th. The barometer was quite low at the Bermudas on the 16th, 17th, and 18th, and was followed by northerly winds, low temperatures, and heavy rain.

VIII. The morning map of the 16th shows a decided depression west of Texas, which probably originated west of the Cordilleras, possibly in the equatorial portion of the Pacific Ocean, as Mr. Redfield has shown to be frequently the case with the storms that arrive on the Mexican and California coasts. This storm-centre moved quite slowly eastward, influenced, no doubt, by the area of moderately high barometer and cold air over the Lake region and Ohio Valley. On passing beyond the coast of Georgia it seems to have given rise to at least two areas of special precipitation and possibly low pressure, one of which existed in Florida on the morning of the 18th, while the other was east of South Carolina. The Bermuda reports indicate that both of these passed northeastward, without important development.

IX. On the 16th and 17th the falling barometer, clouds and rain at San Francisco and Portland, Oreg., indicated the approach of areas of low pressure, of which the one represented as No. IX, passed within the cognizance of the office, while others kept to the northward. This storm-centre apparently passed eastward over the northern part of California into Nevada and Idaho, where it was central on the 18th, and there co-operating with a smaller storm-centre to the northward, produced what threatened, on the morning of the 19th, to be an unusually severe disturbance; this, however, passed northeastward over Lake Superior, and was only especially notable by reason of the northwest gales in Minnesota and Dakota. The steady southerly winds induced over the Lower Lakes, Middle and East Atlantic States brought steady light rains to those sections.

X. While the previous storm-centre was, on the 19th, in the extreme northwest, the induced southeasterly winds in Texas prepared the way for the formation of an independent area of precipitation and low pressure in Texas, the existence of which was, as usual, determined by the nightly radiation; its centre on the morning of the 20th was probably in Northwestern Texas. The rain-area extended very rapidly, by midnight, over the Ohio Valley to Western Pennsylvania. The remarkable contrast of temperature noted in a subsequent portion of this review formed the most notable features of the storm-centre, which soon seemed to die away.

XI. The belt of isotherms above alluded to as originating on the dissolution of storm

No. X, seems to have lasted until the development of No. XI disturbed its arrangement. The passage of No. IX from the Pacific coast had been followed on the 21st by the area of highest barometric readings that appeared on that coast during the month. The cold northerly winds from this area of high barometer prevailed over the Lower Missouri, Upper Mississippi, and Ohio Valleys, and in Texas on the morning and afternoon of the 21st, apparently there formed in consequence some precipitation in Southern Texas and off the Texas coast, for by midnight the coast-winds have veered to south and east, with rising temperature. During the whole of this night the rain-fall was quite large in Tennessee, and the area of lowest pressure, after moving into that State, extended simultaneously and rapidly to the northeast and northwestward, and on the morning of the 23d was represented by two depressions, respectively over Upper Michigan and the Lower Lake region. The former disappeared from the cognizance of the signal-stations, and the latter passed over the mouth of the Saint Lawrence River.

XII. The cold northerly winds attending the high barometer that followed the preceding storm seem to have underrun the warmer and moister air of the Gulf and the Atlantic between latitudes 25° and 30°, so that already on the morning of the 23d the Texas "Norther," and its feebler representative in Alabama, were attended by the invariable upper southerly cloud-bearing current moving toward the centre of low temperature and high barometer. During the 24th there appeared traces of an incipient storm-centre in the northern portions of the Gulf, while cold north and northeast winds, with sleet, rain, and high barometer, prevailed on the South and Middle Atlantic coasts, probably indicating the simultaneous development, in a similar manner, of a storm-centre at some distance east of the Carolina coast. On the 25th this latter centre had moved on to the coast of New Jersey, while the depression in the Gulf of Mexico had moved eastward over the Florida peninsula and disappeared, possibly uniting with its predecessor.

The storm-centre then advanced rapidly northeastward along the New England coast; it was, in the afternoon of the 26th, east of Cape Breton. This storm appears to be the same as that experienced by the steamer Donau, which met a violent hurricane shortly before reaching New York on the 27th. The same hurricane was also met by the steamships Russia, City of Dublin, Wisconsin, and Andes, and the latest report received concerning it is from the steamship Pennsylvania, which experienced a violent hurricane at midnight of the 27th.

CAUTIONARY SIGNALS.

There have been displayed during the month at stations in the United States ninety cautionary signals, while to the Canadian stations forty-two storm-warnings have been sent. Of these latter the tri-daily weather-maps show with more or less certainty that twenty were verified by the storm-winds following within twenty-four hours after the observations were made upon which the warnings were based. Of the remaining twenty-two signals, eighteen appear not to have been verified, while two orders, classed as late, were sent after the winds had become dangerous, because it was anticipated that these would so continue for some time; concerning the verification of two others, no information is at present available. Of the ninety signals displayed at stations in the United States, twenty-three are classed as late, the orders having been issued immediately on the reception of the news of unexpected strong winds; other twenty-three are reported by the observers as not verified at the station, but of these twelve appear to have been verified within one hundred miles thereof, leaving fifty-six signals, or sixty-two per cent., verified. Three cases are reported in which dangerous winds prevailed for a short time without the display of signals.

BAROMETIC PRESSURE.

The isobars given on Map No. 2 show that the area of high pressure on the Pacific Ocean has encroached upon the coast of California; on the other hand, the area of high barometer over the Atlantic Ocean has apparently extended somewhat farther eastward than usual. The lowest pressure is found on Lake Superior.

TEMPERATURE.

The temperature during this month has been about the average of many years past, the most decided departure being in Minnesota, Wyoming, and Colorado. On the 24th, in the latter Territories, the thermometer indicated the lowest temperature ever recorded there, it being —24° at Cheyenne, —17° at Colorado Springs, —9° at Denver, and 0 at Santa Fé.

The isothermal lines for the month are given on Map No. 2. In drawing these, some use has been made of the observations made by the corps of voluntary observers reporting to the Signal-Office.

The southeastern side of a region of cold air and high barometer generally presents cases of extreme contrasts of temperature, and such have been quite frequent during this month. The most remarkable instance was noted on the afternoon of February 22, and it is worthy of special attention, since similar cases have occurred but three or four times during the last three years. On the date in question a line drawn northward through Louisiana to Vicksburg; thence northeast to Baltimore, and thence southeast to the Atlantic Coast, separated the area of cold northeast winds and rain on the northward from that of warm southwest winds to the southward. This belt of great thermal contrasts had existed on the 20th, and extended slowly eastward until the 23d.

The greatest contrast recorded is found in the Middle Atlantic States, although probably parallel cases occurred at other places where the Signal-Office has no stations. At New York the temperature of 41°, with northeast winds, is first recorded on the 21st at 7.35 a. m., and continued uniformly until the 23d, 7.35 a. m. At Philadelphia there were northeast winds, temperature 44°, on the 22d, 7.35 a. m., and continuing uniformly until the 23d, 7.35 a. m.; at Baltimore northeast winds, temperature 58°, on the 22d 11 p. m. This is the only northeast wind reported at Baltimore. During the three days in question Baltimore, as also always Washington, experienced only warm southwest winds.

On the 21st, 4.35 p. m.	*On the 22d, 4.35 p. m.*	*On the 23d, 7.35 a. m.*
New York, wind E., temp. 51°.....	Philadelphia, wind NE., temp. 47°.	Philadelphia, wind E., temp. 41°.
Philadelphia, wind SW., temp. 67°.	Baltimore, wind SW., temp. 73°.	Baltimore, wind SW., temp. 62°.

It thus appears that at these stations, as also along the entire belt from Louisiana to New Jersey, cold north and east winds met, and perhaps, to a slight extent, underrun the warm south and west winds, the contest between the two being maintained with great uniformity for 48 hours. The examination of the movement of the upper clouds, as far as they could be observed when the belt was most distinctly marked on the afternoon of the 22d, shows that while the crowded isothermal lines bounded the regions of north and south surface winds, they also bounded the regions, respectively, of the northeast and southwest upper currents, into which directions the surface winds were respectively turned after their ascension. The heaviest rain seems to have been falling on the north side of the dividing belt at the time of each report. As has been mentioned in the study of the storm No. XI, this belt of isotherms disappeared on the development of that storm-centre.

PRECIPITATION.

The monthly chart of precipitation shows that there has been a very great excess in the South Atlantic States, and a decided excess in the Western Gulf States and the Ohio Valley. In compiling this chart, use has been made of the reports of voluntary observers, in addition to those of the Signal Corps.

On the 21st and 22d, at Nashville, there fell 5.96 inches in 36 hours, being the heaviest rain-fall ever recorded there.

RIVERS.

The Missouri River at the end of the month was at about the same height as at the beginning, both at Leavenworth and at Saint Louis, having in the interval risen and again fallen from 1 to 3 feet. The Ohio fell, with but slight interruption, until the 13th of the month, when a sudden rise of about 8 feet occurred in the upper portion of the river, producing by the 20th a rise of 15 feet at Cincinnati. The extensive rain of the 23d and 24th, throughout the Ohio Valley, caused a very general rise, which was especially marked at Nashville. At the close of the month the river stood at Cincinnati, Louisville, and Cairo from 8 to 12 feet above its position at the middle of the month. The Upper Mississippi has varied but slightly, and at the close of the month averaged about 1 foot lower than at the beginning; below Saint Louis it has varied considerably, and at Cairo, Memphis, and Vicksburg closed from 4 to 6 feet higher than at the beginning of the month. The wave of high water which, on the 28th, was passing Cairo and Memphis, had not at that time reached Vicksburg.

ICE IN RIVERS, ETC.

During the month the ice has averaged 16 inches in thickness at Dubuque, and 21¼ at La Crosse. At Keokuk the river was clear of ice on the 11th and 27th, but full of thin ice at the other days of observations. At Detroit on the 12th the river was almost free of ice. At Toledo the ice broke up on the 15th. At Buffalo the river and lake continued frozen during the month. At Rochester, at the beginning of the month, the ice was from 6 to 8 inches thick, and at the close from 12 to 18 inches.

TEMPERATURE OF THE WATER.

But five stations have sent reports of the temperature of the water in the rivers The ranges are as follows:

	Maximum.	Minimum.
Leavenworth	33°	32°
Nashville	53	39
Knoxville	51	41
Montgomery	61	47
Shreveport	57	48.5

At stations on the Atlantic and Gulf coasts the ranges have been as follows:

	Maximum.	Minimum.
Galveston	65°	51°
Mobile	60	52
Jacksonville	66	57
Wilmington	54	42
Norfolk	56	37
New York	36	31
Wood's Hole	34	29
Portland, Me	34 (?)	29

FROSTS.

Frosts are reported at the following stations:

On the 3d, Shreveport; 4th, Cairo; 5th, Savannah; 8th, Shreveport; 10th, Montgomery; 24th, Shreveport.

SOLAR AND LUNAR HALOS.

Solar or lunar halos have been recorded as follows: On the 2d, Santa Fé and Oswego; 4th, Atlantic City and Long Branch; 9th, Santa Fé; 10th, Eastport; 11th, Eastport; 14th, Washington; 19th, Eastport and Breckenridge; 20th, Atlantic City; 21st, Breckenridge and Duluth; 22d, Wytheville and Breckenridge; 24th, Cairo, Escanaba, Dubuque, Norfolk, Eastport, Albany, Barnegat, and Saint Paul; 25th, Saint Paul, Breckenridge, and Omaha; 26th, Duluth, Marquette, Buffalo, Oswego, Sandy Hook, Wood's Hole, Albany, Barnegat, Norfolk, New Haven, Philadelphia, Atlantic City, Lynchburg, Rochester, Grand Haven, and Washington; 27th, Keokuk, Davenport, Omaha, Dubuque, and Washington.

POLAR BANDS.

Notable arrangements of cirri-clouds, in what are called polar bands, were recorded as follows: On the 5th, at Saint Paul; 8th, Atlantic City; 14th, Saint Paul and Washington; 21st, Norfolk; 23d, Sandy Hook; 26th, Norfolk.

AURORAS.

Auroral displays have been generally quite faint. They have been observed at the following stations: On the 5th at Burlington, Eastport, Boston, Albany, Long Branch, Alpena, and Rochester; 7th, Eastport, Marquette, and Alpena; 14th, Eastport, Burlington, Rochester, Erie, and Breckenridge; 17th, Burlington, Alpena, and Marquette; 18th, Boston, and at Lake City "an anomalous luminous appearance;" 20th, Eastport.

ATMOSPHERIC ELECTRICITY.

Remarkable earth currents were noted on the 25th at Breckenridge. Thunder and lightning storms were experienced on the 5th at Galveston; 6th, Mobile; 17th, Montgomery, Charleston, and Augusta; 21st, Cairo and Shreveport; 22d, Shreveport; 28th, Atlantic City.

MISCELLANEOUS.

An earthquake was experienced at Eastport at 10.50 p. m. on the 27th. The trembling lasted three or four minutes.

The migration southward of flocks of wild ducks was noted on the 11th at Saint Louis, and 24th at Morgantown.

A bright meteor was observed February 1st, at Atlantic City.

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ALBERT J. MYER,
Brig. Gen. (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[6].

MONTHLY WEATHER REVIEW, MARCH, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

The weather for the past month has been, in almost all parts of the United States, an easy transition from winter to spring. The only instances of abnormal weather have occurred in the northernmost portion of the country. The winter temperatures and other meteorological conditions have been generally quite evenly balanced with those of early spring. These conditions are reviewed below in detail.

STORMS AND CYCLONES.

The month of March has been characterized by its usual storminess. Twelve noticeable depressions have passed over more or less of the territory of the United States. The following details sufficiently describe them. (See Storm Track Chart No. 1.)

No. I. This disturbance originated apparently in the Western Gulf States on the last night of February, and moved nearly due eastward, expanding its area of depression, and passing off the Georgia coast at midnight of March 1st. It was attended by no serious consequences.

No. II. This second storm-area of the month entered the United States on the 1st of March, from the northwest, and was marked by a very low barometer. Its track was, however, so high in latitude that its effects were not much felt.

No. III Was of more cyclonic force, and passed from the southwest to northeast directly over the country. It started from Kansas on the morning of March 3d, and reached the Saint Lawrence Valley on the morning of the 4th. From Montreal its course was eastward, and it disappeared off the coast on the 5th.

No. IV Approached from the southwest on the evening of the 5th, and pursued a northeastward course steadily until it reached the Saint Lawrence Valley. It made a slight detour to the northward, crossing the Upper Lakes on the 7th, and thence advanced in a line nearly due eastward. After reaching the Lower Saint Lawrence Valley on the afternoon of the 8th, it paused and remained stationary, or nearly so, until the 12th—a fact most extraordinary in the progressive movements of storm-centres.

No. V. While No. IV was in progress across the country a smaller storm-centre was formed in Virginia on the night of the 6th, and advancing up the coast in a northeasterly direction, appears to have passed beyond the Nova Scotia coast on the 8th, or else to have merged into the larger storm, (No. IV,) which was then coming very near to its track.

No. VI Commenced in the southwest on the 9th and moved over the Southern States, its track on the 11th being deflected from Central Alabama to Northern Florida, whence it disappeared to the eastward on that day.

No. VII. Although this storm-centre appears to have been formed in the shape of a long trough, lying north and south, west of the Mississippi Valley, and in the northwest, early on the 14th, it does not appear in concentrated force until the midnight of the 15th. Then it commenced moving slowly southeastwardly from Dakota to Iowa and Northern Missouri, which latter district it reached on the afternoon of the 17th. Thence its course is at right angles to its earlier track as it passed from Missouri to Michigan on the 18th, and, on the 19th, rapidly bore away to the Lower Saint Lawrence Valley, which it traversed during the night of the 19th, and next morning had disappeared. While the main storm-centre was in Eastern Missouri, and making a northward or northeastward curve in its course, there was formed a severe storm or tornado in the Mississippi Valley, which, at 4 a. m. of the 18th, swept with great fury over Cairo, Ill. It was accompanied by violent lightning and thunder and heavy rain, but no very remarkable oscillation of the barometer was reported. Great damage was done to property by this apparently local whirlwind. Simultaneous, but less violent, disturbances took place in Memphis, Tenn., and the vicinities.

No. VIII Was of little importance, originating in the northwest on the 19th, and moving north of the Signal-Service stations toward the Lower Saint Lawrence Valley.

No. IX Pursued the same track on the 21st and 22d, and it, too, was of comparatively minor importance.

No. X Began in the northwest on the 24th, in the morning, and advanced from Dakota to Lake Superior on the morning of the 25th, and then rapidly moved south of Hudson Bay toward Labrador.

No. XI Came up from the Lower Missouri Valley on the afternoon of the 25th, and pursued its way over Illinois, Indiana, and the Lower Lakes on the 26th. It passed

down the Saint Lawrence Valley, and thence from the vicinity of Montreal over New Brunswick, and was lost to view on the night of the 27th.

No. XII. A twelfth quite noticeable depression appeared in the southwest on the 30th, and moved thence over Tennessee on the 31st, producing considerable rain and snow in the Ohio Valley, and in its progress eastward over Virginia caused high winds on the Atlantic coasts. It disappeared April 1st in the Atlantic.

Besides these storms, several depressions have apparently advanced from the vicinity of Hudson Bay, southeastwardly, nearly to the Lower Lake region and Saint Lawrence Valley, but scarcely producing any marked effects in these sections, because their centres were moving eastward on higher parallels of latitude.

Meteorological data, gathered from various sources, show that these storms have been very severe after passing off the American coasts, and have apparently become more violent as they penetrated the middle and eastern side of the North Atlantic.

Without endeavoring to explain this last-named fact, it may be proper to notice that large masses of ice and icebergs were reported during March moving southward and eastward off the Newfoundland coast and banks.

ANTI-CYCLONIC AREAS.

The number of anti-cyclones, or areas of high barometer, around which the winds drew in a general direction with the hands of a watch, is six. Some of these anti-cyclonic areas have been very large, covering more than one-half of the country at the same time. The pressure of the atmosphere near their centres or crests has in some cases been as high as 30.58 and 30.73 inches. The general path pursued by these meteors has been from northwest to southeast. They have largely served to determine the temperature, wind and humidity conditions of the entire country. They have also exerted a marked and potent influence on the direction, intensity, &c., of all the cyclonic centres. Some of them remained stationary, or almost so, for several days in the Northwest.

PRECIPITATION.

The rain-fall and snow-fall are graphically shown on Chart No. 2. It will be observed there was a very large excess of rain for all the Gulf States, and a deficiency for New England, the Middle and South Atlantic States The deficiency is quite marked in northern New England and in Florida, where the precipitation falls below a single inch for the entire month. The most marked deficiency is in the Middle States, and is one and a half inches, and nearly the same in New England and the Lower Lake region.

There is an excess of about one and a half inches for the Ohio Valley and Tennessee. The snow-fall in the Rocky Mountains has been unusually heavy.

TEMPERATURE.

The thermometric data are given on accompanying Chart No. 3. This chart shows that the thermal conditions were decidedly equinoctial over the larger portion of the country, excepting, of course, the mountainous and extreme northerly States and Territories. The only remarkable deficiency of temperature was in the Upper Mississippi Valley. There was a slight excess in the South Atlantic States and the Ohio Valley and Tennessee. The uniformity of the isothermals and their parallelism with the lines of latitude are strikingly delineated on the chart. The only departure from this parallelism is in the Appalachian region, where the influence of altitude deflects the isothermal of 45° southward.

ATMOSPHERIC PRESSURE.

The only remarkable feature in this element of the weather is the uniformity, which is strikingly appropriate to the equinoctial month. There is no considerable deviation from 30.00 inches of pressure, except in the northeastern section of the country. There, the isobars come near together, and the pressure is very low, especially in Nova Scotia and the Lower Saint Lawrence Valley. The isobarometric lines are found on Chart No. 3.

WINDS.

The March winds, as a glance at Chart No. 3 will show, are characteristically from the northwest. The only observable exception to this is in the easterly and southeasterly winds of the Gulf of Mexico and the Western Gulf States, in which the trade-wind influence manifests, so early in the spring, its predominance. At Mount Washington, winds were reported on the 23d, of velocity as high as 130 miles an hour and continuing near that enormous force for twenty-four hours.

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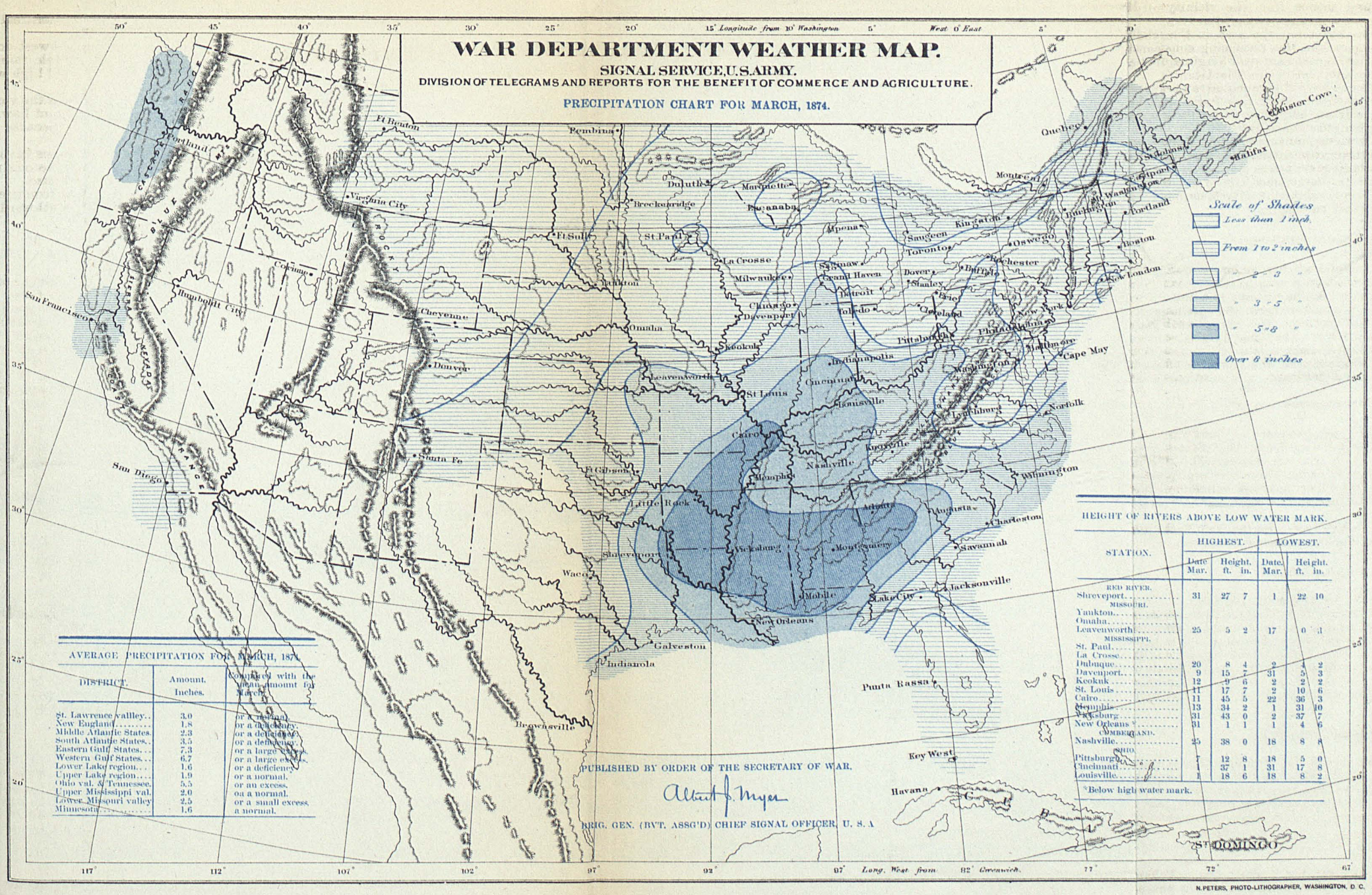
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR MARCH, 1874.



AVERAGE PRECIPITATION FOR MARCH, 1874.

DISTRICT.	Amount. Inches.	Compared with the mean amount for March.
St. Lawrence valley..	3.0	or a normal.
New England.....	1.8	or a deficiency.
Middle Atlantic States.	2.3	or a deficiency.
South Atlantic States..	3.5	or a deficiency.
Eastern Gulf States...	7.3	or a large excess.
Western Gulf States...	6.7	or a large excess.
Lower Lake region...	1.6	or a deficiency.
Upper Lake region....	1.9	or a normal.
Ohio val. & Tennessee.	5.5	or an excess.
Upper Mississippi val.	2.0	oa a normal.
Lower Missouri valley	2.5	or a small excess.
Minnesota.....	1.6	a normal.

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Albert J. Myer

BRIG. GEN. (BV'T. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

HEIGHT OF RIVERS ABOVE LOW WATER MARK.

STATION.	HIGHEST. Date Mar.	Height. ft.	in.	LOWEST. Date Mar.	Height. ft.	in.
RED RIVER.						
Shreveport.....	31	27	7	1	22	10
MISSOURI.						
Yankton.....						
Omaha.....						
Leavenworth.....	25	5	2	17	0	3
MISSISSIPPI.						
St. Paul.....						
La Crosse.....						
Dubuque.....	20	8	4	2	4	2
Davenport.....	9	15	7	31	5	3
Keokuk.....	12	9	6	2	2	2
St. Louis.....	11	17	7	2	10	6
Cairo.....	11	45	5	22	36	3
Memphis.....	13	34	2	1	31	10
Vicksburg.....	31	43	0	2	37	7
New Orleans *.....	31	1	1	1	4	6
CUMBERLAND.						
Nashville.....	25	38	0	18	8	8
OHIO.						
Pittsburgh.....	7	12	8	18	5	0
Cincinnati.....	1	37	1	31	17	8
Louisville.....	1	18	6	18	8	2

*Below high water mark.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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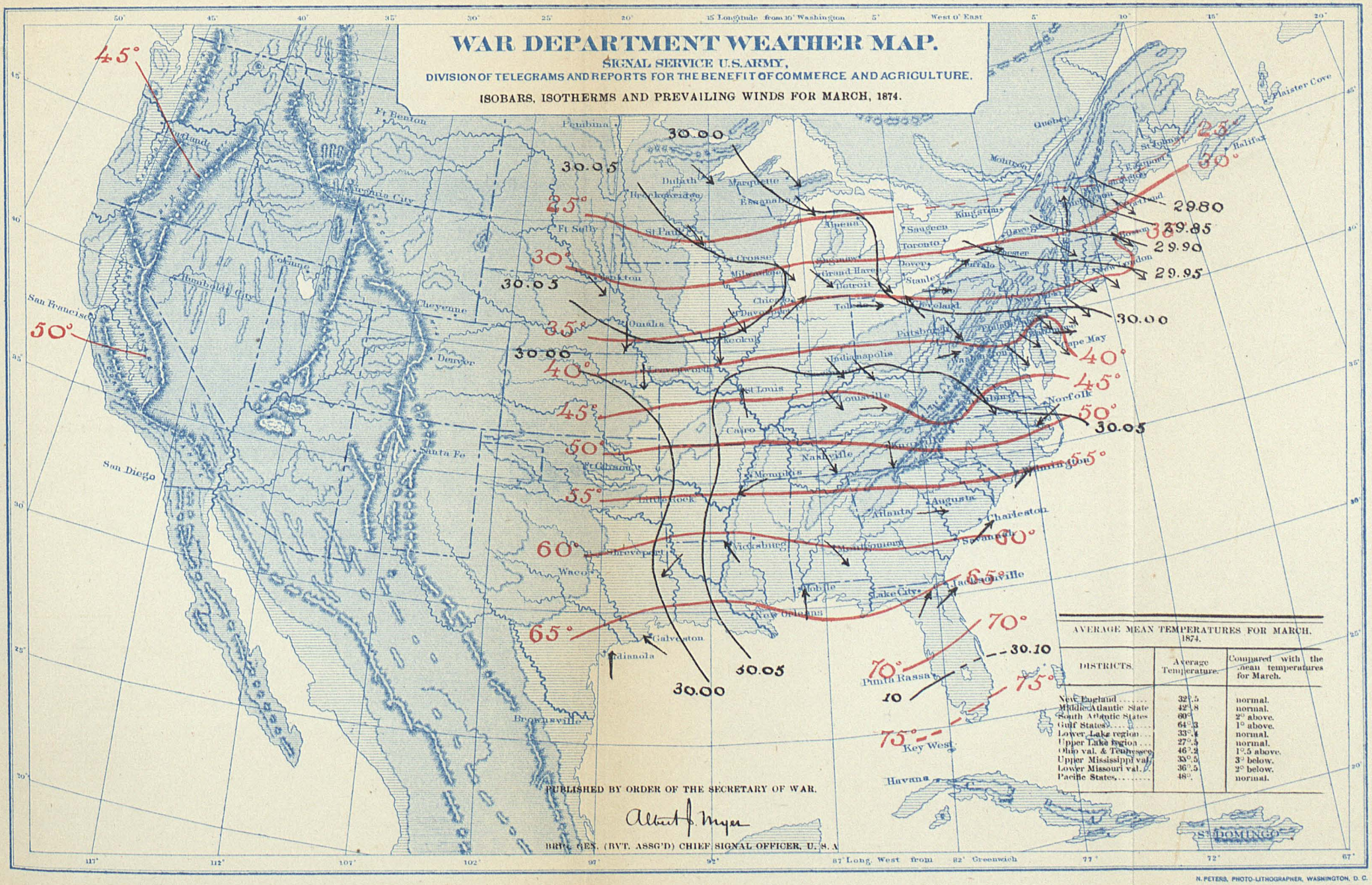
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR MARCH, 1874.



AVERAGE MEAN TEMPERATURES FOR MARCH, 1874.

DISTRICTS.	Average Temperature.	Compared with the mean temperatures for March.
New England	32°.5	normal.
Middle Atlantic State	42°.8	normal.
South Atlantic States	60°	2° above.
Gulf States	64°.3	1° above.
Lower Lake region	33°.4	normal.
Upper Lake region	27°.5	normal.
Ohio val. & Tennessee	46°.2	1°.5 above.
Upper Mississippi val.	35°.5	3° below.
Lower Missouri val.	36°.5	2° below.
Pacific States	48°	normal.

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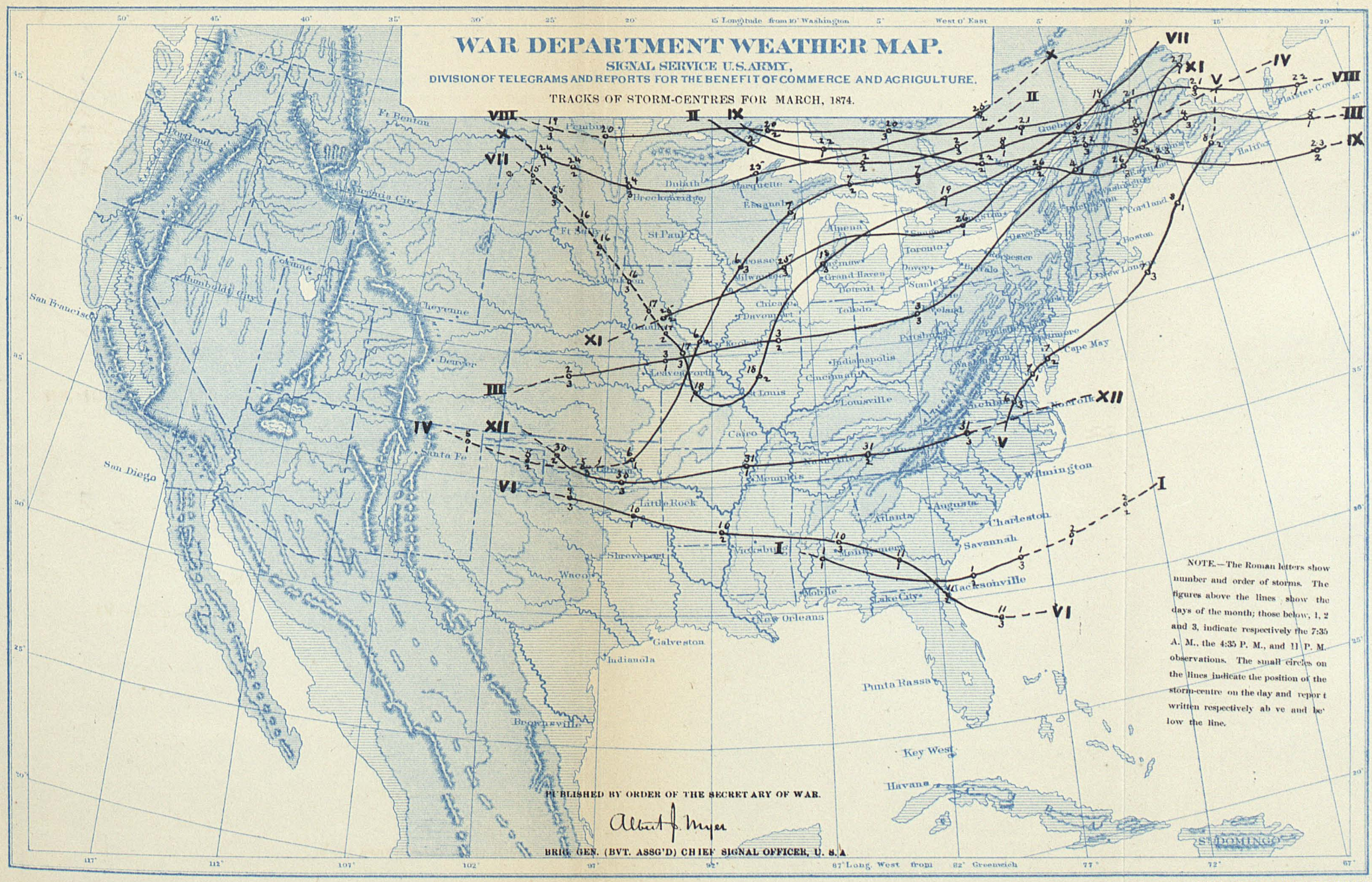
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF STORM-CENTRES FOR MARCH, 1874.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report written respectively above and below the line.

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N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

RIVERS.

The condition of the rivers will be found in one of the tables on Chart No. 2. The Red River, it will be seen, rose at Shreveport to its highest as the month closed. So also the Missouri at Leavenworth. The Cumberland was very high on the 25th, but afterward fell considerably. The Ohio was in flood, the first of the month, at Cincinnati and Louisville, but it fell at the close. During the whole month the Mississippi River rose slowly but steadily at Vicksburg to forty-three feet above low-water mark. Also, about the 11th, it rose at Cairo forty-five feet above low-water mark, but, as the month progressed, it fell at the latter point. The month closed without any indications of very alarming floods in the western rivers.

PECULIAR PHENOMENA AND FACTS.

From Nashville the observer reports, what may be of interest to agriculturists, that an inspection of the country around Nashville by a member of the board of trade of that city shows "that the grasshoppers and other insects which are usually killed by the cold of winter are this spring alive and already moving." Repeated investigation has confirmed this statement.

At Knoxville, March 7, 7 p. m., there was an extraordinarily brilliant aurora, the first of this year, "in two bands: one triangular, base in the horizon, or near it, with opposite vertex, which was ill-defined, about 15° N.W from zenith; the other was nearer in the north and far brighter, but not so extensive." The "dark segment," the "waving flag aurora," and the "merry dancers" were plainly seen for some time. The same phenomenon was seen at other points in the west where the night was cloudless. It was also reported, same night, from Albany, N. Y., "where a continuous sheet of brilliant white light encircled the horizon, extending to an altitude of 35° in the northeast and to an altitude of 12° in the southwest, the light in the northeast strongly contrasted with a dark segment of slate-color beneath it and about fifty-two streamers of straw-color." On the same night and hour it was observed at Norfolk, Va., where the color was of a "pale yellow," partly obscured by clouds; and, from this point, it was visible far westward. The observer at Pike's Peak reports that, for the first time since the occupation of the summit, he saw an auroral arch on the same evening. It was seen simultaneously at Louisville, Ky.; at Breckenridge, Minn.; at Eastport, Me.; faintly at Indianapolis, Ind.; apparently at Augusta, Ga.; faintly at Yankton, Dak., Davenport, Iowa, and other points.

During the conflagration at Indianapolis on the 22d, the wind was observed not to take any cyclonic direction, but to blow in a straight line. At Mobile, on the 22d, the thermometer reached 82° F. At Augusta, Ga., on the 16th and 17th, there were forty consecutive hours of rain-fall, amounting to 5.10 inches. At Salt Lake City, on the 17th, light snow fell from a cloudless sky, while the stars were visible over the whole sky. At Marquette, on Lake Superior, where observations are taken to compare the movements of water in the lake, and the rise and fall of the barometer, the result shows the water and barometer acted together forty times and in a contrary manner fifty-three times.

At Omaha, Nebr., on the 6th, wild geese were seen moving south. The Santa Fé observer states, in his March report: "One year ago the trees and vines had leaved out, but were killed by the frosts that came in the latter part of the month. Thus far, this year, there have been no signs of premature buds, leaves, and blossoms; from which fact all classes predict an unusually good year for fruit and all the productions of the soil. But particularly are they looking forward to a good 'grape-crop.' In the mountains there is so much snow that water is abundant everywhere; in fact all classes of people are rejoicing."

BREAKING UP OF ICE AND OPENING OF NAVIGATION.

On the 19th of March the ice all disappeared from the river at Rochester, N. Y., and navigation to that port was resumed on the 23d. At La Crosse, Wis., the Mississippi opened on the 28th, or nine days later than last year, having been closed four months and one day. The navigation at Alpena, Mich., re-opened on the 20th; at Detroit on the 18th. At Yankton, Dak., the ice in the Missiouri broke up on the 20th; the ice in the harbor at Buffalo gave way on the same day, but not sufficiently to render navigation easy or safe.

CAUTIONARY SIGNALS.

During the month of March, including the night of the 31st, there were ordered for ports of the United States, in all, fourteen cautionary signals. Of this number

one was late. The correctness of one is doubtful. The number reported as actually justified was twelve. This gives as the percentage of correct signaling, 85. Owing to the suspension of navigation on the lakes, no signals were displayed there during March.

Besides the display of cautionary signals at United States ports, there were telegraphed to Canadian ports twenty-nine warnings of approaching storms. Although the exact percentage of justification cannot be determined from data in this office, it is known that most of these warnings were followed by dangerous gales.

It may serve to illustrate the practical utility of the cautionary signals to quote the words of the observer regarding the warning-signal hoisted on the 31st at Norfolk, Va. He says: "The signal was fully justified, as a heavy gale prevailed outside. A very large fleet (200) of sailing-vessels put into Hampton Roads, and remained there twelve hours after the signal was lowered."

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Brt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[7].

MONTHLY WEATHER REVIEW, APRIL, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTORY.

The weather of April has been distinguished by the prevalence of extraordinary rain-fall throughout the Southern and Middle States, and equally unusual snows in New England and in Colorado. The courses pursued by storms have, on the average, been much to the south of their tracks of previous years. The average barometric pressure is unusually high throughout the northern sections of the country. Vegetation is everywhere reported as from ten to twenty days behind its usual condition at the end of the month. Severe floods have been reported from all the tributaries of the Mississippi River, and the result has been that a disastrous overflow has been experienced throughout Mississippi, Louisiana, and Arkansas.

STORMS.

I. The history of this storm belongs chiefly to the month of March; it was central on the 1st of April in the South Atlantic States, and disappeared during the day in the Atlantic Ocean.

II. The track of this storm is confined to the extreme northern limits and border of the region of our stations; it passed on the 3d of the month over the mouth of the Saint Lawrence, after having produced a slight disturbance in the Lower Lake region.

III. This storm first became visible as a well-developed depression in Indian Territory on the morning of the 4th, having apparently traveled northeastward from Texas; its course was in a straight line due northeastward over Lake Erie and the Gulf of Saint Lawrence, which latter region was reached on the 6th. Very extensive rains uniformly prevailed over the Southern and Atlantic States, and snow over the Lake region and Upper Mississippi Valley. Dangerous winds prevailed over the Lower Lakes and Middle Atlantic coasts.

IV. This is first located in Texas, where it very possibly may have originated; it moved eastward into Alabama on the 9th, and thence northeastward to the Middle Atlantic coast on the 10th. Severe northerly gales followed in its rear in the southwest; northeasterly gales preceded its approach to the Atlantic coast; it then passed northeastward at a short distance off the coasts of New England and Nova Scotia, and was east of Cape Sable on the 11th. This was the most generally severe storm of the month on the Atlantic coast, but was on the New Jersey coast perhaps exceeded by that of the 25th instant.

V. The fifth important storm of the month was confined to the extreme northeastern portion of the country. While an area of very high pressure was pressing southeastward over the northwest and Upper Lake region, the storm in question moved southeast and then northeastward over the Saint Lawrence and Canadian Provinces, its effects being most severely felt in New England on the 12th.

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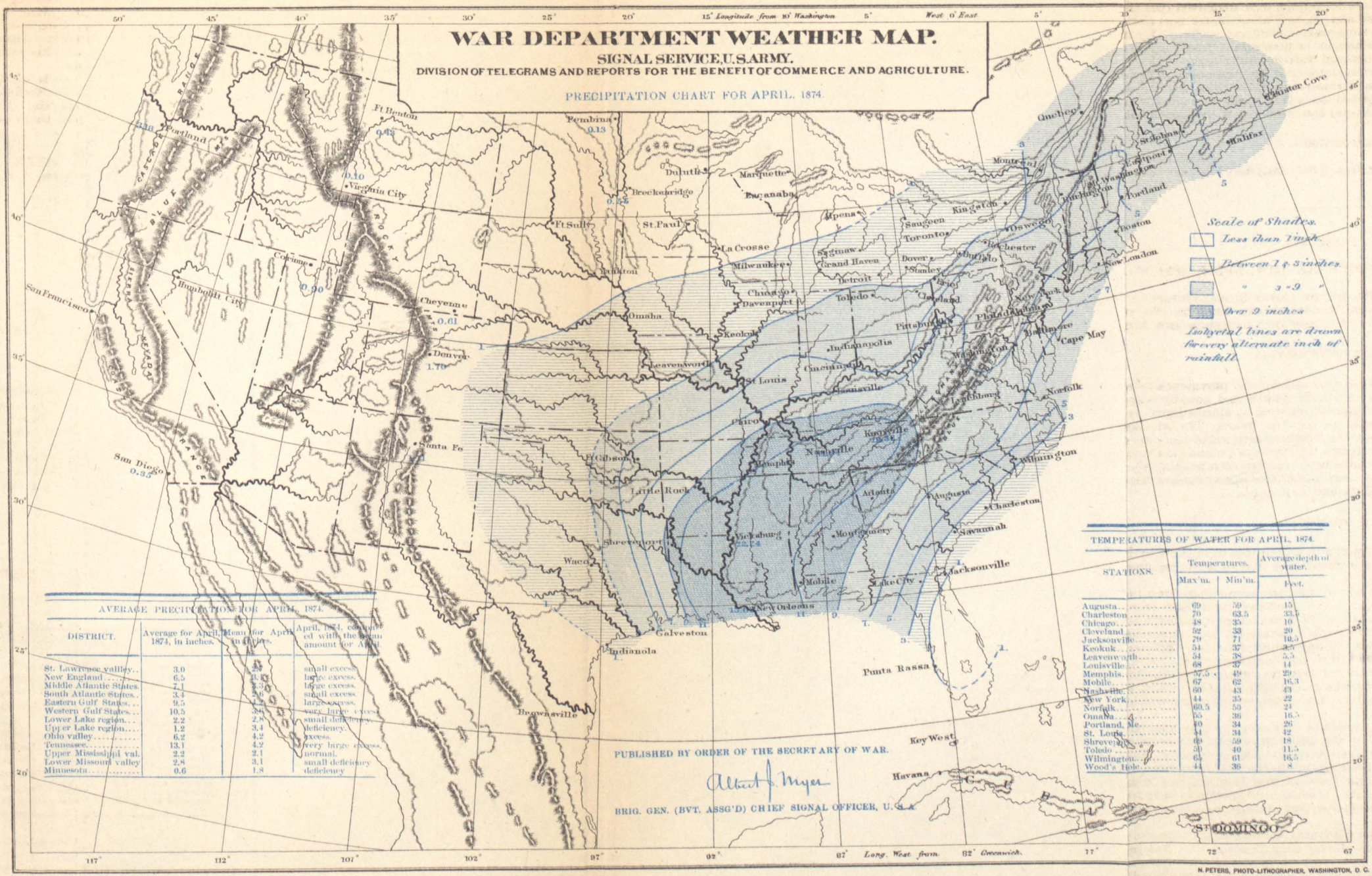
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR APRIL, 1874.



PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

AVERAGE PRECIPITATION FOR APRIL, 1874.

DISTRICT.	Average for April, 1874, in inches.	Mean for April in inches.	April, 1874, compared with the mean amount for April
St. Lawrence valley	3.0	2.8	small excess.
New England	6.5	4.0	large excess.
Middle Atlantic States	7.1	3.3	large excess.
South Atlantic States	3.4	2.6	small excess.
Eastern Gulf States	9.5	4.0	large excess.
Western Gulf States	10.5	3.6	very large excess.
Lower Lake region	2.2	2.8	small deficiency.
Upper Lake region	1.2	3.4	deficiency.
Ohio valley	6.2	4.2	excess.
Tennessee	13.1	4.2	very large excess.
Upper Mississippi val.	2.2	2.1	normal.
Lower Missouri valley	2.8	3.1	small deficiency
Minnesota	0.6	1.8	deficiency

TEMPERATURES OF WATER FOR APRIL, 1874.

STATIONS.	Temperatures. Max'm.	Temperatures. Min'm.	Average depth of water. Feet.
Augusta	69	59	15
Charleston	70	63.5	33.5
Chicago	48	35	10
Cleveland	52	33	20
Jacksonville	79	71	18.5
Keokuk	54	37	3.5
Leavenworth	54	38	5.5
Louisville	68	37	14
Memphis	57.5	49	29
Mobile	67	62	16.3
Nashville	60	43	43
New York	44	35	22
Norfolk	60.5	50	24
Omaha	55	36	16.5
Portland, Me.	40	34	26
St. Louis	44	34	42
Shreveport	69	59	18
Toledo	50	40	11.5
Wilmington	65	61	16.5
Wood's Hole	44	36	8

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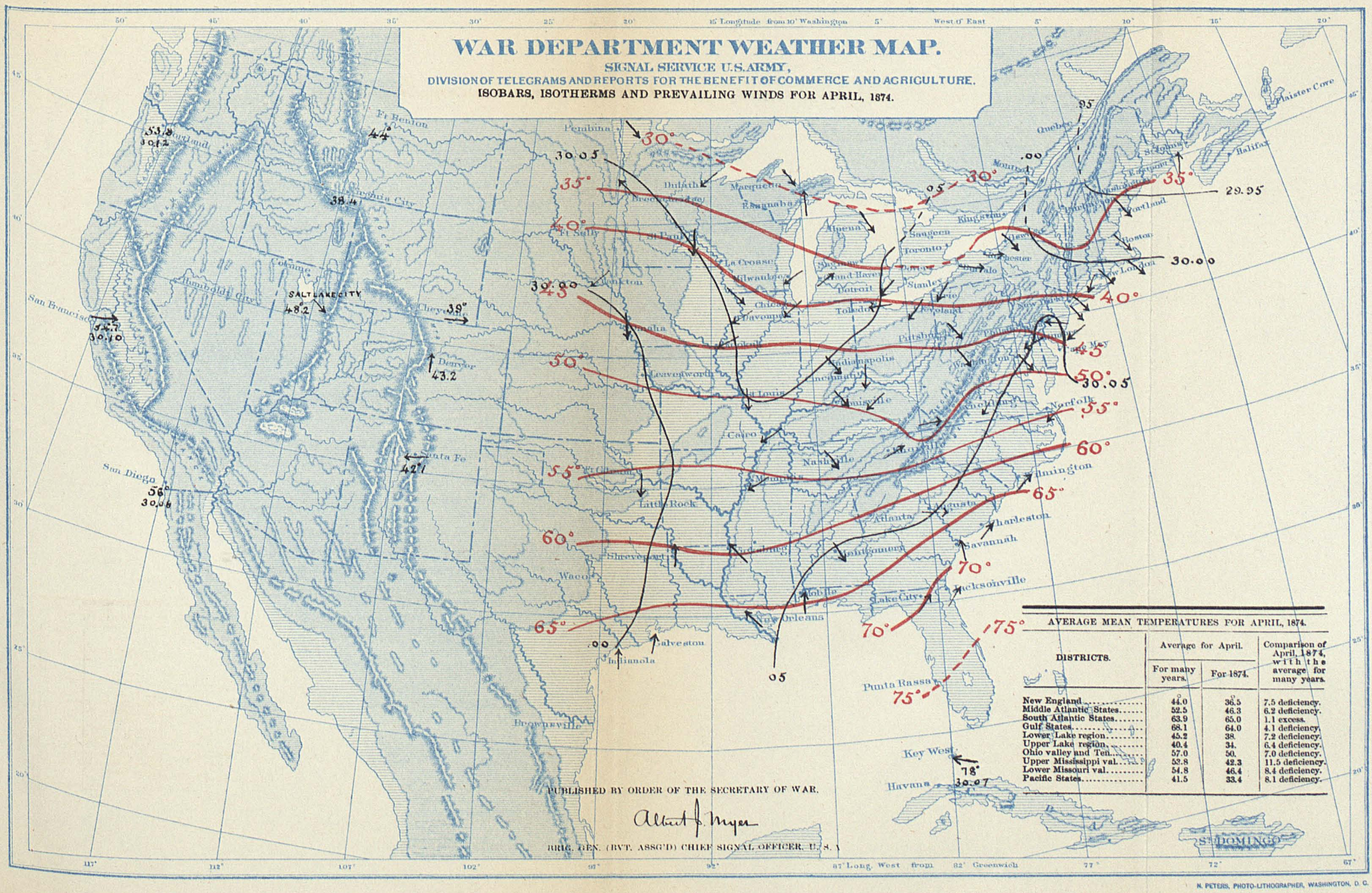
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR APRIL, 1874.



AVERAGE MEAN TEMPERATURES FOR APRIL, 1874.

DISTRICTS.	Average for April. For many years.	Average for April. For 1874.	Comparison of April, 1874, with the average for many years.
	°	°	
New England	44.0	36.5	7.5 deficiency.
Middle Atlantic States	52.5	46.3	6.2 deficiency.
South Atlantic States	63.9	65.0	1.1 excess.
Gulf States	68.1	64.0	4.1 deficiency.
Lower Lake region	45.2	38.	7.2 deficiency.
Upper Lake region	40.4	34.	6.4 deficiency.
Ohio valley and Ten.	57.0	50.	7.0 deficiency.
Upper Mississippi val.	53.8	42.3	11.5 deficiency.
Lower Missouri val.	54.8	46.4	8.4 deficiency.
Pacific States	41.5	33.4	8.1 deficiency.

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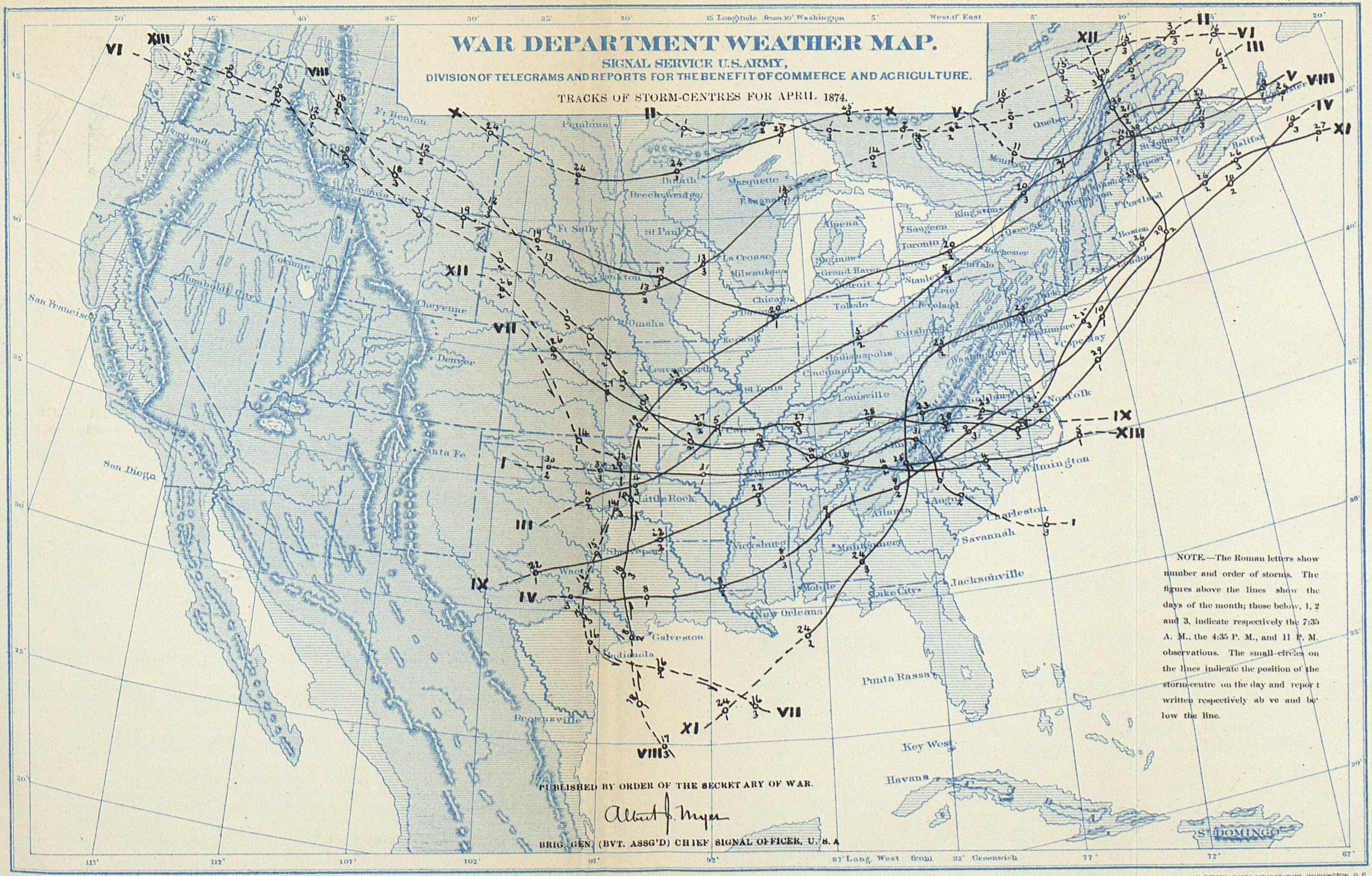

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

VI. The area of high barometer alluded to in the preceding paragraph separated the centres of storms Nos. V and VI. The latter disturbance apparently passed from the Pacific Ocean eastward into the northwestern Territories and British Possessions on the 11th, and very quickly produced a rapid fall in the barometer throughout the Northwest, the intensity of the disturbance being increased by the influence of the high barometer over the Lake region. Southwesterly gales prevailed in the Missouri Valley at midnight of the 11th, and over the Missouri and Upper Mississippi Valleys on the 12th, with fresh, southerly winds throughout the entire Southwest. The depression assumed the shape of a trough, or extremely elongated ellipse, on the morning of the 13th, but the southern extremity rapidly closing up, it became approximately circular by midnight of that date, at which time it was central in Southern Wisconsin. Brisk and high southerly winds prevailed during the 13th and 14th, successively, over Lake Michigan and the Lower Lake region, while the storm-centre pursued a northeasterly course over Canada to the Gulf of Saint Lawrence, where it was last observed on the 16th.

VII. This storm first appeared in Indian Territory on the morning of the 14th, its origin having apparently an intimate connection with the storm No. VI, which was at that time in the extreme Northwest. The track of No. VII presents an unusual appearance in that it trends nearly southeastward, and is finally lost in the Gulf of Mexico. It appears to have been broken up into several areas of low pressure, accompanied by numerous local thunder and hail storms throughout the Southern States. The severest winds are reported from the coast of Texas on the 16th and 17th.

VIII. It is not impossible but that this storm, which is first located, at midnight of the 17th, in the western portion of the Gulf of Mexico, may be in fact identical with No. VII, which latter, after having pursued its unusual course, may have returned upon the usual track of the storms visiting the western Gulf. The course pursued by No. VIII during the 18th was almost due northward into Indian Territory, and thence northeastward over the Lower Lake region, over which it passed on the 20th, to Cape Breton, where it disappeared on the 22d. Strong northeast winds and rain prevailed over the Lake region; easterly winds and heavy rain in the Atlantic States on the 18th, 19th, and 20th.

IX. The extensive snows of the 20th, in Colorado and New Mexico, are our earliest indications of the disturbance that culminated on the 22d in a well-defined storm-centre in Texas, which was by the 22d central in Tennessee, and was followed by a severe "Norther" on the western Gulf coast. The storm disappeared on the 23d, off Cape Hatteras, having been accompanied by very general rains in the Southern States.

X. While the preceding storm was passing eastward, No. X was advancing rapidly southeastward over Manitoba and Dakota, where it was central on the 24th. Considerable rain fell on that and the subsequent day over the Upper Lake region, when the storm turned northeastward and disappeared in Canada.

XI. The cold northerly winds over the Southwestern States on the 23d, undoubtedly initiated the extensive precipitation that prevailed on the morning of the 24th throughout the Northern Gulf coast, developing a well-marked barometric depression that had by midnight progressed northeastward into Alabama. By midnight of the 25th, the storm was central in the immediate neighborhood of the coast of New Jersey, and severe easterly gales were then prevailing from that point to Nova Scotia, and continued to precede the advance of the storm throughout the following day. The last position given for this storm-centre was on the morning of the 27th, when it was off the coast of Cape Breton. While the storm was passing eastward from Tennessee on the 25th, there appears to have been formed a subsidiary depression, which passed north and then eastward, uniting with the main centre on the 26th.

XII. This storm appears to have originated in the mountains of Colorado and the neighboring Territories on the 25th and 26th; it was central in Kansas and Nebraska by midnight of the latter date; its advance eastward was, at first, comparatively slow in the presence of areas of high barometer then existing in the Upper Lake region and the South Atlantic States. Heavy rains prevailed on the night of the 27-28th in the Ohio and Tennessee Valleys and snow on the Lower Lakes. The storm-centre moved nearly eastward to the Atlantic coast and then turned sharply to the northeast, passing over Maine on the 29th at midnight.

XIII. The history of this remarkable storm belongs especially to the month of May, during the first five days of which it slowly moved from the Northwest to Tennessee and thence to Cape Hatteras. The origin of this storm is to be found on the Pacific coast, as it evidently passed over Washington Territory on the 28th and 29th, and over Montana on the 30th.

BAROMETRIC PRESSURE.

The distribution of barometric pressure for the month is shown by the isobaric lines on Chart No. 2, and appears to have been unusually high over the northern sections of the country, with, however, only a very slight deficiency in the extreme southeast.

TEMPERATURE OF THE AIR.

The distribution of temperature for the month is shown by the isothermal lines on the appropriate chart accompanying this text. These lines result from the study of observations reported by about two hundred of the volunteer observers in correspondence with this office, combined with the observations at the regular stations of the Signal-Service. The principal feature of the month is the very general low average temperature. This is made especially apparent by collating, as follows, the reports from volunteer stations whose records run back over a long series of years:

In Maine the average temperature has been the lowest recorded in 38 years.
In Vermont the average temperature has been the lowest recorded in 24 years.
In Massachusetts the average temperature has been the lowest recorded in 34 years.
In New York the average temperature has been the lowest recorded in 25 years.
In Pennsylvania the average temperature has been the lowest recorded in 20 years.
In New Jersey the average temperature has been the lowest recorded in 9 years.
In Connecticut the average temperature has been the lowest recorded in 20 years.
In Maryland the average temperature has been the lowest recorded in 10 years.
In Indiana the average temperature has been the lowest recorded in 10 years.
In Illinois the average temperature has been the lowest recorded in 23 years.
In Kansas the average temperature has been the lowest recorded in 10 years.

PRECIPITATION.

The general distribution of the rain and melted snow is shown by the isohyetal lines on the accompanying chart, in drawing which about two hundred of the volunteer observers' reports have been combined with those of the Signal-Service stations. The rain-fall in the Gulf and Atlantic States has been, in general, one of the largest on record; that at Vicksburg, where sixteen inches fell in four days, has been quite without precedent.

As with the rain-fall in the South, so with the snow-fall in the eastern section of the country, and equally so in the far West.

The snow-fall in Maine has varied from 15 to 41 inches.
The snow-fall in New Hampshire has varied from 30 to 43 inches.
The snow-fall in Vermont has varied from 33 to 56 inches.
The snow-fall in Massachusetts has varied from 11 to 2 inches.
The snow-fall in Connecticut has varied from 12 to 22 inches.
The snow-fall in New York has varied from 10 to 50 inches.
The snow-fall in Pennsylvania has varied from 4 ? to 38 inches.
The snow-fall in Ohio has varied from 2 to 16 inches.
The snow-fall in Indiana has varied from 2 to 4 inches.
The snow-fall in Illinois has varied from 5 to 11 inches.

In Colorado 20 inches, and in New Mexico 15, fell in a single storm on the 20th. The total fall in Colorado appears to have varied between 18 and 33 according to the locality of the stations, being entirely without precedent since the settlement of the State in 1857, and producing great destruction among the herds of cattle and sheep, &c.

At the close of the month several inches of snow remained on the ground throughout Northern New York and New England, and great drifts in the ravines in Colorado.

WINDS.

The prevailing winds are shown by the arrows on Map No. 2. North and east winds have been unusually frequent throughout the Northeast and Northwest.

Of special instances of severe winds probably those observed at Long Branch on the 25th and 26th were the most unusual. Hourly velocities of 64 and 72 miles were recorded on those dates.

CAUTIONARY SIGNALS.

Reports have been received from 37 stations concerning the justification of cautionary storm-signals displayed at those ports. No exact information is at hand with reference to the dispatches sent to the Canadian government. With respect to the Signal-Service stations, out of 153 signals displayed at 37 ports, 114 or 75 per cent. have been justified, 33 or 21 per cent. not justified, and 6 or 4 per cent. late, while 44 cases are reported in which signals were needed but not displayed.

RIVER FLOODS.

The most notable feature has been the disastrous floods in the Lower Mississippi. The usual spring flood had, during the latter part of March, occasioned considerable

damage to the levees near New Orleans, which were being repaired as usual, when the extraordinary rains of April began to make themselves felt throughout Louisiana. The most severe crevasses have been those known as Hickey's, Hushpuckana, the Grand Levee or Morganza, McCullum's, Waterproof, Bonnet Carré, Belle Chasse, and Greenwood.

The first and third remained open at the end of the month and must continue so until the waters have subsided enough to allow filling them up; that at McCullum's was closed on the 28th. Through these crevasses and general overflow of the banks of the Mississippi the whole valley of the river has been devastated to such an extent that it is estimated that the loss will be equivalent to one-sixth of the annual produce of the region in question. The highest and lowest water recorded at the Signal-Service stations are given in the accompanying table.

Height of rivers above low-water mark.

Stations.	Highest.			Lowest.		
	Date, April.	Height,		Date, April.	Height,	
		Ft.	*in.*		*Ft.*	*in.*
MISSOURI.						
Fort Sully	18	3	6	22	1	7
Yankton	20	11	4	1	5	10
Omaha	22	7	5	15	3	4
Plattsmouth	22	1	4	18	1	11*
Saint Joseph	24	6	3	18	2	1
Leavenworth	25	3	11	18	0	4
Kansas City	25	9	3	19	5	10
Lexington	25	7	0	18	3	8
Brunswick	26	6	1	16	1	4
Boonsville	27	8	9	15	5	7
Jefferson City	22	9	9	4	3	8
Hermann	23	10	8	16	5	8
MISSISSIPPI.						
Saint Paul	27	9	0	12	6	2
La Crosse	30	7	6	5	3	3
Le Claire	30	5	9	2	3	5
Dubuque	30	10	3	1	6	4
Davenport	30	7	0	18	4	5
Keokuk	1	7	8	19	5	5
Warsaw	30	6	8	19	5	8
Saint Louis	24	18	11	18	13	1
Cairo	27	47	4	7	33	4
Memphis	30	34	10	6	43	0
Helena	30	43	2	14	40	9
Vicksburg	30	45	8	6	43	0
New Orleans	15	0	7†	30	1	8‡
RED RIVER.						
Shreveport	30	30	3	15	25	5
CUMBERLAND.						
Nashville	16	49	2	1	12	2
OHIO.						
Pittsburgh	29	17	1	1	5	11
Marietta	30	25	7	3	7	5
Cincinnati	30	45	0	8	18	8
Louisville	30	19	2	2	8	6
Evansville	16	37	2	10	12	8
Paducah	26	46	10	7	27	3
ALLEGHENY.						
Freeport	21	8	2	3	1	8*
YOUGHIOGHENY.						
Confluence	29	7	10	2	1	10
MONONGAHELA.						
Morgantown	26	16	2	1	2	11
New Geneva	26	17	8	1	0	3
Brownsville	11	23	0	7	2	0

* Below low-water mark. † Above high-water mark. ‡ Below high-water mark.

ICE IN RIVERS, LAKES, ETC.

The ice is reported to have cleared away on the following dates, so as not to impede navigation at the places named:

On the 3d, at Gardiner, Me., the Kennebec River having been closed one hundred and thirty-four days at Augusta; on the 10th, at Saint Paul, Minn.; on the 14th, at Breckenridge, Minn.; on the 16th, at Bangor, Me; on the 18th, at Buffalo, N. Y.; on the 23d, at Pembina; on the 30th, at Escanaba; and on the 29th, at Rochester, the Erie Canal was opened.

TEMPERATURE OF WATER.

The maximum and minimum temperature of the water, in the rivers and harbors, is given in the small table on the Map No. III.

FROSTS.

The prevailing cloud and rain of the month have retarded the advance of vegetation to such an extent that the frosts that have been experienced, although severe on early vegetables, appear to have done less damage to fruits than might have been otherwise experienced. Frosts were reported from Texas, Alabama, and Virginia, on the 10th, and in Illinois and Nebraska on the 21st; the frosts most extensively felt, however, were those of the mornings of the 29th and 30th. On the former date it was experienced in Missouri, Illinois, Michigan, Ohio, Tennessee, Virginia, New Jersey, and possibly to a slight extent in Florida; on the 30th frost prevailed very generally over Alabama, Tennessee, and West Virginia, and the entire Atlantic States, from Northern Florida to New York.

BOTANICAL AND ZOOLOGICAL PHENOMENA.

1. *Vegetation.*—From observations too numerous to detail, it appears that on the last day of the month vegetation was very generally backward to the extent of fifteen or twenty days, in comparison with the average of former years, but had been developing very rapidly during the last two days in the south, and especially in the west. The frosts of the month appear in general to have injured only such a proportion of fruit, buds, or blossoms, as was beneficial rather than injurious to the remainder of the crop.

2. *Fisheries.*—Shad are reported to have first appeared in the Potomac on the 5th and in the Hudson on the 13th.

3. *The migration of Geese and Ducks.*—The migration northward of wild geese, which is looked upon by many as the sure harbinger of spring, was noted on the following dates:

On the 3d at Kingston, Mass.; 4th at Mount Desert, Me.; 10th, 11th, and 12th at Saint Paul; 15th near New York City; 19th at Saint Paul, Minn.; 22d at New Haven, and 29th at Welborn, Fla.

LOCAL STORMS.

Local storms, generally of the nature of tornadoes and hail-storms, have been reported on the 6th at Memphis and New Madrid; 14th at Cleveland; 15th at Shreveport; 20th at Erie, Pa.; 14th at Fort Gibson, Ind. T.; 7th at Norfolk, Va.; midnight of 14–15th at Nashville, Tenn.; 7th at Wilmington, N. C.; a terrible squall, of the violence of a hurricane, was reported from Halifax on the 10th.

PRAIRIE-FIRES.

Numerous prairie-fires were reported as seen on the 16th at Breckenridge; 19th at Saint Paul.

METEORS.

Remarkably bright meteors were noted on the 3d at Trenton, N. J.; 13th at Fort Gibson, Ind. T., and Morgantown, W. Va.; 16th at Troy, N. Y.; 18th at Wooster, Ohio; 21st at Augusta, Ga.

SOLAR AND LUNAR HALOS.

These have been remarkably frequent during the month. The only day on which a lunar halo has not been reported at some one of the three hundred stations was the 5th. The lunar halos most extensively observed were those of the 1st, observed from Nebraska to New York; the 4th, from Virginia to Michigan; the 10th, from New Jersey to Massachusetts; the 22d, from Georgia to New Jersey; the 23d, in North and South Carolina; the 24th, over Pennsylvania, New York, and New England; the 26th, in Kansas, Minnesota, Mississippi, and New York; the 27th, in Michigan, New York, and

Pennsylvania; the 28th, from Iowa to Maine; the 29th, from Minnesota to Georgia and to Maine.

Solar halos have been observed on about half the days of the month; of these, those especially notable were observed—on the 4th, in Illinois, Iowa, and Pennsylvania; on the 5th, in New York and New England; the 13th, from North Carolina to New York and Ohio; the 14th, in Maine, the Middle States, and Iowa; the 22d, in New Jersey, Delaware, Ohio, and Indian Territory; the 24th, in Delaware, Pennsylvania, Ohio, and Indian Territory; the 28th, in Maine, New York, Ohio, and Iowa.

ATMOSPHERIC ELECTRICITY.

1. *Thunder-storms.*—The records of April seem hardly full enough to warrant an attempt at a graphical representation of the distribution of thunder-storms. The following list gives, in general, the date of the occurrence of the first thunder-storm of the season and occasionally the date of an extremely severe storm: On the 4th, in Kansas; 5th in Indian Territory; 6th, in Tennessee and Missouri; 7th, in North Carolina, Virginia and New Jersey; 9th, in Virginia; 10th, in New Jersey; 14th, in Tennessee, Ohio, and Indian Territory; 15th, in Tennessee and Louisiana; 17th, in Florida; 20th, in Virginia, Ohio, Pennsylvania, and New York; 21st, in Virginia and Louisiana; 27th, in Texas; 28th, in Maryland.

2. *Telegraphic ground currents.*—The one station reporting the occurrence of the phenomena is Pembina, where it was observed during the 29th.

3. *Auroras.*—The most remarkable aurora that has been recorded during this month was that observed on the night of the 7th and morning of the 8th. Details of its observation have thus far been received from over fifty stations, covering the country from Iowa and Dakota on the west to New Jersey and Maine on the east; this aurora was also well observed at Fort Gibson, Ind. T. Auroras were also observed at numerous stations on the 1st, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 12th, 13th, 14th, 16th, 28th 29th.

EARTHQUAKES.

No notices of earthquakes have been reported by the signal-service or volunteer observers, except the reports of Professor Duprey and others relating to the disturbances at Bald Mountain, in North Carolina, which show that the phenomena in that region have continued and are of the nature of slight concussions, with no traces of volcanic action.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Brt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[8].

MONTHLY WEATHER REVIEW, MAY, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

I.—INTRODUCTORY.

This month has not been distinguished by any general storm of unusual severity, but numerous local thunder and hail storms have been reported. The presence in the southeastern quarter of the United States of several large areas of high barometer has apparently produced a considerable rain-fall on the immediate Atlantic coast, with a decided deficiency in the interior of the country.

II.—BAROMETRIC PRESSURE.

1. *In general.*—The average distribution of atmospheric pressure for the month of May is shown on the accompanying chart, from which it appears that the region of highest barometer includes the South Atlantic and Gulf States, while the areas of lowest pressure are respectively in the Missouri Valley and the Saint Lawrence Valley; the barometric pressure in Oregon is notably higher than in New England, a feature which accords with the general law that pressures average higher on the eastern than on the western borders of oceans.

2. *Areas of high barometer.*—Nine well-marked areas of high barometer have been traced during the month, five of which appear to have passed, without losing their identity, from the Pacific coast southeastward to the Atlantic.

3. *Areas of low barometer.*—Eight areas of low barometer, forming the centres of considerable atmospheric disturbances, have passed over the region covered by our stations, and their central tracks are shown on chart No. I. In general the paths of these storm-tracts lie considerably further north than do those of May, 1873; their courses being almost due eastward, while those of last year were more frequently northeastward.

No. I. The course of this depression is traced, in the review for April, backwards to the Pacific coast. It was, on the 1st of May, central in Nebraska, and quite steep barometric gradients extended from that region to the Upper Lakes and to the Gulf States. The storm-centre, which had been moving with extreme slowness during several preceding days, apparently moved southward to the western plains until, on the morning of the 3d, it was central in Eastern Kansas. A very extensive area of cold air and high barometer had meanwhile pressed southeastward over the Lake region to the Middle Atlantic coast, the presence of which evidently materially modified the subsequent movements of the storm-centre. The latter moved in consequence almost due eastward, passing over Tennessee and Kentucky on the 4th, on which date the barometer at the centre was fully three-tenths of an inch higher than it had been on the previous day; but on passing over the Blue Ridge the central depression again increased until it had passed over Cape Hatteras beyond our cognizance.

No. II. This depression is first indicated by reports from the extreme Northwest on the 6th, and on the 7th, while it was still in the Upper Missouri Valley, a very extensive area of high barometer developed over the Gulf and South Atlantic States. On the morning of the 8th a quite steep barometric gradient prevailed over the entire country from Texas and Michigan to Manitoba, and south or southwest gales prevailed from Colorado and Wyoming to Wisconsin and Illinois. The barometer continued to rise during the day throughout almost the entire Atlantic and Gulf coast States, while it fell rapidly over the entire country north of the Ohio and Missouri Rivers. This unusual state of things continued during the 9th and 10th, and on the morning of the 11th the barometric depression was still central in Minnesota and Dakota; during the subsequent day, however, it slowly moved eastward into Canada and was lost to further observation, having apparently been separated into at least two portions, one of which is No. III of the accompanying chart.

No. IV. This disturbance was first indicated by falling barometer and rain reported from Santa Fé on the 12th. The exact position of the area of greatest disturbance can scarcely be given until the morning of the 14th, at which time it was central in Kansas, whence it moved slowly eastward over Illinois on the 15th, Lake Erie on the 16th, and the Saint Lawrence Valley on the 17th. During the middle portion of its course the barometric gradients were very slight, but increased decidedly when the disturbance was in the Ohio Valley.

No. V. The area of high barometer, that on the 17th covered the Southern States, gave rise to warm southerly winds, that encountering an area of cold air that pressed southeastward over the Upper Lake region, initiated a precipitation that gave rise to the depression numbered V, which may be considered in some sort as a remnant of No. IV. This area of low barometer passed slowly eastward over New England, and turning northeastward over Maine on the 19th disappeared in the Gulf of Saint Lawrence; it was accompanied by numerous light rains in the Middle and Eastern States.

No. VI. This depression probably passed over the Rocky Mountains on the 17th, and followed immediately in the train of an area of high pressure. Rain was reported from Minnesota on the afternoon of the 18th, and the lowest pressure was central in the southern portion of that State on the morning of the 19th. Its course continued slowly southeastward over Lake Erie on the morning of the 20th, and thence over New York on the 21st and Maine on the 22d.

No. VII. An extensive area of high barometer separated the preceding storm-centre while it was in Maine from No. VII, which, on the morning of the 22d, was in Dakota and Manitoba. In twenty-four hours this depression moved somewhat to the northeast, and on the 24th it developed rapidly as it moved over the Upper Lakes. On the morning of the 25th the depression was central over Lake Huron, and rain prevailed throughout the Middle and Eastern States. During the day this disturbance moved eastward and northeastward, and was accompanied on its south and east sides by unusually numerous local thunder and hail storms, of which a special report is in preparation.

No. VIII. This disturbance probably originated on the plains west of the Mississippi, up which an easterly wind had, for several days, been blowing, in consequence of the high pressure then existing in the South Atlantic States. The greatest depression was on the morning of the 27th, in Dakota, on the afternoon of which date there were presented in that region, in a marked degree, a great contrast of cold north and hot south winds, the temperature ranging from 90 to 95 degrees from Lake Superior to Nebraska, with numerous local thunder-storms, while 57 degrees was reported from

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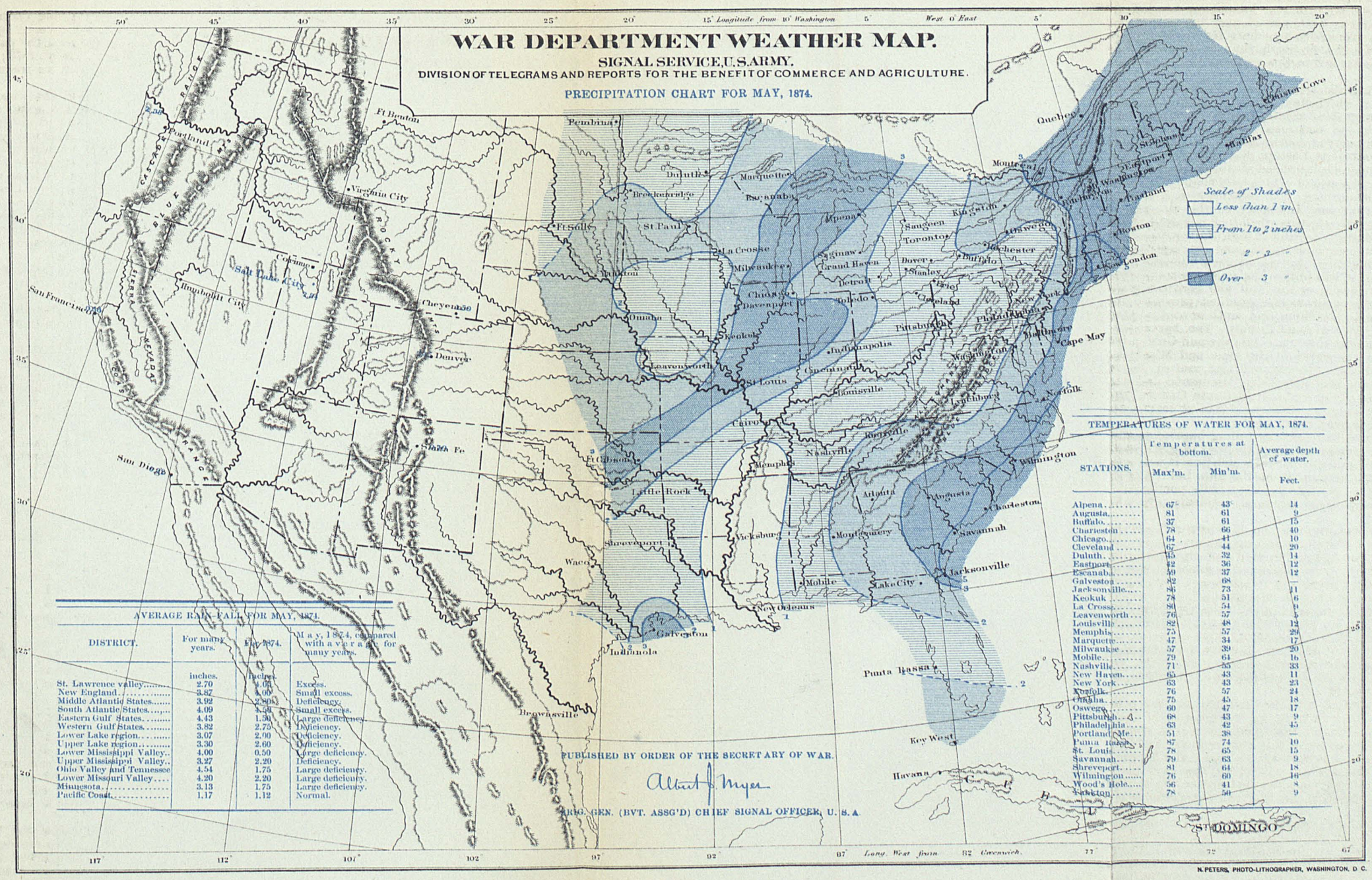
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR MAY, 1874.



AVERAGE RAIN-FALL FOR MAY, 1874.

DISTRICT.	For many years.	For 1874.	May, 1874, compared with average for many years.
	inches.	Inches.	
St. Lawrence valley	2.70	4.05	Excess.
New England	3.87	4.00	Small excess.
Middle Atlantic States	3.92	2.80	Deficiency.
South Atlantic States	4.09	4.50	Small excess.
Eastern Gulf States	4.43	1.90	Large deficiency.
Western Gulf States	3.82	2.75	Deficiency.
Lower Lake region	3.07	2.00	Deficiency.
Upper Lake region	3.30	2.60	Deficiency.
Lower Mississippi Valley	4.00	0.50	Large deficiency.
Upper Mississippi Valley	3.27	2.20	Deficiency.
Ohio Valley and Tennessee	4.54	1.75	Large deficiency.
Lower Missouri Valley	4.20	2.20	Large deficiency.
Minnesota	3.13	1.75	Large deficiency.
Pacific Coast	1.17	1.12	Normal.

TEMPERATURES OF WATER FOR MAY, 1874.

STATIONS.	Temperatures at bottom. Max'm.	Min'm.	Average depth of water. Feet.
Alpena	67°	43°	14
Augusta	81	61	9
Buffalo	37	61	15
Charleston	78	66	40
Chicago	64	41	10
Cleveland	67	44	20
Duluth	45	32	14
Eastport	42	36	12
Escanaba	50	37	12
Galveston	82	68	—
Jacksonville	86	73	11
Keokuk	78	51	6
La Crosse	80	54	9
Leavenworth	76	57	5
Louisville	82	48	12
Memphis	75	57	29
Marquette	47	34	17
Milwaukee	57	39	20
Mobile	79	64	16
Nashville	71	55	33
New Haven	65	43	11
New York	63	43	23
Norfolk	76	57	24
Omaha	75	45	18
Oswego	60	47	17
Pittsburgh	68	43	9
Philadelphia	63	42	45
Portland, Me.	51	38	—
Punta Rassa	87	74	10
St. Louis	78	65	15
Savannah	79	63	9
Shreveport	81	64	18
Wilmington	76	60	10
Wood's Hole	56	41	8
Yorktown	78	50	9

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Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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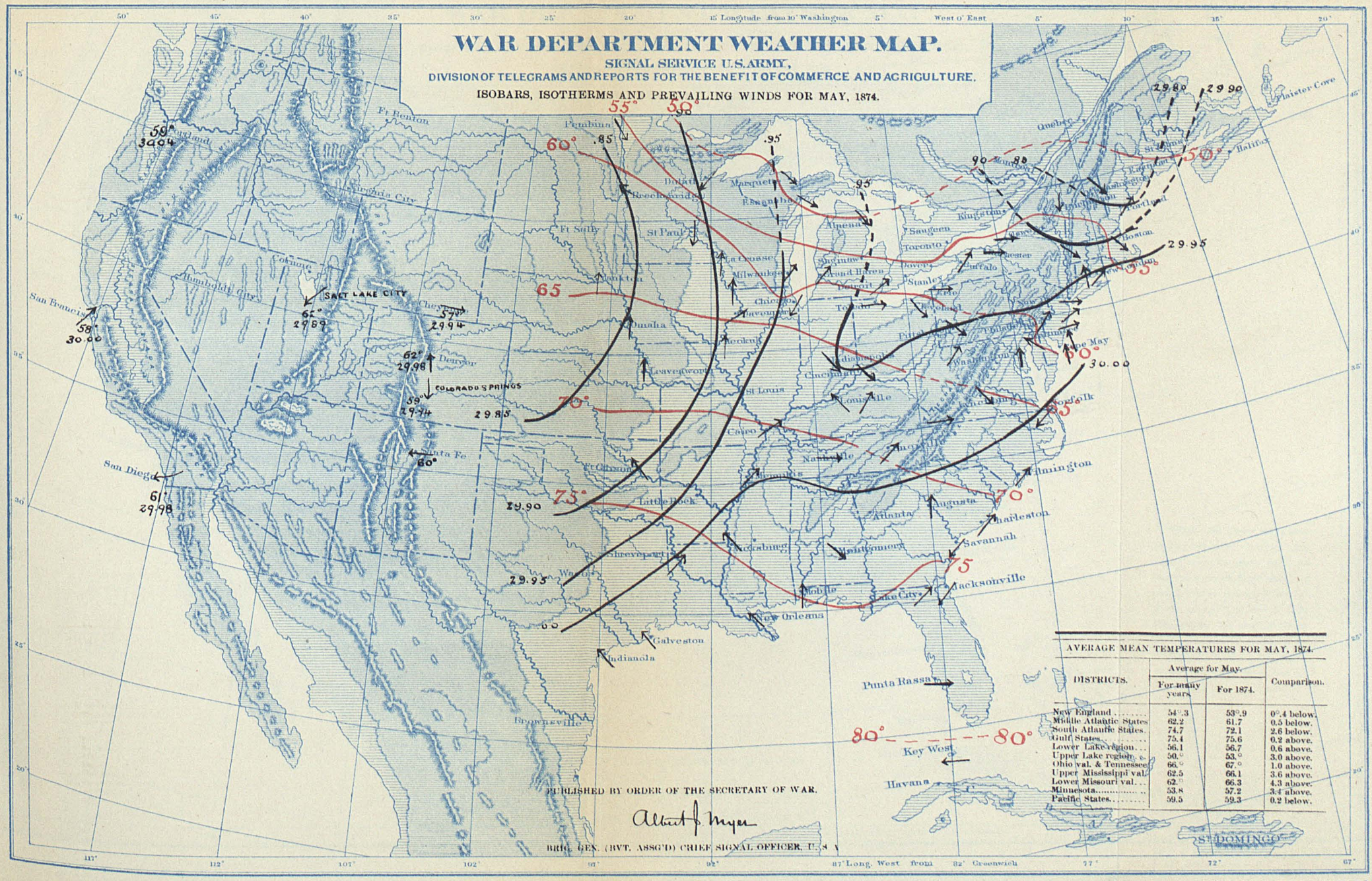
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR MAY, 1874.



AVERAGE MEAN TEMPERATURES FOR MAY, 1874.

DISTRICTS.	Average for May. For many years.	For 1874.	Comparison.
New England	54°.3	53°.9	0°.4 below.
Middle Atlantic States	62.2	61.7	0.5 below.
South Atlantic States	74.7	72.1	2.6 below.
Gulf States	75.4	75.6	0.2 above.
Lower Lake region	56.1	56.7	0.6 above.
Upper Lake region	50.°	53.°	3.0 above.
Ohio val. & Tennessee	66.°	67.°	1.0 above.
Upper Mississippi val.	62.5	66.1	3.6 above.
Lower Missouri val.	62.°	66.3	4.3 above.
Minnesota	53.8	57.2	3.4 above.
Pacific States	59.5	59.3	0.2 below.

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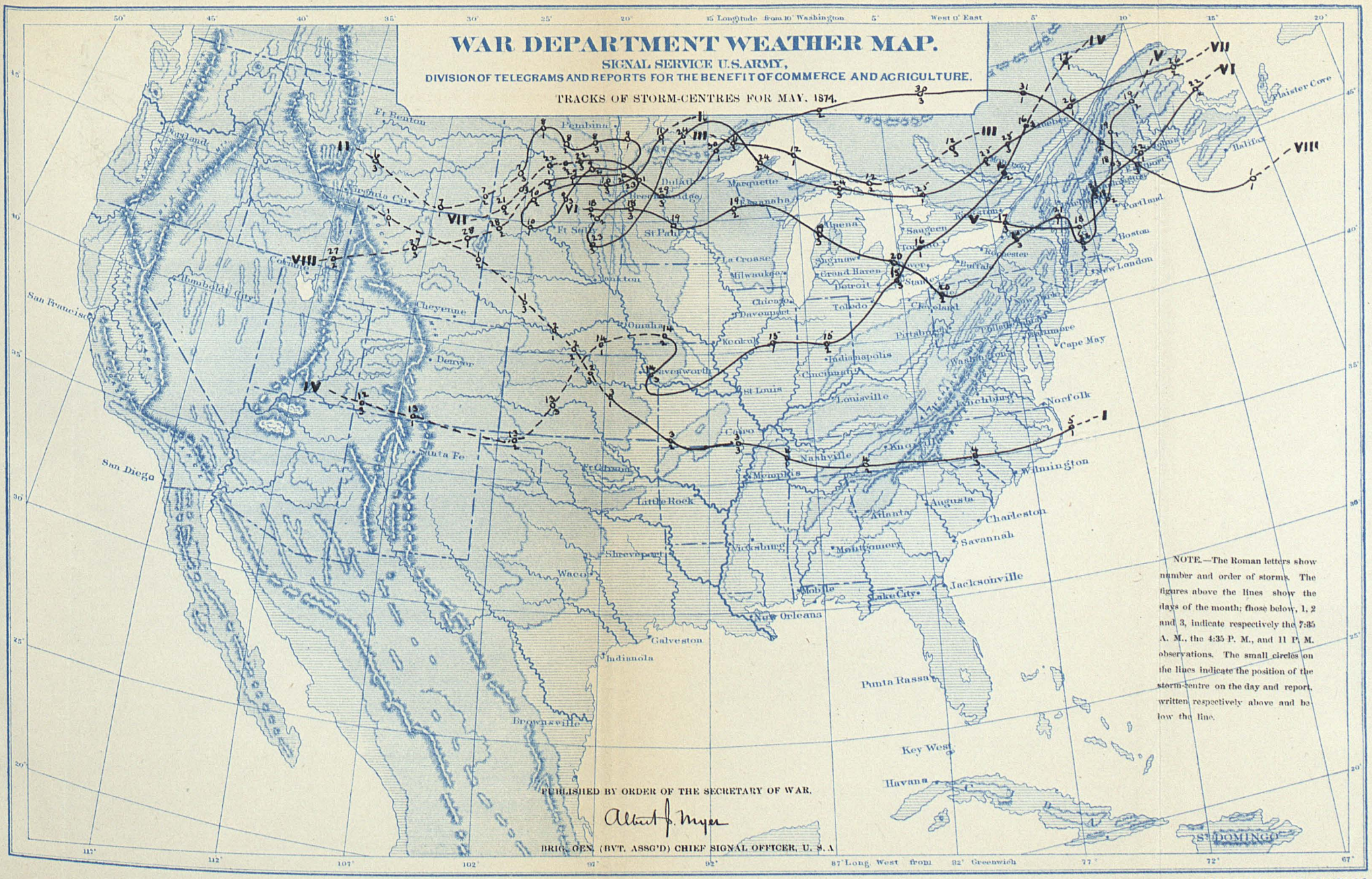
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF STORM-CENTRES FOR MAY, 1874.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.

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Pembina and Fort Garry. This conflict of north and south winds, with low barometer, continued for forty-eight hours, when an area of high barometer advanced southeastward toward Lake Superior, and on the 29th and 30th the original disturbance died away, and disappeared in Canada.

4. *Local storms.*—By the term local storm, will be included, in this section, every recorded case of thunder, lightning, or hail. The electrical phenomena attending these storms will be considered in a subsequent paragraph; but so far as these storms are connected with the areas of low barometer, their distribution will be apparent from the following table of local storm frequency:

Regions reporting 1, 2, or 3 local storms during the month, at the signal-service stations:

Ohio Valley.
Middle Atlantic coast.
New England.
New York
Upper Lake region.
Upper Mississippi Valley.

Regions reporting from 4 to 8 local storms during the month, at the signal-service stations:

South Atlantic States.
Blue Ridge.
Tennessee.
Gulf States.
Missouri Valley.
Colorado.
New Mexico.

The most remarkable series of thunder and hail storms is reported from Pike's Peak, where they have occurred on 12 different days, mostly during the last half of the month.

III.—ATMOSPHERIC TEMPERATURE.

1. *In general.*—The general distribution of the temperature is apparent from the accompanying chart of isothermal lines and the table of comparative temperatures. For the entire Atlantic States a slight deficiency is reported, but in the interior of the country a decided excess.

2. *Frosts.*—No remarkably severe frosts have been reported during the month, but slight frosts have been quite frequent in the Northwest, the Ohio Valley, the Lower Lake region, and New England. The most extensive frosts occurred on the 7th in North Carolina, Virginia, Pennsylvania, New York, and Ohio; on the 18th in Illinois, Iowa, Michigan, Wisconsin, Indiana, and Ohio; on the 19th in Ohio, Indiana, Virginia, North Carolina, New York, and Maine; on the 23d in Pennsylvania, Virginia, and New Jersey.

IV.—PRECIPITATION.

1. *In general.*—By the isohytal lines on the accompanying chart, it will be seen that the rain-fall during May has been distributed in a manner remarkably complementary to that of the preceding one, a great deficiency being reported from the Mississippi Valley and the entire northern and western sections, while a slight excess has prevailed in the South and East Atlantic States.

2. *Special droughts.*—The long succession of 26 rainless days in some portions of the South Atlantic States has given rise to some complaints from limited regions in North Carolina, notwithstanding the large quantity of rain that has fallen on the coast. In the Tennessee and Ohio Valleys, Iowa, Indiana, Illinois, and Minnesota, the month has been remarkably dry.

3. *Cloudy days.*—The number of days entirely cloudy, as reported from the signal-stations, averages as follows:

5 on the Gulf coast.
7 on the South Atlantic coast.
8 on the Middle Atlantic coast.
12 on the East Atlantic coast.
5 in the Lower Mississippi Valley.
5 in the Ohio Valley.
5 in the Upper Mississippi Valley.
8 in the Lower Missouri Valley.
7 in the Lake region.

4. *Rainy days.*—The number of days in which rain fell, as reported from the signal-service stations only, is as follows:

3 on the Gulf coast.
10 on the South Atlantic coast.
8 on the Middle Atlantic coast.
8 in the Upper Mississippi Valley.
10 in the Lake region.
6 on the East Atlantic coast.
3 in the Lower Mississippi Valley.
7 in the Ohio Valley.
9 in the Lower Missouri Valley.
8 over the Blue Ridge and Alleghanies.

5. *Special rains.*—Remarkably heavy rain-falls occurred—

On the 27th at Galveston.
On the 11th at Clarksville, Tex.
On the 25th at Brookhaven, Miss.
On the 25th at Sugar Island, Mich.
On the 20th at Brownsville, Penn.

Severe hail-storms appear to have been unusually frequent. The most instructive report on the subject comes from the summit of Pike's Peak, where, on the 14th, large balls of hail fell, composed of soft, white snow, without any nucleus. Remarkably large hail is reported from Pennsylvania on the 20th, and from Mississippi on the 25th.

V.—HUMIDITY.

In the following table a synoptical view is given of the average per cent. of relative humidity for the several sections of the country:

For the Texas coast, 72; for the New Jersey coast, 74; for the South Atlantic coast, 68; for the interior of the Middle Atlantic States, 62; for the New England coast, 65; for the southern shores of the Lower Lake region, 62; for the Upper Lake region, 65; for the Lower Mississippi Valley, 60; for the Ohio and Tennessee Valleys, 56; for the Upper Mississippi Valley, 56; for the Lower Missouri Valley, 56; for the extreme Northwest, 62; for Cheyenne and Denver, 42: for Salt Lake City and Colorado Springs, 40; for Santa Fé, 23; for summit of Pike's Peak,* 69; for summit of Mount Washington,* 86.

Reports from the interior of Virginia, from Wisconsin, Iowa, and Indiana, state that in its relation to agriculture the month has been very dry and hot, but that cool nights and heavy dews have prevailed.

VI.—THE WINDS.

1. *In general.*—The winds most frequently observed are shown by the arrows on the accompanying chart, from which it is evident that southeasterly winds predominated on the Gulf and South Atlantic coasts, but southerly winds in the valley of the Mississippi River and its tributaries. Westerly winds have predominated in New England, and west to northwest winds over the Lake region. Northwest winds have prevailed at the summits of Mount Washington and Pike's Peak.

2. *Strong winds.*—The maxima of hourly velocity of winds recorded at each signal-station, without regard to the direction or the time of day, are as follows: Mount Washington, 88 miles; Pike's Peak, 60 miles; Saint Paul, 50 miles; Keokuk, Omaha, Denver, Indianola, and New York, 48 miles; Breckenridge, Duluth, Fort Sully, Santa Fé, Philadelphia, Toledo, Squan Beach, and Long Branch, 45 miles.

In general the maximum hourly velocity has been least throughout the Atlantic and Gulf States, and greatest in the Northwest, where numerous violent local wind-storms have occurred.

The dates on which strong winds were most generally observed were—May 1st, in the Western Territories and Northwest; May 8th, in the Western Territories and Northwest; May 29, in the Western Territories and Northwest; May 25, in the Lake region, Middle and Eastern States; May 11, on the Middle Atlantic coast.

VII.—VERIFICATION OF PREDICTIONS.

1. *Probabilities.*—The critical comparison between the separate items of the published tri-daily probabilities and the subsequent weather-reports shows that on the average, during the month, 84½ per cent. of the predictions have been well verified.

VIII.—RIVERS AND NAVIGATION.

1. *Opening of harbors, &c.*—The last traces of ice in harbors and lakes are reported at Traverse City, Michigan, on the 3d; at Mount Desert, Maine, on the 6th; at Buffalo and Duluth, on the 9th. The Erie Canal was opened on the 5th. An unusually high tide is reported at Indianola, Texas, on the 29th. Navigation is reported as beginning at Duluth on the 4th, and at Traverse City on the 7th.

2. *Heights of rivers.*—The general condition of the rivers will be found from the accompanying table, which gives the dates of the maximum and minimum heights of water:

* These figures have not been corrected for the altitude of these stations, which respectively are 14,216 and 6,285.

Height of rivers above low-water mark.

Stations.	Highest.		Lowest.	
	Date, May.	Height.	Date, May.	Height.
		Ft. in.		*Ft. in.*
MISSOURI.				
Yankton	19	12 4	13	8 11
Omaha	22	7 1	13	4 4
Plattsmouth	23	2 0	13	1 2†
Saint Joseph	24	6 4	8–9, 15–17	3 3
Leavenworth	25	3 9	9	1 4
Kansas City	25	9 1	8–15	6 7
Lexington	26	6 4	22	3 4
Brunswick	27	4 9	21–22	1 9
Boonville	5	8 6	23	4 9
Jefferson City	5	8 6	23	5 0
Hermann	5	7 10	23	4 10
MISSISSIPPI.				
Saint Paul	1	8 9	22	6 0
La Crosse	10	8 5	31	5 3
Eau Claire	15–16	6 6	28	5 2
Dubuque	13–17	11 5	31	8 7
Davenport	16–17	8 2	31	6 0
Keokuk	19	8 3	31	6 6
Warsaw	17–20	8 11	31	7 1
Saint Louis	7	17 5	28	13 5
Cairo	1	45 8	30–31	14 8
Memphis	1–4	34 10	31	14 0
Helena	11	45 10	30	26 8
Vicksburg	1–5	45 8	31	43 1
New Orleans	2	1 6*	26–31	2 7*
RED RIVER.				
Shreveport	1	30 3	21–22	23 2
CUMBERLAND.				
Nashville	1	34 2	31	3 6
OHIO.				
Pittsburgh	1	13 2	31	4 0
Marietta	1	25 7	28	4 10
Cincinnati	1	46 0	31	9 1
Louisville	3	22 9	31	4 8
Evansville	5	38 7	31	5 7
Paducah	1	44 10	30	8 6
ALLEGHENY.				
Freeport	1	5 5	25	1 5†
YOUGHIOGHENY.				
Confluence	1	5 5	31	0 1†
MONONGAHELA.				
Morgantown	1	7 2	29–31	0 10
New Geneva	1	8 4	29	2 5†
Brownsville	1	10 6	28–29	1 2†

* Below high-water mark. † Below bench-mark.

3 *Special river-floods.*—The river-flood of most importance during this month has been that which devastated the valleys of the Lower Mississippi, Arkansas, White, Red, and other rivers. The crevasses on the Mississippi may be classified as follows: Between Memphis and the Louisiana State-line were four large crevasses and several smaller ones, opening into the States of Mississippi, Arkansas, and Tennessee. South of the Louisiana State-line, and almost exclusively opening into that State, were fourteen large and nine small crevasses. The total length of breaks in levees exceeds twelve miles. The total extent of bottom-lands overflowed exceeds 25,000 square miles. The overflowed land in Louisiana was confined to a region 20 to 50 miles broad, immediately adjoining the western bank of the river, and spreading out over at least one-half of the delta, properly so called; the entire length of the inundated region, in a north and south direction, being nearly 400 miles.

IX.—WATER TEMPERATURES.

The extremes of the temperature of the water, as observed at the signal-service stations, are given in the table on the accompanying Chart No. III.

X.—ELECTRICAL PHENOMENA.

1. *Lightning.*—The general distribution of atmospheric electricity, so far as it accompanies local thunder-storms, has been given in a previous section. The relation of the phenomena of lightning and thunder-storms in general to the general areas of low pressure may be seen from the following statement:

The area of low pressure, No. VII, central on the morning of the 25th, near Lake Huron, had moved by the morning of the 26th to a position near Quebec, the central barometric pressure having diminished decidedly during the 25th. Local thunder-storms are reported on the afternoon of the 25th from nearly every station in the Gulf States, Tennessee, Virginia, the Middle Atlantic coast, Southern New England, and Lake Ontario.

On the 24th, area No. VII passed over the Upper Lake region. On the afternoon of that day thunder-storms were reported from nearly every station in New Mexico, Colorado, Northern Texas, the Upper Mississippi Valley, the Upper Lake region, and Lake Erie.

On the 20th, area No. VI passed over the Lower Lake region, and on the same day thunder-storms were reported from numerous stations between the Blue Ridge and Middle Atlantic coast.

On the 21st, low barometer, No. VI, passed over New England, and numerous storms were reported from the Eastern Gulf and South Atlantic States, and southern portions of New England and the Middle States.

Of special electrical phenomena, the record of the station on the summit of Pike's Peak affords remarkable instances. Those noted at that place on the 24th are among the most instructive and interesting on record. The summit of the mountain was evidently highly charged, and discharges were continually given off from every prominent point into the atmosphere and to the adjacent clouds, the only position of safety being within the stone hut occupied by the observers.

2. *Auroras.*—An unusually large number of auroras has been reported during the month, but those that have been seen were extremely faint and insignificant. They were observed on the following dates: 1st, 3d, 4th, 5th, 11th, 12th, 13th, 14th, 15th, 17th, 18th, 20th, 21st, 24th, 26th, 27th.

3. *Ground-currents.*—The phenomenon of ground-currents on telegraphic wires, common as it is on the lines running up Mount Washington and Pike's Peak, was especially noticed at the latter station on the 20th and 24th.

XI.—OPTICAL PHENOMENA.

Solar and lunar halos have been very frequently reported, but appear not to have possessed such interesting characteristics as those of April.

The lunar halo of the 22d was very generally visible throughout the Northwest, the Lake region, and the Ohio and Tennessee Valleys. A solar halo was recorded on the 23d at numerous stations in the Middle Atlantic States and in New York, and a lunar halo on the evening of the same day in the Middle and Eastern States.

XII.—MISCELLANEOUS.

1. *Botanical phenomena.*—Among the earlier phenomena of spring vegetation we note the budding of forest-trees at Colorado Springs on the 16th, the blooming of cherry-trees at Rochester on the 12th. For Lunenburgh, Massachusetts, a table has been furnished by the volunteer observer, giving the date of blooming of apple-trees for 77 years past; the earliest recorded date is the 9th of May; the mean date is the 21st of May; the latest the 3d of June. The date for the current year is the 29th of May.

2. *Zoological phenomena.*—The early appearance of insects injurious to vegetation is very generally noted, among which may be mentioned, in West Virginia and Kentucky, the so-called Colorado potato-bug. In Western New York, myriads of small flies.

3. *Prairie and forest fires.*—These have been reported from the vicinity of Alpena, Breckenridge, Buffalo, Denver, Duluth, Keokuk, Pike's Peak, Rochester, and Vicksburg.

4. *Meteors.*—Unusually bright meteors have been reported on the following dates: The 8th, 10th, 14th, 16th, 17th, 18th, 19th, 20th, 21st, and 25th.

5. *Polar bands.*—This peculiar arrangement of cirrus clouds was noticed on the 1st at Omaha; on the 2d, at Key West, Toledo, and Sandy Hook; on the 3d, at Atlantic City; on the 7th and 20th, at Key West; on the 22d, at Keokuk; on the 27th, at Atlantic City, and on the 29th, at Savannah.

6. *Earthquakes.*—The only earthquake phenomena that has been reported consist in occasional and spasmodic repetitions of the shocks that were so frequently observed in the western portion of North Carolina in March.

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ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[a].

MONTHLY WEATHER REVIEW, JUNE, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND GRICULTURE.

I.—INTRODUCTORY.

The month of June has been distinguished by a decided excess of temperature, which has been especially marked in the central and western portions of the country, and by a decided excess of rain in the extreme northwest and northeast. The crop reports indicate on the average favorable returns, although the local exceptions to this general statement are quite remarkable, and the destruction by insects has, in some sections, particularly Southern Minnesota, been quite complete. No severe general storms have been experienced within the United States, but their occurrence has been replaced as usual during June by numerous and severe thunder and lightning and hail storms.

II.—BAROMETRIC PRESSURE.

1. *In general.*—The general distribution of barometric pressure during the month will be apparent from the accompanying map, No. 2, from which will be seen that on the average the pressure has been highest on the Gulf and South Atlantic coasts, diminishing gradually as we proceed northward to the Saint Lawrence Valley and northwestward to Dakota. On the Pacific coast the barometer has as usual stood higher than on the Atlantic coast in similar latitudes; it has averaged 0.17 inch higher at Portland, Oreg., than at San Diego. The barometric range during the month has been greatest in the northern portion of the Upper Lake region and somewhat less in Minnesota, Dakota, and New England; it has been least in Southern Florida and Texas, and on the California coast; the range in Colorado and Wyoming Territories has been about the same as in the Lower Mississippi Valley.

2. *Areas of high barometer.*—The principal areas of high barometer have been:

No. I. That which on the 3d and 4th of the month existed off the coast of the Middle and Eastern States, producing south and east winds, with cloudy weather and rain.

No. II. Present in the Gulf States on the 9th.

No. III. Advanced from Upper Canada on the 10th southeastward over New England on the 11th.

No. IV. Passed over the Rocky Mountains on the 10th, having been central in Oregon on the 9th. Its influence was felt southward as far as Texas, while the central area passed eastward over the Lower Missouri and Ohio Valleys, reaching the Middle Atlantic coast on the 14th, and continuing to produce easterly winds, with increasing cloudiness, on that coast on the 15th.

No. V. Was present over the South Atlantic and Eastern Gulf States from the 23d to the 26th.

3. *Areas of low barometer.*—The tracks pursued by the areas of low barometer are shown upon the accompanying map, No. 1, from which it will be seen that these have been confined to the northern portion of the country, the average latitude of the whole being somewhat more northerly than the similar average for June, 1873.

No. I. This depression passed from Nebraska on the 2d of the month into Iowa on the 3d, after which it ceased to be traceable as a definite disturbance, although rainy and cloudy weather were very generally reported over New England.

No. II. Passed from Dakota on the 3d into Canada, and was last recorded north of Lake Superior on the 4th.

No. III. Passed from Nebraska on the 6th eastward over the Lake region and New England, being central in the latter region on the 8th.

No. IV. Passed from Nebraska on the 7th, northeast and eastward over the Lake region and New England, being central in the latter region on the 9th.

No. V. Passed from Nebraska on the 10th, northeastward over the Upper Lake region, Canada, and the Saint Lawrence Valley, reaching the Gulf of Saint Lawrence on the 13th.

No. VI. Passed from Kansas on the 14th, northeastward over the Upper Lake region, and thence slowly east and southeastward over Canada and New England, reaching a point south of Halifax on the 18th. The barometric gradients observed in the latter part of the course of this storm-centre were, with one exception, the steepest recorded during the month, although barely amounting to a tenth of an inch for a hundred miles.

No. VII. This storm passed somewhat suddenly from an unknown point one hundred and fifty miles north of Quebec, southeastward over Nova Scotia on the 23d.

No. VIII. Passed from Wyoming Territory on the 23d, eastward over the Upper Lakes, and was lost in Canada on the 25th.

No. IX. Passed from Nebraska on the 27th, northeastward over Lake Superior and thence to the Saint Lawrence Valley, reaching the Gulf of Saint Lawrence on the 30th. This was a very well marked storm-centre. Its barometric gradients on the western

side were, on the 28th, three-tenths of an inch to a hundred miles, with corresponding high north and west winds. During its passage eastward over Canada on the 29th, the Middle and Eastern States were visited by numerous local storms, of which some were unusually severe.

4. *Local storms.*—The number of local storms has been apparently greater than usual in the northeastern and northwestern portions of the country, and has been fully up to the average in other sections. Approximately it is estimated that at least five hundred and fifty such storms have been recorded, most of which have been seen at more than two stations. Of those that were especially remarkable, whether in relation to wind, hail, rain, or lightning, those may be noted that occurred on the following dates: On the 4th, in Colorado, Missouri, Illinois; 5th, Ohio, Michigan; 6th, Illinois, New York, Massachusetts; 7th, Nebraska, Wisconsin, Illinois, Canada, New York, Michigan, and Massachusetts; 8th, Nebraska, Iowa, Illinois, Wisconsin, Maryland, Rhode Island, Massachusetts, Canada, Cape Breton; 9th, Nebraska, Indian Territory, Pennsylvania, New York, New Jersey, Long Island, Massachusetts; 10th, Indiana, South Carolina, Virginia; 11th, Indiana and Kingston, West Indies; 13th, Louisiana; 14th, Missouri, Nebraska; 15th, Minnesota; 17th, Massachusetts; 20th, Tennessee; 21st, Havana, West Indies; 23d, Texas; 24th, Texas, Wisconsin, Virginia; 25th, Texas, Indiana, Michigan, Ohio, Canada, Pennsylvania, Virginia; 26th, Minnesota, Wisconsin; 28th, Missouri, Indiana, Ohio; 29th, Indiana, Ohio, Pennsylvania, New York, New Hampshire.

In this series of storms the most remarkable dates are those of the 7th, 8th, 9th, 25th, and 29th, on all of which days the local storms were especially prevalent over regions covered by masses of air flowing north and northeastward toward the general barometric depressions then existing in the northern sections of the country. The observer on the summit of Pike's Peak states that the local storms there experienced come from the northwest, west, or southwest, and evidently originate over the central portions of the "parks" on the hot afternoons. One such storm approached his station under conditions very favorable for observation, and he noted that while the cloud-bearing currents of air flowed toward the rotating centre from all directions they had also a decided downward movement, but through the interior funnel masses of smoke-like vapor rapidly ascended. The local storms observed at Pike's Peak belong possibly to the same class with those observed in the Gulf States and the West Indies, and which apparently originate often in the overheating of limited portions of land, rather than in the influence of the wind attending areas of low pressure. The average number of this class of storms, as observed at any one station, has been: In the Western Gulf States, 6; in the Central and Eastern Gulf, Florida and Key West, 15.

III.—ATMOSPHERIC TEMPERATURE.

1. *In general.*—The general distribution of temperature during the month is shown by the isotherms on the accompanying map No. II, on which map, as also on map No. III, the Canadian observations have been carefully combined with those of the United States. From the table of comparative temperatures, it will appear that the month throughout the whole country has been warmer than usual. The range of temperature has been least on the Texas coast and in Southern Florida, where it has amounted to about 20 degrees. It has averaged about 30 degrees from Cape May to Wood's Hole. The greatest range has been reported from Colorado and Minnesota, where it has amounted to 50 and 60 degrees. The average temperature on the summit of Mount Washington has been 42.9, or 25° below that of stations near the sea-level.

The remarkable contrasts of temperature that are noticed in the winter months on the border of regions over which northerly and southerly winds respectively prevail, are represented during this month by only a single instance—that of the afternoon of the 26th of June—on which occasion a slight barometric depression appears to have been central in Northeastern Pennsylvania. South and west winds were at the time prevailing, with a temperature of 90 or more over the South Atlantic and Eastern Gulf States, as also over a portion of West Virginia and Maryland. Southeasterly winds, with a temperature of 68 to 76, prevailed in the southern part of New England, and northerly winds, with a temperature of 56 to 60, prevailed in Central New York.

2. *Frosts.*—Slight frosts have been very generally reported on the following dates: 1st, Michigan; 2d, New York, Ohio, Pennsylvania, and Vermont; 10th, Iowa; 11th, Iowa; 12th, Michigan and Nebraska; 13th, Ohio; 14th, Pennsylvania and Vermont; 15th, Maryland; 16th, Maryland; 24th, Vermont; 25th, Vermont; 27th, Vermont.

IV.—PRECIPITATION.

1. *In general.*—The general distribution of rain-fall for the month will be apparent from the accompanying Map No. III, from which it will be seen that a remarkable excess has been experienced in Minnesota and the adjacent country, as also in Nova Scotia and New Brunswick. The unequal distribution of the rain-fall, owing to the peculiar local nature of the storms of June, gives rise to the existence of innumerable small regions of from 10 to 100 miles in diameter, over which little or no rain has fallen in comparison with that experienced in the country immediately adjoining. Besides these smaller areas, larger ones have existed, as shown on the map, in Eastern

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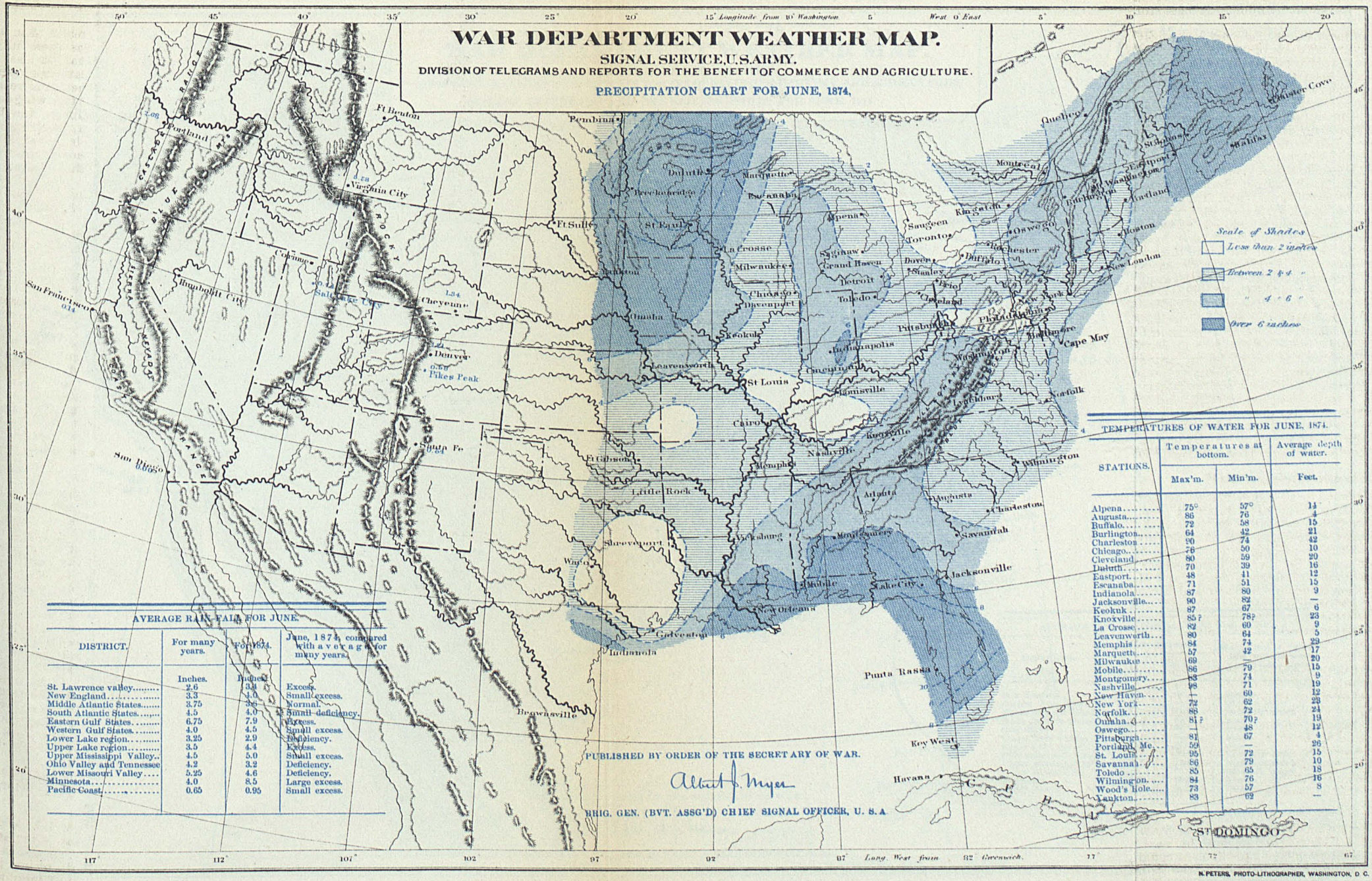
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR JUNE, 1874.



AVERAGE RAINFALL FOR JUNE.

DISTRICT.	For many years.	For 1874.	June, 1874, compared with average for many years.
	Inches.	Inches.	
St. Lawrence valley	2.6	3.4	Excess.
New England	3.3	4.0	Small excess.
Middle Atlantic States	3.75	3.6	Normal.
South Atlantic States	4.5	4.0	Small deficiency.
Eastern Gulf States	6.75	7.9	Excess.
Western Gulf States	4.0	4.5	Small excess.
Lower Lake region	3.25	2.9	Deficiency.
Upper Lake region	3.5	4.4	Excess.
Upper Mississippi Valley	4.5	5.0	Small excess.
Ohio Valley and Tennessee	4.2	3.2	Deficiency.
Lower Missouri Valley	5.25	4.6	Deficiency.
Minnesota	4.0	8.5	Large excess.
Pacific Coast	0.65	0.95	Small excess.

TEMPERATURES OF WATER FOR JUNE, 1874.

STATIONS.	Temperatures at bottom.		Average depth of water.
	Max'm.	Min'm.	Feet.
Alpena	75°	57°	14
Augusta	86	76	4
Buffalo	72	58	15
Burlington	64	42	21
Charleston	90	74	42
Chicago	76	50	10
Cleveland	80	59	20
Duluth	70	39	16
Eastport	48	41	12
Escanaba	71	51	15
Indianola	87	80	9
Jacksonville	90	82	—
Keokuk	87	67	6
Knoxville	85?	78?	23
La Crosse	82	60	9
Leavenworth	80	64	5
Memphis	84	74	29
Marquette	57	42	17
Milwaukee	69	—	20
Mobile	86	79	15
Montgomery	83	74	9
Nashville	98	71	19
New Haven	—	60	12
New York	72	62	23
Norfolk	88	72	24
Omaha	81?	70?	19
Oswego	—	48	12
Pittsburgh	81	67	4
Portland, Me.	59	—	26
St. Louis	95	72	15
Savannah	86	79	10
Toledo	85	65	18
Wilmington	84	76	16
Wood's Hole	73	57	8
Yankton	83	62	—

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Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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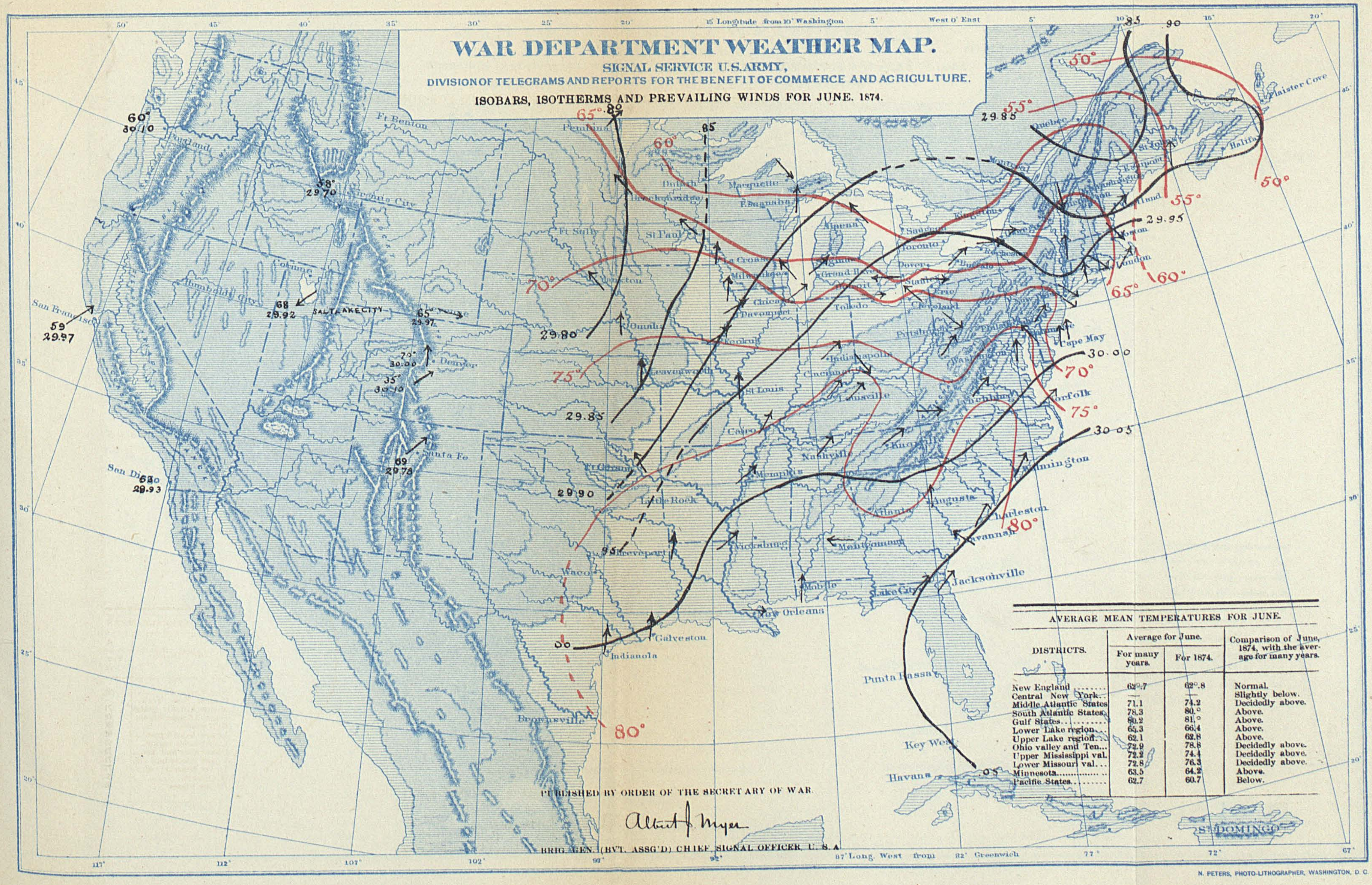

WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR JUNE. 1874.

AVERAGE MEAN TEMPERATURES FOR JUNE.

DISTRICTS.	Average for June. For many years.	Average for June. For 1874.	Comparison of June, 1874, with the average for many years.
New England	62°.7	62°.8	Normal.
Central New York..	—	—	Slightly below.
Middle Atlantic States	71.1	74.2	Decidedly above.
South Atlantic States	78.3	80.°	Above.
Gulf States...........	80.2	81.°	Above.
Lower Lake region...	65.3	66.4	Above.
Upper Lake region...	62.1	62.8	Above.
Ohio valley and Ten...	72.9	78.8	Decidedly above.
Upper Mississippi val.	72.2	74.4	Decidedly above.
Lower Missouri val...	72.8	76.3	Decidedly above.
Minnesota..............	63.5	64.2	Above.
Pacific States.........	62.7	60.7	Below.

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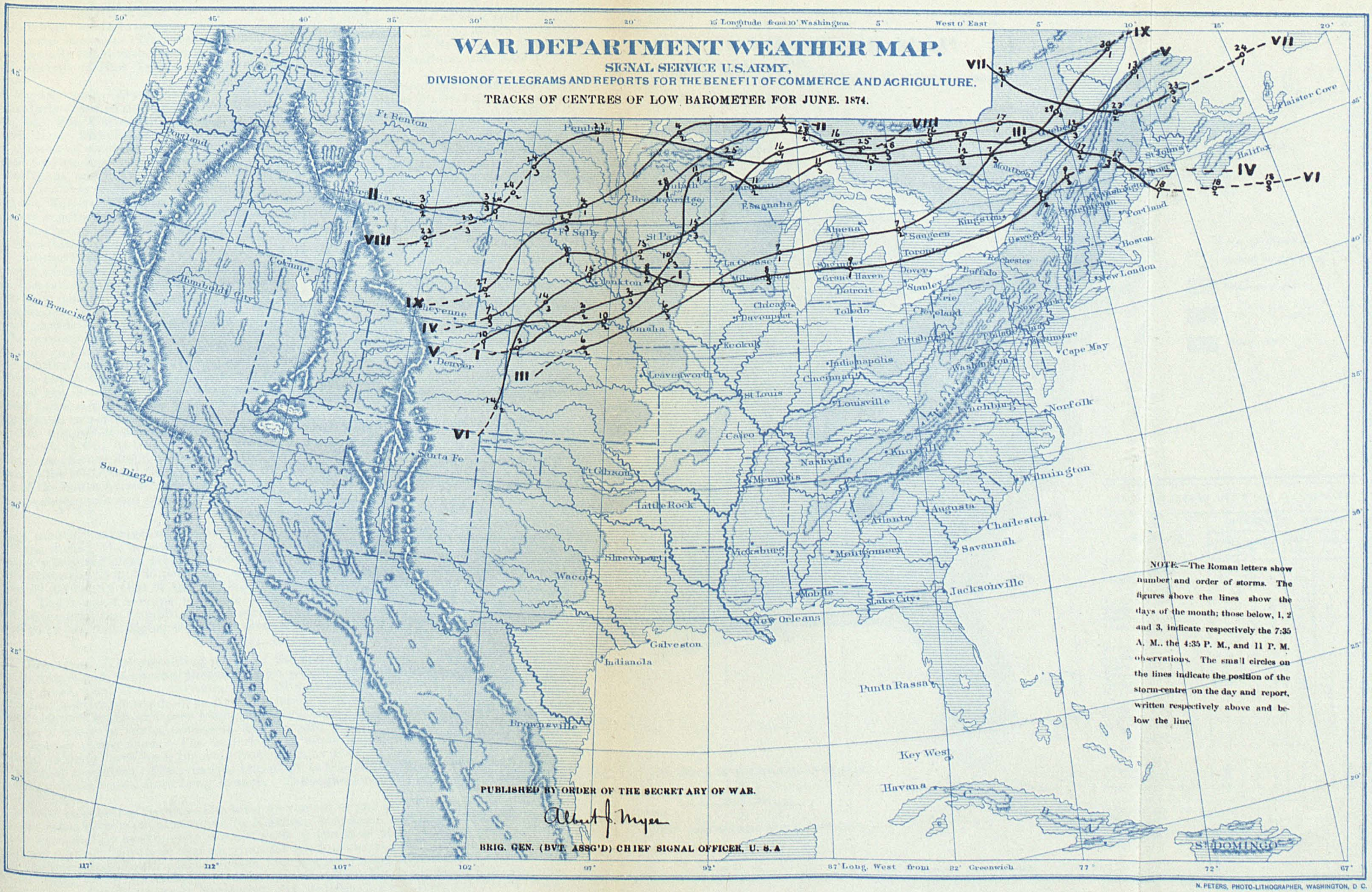
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF CENTRES OF LOW BAROMETER FOR JUNE. 1874.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.

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N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

Texas, Southwestern Missouri, the Lower Ohio Valley, the Middle States, Upper Canada, and the Lower Saint Lawrence Valley, in all of which less than two inches of rain have fallen. The rain-fall in Minnesota and Nebraska is generally remarked upon as the heaviest ever known to have occurred. That on the summit of Mount Washington (13.44 inches) exhibits as usual the great fluctuations of the climate of that spot.

2. *Special droughts.*—The local droughts that have occurred during the month have been specially commented upon as threatening the future harvest in New Jersey, some small sections of New York and Virginia, Southern Ohio and Indiana, and Eastern Texas.

3. *Special rains.*—Among the rain-falls remarkable for their quantity that have been particularly reported during the month, have been the following: on the 8th, at Sandwich, Ill.; 9th, Plattsmouth, Nebr.; 14th, Fort Gibson, Indian Territory, and Plattsmouth, Neb.; 24th, Indianola, Tex.

4. *Number of cloudy days.*—The number of days wholly cloudy, as reported from the Signal-Service stations, was least in the eastern portion of North Carolina, in the interior of Texas, and in Colorado, New Mexico, and Kansas, from all of which sections but one day entirely cloudy has been reported. Less than five cloudy days are reported from the Western Gulf coast, the Ohio and Lower Mississippi Valleys. From five to ten days are reported from the Middle Atlantic States and Iowa. From ten to fifteen cloudy days, and occasionally more, are reported from New England, Lakes Ontario, Huron, and Superior, and in Minnesota.

5. *Number of rainy days.*—The number of days on which some, even the slightest amount, of rain fell, at a given station, will, if combined with the quantity of rain that has fallen, give a general indication of the character of the individual rain-storms as to their gentleness or severity. Thus, over those portions of the country that have experienced more than six inches of rain, the average number of rainy days has been—on the Gulf coast, 10; in the Northwest, 18.

The average number of rainy days in districts over which the rain-fall has been from two to four inches, has been—in the Southwest, 6; on the Atlantic coast, 10; in the Middle Atlantic States, 11; and on the Middle Atlantic coast, 9.

From two to five light local showers have generally been reported from those sections of the country in which less than two inches of rain has fallen, except in the Lower Lake region, where from nine to twelve showers and sprinkles have brought only one or two inches of rain.

If the number of rainy or cloudy days is compared with the map of storm-tracks for the month, it will be found that in general the region of greatest rain or cloud frequency on the one hand accompanies the belt of storm-tracks lying, of course, somewhat to the southward thereof; and, on the other hand, these regions cover that portion of the South Atlantic and Eastern Gulf coasts over which masses of moist air have been pushed north and west up over the high land in the interior.

V.—RELATIVE HUMIDITY.

The monthly averages of relative humidity show a very uniform distribution of this element during the month. The lowest average is as usual found on the western plains, where the mean for the month, after correction for the altitude of the stations, varies between 25 and 45 per cent. The average humidity for the Ohio Valley is from 55 to 60 per cent.; that of the South Atlantic coast and Upper Lake region is 75 per cent. The highest average is 88 per cent. on Mount Washington and at Cape May, and, in general, the humidity at the stations on the immediate Middle Atlantic coast is 10 to 15 per cent. higher than at stations a hundred miles in the interior.

VI.—WINDS.

1. *In general.*—The prevailing winds of the month are shown by the arrows on map No. 2, from which it appears that southwest winds have prevailed in the Central New Jersey coast, Central Pennsylvania, Ohio, Illinois and southward to the Gulf; northwest and southwest winds over New England; west and east winds over the Lower Lake region; south and east winds over the Upper Lakes and the Northwest, and southerly winds in Texas, Louisiana, and Kansas.

2. *Special strong winds.*—The majority of winds above thirty-five or forty miles hourly velocity have been reported from stations north of the 35th parallel and west of the 85th meridian. The principal exception to this statement has been the velocity of fifty miles reported from Long Branch. The highest velocity on Mount Washington was 108 miles.

3. *Total movement of the air.*—The total movement of the air irrespective of direction has as usual been least at stations in Northern Louisiana and in the Atlantic States lying immediately among or to the eastward of the Blue Ridge. The average of six stations representing these regions, gives for the total movement of the air 2,800 miles. For the immediate South Atlantic coast, four stations, 5,000 miles; for the Middle Atlantic coast, seven stations, 7,400 miles; for the New England coast, four stations, 5,500 miles; for the extreme Northwest, six stations, 7,100 miles; for Pike's Peak, 15,700 miles; for San Francisco, 9,500 miles; for San Diego, 3,900 miles; for Portland, Oreg., 2,800 miles.

VII.—VERIFICATION OF PREDICTIONS.

The critical comparison of the regular tri-daily Probabilities with the weather-maps for the succeeding day show that, on the average of the entire country, 86.3 per cent. of the predictions have been verified.

VIII.—NAVIGATION.

The height of water in the rivers is given in the accompanying table, from which it will be seen that no extensively dangerous river-floods have occurred. In consequence of heavy rains, local freshets have been reported on the 7th in New York and Connecticut, and, on the 12th, in New York.

The June rise in the Missouri has been well marked. The floods that prevailed in the Lower Mississippi at the beginning of the month have gradually subsided, allowing the repair of some of the more important crevasses. Observations have been reported referring to a remarkable fluctuation of the waters of Lake Superior, extending about 18 inches above and below the average level.

Height of rivers above low-water mark.

Stations.	Highest.		Lowest.	
	Date, June.	Height.	Date, June.	Height.
		Ft. in.		*Ft. in.*
MISSOURI.				
Fort Sully	3	9 10	10	7 4
Yankton	5	14 10	1	13 0
Omaha	15	12 11	1	5 0
Plattsmouth	14	6 10	1-2	†0 1
Saint Joseph	17	12 6	3	3 9
Leavenworth	17	10 0	3	1 11
Kansas City	17-19	16 2	4	7 0
Lexington	19-20	12 11	4	4 2
Brunswick	18	13 0	5	2 0
Boonville	15-17	12 10	7	1 6
Jefferson City	19	13 10	7	5 0
Hermann	19	12 5	7	4 5
MISSISSIPPI.				
Saint Paul	22-25	9 8	9-10	5 0
La Crosse	29	7 10	10-11	3 10
Le Claire	30	4 10	19	3 10
Dubuque	30	9 2	20-21	7 8
Davenport	11	7 0	21-23	4 7
Keokuk	18	7 9	23-25	5 6
Warsaw	14	8 9	26-27	5 10
Saint Louis	20	18 5	6-7	11 0
Cairo	22	18 4	10-11	10 10
Memphis	24-25	14 8	13-14	9 4
Helena	1	23 4	12	14 1
Vicksburg	1	42 8	30	22 3
New Orleans	1-2	*2 7	30	*6 6
RED RIVER.				
Shreveport	1	24 1	30	14 2
CUMBERLAND.				
Nashville	6	3 6	30	1 4
OHIO.				
Pittsburgh	14	6 0	30	1 9
Marietta	16	6 10	30	3 6
Cincinnati	21	9 8	30	0 1
Louisville	22-24	5 4	14-15	4 3
Evansville	1	5 5	15	3 10
Paducah	1	8 0	30	4 10
ALLEGHENY.				
Oil City	13	3 4	30	0 6
Freeport	13	2 0	30	†3 2
YOUGHIOGHENY.				
Confluence	12	0 0	24-25	†0 6
MONONGAHELA.				
Morgantown	11	2 11	27	0 4
New Geneva	12	0 2	27	†3 7
Brownsville	12	0 2	27	†1 9

* Below high-water mark. † Below bench-mark.

IX.—TEMPERATURE OF WATER.

The table on Map No. III shows the maximum and minimum temperatures of the water at the stations there given. In reference to this subject, the following general remarks may be made: The average temperature of the water has been within five degrees the same as that of the air, except for the Lower Missouri, Lakes Superior, Huron, and Champlain, and the coast of Maine. The range of temperature has been: In the Lower Missouri, 16 degrees; in the Upper Mississippi, 21; in the Ohio and tributaries, 20; on the Eastern Gulf coast, 25; on the South Atlantic coast, 8; on the Middle Atlantic coast, 14; in the Lower Lakes, 20, and in the Upper Lakes, from 15 to 30 degrees.

The difference between the maximum water temperature and the maximum air temperature has been greatest in the northern sections of the country, where it has averaged 23 degrees. The average difference for the South Atlantic and Gulf coasts is 11 degrees. In general the minimum water temperatures are higher than those of the air, the only exceptions being at Duluth and Burlington, Vermont. The average difference of these minima decreases gradually from North Carolina, where it is 15, to Maine, where it is one degree. In the waters of the Mississippi and its tributaries this difference varies between 15 and 22 degrees. At Galveston the water has thence been warmer than the air.

X.—ELECTRICAL PHENOMENA.

1. *Thunder and lightning.*—The month of June has been notable in certain sections of the country for the display of atmospheric electricity, the remarkable cases of which have naturally coincided with the dates of severe local storms as given in a preceding section. The first half of the month was in fact remarkable for an almost continuous series of displays of thunder and lightning throughout the West and Northwest. The maximum number of days on which thunder or lightning has been recorded as observed somewhere within the range of vision of the observer, has been 20 to 25 in the South Atlantic and Gulf States and Missouri. It has been observed on from 15 to 20 days in Iowa, Minnesota, Wisconsin, New York, and Maine.

2. *Auroras.*—The auroral displays, recorded in June, have sometimes evidently stood in an intimate relation to the existing thunder and lightning storms. The auroral streamers of the 7th and 8th appeared brilliant at some few places, but the others were in general very faint. The dates on which they occurred are given in the following list:

1st, in Iowa; 2nd, in Vermont; 3rd, Iowa, Minnesota, New York, and Maine; 4th, Wisconsin; 5th, Illinois and Iowa; 6th, Illinois and Maryland; 7th, Colorado, Nebraska, Wisconsin, Iowa, Michigan, Indiana, Illinois, Missouri, Ohio, Tennessee, New York, Virginia, Maryland, and Vermont; 8th, Nebraska, Illinois, Ohio, Tennessee, New York, Pennsylvania, and Maine; 9th, Vermont; 10th, Vermont; 12th, Wisconsin; 13th, Wisconsin, Vermont, and Maine; 14th, Pennsylvania, New Jersey, Connecticut, and Vermont; 15th, Connecticut; 17th, Michigan and Maryland; 18th, Pennsylvania; 21st, Vermont; 22nd, Vermont; 23rd, Vermont, 26th, Vermont and Ohio; 28th, Indiana; 30th, Ohio.

XI.—OPTICAL PHENOMENA.

1. *Solar halos.*—The solar halos most extensively observed during the month were the following: On the 3d, Massachusetts, New Hampshire, and New York; on the 15th, New Hampshire, New York, and Missouri; on the 16th, Iowa, New Hampshire, New York, and Massachusetts.

2. *Lunar halos.*—The lunar halos, so far as recorded, appear to have been very local phenomena. Those that occurred between the 22d and 27th were individually observed in one or two States; the others of the month were seen only over small sections of country.

3. *Mirage.*—Mirage has been recorded only once during the month, viz: At Oswego, on the 10th.

XII.—MISCELLANEOUS.

1. *Meteors.*—Notably bright meteors have been rather frequently observed, viz: On the 3d, in Florida; 4th, in Florida; 6th, in North Carolina; 7th, in Indian Territory and Florida; 11th, in Florida; 13th, in North Carolina and Tennessee; 14th, in Florida; 15th, in Florida; 16th, in Tennessee; 18th, in North Carolina and Pennsylvania; 22d, in Florida.

2. *Earthquakes.*—The only occurrence of this phenomena that has been reported is the slight shock that was felt on the 18th at Salt Lake City.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[10].

MONTHLY WEATHER REVIEW, JULY, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

A careful examination of the meteorological data accumulated in this office during the past month, from both the regular and volunteer observers, has rendered it necessary to consider facts referring to an unusual series of atmospheric phenomena.

The month has been particularly marked in the occurrence of severe local storms, which have, in some cases, proved greatly destructive to both life and property.

The accompanying charts show an intimate relation existing between the barometric pressure, temperature, prevailing direction of winds and moisture, in the several geographic districts, and illustrate in a forcible manner that each of the elements above named is an important but variable function of the weather, while a comparison with previous months and years would indicate that decided changes in atmospheric conditions depend more directly upon the supply of aqueous vapor.

Generally, the weather has been favorable for agricultural pursuits. This is especially so on the Pacific coast, where the yield of wheat is reported to be greater than in previous years, although there are sections in the northern portion of this region where excessive rains have been injurious, and the low temperature prevented the maturing and ripening of the grain.

It is now quite certain that the late frosts which occurred in Virginia, North Carolina, Mississippi, and Tennessee will materially reduce the fruit-crop in these regions, and that the drought in the Ohio Valley, Tennessee, and Arkansas has caused an almost total failure of the tobacco-crop. There has been a deficiency of rain in the regions north and west of the Ohio Valley, but the excess in previous months has produced excellent crops, except in limited localities, where drought or insects have completely destroyed vegetation. In some districts the agricultural interests have been improved by the occurrence of timely rains, while in others too much rain, or almost a total absence of it, has caused a total failure of particular crops.

BAROMETRIC PRESSURE.

The influence of the land upon atmospheric pressure has been unusually well marked. Upon Chart No. II is represented the general distribution of this pressure for the month. A comparison of the months of June and May shows that the area of mean low barometer has moved slowly to the northeastward, and that it now extends over the centre of the continent; in the mean time the barometric pressure has increased in the southern and southeastern portions of the country, which is now within the limits of the increased area of high barometer, extending over the Atlantic between the twenty-fifth and fortieth degrees of latitude. During the past three months there has been a gradual increase of pressure in the region last named, the direction of increase being westward from the Atlantic, while during the same time there has been but little change in the mean barometric readings of the central depression. Compared with July, 1873, there has been but little change, both years showing an excess of the mean pressure previously calculated. On the Pacific coast there has been no marked variation from the monthly mean, the pressure being greatest at Portland, Oreg., and least at San Diego, Cal., thus indicating that the mean pressure on this coast increases with the latitude, within the limits of the United States, while the reverse obtains on the Atlantic coast. The barometric range is shown to be greatest in the northern districts, near the forty-fifth parallel of latitude, and from this region southward it is gradually diminished, finally becoming least in Florida.

Areas of high barometer.—These areas are not traced on the charts, but their general direction of progression has been from the northwest to the southeast; they have moved with less rapidity after reaching the Atlantic, becoming more extended in longitude, conforming to the general contour of the coast, and in some cases extending to the westward, in the direction of the Gulf coast. They have also been uniformly attended by fair weather, falling temperature, and less relative humidity, and followed by rain, especially in the Atlantic and Gulf States, after the winds had shifted to easterly.

No. I. The first area observed was central off the South Atlantic coast on the 4th, and gradually extended to the westward, apparently following and displacing the depression which existed in the Gulf during the 2d, 3d, and 4th.

No. II was central in Manitoba on the 10th, passed thence almost due east to the

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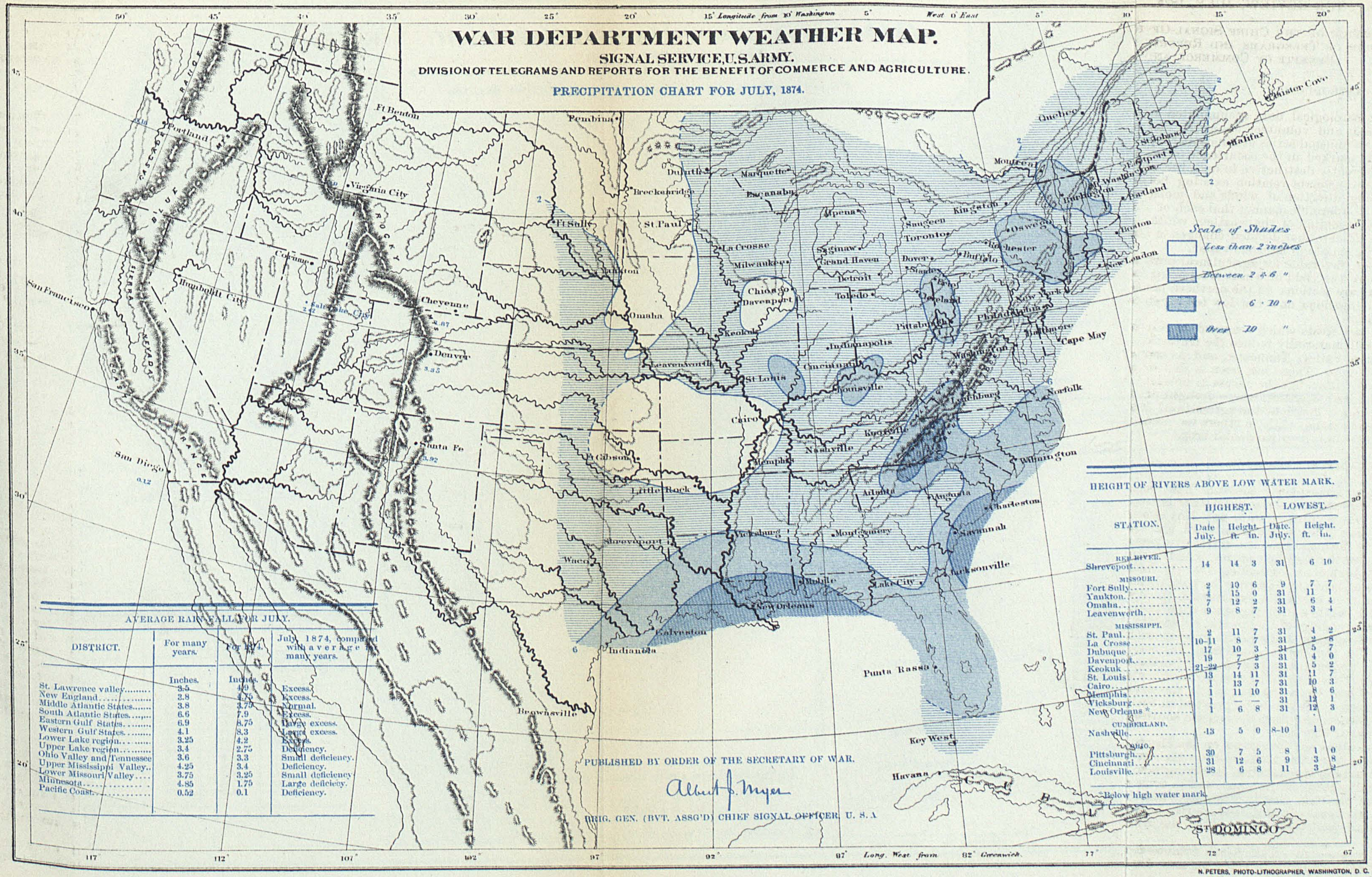

AVERAGE RAIN-FALL FOR JULY.

DISTRICT.	For many years.	For 1874.	July, 1874, compared with average for many years.
	Inches.	Inches.	
St. Lawrence valley	3.5	4.9	Excess.
New England	3.8	4.75	Excess.
Middle Atlantic States	3.8	3.75	Normal.
South Atlantic States	6.6	7.9	Excess.
Eastern Gulf States	6.9	8.75	Large excess.
Western Gulf States	4.1	8.3	Large excess.
Lower Lake region	3.25	4.2	Excess.
Upper Lake region	3.4	2.75	Deficiency.
Ohio Valley and Tennessee	3.6	3.3	Small deficiency.
Upper Mississippi Valley	4.25	3.4	Deficiency.
Lower Missouri Valley	3.75	3.25	Small deficiency.
Minnesota	4.85	1.75	Large deficiecy.
Pacific Coast	0.52	0.1	Deficiency.

HEIGHT OF RIVERS ABOVE LOW WATER MARK.

STATION.	HIGHEST. Date July.	HIGHEST. Height ft.	HIGHEST. Height in.	LOWEST. Date July.	LOWEST. Height ft.	LOWEST. Height in.
RED RIVER.						
Shreveport	14	14	3	31	6	10
MISSOURI.						
Fort Sully	2	10	6	9	7	7
Yankton	4	15	0	31	11	1
Omaha	7	12	2	31	6	4
Leavenworth	9	8	7	31	3	4
MISSISSIPPI.						
St. Paul	2	11	7	31	4	2
La Crosse	10–11	8	7	31	2	8
Dubuque	17	10	3	31	5	7
Davenport	19	7	2	31	4	0
Keokuk	21–22	7	3	31	5	2
St. Louis	13	14	11	31	11	7
Cairo	1	13	7	31	10	3
Memphis	1	11	10	31	8	6
Vicksburg	1	—	—	31	12	1
New Orleans *	1	6	8	31	12	3
CUMBERLAND.						
Nashville	13	5	0	8–10	1	0
OHIO.						
Pittsburgh	30	7	5	8	1	0
Cincinnati	31	12	6	9	3	8
Louisville	28	6	8	11	3	2

*Below high water mark.

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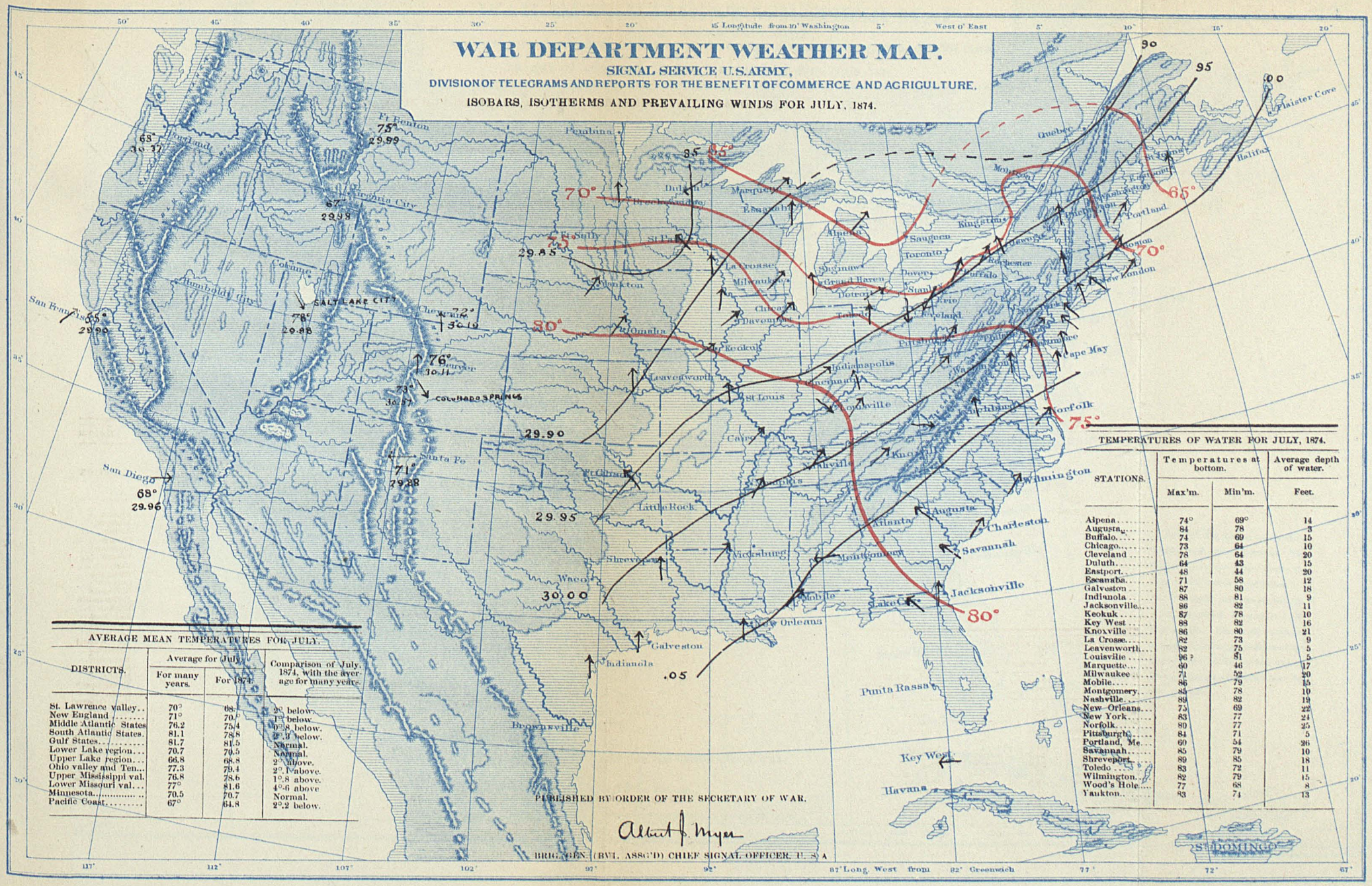
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR JULY, 1874.



PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. ASS'T) CHIEF SIGNAL OFFICER, U. S. A.

AVERAGE MEAN TEMPERATURES FOR JULY.

DISTRICTS.	Average for July. For many years.	Average for July. For 1874.	Comparison of July, 1874, with the average for many years.
St. Lawrence valley..	70°	68.	2°. below.
New England	71°	70.°	1°. below.
Middle Atlantic States	76.2	75.4	0°.8 below.
South Atlantic States.	81.1	78.8	2°.3 below.
Gulf States.....	81.7	81.5	Normal.
Lower Lake region...	70.7	70.5	Normal.
Upper Lake region...	66.8	68.8	2°. above.
Ohio valley and Ten...	77.3	79.4	2°. 1 above.
Upper Mississippi val.	76.8	78.6	1°.8 above.
Lower Missouri val...	77°	81.6	4°.6 above
Minnesota.....	70.5	70.7	Normal.
Pacific Coast.....	67°	64.8	2°.2 below.

TEMPERATURES OF WATER FOR JULY, 1874.

STATIONS.	Temperatures at bottom. Max'm.	Temperatures at bottom. Min'm.	Average depth of water. Feet.
Alpena.....	74°	69°	14
Augusta.....	84	78	3
Buffalo.....	74	69	15
Chicago.....	73	64	10
Cleveland	78	64	20
Duluth.....	64	43	15
Eastport.....	48	44	20
Escanaba.....	71	58	12
Galveston	87	80	18
Indianola	88	81	9
Jacksonville....	86	82	11
Keokuk	87	78	10
Key West	88	82	16
Knoxville	86	80	21
La Crosse.....	82	73	9
Leavenworth....	82	75	5
Louisville	96 ?	81	5
Marquette.....	60	46	17
Milwaukee	71	52	20
Mobile.....	86	79	15
Montgomery.....	85	78	10
Nashville.....	89	82	19
New Orleans...	75	69	22
New York.....	83	77	24
Norfolk.....	80	77	25
Pittsburgh.....	84	71	5
Portland, Me...	60	54	26
Savannah.....	85	79	10
Shreveport.....	89	85	18
Toledo	83	72	11
Wilmington.....	82	79	15
Wood's Hole....	77	68	8
Yankton.....	83	74	13

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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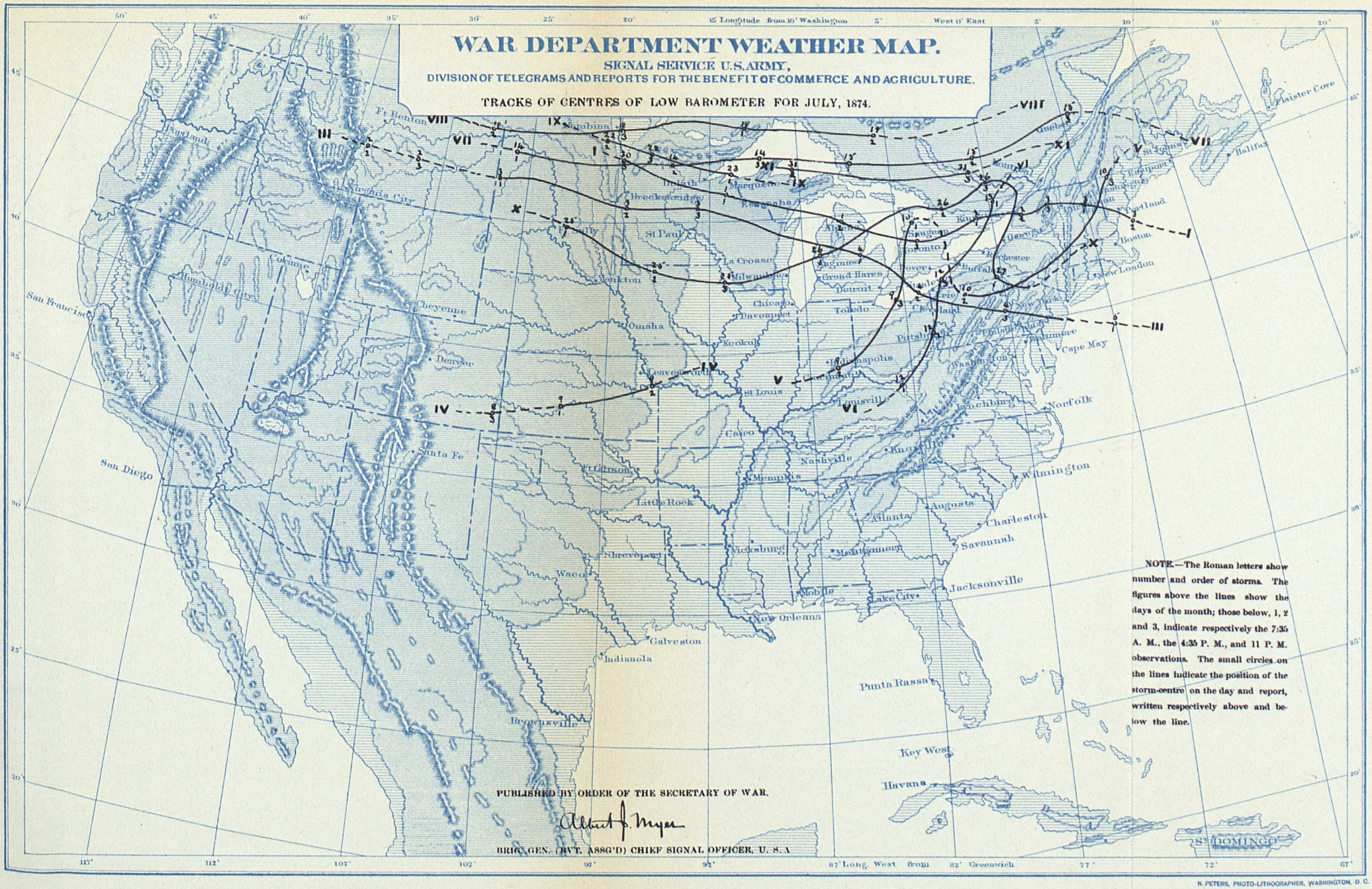
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF CENTRES OF LOW BAROMETER FOR JULY, 1874.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

Atlantic by the afternoon of the 12th; after which the pressure increased in the Atlantic and Southern States, and on the 15th it was still traced in the southeastern portion of the country.

No. III, Observed in the Missouri Valley on the 15th, had passed from the Pacific coast southeastward to this position, after which it extended over the southern portions of the country, and disappeared on the 26th.

No. IV. During the 28th, 29th, 30th, and 31st this area moved from the Northwest to the South Atlantic coast, succeeding the depression which was attended by unusual rains in the Eastern and Middle States.

Areas of low barometer.—Eleven areas of atmospheric depression have been observed, some of which originated and disappeared within the limits of the United States, while the greater number passed to the north of the Lake region on a mean latitude greater than that of similar depressions in previous years. This fact, which was noticeable in July, 1873, is now equally marked, as will appear from the following comparative statement:

July, 1871, No. of areas of low barometer, 15; mean latitude of same, 45°.
July, 1872, No. of areas of low barometer, 14; mean latitude of same, 44°.
July, 1873, No. of areas of low barometer, 13; mean latitude of same, 47°.
July, 1874, No. of areas of low barometer, 11; mean latitude of same, 47°.

From the above it will also be observed that there has been a gradual decrease in the number of defined areas of low barometer, a fact which is also noticeable in comparing records of June with 1874 and 1873.

The approximate geographical position of the centre of each depression at each of the tri-daily reports during the time the depression remained within or near the stations of observation is given on Chart No. 1, and through these points have been traced the general course of the depression.

No. I Was apparent in Manitoba on June 30, and moved rapidly toward the Atlantic coast during July 1 and 2, following the general course of the great lakes, and moving with less progressive velocity as it approached the coast.

No. II Was attended by the unusual rains near the Gulf coast during the 2d, 3d, and 4th, and is interesting from the fact that it is the first barometric depression of the season which originated in the tropics having a progressive movement to the westward. This storm had its parallel in July of last year, but usually they are not observed within the limits of the United States until the season is more advanced. Its westerly course, with a velocity of twelve miles per hour, carried the centre of the depression slowly toward the dry and sandy plains of Texas, where it disappeared and was followed by the succeeding high barometer from the Atlantic coast, which now moved to the westward and became central in the Lower Missouri Valley on the morning of July 6. The same cause which produced the shifting of the mean tracks of barometric depressions in the temperate zone may be equally effective in changing the mean latitude of tropical storms.

No. III. The approach of this depression from the extreme Northwest was indicated by the reports from that region on the 2d of July, while No. 1 continued within the limits of the eastern station and No. 2 in an undeveloped condition in the Gulf. It passed from its initial position to the eastward as far as Lake Huron without marked results, except that on the morning of the 3d it had almost lost its identity as a defined area of low barometer, the centre of depression having increased thirty-five hundredths of an inch and the gradient diminished from 0.1 inch in eighty miles to 0.1 inch in two hundred miles. On the morning of the 4th this depression had taken the form of a slightly eccentric ellipse, the transverse axis of which coincided with the forty-fourth degree of north latitude, and was 400 miles in length.

The area of high barometer which had previously extended over the districts on the Atlantic coast, and which by its southerly wind had accumulated a supply of vapor in these districts, now moved to the south and westward, apparently drawing the depression toward the coast in the most direct line. In this, as in other storms, there has been a deviation to the south of the direct course as the depression approached the coast.

Severe local storms occurred in the southern half of this depression, while its centre was near the eastern portion of Lake Erie, the region of greatest severity being near the Atlantic coast, and including New Jersey, Delaware, Maryland, and the eastern portions of Pennsylvania and Virginia.

Nos. IV and V. No decided change occurred in the atmospheric condition within the United States until the 7th, although there seems to have been some disturbance in the Lower Saint Lawrence Valley, which caused local storms in the northern portions of New York. The general barometric depression in the Northwest, now contracted as an area of low barometer, central in the western portions of Kansas, and moved slowly to the eastward during the succeeding twenty-four hours, completely lost its cyclonic appearance in the Upper Mississippi Valley. This was succeeded by No. V, an extensive depression central in the Upper Ohio Valley, indicating an unstable condition of the

atmosphere throughout the country east of the Mississippi River. After the barometric gradient had increased, this storm passed to the northeast to the Lower Lake region, where it seems to have been retarded, the easterly movement of its centre during thirty-six hours being less than 250 miles, while its movements in latitude were much greater.

No. VI. This disturbance was indicated by the appearance of an extended trough of barometric depression on the afternoon of July 11. It had taken the form of a circular depression, central in the Upper Ohio Valley on the succeeding morning, when a small central area could be distinctly traced. A general rain prevailed at this time in the districts of the Atlantic coast and in the Lower Lake region, the course of the storm being directly to the east, with a mean velocity of twenty-five miles per hour, and a greatest barometric gradient of 0.1 inch in fifty miles.

No. VII. Observed in the Northwest on the morning of the 14th while ian area of decidedly high barometer extended over that portion of the United States south of the Lake region. These general conditions continued while this depression moved almost directly east toward the Lower Saint Lawrence Valley without producing any serious disturbance within the limits of the United States. Generally it has been observed that the relative positions of the areas of high and low barometer materially affect the course of the latter, and that the former seem to deflect the latter from their mean tracks.

Nos. VIII and IX were only partially developed areas of low barometer, central in the Northwest near the boundary of the United States on the 18th and 22d. They produced no disturbance, but caused a rise of temperature in the Mississippi Valley.

From the 21st until the 25th, the barometer continued low in the Western Territories with but slight changes of pressure within the States until the development of storm marked No. X, which can be traced to the west of the Rocky Mountains by a reference to the barometric readings taken at the stations in the Far West. This storm moved with quite a uniform velocity of about 40 miles per hour, producing heavy rains over a belt of country seven hundred miles in width, extending from the Upper Mississippi Valley to the Atlantic coast. The midnight reports of July 26 shows that the depression divided, leaving a small elliptical area in the Ohio Valley to the southwest of Lake Erie, while the principal area was to the northeast of this position. Such a distribution of pressure would necessarily give a continuous supply of warm moist air flowing from the southeast over Ohio and Pennsylvania, while a supply of cold currents flowing from the north and west in the rear of the more advanced depression would be forced over the same region. It was the sudden interference of these currents which produced the heavy rains which occurred in Western Pennsylvania on the night of the 26th. On the morning of the 27th the depressions had again united, forming an extended but narrow trough nearly parallel to the coast, where southerly winds continued, while in the Lower Lake region and the Saint Lawrence Valley the winds had backed to north and west. This depression did not pass directly to the Atlantic, but apparently extended over the entire country south of the Lake region, and continued until the 29th, when it was replaced by an equally extensive area of high barometer.

No. XI. The afternoon report of the 29th from the Northwest indicated the approach of this depression, but at no succeeding report could its center be more than approximately located; it passed to the north of the lakes, and was only attended by light local rains in the regions north of the Ohio Valley.

Local storms.—These storms have been particularly marked for their severity during the past month. Their occurrence seems to depend upon the relative distribution of barometric pressure considered in relation to the topography of the country. The region of greatest frequency has been in the vicinity of the Appalachian chain, where the vapor from the Gulf and the Atlantic was forced over the ascending plains by the prevailing southerly and southwesterly winds. Those producing the greatest destruction of life and property occurred on the 4th, 7th, 24th, and 26th of the month. On the afternoon of July 4 the depression already referred to as No. 3 was central near the eastern portion of Lake Erie; at midnight this depression was located near the eastern boundary of New York, south of its previous position. The sudden veering of the winds in the south and west quadrants of this area was attended by violent storms during the afternoon and evening in the States of Maryland, Virginia, Delaware, New Jersey, and Pennsylvania. From an examination of a large number of reports referring to these storms, it is shown that the regions of severity were limited in area, and that the storms uniformly approached from the northwest. The storm of the 24th occurred at Eureka, Nev., and was very destructive; but no official report has been received concerning it.

The remarks referring to the area of low barometer marked No. X, considered in connection with the peculiar arrangement of clouds at Erie, Pa., during the evening of the 26th, which was as follows: "Three distinct strata of clouds: *First*, black cumulo-stratus, moving from the southwest; *Second*, heavy cumulus well defined, moving from a little north of west; *Third*, cirro-cumulus, moving from the north," give the

general atmospheric conditions which attended the unusually heavy rains occurring in Western Pennsylvania on that date. The official report from the observer at Pittsburgh states that the total number of lives lost at or near that city is one hundred and thirty-four, and that property valued at five hundred thousand dollars was destroyed.

PRECIPITATION.

In the construction of Chart No. 3, which is a graphical representation of the distribution of rain in the United States, the regular and volunteer reports have been combined with those furnished by Professor Kingston, of the Toronto Observatory. From the comparative tables accompanying the chart, it will be observed that the districts showing an excess over the normal are near the coast, and that the regions of excess of rain correspond with those in which the mean temperature has been below the normal. Within the large area representing less than two inches of rain there are small districts where there has been a total absence of it. Special droughts have prevailed, proving injurious to crops in Kentucky, Arkansas, Texas, Missouri, and Kansas.

Cloudy days.—The number of cloudy days reported from the Signal-Service stations average as follows: Six on the Gulf coast, eight on the South Atlantic coast, seven on the Middle Atlantic coast, twelve on the East Atlantic coast, three in the Lower Mississippi Valley, six in the Ohio Valley, seven in the Upper Mississippi Valley, four in the Lower Missouri Valley, and six in the Lake region.

Rainy days.—The number of days on which rain fell are as follows: Eleven in the Gulf States, fifteen in the South Atlantic States, eleven in New England, eleven in the Lower Lake region, nine in the Upper Lake region, eight in the Upper Mississippi Valley, seven in the Lower Mississippi Valley, and twelve over the Blue Ridge and Alleghanies.

Special rains.—Remarkably heavy rains occurred on the 3d at Wilmington, Charleston, and Savannah; on the 4th at New Orleans and Mobile; on the 12th at Hinsdale, Mass.; on the 24th at Eureka, Nev.; on the 26th at Pittsburgh and Allegheny City, Pa., and at Port Huron, Mich.; on the 27th at Rising Sun, Ind.

HUMIDITY.

During the month of July the relative humidity has averaged as follows in the different sections of the country:

On the Gulf and South and East Atlantic States, 0.75; on the New Jersey coast, 0.85; in the Lake region, 0.68; in the Lower Mississippi Valley, 0.70; in Tennessee and the Ohio and Upper Mississippi Valley, 0.62; in the Lower Missouri Valley, 0.58; at the Rocky Mountain stations, 0.41.

ATMOSPHERIC TEMPERATURE.

The mean isothermal lines for the month are represented on Chart No. II, and the comparison of the mean temperature of the several districts with that of the mean temperature of July in previous years is given in the table. It will be seen that the temperature has been above the mean in the districts of the Mississippi Valley and below it in the districts near the coast; this has been particularly noticeable on the Middle Atlantic and New England coasts and at San Francisco. The range of temperature compared to that of 1873 has diminished slightly on the Gulf coast and increased in the northern sections of the country. The unusual high temperature of 100° prevailed over an extensive region, including Indian Territory, Missouri, Kansas, Nebraska, and portions of Iowa and Arkansas, on the 25th of the month. The mean temperature at the summit of Pike's Peak was 42°; that at the summit of Mount Washington, 48°.5.

Frosts were reported on the 10th in Colorado, and on the 27th in Minnesota.

TEMPERATURE OF WATER.

The table on Chart No. III gives the maximum and minimum temperature of water by observations made at the bottom at many of the Signal-Service stations on lakes, rivers, and coasts. The range of temperature of the water on the Atlantic sea-board has been about five degrees, and on the Gulf coast seven degrees. In Lake Erie the range varies from five degrees at Buffalo to fourteen degrees at Cleveland; in Lake Michigan from nine degrees at Chicago to nineteen degrees at Milwaukee, and in Lake Superior from fourteen degrees at Marquette to twenty-one degrees at Duluth. The range averages about fourteen degrees in the Ohio, nine degrees in the Upper Mississippi, and four degrees in the Lower Missouri.

The difference between the maximum air-temperature and maximum water-temperature has been greatest on the coast of Maine and near Lake Superior, where it has averaged thirty degrees; this difference has been least in the Gulf and on the South

Atlantic coast, where it has averaged nine degrees. At the stations on the western rivers the temperature of the air has risen from twelve to twenty-five degrees above the highest water temperature.

The minimum air temperature has been lower than the minimum water temperature at nearly all stations, the only exception being at Duluth, where the water temperature was five degrees lower than the air, and at Milwaukee and Eastport, where it has been two degrees colder. The mean temperature of the water has been slightly above the mean temperature of the air on the Gulf and South Atlantic coasts and in the Ohio, Cumberland, and Tennessee Rivers. In Lake Michigan the water has averaged colder than the air by seven degrees, in Lake Superior by fourteen degrees, and on the coast of Maine by twelve degrees.

WINDS.

Southerly winds have prevailed throughout the United States east of the Rocky Mountains. Chart No. II shows the mean direction as obtained from each of the stations of the Signal-Service, and it will be observed that these directions are generally toward the area of mean low barometer. The total atmospheric movement, independent of the direction, has been as follows in the several districts: New England, 5,280 miles; Middle Atlantic coast, 6,480 miles; interior of the Middle Atlantic States, 4,690 miles; South Atlantic coast, 4,730 miles; Gulf coast, 5,650 miles; Ohio, Tennessee, and the interior of the Gulf States, 3,360 miles; Lower Lake region, 5,710 miles; Upper Lake region, 6,370 miles; Upper Mississippi Valley, 6,395 miles; Missouri Valley, 3,517 miles. Violent winds occurred at Washington, D. C., July 4th, 60 miles; Mount Washington, N. H., July 9, 96 miles; Milwaukee, Wis., July 9, 63 miles; Long Branch, July 26, 50 miles. Tornadoes were reported at Three-Mile Bay, N. Y., July 7; Bass Harbor, Me., July 16; Lexington, Mich., July 24; South Bend, Ind., July 26.

Dove's law of gyration received four complete verifications at Signal-Service observatory in this city, with a single backing of the wind through an arc of 180 degrees.

NAVIGATION.

From the Table on Chart No. III, which gives the condition of the western rivers, it will be seen that the Mississippi and Missouri Rivers have declined slowly during the month, the lowest readings being those made on the 31st. The Ohio River experienced a sudden rise during the 26th, 27th, and 28th, which caused some damage near Cincinnati.

Comparative observations of the fluctuations of the barometer and the water in Lake Superior at Marquette, Mich., show that the mercury and the water acted together thirty-four times, and in an opposite direction fifty-nine times.

An unusual wave occurred at the east end of Lake Erie on the 25th, causing the water to rise three or four feet, the water returning to its normal condition as rapidly as it rose. A similar wave occurred at Northport, Mich., on the 31st.

ELECTRICAL PHENOMENA.

The local storms previously referred to were, in many instances, accompanied by vivid displays of lightning. The most remarkable series of thunder-storms occurred at the summit of Pike's Peak from the 14th to the 25th, during which the electrical effect was so intense as to interrupt telegraphic communication with that station. The observer reports that sharp peculiar sounds were emitted from all pointed objects, and that painful sensations were experienced in the hands and face.

A brilliant display of ball-lightning was observed at Denver, July 21, the ball exploding in full view, and the fragments re-exploding as they reached the earth; this phenomena was also observed at Keokuk, Iowa, on the 16th.

Ground-currents interfered with the working of the telegraph-line at Sandy Hook on the 4th, 11th, and 16th.

Auroras.—The auroral display during the month has in some localities been unusually brilliant; the region of greatest frequency being near the 45th parallel of latitude.

OPTICAL PHENOMENA.

The Solar Halos observed at more than one station on any particular date were those reported from New York, Indiana, and Maine, on the 1st; New York, Ohio, Illinois, and Mississippi, on the 17th; Illinois, Iowa, and Vermont, on the 21st; Tennessee and Maine, on the 31st. *Lunar Halos* were observed in Georgia and Mississippi, on the 8th; Indiana, New York, and Michigan, on the 19th; Tennessee, Georgia, and Iowa, on the 22d; Tennessee and Mississippi, on the 25th; Rhode Island and Vermont, on the 27th; and Vermont and Delaware, on the 30th.

Fog Bow.—This phenomena was observed at Oxford, Me., on the 25th.

Mirage occurred at New London on the 18th.

MISCELLANEOUS.

Polar Bands were observed at Key West on the 4th, and at Toledo on the 1st.

Brilliant Meteors have appeared in large numbers during the month, the most noted being those observed in Indiana, Missouri, and New York, on the 3d; Kentucky, Missouri, and Tennessee, on the 7th; Nova Scotia, (near Halifax,) on the 9th; Pennsylvania and New York, on the 19th.

Earthquakes.—Light but perceptible shocks were experienced at Cairo, Ill., July 9th, at 4 p. m., and at Camp Russell, Nebr., July 23d.

VERIFICATION OF PROBABILITIES.

Probabilities.—The critical comparison between the separate items of the published tri-daily probabilities and the subsequent weather-reports, shows that on the average, during the month, 85.7 per cent. of the predictions have been well verified.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48[11].

MONTHLY WEATHER REVIEW, AUGUST, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In the preparation of this review, besides the regular reports from the Signal-Servic stations, United States Army, and the Canadian stations, monthly metereological registers from many volunteer observers and from post-surgeons, forwarded by the Surgeon-General United States Army, and other data, have been examined. The accompanying charts illustrate approximately the courses of low barometers, the curves of mean atmospheric pressure and temperature, the prevailing direction of the wind, and the distribution of rain.

The month has been characterized by an absence, comparatively, of destructive storms; by a deficiency of barometric pressure, and continued high temperatures from Southern Dakota to the Ohio Valley, and southward over the Gulf States; by extraordinary rain-falls over the Southern New England coast and Long Island; by cooler weather than usual over the Atlantic States, Lake region, and Saint Lawrence Valley; and by droughts in the Lower Lake region, Ohio Valley, Gulf States, and from Nebraska and Iowa southward, destroying crops in the two last sections.

BAROMETRIC PRESSURE.

Chart No. II shows the distribution of the pressure for the month, as represented by the curves in black. It is somewhat above the average over the Lake region. Over the remainder of the country it is below, especially from Kentucky and Tennessee to the southwest and the northwest. The latter is accounted for by the unusual number of low barometers which have moved down the Missouri Valley, while others, traced over the Lake region, left slight depressions in those sections, which gradually disappeared, some of which have been traced. An examination of Chart No. I will render this apparent.

Areas of low barometer accompanying Chart No. I show that the paths of the centres of eleven have, approximately, been traced. Their centres have been located for each synchronous observation, (three times daily,) and these connected. In case of doubt as to their positions, they were united by broken lines. Such are observed during every month, as many pass to the north of the Lower Lake region and the Saint Lawrence Valley on their way eastward. Frequently they leave minor depressions within the limit of the stations. In detail they are as follows:

No. I properly belongs to July, having moved from Dakota eastward over the Upper Lake region to the Saint Lawrence Valley on the 29th, 30th, and 31st ultimo. On the 1st and 2d instant it disappeared to the eastward, having been accompanied by generally light thunder-storms from the Lower Lakes, Ohio Valley, Tennessee, and the South Atlantic States eastward. A hurricane prevailed on Mount Washington, on the 1st, and a tornado at Troy, N. Y., on the 2d

No. II was first felt on the 3d at the Rocky Mountain stations by cloudy, threatening,

or rainy weather and brisk southerly winds. Very heavy hail fell on the "divide" between Denver and Colorado Springs, Col. At the latter place a bank of water passed down the creek at 7 p. m., sweeping everything, and supposed to have been caused by the hail-storm. On the 4th the barometer fell quite rapidly from the Upper Mississippi Valley westward, with increasing east to south winds. At Saint Paul violent high winds prevailed during the evening. The centre passed within the limit of the stations on the 4th, and down the Missouri Valley on the 5th, with threatening or rainy weather, from thence to the Upper Lakes. On the 6th it separated into two, one gradually disappearing over the Indian Territory, the other following the course shown on the chart. Cloudy or rainy weather accompanied it, except in the Gulf States. Remarkably heavy rains fell on the Middle Atlantic and New England coasts, with brisk and high easterly winds. Violent thunder-storms are reported as having occurred in Ohio, Indiana, New York, Pennsylvania, and North Carolina.

No. III passed to the south and east of Nova Scotia on the 6th, producing rain and brisk east to north winds in that section. It was evidently a cyclone, and most severe at some distance off the coast. A sailing-vessel reported having experienced a hurricane for eight hours upon this date in that vicinity, the wind backing from east to north.

No. IV was first observed by the falling barometer and high temperature, on the 8th and 9th, at the stations in the Rocky Mountains and the Lower Missouri Valley. From Nebraska and Iowa southward to the Gulf States the temperature continued rising, and thermometer-readings varying from 100° to 106° were reported for several days. On the 10th the centre moved within the limit of the stations; on the 11th, northeastward over Lake Superior into Canada; on the 12th, to the north of the Saint Lawrence Valley, leaving depressions in the Lower Missouri Valley and New England. Occasional rain fell during its progress over the Northwest and the Lake region, but became quite general, with severe thunder-storms in New England and the Middle States. A destructive tornado prevailed at Dixon, Ill., and a gale at Saint Paul during the night of the 10th; violent northwest winds at Davenport, Iowa, on the night of the 11th; hurricane on Mount Washington and severe thunder-storm at Berlin Heights, Ohio, on the night of the 12th.

No. V moved eastward from Dakota on the 15th, 16th, and 17th over the Upper Lake region into Canada, accompanied by occasional rain, with high winds at Saint Paul on the evening of the 16th, and a hurricane on Mount Washington during the night of the 18th.

No. VI. During the day the barometer fell very rapidly over the Northwest, with brisk south and east winds, and during the night of the 18th the central depression passed from Dakota to Minnesota, and thence, on the 19th, over Lake Superior into Canada. Rain fell in the Northwest and Lake region, and at places high winds prevailed.

No. VII advanced from Dakota on the 20th. The peculiarity of this consists in that it sent out in advance a secondary depression over the Middle Atlantic coast, producing at places severe thunder-storms. In the States east of the Rocky Mountains rainy weather accompanied them, with also severe thunder-storms in the Southern States.

No. VIII, appearing from Dakota, moved down the Missouri Valley and disappeared over the Southwest without producing any serious disturbance.

Nos. IX and X. The low barometric readings at the Rocky-Mountain stations on the 26th and 27th indicated the presence of a serious disturbance. On the 27th the pressure rapidly diminished from the Upper Mississippi Valley westward, and on the 28th there appeared an extensive trough of low barometer, extending from Indian Territory northward over Minnesota and Manitoba, but being lowest over the latter and the Lower Missouri Valley. Previous to this time it is probable there was one low barometer, which gradually developed into the two. From the chart it will be seen that No. IX, after separating into three distinct areas, finally disappeared in the Southern States and Ohio Valley. In their movement across the country cloudy or rainy weather became quite general, except in the West Gulf States, Lower Lake region, Middle States, and New England, with very serious and destructive storms. Heavy rains and high winds are reported from Iowa, Tennessee, Georgia, Louisiana, and no doubt occurred in all the Southern States.

No. XI was of minor importance, producing rain in Maine and the eastern British Provinces. It apparently united with No. X over the mouth of the St. Lawrence River.

Areas of high barometer.—Of the most marked, the *first* apparently extended itself southeastward, on the 2d and 3d, from Manitoba over the Lake region, and on the 4th and 5th over the Atlantic States. The *second*, following low barometer No. IV, first appeared over the Lake region, from Manitoba, on the 12th and 13th, where it remained nearly stationery until the 15th, and extended itself over the Middle States and to the East Atlantic coast on the 16th and 17th. On the 18th and 19th, the *third* gradually appeared over the Lower Lake region, Middle and South Atlantic States, which extended over the South Atlantic and East Gulf States on the 19th and 20th, and then slowly disappeared. The *fourth*, following low barometer No. VII, was felt over the

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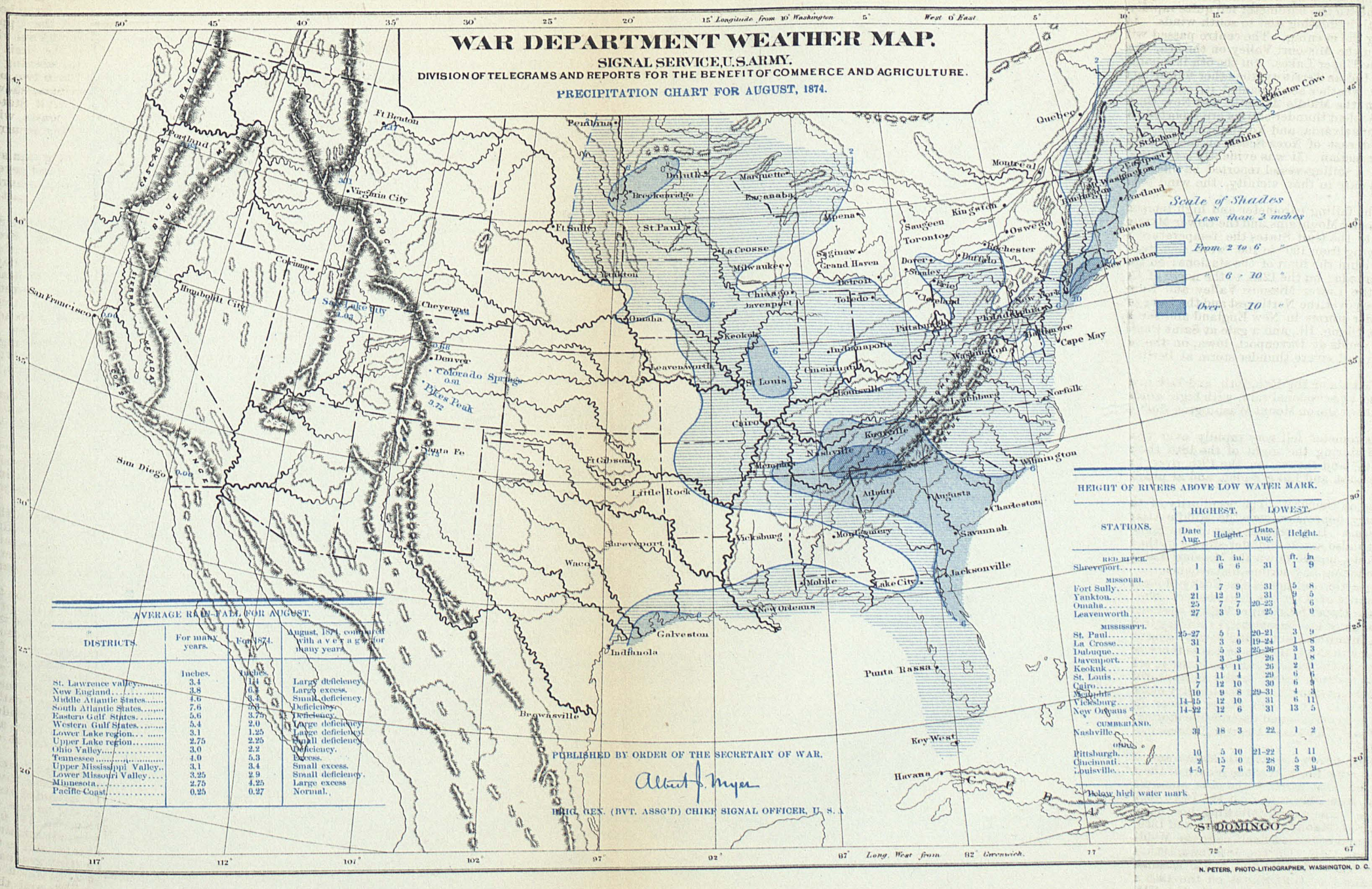
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE, U.S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

PRECIPITATION CHART FOR AUGUST, 1874.



AVERAGE RAIN-FALL FOR AUGUST.

DISTRICTS.	For many years.	For 1874.	August, 1874, compared with average for many years.
	Inches.	Inches.	
St. Lawrence valley	3.4	1.4	Large deficiency.
New England	3.8	6.3	Large excess.
Middle Atlantic States	4.6	3.4	Small deficiency.
South Atlantic States	7.6	5.0	Deficiency.
Eastern Gulf States	5.6	3.75	Deficiency.
Western Gulf States	5.4	2.0	Large deficiency.
Lower Lake region	3.1	1.25	Large deficiency.
Upper Lake region	2.75	2.25	Small deficiency.
Ohio Valley	3.0	2.2	Deficiency.
Tennessee	4.0	5.3	Excess.
Upper Mississippi Valley	3.1	3.4	Small excess.
Lower Missouri Valley	3.25	2.9	Small deficiency.
Minnesota	2.75	4.25	Large excess
Pacific Coast	0.25	0.27	Normal.

HEIGHT OF RIVERS ABOVE LOW WATER MARK.

STATIONS.	HIGHEST. Date Aug.	HIGHEST. Height. ft.	HIGHEST. Height. in.	LOWEST. Date. Aug.	LOWEST. Height. ft.	LOWEST. Height. in.
RED RIVER.						
Shreveport	1	6	6	31	1	9
MISSOURI.						
Fort Sully	1	7	9	31	5	8
Yanktou	21	12	9	31	9	5
Omaha	25	7	7	20-23	1	6
Leavenworth	27	3	9	25	1	0
MISSISSIPPI.						
St. Paul	25-27	5	1	20-21	3	9
La Crosse	31	3	0	19-24	1	8
Dubuque	1	5	3	25-26	3	3
Davenport	1	3	9	26	1	8
Keokuk	1	4	11	26	2	1
St. Louis	1	11	4	29	6	6
Cairo	7	12	10	30	6	9
Memphis	10	9	8	29-31	4	3
Vicksburg	14-15	12	10	31	6	11
New Orleans	14-22	12	6	31	13	5
CUMBERLAND.						
Nashville	31	18	3	22	1	2
OHIO.						
Pittsburgh	10	5	10	21-22	1	11
Cincinnati	2	15	0	28	5	0
Louisville	4-5	7	6	30	3	9

Below high water mark.

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Albert J. Myer

BRIG. GEN. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

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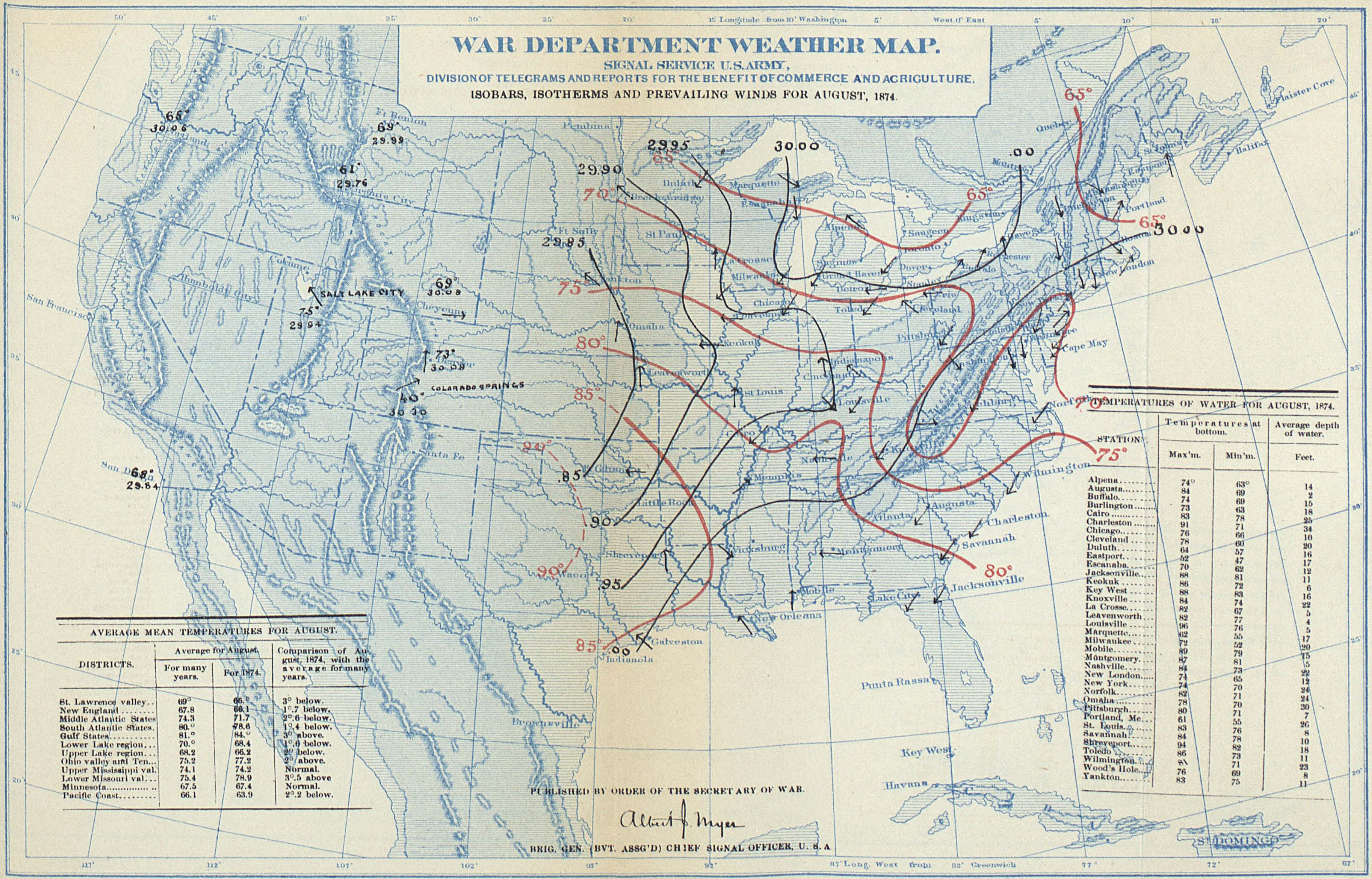

AVERAGE MEAN TEMPERATURES FOR AUGUST.

DISTRICTS.	Average for August. For many years.	Average for August. For 1874.	Comparison of August, 1874, with the average for many years.
St. Lawrence valley..	69°	66.°	3° below.
New England	67.8	66.1	1°.7 below.
Middle Atlantic States	74.3	71.7	2°.6 below.
South Atlantic States.	80.°	78.6	1°.4 below.
Gulf States...........	81.°	84.°	3° above.
Lower Lake region...	70.°	68.4	1°.6 below.
Upper Lake region...	68.2	66.2	2° below.
Ohio valley and Ten...	75.2	77.2	2° above.
Upper Mississippi val.	74.1	74.2	Normal.
Lower Missouri val...	75.4	78.9	3°.5 above
Minnesota..............	67.5	67.4	Normal.
Pacific Coast.........	66.1	63.9	2°.2 below.

TEMPERATURES OF WATER FOR AUGUST, 1874.

STATIONS.	Temperatures at bottom. Max'm.	Temperatures at bottom. Min'm.	Average depth of water. Feet.
Alpena........	74°	63°	14
Augusta........	84	69	2
Buffalo.........	74	69	15
Burlington........	73	63	18
Cairo..........	83	78	25
Charleston........	91	71	34
Chicago........	76	66	10
Cleveland......	78	60	20
Duluth.........	64	57	16
Eastport........	52	47	17
Escanaba........	70	62	12
Jacksonville.....	88	81	11
Keokuk	86	72	6
Key West	88	83	16
Knoxville	84	74	22
La Crosse.......	82	67	5
Leavenworth...	82	77	4
Louisville	96	76	5
Marquette.......	62	55	17
Milwaukee	72	52	20
Mobile..........	89	79	15
Montgomery....	87	81	5
Nashville.......	84	73	22
New London.....	74	65	12
New York......	74	70	24
Norfolk........	82	71	24
Omaha........	78	70	30
Pittsburgh......	80	71	7
Portland, Me...	61	55	26
St. Louis.......	83	76	8
Savannah.......	84	78	10
Shreveport......	94	82	18
Toledo	86	73	11
Wilmington.....	[illegible]	71	23
Wood's Hole....	76	69	8
Yankton.......	83	75	11

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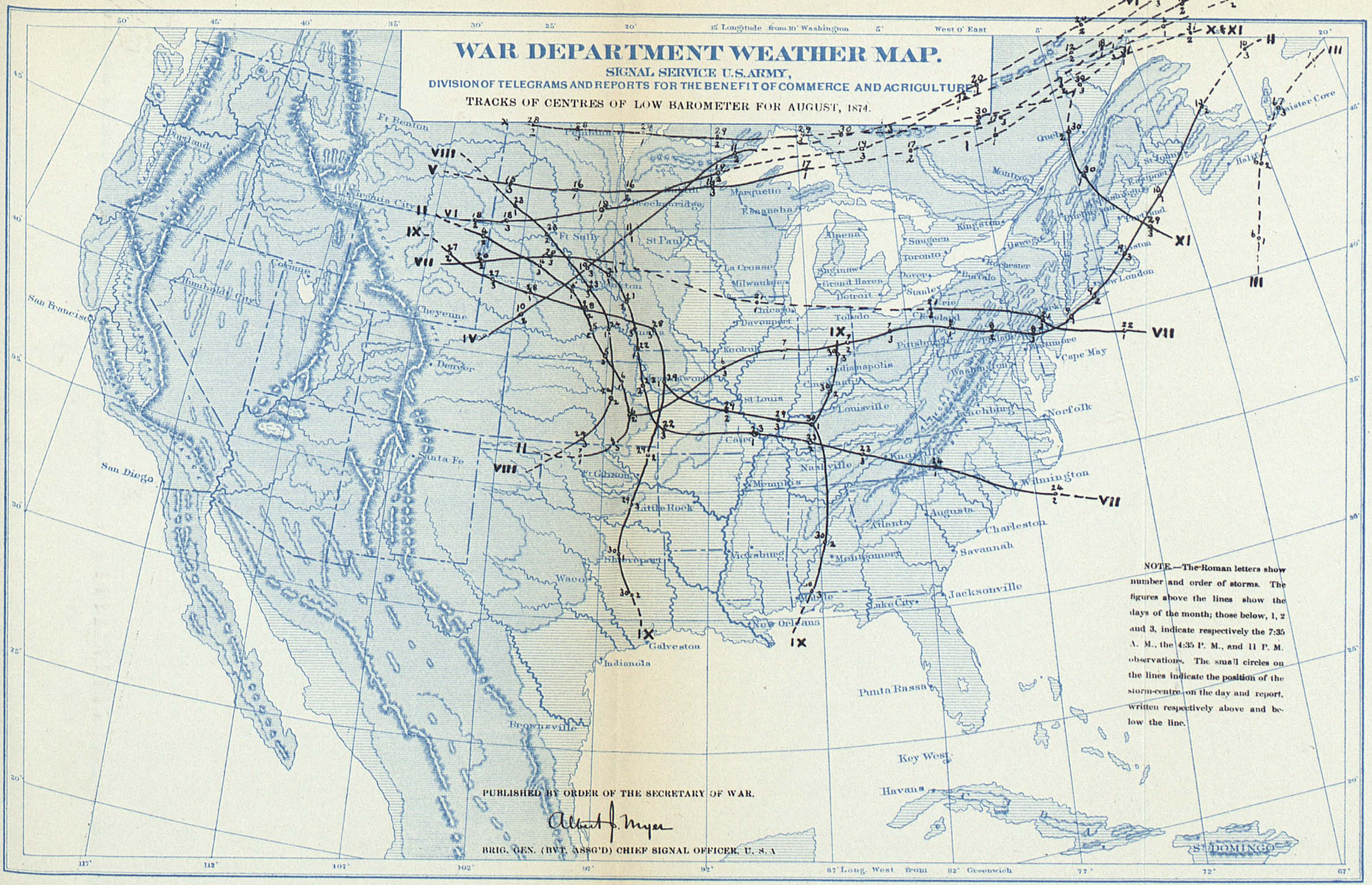
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF CENTRES OF LOW BAROMETER FOR AUGUST, 1874.



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Lake region on the 24th, moved over New England and the Middle States on the 25th, and disappeared on the 28th in advance of depressions Nos. IX, X, and XI. On the 31st, the *fifth* moved southeastward over the Lake region, succeeding low barometers Nos. IX and X. The movement of these areas has been confined principally to the Lake region and the Atlantic States. They have been more prominent than heretofore for August, and have failed to reach the Southern and Western States, especially the Southwest and West, over which sections the barometer has continued low for longer periods than usual.

ATMOSPHERIC TEMPERATURE.

The curves, in red, upon Chart No. II, are the mean isothermal lines for the month. The table, upon the same, gives the average mean temperatures of the different geographical districts for August of this year, as well as those for a number of years. Throughout the Atlantic States it has been the coolest August for many years, and is explained by the movement of the areas of high barometers, with north and east winds, over these districts. In the Gulf States and northward to Ohio, Indiana, Illinois, Iowa, and Nebraska, it has been an extremely hot month, especially between the 4th and 14th, the thermometer ranging from 100° as high as 114° for several days at a time. In that portion west of the Mississippi the extreme heat continued for several weeks, and the mean temperature ranged from 1° to 8° above the average. This hot weathe, is intimately connected with and accounted for the deficiency in atmospheric pressurer producing southerly winds. On the Pacific coast the mean temperature is 2°.2 below, the average.

Frosts occurred on the 3d, 4th, and 5th in New York and New Jersey; on the 7th in Massachusetts; on the 17th in New Hampshire; on the 23d, 24th, 25th, 26th, 27th, and 28th in Connecticut, New York, Vermont, New Hampshire, Massachusetts and Maine

PRECIPITATION.

Chart No. III illustrates the distribution of the rain-fall for the month. The districts in which there has been an excess or a deficiency is apparent from an examination of the table upon the same. The decided excess for New England is principally due to the very heavy rains on the southern coast, produced by low barometer No. II. The deficiency in the Lower Lake region and the Ohio Valley gave rise to droughts during the latter part of the month. In the Gulf States the deficiency, with the heat, was sufficient in a great measure to injure the crops. From Northern Texas northward to Nebraska and Iowa the extreme dryness, excessive heat, and grasshoppers at many places, destroyed all vegetation. On the Pacific coast the rain-fall has been about the average.

The number of days on which rain fell during the month averages: in New England, eight; in the Middle Atlantic States, nine; in the South Atlantic States, eleven; in the Gulf States, eight; in the Lower Lake region, five; in the Upper Lake region, nine; in the Ohio Valley and Tennessee, eight; in the Upper Mississippi Valley, eleven; in the Lower Missouri Valley, nine; in Minnesota, fifteen.

Hail fell at Troy, N. Y., on the 2d; on the "divide," between Denver and Colorado Springs, Colo., as large as walnuts, on the 3d; at Jamestown, N. Y., on the 7th; at Indianapolis, Ind., on the 7th and 9th; at Spartansburgh, S. C., Weldon and Mount Pleasant, N. C., on the 8th; at Greensboro, N. C., Rochester and Benton Centre, N. Y., on the 12th; at Lunenburgh, Vt., on the 12th and 30th; at Mount Solon, Va., on the 21st; at Pomaria, S. C., on the 24th; at Castalian Springs, Tenn., on the 29th. On Pike's Peak, Colo., rain, hail, sleet, and snow fell frequently, and often during the same storm, in succession.

HUMIDITY.

The percentages of relative humidity for the various sections average as follows: on the Gulf and South Atlantic coasts, .73; on the New England coast, .74; on the New Jersey coast, .77; in the interior of the Middle States, .66; in the Lower Lake region, .65; in the Upper Lake region, .72; in the Ohio Valley, Tennessee, and the Mississippi Valley, from Dubuque to Vicksburg, .60; in the Lower Missouri Valley, .61; in Minnesota, .74; at the Rocky-Mountain stations, (excepting Pike's Peak,) .38.

WINDS.

The arrows upon chart No. II show the prevailing winds for the month. As usual they are from the high towards the low barometer. It is most perceptible in the Mississippi Valley and westward, where the barometric gradient is the steepest, and no effect from land and sea breezes. On the Atlantic coast the prevailing winds have been from the north and east. As the high winds and gales have accompanied the movement of low barometers, they are spoken of under that heading.

The average total atmospheric movement, independent of direction, has been as follows in the several districts: New England, 4,180 miles; Middle Atlantic coast, 7,360; interior of the Middle Atlantic States, 4,306; South Atlantic coast, 4,587; Gulf coast, 5,120; Ohio and Lower Mississippi Valleys, Tennessee and the interior of the Gulf and South Atlantic States, 3,359; Lower Lake region, 4,963; Upper Lake region, 5,675; Upper Mississippi Valley, 4,991; Missouri Valley, 5,386.

NAVIGATION.

On Chart No. III is given a table of the highest and lowest water marks during the month. The Red River has continued falling during the entire month, and was remarkably low at its close, rendering navigation difficult. The Lower Missouri, Mississippi, and Ohio Rivers experienced slight changes, and were lower at the end of the month than at the beginning. The Cumberland at Nashville fell steadily until the 22d, when it was very low, but rose sixteen feet during the last week. The only freshets reported were in Southern New England, resulting from the heavy rains of the 8th and 9th.

TEMPERATURE OF WATER.

Upon Chart No. III will be found a table giving the maximum and minimum temperatures, at the bottom, at stations on the coast, lakes, and rivers. The average range has been: in the upper lakes, 11°; in Lake Erie, 12°; in the Upper Mississippi, 14°; in the Lower Missouri, 7°; in the Ohio, 15°; on the South Atlantic coast, 11°; on the Middle Atlantic coast, 7°; on the New England coast, 7°.

For the purpose of comparing the temperatures of water and air, (observations made at 3 p. m., daily,) the following table of averages is added:

Average temperatures, August, 1874.	New England coast.	Middle Atlantic coast.	South Atlantic coast.	Gulf coast.	Lake Erie.	Alpena, (Lake Huron.)	Lake Michigan.	Lake Superior.	Ohio River.	Cumberland, (Nashville.)	Upper Mississippi.	Lower Missouri.	San Francisco.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Maximum of water	62	78	85	90	79	73	72	57	88	84	83	81	61
Maximum of air	81	93	95	100	90	83	91	87	99	104	98	102	71
Minimum of water	55	70	74	80	67	64	60	56	73	73	71	74	58
Minimum of air	48	55	61	73	49	45	50	54	56	66	59	56	51

ELECTRICAL PHENOMENA.

In addition to thunder-storms spoken of under previous headings, there were strong ground-currents on the telegraph-line connecting Colorado Springs with the summit of Pike's Peak, Col., on the evening of the 1st. Frequent lightning was observed on the same line during the month. On the 3d heavy snow accompanied a heavy thunder-storm on Pike's Peak, from which station thunder-storms are reported as having occurred almost daily. Thunder or lightning, or both, were more frequent in the Southern and Western States, especially the latter, than in other sections.

Auroras were observed in the most northern States; that of the 14th at places in Vermont, New York, Michigan, and Wisconsin as an auroral arch.

OPTICAL PHENOMENA.

Solar halos.—Those reported most frequently are as follows: On the 4th, in Illinois; 6th and 7th, in Georgia and Maine; 9th, in New York and Ohio; 17th and 18th, in Georgia and Massachusetts; 19th and 20th, in Alabama, Georgia, Pennsylvania, New Hampshire, Massachusetts, and Maine; 22d, in Maine and New Hampshire; 23d in Kansas, Nebraska, and New Hampshire; 25th, in Massachusetts, New Hampshire, New York, and Michigan; 26th, in Iowa, Illinois, Wisconsin, Ohio, Pennsylvania, and Newfoundland; 28th, in Maine and Massachusetts; 29th, in Maine, New York, Pennsylvania, and Michigan.

Lunar halos were seen at more than one station in Maine, New York, Indiana, and Iowa on the 25th; in Georgia, Ohio, and Indiana on the 26th; in Georgia, South Carolina, and Pennsylvania on the 27th.

MISCELLANEOUS.

Meteors have been reported as seen in large numbers during the first half of the month, and principally in the Northern States. The dates upon which they were most frequent are the 1st, 2d, 3d, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, and 13th, particularly

the 7th, in Florida, Texas, Missouri, Wisconsin, Iowa, Michigan, Illinois, Indiana, Virginia, Pennsylvania, New York, New Jersey, and Maine.

Earthquakes were felt at Clifton, San Bernadino County, Cal., during the evening of the 3d, light shock from the east; at the following points in the West Indies about noon of the 8th, but without any damage: Saint Kitts, very heavy shock, Antigua, sharp shock, and Saint Thomas, smart shock with a long rumbling before and after; at El Monte, Los Angelos County, Cal., on the 20th, rumblings of distant earthquake heard; on the 24th, mutterings in the ground during the morning; on the 25th, mutterings at intervals during the morning.

The water in Lake Champlain, at West Charlotte, Vt., has been two feet above the August average.

At Marquette, Mich., out of ninety-three observations made upon the rise and fall of the surface of the water in the lake, it acted with the barometer forty-one times and contrary to it fifty-two times.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 48½.

MONTHLY WEATHER REVIEW, SEPTEMBER, 1874.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTORY.

The Monthly Weather Review for September is based upon reports from 442 stations, classified principally as follows:

Canadian Meteorological Service	14
United States Army Signal-Service	92
United States Army-Surgeons	45
United States Naval Hospitals	5
Volunteer Observers	286

Together with numerous extracts from logs of vessels. Destructive storms have not been numerous; the single prominent exception was No. XIII, which was only destructive in its passage from Florida to North Carolina.

The weather, in general, for the month, has been marked only by the not unusual features of droughts in some portions of the country, while other portions have experienced unusually heavy rains. These latter regions are well shown by the heavily-shaded spots on Map No. III, in Texas, the Missouri and Mississippi Valleys, and the Middle Atlantic States. Portions of Ohio, Indiana, and Illinois still continue to report a deficiency of rain-fall, thus prolonging the dry season in that region, to the great detriment of agriculture.

BAROMETRIC PRESSURE.

1. *In general.*—The general distribution of barometric pressure is seen from the isobars on Map No. II, where it appears that the highest average, 30.10, pertains to the Middle Atlantic, between Capes Hatteras and Cod, whence the pressure steadily diminished to 29.90 in Dakota. The mean 29.90 for the southern end of California seems low for that region.

2. *Areas of low barometer.*—The tracks pursued by the areas of low pressure are given on Map No. I; further details are found in the following paragraphs. It will be seen that these have, as in previous years, been frequently pushed far to the west and north, but that the better-developed, severe cyclones Nos. I, III, IV, V, and XIII have pursued tracks differing but little from their normal courses.

Storm No. I. This small but well-marked cyclonic depression became first apparent on the 1st, near Nova Scotia, but kept to the eastward of that province, and passed beyond Cape Breton, without being accompanied by high winds on the land as far as reported. In its earlier course during the latter part of August, this storm may have passed near and to the northeast of the Bermudas.

No. II. This depression moved eastward over Lake Superior to the Gulf of Saint Lawrence, followed by an area of high barometer and generally accompanied by rain in the Lower Lake region and Saint Lawrence Valley. While this disturbance was central over the Gulf of Saint Lawrence, on the 3d, a belt of notable contrasts of tem-

perature extended from Iowa to New England, and severe gales were reported in Eastern Massachusetts, followed by rapidly-falling temperatures.

No. III. The brisk and high northeast winds that prevailed on the 3d on the western coast of Texas, appear to have been connected with the presence of a barometric depression in Northern Mexico, and which may originally have entered that country from the Pacific coast, as the barometer was below the average in Southern California during the preceding day. If a definite central area of depression existed on the 2d and 3d in Mexico and Texas, its location must have been approximately as given on the chart. The cyclonic character of the disturbance on the 4th is not well shown by our observations, but may reasonably be inferred from the severity of the gale which raged on the 4th and 5th from Galveston southward, and which resulted in a large destruction of property along that coast. The barometric disturbance undoubtedly spent itself, in great part, in Central Texas, where, however, the depression continued during the 7th, and on the 8th the existence of a storm-centre in the interior of Kansas became evident. This depression then continued its course northward to Manitoba, which it passed on the 10th.

No. IV. While the severe storm mentioned in the previous paragraph was moving northward into Texas, a similar and better developed cyclone was pursuing an almost parallel course about 1,500 miles to the eastward. The published weather-maps of the morning of the 7th show the existence of this storm a short distance southeast of Nova Scotia. Its previous history has been traced by means of the published logs of ocean-vessels, from which it appears that during the 5th the storm-centre passed a short distance southwest of the Bermudas, where the gale was quite severe; and on the 6th, recurved on its northward track, and that as early as the 2d instant its force was felt by a vessel in latitude 28° 10′ and longitude 55° 38′. The track given on Chart No. I may be regarded as a first approximate determination of its course, which, on the afternoon of the 7th, passed over Cape Breton Island. The lowest depression observed at Cape Breton was 28.75, which corresponds with the figures reported from ocean-vessels, by many of which the hurricane wind was described as being one of the most severe ever experienced.

No. V. The cyclone No. IV was immediately followed by No. V, which passed nearly midway between Cape Hatteras and the Bermudas on the 9th, producing high winds on the North Carolina coast. The path of this depression remained persistently some distance east of the Atlantic coast, but its centre must have passed quite near Cape Breton on the morning of the 11th.

No. VI. This depression was preceded by rain and low barometer, with southerly winds in Oregon on the 10th. It was itself first well defined on the afternoon of the 11th, when it was central in Minnesota. The cold northwesterly winds that followed in its rear gave rise to numerous rain-areas from Missouri to the Upper Lake region, while the barometric depression moved rapidly northeastward over Lake Superior and beyond our station.

No. VII. The origin of this depression during the 13th appears to have been similar to that of area No. III, the barometer having been reported quite low during the 11th in Southern California, and the existence of a depression in Northern Mexico and Western Texas, on the 12th and 13th, may be inferred from the prevailing winds. This depression was, however, but very feebly marked, as it moved eastward, and became more or less marked by the influence of depression No. VIII to the northward. On the afternoon of the 15th, however, No. VII became distinctly separate from No. VIII, and on the morning of the 16th was central in North Carolina, while northeast winds and heavy rains extended from that State northeastward to New England. The further history of this disturbance becomes very interesting, from the fact that an unexpectedly large area of high barometer moved into the Gulf of Saint Lawrence, whence a stream of air flowed steadily for over three days from the northeast along the Middle and East Atlantic coasts, bringing cloud and rain to all that region and causing the barometric depression to dwindle away and disappear as it moved *northwestward* into Central New York. The rains of the 15th, 16th, and 17th ended the drought which had prevailed for six weeks on the Middle and East Atlantic coasts.

No. VIII. This depression, of which but slight and uncertain traces are visible previous to the afternoon of the 13th, moved eastward into Upper Canada, where it was lost sight of on the 15th.

No. IX. The low barometric pressure that prevailed on the 14th and 15th from California to Texas, was probably the initiative of a disturbance that was central on that day in Montana and on the 16th in Dakota, whence it slowly moved into Manitoba, and thence apparently eastward.

No. X. This depression developed slowly in Kansas and Northern Texas on the 16th and 17th, and was well defined on the 18th, as it passed eastward over the Lower Missouri Valley into Illinois. On this day occurred the lowest barometer during the month in Kansas, New Mexico, Colorado, &c. In the southeastern portion of Iowa and the adjacent portions of Illinois and Missouri the wind and rain on the 18th were exceedingly severe, and much damage was reported. The course of this storm-centre

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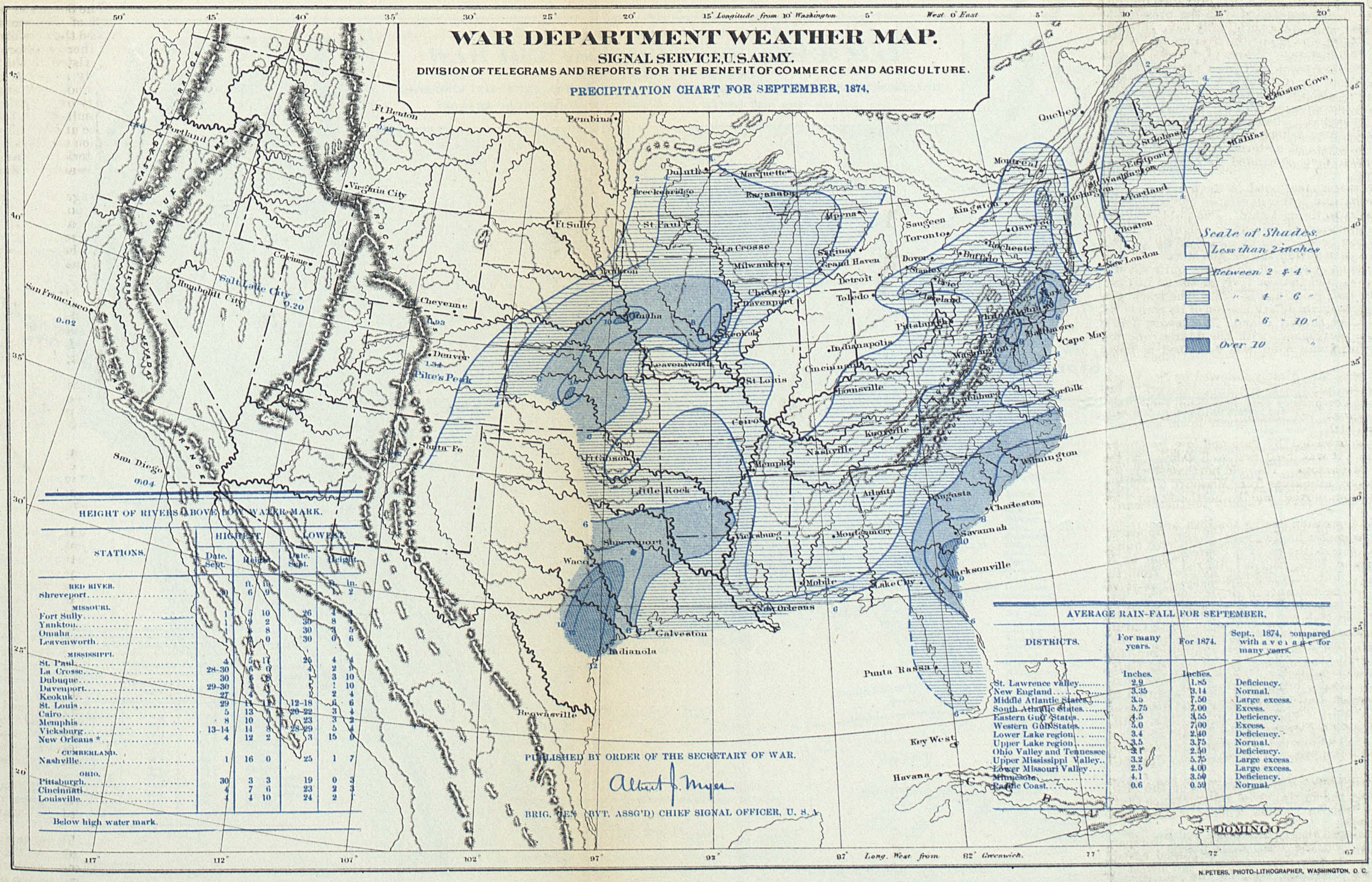

HEIGHT OF RIVERS ABOVE LOW WATER MARK.

STATIONS.	HIGHEST. Date. Sept.	Height. ft.	in.	LOWEST. Date. Sept.	Height. ft.	in.
RED RIVER.						
Shreveport	30	6	9		1	2
MISSOURI.						
Fort Sully	1	5	10	26	4	3
Yankton	1	9	2	30	8	1
Omaha	1	4	8	30	3	5
Leavenworth	1	2	0	30	0	6
MISSISSIPPI.						
St. Paul	4	5	11	25	4	4
La Crosse	28-30	6	0	4	2	9
Dubuque	30	6	8	1	3	10
Davenport	29-30	4	1	5	1	10
Keokuk	27	4	2	1	2	4
St. Louis	29	11	1	12-18	6	6
Cairo	5	13	5	20-22	3	4
Memphis	8	10	0	23	3	2
Vicksburg	13-14	11	8	28-29	5	4
New Orleans *	4	12	2	3	15	0
CUMBERLAND.						
Nashville	1	16	0	25	1	7
OHIO.						
Pittsburgh	30	3	3	19	0	3
Cincinnati	4	7	6	23	2	3
Louisville	4	4	10	24	2	1

* Below high water mark.

AVERAGE RAIN-FALL FOR SEPTEMBER.

DISTRICTS.	For many years. Inches.	For 1874. Inches.	Sept., 1874, compared with average for many years.
St. Lawrence valley	2.9	1.85	Deficiency.
New England	3.35	3.14	Normal.
Middle Atlantic States	3.5	7.50	Large excess.
South Atlantic States	5.75	7.00	Excess.
Eastern Gulf States	4.5	3.55	Deficiency.
Western Gulf States	5.0	7.00	Excess.
Lower Lake region	3.4	2.40	Deficiency.
Upper Lake region	3.5	3.75	Normal.
Ohio Valley and Tennessee	3.1	2.50	Deficiency.
Upper Mississippi Valley	3.2	5.75	Large excess.
Lower Missouri Valley	2.5	4.00	Large excess.
Minnesota	4.1	3.50	Deficiency.
Pacific Coast	0.6	0.59	Normal.

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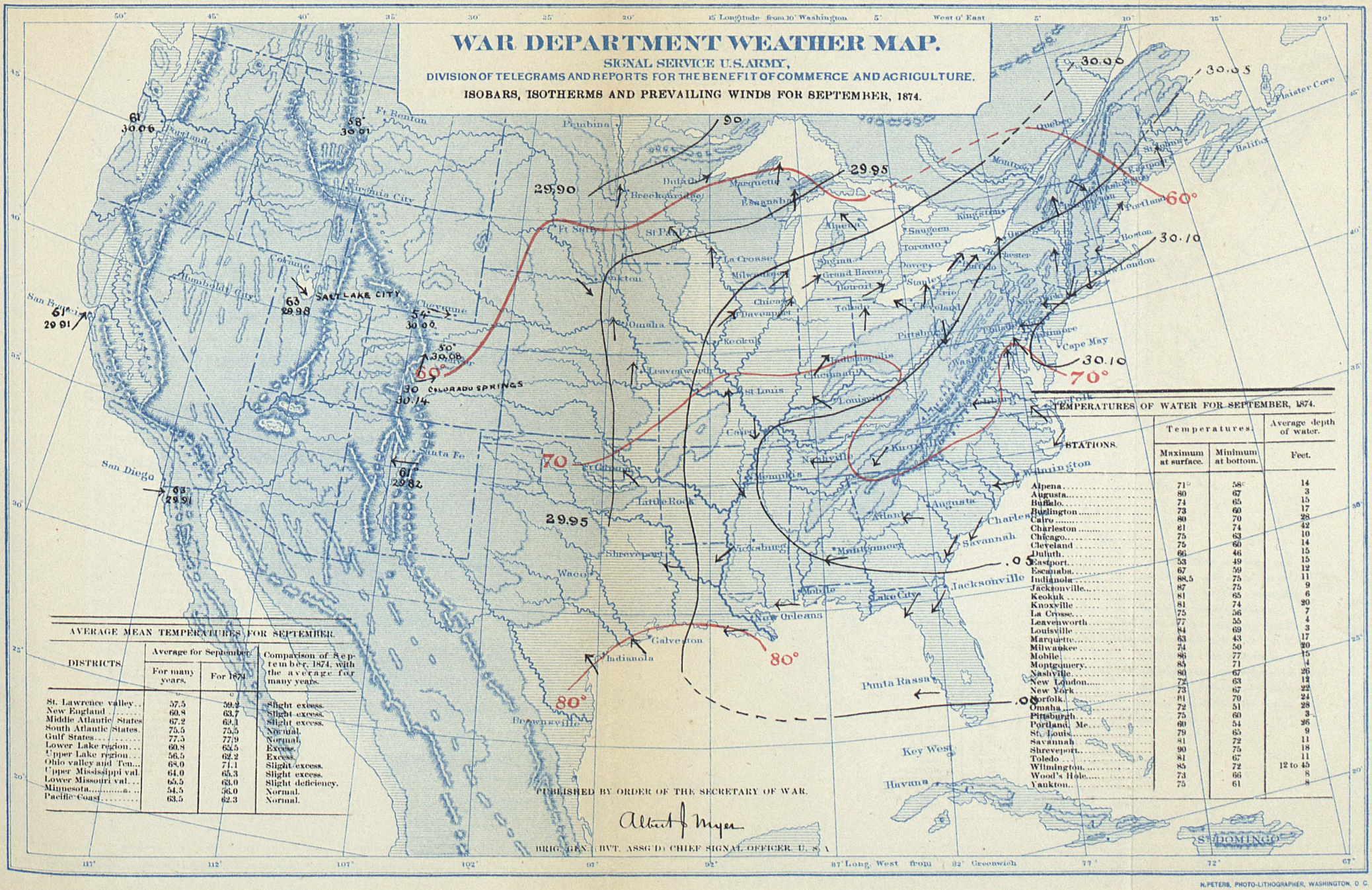
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ISOBARS, ISOTHERMS AND PREVAILING WINDS FOR SEPTEMBER, 1874.



AVERAGE MEAN TEMPERATURES FOR SEPTEMBER.

DISTRICTS	Average for September		Comparison of September, 1874, with the average for many years.
	For many years.	For 1874	
	°	°	
St. Lawrence valley	57.5	59.2	Slight excess.
New England	60.8	63.7	Slight excess.
Middle Atlantic States	67.2	69.1	Slight excess.
South Atlantic States	75.5	75.5	Normal.
Gulf States	77.5	77.9	Normal.
Lower Lake region	60.8	63.5	Excess.
Upper Lake region	56.5	62.2	Excess.
Ohio valley and Ten.	68.0	71.1	Slight excess.
Upper Mississippi val.	64.0	65.3	Slight excess.
Lower Missouri val.	65.5	63.0	Slight deficiency.
Minnesota	54.5	56.0	Normal.
Pacific Coast	63.5	62.3	Normal.

TEMPERATURES OF WATER FOR SEPTEMBER, 1874.

STATIONS.	Temperatures.		Average depth of water.
	Maximum at surface.	Minimum at bottom.	Feet.
Alpena	71°	58°	14
Augusta	80	67	3
Buffalo	74	65	15
Burlington	73	60	17
Cairo	80	70	28
Charleston	81	74	42
Chicago	75	63	10
Cleveland	75	60	14
Duluth	66	46	15
Eastport	53	49	15
Escanaba	67	59	12
Indianola	88.5	75	11
Jacksonville	87	75	9
Keokuk	81	65	6
Knoxville	81	74	20
La Crosse	75	56	7
Leavenworth	77	55	4
Louisville	84	69	3
Marquette	63	43	17
Milwaukee	74	50	20
Mobile	86	77	15
Montgomery	85	71	4
Nashville	80	67	26
New London	72	63	12
New York	73	67	22
Norfolk	81	70	24
Omaha	72	51	28
Pittsburgh	75	60	3
Portland, Me	60	54	26
St. Louis	79	65	9
Savannah	81	72	11
Shreveport	90	75	18
Toledo	81	67	11
Wilmington	85	72	12 to 45
Wood's Hole	73	66	8
Yankton	75	61	8

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

BRIG. GEN. BVT. ASS'G'D CHIEF SIGNAL OFFICER U. S. A.

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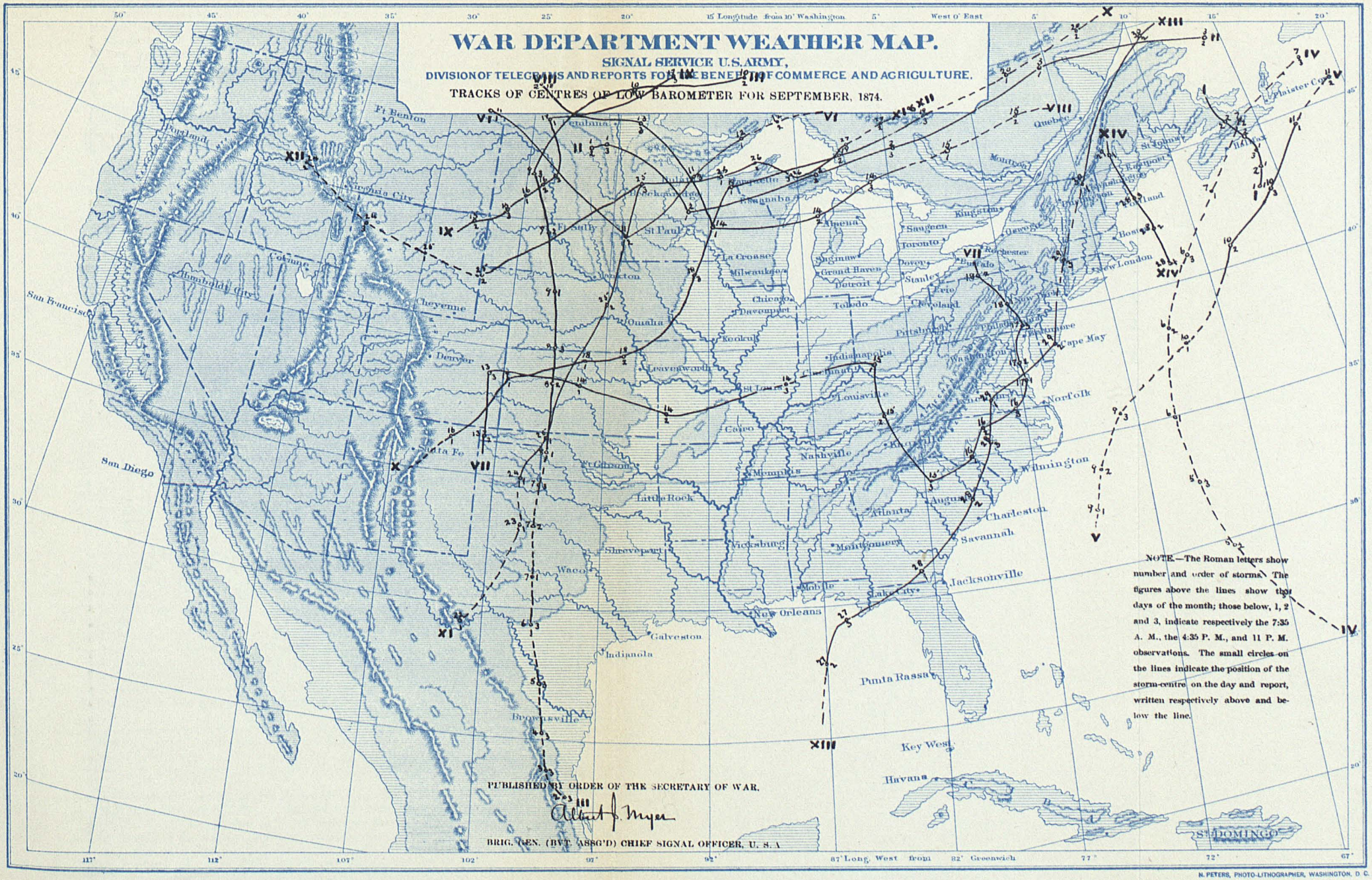
WAR DEPARTMENT WEATHER MAP.

SIGNAL SERVICE U.S. ARMY,

DIVISION OF TELEGRAPHS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

TRACKS OF CENTRES OF LOW BAROMETER FOR SEPTEMBER, 1874.



NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.

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BRIG. GEN. (BVT. ASS'G'D) CHIEF SIGNAL OFFICER, U. S. A.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

then turned northward over Upper Michigan into Canada, producing high southwest wind on Lakes Michigan, Erie, and Huron on the 19th.

No. XI. This disturbance was preceded by a low barometer in Southern California and probably southward over Mexico, but itself apparently had an origin on the border of Texas and Mexico on the 22d, in a manner similar to that of No. X, since it would appear that during the previous two days dry cold currents of air flowing southeastward from the extreme northwestern part of Texas underran and uplifted the warm air of the plains. On the 24th this area of low barometer passed northward over Indian Territory, and on the 25th united with No. XII, which had rapidly developed in Montana.

No. XII. The trough of low pressure that stretched during the 25th from Kansas to Manitoba had, by midnight of that day, contracted to a small area in Minnesota, which moved slowly eastward into Canada, developing a quite low central pressure, and accompanied by southerly winds and rain over the Lower Lakes on the 26th and 27th.

No. XIII. While No. XII threatened on the 26th to give rise to a very severe storm on the lakes, a notable cyclonic disturbance moved northeastward over the Gulf of Mexico, for whose early history no data have as yet been received. Its existence was first rendered evident by strong northeast winds on the Texas coast on the afternoon of the 25th, at which time the central depression must have been south of Louisiana and possibly nearer Yucatan or Mexico. During the nights of the 27th and 28th the center passed northeastwardly over Upper Florida to the coast of Georgia, pursuing a track medial between those followed by storms Nos. VI and VII of September, 1873. As the present cyclone passed along the Carolina coast on the 28th, it developed a force that has been very generally compared to the hurricane of 1854. The centre of this storm passed a short distance east of Charleston and west of Wilmington and Norfolk, crossing Chesapeake Bay on the morning of the 29th; here the violence of the winds sensibly diminished, while the barometric depression spread irregularly in various directions. After passing east of the New Jersey coast the storm seems to have turned northward through New England, and is lost sight of on the afternoon of the 30th at the mouth of the Saint Lawrence. The lowest reported barometric pressures at points near the track of the storm-center were as follows:

Lake City....	29.40	at 4	a. m., 28th.	Cape May.....	29.39	at 4.35	p. m., 29th.
Jacksonville..	29.42	at 7	a. m., 28th.	New York.....	29.37	at 11	p. m., 29th.
Savannah.....	29.40	at 9	a. m., 28th.	New Haven...	29.29	at 11.16	p. m., 29th.
Charleston....	29.06	at 1	p. m., 28th.	New London..	29.24	at 11.35	p. m., 29th.
Augusta.....	29.57	at 4	p. m., 28th.	Wood's Hole..	29.31	at 7	a. m., 30th.
Wilmington ..	29.15	at 6.15	p. m., 28th.	Boston	29.13	at 4	a. m., 30th.
Cape Henry ..	29.31?	at 11	p. m., 28th.	Portland.....	29.05	at 7.35	a. m., 30th.
Norfolk	29.41?	at 11	p. m., 28th.	Eastport.....	29.20	at 7	a. m., 30th.
Lynchburg...	29.47	at 11	p. m., 28th.	Father Point..	28.94	at 4.35	p. m., 30th.

The highest winds were: At Savannah, N.W., 36 miles; at Tybee Island, E., 60; at Charleston, E., 51, and N.W., 48; at Cape Hatteras, S.E., 75; at Wilmington, S.E., 45, and S.W., 50; at Cape Henry, 60 miles.

3. *Areas of high barometer.*—Of these areas the most notable has been No. V, which obtained its greatest development on the 18th, when it was probably central on the Gulf of Saint Lawrence.

No. I. This passed from British America on the 1st southeastward over the lakes to the Carolina coast on the 3d, followed by storm No. II on its northeastern boundary, and by the still higher pressure of the next paragraph.

No. II Is first reported in Oregon and British Columbia on the 2d. It moved southeastward over Dakota on the 3d to South Carolina and Georgia on the 8th. Clear, dry weather accompanied it over the greater part of the country, except the Texas coast, during that period.

No. III Began to press southward, over the Saint Lawrence Valley, on the 12th, and, after passing over New England, disappeared east of Cape Cod on the 15th.

No. IV Was, apparently, a western division of the same area of cold, dry air, and moved southeastward on the 12th over Dakota, disappearing on the 14th over the Lake region.

No. V Appears on the 14th as a continuation of No. IV, and extended, on the morning of that day, over the Upper Missouri Valley. It passed thence eastward to the Upper Lake region on the 16th, where it appears to have been re-enforced by further contributions from Hudson Bay and Labrador, forming an unusually extensive area of high pressure, whose centre was over the Gulf of Saint Lawrence on the 18th and 19th, where the barometric reading averaged 30.70 on the morning of the former day. The influence of this high barometer in producing continued easterly winds and rain on the New England and New Jersey coasts from the 15th to the 20th has already been alluded to.

No. VI. The extensive area of low pressure prevailing over the Lake region on the 18th and 19th seems not only to have drawn from the northward and eastward the air that produced the high barometer of the preceding section, but also induced a flow from the south and west that gave rise to No. VI, whose existence may be traced from the Ohio Valley on the morning of the 21st, backward to Indian Territory on the 19th, and forward over Maryland on the 22d to the Middle Atlantic coast, where traces of it still remained on the 26th.

No. VII. This area began, like the preceding one, in or near Texas, and, like it, its origin is attributable to the presence of an area of low pressure, (No. XIII,) which existed on the 27th in the Gulf of Mexico. Like it, also, the highest barometer at centre moved eastward, and was not remarkably conspicuous.

ATMOSPHERIC TEMPERATURE.

The isothermal lines, as given on Chart No. II, show the average distribution of temperature during the month, which are supplemented by the small table, which gives the mean temperatures for the different geographical divisions. The cool weather of August was gradually succeeded throughout the Middle Atlantic States and neighboring sections by hot weather, accompanying the drought, the influence of which is not fully seen in the average temperatures. The extremes of temperature reported from sections in Dakota, and adjoining sections, have been quite remarkable—very hot southerly winds being reported during the 2d and 9th, followed by frost on the 15th. Frosts were reported over extensive portions of the country on the 4th and 5th in New England; on the 15th and 16th, from Michigan and Illinois to Dakota; on the 20th, 21st, and 22d, from Massachusetts and Pennsylvania to Wisconsin; on the 28th, 29th, and 30th, from Ohio to Kansas and Minnesota; besides these, frosts were reported in portions of one or two States on the 8th, 10th, 12th, 14th, 19th, 23d, 25th, 26th, and 27th.

PRECIPITATION.

Map No. III gives the details of the total amount of rain-fall for the month over the entire country, and the accompanying table shows the districts in which there has been an excess or deficiency. Remarkable rain-falls occurred on the 3d, 4th, 5th, and 6th, in Texas, accompanying storm No. III, and in Iowa, Missouri, and Illinois, on the 18th, accompanying storm No. X. The heavy rain-fall of the Middle Atlantic States occurred, principally, on the 16th, 17th, and 18th, in connection with storm No. VII, and on the 29th in connection with No. XIII.

The drought in the Middle Atlantic and Southern New England States closed on the 15th, after lasting about six weeks; that in Central New York closed on September 3d; that in Tennessee, Ohio, and Indiana, and portions of Illinois and Iowa, has been only in a slight degree abated by the light rains in those States.

The distribution of the number of rainy days exhibits, in some respects, a notable contrast to the distribution of the number of cloudy days. The greatest number of rainy days is reported from the Gulf coast, especially Florida and Texas, while the numbers reported from portions of Illinois, Iowa, Nebraska, and Michigan are but little lower. The minimum number of rainy days for the country east of the Rocky Mountains appears in the interior of New England and the basin of the Ohio. The number of cloudy days is decidedly greater on the Middle and East Atlantic coasts, reaching a maximum in Maine. The region of minimum cloudiness, averaging five or six days during the month, extends from Ohio and Illinois southward to the Gulf States.

RELATIVE HUMIDITY.

The relative humidity averages about seventy-five per cent. throughout the Gulf and Atlantic States, and diminishes as we proceed inward toward the Ohio Valley to sixty-two per cent. The averages for the Upper Lake region are seventy or seventy-five, and for the Lower Lakes about two per cent. less.

PREVAILING WINDS.

The prevailing winds exhibit, in general, a complete accord with the law according to which they should blow outward from the regions of greatest pressure. The latter region being off the Middle Atlantic coast, we find northeast winds prevailing over the South Atlantic and Gulf States, but southerly winds over Maine, Vermont, and New York. The low barometer in the Northwest has evidently determined the southerly courses of the winds from Texas to the Upper Lake region, and has had an equal influence on the northerly direction of the winds prevailing in Western Dakota. The total movement of the atmosphere irrespective of the direction has been a minimum at Memphis, and less than usual, namely, from fifteen hundred to four thousand miles, over

Kentucky and Tennessee, and the greater portion of the States adjoining these on all sides. The greatest total movements, viz, from seven thousand to ninety-five hundred, are reported from the Texas and Middle Atlantic coasts. The maximum winds have already been mentioned in connection with the respective storms.

NAVIGATION.

On Chart No. III is given a table of the highest and lowest stages of the rivers during the month. The fluctuations have, in general, been very slight, the greatest range being that at Cairo, 10 feet. On the whole, the Missouri River, the Ohio, and the Lower Mississippi were lower during the latter part of the month than at the beginning. Destructive freshets have nowhere been reported, notwithstanding the heavy local rains reported in the Lower Missouri Valley and the Middle Atlantic coast.

TEMPERATURES OF WATER.

The observed water-temperatures have been as follows:

	Surface maximum.	Bottom minimum.
Lower Missouri River	72° to 79°	51° to 65°
Upper Mississippi River	75 to 81	65 to 66
The Red River	90	75
The Ohio River	75 to 80	60 to 70
The Gulf coast	88.5	75
South Atlantic coast	81 to 85	72 to 75
From Cape Hatteras to Cape Cod	72 to 81	63 to 70
Cape Cod to Eastport	53 to 75	49 to 66
Lake Erie	74 to 81	60 to 67
Lake Michigan	67 to 75	50 to 63
Lake Superior	63 to 66	43 to 46

In general, it will be noticed that the ranges of temperature are greatest in the Upper Lakes and the Missouri River, and least on the coast of Maine.

ATMOSPHERIC ELECTRICITY.

1. *Thunder and Lightning.*—The diminution in frequency of thunder and lightning storms during the latter part of the month has been very notable. The days of most numerous local storms, covering the greatest extent of territory, appear to have been 5th, 8th, 11th, 12th, 17th, 18th, and 26th. By far the greater number of these storms have occurred in the South Atlantic States, Mississippi Valley, and the Southwest, and a much smaller number in the Ohio Valley, Lower Lakes, Middle and Eastern States.

2. *Auroras.*—The auroral displays during September have generally been faint, although not less numerous than usual. They have been noted on the 3d, 4th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 15th, 17th, 21st, 23d, 26th, 27th, and 30th, and, as in previous months, the general relationship between auroras and thunder-storms has been well marked. The only auroras reported from more than one station were those of the 7th, seen in Maine, New York, Wisconsin, and Dakota. The 8th, seen in Dakota, Iowa, and Michigan. The 11th, seen in Maine, Wisconsin, Dakota, and Iowa. The 12th, seen in Maine, New Hampshire, Vermont, Massachusetts, New York, Michigan, Ohio, Indiana, Tennessee, and Dakota; and the 13th, seen in Massachusetts and Michigan.

OPTICAL PHENOMENA.

1. *Solar halos.*—Solar halos have been observed principally during the latter portion of the month. Those that are reported by more than one observer are as follows: On the 6th, in New Hampshire, New York, and Pennsylvania. On the 21st, in Ohio and Vermont. On the 23d, in Kansas and North Carolina. On the 24th, in Massachusetts, New Jersey, Virginia, North Carolina, Tennessee, Ohio, Indiana, and Illinois.

2. *Lunar halos.*—Lunar halos have also been observed, principally during the latter portion of the month, and as usual appear over nearly the same regions in which solar halos are observed; the former are, however, much more fully reported. The halos recorded by two or more observers are as follows: 11th, in Vermont and Indiana; 19th, in Indiana, Illinois, and Iowa; 21st, in Massachusetts, New York, New Jersey, and Ohio; 22d, in Louisiana, Indiana, and Pennsylvania; 23d, in Pennsylvania, Indiana, Illinois, Iowa, Kansas, North Carolina, and Texas; 24th, in Vermont, Pennsylvania, North Carolina, Alabama, Ohio, Illinois, Michigan, Iowa, Missouri, and Nebraska; 25th, in Vermont, Tennessee, Ohio, and Michigan; 26th, in New York, North Carolina, Georgia, and Illinois; 28th, in Vermont, New York, and Mississippi.

MISCELLANEOUS PHENOMENA.

1. *Forest and prairie fires.*—The general dryness of the country has materially contributed to the prevalence of forest-fires during the first half of the month. These have been reported as extensive in New Jersey from the 12th to the 15th, and in Upper Canada from the 10th to the 16th. The resulting wide-spread smoke and haze was noted on the following dates: on the 1st, 2d, and 3d in Maine, Massachusetts, New York, New Jersey, Virginia, and Ohio; from the 10th to the 15th inclusive, in Maine, Massachusetts, New York, New Jersey, Virginia, Pennsylvania, Ohio, and Illinois.

2. *Migration of birds.*—The northward flight of wild geese was observed on the 6th in Colorado; 12th and 22d in Iowa; 27th, in Kansas. That of wild pigeons was observed on the 28th in Kentucky.

3. *Unusually light meteors* were observed on the 1st, 2d, 3d, 4th, 5th, 6th, 8th, 10th, 14th, 15th, 21st, 23d, 27th, 29th, and 30th. Of these, those of the 1st, 4th, 6th, 10th, 14th, and 27th were not reported from two or more stations.

Published by order of the Secretary of War.

ALBERT J. MYER,
Brig. Gen., (Brt. Assig'd,) Chief Signal-Officer, U. S. A.

PAPER 49.

Table showing stations inspected, by whom, and when inspected.

Stations.	Name of inspector.	Date.
Albany, N. Y	First Lieut. F. C. Grugan, acting signal-officer	July 1-4, 1874.
Alpena, Mich	do	Aug. 11, 1874.
Atlantic City, N. J	Second Lieut. D. J. Gibbon, acting signal-officer	Mar. 28-30, 1874.
Augusta, Ga	First Lieut. A. W. Greely, acting signal-officer	Dec. 13-16, 1873.
Baltimore, Md	Second Lieut. Theodore Smith, acting signal-officer	Jan. 27, 28, 1874.
Bangor, Me	Second Lieut. D. J. Gibbon, acting signal-officer	Mar. 3, 4, 1874.
Barnegat, N. J	do	Mar. 27, 28, 1874.
Boston, Mass	do	Feb. 19-25, 1874.
Breckenridge, Minn	do	May 13-15, 1874.
Buffalo, N. Y	First Lieut. F. C. Grugan, acting signal-officer	July 18, 1874.
Burlington, Vt	First Lieut. A. W. Greely, acting signal-officer	Oct. 7-10, 1873.
Cairo, Ill	Second Lieut. Theodore Smith, acting signal-officer	Jan. 7, 8, 1874.
	First Lieut. F. C. Grugan, acting signal-officer	Sept. 23, 1874.
Cape May, N. J	Second Lieut. D. J. Gibbon, acting signal-officer	Mar. 31 to Apr. 2, 1874.
Charleston, S. C	First Lieut. A. W. Greely, acting signal-officer	Dec. 10, 13, 1873.
Cheyenne, Wyo	Second Lieut. D. J. Gibbon, acting signal-officer	Aug. 2-5, 1874.
Chicago, Ill	First Lieut. F. C. Grugan, acting signal-officer	Aug. 29, 1874.
Cincinnati, Ohio	Second Lieut. Theodore Smith, acting signal-officer	Dec. 21-25, 1873.
	First Lieut. F. C. Grugan, acting signal-officer	Sept. 6, 1874.
Cleveland, Ohio	do	July 25, 1874.
Colorado Springs, Colo	First Lieut. A. W. Greely, acting signal-officer	Feb. 24 to Mar. 4, 1874.
Davenport, Iowa	Second Lieut. D. J. Gibbon, acting signal-officer	Apr. 25-28, 1874.
Denver, Colo	First Lieut. A. W. Greely, acting signal-officer	Mar. 5-12, 1874.
Detroit, Mich	First Lieut. F. C. Grugan, acting signal-officer	Aug. 3, 1874.
Dubuque, Iowa	Second Lieut. D. J. Gibbon, acting signal-officer	Apr. 29 to May 1, 1874.
Duluth, Minn	do	May 6-8, 1874.
Eastport, Me	do	Mar. 6-9, 1874.
Erie, Pa	First Lieut. F. C. Grugan, acting signal-officer	July 23, 1874.
Escanaba, Mich	do	Aug. 20, 21, 1874.
Fort Gibson, Ind. T	First Lieut. A. W. Greely, acting signal officer	Feb. 18-20, 1874.
Fort Sully, Dak	Second Lieut. D. J. Gibbon, acting signal-officer	June 9-11, 1874.
Galveston, Tex	First Lieut. A. W. Greely, acting signal-officer	Jan. 31 to Feb. 5, 1874.
Grand Haven, Mich	First Lieut. F. C. Grugan, acting signal-officer	Aug. 14, 1874.
Indianapolis, Ind	Second Lieut. Theodore Smith, acting signal-officer	Dec. 26-29, 1873.
	First Lieut. F. C. Grugan, acting signal-officer	Sept. 1-5, 1874.
Indianola, Tex	First Lieut. A. W. Greely, acting signal-officer	Feb. 1, 2, 1874.
Jacksonville, Fla	do	Dec. 22-25, 1873.
Keokuk, Iowa	Second Lieut. D. J. Gibbon, acting signal-officer	Apr. 21-24, 1874.
Key West, Fla	First Lieut. A. W. Greely, acting signal-officer	Jan. 1-4, 1874.
Knoxville, Tenn	do	Apr. 2-5, 1874.
La Crosse, Wis	Second Lieut. D. J. Gibbon, acting signal-officer	May 1, 2, 1874.
Lake City, Fla	First Lieut. A. W. Greely, acting signal-officer	Dec. 20, 22, 1873.
Leavenworth, Kans	do	Mar. 14-20, 1874.
Logansport, Ind	First Lieut. F. C. Grugan, acting signal-officer	Aug. 30, 31, 1874.
Louisville, Ky	Second Lieut. Theodore Smith, acting signal-officer	Dec. 30, 1873, to Jan. 2, 1874.
	First Lieut. F. C. Grugan, acting signal-officer	Sept. 24, 1874.
Lynchburg, Va	First Lieut. A. W. Greely, acting signal-officer	Apr. 8-10, 1874.
Marquette, Mich	First Lieut. F. C. Grugan, acting signal-officer	Aug. 22, 1874.
Memphis, Tenn	Second Lieut. Theodore Smith, acting signal-officer	Jan. 9-12, 1874.
Milwaukee, Wis	First Lieut. F. C. Grugan, acting signal-officer	Aug. 19, 1874.

Table showing stations inspected, by whom, and when inspected—Continued.

Stations.	Name of inspector.	Date.
Mobile, Ala	First Lieut. A. W. Greely, acting signal-officer	Jan. 20–23, 1874.
Montgomery, Ala	do	Jan. 24–27, 1874.
Mount Washington, N. H.	do	Oct. 2–4, 1873.
Nashville, Tenn	Second Lieut. Theodore Smith, acting signal-officer	Jan. 3–6, 1874.
New Haven, Conn	First Lieut. A. W. Greely, acting signal-officer	Oct. 29 to Nov. 3, 1873.
New London, Conn	do	Oct. 22–28, 1873.
	Second Lieut. D. J. Gibbon, acting signal-officer	Mar. 11, 12, 1874.
New Orleans, La	Second Lieut. Theodore Smith, acting signal-officer	Jan. 16–19, 1874.
New York, N. Y	First Lieut. A. W. Greely, acting signal-officer	Nov. 3–12, 1873.
	Second Lieut. D. J. Gibbon, acting signal-officer	Mar. 13–23, 1874.
Norfolk, Va	First Lieut. A. W. Greely, acting signal-officer	Dec. 2–5, 1873.
Omaha, Neb	Second Lieut. D. J. Gibbon, acting signal-officer	June 16–25, 1874.
Oswego, N. Y	First Lieut. F. C. Grugan, acting signal-officer	July 6–11, 1874.
Peck's Beach, N. J	Second Lieut. D. J. Gibbon, acting signal-officer	Mar. 30, 31, 1874.
Pembina, Dak	do	May 24–26, 1874
Philadelphia, Pa	First Lieut. A. W. Greely, acting signal-officer	Nov. 11–15, 1873.
Pike's Peak, Colo	do	June 6–8, 1874.
Pittsburgh, Pa	Second Lieut. Theodore Smith, acting signal-officer	Dec. 18–20, 1873.
Portland, Me	Second Lieut. D. J. Gibbon, acting signal-officer	Feb. 25 to Mar. 2, 1874.
Portland, Oreg	do	Aug. 19–22, 1874.
Punta Rassa, Fla	First Lieut. A. W. Greely, acting signal-officer	Jan. 6–9, 1874.
Rochester, N. Y	First Lieut. F. C. Grugan, acting signal-officer	July 13–17, 1874.
Saint Louis, Mo	First Lieut. A. W. Greely, acting signal-officer	Mar. 24, 1874.
	First Lieut. F. C. Grugan, acting signal-officer	Sept. 17, 1874.
Saint Paul, Minn	Second Lieut. D. J. Gibbon, acting signal-officer	May 4, 5, 9–12, 1874.
Salt Lake City, Utah	do	Aug. 6–9, 1874.
San Diego, Cal	do	Sept. 5–7, 1874.
Sandy Hook, N. J	do	Mar. 23, 24, 1874.
San Francisco, Cal	do	Aug. 12–15, 1874.
Savannah, Ga	First Lieut. A. W. Greely, acting signal-officer	Dec. 16–19, 1873.
Shreveport, La	do	Feb. 6–8, 1874.
Springfield, Mass	Second Lieut. D. J. Gibbon, acting signal-officer	Feb. 18, 19, 1874.
Squan Beach, N. J	do	Mar. 25, 26, 1874.
Toledo, Ohio	First Lieut. F. C. Grugan, acting signal-officer	July 29, 1874.
Vicksburg, Miss	Second Lieut. Theodore Smith, acting signal-officer	Jan. 14–16, 1874.
Wilmington, N. C	First Lieut. A. W. Greely, acting signal-officer	Dec. 6–9, 1873.
Wood's Hole, Mass	do	Oct. 14–17, 1873.
Wytheville, Va	do	Apr. 7, 1874.
Yankton, Dak	Second Lieut. D. J. Gibbon, acting signal-officer	June 13–15, 1874.

PAPER 50.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE
BENEFIT OF COMMERCE AND AGRICULTURE,
Washington, D. C., ——— —, 187—.

Sergeant ——— ———:

Observer Signal-Service, U. S. A., ———:

SERGEANT: The following instructions are furnished for the information and guidance of all observer-sergeants in charge of sea-coast stations upon the signal telegraph line extending from this Office to the coast of New Jersey:

I.—GENERAL DUTIES OF THE COAST SIGNAL-SERVICE.

Officers and enlisted men, or others of the Signal Service, employed upon sea-coast service at Light-Houses, Life-saving Stations, or points of observation, are charged with the following duties:

First. To make direct to the Chief Signal-Officer, for the information of the War, Treasury, or Navy Department, reports of all occurrences of important interest to any service of the United States.

Second. To report especially all meteoric changes and indications of approaching storms.

Third. To display, note, and exchange all necessary signals.

Fourth. To maintain necessary official communication along the coasts between the different services, and between the different coasts and Washington.

To enable the officers, non-commissioned officers, or enlisted men of the Signal Service to render with the greatest promptness the reports of information required of them, the officers and employés of other Services are requested to report to them with the least delay all important occurrences coming within the scope of the coast service.

II.—STATION-CALLS.

Signal-Office, Washington	S. O.
Cape Hatteras	H.
Baltimore	Br.
Philadelphia	Ch.
Long Branch	U. S.
Sandy Hook	H.
Squan Beach	K.
Barnegat	Di.
Cape Henry	C.
Norfolk	X.

III.—SIGNALS.

1. Wait a minute.
4. Start me.
7. Are you ready?
8. Busy on other wire.
9. Test.
13. Do you understand?
18. What's trouble?
27. Adjust your magnet.
134. Who is writing?

Operators must in all cases give way for the signal 9.

IV.—TELEGRAPHIC REGULATIONS.

1. Each operator will have a private signal, (generally the initial letter of his name,) which must be given after the "O. K." to all telegrams received or sent.

2. Before opening the circuit, each operator must carefully adjust his relay and be certain that no other person is using the line.

3. All calls must be answered promptly.

4. The order in which the several stations shall occupy the wire for the transmission of reports and other business will be indicated by the Sergeant in Charge of the station at this Office.

The Sergeant will also have general supervision over the whole line, and his orders given by proper authority will be obeyed at all stations upon it.

Struggling for the circuit will not be permitted. Each man must take his regular turn in sending reports.

5. An operator will be on duty daily at each station from 7 a. m. until receipt of "Good-night" from this Office. At stations where the Sergeant has an Assistant, the hours of duty will be equally divided between himself and assistant, and so arranged that the night-work shall be done alternately.

6. Messages for transmission must be written on Blank No. 2.

7. The date and time at which a message is received for transmission must in all cases be plainly written by the receiver upon the margin of the message.

8. The following rules must be observed in counting words in all messages: All words will be counted, except the *date* and *place* at which the message is filed. Names of cities and places, when used to designate such cities or places, will be counted as one word—for example: New Orleans, New York, West Troy. Words connected by a hyphen, as found in Webster's Dictionary, will be counted as one word. Examples: To-day, Rail-road, Head-quarters, Aid-de-camp.

Names of persons and places, when given to things, must be counted according to the number of distinct words in each. Examples—Names of steamers: "Isaac Newton," two words; "Maid of the Mist," four words. Names of hotels: "Burnett House," two words; "United States Hotel," three words.

When there are prefixes to surnames, such as Van, Mac, or Mc, Saint or St., &c, the whole name is to be counted as one word.

9. Every message sent by telegraph must be checked at the end with the number of words it contains.

10. The receiving operator will count the number of words in each message received, and assure himself that it agrees with the check of the sending operator before giving his "O. K."

11. Messages may be shown to the senders or receivers upon personal application, or to a third person, upon their written order, and they may be allowed to make copies of the messages; but in all cases the sender or receiver, or the signature to the order, must be well known or fully identified by the operator.

12. Care must be taken in preserving and filing away messages which have been transmitted, in order to make reference thereto easy and expeditious.

13. The Sergeant in Charge of the Long Branch office must test wires daily and ascertain the location of any interruption to the circuit, and give directions for making necessary repairs, and will have immediate supervision over the line from Sandy Hook to Barnegat. Observers at intermediate stations will report to, and promptly obey any instructions from, him in reference to this duty. All necessary repairs must be made with as little delay as practicable.

14. Observers at terminal stations will be held strictly responsible for the good condition of their batteries, which must never be wholly taken down, but cleaned and renewed by sections.

15. All messages must be transmitted precisely as they are received. No abbreviations will be used.

16. Observers will use extra caution in the transmission of proper names. The names must be written slowly, and double the usual space made between the initials.

17. In working with inexperienced operators, the words must be written slowly and plainly, and the sender assured that the message is understood.

18. When calling an office, the office calling will sign the office-signal at short intervals.

19. When leaving the office temporarily, or for the night, the main line will be cut off from the instrument. This, however, must never be done without examining the switch or cut-off, to be sure that the circuit is complete through it.

20. The ground-wire, at intermediate offices, must never be used, except in cases of breaks in the wire, and then only long enough to enable an office to do the business in hand, after which it must be instantly removed.

21. The ground-wire must never be used as a protection against lightning. During thunder-storms the main wire should be securely cut off from the instruments.

22. A copy of each message received must be kept and forwarded weekly to the Central Office with Form B.

23. A receipt must be obtained for every message delivered, which will be kept for future reference, and the time of delivery noted thereon. Proper receipt-books will be furnished by this Office.

24. A careful estimate of articles required for the succeeding quarter must be made with the report for the last month in the quarter for which the office has been supplied.

25. All instruments, relays, keys, switches, or parts of the same, refuse zinc or copper from batteries, and other property not in use, must be reported quarterly at the time of making requisition for supplies, stating number, kind, quantity, and condition of each.

26. Information will in no case be given to persons not clearly entitled to receive it, concerning any message passed, or designed to pass, over the wires.

27. Observers and Assistant Observers are prohibited from giving copies of messages or written statements relating thereto without authority from this Office.

28. A weekly report will be made from each station of the amount and nature of repairs on that portion of the line at or near the station.

V.—GENERAL INSTRUCTIONS.

1. In making the regular meteorological observations at the sea-coast stations, the Sergeant in Charge will always note the character of the ocean-swell and the direction from which it comes, and will add the same to his telegraphic reports, using the words "Heavy," "Long," and "Light," as the case may be. When the direction from which the swell is moving is the same as that of the surface-wind given in the body of the report, no record will be made of it; but when it varies from this the direction will be given at each telegraphic report. Great care must be taken in making and reporting these observations, and the usual record of them will be kept on Form 4, for file in this office.

2. A general report will be made by telegraph, daily, at 6 p. m., to the Chief Signal-Officer by the Sergeant in Charge of each sea-coast station, unless he is otherwise instructed. This report will contain:

First. A statement of the number of vessels of each class noted by the Sergeant as passing within sight of the station during the preceding twenty-four hours, with the direction in which they were going.

Second. Names of vessels with which communication has been held during the day, and the name of code used.

Third. Number of wrecks or other marine disasters, with names of vessels, number of crew, number saved, nature of cargo, and condition at time of report, and such other specific information as may be necessary for the full information of the Departments at Washington.

Fourth. All unusual occurrences affecting the interests of the United States or the duties of the Navy, Treasury, or War Departments, with source of information.

Fifth. All unusual atmospheric phenomena.

3. All shipwrecks or other disasters occurring, or about to occur, must be promptly

reported to this Office, that information may be given to the proper authorities at the neighboring cities, ports, and other places, to the end that assistance may, if necessary, be called for.

All reports of this nature must be addressed to the Chief Signal-Officer, who is charged with the proper communication of the intelligence to the Departments, and they must be authenticated by the signature of the Sergeant in Charge. Necessary messages from captains, crews, or passengers of vessels in distress, or official messages from any member of the Military, Revenue, the Naval, Light-House, or Life-saving Service, will be sent in like manner to this Office, whence they will be forwarded to the proper address.

In cases of need, the Sergeant will promptly communicate information along the coast to other Life-saving Stations, Light-Houses, and places from which aid may be given.

4. Each Sergeant must have a thorough knowledge of the General Service and International Signal-Codes, and the manner of using them for actual work, and to have sufficient knowledge of telegraphy to send and receive at a rate of speed of not less than ten words per minute. The Assistant Observer will be instructed on station in these subjects, and be practiced daily in their use until he becomes sufficiently informed to perform the station duty, in the sickness or absence of the Sergeant.

In using the flags of the International Code, for *practice*, the six-foot flag of the General-Service Code will be displayed at the top of *every* hoist, as a distinguishing signal, and to prevent misunderstanding on the part of vessels within sight.

Weekly reports of this instruction will be made on Form 30, and the amount of progress made by each man clearly stated under the head of "Remarks."

5. "Attention" signals or "Calls" from any passing vessel will be promptly acknowledged by the Sergeant, and all proper inquiries answered. A report of all such calls, inquiries, and answers will be made to this Office.

6. Ordinary commercial and business messages will not be received for transmission.

7. These instructions are solely for the official information of officers, enlisted men, or others employed upon the Sea-Coast Service.

By order of the Chief Signal-Officer of the Army:

H. W. HOWGATE,
Second Lieutenant and Brevet Captain, U. S. A., Acting Signal-Officer and Assistant.

PAPER 51.

WAR DEPARTMENT,
Washington City, July 30, 1874.

SIR: The Secretary of War directs that the following order be substituted for the previous memorandum in regard to the same subject, dated July 24, 1874, which will be returned to the Secretary.

ORDERS.

The Chief Signal-Officer of the Army will assume charge, subject to the direction of the Secretary of War, of the construction, operation, and maintenance of the military telegraph existing or to be established in pursuance of the following acts of Congress: "An act making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1874, and for other purposes," approved March 3, 1873; "An act to provide for the better protection of the frontier settlements of Texas against Indians and Mexican depredations," approved June 3, 1874; "An act making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1875, and for other purposes," approved June 23, 1874.

The expenditures in connection with the construction, operation, and maintenance of these lines must not exceed the amounts appropriated in the acts above named, and the necessary escort and transportation will be furnished by the military authorities, provided that, in the judgment of the division commanders, the troops and transportation can be spared without detriment to the service.

The Chief Signal-Officer will report monthly, in writing, the progress that has been made in the construction of the several lines placed under his charge, giving details of the cost of material, labor, and all other expenses incident thereto, which may be paid from the appropriations for the several lines.

By order of the Secretary of War:

H. T. CROSBY,
Chief Clerk.

The CHIEF SIGNAL-OFFICER OF THE ARMY.

PAPER 52.

WASHINGTON, D. C.,
August 15, 1874.

SIR: In pursuance of the instructions of the Honorable Secretary of War, of which a copy is herewith, you are charged with the construction of the telegraph-line provided under the "Act to provide for the better protection of the frontier settlements of Texas against Indian and Mexican depredators," approved June 3, 1874.

You will proceed, in company with Mr. Van Duzer, superintendent of construction, to San Antonio, Tex., and submit to the general commanding the district the project of construction of the line.

You will request such facilities for escort and transportation as may be necessary for a reconnaissance of the route of the line, and will then, with the least delay, proceed upon such reconnaissance.

The reconnaissance will be made as rapidly as circumstances will permit, and the route will be at the same time definitely located, if this is found possible.

You will keep a daily journal in writing, in which you will note each day the route as shown by the odometer, the distances and roads or route selected, the character of the soil and country in their reference to the erection of a telegraph-line, the facilities for procuring poles, the points from which they can be procured, the distance it will be necessary to move them, whether they must be purchased from citizens or can be had from public lands by the labor of troops; whether they can be purchased and delivered by citizens upon the route, and at what rates; whether they can be purchased standing and be prepared and placed upon the route by soldiers; at what points upon the route the depots for wire, tools, and material for construction for the different sections ought to be located; to what points in Texas these articles should be shipped for distribution to these depots, and generally such facts as your experience and that of Mr. Van Duzer will indicate as proper subjects for consideration in advance of the actual work of construction.

You will notify this Office, with as little delay as possible, of the points to which material is to be shipped in bulk to Texas, and of the amounts to each one; and you will request that arrangements be made in advance for the transportation of the material, which will be forwarded from the points to which shipped to the depots selected along the route. So soon as any route or part of a route has been located, and it has been determined upon that poles are to be there provided by the labor of troops, you will request that a working party, with suitable transportation, be ordered to report to you, provided more than one section is to be undertaken, and will cause the work of procuring poles upon the route to be at once commenced. If one section only is to be commenced, you will need to apply for escort and transportation only. It is suggested that the poles be distributed upon the route in numbers of thirty to the mile, in piles of seven and eight, at distances, by odometer, of one-fourth of a mile each.

This part of the work, which is most likely to cause uncertain delay, may be commenced on as many sections as practicable, and, if necessary, long in advance of the actual erection of the line. It seems advisable that in any country at all dangerous these "pole parties" should move by themselves, and with separate escorts, in advance of the construction parties.

So soon as a sufficient portion of the section route or routes is thus supplied, the construction parties should follow, either in two divisions, one charged with making the post-holes, and the other with the erection of the line—or both of these duties may be discharged by the same party, if, on account of dangerous country or other reasons, it is considered desirable.

By these suggestions it is endeavored to provide—

1st. That the cost of procuring poles—by far the most serious to be done—may be commenced on one or several sections in advance, to prevent delays in construction.

2d. That the parties may be so divided and employed as to be easily protected.

3d. That each party being charged with only a special portion of the work, and each succeeding one finding all but its specific portion already done, may proceed with the greatest rapidity. In very dangerous country it may be that all operations will need to be by one party, moving under a large escort and very slowly; but it is probable that such conditions will exist on a small portion only of the line.

So soon as the final parties of construction are fairly in the field and portions of the line completed, it is desirable that telegraphic communication be kept up between the posts and the working parties, and suitable arrangements will be made for this purpose.

The information had from the reconnaissance, and obtained at headquarters and the different posts, is expected to be such as will enable you definitely to advise this Office—

1st. Of the posts or places to which supplies of material are to be sent in bulk, and the quantities to be so sent.

2d. Of the depots to which you propose to distribute them upon each section.

3d. Of the character and quantity of material necessary to be purchased for each section.

In such report you will consider as carefully as practicable, and in advance, everything which will be required, exclusive of such articles as can be had for temporary use from the Army supplies. As an instance of matters to be considered under this head, should it prove absolutely impracticable to procure poles for some parts of the route in Texas, it may be necessary to ship sawed or other poles for these portions. The number to be so estimated must of course be the minimum.

4th. Of the time probably to be required for the construction of any one section, of several sections, or of the whole number of sections.

5th. Whether it will be possible to complete the line with the present appropriation, or what parts of it can be completed.

6th. Of the force of operators which will be needed after its completion, and what provisions will probably be required to maintain and repair it after completion.

Upon all of these questions you will avail yourself of the thorough practical knowledge of Mr. Van Duzer, and you will forward with your report a report made by him, in which he will include whatever subjects he may wish to bring to the notice of this office. A detachment of non-commissioned officers and enlisted men of the Signal-Service having practical knowledge of the construction and working of telegraphs, and of sufficient force to commence one section or to permit to be distributed with the working parties upon several sections, will report to you so soon as you shall indicate place and time at which you wish them to report.

You will make monthly during the continuance of this work a report of progress, &c., giving also details of cost of material, labor, and other expenditures, so far as they may be made by you, on which will be based the report of this office to the Secretary of War.

The Chief Signal-Officer does not deem it necessary to impress upon you the need of the closest economy, and he relies upon your energy and fidelity to do all it is possible to do.

A sum of money subject to your order will be placed with the United States Treasurer at New Orleans, with which to meet any expenses properly to be charged to the sum appropriated for the construction of the line.

The duty with which you are charged is one of the first importance, and every support and assistance will be given you that is in the power of this office to render.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

Brig. Gen., (Bvt. Assig'd,) Chief Signal-Officer of the Army.

First Lieut. ALLYN CAPRON,

Acting Signal-Officer, Washington, D. C.

PAPER 53.

BALTIMORE, *April* 6, 1874.

SIR: The several questions upon which you have desired my opinion, I have considered with the care demanded by their importance.

The questions are these:

First. Is the act of the 24th July, 1866, entitled "An act to aid in the construction of telegraph-lines, and to secure to the Government the use of the same for postal, military, and other purposes," constitutional? And are the subsequent acts of 10th June, 1872, and 3d March, 1873, also constitutional?

Second. The Western Union and other telegraph companies having accepted the terms of the act of 24th July, 1866, what are the rights of the United States and the obligations of the companies by virtue of the same?

I proceed to consider these questions in their order.

The authority of Congress to pass the acts in question is under the provision in the eighth section of the first article of the Constitution of the United States, which gives to that body power "to regulate commerce with foreign nations and among the several States, and with the Indian tribes."

These powers, like all others vested in Congress, unless they are expressly restricted by some other provision in the Constitution, or by their very nature, are unlimited in regard to the subject with which they deal. And it is equally true that they are intended to continue as long as the Government exists. This commercial clause was designed to avert the mischief resulting from conflicting commercial regulations by the several States. It is, we know, historically true that such regulations, more than any other one cause, led to the adoption of the Constitution. Indeed, the peace and prosperity of the States demanded that legislation upon the subject should be made impossible. The end for which the power was vested in Congress, it was evident, could not be accomplished by the States. Their jurisdiction extended only over their respective limits. No regulation made by them separately could exceed those limits. Commerce, therefore, with foreign nations and among the several States could only be regulated by a

power possessing general jurisdiction. The theory of the Constitution—and all the powers with which Congress is clothed are in accordance with that theory—is that every power which could not be exercised by the States separately should be vested in Congress. The object of the Convention was to establish a government for a great nation, and was, of course, to repose in it every authority necessary to attain that result, and to secure union and harmony at home as well as peace abroad. In relation to the powers so conferred, the Supreme Court has, over and over again, declared that they are to be construed as if there were no State governments. The constituency of the General Government are the people of the whole country; the constituency of the State governments are the people of the States, respectively. In the language of Chief Justice Marshall, in the case of McCulloch *vs.* Maryland, 4 Wheaton, 406, "If any proposition could command the universal assent of mankind, we might expect it would be this: that the Government of the Union, though limited in its powers, is supreme within its sphere of action. This would seem to result necessarily from its nature. It is the government of all; its powers are delegated by all; it represents all and acts for all." Every power incidental to those expressly granted is as much granted as the expressly granted power. And every power not limited is intended to exist during the entire continuance of the Government. The design of the framers of the Constitution was that it should [illegible] for all time, unless it should be constitutionally modified. Nor, in the exercise of the incidental powers which Congress possesses, are they limited to the use of the means known to exist at the date of the Constitution. Whatever means, therefore, may at any time, through experience, or by the discoveries of science, or in any other way, be found out, may be resorted to. To apply these remarks to the subject before me: The matters to be regulated are, first, foreign commerce; second, commerce among the States; and, third, commerce among the Indian tribes. Whatever powers are incidental to the regulation of the first, are equally incidental to the regulation of the second and third. This seems to me to be obvious. The term is found in the same section and in the same clause of the Constitution. Whatever, therefore, is commerce among the States may be regulated by Congress, as well as whatever is commerce with foreign nations. What, then, is commerce, as the term is here used? Is it traffic alone, or is it not also intercourse, and the means by which traffic and intercourse may be carried on? If any doubt existed upon such a point, it was removed by the decision of the Supreme Court of the United States in the case of Gibbons *vs.* Ogden, 9 Wheaton, 1. In that case the court said that "Commerce undoubtedly is traffic, but it is something more—it is intercourse;" and also said, "All America understands, and has uniformly understood, the word commerce to comprehend navigation. It was so understood, and must have been so understood, when the Constitution was framed." Whether the power be exclusively vested in the United States, or remains for any purpose in the States, is a proposition which I need not examine. It is, however, I think, clear from the opinion from which I have quoted that the judges who decided that case thought that the power was exclusive. Subsequent decisions of the same tribunal, or rather the opinions of some of the judges, leave this point in doubt. But there has been a uniform concurrence of views upon this point—that where, under the authority of the commercial clause, Congress has regulated to any extent commerce with foreign nations or among the several States, such regulation displaces all existing similar or inconsistent State regulations, and prohibits their adoption as long as the congressional legislation remains.

Whatever, therefore, is a regulation by Congress, and tends to accomplish the end for which the power was given, must be constitutional. No authority claimed under a State in conflict with it has any validity. Nothing that a State can do, by legislation or otherwise, can in the slightest degree limit the power. In the case already quoted, as well as in the case of McCulloch *vs.* Maryland, (4 Wheaton,) it was held that the question, what means Congress can resort to to accomplish the purpose of any granted power, is a matter entirely within its discretion. The language of the court in the latter case (p. 421) is: "Let the end be legitimate; let it be within the scope of the Constitution, and all means which are appropriate, which are plainly adapted to that end, which are not prohibited but consistent with the letter and spirit of the Constitution, are constitutional." This discretion belonging to Congress, the manner of exercising it is for them to decide. The object of the act of 24th July, 1866, as declared in its title, is to secure to the Government the use of telegraph-lines "for postal, military, and other purposes." The power to establish post-offices and post-roads, and to declare war, to raise armies, and provide navies, was expressly vested in Congress. Whatever, therefore, could aid in any way the work of the Army or the Navy or the postal service, is within the discretionary power of Congress. That the telegraph will assist in accomplishing these results is clear. In time of war or of threatened war, rapid communication between the Government and the Army may be all-important. And so in relation to the mails and the Navy. It may be vital that a fleet or a ship should sail on a certain day; that any impediments, by violence or otherwise, to the transmission of the mails may be removed at the earliest period, and this can be best accomplished through the means of information furnished by the telegraph. The operation, too, of the signal-service, the beneficial use of which is now so universally acknowledged,

cannot be accomplished by any other mode than by telegraph. Its beneficial use depends upon the receipt in Washington of information of the state of the weather in every part of the country. This information enables the Bureau to predict from day to day, with reasonable precision, the state of the weather for the next twenty-four hours. This scientific prediction may be most important to the commercial as well as to the naval marine of the country. When may a fleet or ship sail with a reasonable hope that they will encounter no extraordinary perils from the winds and waves? and when may they expect such perils? This knowledge can only be distributed throughout our ports by telegraph operated by the Bureau or controlled by it, so far as its dispatches are concerned. That the assistance of the telegraph is indispensable to these objects is obvious, and it is equally obvious that the mode in which this assistance is to be rendered should be placed in the hands and under the exclusive control of the Government. This is the purpose of the act of 1866 and the subsequent acts. Their constitutionality, therefore, in my judgment, is free of all reasonable doubt.

The next question under this head is, can the United States themselves lay a telegraph-line along the several railroads for their own use? To give them the power to communicate by telegraph and deny them the right to establish a telegraph-line seems to me to be simply absurd. That the railroads in the country have been constructed for the most part under the authority of State charters in no manner affects the question. If the United States would have had the authority, as I think they clearly would, to construct telegraph-lines over the sites occupied by the railroads, they cannot be deprived of the right to establish such lines over or along the railroads, if, by so doing, they in no way injure the working of the roads. Upon the whole, then, in reference to the question submitted to me, I am of opinion that the acts referred to of 24th July, 1866, 10th June, 1872, and 3d March, 1873, are constitutional.

Second. The Western Union and other telegraph companies having accepted the terms of the act of the 24th July, 1866, what are the rights of the United States and the obligations of the companies? The act in question conferred great privileges upon the companies. It authorized them to construct their lines through the Territories of the United States, and granted them valuable portions of the same. The rights secured to the United States are that the telegrams of every Department of the Government shall have priority over all other business, and the rates for such transmission are to be annually fixed by the Postmaster-General.

What those rates are to be is submitted to his sole judgment. The object of the act was to give to the United States the authority to use the lines generally. No limitation of the time within which such right is to be exercised is provided for. Day or night, and at any period of the day or night, the right may be exerted. Any restriction upon it might be prejudicial to the interests of the Government, and cannot, therefore, be supposed to have been intended. It may be all-important to send communications to the different branches of the Army, wherever they may be, at an instant's notice. And so in relation to the Navy. To give to the companies the authority to say when such communications shall be forwarded would be to submit to them the interests of the Government. This could never have been designed.

And upon no rule of interpretation can the act be so constructed. That the companies must have, if this right is in the United States, operators at their several stations, day and night, ready to receive and transmit all governmental dispatches that may be handed in, is within the general terms of the contract; nor is the inconvenience to the companies occasioned by this obligation greater than that which is occasioned the officers of the Government. In the Signal Bureau some one of the operators must be on hand at all times during the twenty-four hours to receive or transmit all dispatches necessary to accomplish the objects of the Bureau. The sentinels in the Army are to be posted day and night. The same is true of the watches in the naval and commercial marine. It is no answer, therefore, to the rights claimed by the United States that its enjoyment of them will cause trouble to the agents of the companies. It is a trouble, if trouble it be, which the companies have agreed to assume, and a trouble, too, which at times may be vitally important to the true interests of the Government. And for this trouble the companies have been well compensated. The privileges granted to them and the property secured to them are of great value, and may in truth be said to be essential to their welfare. I am, consequently, of opinion that the Government has a right at all times, day or night, to have their messages transmitted by the companies who have assented or may assent to the act of 24th July, 1866. I am also of opinion that the Government has a right to drop their telegrams at all intermediate stations between the place from which they are sent and the place of their ultimate destination. The right to transmit involves the right to drop, as the dropping is a practice well known and used in the transmission of telegrams.

I understand that the Western Union Company has been advised that the rights of the Government and their own are secured by the contract growing out of the act of 1866, and that the same cannot be repealed or modified by the United States. Although the United States have not attempted to exercise such a right, and the question is not

before me, yet I deem it due to the subject to say that the idea is founded upon a misapprehension of the Constitution.

"The 10th section of its first article provides that "no State shall pass any law impairing the obligation of contracts." But this restriction, by its very terms, applies only to State legislation. What Congress may do, and is authorized to do, rests upon grounds irrespective of this provision. That such is the correct view, several Judges of the Supreme Court of the United States have more than once declared in official opinions, and I am not aware that any judge of that tribunal has ever expressed a different view. The only limitation upon the power of Congress is to be found in the 5th constitutional amendment, which declares that "private property" shall not "be taken for public use without just compensation." But what is proposed by the Government in this instance is not to exercise the right of eminent domain by appropriating private property for its own use, but to insist that the companies shall comply with their engagements entered into under the authority of the act of July 24, 1866, and for which they have been fully compensated. But conceding, for argument' sake, that there is a contract between the Government and the companies who assented to the act of 1866, and that the same is protected by the constitutional clause first referred to, it is still evident that the same will not be in any way impaired by the Government's not sending their dispatches through those companies, or by constructing a telegraph-line for itself. As to the first, the Government has not agreed to send their telegrams by the companies. They have only reserved the right to do so. They may, therefore, not send any, or only a portion, of their dispatches as they may think best.

Secondly. By constructing a line for itself, running near or in juxtaposition with the existing lines, they will not violate any such supposed contract. The States may authorize competing railroads, or canals, or bridges. The question of the right in the latter instance was decided in favor of the right by the Supreme Court of the United States in the case of the Charles River Bridge *vs.* Warren Bridge, 11 Peters, 536. If a State has the authority here adjudged, *a fortiori* have the United States. I am, therefore, clearly of the opinion that the Government may construct a line of its own, and transmit all messages which it may have occasion to transmit, and that the same will, in no respect whatever, interfere with any right of the existing companies.

I remain, with regard, your obedient servant,

REVERDY JOHNSON,
Assistant Attorney-General.

Bvt. Brig. Gen. ALBERT J. MYER,
Chief Signal-Officer, Washington, D. C.

PAPER 54.

AN ACT to protect lines of telegraph constructed or used by the United States from malicious injury and obstruction.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person or persons who shall willfully or maliciously injure or destroy any of the works or property or material of any telegraphic line constructed and owned, or in process of construction, by the United States, or that may be hereafter constructed and owned or occupied and controlled by the United States, or who shall willfully or maliciously interfere in any way with the working or use of any such telegraphic line, or who shall willfully or maliciously obstruct, hinder, or delay the transmission of any communication over any such telegraphic line, shall be deemed guilty of a misdemeanor, and, on conviction thereof in any district court of the United States having jurisdiction of the same, shall be punished by a fine of not less than one hundred nor more than one thousand dollars, or with imprisonment for a term not exceeding three years, or with both, in the discretion of the court.

Approved, June 23, 1874.

PAPER 55.

OFFICE OF THE CHIEF SIGNAL OFFICER,
October 20, 1874.

SIR: Immediately upon the receipt of the first reports received from our observers relative to the aurora of the evening of the 7th of April, 1874, it became evident to me that certain features of that exhibition were of exceptionally great interest, and would, if properly investigated, prove of importance in elucidating some obscure points as to the origin, nature, and meteorological relations of auroral phenomena in general.

I accordingly began diligently the work of collecting such data as the Office was daily receiving, and while engaged upon this work the Office learned from Prof. H.

A. Newton, of Yale College, that a similar interest in this phenomena was felt by him, and that he desired, if possible, copies of such observations relating to this aurora as the office might come into possession of.

As, however, the answers to the circular of inquiry issued by Captain Howgate, at my request, gradually came in from all parts of the country, it soon became evident that the increasing mass of crude material required careful analysis, and oftentimes necessitated further correspondence before it could be brought into a fit state for submission to yourself or Professor Newton.

Although occasional contributions of observation still continue to be received, yet the greater portion of the correspondence was concluded before the 1st of July, and it had become necessary to carry out my original intention of a detailed review and analysis of the records.

As I have not yet been able to bring this tedious work to a satisfactory conclusion, I take the liberty of presenting to you this preliminary report, in order that you may assure Professor Newton that his request will be complied with as soon as possible.

Before passing to a brief description of the material and my results, I will take the occasion to remark that the future studies of this kind would be much facilitated if observers would in general record the appearances of an aurora simultaneously, say at every quarter or half hour, or every ten minutes of Washington time.

1. The material received by me consists of reports from 71 stations, distributed as shown on the accompanying map, and which may be summarized as follows:

State.	No. of stations.	State.	No. of stations.
Canada	1	Michigan	5
Connecticut	3	Minnesota	3
Illinois	3	New Jersey	8
Indiana	1	New Hampshire	1
Indian Territory	1	New York	20
Iowa	5	Ohio	2
Maine	3	Pennsylvania	3
Maryland	1	Vermont	5
Massachusetts	2	Wisconsin	8

While many of these reports are of course meager and unsatisfactory, yet others are of sufficient fullness to justify an attempt to determine the parallax, and therefore the positions and dimensions, of the numerous well-defined arches by which this aurora was characterized.

2. The general appearance of the aurora, as seen at any one station, was simply an arch or series of arches nearly parallel to each other, and extending either from east to west or from northeast to northwest. In most of the States in the preceding list there were one or more stations at which there were visible from one to four or five such arches, but the most brilliant display was visible in Northern New York. These arches had in all cases a slow movement bodily from north to south, but occasionally halting and even retrograding in this movement, while the light composing each arch was subject to very considerable fluctuations, even to the extent of temporary disappearance, and was also subject to a wave-like movement from east to west, and the reverse. Perhaps, however, the most instructive feature of these arches was the fact that, although they generally shot over from the east to the west horizon, yet quite frequently they were seen to begin in both the east and the west, and grow in either direction toward the zenith, while very often it happened at western stations that no complete arches were observed, but only their beginnings, rising up like figures or rays in the east and northeast.

3. The display continued at favorably situated stations from sunset of the 7th to sunrise of the 8th.

4. The records of disturbances of the magnetic needle at such stations as conduct those observations show that the causes producing our aurora were felt, as is so frequently the case, throughout the whole world.

5. The difficult work of the identification of the arches seen by the observers, and the determination of their heights and distances, is not yet entirely completed, but there is reason to believe that these arches were in reality nearly parallel beams of light, stretching from New England to Michigan; that they were elevated but a few miles above the earth's surface, and were very numerous, so that rarely did two observers at distant stations see the same beams; it is possible that the western, and perhaps also the eastern, ends of the beams were higher than the central portions.

6. Like several other auroras to which I have had occasion to call attention in the "monthly reviews," so this was associated with the prevalence of numerous thunderstorms south and west of the regions experiencing the aurora, thus affording an addi-

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N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

tional confirmation of the view that both these forms of electric manifestations are due to the same general cause. In the subsequent part of this report, I shall give reason for believing that the ultimate causes of atmospheric electricity are the friction of the particles driven by the wind and the violent seismic changes going on upon and within the earth, and to a less extent the changes occurring on the sun; but that these ultimate causes of electric excitation can only produce their visible effects (the aurora and the lightning) when the atmospheric conditions are favorable.

I have the honor to remain, very respectfully, yours,

CLEVELAND ABBE.

The CHIEF SIGNAL-OFFICER.

PAPER 56.

RELATIVE PRESSURES, OR BAROMETRIC GRADIENTS.

In all storm-warnings, the wind-velocity is the most important element to predict. This can be calculated, not from the absolute amount of depression in the storm-centre, but from the relative depression. The greater the deficiency of pressure at any one point, as compared with the surrounding pressures, it is obvious the more powerful will be the indraught thither; and hence the greater the velocity and the danger of the cyclonic winds. It is very desirable to approximately determine, in arithmetical terms, what velocity the winds will attain at a station by the difference of synchronous barometer-readings at that and the neighboring station.* This is done by ascertaining "the barometric gradient," as it has been called. The barometric gradient numerically defines the storm's violence by dividing the distance between the two places given in nautical miles, by the difference of the synchronous pressure observations.† For example, if the distance between New York and Washington be taken as one hundred and eighty-five miles, and the respective barometer-readings be 30.40 and 29.90 inches, the barometric gradient will be one inch in three hundred and seventy miles. It has been ascertained by engineers that when the barometric gradients in storms are as great as one inch of mercury in one hundred and seventy miles, the wind is high enough to overturn many houses.‡ When the barometric gradient does not exceed one inch in six hundred miles, such danger is scarcely ever to be apprehended. In regard to vessels at sea, a gradient of one inch in six hundred miles will, however, sometimes produce dangerous winds. During the Bahama hurricane, in October, 1866, the gradient was, at one time, one inch in one hundred and fifty miles, with winds blowing from eighty to one hundred and twenty miles an hour.§ The extremely steep gradients occur in nearly all the great tropical hurricanes and typhoons. The storm-disc is of small dimensions within the tropics, and the depression takes place so rapidly that the surrounding air has not time to come in and restore equilibrium gradually.

It is of the utmost consequence, for the guidance of any one predicting a dangerous wind at any point or station, to obtain an arithmetical expression of what constitutes a dangerous barometric gradient.

In the Mauritius gale of February 25, 1863, between that island and Réunion, the barometric gradient appears to have been about one inch in two hundred and ninety or three hundred miles, the wind blowing about sixty miles an hour. A very instructive record of the British storm of August 22, 1868, 6 p. m., shows, between Valencia and Liverpool, a gradient of one inch in three hundred or three hundred and fifty miles, with wind velocity rising from forty-five to sixty miles an hour.‖ On February 1, 1868, the readings were, respectively, 30.16 and 28.40 at Rochefort, France, and Aberdeen, Scotland, (difference 1.76 of an inch,) and the gradient one inch in three hundred and sixty miles. It was followed by a tremendous gale between the two points. In the European tempest of January 7, 1839, says Mr. Stevenson,¶ we find a mean gradient between Bara and Lismore of one inch in two hundred and eighty miles, and of one inch in two hundred and sixty-four miles between Lismore and Bell Rock—slopes steep enough to account for the damage done to buildings and other property. No doubt, had intermediate points of comparison been in existence, we should have found still steeper gradients. Tropical storms, from their greater violence, might be expected to occur in connection with very steep gradients, and such appears to be the case. Thus, on calculating that of the Bahama tempest, in September, 1866, we get one inch in one hundred and forty-three miles, while, during the hurricane on the Malabar coast, recorded by Colonel Sykes, the observations indicate a gradient as steep as one inch in

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* See Barometer Manual of Board of Trade, London, by R. H. Scott, 1871, page 21 *et seq.*

† The "barometric gradient" was first proposed by Thomas Stevenson, esq., C. E., in a paper read before the Scottish Meteorological Society, June, 1867. See Society's Journal for January, 1868, new series, No. XVII, p. 132.

‡ See paper of Mr. Stevenson just referred to. Also Buchan's Meteorology, p. 260.

§ See Buchan, pp. 265–267.

‖ See pp. 9, 10, Non-official report of Captain Toynbee.

¶ See paper in Journal of Scottish Meteorological Society for January, 1868, p. 132.

only fifty miles. In the great Scottish hurricane of January 23 and 24, 1868, the following invaluable observations and computations of barometric gradients were made at Aberdeen and Culleden, distant sixty-eight miles. On the 23d the following were the changes:*

Time.	Gradient.	Wind—velocity.
9 a. m.	1 inch in 167 miles.	70 miles an hour.
At noon	1 inch in 138 miles.	91 miles an hour.
1 p. m.	1 inch in 164 miles.	80 miles an hour.
3 p. m.	1 inch in 232 miles.	60 miles an hour.
Midnight	1 inch in 521 miles.	24 miles an hour.

These figures show, in general, that where the barometric gradient was about one inch in one hundred and seventy or two hundred miles, the velocity of the wind rose to more than ninety miles an hour, or the extreme hurricane-rate. There were no wind velocities reported from Aberdeen, but it is probable they were greater there than at Culloden. The preceding statements, when combined with the following, will afford the rough arithmetical approximations desired.

The following table shows characteristic barometric gradients in some of the storms reported by the Signal-Office of the United States Army:

Barometric gradients in cyclones.

Date.	Points compared between which gradient is computed.	Gradients.	Wind; velocity per hour at—	
1871.				*Miles.*
Aug 26, 7.35 a. m	Savannah and Augusta	1 inch in 700 miles	Savannah	22
Nov. 12, 7.35 a. m.	Chicago and Omaha	1 inch in 684 miles	Chicago	20
Nov. 13, 4.35 p. m.	Leavenworth and Fort Gibson	1 inch in 370 miles	Leavenworth	31
Nov. 13, 11 p. m	Cairo and Dover, Tenn	1 inch in 391 miles	Cairo	33
Nov. 14, 7.35 a. m	Chicago and Indianapolis	1 inch in 400 miles	Chicago	33
Nov. 14, 4.35 p. m.	New York and Williamsport, Pa	1 inch in 340 miles	New York	48
Nov. 14, 4.35 p. m.	Philadelphia and Harrisburgh	1 inch in 370 miles	Philadelphia	30
Nov. 15	Portland and Albany	1 inch in 375 miles	Portland	29
1872.				
Feb. 3, 7.35 a. m	Cape May and Norfolk	1 inch in 380 miles	Cape May	28
Feb. 12, 4.85 p. m	Duluth and Saint Paul	1 inch in 700 miles	Duluth	21
Feb. 13, 7.35 a. m.	Chicago and Grand Haven	1 inch in 360 miles	Chicago	31
Mar. 1, 11 p m	Knoxville and Augusta	1 inch in 685 miles	Knoxville	20
Mar. 8, 4.85 p. m.	Detroit and Chicago	1 inch in 665 miles	Detroit	20
Sept. 25, 7.35 a. m.	Buffalo and Saugeen	1 inch in 400 miles	Buffalo	30
Sept. 29, 7.35 a. m.	Cleveland and Detroit	1 inch in 500 miles	Cleveland	24
Sept. 29, 7.35 a. m.	Buffalo and Detroit	1 inch in 350 miles	Buffalo	34
1873.				
Jan. 15, 7.35 a. m.	New York and Philadelphia	1 inch in 750 miles	New York	20
Jan. 15, 4.35 p. m.	Philadelphia and Baltimore	1 inch in 750 miles	Philadelphia	22
Mar. 13, 7.35 a. m.	Chicago and Grand Haven	1 inch in 850 miles	Chicago	16
Mar. 24, 7.35 a. m.	Toledo and Cincinnati	1 inch in 440 miles	Toledo	22
May 9, 4.35 p. m.	Nashville and Louisville	1 inch in 700 miles	Nashville	19
May 22, 4.35 p. m	Saint Louis and Keokuk	1 inch in 800 miles	Saint Louis	20
Aug. 23, 11 p. m	Oswego and New York	1 inch in 800 miles	Oswego	20
Aug. 24, 7.85 a. m.	Boston and Wood's Hole	1 inch in 388 miles	Boston	36
Nov. 16, 7.35 a. m.	Cleveland and Erie	1 inch in 700 miles	Cleveland	24
Nov. 16, 11 p. m.	Jacksonville and Savannah	1 inch in 750 miles	Jacksonville	24
Nov. 17, 7.35 a. m.	Savannah and Wilmington	1 inch in 740 miles	Savannah	24
Nov. 17, 7.35 a. m.	Washington and Norfolk	1 inch in 1,000 miles	Washington	13
Nov. 17, 4.35 p. m.	New London and New York	1 inch in 750 miles	New London	24
Nov. 17, 4.35 p. m.	Washington and Norfolk	1 inch in 712 miles	Washington	24
Nov. 17, 4.35 p. m.	New York and Cape May	1 inch in 600 miles	New York	26
Nov. 18, 7.35 a. m.	Quebec and Mount Washington	1 inch in 360 miles	Quebec	57

In studying these data, it is of course necessary to remember that the effect of a barometric gradient will be modified by the orography and relief features of the country.† Interposing hills and mountains will make the results very different from those

* See Journal of Scottish Meteorological Society, January, 1868, p. 132 *et seq.*
† See Ferrel on Motions of Fluids and Solids relative to earth's surface, p. 51.

produced by the same gradients in a level country. But, from all these figures and facts, we may roughly deduce some useful, approximate expressions as to what wind velocities will be likely to follow certain barometric gradients, and, also, what barometric gradients indicate peril to shipping.* The following results are tentative:

1. When the barometric gradient amounts to one inch in 750 or 800 miles, a wind blowing about 20 or 25 miles per hour may be expected. Such a wind on the Lakes is dangerous; especially is it to be apprehended in foggy, rainy, or snowy weather. When the wind reaches even 20 miles an hour on the Atlantic coast, with a heavy snow-fall, it is then dangerous to navigation. Occasionally a gradient of one inch in 800 miles has been soon followed by a wind velocity of 30 or 35 miles an hour; but such instances seem to be rare. This gradient (one inch in 750 or 800 miles) may, therefore, be called THE DANGER GRADIENT.

2. A barometric gradient of one inch in 650 miles will generally produce a wind blowing about 25 or 30 miles, or upward, except in a mountainous country.

3. A barometric gradient of one inch in 550 or 600 miles will generally be followed by a wind blowing about 30 or 35 miles an hour, the results of course as always being modified by the topography of the country.

4. If the barometric gradient is as much as one inch in 450 or 500 miles, the wind will probably blow about 35 or 40 miles an hour.

5. If the barometric gradient is one inch in 350 miles, it will be followed by a gale blowing from 45 to 50 miles an hour, though it may exceed that velocity.

6. When the gradient is as steep as one inch in 300 miles or less, almost a hurricane wind of, say, from 50t o 75 miles an hour may confidently be looked for, with still fiercer squalls.

7. No gradient less than or about one inch in 1,000 miles need be apprehended as a source of dangerous atmospheric disturbance.

It should be mentioned that, in computing the above gradients as nearly as possible, the stations compared are those lying on the same line of cyclonic indraught, *i. e.*, in the path pursued by a particle of the air, which rushes from the circumference inward to the centre of the storm.

Owing to the present difficulty of applying the proper correction of barometers for elevation, it may be best not to use these approximate results with barometric gradients computed from readings taken from high-mountain ranges or in regions rising more than 2,500 feet above the sea. It may be instructive to add to the above observations the following remarks from M. Buys Ballot, of Holland, speaking for his own country:†

"On 1st January, 1870, pressure fell from Maestricht northward to Helder, the distance being 125 miles and the difference in pressure 0.154 inch, thus giving a barometric gradient at the rate of one inch in 812 miles. The greatest force of the wind at Maestricht was 49 kilograms in the square metre, being equal to a pressure of about 11 pounds on the square foot. The direction of the arrow shows the wind was from southwest.

"From a careful examination of the large mass of details collected in the Annuaires, the following results will appear:

"1. As regards the relation of the wind to atmospheric pressure, the direction of the wind obeys the law of the relation better than the force does, nearly without exception, if pressure be higher in the south than in the north, winds in such cases being westerly. On the other hand, easterly winds do not arise so easily as westerly winds; they not only do not follow the gradients so closely, but if the difference between the gradients be not considerable, they (the easterly winds) do not follow at all.

"2. Polar winds have a different gradient from equatorial winds. Thus, if atmospheric pressure be higher in the north than in the south, a steeper gradient is required to give a pressure of six pounds to the square foot.

"3. The east and northeast winds are not only weaker with respect to the steepness of the gradients, which have to be formed, but they follow the formation of the gradients after a much longer interval of time than happens in the case of the northwest winds.

"It, indeed, frequently occurs that after a pretty steep gradient has been formed, from which an easterly wind might be looked for, rain follows, and not a very strong easterly wind. In general the northwest wind is a weak point in my predictions of weather, owing to the quickness and force with which these winds spring up after the barometric indications have appeared.

"4. The converse of this does not appear to hold good, viz, a strong wind does not arise when there has been neither a steep gradient preceding nor a great difference between two consecutive gradients.

"5. If there has been a strong wind after a steep barometric gradient, as, for example,

* See report of an inquiry into the connection between strong winds and barometrical differences, by R. H. Scott, London, 1869, pp. 3-10.

† For original authority see end of extract.

on the occasion of the storm of the 28th of May, 1860, then the strong wind is not only preceded but is also followed by great steepness in the gradient. It often occurs after strong northwesterly winds that the gradient from Flushing to Helder or Groningen continues to be great still, and is not followed by a continuance of the storm.*

As has been already suggested, when discussing the United States Signal-Service gradients, it will always be necessary to consider the orographic and other features of the country for which high winds are computed. When the country is flat or littoral and the wind has no retarding obstacle to overcome, the velocity will be higher than when the region considered is mountainous or hilly. So in river-valleys the descending wind will blow with unrestrained force.

Generally, some hours must intervene between the formation of a steep barometric gradient and its normal consequence, a very high wind.

It may, finally, be observed that, in general, the cyclonic winds will blow in a direction varying, as regards the isobaric curves, from the tangential to the centripetal. Sometimes the high wind will be nearly tangential; but the more rapidly and suddenly the barometer falls the more nearly will its direction approach a radial line, drawn from the circumference to the centre of the disturbance. If an average angle must be indicated, it is perhaps near the truth to say that the cyclonic winds will blow across the isobaric curves at an angle of about 40° in ordinary land-storms and 60° in severe storms. But the topography of the region so modifies, in each case, the direction as well as velocity of the wind, that *no exact* arithmetical expressions can be rigidly applied. Thus, winds on the Atlantic seaboard, due to indraught from a storm-centre on the Lower Lakes, according to the law of storms, ought to be east and southeast. But the diverting influence of the Allegheny Mountains will often make them more decidedly south or southwest winds.

The meteorologist, however, by constant and close observation of the weather-map, will be enabled to predict very nearly the direction, from a judicious comparison of all the conditions. In discussing this subject, regard has been had solely to the calculation of the wind-velocity, that will follow an *already existent* barometric gradient. During the progress of the cyclone, the gradients are, however, undergoing important changes. It will, therefore, often be as important to predict a *future gradient* as to ascertain that already formed.

To predict the future gradient is very difficult, since it requires a study of the extent, direction and velocity of the movement of upper currents of the atmosphere.

But, in general, it may be stated, that the formation of new gradients, during the progress of the storm, will depend upon the amount, rapidity, and area of the rain-fall or snow-fall, accompanying the progressive depression. The greater the amount of precipitation in a given number of hours, the more marked will be the fall of the mercury in the barometer,† and the greater will be the indraught of cyclonic winds, and hence the greater the wind velocity.

The telegraphic report of the rain-fall in the previous eight hours will, therefore, furnish the storm-warner, the data for an approximate estimate of the future, or following barometric gradient.

PAPER 57.

LIST OF DISASTERS ON THE LAKES FROM JANUARY 1 TO AUGUST 31, 1874.

JANUARY.

3.—Propeller Bertschy, ran ashore in a fog, on North Point, Milwaukee; released.
Schooners J. C. Harrison, E. Corning and T. P. Sheldon damaged by freshet at Buffalo.
15.—Jessie Turner killed by fall from a vessel at Port Huron.
28.—A severe storm on Lake Michigan; propeller Bertschy and Schooner Napoleon severely handled.

FEBRUARY.

2.—Milwaukee harbor blocked with ice.
Steamer International destroyed by fire at Fort Erie.
8.—Schooner F. Morell lost foretopmast by collision with a bridge at Milwaukee.
11.—Propeller Lake Breeze broke her rudder in the ice off Milwaukee.
14.—Tug Hagerman broke wheel in ice at Milwaukee.
Propeller G. J. Truesdell broke machinery at Chicago.

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* See Scottish Meteorological Journal, pp. 25, 26, New Series, Nos. XXVII-XXVIII, for January and April, 1873.

† See W. C. Loy's Laws of the Winds, pp. 30-39.

18.—Propeller Lake Breeze ran ashore at Ludington; released with little injury.
22.—Propellers Russia, Jay Gould, and schooner Annie Vought damaged by ice at Buffalo.
25.—Tug Golden City sunk by ice near Buffalo.

MARCH.

7.—Schooner Evaline lost deck-load in storm off Milwaukee.
Tug Wetzel damaged at Racine by collision with line of schooner City of Manitowoc.
21.—Steamer M. A. Thompson damaged by ice at Fort Erie.
Scow Baker damaged at Black River by being driven against schooner Turner by heavy wind.
22.—Schooners Camanche, Montauk, Forest Queen, J. Bigler, and Smith and Post damaged by storm at Oswego,
Schooner Industry struck a rock and sprang a leak, near Centreville.
30.—Steam-barge Mary Groh damaged machinery off Rocky River, Lake Erie; towed to Cleveland.
Steam-barge Sanilac and schooner Uncle Sam damaged at Port Huron by tow of steamer Ballentine.

APRIL.

1.—Schooner Louisa lost mizzen-mast by storm on Lake Huron.
2.—Schooner Eliza White damaged by storm on Lake Ontario.
Schooner E. M. Rathbun damaged by storm on Lake Ontario; Captain Cortes badly frozen.
3.—Schooner John Jewett damaged by storm on Lake Erie.
Schooner Lizzie Doak damaged by collision with a bridge at Saint Joseph.
Scow Mary and Lucy sprung a leak off Cleveland and towed back in a sinking condition.
Steamer Saginaw damaged by collision with steam-barge Nahant, at Milwaukee.
9.—Steamer Huron damaged by fire on Saginaw Bay.
Schooner Sweetheart aground in Detroit River; off.
Barge Globe driven ashore at Put-in-Bay; released and arrived at Detroit leaking.
Eight fishermen drowned off Kenosha in a gale.
11.—Scow Radical ran ashore in Milwaukee Harbor and carried away her rudder.
Scow John F. Prince ran ashore at Milwaukee; got off on the 14th, leaking badly.
George Scholz, sailor on scow Forest, drowned off Racine.
Steamer Marine City damaged by ice in Thunder Bay.
Schooner Melrose lost jib-boom off Oswego.
Steamer Carrie B. Blood damaged by fire near Port Huron.
Tug Starling damaged by ice and sunk at Belleville, Ontario.
Schooner Echo badly damaged by collision with schooner Norseman, at Charlotte, Lake Ontario.
Schooner Napoleon lost bowsprit and jib-boom by collision with schooner Beloit, off Ahnepee.
13.—Schooner Meteor water-logged and sunk off Oswego.
Schooner P. Hayden damaged by storm on Lake Michigan.
Steamer Marine City ran ashore on Belle Isle, Detroit River, and broke her wheels.
14.—Bark Montmorenci ran ashore on Long Point, Lake Erie.
Steamer Michigan and scow Charlie Crawford damaged by collision at Detroit.
Schooners Trumpff and Rutherford and propeller Asia damaged by collision at Port Dalhousie.
Propeller Dubuque and three barges ran ashore at Southeast Bend; released with little injury.
17.—Schooner Lizzie Doak damaged by collision with steamer Norseman, at Chicago.
19.—Schooner James Scott struck the pier and sank at Port Burwell.
Scow Home water-logged near Sandusky.
20.—Schooner Provost struck harbor-piers at Cleveland and was badly damaged.
Schooner Gertrude ran ashore at Port Ulao, Lake Michigan.
21.—Propeller Dunkirk grounded on bar at entrance to Saginaw River; released.
22.—Barge Susan Ward drifted ashore at Oscoda, Lake Huron.
Schooner Vienna damaged by collision with tug Morey, off Oswego.
Bark Gibraltar lost canvas and was driven back by storm, off Kingston.
23.—Tug Ida H. Lee capsized and sunk in Milwaukee Bay; James Slocum, engineer, drowned.
Scow R. H. Belcher ran ashore in a storm near harbor-pier at Milwaukee; released.

Schooners Traveler and Waleska damaged by collision off Milwaukee.
Schooner Emma A. Mayes damaged by collision at Milwaukee.
Schooner Louisa lost jib-boom by collision with tug Shields, at Chicago.
Schooner John Kilderhouse damaged by storm off Milwaukee.
Schooner Louisa McDonald badly damaged by steamer James Couch, at Chicago.
Schooner Lucy J. Clark was run into by propeller Truesdell, at Chicago, and badly damaged.
Schooners Norman and A. Plugger damaged by collision at Chicago.
Schooner G. Barber struck on bar at Saint Joseph and sprang a leak; towed inside.
24.—Schooner Wood Duck arrived at Oswego in a water-logged condition; had a hole stove in her bottom at Presque Isle.
26.—Tug Joe Knight badly damaged by fire at Danville, Ontario.
28.—Schooner Wawanosh went ashore at False Docks, while attempting to save a man who had fallen overboard.
Schooner Australia lost jib-boom by collision, off Whitby, Lake Ontario.
Scow Selt lost centre-board on Lake Michigan.

MAY.

1.—James Colloneux, sailor on schooner Chicago Board of Trade, killed by fall from mast while schooner was fast in ice in the Straits of Mackinac.
Propeller Leland and several barges grounded on Saint Clair Flats; lightened off.
Propeller Favorite broke her wheel off Milwaukee.
2.—Propeller Champlain damaged machinery on Lake Michigan.
Schooner Gulnier lost jib-boom by collision with propeller Colorado off Milwaukee.
Schooner James Norris damaged by ice on Lake Michigan.
Bark Lafrinier damaged to the extent $1,000 by collision at Chicago.
Schooners Hungarian, Kate Gillett, and Jarvis Lord, damaged at Chicago.
Bark Carrier, scow Sea Bird, and schooners Curlew and J. B. Pomeroy, damaged by storm on Lake Michigan.
Schooner L. W. Perry ran ashore on Point Aux Barques, jettisoned 1,000 bushels wheat, and got off; arrived at Detroit in a damaged condition.
3.—Scow Sea Star pounded heavily while entering South Chicago Harbor and was seriously damaged.
Schooner Addie lost foretopmast by collision at Chicago.
Schooner Helen Blood suffered damage to extent of $2,500 by storm on Lake Michigan.
Propeller Montana damaged by ice in the Straits.
Schooner Hattie Johnson sprang a leak on Lake Erie; arrived at Detroit with 30 inches of water in hold.
4.—Bark Golden West damaged by striking harbor-piers at Milwaukee.
Propeller Missouri and schooner Aldrich damaged by collision at Milwaukee.
Schooner Norman ran ashore on Peshtigo Reef in Green Bay.
Schooner Exile aground in the Straits; released after 36 hours' delay.
7.—Schooner Bertie Calkins lost jib-boom and bowsprit by collision with schooner R. P. Mason off Big Point Sauble.
Propeller Lake Erie sprang a leak off Port Colborne.
Schooner R. P. Mason became water-logged and lost deck-load of lumber, after the collision with schooner Bertie Calkins, off Big Point Sauble.
9.—Tug E. H. Miller damaged by fire to the extent of $2,000 on Saginaw River.
Schooner Northwest ran ashore near Point Aux Barques.
5.—Schooner St. Peter sprang a leak and sank thirty-five miles off Milwaukee; crew all saved.
Tug Porter ran aground on Walpole Island, Detroit River.
Propeller Menominee broke machinery at Grand Haven and was towed to Chicago.
Schooners John Burt and Wells Burt lost their centre-boards on Lake Michigan.
10.—Schooner Octavia ran ashore at Kewaunee, Lake Michigan.
Schooner Emma and H. C. Richards, badly damaged by collision off Sheboygan.
Schooner Milan lost jib-boom at Chicago.
Schooner Octavia abandoned as a total loss.
Tug Robert Dunbar and two scows ran ashore near Ashtabula; released without injury.
Schooner Carlingford ashore at Thunder Bay Island.
Propeller Lawrence broke her wheel in Welland Canal.
Brig Baltimore damaged to extent of $500, by collision with schooner I. G. Jenkins in Welland Canal.
Propeller Messenger and brig Fountain City damaged by collision off Big Point Sauble, in a fog.
12.—Schooner Pilgrim sprang a leak at Muskegon.

Schooner Lasalle struck on Lime-Kiln Crossing, Detroit River, and jammed her centre-board.

13.—Tug Martin Green lost smoke-stack at Chicago.
Schooner Snow Bird collided with schooner Union at Detroit.
Schooner Adirondack sprang a bad leak off Milwaukee.
Schooner D. A. Van Valkenburg and Active collided on Lake Michigan; schooner Active damaged to the extent of $500 and the other lost jib-boom and head-gear.
Steam-barge Raleigh aground on Saint Clair Flats.
A wheelman on propeller Wenona killed at Sheboygan by log striking the wheel.

14.—Scow I. N. Hill and Schooner Hamlet damaged by collision on Lake Michigan.
Tug Tawas destroyed by explosion near Port Huron; loss $4,000; Henry Chandler, second mate of schooner Z. Chandler, killed.
Schooner William Young ran ashore in Thunder Bay.
Tug F. C. Maxon and schooner Elida damaged at Chicago.
Steam-barge Mary Jarecki badly damaged by collision near Malden.
Captain Warren, of barge Niagara, fell overboard and drowned at Wenona.
Propeller City of Concord ran ashore on Feather bed Shoals near Cape Vincent; released by United States steamer Ada.

15.—Schooner Ontario ran into propeller Sovereign at Port Robinson.
Schooner Bolivia sprang a leak while loading at Oswego.
Tug Mocking-Bird broke her wheel on Lake Erie; towed to Detroit.
Propeller Annie L. Craig broke her wheel and damaged her fore-foot at Sault Ste. Marie.

16.—Tug B. W. Aldrich badly damaged by fire at Ludington, Mich; loss, $3,000.
Schooner Margaret Dall struck bottom while entering Michigan City Harbor and sprang a leak.
Schooner J. J. Hill filled and sank near wharf at Lewiston.
Propeller C. Hickox sprang a leak on Lake Erie.

17.—Tug F. C. Maxon broke cross-head in Milwaukee Bay.
Propeller Sun broke her stern-bearings in Saginaw River.
Scow Horace Greeley arrived at Collingwood in a leaking condition.
Chris. McGarry, sailor on schooner S. G. Andrews, drowned off Point Sauble.
Richard Galloway, colored fireman on steam-barge Concord, fell dead while shovelling coal on trip Tawas City to Cleveland.

18.—Schooner David Ferguson lost jib-boom by collision at Chicago.
Steamer Scotia grounded on Saint Clair Flats.
Tug Georgiana ran on rocks near Grafton, Ontario, and sank in shoal water.

20.—Tugs F. C. Maxon and W. K. Muir collided in Milwaukee Harbor; tug Maxon narrowly escaped capsizing.
Schooner Buena Vista lost jib-boom and foretopmast by collision with schooner William Aldrich at Milwaukee.
Barge Palermo grounded in canal at Sault Ste. Marie; pulled off after 24 hours' delay.
Schooner Presto sprang a leak on Lake Michigan.
Tug Chieftain broke her walking-beam near Kingston, Ontario.
Schooner George H. Ward sprang foremast on Lake Huron.
Schooner Joseph Paige sprang a leak on Lake Michigan.

21.—Scow Planet damaged by colliding with a bridge at Milwaukee.
Daniel Haley, deck-hand on propeller Annie L. Craig, killed by fall into hold, at Cleveland.

22.—Steam-barge Mary Groh sprang a leak and sank at dock at Cleveland.
Schooner McClellan arrived at Sackett's Harbor in a water-logged condition.
Schooner Kate Winslow ran on rocks at Sault Ste. Marie and sprang a leak.
Schooner Mary Nan lost jib-boom by collision at Chicago.
Schooner R. J. Gibbs lost jib-boom, head-gear, and small-boat by collision with a tow in Detroit River.

23.—Schooner Mary ran ashore at Death's Door, Lake Michigan.
Steam-barge Raleigh struck a rock in Saint Mary's River and sprang a leak.
Propeller Mayflower ran ashore on Belle Isle, Detroit River.

25.—Steam-barge Ira H. Owen arrived at Detroit leaking.
Tug F. C. Maxon became disabled in Milwaukee Bay.
Schooner M. F. Merrick arrived at Detroit leaking badly.
Tug Wetzel broke her wheel at Racine.
Schooner Alleghany ran aground on Hurson's Island, Saint Clair River.

26.—Schooner Elgin ashore near Sheboygan; released.
Schooner James Platt ran ashore on North Fox Island, Lake Michigan.
Scow Christie arrived at Milwaukee leaking.
Schooner Minnie Mueller lost jib-boom by collision at Chicago.

27.—Scow Herman lost 50,000 shingles and 9,000 feet lumber in storm on Lake Michigan.

Schooner Sparrow damaged to extent of $500 by collision in Detroit River.
Schooner Harvest Home lost mainmast on Lake Huron.
Propeller Anna Smith and schooner James Platt arrived at Cleveland in a leaking condition.

29.—Schooner Saint Paul ran aground in Sturgeon Bay; lightened deck-load and got off.
Schooner Pride of America ran ashore in Saginaw Bay; released after 24 hours' delay.

30.—Propeller Passaic ran ashore at Fish Creek, on Green Bay; released.
Steamer Forest Queen burned at Pembroke Lake Ontario; Maggie Cavanaugh, stewardess, burned to death.

JUNE.

1.—Henry Schmidt, sailor on schooner Napoleon, drowned off Whitefish Bay, near Milwaukee.
Schooner I. N. Foster sprang a leak on Lake Michigan.

2.—Schooner Babinean ran into and damaged by schooner Albacore at Kingston.

3.—Tug Little Giant broke her shaft at Chicago.
James Powers, fireman on Tug Mary A. Green, pulled overboard by tow-line and drowned, at Detroit.

4.—Schooners Annie Vought and City of the Straits damaged by a severe squall in Chicago River.
Schooner J. I. Case lost jib-boom by collision with schooner Moonlight off Beaver's Island, in a fog.
Propeller Phil Sheridan ran ashore at Scarecrow Island, Lake Huron; lightened off.

5.—Tug Starkweather blew out boiler-head at Cleveland; fireman Charles Smith scalded to death.
Schooner Edward Kelley struck on a rock and sprang a leak; repaired at Kingston.
Schooner Alida J. Rogers ran ashore on Bois Blanc Island; pulled off with little injury.

7.—Schooner Canadian capsized off Bronte, Ontario.
Schooner Exile blown to pieces by explosion of nitro-glycerine at entrance to Saint Mary's River; Captain Peterson and eight others drowned or killed.
Tugs Black Ball, Ewing, and Reciprocity lost smoke stacks, and tug Mosher damaged her stern at Chicago.

8.—Schooner Enterprise struck pier at Racine, capsized and sank; deck-load of wood lost; raised and towed into harbor.
Schooner C. C. Barnes lost bowsprit and jib-boom in a squall off Sheboygan.
Several vessels damaged at Chicago by a sudden rise of the water to the height of two feet, caused by a strong east wind.
Steam-barge Ira H. Owen, schooners A. Rust and R. Winslow damaged by collision at Chicago.
Collin Murray, sailor on schooner Tecumseh, fell into river at Goderich and was drowned.
Schooner Hattie Wells damaged to extent of $1,500 by being run into by schooner Winona, off Kewaunee.
Schooner Camden collided with scow D. R. Holt, at Milwaukee.
Steamer Nahant ran ashore at Point au Pelloe, in a dense fog.

11.—Tug Alice C. Campbell broke shaft and lost her wheel at Muskegon.
Schooner Pathfinder lost foretopmast at Chicago.
Tug E. P. Ferry broke her wheel at Chicago.
Schooner Laura sprung a leak on Lake Ontario.
Schooner Morning Star lost her centre-board off Sheboygan.
Schooner Pulaski struck obstruction in Welland Canal and sprang a bad leak.
Tug Tarrant damaged by fire at Chicago to extent of $300.

12.—Scow Dan Baker sunk off Cedar Point, Lake Erie; vessel and cargo a total loss.
Schooner Pensaukee had her spars carried away by a squall off Dunkirk.
Schooner Unadilla had her main-boom broken by a squall on Lake Erie.
Barge D. M. Wilson ran upon miter-sill at the Sault Canal, and had to be lightened off.

14.—Tug Bob Anderson damaged to the extent of $1,400 by fire.

15.—Tug W. Shield broke her machinery at Chicago.
Schooner Fearless lost foremast and bowsprit on Lake Ontario.
Schooner Selkirk disabled rudder off Buffalo.
Schooner John F. Tracy ran into propeller Montgomery at Chicago; both severely damaged.
Schooner Twin-Sister sprang a leak on Lake Erie.

Schooner Annie Falconer struck a rock and sank in Welland Canal, near Port Colborne.
William Hartnett, sailor on barge Monarch, crushed to death between barge and dock at Buffalo.
16.—Schooner Enterprise lost jib-boom, bowsprit, and head-gear by collision at Oswego.
Schooner Belle Mitchell damaged by collision with schooner Miami on Lake Michigan.
Samuel Swenson, sailor on schooner America, killed in Welland Canal by breaking of tow-line.
Steamer City of Sandusky broke wheel on Lake Erie.
Schooners Finney, Ferry, and Hartford ran upon reef between South Fox and Manitou Islands, Lake Michigan.
17.—Schooner Willie Keller run into and damaged by propeller Mohawk at Detroit.
Schooner Mollison struck reef near South Fox Island and foundered.
Schooner M. C. Upper lost bowsprit and jib-boom by collision with steam-barge Fred Kelley on Lake Huron.
Scow Skidmore sprang a leak on Lake Michigan.
Schooners Woodruff and Mocking-Bird lost topmasts on Lake Michigan.
18.—Schooner Charlie ashore on Madeline Island, Lake Superior; hole stove in bottom.
19.—Schooner Fawn cut down to water's edge on starboard side by tug Parsons, off Big Point Sauble.
20.—Schooner Shannon sprang a leak and sank near Oswego; crew saved.
Schooner Hartford struck on Lime-Kiln Reef.
Schooners America and A. Boody sprang leaks on Lake Michigan.
21.—Charles McGeehan, sailor on schooner Contest, drowned of Kenosha.
Schooner M. F. Merrick arrived at Oswego leaking badly.
Propeller Scotia ran aground on Middle Island, Lake Huron; jettisoned 50 tons Scotch pig-iron.
22.—Propeller Nassau broke her cylinder-head at Glen Harbor; towed to Milwaukee.
Propeller India broke her wheel in Neebish Rapids.
23.—Schooner Homer lost jib-boom by collision at Chicago.
Bark Lottie Wolf struck by lightning off Manitowoc, Lake Michigan.
Steamer Spartan damaged by fire at Kingston.
25.—Steamer Jarvis Lord disabled machinery at Sault Ste. Marie.
Schooner Maumee Valley ran aground at Church's, Saint Mary's River, and had to be lightened off.
Steamer Ontario damaged by storm on Lake Superior.
26.—Barge Harvest driven ashore by a squall at Turtle Bay, Detroit River.
Propeller Maine disabled machinery on Lake Huron.
John Simpson, sailor, drowned near Kingston.
27.—William Birdsell, sailor on steamer Frost, drowned on Lake Saint Clair.
Schooner E. C. Roberts broke centre-board on Lake Huron.
Schooner Delphin struck a scow while entering Ludington, Mich.; filled and sank in 30 feet of water.
28.—Schooner O. M. Bond and bark Arabia lost jib-booms by collision in Welland Canal.
Tug William Livingston broke wheel in Saint Clair River.
Schooner H. C. Deming ran aground at Buffalo.
29.—Schooners Minnie Slawson and City of Green Bay damaged by collision at Chicago.
Schooner Alida J. Rogers sprang a leak on Lake Michigan.
Schooners Annie Tomine and Lornie A. Burton damaged by collision off Chicago.
John McDermott drowned from schooner Two Fannies at Sault Ste. Marie.
Schooner Babineau and Gaudry damaged to extent of $300 by collision with Schooner Gildersleeve on Saint Clair Flats.
30.—Schooner Marengo had her fore-gaff broken on Lake Michigan.
Schooner E. P. Royce lost foremast off Manitowoc.

JULY.

1.—Schooner Lone Star lost jib-boom in Welland Canal.
Tug McClellan broke her crank-pin on Lake Saint Clair.
Schooners Sea Gull and Mary Merritt badly damaged by collision in Welland Canal.
Joseph Conway drowned from bark Maggie McRae, in Welland Canal.
2.—Propeller Norman damaged by fire at Chicago to the extent of $2,500.
Schooner Two Brothers and steam-barge Leland damaged by collision at Chicago.
3.—Schooners Ellingwood and J. C. King damaged by collision at Chicago.
Scow Butcher Boy lost her small boat by collision in Detroit River.

Schooner B. W. Folger ran on middle ground near Northport, Bay of Quitle, and sank.
Schooner Ardent sprang a leak off Milwaukee.
A sailor drowned from schooner White Oak.
4.—Schooner Wave run into by schooner Southwest in Welland Canal. Damage amounted to $500.
Schooner Lillie Parsons struck a rock in Welland Canal, and was obliged to return to Buffalo.
Propeller India ran aground at foot of Stag Island; released after twenty-four hours' delay.
Bark S. V. R. Watson run down by steam-barge W. H. Barnum on Lake Erie; sunk in 35 feet of water.
Four persons drowned by capsizing of yacht off Buffalo: John Langley and William Forest of schooner Annie Vought, and Mary Kurts and Lizzie Glass of Buffalo.
Propeller America arrived at Saint Catherine's leaking.
Tug Oswego damaged by collision on Saint Clair Flats.
Schooner Rainbow arrived at Chicago leaking.
6.—Steamer Corinthian struck upon Split Rock, Lachine Rapids, and sank; steamer Osprey sank in Saint Lawrence River at same time; the effects of a hurricane.
7.—Schooner Louise carried away gate in Welland Canal, and ran into schooner M. C. Upper; schooner Upper will prove a total loss.
Schooner William Grandy lost mizzenmast and some canvas on Lake Huron.
Schooner Kate Lyons had her mainmast shattered by lightning on Lake Michigan.
Tug Margaret badly damaged by collision with Tug Parsons at Manistee.
Schooner Norway capsized on Lake Huron; crew saved.
Schooner China damaged her rudder and sprang a leak on Lake Ontario.
Steamer Chief-Justice Waite ran aground at Toledo.
Bark Great West and schooners Imperial, Pauline, Ida Keith, and J. R. Bentley, damaged by collision at Chicago.
Steamer Stranger ran ashore near Sea Breeze house, Lake Ontario.
Schooner Eliza Fisher dismasted on Lake Ontario.
Bark John Breden sprang foremasts in the Straits.
Propeller City of New York broke her wheel near Detroit.
Steam-barge Tecumseh broke foretopmast in a storm on Lake Erie.
Propeller Prussia damaged to extent of $200 by schooner Evaline Bates in Welland Canal.
8.—Jared Merrigo drowned from steam-barge Eclipse at Essexville.
Scow J. A. Sanders struck a rock at Forest Bay, Lake Huron, and arrived at Detroit in a sinking condition.
Tug James Amadeus damaged by collision with schooner Watts Sherman at Cleveland.
Schooners Augusta and G. M. Neelon damaged by collision near Port Colborne.
9.—Tug Queen City ran down a scow at Buffalo; Joshua Sheldon and his wife and child drowned.
A deck-hand named Smith drowned from steamer Keweenaw at Detroit.
Propeller Bertschy broke cross-head off Manistee.
10.—Schooner R. B. King struck dock and drove fluke of anchor into her hull at Milwaukee.
Propeller Mary Robertson damaged machinery at Detroit.
12.—Propeller Sun sprang a leak and foundered off Rond Eau, Lake Erie; total loss.
Alexander Pecan, sailor on barge Energy, drowned at La Chine Canal.
Propeller E. B. Ward, jr., ran ashore at Northport, Lake Michigan.
Propeller Roanoke disabled machinery on Lake Erie in a storm.
Propeller Pacific and two vessels grounded on Saint Clair Flats.
Propeller Missouri ran into schooner E. P. Ryerse, lying at anchor near Long Point.
13.—Scow Chapin lost jib-boom by collision with schooner Tomine at Chicago.
Ferry steamer Boquet sank at her dock at Toronto.
John Shepard, fireman on steamer Union, killed at Oconto, by being crushed against dock.
Scow Iosco ran ashore at Port Austin Reef, Lake Huron; 280 tons plaster jettisoned.
Schooner E. M. Blake sprang a leak on Lake Erie in a storm, and threw ten tons freight overboard.
15.—Schooner Maggie McRae broke her centre-board near Port Colborne.
Schooner M. L. Higgie broke centre-board on Lake Ontario.
16.—Schooner G. M. Filer lost jib-boom by colliding with bridge at Chicago.
Patrick Tracy drowned at Oconto.
Schooner Harvest Home aground in Waiska Bay, Lake Superior.
Bark Gibraltar lost foretop-gallant mast on Lake Huron.

Schooner Pilgrim dragged ashore at Antrim City, Traverse Bay, lies in 5 feet water.
Schooner Curlew beached in Traverse Bay.
Bark L. C. Woodruff lost jib-boom in Straits.
Schooners Anna Maria and Topsey lost jib-booms in Lake Michigan.
Schooner A. Cohn ran aground in Detroit River.
18.—Scow Lily Gary ran on beach at Michigan City, and went to pieces.
Propeller Roanoke damaged by collision with propeller Norman at Chicago.
Steamer Dove ran aground on Stony Island, Detroit River.
20.—A sailor on schooner J. I. Case, killed by falling into hold of schooner at Buffalo.
21.—Scow Planet sprang a leak on Lake Michigan.
Tug Favorite damaged by fire to extent of $200 on Lake Erie.
Schooner Australia sprang a leak on Lake Michigan.
Schooner Hubbard sprang a leak near Oswego.
Steam-barge Sparta ran aground on Saint George's Flats, Saint Mary's River.
Walter Payne, son of engineer of steamer Inter-Ocean, drowned from steamer near Detroit.
22.—Schooner Richard Mott damaged by colliding with bridge at Milwaukee.
Steamer Magnet broke her walking-beam and cylinder, off Clayton.
Schooner M. L. Breck ran aground on Fighting Island, Detroit River.
24.—Schooner Arcturus lost jib-boom off Kewaunee.
Thomas Boggs, sailor, drowned at Buffalo.
Propeller Merchant ashore on South Point, near Milwaukee.
25.—Schooner Pauline lost jib-boom by collision at Chicago.
Propeller Lowell and tug Gladiator damaged by collision at Port Huron.
Schooner Eliza Gerlach, laden with steel rails, struck by lightning on Saint Clair Flats.
Propeller City of Duluth ran aground in a squall on Hurson's Island, Detroit River.
26.—Tug Ransom sunk in Detroit River by collision with tug Urania while racing for a tow.
Schooner A. L. Lyon and barge Arizona damaged by collision off Lexington, Lake Huron.
Scow Supply arrived at Milwaukee leaking.
Schooners Mary Collins, Winona, and Comet, and the brig Mechanic damaged by squall on Lake Michigan.
Schooner Pensaukee ran into pier at Chicago.
Bark J. C. King damaged by collision on Saint Clair Flats.
Schooner Nellie Redington torn from her moorings and damaged by a sudden rise of water at Buffalo.
Scow Hurrah Boys ran ashore at Milwaukee and went to pieces.
Brigs Commerce and Fountain City and schooners Imperial and Maggie Thompson damaged by storm on Lake Michigan.
Schooner Argo lost jib-boom by collision with schooner M. A. Scott off Chicago.
Schooner Gerritt Smith had her foretop-mast carried away by squall on Lake Ontario.
Schooners Higgie and Jones and Unadilla lost canvas by squall on Lake Michigan.
Scow Maria capsized off Lexington, Lake Huron, and drifted ashore.
Propeller Dromedary sprang a leak on Lake Ontario.
27.—Schooner John M. Hutchinson grounded on Saint Clair Flats and damaged her steering-gear.
Oscar Turner drowned from propeller Scotia at Detroit.
Tug J. F. Behn exploded her boiler at Buffalo; a total loss.
A sailor on barge Racine drowned off Sand Beach, Lake Huron.
Michael McMahon, sailor on bark Gibraltar, drowned at Kingston.
Schooner Exile struck on reef at Calumet, Lake Michigan, and sprang a leak.
Schooner Seaton damaged by collision at Chicago.
Scow Butts ran on harbor-pier at Chicago, was towed up the North Branch, and became water-logged.
28.—Steamer Island Queen broke her cross-head near Malden; towed to port.
29.—Tug Little Giant damaged by collision at Chicago.
Propeller Mohawk, tug Favorite, and schooner John S. Miner damaged by collision at Detroit.
Barge M. R. Warner aground on Grassy Island, Detroit River.
Schooner Chicago Board of Trade sprang a leak and sank near Fairport, Lake Erie, in 13 fathoms of water.
30.—Scow William Bates lost foresail, &c., in storm off Racine.
Steam-barge B. W. Jenness broke machinery on Lake Erie and was towed to Detroit.
Schooner Wm. Hunter sprang a leak and sank in 13 feet of water at Dunkirk.

AUGUST.

2.—Barge Oneida lost deck-load of wood and became water-logged on Lake Michigan.
Henry Evans, sailor on schooner Australia, killed by being thrown upon anchor by tow-line at Muskegon.
Tug Neshoto collided with schooner Silver Cloud at Two Rivers and lost her smoke-stack.
3.—Bark John Breden lost foretop-gallant mast on Lake Michigan.
Schooner William Sturgis damaged by collision with propeller Norman at Chicago.
Schooner Ironside sprang a leak on Lake Erie.
Schooner Cecilia Jeffrey ran ashore at Painesville, Ohio.
Barge City of Port Huron ran afoul of scow St. Charles in Saint Clair River.
4.—Schooner Mystic lost bowsprit and jib-boom by collision with propeller C. J. Kershaw at Chicago.
Schooner C. N. Johnson arrived at Chicago leaking badly.
Schooners Great West and Little Belle lost jib-booms by collision at Chicago.
Tugman Earnest Fesing drowned in Torch Lake, Lake Superior.
Schooner Queen of the Lakes arrived at Chicago leaking.
6.—Barge Golden Harvest damaged by collision with schooner J. C. Harrison at Chicago.
7.—Schooner Maid of the Mist dismasted off Huron, Ohio.
Steamer Fawn burst her boiler at Port Fortune, Ontario; loss $3,000; engineer badly scalded.
Steamer Warrington damaged by collision with a raft on Lake St. Clair.
8.—Charles Williams, sailor on barge Norway, drowned at Buffalo.
Steamer Keweenaw, ashore near Delour, Lake Huron.
10.—Steamer Mystic ran aground in Detroit River.
Tug Union broke her shoe at Chicago.
Schooner Lewis Wells struck by squall and lost her jib; afterward ran on pier at Buffalo and stove a hole in her bottom.
Steamer Gazelle broke machinery near Detroit.
Edward McNamara, of steam-barge Clinton, drowned at Port Dalhousie.
11.—Bark Erastus Corning aground at Buffalo.
13.—Albert Green of propeller City of Duluth, drowned at Duluth.
Steamer Thomas L. Parsons sunk in Welland Canal near Thorold.
Schooner Bessie Bolt damaged by collision at Chicago.
Steam-barge Bay City disabled and returned to Cleveland.
Steam-barge Thames burned down to hull at Lambton, Ontario.
Sailor on barge Venice killed at Toledo by a fall from the mast.
Schooner R. P. Mason aground at Sheboygan.
Propeller Clinton ran into schooner Willard at Toledo.
14.—Schooner Mary Amelia arrived at Port Colborne leaking.
Propeller City of New York broke her wheel in Welland Canal; towed to Cleveland.
15.—Barge Wyoming ashore at Sandusky.
16.—Schooner King Sisters ran ashore near False Presque Isle, Lake Huron; jettisoned 100 tons pig-iron and got off.
17.—Tug Margaret damaged by collision with tug Osgood at Manistee; loss $1,500.
Wm. Kelley, sailor on steamer W. L. Wetmore, drowned near Point au Pellee.
18.—Schooner Senator Blood ashore at Bay Point, Lake Erie; released with little injury.
19.—Schooners C. A. King and E. G. Gray lost jib-booms by collision at Chicago.
Schooner C. J. Wells arrived at Buffalo with a broken bowsprit.
Schooner W. S. Crossthwaite ashore at Point Albino, twelve miles from Buffalo; released.
Steamship W. T. Graves sprang a leak on Lake Michigan.
Sailor on steamer St. Lawrence drowned at Indian Cove.
Propeller Ontario arrived at Detroit with a broken wheel.
20.—Schooner Alvira Cobb sprang a leak at Chicago.
Bark S. V. R. Watson, after being pulled off from Point au Pellee, leaked so badly that she was beached at Port Burwell, Lake Erie, and now lies full of water.
Capt. John Morrison, of schooner Eva, struck by lightning off Manitowoc and remained senseless for three hours. Next day he was knocked overboard and drowned by jibbing of main boom.
Schooner Union ashore near Port Colborne; released with slight injury.
Ferry-steamer Stillman Witt sprang a leak and sunk at Deluth; in water up to her guards.
21.—Schooner L. J. Farwell ran ashore in Detroit River.
Steamer City of London destroyed by fire at Collin's Inlet, Georgian Bay; deck-hand named Campbell burned to death.
Barge Advance and schooners J. G. Masten and City of the Straits damaged by lightning at Chicago.

22.—Schooner Raleigh lost foretop-mast on Lake Michigan.
Propeller Shickluna lost foretop-mast by collision with schooner Typho at Milwaukee.
Schooner Wm. Sanderson struck by a squall and sprang a leak, and was beached at White Rock.
A convict named Kane jumped overboard from a propeller at Algonac and was drowned.
Scow Shaw struck old pier off Fairport, Ohio, and went to pieces.
24.—Steamer City of Toledo burned at Manistee; all inside work burned; loss $10,000.
Tug Annie M. Pierce broke wheel on Lake Huron.
Schooner Evelyn had her bulwarks stove in and anchor carried away by schooner Monitor, at Two Rivers.
Schooner C. H. Walker passed Detroit minus foretop-mast.
Schooner Butcher Boy sprang a leak on Lake Erie; towed to Cleveland.
Tug J. L. Higgie sunk in Mud Lake, near Chicago.
25.—Scow Industry wrecked off Black River, Lake Erie; a total loss.
Barge Chester B. Jones returned to Chicago leaking.
A deck-hand on tug McClellan drowned at Chicago.
Schooner John T. Mott sprang a leak in the Straits and was towed to Detroit.
Deck-hand named Sutherland drowned from steamer Watertown in Saint Lawrence River.
Propeller Music broke her shaft on Lake Michigan; towed to Traverse City.
27.—Steam-barge S. C. Baldwin sprang a leak during storm on Lake Michigan; arrived at Milwaukee with water running into hold at the rate of 14 inches per hour.
Schooner Dashing Wave lost jib-boom by collision with bark Erastus Corning, at Chicago.
Barge F. X. arrived at Bay City leaking badly.
Lewis S. Blondheim drowned from schooner Augusta on Lake Ontario.
Schooner M. I. Wilcox sprang a leak in the Straits.
Steam-barge D. W. Rust aground on Saint Clair Flats.
Schooner Mowry lost bowsprit and jib-boom by collision with schooner Nevada off Grand Haven.
Schooner H. C. Post ran ashore at Two Rivers; released.
Schooner Elvina ashore on North Harbor Reef, Lake Ontario.
28.—Steamer Antelope sprang a leak off Oswego.
Steamer Wave destroyed by fire off the Charities, Saginaw Bay.
Schooner Harrison sprang a leak on Lake Michigan.
Propeller Cuba ran into schooner Franklin and carried away schooner's rail and stanchions.
29.—Schooner J. H. Hazard damaged by colliding with a bridge at Toledo.
30.—Steamship Ketcham and schooner Belle Walbridge collided off Waukegan. Ketcham put into Racine leaking, and schooner returned to Chicago minus foremast, &c.
31.—Schooner Bertha Barnes damaged by colliding with a bridge at Toledo.
Schooners Lumberman, Milwaukee Belle, and H. C. Hegg, damaged by collision at Chicago.
Tug Dexter damaged by collision with schooner M. L. Collins at Milwaukee.
Schooner Argo sprang a leak and water-logged off Kewaunee, Lake Michigan.

RECAPITULATION.

Casualties.	January.	February.	March.	April.	May.	June.	July.	August.	Total.
Sunk	....	1	....	4	2	6	16	7	36
Damaged, disabled, &c	3	6	9	12	26	23	29	12	102
Ashore and aground	1	1	....	16	31	14	22	14	99
Sprang a leak	....	....	1	24	16	10	11	15	55
Damaged by collision	....	1	3	24	42	30	38	27	165
Damaged by fire	....	1	....	3	3	3	2	2	13
Destroyed by fire	....	1	....	....	....	....	....	2	3
Water-logged	....	....	....	2	2	....	1	1	6
Struck by lightning	....	....	....	....	....	1	2	3	6
Dismasted	....	....	....	....	1	1	....	....	.....
Exploded boiler	....	....	....	....	....	....	....	1	3
Drowned	....	....	....	10	3	5	17	11	46
Killed by accident	1	....	....	....	10	13	2	2	28
	1	....	....	10	13	18	19	13	74

PAPER 58.

List of Boards of Trade, Chambers of Commerce, and other organizations, apart from those directly connected with agriculture, which had on September 30, 1874, appointed permanent committees to confer with the Chief Signal-Officer of the Army.

Name of organization.	State.	Committee.
Chamber of Commerce of New York	New York	George W. Dow, M. Maury, J. D. Jones, Charles G. Curtis.
Board of Trade of Buffalo	do	Alonzo Richmond, George S. Hazard, John H. Vaught.
Board of Underwriters of New York	do	John D. Jones, Daniel Drake Smith, Elwood Walter, Alfred Ogden.
Board of Trade of Toledo	Ohio	W. T. Walker, M. D. Carrington, A. W. Colton, C. A. King.
Board of Trade of Washington	District of Columbia	J. W. Thompson, A. S. Solomons, R. M. Hall.
Board of Trade of Detroit	Michigan	J. Aspinwall, G. W. Bissell, E. W. Hudson.
Board of Trade of Chicago	Illinois	C. Randolph, D. H. Denton, E. T. Lawrence.
Board of Trade of Boston	Massachusetts	Nathaniel Spooner, Thomas Gaffield, Eben Howes.
Chamber of Commerce of Milwaukee	Wisconsin	John L. Hathaway, J. B. Merrill, L. R. Durand.
Board of Trade of Nashville	Tennessee	James Whitworth, R. T. Kirkpatrick, Dr. W. W. Berry, E. D. Hicks, M. S. Cochrill.
Chamber of Commerce of Duluth	Minnesota	Charles M. Cushman.
Board of Trade of Baltimore	Maryland	H. L. Whitridge, Robert R. Kirkland, Benjamin M. Hodges, jr., J. Hall Pleasants
Board of Trade of New London	Connecticut	James T. Skinner, George P. Rogers.
Board of Trade of San Francisco	California	R. R. Swain, J. De Freney, R. G. Sneath, C. A. Low.
Board of Trade of Cleveland	Ohio	R. K. Winslow, R. F. Lyon, J. C. Sage.
Chamber of Commerce of Charleston	South Carolina	E. H. Frost, W. P. Hall, T. W. Dawson.
Board of Trade of Charleston	do	Hon. George A. Trenholm, Prof. F. S. Holme, E. Lafitte.
Chamber of Commerce of Memphis	Tennessee	B. J. Semmes, H. H. Higbee, Thomas H. Allen.
Board of Trade of Oswego	New York	A. H. Failing, W. J. Malcolm.
Board of Trade of Omaha	Nebraska	A. D. Jones, G. H. Collins, M. Stephens, Col. J. Patrick, C. C. Housel.
Committee appointed by mayor of Rochester.	New York	George Schofield, John Siddons, Henry S. Hebbard.
Board of Trade of Portland	Maine	C. H. Farley, J. S. Bedlow, M. N. Rich.
Board of Trade at Philadelphia	Pennsylvania	Henry Winsor, Thomas C. Hand, Thomas L. Gillespie, George N. Fotham, George N. Allen, James Hand.
Board of Trade of Mobile	Alabama	J. M. Thompson, J. Y. Thompson, Daniel Jones.
Chamber of Commerce of Savannah	Georgia	General Joseph E. Johnston, J. F. Gilmer, H. C. Wayne.
Chamber of Commerce of Wilmington	North Carolina	A. H. Van Bokkelen, George Harriss, W. L. De Rossett.
Board of Trade of Norfolk	Virginia	Dr. S. K. Jackson, W. A. Graves, E. C. Lindsay.
Board of Trade of Indianapolis	Indiana	D. M. Berry, E. F. Cox, John E. Wright, W. R. Nofsinger, S. T. Bowen.
Chamber of Commerce of Saint Paul	Minnesota	R. Ormsby Sweeney, Rev. J. Mattocks, J. Fletcher Williams.
Board of Trade of Burlington	Vermont	G. G. Benedict, Prof. Peter Collier, Prof. McK. Petty.
Union Merchants' Exchange of Saint Louis.	Missouri	George P. Plant, R. P. Tancy, W. F. Scudder.
Chamber of Commerce of Galveston	Texas	J. S. Thrasher, W. Richardson, C. G. Forshey.
Board of Trade of Shreveport	Louisiana	George Williamson, R. D. Sale, George A. Pike.
Chamber of Commerce of San Diego	California	Douglass Gunn, C. A. Jones, J. S. Gordon.
Philadelphia County Medical Society	Pennsylvania	Lawrence Turnbull.
Board of Trade of Davenport	Iowa	James M. Dalzell, Edward Russell, F. A. Angel.
Board of Trade of Jacksonville	Florida	A. S. Baldwin.
Chamber of Commerce of Indianola	Texas	G. Seeligson, W. P. Milby, D. Sullivan.
Board of Trade of La Crosse	Wisconsin	William W. Jones, James J. Lynden, S. L. Nevins.
Cotton Exchange of New Orleans	Louisiana	John J. Noble, Cyrus Bussey, Thomas Henderson.
Chamber of Commerce of New Haven	Connecticut	Johnson T. Platt, Mayor Lewis, E. S. Wheeler.

List of boards of trade, chambers of commerce, &c.—Continued.

Name of organization.	State.	Committee.
Chamber of Commerce of Cairo	Illinois	W. P. Halliday, Charles M. Howe, Peter Cuhl.
Board of Trade of Cincinnati	Ohio	Daniel B. Pierson.
Board of Trade of Dubuque	Iowa	Dr. Asa How, Franklin Hinds, R. J. Gibbs.
Board of Trade of Albany	New York	William H. Hale, E. C. Jackson, E. T. Durant.
Board of Trade of Louisville	Kentucky	J. L. Smith, Dr. B. M. Wible, R. A. Robinson, John A. Carter, J. Val Cowling.

PAPER 59.

List of places for which stations have been requested but not established on September 30, 1874.

Place.	Applicant.	Date.
Muskegon, Mich	Hon. H. H. Holt, Michigan legislature, inclosing petition of 99 citizens.	Jan. 21, 1871
	Board of Trade of Toledo	Jan. 27, 1871
	Board of Trade of Chicago	Feb. 10, 1871
	Hon. T. W. Ferry, United States Senate	Mar. 3, 1871
Manitowoc, Wis	H. P. Sawyer, member of Congress	Jan. 25, 1871
Huron City, Mich	Board of Trade of Toledo	Jan. 27, 1871
	Board of Trade of Cleveland	Jan. 19, 1871
	Board of Trade of Detroit	Feb. 19, 1871
Mackinac, Mich	Board of Trade of Chicago	Feb. 10, 1871
Richmond, Va	W. G. Turpin	Apr. 3, 1871
Body Island, N. C	Board of Trade of Norfolk, Va., and resolution of the general assembly of Virginia.	Apr. 17, 1871
Lewes, Del	Board of Trade of Philadelphia	May 25, 1871
Parks, Colo	E. J. Mallett, late consul-general	May 24, 1871
Staten Island	C. Kentgen, jr	June 9, 1871
Chambersburgh, Pa	Hon. John Scott, United States Senate	June 12, 1871
	Hon. Simon Cameron, United States Senate	June 12, 1871
Watertown, N. Y	L. L. Pratt	June 21, 1871
Xenia, Ohio	C. E. Case	June 30, 1871
Port Hope	Board of Trade of Detroit, Mich	July 22, 1871
Illinois Industrial University, Champaign, Ill.	Hon. W. C. Flagg, secretary	July 21, 1871
	Hon. J. M. Gregory, president	Feb. 21, 1872
	E. A. Gustman, chairman meteorological committee Macon County Fruit-Growers' Association.	Aug. 30, 1874
Little Rock, Ark	Hon. J. M. Hawks, member of Congress	July 26, 1871
	Albert Cohen	July 1, 1872
	A. Van Cleff	May 31, 1873
	Hon. Powell Clayton, United States Senate	Mar. 11, 1874
Sacramento, Cal	J. N. Hoag, secretary California State Board of Agriculture.	July 26, 1871
	Concurrent resolution of the Legislature of California, presented by Dr. T. M. Logan, secretary State board of health.	May 15, 1872 Jan. 10, 1872
Niles, Mich	J. B. Fitzgerald, secretary Berrien County Agricultural Society.	July 27, 1871
Hot Springs, Ark	J. H. Morton, M. D	Aug. 2, 1871
Louisiana, Mo	William Stark and R. E. Pleasants	Aug. 3, 1871
Janesville, Wis	J. B. Whiting, M. D., and Rock County Agricultural Society.	Aug. 7, 1871
Hilledale, Mich	Prof. George M. Miller, secretary Hillsdale College	Aug. 6, 1871
	Hillsdale County Agricultural Society	Aug. 6, 1871
Metamora, Ill	Edward Kipp, secretary Woodford County Agricultural Society.	Aug. 8, 1871
Marietta, Ohio	J. W. Andrews, president Marietta College	Aug. 10, 1871
	Washington County Agricultural Society	Aug. 10, 1871
Mount Pleasant Academy, Pa	W. H. McCrey, Mount Pleasant Academy and Normal School.	Aug. 11, 1871
Nebraska City, Neb	H. K. Raymond, secretary Otoe County Farmers' Club	Aug. 14, 1871
Mount Moosilauke, N. H	Prof. C. H. Hitchcock	Aug. 16, 1871
	A. F. Clough	Aug. 16, 1871
Catasauqua, Pa	Hon. E. McPherson, Clerk United States House of Representatives.	Sept. 11, 1871
Galena, Ill	Dr. Wilmot Scott, editor Galena Commercial Advertiser.	Sept. 14, 1871
Columbus, Neb	J. O. Shannon, secretary Platte County Agricultural Society.	Sept. 5, 1871
Farther Point, Coburg, and Collingwood, Canada.	Oswego Board of Trade, by J. L. McWhorter.	Aug. 30, 1871

List of places for which stations have been requested, &c.—Continued.

Place.	Applicant.	Date.
Springfield, Mo	John E. Worth, for Greene County Agricultural and Mechanical Society.	Sept. 18, 1871
Mason City, Iowa	T. G. Emsley, Secretary Cerro Gordo County Agricultural Society.	Oct. 6, 1871
Orono, Me	M. C. Fernald, Maine State College of Agriculture	Oct. 19, 1871
Balize, La., Fort Morgan, Ala., Waco, Tex.	Agent and captains of Morgan Steamship Company	Oct. 31, 1871
Fort Randall, Dak	R. J. Percy, for Missouri Valley Telegraph Company	Nov. 9, 1871
University of Michigan, Ann Arbor.	Prof. G. B. Merriman	Nov. 28, 1871
Fort Garry, Manitoba	N. McDongall	Dec. 2, 1871
Fountain, Colo	R. F. Long, editor El Paso Ranchman	Dec. 4, 1871
Vineyard Haven, Mass	Prof. J. E. Hilgard, United States Coast Survey, Daniel W. Stevens, and Rev. Thomas Hill.	Dec. 18, 1871
Newport, R. I	Hon. H. B. Anthony, United States Senate, forwarding memorial of 29 citizens	Dec. 8, 1871
	Capt. S. A. Day, United States Army	July 26, 1871
Cape Ann, Mass	Hon. B. F. Butler, member of Congress	Dec. 19, 1871
Iowa City, Iowa	John P. Irish	Dec. 14, 1871
Manassas, Va	George C. Round	Dec. 27, 1871
Quincy, Ill	A. H. Hill, Secretary National Baord of Trade	Jan. 4, 1872
Dover Point, N. H	John B. Stivens, mayor	Jan. 13, 1872
Wilmington, Del	Board of trade	Jan. 24, 1872
Additional stations on eastern shore of Lake Michigan.	Hon. H. H. Holt, Michigan legislature	Feb. 11, 1871
Additional stations on Mountains of Virginia.	G. C. Wedderburn, secretary Virginia Telegraph Company; L. A. Gobright, associated press.	May 7, 1871
Additional stations on western slope of Mississippi Valley.	George P. Plant, W. H. Scudder	May 7, 1871
	R. P. Handey, committee of Merchants' Exchange, Saint Louis, Mo.	July 16, 1871
Southwest Pass, Pass à l'Outre	Thornton A. Jenkins, rear-admiral United States Navy	Mar. 20, 1871
Stanton, Va.; Christianburgh, Va.; Bristol, Tenn.; Easton, Pa.; Harrisburgh, Pa.; Winchester, Va.	Jed. Hotchkiss	Aug. 15, 1871
Towanda, Kans	M. D. Ellis	Feb. 12, 1872
Black Dome, Black Mountain, N. C.	William Cain	Feb. 12, 1872
Charlotte, N. Y	J. Eaton and thirty-five others	Feb. 14, 1872
Gallitzin, Altoona on Pennsylvania Central Railroad.	David Peelor	Feb. 17, 1872
University of Minnesota, Minneapolis.	William Folwell, president	Feb. 21, 1872
Each of the State Agricultural Colleges.	J. B. Bowman, regent Kentucky University, and others	Feb. 29, 1872
Columbus, Ohio	J. H. Klippart, secretary of Ohio State Board of Agriculture.	Mar. 5, 1872
Norwich University, Northfield, Vt.	Capt. C. A. Curtis	Mar. 15, 1872
Grand Tower, Ill	A. R. Harris	Mar. 21, 1872
Iuka, Miss	Rev. J. T. Freeman, through Hon. George E. Harris, member of Congress.	Mar. 25, 1872
Great Natihalee, Bald Mountain, N. C.	Charles W. Jenks	Apr. 1, 1872
Deposit, N. Y	G. W. Hanford	Apr. 1, 1872
Heilman Dale	S. P. Heilman	Apr. 1, 1872
Boonville, Mo	J. L. Stephens	Apr. 11, 1872
Fort Wayne, Ind.; New Albany, Ind.	F. C. Johnson, Indiana State Board of Agriculture	Apr. 12, 1872
Maryland Agricultural College.	A. R. Davis, president board of trustees	Apr. 19, 1872
San Antonio, Tex	Thomas G. Williams	May 10, 1872
	Tred. Petterson, and 52 others	Mar. 16, 1872
	Hon. M. C. Hamilton, United States Senator	Mar. 17, 1872
	Hon. John Hancock, member of Congress	Apr. 1, 1872
Atlanta, Ga	Hon. John H. James, mayor	May. 10, 1872
	R. W. Whiteley	Feb. 15, 1872
Auburn, Ala.; Agricultural and Mechanical College of Alabama.	William C. Stubbs, John B. Reed, W. H. Jenison	May 14, 1872
Racine, Wis	Mayor and Council	May 18, 1872
Ogdensburgh, N. Y	Hon. W. A. Wheeler, member of Congress	May 25, 1872
Plattsburgh, N. Y	Hon. John Rogers, member of Congress	May 28, 1872
Sewanee, Tenn	John L. Cooper, through Prof. Joseph Henry, Smithsonian Institution.	June 10, 1872
Newark College, Del	William D. Mackey, secretary	June 11, 1872
Green Bay, Wis	Hon. P. Sawyer, member of Congress	June 13, 1872
	Philotus Sawyer, member of Congress	June 24, 1872
Kenosha, Wis	Wallace Mygatt	June 20, 1872
Warsaw, Ind	Marshall H. Parks	June 24, 1872
Beaver City, Utah	Daniel Tyler	July 8, 1872
New Ulm, Minn	Dr. Alfred Miller	July 10, 1872

List of places for which stations have been requested, &c.—Continued.

Place.	Applicant.	Date.
Evansville, Ind	F. C. Johnson; P. Hornbrook, surveyor of customs; Thomas P. Britton, president Vanderburgh County Agricultural Society.	July 13, 1872
	John Ingle, secretary Vanderburgh County Agricultural Society.	July 13, 1872
	Charles Butterfield, mayor	July 13, 1872
	C. H. Butterfield, mayor	Nov. 26, 1873
	H. L. Morrill, citizens of Evansville	Jan. 16, 1874
Aiken, S. C	Hon. F. A. Sawyer, United States Senate, and 16 citizens.	July 16, 1872
	John C. Derby	Sept. 2, 1872
Winona, Miss	A. M. Rafter	July 20, 1872
Eutaw, Ala	W. S. Bird	July 20, 1872
Belfast, Me	George E. Brackett	Aug. 6, 1872
Ithaca, N. Y., Cornell University	A. D. White, president, petition of 75 citizens	Aug. 8, 1872
Straits of Mackinac	Roys I. Cram	Aug. 7, 1872
	Board of Trade of Buffalo	May 26, 1873.
	Board of Trade of Chicago	May 22, 1873
	J. L. Hathaway, J. B. Merrill, Meteorological Chamber of Commerce, Milwaukee	Sept. 5, 1874
Carthage, Ill	L. F. M. Easterday, petition of 105 citizens	Sept. 2, 1872
Kutztown, Pa	A. R. Horned, principal of Keystone State normal school.	Sept. 13, 1872
Pensacola, Fla	Pensacola Ice Company, M. H. Sullivan, and 29 others	Oct. 7, 1872
Gainesville, Ga	M. F. Stephenson	Nov. 5, 1872
	D. L. Yulee	Feb. 7, 1874
Chattanooga and some point between Leavenworth and Shreveport.	Steamboatmen's convention assembled at Cairo	Nov. 17, 1872
Dallas, Tex	W. A. Jones & Co., W. C. Conner, and 133 others	Dec. 26, 1872
On plains of Western Kansas and regions southward and southwestward.	Kansas State Horticultural Society	Dec. 21, 1872
Oil City and Parker's Landing, on the Allegheny River. Greensborough and Brownsville, on the Monongahela.	Resolution of select council of Pittsburgh, transmitting and approving petition of forty-six citizens of Pittsburgh	Dec. 28, 1872 Jan. 10, 1873
University of Kansas, Lawrence.	John Fraser, chancellor	Jan. 16, 1873
Manchester, N. H	Hon. S. N. Bell, member of Congress, inclosing resolution of New Hampshire State Agricultural Society.	Jan 21, 1873
Sandwich, Ill	M. E. Ballou, through Commissioner of Agriculture	Jan. 22, 1873
Detroit, Minn	Daniel Coney	Feb. 2, 1873
Dayton, Ohio	Isaac Strohm	Feb. 11, 1873
Pilatka, Fla	J. F. Starr, through Secretary of the Navy	Feb. 17, 1873
Put-in-Bay, Ohio	H. B. West	Mar. 3, 1873
	H. D. Cooke, governor of the District of Columbia	July 17, 1873
Emporia, Kans	Robert Milliken	Mar. 6, 1873
North and west of Galveston, Texas.	Chamber of Commerce, through John Hancock	Mar. 6, 1873
Charlottesville, Va.; University of Virginia.	R. T. W. Duke, member of Congress	Mar. 2, 1873
Raleigh, N. C	Cotton Exchange, New Orleans, La	Mar. 30, 1873
Columbia, S. C	Mayor of city and city council	June 11, 1873
Columbus, Miss	Cotton Exchange, New Orleans, La	Mar. 30, 1873
Pierce City, Mo	E. P. Lingoe	Apr. 9, 1873
Nashanic, N. J	John V. D. Pumyea	Apr. 12, 1873
	N. B. Bradley, member of Congress	Apr. 27, 1873
Bay City, Mich	N. B. Bradley, member of Congress	Feb. 19, 1874
	N. B. Bradley, member of Congress	June 17, 1874
Vincennes, Ind	W. Hays	June 15, 1873
Springfield, Ill	S. M. Cullow, petition of governor, State officers, &c. E. A. Gastman, chairman meteorological committee Macon County Fruit-Growers' Association	July 5, 1873 Aug. 30, 1874
Cedar Keys	Abert E. Willard, mayor, and sixteen others	July 7, 1873
	D. L. Yulee, Ferdinanda, Fla	Feb. 7, 1874
Salina, Kans	Treeman Kingman	July 17, 1873
Alleghanies	George W. Warren, jr	July 26, 1873
Carthage, Mo	E. P. Searle, Henry C. Henney, C. C. Allen, and others	Aug. 15, 1873
New Berne, N. C	George W. Nason, jr	Sept. 13, 1873
Port Townsend, Washington Territory.	Puget Sound Telegraph	Sept. 30, 1873
Mineral Point, Wis	Hon. T. O. Howe, U. S. Senator; Moses M. Strong	Dec. 16, 1873
Latitude 40° 30′, longitude 74° 42′; Somerset, N. J.	Hon. F. T. Frelinghuysen; citizens of Somerset, Hunterdon and Middlesex Counties.	Dec. 22, 1873
Carlton, Kewaunee County, Wis	Edward Bach; farmers and shipowners of the district	Jan. 10, 1874 Jan. 15, 1874
Ferdinanda, Fla	Henry Hazen, collector; W. S. Simmons, 1st lieut. U. S. R. M.; D. C. Conover, U. S. Senator; G. Stark, mayor; Isaiah Wind, president of council, and twenty-two others	Jan. 17, 1874 Jan. 19, 1874
	D. L. Yulee	Feb. 7, 1874
University of California	J. West Martin, secretary board of regents	Feb. 12, 1874

List of places for which stations have been requested, &c.—Continued.

Place.	Applicant.	Date.
Helena, Ark	J. L. Alcorn, United States Senator	Feb. 12, 1874
Fayetteville, Ark	Hon. A. S. Prather, trustee Arkansas Industrial University, Huntsville, Ark.	Feb. 17, 1874
Manhattan State Agricultural College.	John J. Ingalls, R. Crozier, W. A. Phillips, and D. P. Lowe.	Feb. 18, 1874
Beatrice, Gage County, Neb	P. W. Hitchcock, United States Senate; A. S. Paddock	Mar. 3, 1874
One or more stations in Arizona	Charles Denison, M. D	Mar. 16, 1874
Manistee, Mich	Hon. J. A. Hubbell, United States Senator; G. T. Estis	Mar. 18, 1874
Fort Macon, N. C	J. M. Leach, M. C	Mar. 28, 1874
Gorham, N. H	Elias S. Mason	Mar. 30, 1874
Mason City, Mason County, Mo.	J. F. Benjamin, Brown & Shepard, E. B. Van Vent, and thirty-three others.	Mar. 30, 1874
Rockland, Me	Citizens of Rockland, Belfast, &c., Me.; E. Waite, and twenty-seven others.	Apr. 9, 1874
Rome, Ga	Thomas J. Perry	Apr. 24, 1874
Kansas City, Mo	Theo. S. Case, postmaster	May 1, 1874
Muscatine, Iowa	J. P. Walton	May 7, 1874
Syracuse, N. Y	M. Graves, mayor, Wm. Kirkpatrick, J. R. Whittock, and J. Hill.	May 9, 1874
	Additional application of Hon. R. H. Duell	May 11, 1874
Bakersfield, Kern County, Cal	A. C. Bratton, M. D.; P. D. McClanahan, M. D	May 14, 1874
Palmyra, Wis	J. C. Minton	May 19, 1874
Crawfordsville, Ind	H. B. Carrington, col. U. S. A., chair of military science, Wabash College.	June 6, 1874
Harbor of Refuge, Sand Beach, Lake Huron.	Maj. G. Weitzel, Corps of Engineers	June 11, 1874
Calais, Me	Hon. Eugene Hale and Boardman Brothers	June 16, 1874
Fort Thompson	Col. D. S. Stanley	June 18, 1874
Chatawa, Pike County, Miss	Alexander W. Gordon, College of the Redemptionist Fathers.	July 13, 1874
Ellsworth, Kans	W. A. Phillips, M. C	July 14, 1874
	M. W. Henry	July 21, 1874
Mount Lake, Giles County, or Bald Knob, W. Va.	Mrs. H. Haupt	July 21, 1874
Camden, N. J	Wood Dialogue & Co	July 29, 1874
Bloomington, Ill	E. A. Gustman, meteorological committee Macon County Fruit-Growers' Association.	Aug. 30, 1874
Decatur, Ill	E. A. Gustman, meteorological committee Macon County Fruit-Growers' Association.	Aug. 30, 1874

PAPER 60.

Names, &c., of vessels from which logs have been received during year ending September 30, 1874.

Names of vessels.	Kind.	Total number logs received.	Kind of blanks used.	Names of vessels.	Kind.	Total number logs received.	Kind of blanks used.
Bessy Parker	Bark	1		Oceanic and Republic	Steamship	4	
Montgomery Castle	Ship	1		Hammonia	do	1	
Monmouthshire	do	1		City of London	do	1	
San Jacinto	Steamer	2	Office blank.	Lottie Stewart	do	1	
Noord Braband	Ship	1		City of Montreal	do	1	
Andromeda	do	1		Unknown	do	1	
Calabria	Steamship	1		Sidonian	do	1	
Prussian	do	1	Office blank.	Periere	Steamer	1	
Russia	Steamer	2	Do.	Sunshine	Bark	1	
Caspian	Steamship	2	Do.	Egypt	Steamship	1	
Nabob	Bark	1		Maury	Bark	1	
Sarah Grice	Ship	1		City of Brussels	Steamship	2	
Abyssinia	Steamer	1		Republic	do	3	
Italy	Steamship	1		America	do	1	Office blank.
Berlin	do	13	Office blank.	Westphalia	do	1	
City of Limerick	do	1		Thuringia	do	1	
Nova Scotian	do	1	Office blank.	Fleur de Lis	Bark	1	
Gaelic	do	1		Columbia	do	1	
Scandinavian	do	1	Office blank.	Albatross	do	1	
Adriatic	do	1		Lady Lycett	Steamship	1	
J. O. Grant	Ship	1		Holland	do	1	
Grace Roberts	Bark	1		Ohio	do	1	
Hansa	Steamship	1		Pennsylvania	do	1	
Rhein	do	1					

Names, &c., of vessels from which logs have been received, &c.—Continued.

Names of vessels.	Kind.	Total number logs received.	Kind of blanks used.
Europe	Steamship	1	Office blank.
Cimbria	...do	1	
Phœnician	...do	1	
C. T. French	...do	1	
Canada	...do	1	
Victoria	...do	1	
Virginia	...do	1	
Main	...do	1	
Macedonia	...do	1	
Donan	...do	1	
Anglia	...do	1	
Circassian	...do	1	Office blank.
Polynesian	...do	2	Do.
Quorn	Ship	1	
Greyhound	Schooner	1	
Alex. Marshall	Ship	1	
C. P. D	Bark	1	
Maravilla	...do	1	
Aureola	...do	1	
Loleta	Schooner	1	
Comet	Bark	1	
Nestorian	Steamship	1	Office blank.
McNear	Ship	1	
Yaruna	Schooner	1	
Ocean Pearl	...do	1	
Sarah Bell	Ship	1	
D. C. Murray	Bark	2	
Cormorant	Ship	1	
Alden Besse	Bark	1	
Wisconsin	Steamship	1	Office blank.
Baltimore	...do	7	Do.
Quickstep	Bark	1	
Brunette	...do	1	
Buena Vista	...do	1	
Luigi	...do	1	
Notre Dame	Ship	1	
Gentoo	...do	1	
Thos. Dana	...do	1	
Geo. Groshan	Bark	1	
Wachusett	U. S. st'r	3	
Shenandoah	...do	4	
Alex. Duffie	Ship	1	
Challenge	Bark	1	
Black Hawk	Ship	1	
A. M. Minot	...do	1	
Alcatraz	...do	1	
Gen. McClellan	...do	1	
Cosma	Bark	1	
Saranac	U. S. st'r	1	
Ocean Rover	Bark	1	
Marion	Ship	1	
Allahabad	...do	1	
Norcus	...do	1	
Java	Steamship	1	
Moselle	...do	2	
Deutchland	...do	1	
Hibernian	Steamer	1	
Arragon	Steamship	1	
Cuba	...do	1	
Austria	Ship	1	
Fletcher	...do	1	
Bermuda Light-House		1	
Eden	Bark	1	
Hercules	Ship	1	
Carrick Castle	...do	1	
Nautilus	Bark	1	Office blank.
Vesuvius	...do	1	
Ravenscrag	Ship	1	
Essey	...do	1	
Glencoe	...do	1	
Thos. Brodeband	Bark	1	
Lunalilo	...do	1	
Austrian	Steamer	1	Office blank.
Franklin	Steamship	1	
Mosel	...do	1	
New York	...do	1	
Golden Gate	Ship	1	
Weser	Steamship	1	
Stanley Sleath	Bark	1	
Total number of logs received		161	

INDEX.

A.

Abbe, Cleveland, A. M. 104, 385
Agricultural Societies.
Corresponded with 307
Albany, N. Y.
Report on station 8
Barometer, mean 127
Rain-fall 239
Temperature, mean 130
Thermometer, maximum and minimum 132
Wind, direction 242
Alpena, Michigan.
Barometer, mean 127
Rain-fall 239
Report on station 10
Thermometer, maximum and minimum 133
Temperature, mean 133
Wind, direction 242
Atlantic City, N. J.
Barometer, mean 127
Rain-fall 239
Report on station 10
Temperature, mean 130
Thermometer, maximum and minimum 134
Wind, direction 242
Augusta, Ga.
Barometer, mean 127
Rain-fall 239
Report on station 11
Temperature, mean 130
Thermometer, maximum and minimum 135
Wind, direction 242
Aurora.
Report on 104, 383

B.

Baird, Spencer F., Prof. 95
Baltimore, Md.
Barometer, mean 127
Rain-fall 239
Report on station 12
Temperature, mean 130
Thermometer, maximum and minimum 136
Wind, direction 242
Bangor, Me.
Report on station 13
Barbadoes, stations in 80

BARNEGAT, N. J.
Barometer, mean 127
Rain-fall 239
Report on station 13
Temperature, mean 130
Thermometer, maximum and minimum 137
Wind, direction 242

BARNES, J. K., Surgeon General, U. S. A.
Army meteorological reports 89

BAROMETRIC CHARTS 96

BAROMETRIC GRADIENTS 104, 385

BAROMETRIC MEANS 127

BISMARCK, DAKOTA.
Rain-fall 239
Report on station 14
Wind, direction 242

BOARDS OF TRADE.
Corresponded with 398

BOSTON, MASS.
Barometer, mean 127
Rain-fall 239
Report on station 14
Temperature, mean 130
Thermometer, maximum and minimum 138
Wind, direction 243

BRECKENRIDGE, MINN.
Barometer, mean 127
Rain-fall 239
Report on station 15
Temperature, mean 130
Thermometer, maximum and minimum 139
Wind, direction 243

BRITISH AMERICA.
Stations in 78
Value of stations in 86

BRIDGETOWN, BARBADOES.
Report on station 80

BROCKVILLE, ONTARIO.
Report on station 82
Thermometer, maximum and minimum 140

BUFFALO, N. Y.
Barometer, mean 127
Rain-fall 239
Report on station 16
Temperature, mean 130
Thermometer, maximum and minimum 141
Wind, direction 243

BULLETINS, FARMERS' 93

BULLETINS, INTERNATIONAL 88, 273

BULLETINS, DAILY 264, 267, 270

BULLETINS, IN CIPHER 255, 258, 261

BURLINGTON, IOWA.
Report on station 17
BURLINGTON, VT.
Barometer, mean 127
Rain-fall 239
Report on station 17
Temperature, mean 130
Thermometer, maximum and minimum 142
Wind, direction 243

C.

CANADA.
Stations in 82
Stations added 84
Stations, value of 86
CANAL REPORTS 95, 324
CAIRO, ILL.
Barometer, mean 127
Rain-fall 239
Report on station 18
Temperature, mean 130
Thermometer, maximum and minimum 143
Wind, direction 243
CAPE HATTERAS, N. C.
Rain-fall 239
Report on station 19
Thermometer, maximum and minimum 144
Wind, direction 243
CAPE HENRY, VA.
Barometer, mean 127
Rain-fall 239
Report on station 19
Temperature, mean 130
Thermometer, maximum and minimum 145
Wind, direction 243
CAPE MAY, N. J.
Barometer, mean 127
Rain-fall 239
Report on station 20
Temperature, mean 130
Thermometer, maximum and minimum 146
Wind, direction 244
CAPE ROZIER, QUEBEC.
Report on station 82
Thermometer, maximum and minimum 147
CAPRON, ALLYN, LT. 101, 380
CAUTIONARY SIGNALS.
Points of display 92
Number and verification 92
CHAMBERS OF COMMERCE.
Corresponded with 398

CHARLESTON, S. C.
Barometer, mean 127
Rain-fall 239
Report on station 20
Temperature, mean 130
Thermometer, maximum and minimum 148
Wind, direction 244

CHARLOTTETOWN, P. E. I.
Report on station 82
Thermometer, maximum and minimum 149

CHATHAM, N. B.
Report on station 82
Thermometer, maximum and minimum 150

CHEYENNE, WYOMING.
Barometer, mean 127
Rain-fall 239
Report on station 21
Temperature, mean 130
Thermometer, maximum and minimum 151
Wind, direction 244

CHICAGO, ILL.
Barometer, mean 127
Rain-fall 239
Report on station 22
Temperature, mean 130
Thermometer, maximum and minimum 152
Wind, direction 244

CHIEF SIGNAL OFFICER OF THE ARMY 4, 84, 91, 93, 100, 103, 105, 106, 286, 287, 312, 321, 322, 323, 324, 325, 328, 330, 333, 335, 340, 344. 349, 354, 359, 365, 369, 374

CINCINNATI, OHIO.
Barometer, mean 127
Rain-fall 239
Report on station 23
Temperature, mean 130
Thermometer, maximum and minimum 153
Wind, direction 244

CLEVELAND, OHIO.
Barometer, mean 127
Rain-fall 239
Report on station 24
Temperature, mean 130
Thermometer, maximum and minimum 154
Wind, direction 244

COLORADO SPRINGS, COL.
Barometer, mean 127
Rain-fall 239
Report on station 25
Temperature, mean 130
Thermometer, maximum and minimum 155
Wind, direction 244

CORINNE, UTAH.
Barometer, mean 127
Rain-fall 239
Report on station 26
Temperature, mean 130
Wind, direction 244

CORSICANA, TEXAS.
Rain-fall 239
Report on station 26

CRAIG, ROBERT, First Lieutenant 91, 96, 100

CUMBERLAND HOUSE, B. A.
Report on station 28

CYCLONE AT PUNTA RASSA, FLA 61

D.

DAVENPORT, IOWA.
Barometer, mean 127
Rain-fall 239
Report on station 26
Temperature, mean 130
Thermometer, maximum and minimum 156
Wind, direction 245

DENVER, COL.
Barometer, mean 127
Rain-fall 239
Report on station 27
Temperature, mean 130
Thermometer, maximum and minimum 157
Wind, direction 245

DETROIT, MICH.
Barometer, mean 127
Rain-fall 239
Report on station 28
Temperature, mean 130
Thermometer, maximum and minimum 158
Wind, direction 245

DISASTERS ON LAKES 104, 388

DODGE CITY, KAN.
Rain-fall 239
Report on station 28

DUBUQUE, IOWA.
Barometer, mean 127
Rain-fall 239
Report on station 29
Temperature, mean 130
Thermometer, maximum and minimum 159
Wind, direction 245

DULUTH, MINN.
Barometer, mean 127
Rain-fall 239
Report on station 29

Temperature, mean 130
Thermometer, maximum and minimum 160
Wind, direction 245
DUNWOODY, H. H. C., First Lieutenant 91, 96, 100

E.

EASTPORT, ME.
Barometer, mean 127
Rain-fall 239
Report on station 30
Temperature, mean 130
Thermometer, maximum and minimum 161
Wind, direction 245
ERIE, PENN.
Barometer, mean 127
Rain-fall 239
Report on station 31
Temperature, mean 130
Thermometer, maximum and minimum 162
Wind, direction 246
ESCANABA, MICH.
Barometer, mean 127
Rain-fall 239
Report on station 31
Thermometer, maximum and minimum 130
Temperature, mean 163
Wind, direction 246

F.

FATHER POINT, QUEBEC.
Report on station 83
FORM, DAILY BULLETIN, CIPHER 255, 258, 261
FORM, DAILY BULLETIN 264, 267, 270
FORM, INTENATIONAL BULLETIN 273
FORT BENTON, MONTANA.
Barometer, mean 127
Rain-fall 239
Report on station 32
Temperature, mean 130
Thermometer, maximum and minimum 164
Wind, direction 246
FORT CHIPPEYAN, B. A.
Report on station 78
FORT GARRY, MANATOBA.
Report on station 82
Thermometer, maximum and minimum 165
FORT GIBSON, INDIAN TERRITORY.
Barometer, mean 127
Rain-fall 239
Report on station 32

Temperature, mean..... 130
Thermometer, maximum and minimum..... 166
Wind, direction..... 246

FORT MCPHERSON, B. A.
Report on station..... 78

FORT SIMPSON, B. A.
Report on..... 78

FORT SULLY, DAKOTA.
Barometer, mean..... 127
Rain-fall..... 239
Report on station..... 33
Temperature, mean..... 130
Thermometer, maximum and minimum..... 167
Wind, direction..... 246

FORT WHIPPLE, VIRGINIA.
Assistants instructed at..... 107
Drills and recitations..... 106
Details of post and duties..... 1
Observer-sergeants instructed at..... 106

FORT YORK, B. A.
Report on station..... 78

G.

GALVESTON, TEXAS.
Barometer, mean..... 127
Rain-fall..... 239
Report on station..... 33
Temperature, mean..... 130
Thermometer, maximum and minimum..... 168
Wind, direction..... 246

GENEVA, N. Y.
Thermometer, maximum and minimum..... 169

GIBBON, D. J., Second Lieutenant.....98, 99, 374, 375

GRAND HAVEN, MICH.
Barometer, mean..... 127
Rain-fall..... 239
Report on station..... 34
Temperature, mean..... 130
Thermometer, maximum and minimum..... 170
Wind, direction..... 246

GREELY, A. W., First Lieutenant.....99, 320, 321, 322, 374, 375

GRIMES, GEORGE S., First Lieutenant,..... 101

GRUGAN, F. C. First Lieutenant,.....99, 374, 375

H.

HALIFAX, N. S.
Report on station..... 82
Thermometer, maximum and minimum..... 171

HAVANA, CUBA.
Report on station..... 79

HENRY, JOSEPH, Professor.....88, 286, 287
HOBART COLLEGE OBSERVATORY.
Thermometer, maximum and minimum..... 169
HOWGATE, H. W., Brevet Captain..... 8, 101, 378

I.

INDIANAPOLIS, INDIANA.
Barometer, mean..... 127
Rain-fall..... 239
Report on station..... 35
Temperature, mean..... 130
Thermometer, maximum and minimum..... 172
Wind, direction..... 247
INDIANOLA, TEXAS.
Barometer, mean..... 127
Rain-fall..... 239
Report on station..... 36
Temperature, mean..... 130
Thermometer, maximum and minimum..... 173
Wind, direction..... 247
INSPECTION.
Details of..... 99
List of..... 374
INSTRUMENT ROOM, O. C. S. O..... 98
INTERNATIONAL METEOROLOGICAL REPORT.
Details of..... 87
Bulletins of..... 88, 273

J.

JACKSON, HENRY, First Lieutenant.....8, 96, 98
JACKSONVILLE, FLORIDA.
Barometer, mean..... 127
Rain-fall..... 239
Report on station..... 37
Temperature, mean..... 130
Thermometer, maximum and minimum..... 175
Wind, direction..... 247
JOHNSON, REVERDY.
Legal opinion of..... 380

K.

KEOKUK, IOWA.
Barometer, mean..... 127
Rain-fall..... 240
Report on station..... 37
Temperature, mean..... 130
Thermometer, maximum and minimum..... 176
Wind, direction..... 247
KEY WEST, FLORIDA.
Barometer, mean..... 127
Rain-fall..... 240

Report on station 38
Temperature, mean 130
Thermometer, maximum and minimum 177
Wind, direction 247

KILBOURNE, C. E., First Lieutenant 4

KINGSTON, JAMAICA.
Report on station 79
Thermometer, maximum and minimum 179

KINGSTON, ONTARIO.
Report on station 82
Thermometer, maximum and minimum 178

KNOXVILLE, TENN.
Barometer, mean 127
Rain-fall 240
Report on station 39
Temperature, mean 130
Thermometer, maximum and minimum 180
Wind, direction 247

L.

LA CROSSE, WIS.
Barometer, mean 131
Rain-fall 240
Report on station 39
Temperature, mean 128
Thermometer, maximum and minimum 181
Wind, direction 247

LAKE CITY, FLA.
Barometer, mean 128
Rain-fall 240
Report on station 40
Temperature, mean 131
Thermometer, maximum and minimum 182
Wind, direction 247

LAPHAM, J. A., Prof. 104

LEAVENWORTH, KAN.
Barometer, mean 129
Rain-fall 240
Report on station 40
Temperature, mean 131
Thermometer, maximum and minimum 183
Wind, direction 248

LEXINGTON, KY.
Barometer, mean 128
Rain-fall 240
Report on station 41
Temperature, mean 131
Thermometer, maximum and minimum 184
Wind, direction 248

LIBRARY, O. C. S. O. 8
Contributions from foreign countries 111

LIFE-SAVING STATIONS.
Connection with 84
Report of 85

LOGANSPORT, IND.
Report on station 41

LOGS RECEIVED FROM VESSELS 402

LONG BRANCH, N. J.
Barometer, mean 128
Rain-fall 240
Report on station 41
Temperature, mean 131
Thermometer, maximum and minimum 185
Wind, direction 248

LOUISVILLE, KY.
Barometer, mean 128
Rain-fall 240
Report on station 42
Temperature, mean 131
Thermometer, maximum and minimum 186
Wind, direction 248

LYNCHBURG, VA.
Barometer, mean 128
Rain-fall 240
Report on station 43
Temperature, mean 131
Thermometer, maximum and minimum 187
Wind, direction 248

M.

MALLERY, GARRICK, Brevet Lieutenant Colonel .....

MARQUETTE, MICH.
Barometer, mean 128
Rain-fall 240
Report on station 43
Temperature, mean 131
Thermometer, maximum and minimum 188
Wind, direction 248

MAURY, J. B., A. M. 9, 104, 196

MEANS, BAROMETRIC 127

MEANS, TEMPERATURE 130

MEMPHIS, TENN.
Barometer, mean 128
Rain-fall 240
Report on station 44
Temperature, mean 131
Thermometer, maximum and minimum 189
Wind, direction 249

METEOROLOGICAL REPORTS.
Barometric means 127
Form for 291, 294
International 88

Medical Corps, U. S. Army 89
Smithsonian 88, 286, 287, 288
St. Paul's Island, Alaska 71
Temperature, mean 130
Thermometer, maximum and minimum 132

MILITARY TELEGRAPH LINES.
Act for protection of 383
Orders concerning 378
Instructions as to building 379
Routes of 101

METEOROLOGICAL OFFICE, CANADA.
Exchange of reports with 84

MILITARY SIGNALLING.
Instruction in 7

MILWAUKEE, WIS.
Barometer, mean 128
Rain-fall 240
Report on station 44
Temperature, mean 131
Thermometer, maximum and minimum 189
Wind, direction 249

MISSISSIPPI RIVER.
Report on "danger line" 312

MISSOURI RIVER.
Report on "danger line" 320

MOBILE, ALA.
Barometer, mean 128
Rain-fall 240
Report on station 46
Temperature, mean 131
Thermometer, maximum and minimum 191
Wind, direction 249

MONTGOMERY, ALA.
Barometer, mean 128
Rain-fall 240
Report on station 47
Temperature, mean 131
Thermometer, maximum and minimum 192
Wind, direction 249

MORGANTOWN, W. VA.
Barometer, mean 128
Rain-fall 240
Report on station 48
Temperature, mean 131
Thermometer, maximum and minimum 194
Wind, direction 249

MOUNT WASHINGTON, N. H.
Barometer, mean 128
Rain-fall 240
Report on station 48
Temperature, mean 131
Thermometer, maximum and minimum 195
Wind, direction 249

MYER, ALBERT J., B'vt. Brig. Gen.....106, 284, 286, 287, 323, 324, 325, 328, 330, 333, 335, 340, 344, 349, 354, 359, 365, 369, 374, 380, 383

N.

NASHVILLE, TENN.
Report on station..... 49
Barometer, mean..... 128
Rain-fall..... 240
Temperature, mean..... 131
Thermometer, maximum and minimum..... 196
Wind, direction..... 249

NEW HAVEN, CONN.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 49
Temperature, mean..... 131
Thermometer, maximum and minimum..... 197
Wind, direction..... 250

NEW LONDON, CONN.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 50
Thermometer, maximum and minimum..... 198
Temperature, mean..... 131
Wind, direction..... 250

NEW ORLEANS, LA.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 51
Temperature, mean..... 131
Thermometer, maximum and minimum..... 199
Wind, direction..... 250

NEW YORK CITY.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 52
Temperature, mean..... 131
Thermometer, maximum and minimum..... 200
Wind, direction..... 250

NORFOLK, VA.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 53
Temperature, mean..... 131
Thermometer, maximum and minimum..... 201
Wind, direction..... 250

NORTH PLATTE, NEB.
Rain-fall..... 240
Report on station..... 54

O.

Office Chief Signal Officer.
Correspondence tabulated..... 110
General correspondence of..... 7

Ohio River.
Report on "danger line" of..... 327

Omaha, Neb.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 54
Temperature, mean..... 131
Thermometer, maximum and minimum..... 202
Wind, direction..... 250

Organization Signal Service.
Present..... 5
Proposed..... 105

Oswego, N. Y.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 55
Temperature, mean..... 131
Thermometer, maximum and minimum..... 203
Wind, direction..... 250

Ottawa, Ontario.
Report on station..... 83
Thermometer, maximum and minimum..... 204

P.

Peck's Beach, N. J.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 55
Temperature, mean..... 131
Thermometer, maximum and minimum..... 205
Wind, direction..... 251

Pembina, Dakota.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 56
Temperature, mean..... 131
Thermometer, maximum and minimum..... 209
Wind, direction..... 251

Ppiladelphia, Penn.
Barometer, mean..... 128
Rain-fall..... 240
Report on station..... 58
Temperature, mean..... 131
Thermometer, maximum and minimum..... 210
Wind, direction..... 251

Pike's Peak, Col.
Barometer, mean..... 128

Rain-fall 240
Report on station 57
Temperature, mean 131
Thermometer, maximum and minimum 208
Wind, direction 251

PITTSBURGH, PENN.
Barometer, mean 128
Rain-fall 240
Report on station 56
Temperature, mean 131
Thermometer, maximum and minimum 209
Wind, direction 251

POINT A PITRE, GUADELOUPE.
Report on station 80

PORT DOVER, ONTARIO.
Report on station 82

PORT HURON, MICH.
Barometer, mean 128
Rain-fall 240
Report on station 59
Temperature, mean 131
Wind, direction 251

PORT STANLEY, ONTARIO.
Report on station 82
Thermometer, maximum and minimum 212

PORTLAND, ME.
Barometer, mean 128
Rain-fall 240
Report on station 60
Temperature, mean 131
Thermometer, maximum and minimum 210
Wind, direction 251

PORTLAND, OREGON.
Barometer, mean 128
Rain-fall 240
Report on station 61
Temperature, mean 131
Thermometer, maximum and minimum 211
Wind, direction 252

PROBABILITIES AND SYNOPSIS.
Form of 324
Manner of distribution 93
Manner of preparation 90
Percentage of verifications 297
Rules for preparation 296
Time of making 104

PUBLICATIONS.
List and number 84
Received from foreign countries 111

PUNTA RASSA, FLA.

Q.

QUEBEC, CANADA.
Report on station 82

R.

READE, PHILIP, Second Lieutenant 7
RECRUITING, METHOD OF 5
RITCHIE, L. W., DR 4
RIVERS.
Mississippi, report on "danger line" 312
Missouri, report on "danger line" 320
Ohio, report on "danger line" 327
RIVER REPORTS.
Details of 94
Display of 95
Form of special 323
RIVER STATIONS.
Importance of 81
List of 81
ROCHESTER, N. Y.
Barometer, mean 128
Rain-fall 240
Report on station 62
Temperature, mean 131
Thermometer, maximum and minimum 214
Wind, direction 252

S.

ST. LOUIS, MO.
Barometer, mean 128
Rain-fall 241
Report on station 68
Temperature, mean 131
Thermometer, maximum and minimum 226
Wind, direction 253
ST. MICHAEL'S ISLAND, ALASKA.
Report on station 69
ST. PAUL'L ISLAND, ALASKA.
Abstract meteorological record 71
Barometer, mean 71
Rain-fall 241
Report on station 70
Temperature, mean 71
Thermometer, maximum and minimum 174
Wind, direction 253
ST. PAUL, MINN.
Barometer, mean 128
Rain-fall 241
Report on station 67
Temperature, mean 131
Thermometer, maximum and minimum 227
Wind, direction 252
ST. THOMAS, W. I.
Report on station 80

SALT LAKE CITY, UTAH.
Barometer, mean 128
Rain-fall 241
Report on station 63
Temperature, mean 131
Thermometer, maximum and minimum 215
Wind, direction 252

SAN DIEGO, CAL.
Barometer, mean 128
Rain-fall 241
Report on station 64
Temperature, mean 131
Thermometer, maximum and minimum 218
Wind, direction 252

SAN ANTONIO, TEXAS.
Thermometer, maximum and minimum 216

SAN FRANCISCO, CAL.
Barometer, mean 128
Rain-fall 240
Report on station 65
Temperature, mean 131
Thermometer, maximum and minimum 219
Wind, direction 252

SANDY HOOK, N. J.
Barometer, mean 128
Rain-fall 240
Report on station 64
Temperature, mean 131
Thermometer, maximum and minimum 217
Wind, direction 252

SANTA FE, N. M.
Barometer, mean 128
Rain-fall 240
Report on station 65
Temperature, mean 131
Thermometer, maximum and minimum 219
Wind, direction 253

SANTIAGO DE CUBA, CUBA.
Report on station 80

SAVANNAH, GA.
Barometer, mean 128
Rain-fall 240
Report on station 66
Temperature, mean 131
Thermometer, maximum and minimum 222
Wind, direction 253

SAUGEEN, ONT.
Report on station 82
Thermometer, maximum and minimum 220

SEA COAST STATIONS 85

SEA COAST TELEGRAPH LINE.
Act of Congress for protection of 383
Connections 85
List of stations and work 101
Report on 99

SIGNAL SERVICE.
Present organization 5
Proposed organization 105
Recruiting of 5

SHREVEPORT, LA.
Barometer, mean 128
Rain-fall 241
Report on station 67
Temperature, mean 131
Thermometer, maximum and minimum 223
Wind, direction 253

SIGNALS, GENERAL SYSTEM OF 100

SMITH, THEODORE, Second Lieutenant 374, 375

SMITHSONIAN METEOROLOGICAL REPORTS.
Transfer of 89, 286, 287

SPRINGFIELD, MASS.
Report on station 67

SQUAN BEACH, N. J.
Barometer, mean 129
Rain-fall 241
Report on station 68
Temperature, mean 131
Thermometer, maximum and minimum 224
Wind, direction 253

STATISTICS OF STATIONS.
Barometer, mean 127
Rain-fall 238
Report on station 8
Temperature, mean 130
Thermometer, maximum and minimum 132
Wind, direction 243

STATIONS, REQUESTED 399

STAYNOR, ONT.
Report on station 83
Thermometer, maximum and minimum 225

SYDNEY, CAPE BRETON.
Report on station 83
Thermometer, maximum and minimum 225

SYNOPSES AND PROBABILITIES.
Form of 324
Manner of distribution 93
Manner of preparation 90
Percentage of verifications 297
Rules for preparation 296
Time of preparation 104

T.

TELEGRAPH LINES.
Act of Congress for protection of 383
Arizona 101
Instructions concerning sea-coast 375
Military 85
Sea-coast 99
Stations on sea-coast 101
Texas 378, 379

TELEGRAPH SERVICE.
Legal opinion on 380
Report on 103

TEMPERATURE.
Mean 130
Maximum and minimum 132

THATCHER'S ISLAND, MASS.
Report on station 72

TOLEDO, OHIO.
Barometer, mean 129
Rain-fall 241
Report on station 73
Temperature, mean 131
Thermometer, maximum and minimum 229
Wind, direction 254

TORONTO, ONT.
Report on station 82
Thermometer, maximum and minimum 230

TYBEE ISLAND, GA.
Rain-fall 241
Report on station 73
Thermometer, maximum and minimum 231
Wind, direction 254

V.

VAN DUZER, J. C. 101

VESSELS, LOG RECEIVED 403

VICKSBURG, MISS.
Barometer, mean 129
Rain-fall 241
Report on station 74
Temperature, mean 131
Thermometer, maximum and minimum 232
Wind, direction 254

VIENNA, CONGRESS OF METEOROLOGISTS 87

VIRGINIA CITY, MON.
Barometer, mean 129
Rain-fall 241
Report on station 74
Temperature, mean 131
Thermometer, maximum and minimum 233
Wind, direction 254

W.

WASHINGTON, D. C.
Barometer, mean 129
Rain-fall 241
Report on station 75
Temperature, mean 131
Thermometer, maximum and minimum 234
Wind, direction 254

WATER TEMPERATURE REPORTS.
Form of 323
Report on 95

WEATHER REVIEW, MONTHLY 325, 328, 330, 333, 336, 341, 344, 349, 355, 360, 365, 369

WEEKLY CHRONICLE 324

WEIR, W. B., Second Lieutenant 8, 101

WEST INDIES, extension of station 85
List of stations 79

WILMINGTON, N. C.
Barometer, mean 129
Rain-fall 241
Report on station 76
Temperature, mean 131
Thermometer, maximum and minimum 235
Wind, direction 254

WOOD'S HOLE, MASS.
Barometer, mean 129
Rain-fall 241
Report on station 76
Temperature, mean 131
Thermometer, maximum and minimum 236
Wind, direction 254

WOLCOTT, C. C., First Lieutenant 101

WYTHEVILLE, VA.
Barometer, mean 129
Rain-fall 241
Report on station 76
Temperature, mean 131
Thermometer, maximum and minimum 237
Wind, direction 255

Y.

YANKTON, DAKOTA.
Barometer, mean 129
Rain-fall 241
Report on station 77
Temperature, mean 131
Thermometer, maximum and minimum 238
Wind, direction 255

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MAP
EXHIBITING LOCATION
OF
STATIONS
FOR
INTERNATIONAL
SIMULTANEOUS OBSERVATION.
NORTH AMERICA
SOUTH AMERICA
EUROPE
ASIA
AFRICA
Equator
Equator
EUROPEAN STATIONS.
1 Bykhalchin.
2 Tchernovo.
3 Kazali Tiree.
4 Tyrno.
5 Bodoe.
6 Bjorneborg.
7 Tiurio.
8 Wyborg.
9 Wyse.
10 Aberdeen.
11 Seaforth Park.
12 Greenwich.
13 Arbroath.
14 Glasgow.
15 Aspinn Hill.
16 Edinburgh.
17 Dublin.
18 Dingwall.
19 Dublin Observy.
20 Cambridge.
21 Greenwich.
22 Kew.
23 Falmouth.
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25 Bangor.
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142 Greenwich.
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144 Greenwich.
145 Greenwich.
146 Greenwich.
147 Greenwich.
148 Greenwich.
149 Greenwich.
150 Greenwich.
AMERICAN STATIONS.
1 St. Paul, Alaska.
2 Ft. St. Michill.
3 Ft. McPherson.
4 Ft. Simpson.
5 Ft. Chipenyyan.
6 Cumberland House.
7 Ft. York.
8 Ft. Garry.
9 Parry Sound.
10 Saugeen.
11 Port Stanley.
12 Port Dover.
13 Toronto.
14 Kingston, (Canada.)
15 Brockville.
16 Ottawa.
17 Montreal.
18 Quebec.
19 Father Point.
20 Cape Rozier.
21 Chatham.
22 Sydney.
23 Halifax.
24 Eastport.
25 Burlington.
26 Mt. Washington
27 Portland, (Maine.)
28 Thatcher's Island.
29 Boston.
30 Wood's Hole.
31 Springfield.
32 New London.
33 New Haven.
34 Albany.
35 New York.
36 Sandy Hook.
37 Long Branch.
38 Squan Beach.
39 Barnegat.
40 Atlantic City.
41 Perk's Beach.
42 Cape May.
43 Philadelphia.
44 Baltimore.
45 Washington.
46 Morgantown.
47 Lynchburg.
48 Wytheville.
49 Norfolk.
50 Cape Henry.
51 Cape Hatteras.
52 Wilmington.
53 Charleston.
54 Augusta.
55 Savannah.
56 Tybee Island.
57 Jacksonville.
58 St. Mark's.
59 Pensacola.
60 Key West.
61 Knoxville.
62 Nashville.
63 Montgomery.
64 Mobile.
65 New Orleans.
66 Galveston.
67 Indianola.
68 Corsicana.
69 Shreveport.
70 Vicksburg.
71 Memphis.
72 Ft. Gibson.
73 Cairo.
74 Louisville.
75 Lexington.
76 Indianapolis.
77 Cincinnati.
78 Pittsburgh.
79 Oswego.
80 Rochester.
81 Buffalo.
82 Erie.
83 Cleveland.
84 Toledo.
85 Detroit.
86 Port Huron.
87 Alpena.
88 Grand Haven.
89 Chicago.
90 Milwaukee.
91 Keewaunee.
92 Marquette.
93 Duluth.
94 St. Paul, (Minn.)
95 La Crosse.
96 Dubuque.
97 Davenport.
98 Keokuk.
99 St. Louis.
100 Leavenworth.
101 Omaha.
102 Yankton.
103 Breckenridge.
104 Pembina.
105 Bismarck.
106 Ft. Sully.
107 North Platte.
108 Dodge City.
109 Santa Fe.
110 Pike's Peak.
111 Colorado Springs.
112 Denver.
113 Cheyenne.
114 Salt Lake City.
115 Virginia City.
116 Ft. Benton.
117 Portland, (Oregon.)
118 San Francisco.
119 San Diego.
120 Havana.
121 Santiago de Cuba.
122 Kingston, (Jam.)
123 Port George.
124 St. Thomas.
125 Guadalupe.
126 St. Pierre.
127 Barbados.
128
129
130
AFRICAN AND ASIATIC STATIONS.
AFRICAN.
1 Mogador.
2 Laracha.
3 Nemours.
4 Oran.
5 Saida.
6 Gerlville.
7 Tenlet el-had.
8 Medeah.
9 Algiers.
10 Aumale.
11 Laghouat.
12 Biella.
13 Biskra.
14 Tebessa.
15 Batna.
16 Constantine.
17 La Calle.
ASIATIC.
18 Scutari
19 Beirut.
20 Fao.
21 Tiflis.
22 Orenburg.
23 Ekaterinburg.
24 Kasali.
25 Tashkend.
26 Barnaul.
27 Yenisetik.
28 Irkutsk.
29 Oorga.
30 Nertchinsk.
31 Nikolaiev.
32 Vladivostock
33 Pekin.
34
N. Peters Photo-Lithographer, Washington, D.C.

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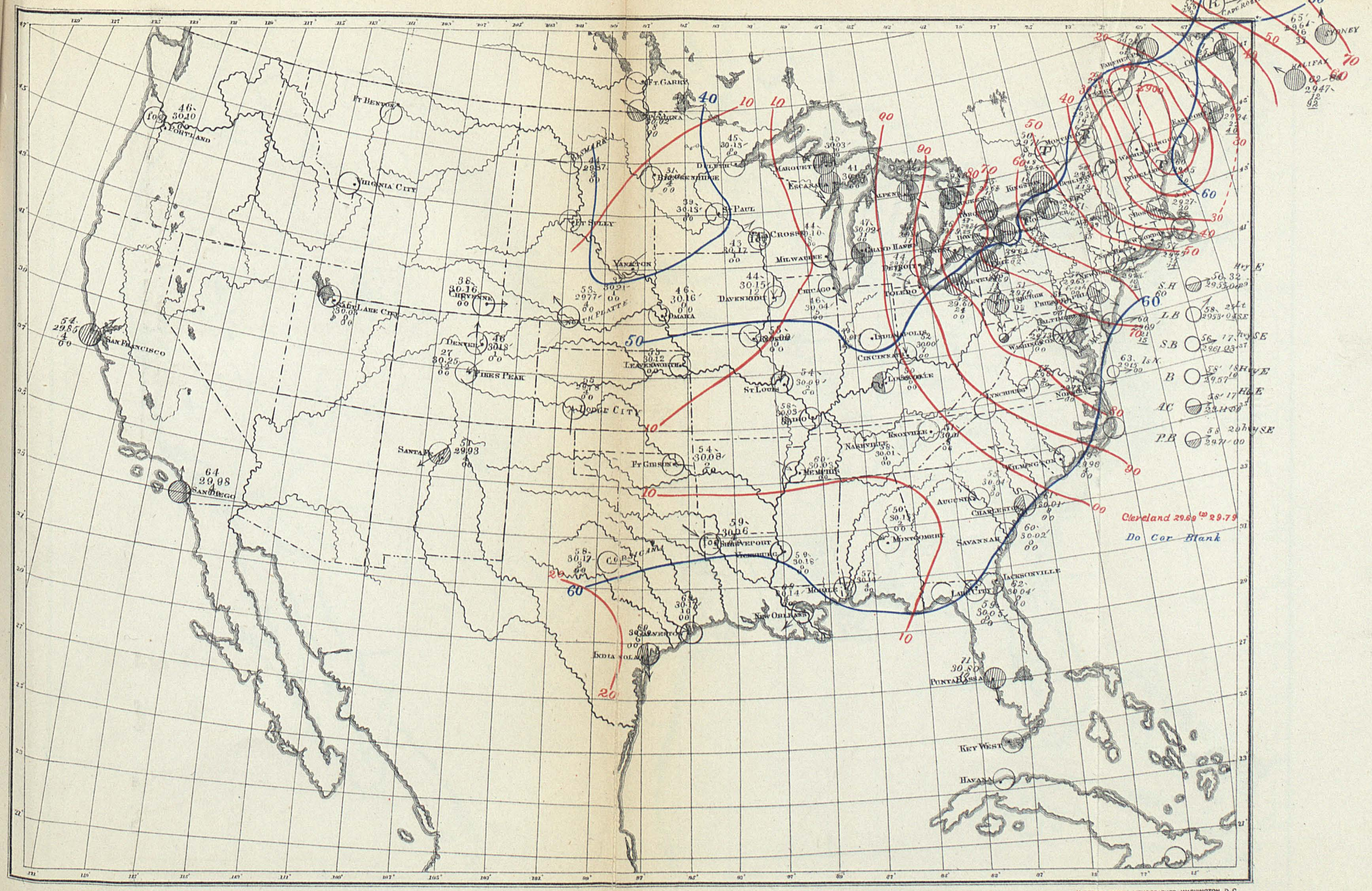
WEDNESDAY SEPT 30th 74. I. BAROMETER.



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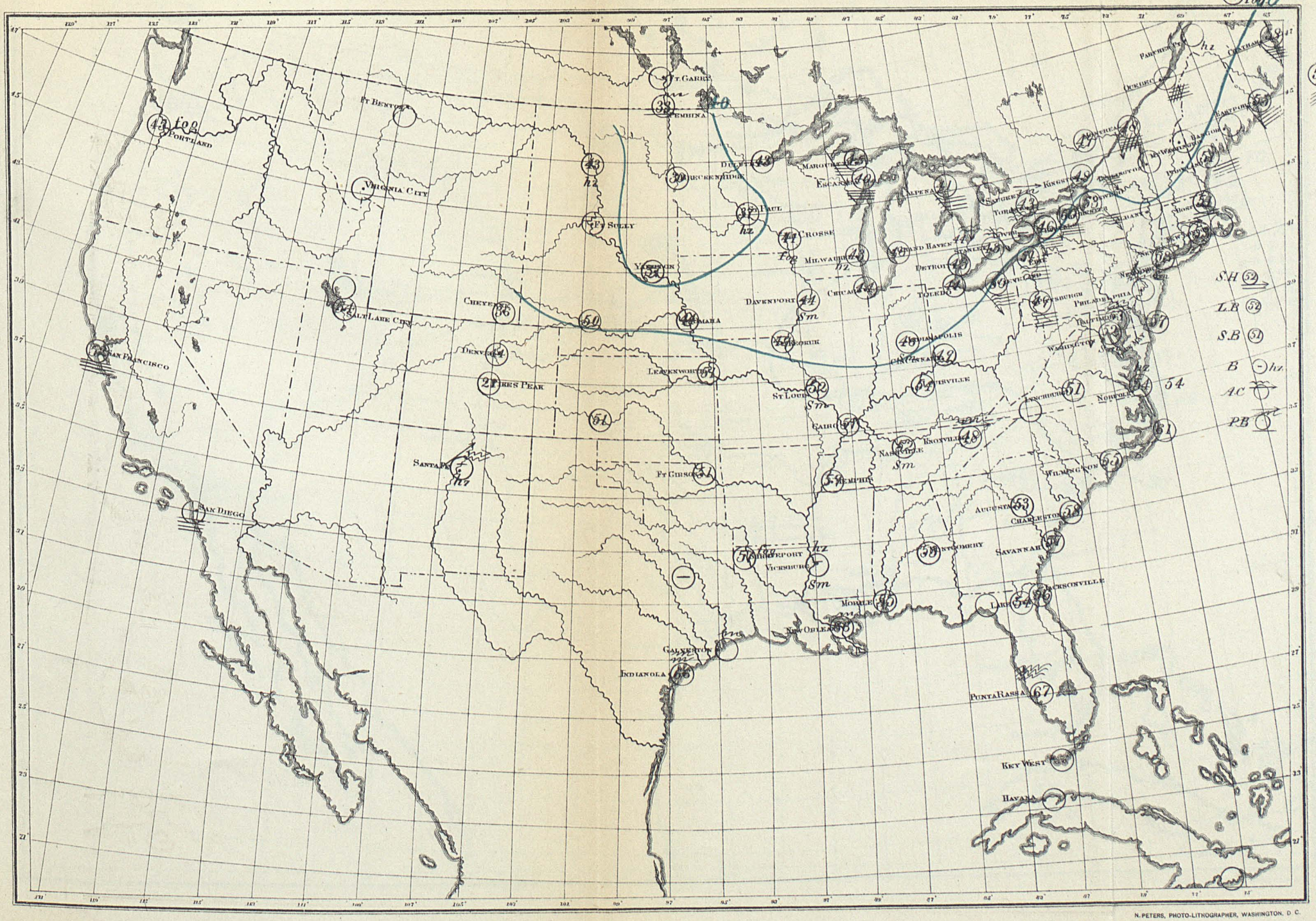
WEDNESDAY SEPT 30th 74. I. CLOUD SYMBOLS



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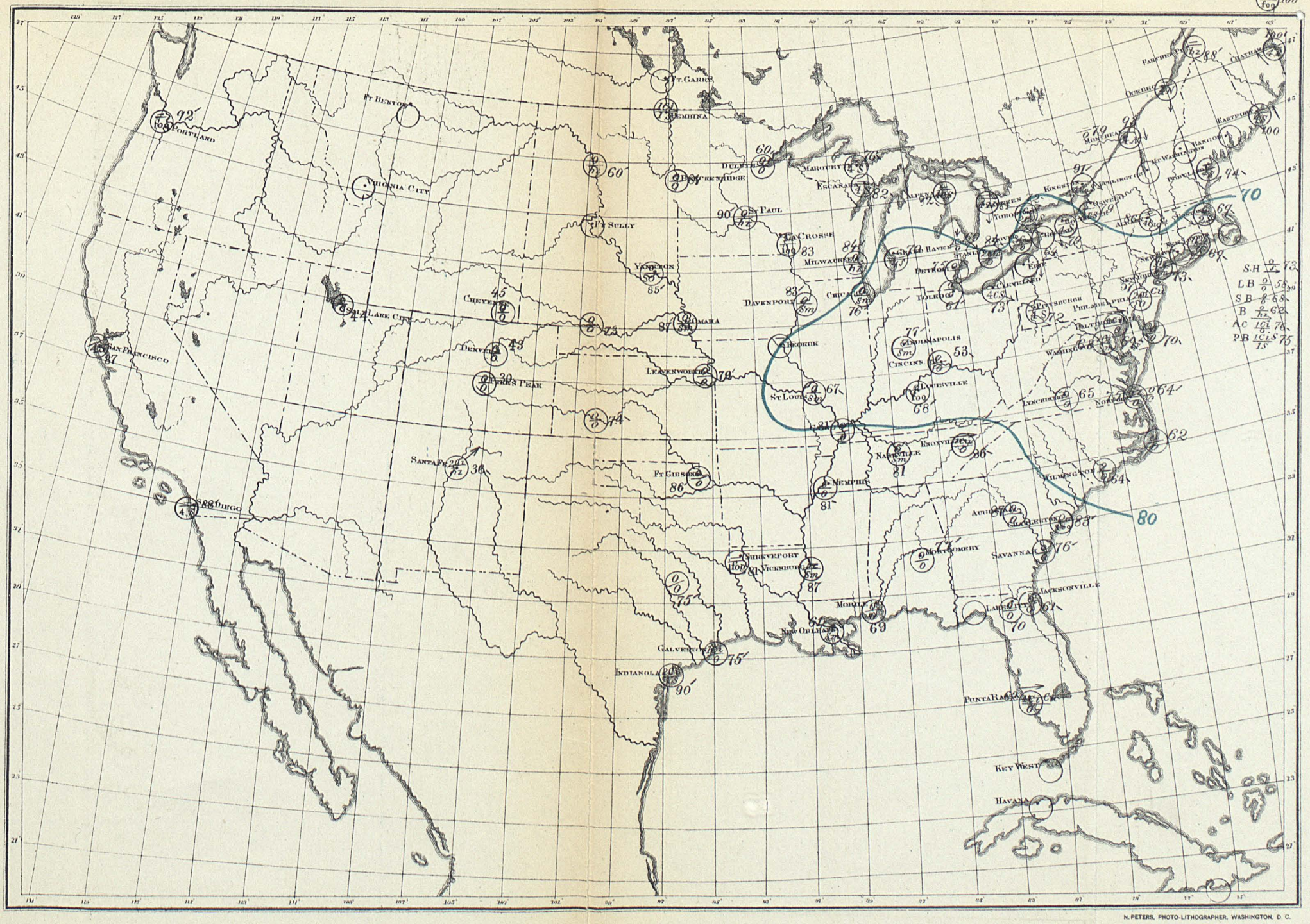
WEDNESDAY SEPT 30th 74. 1. CLOUDS.



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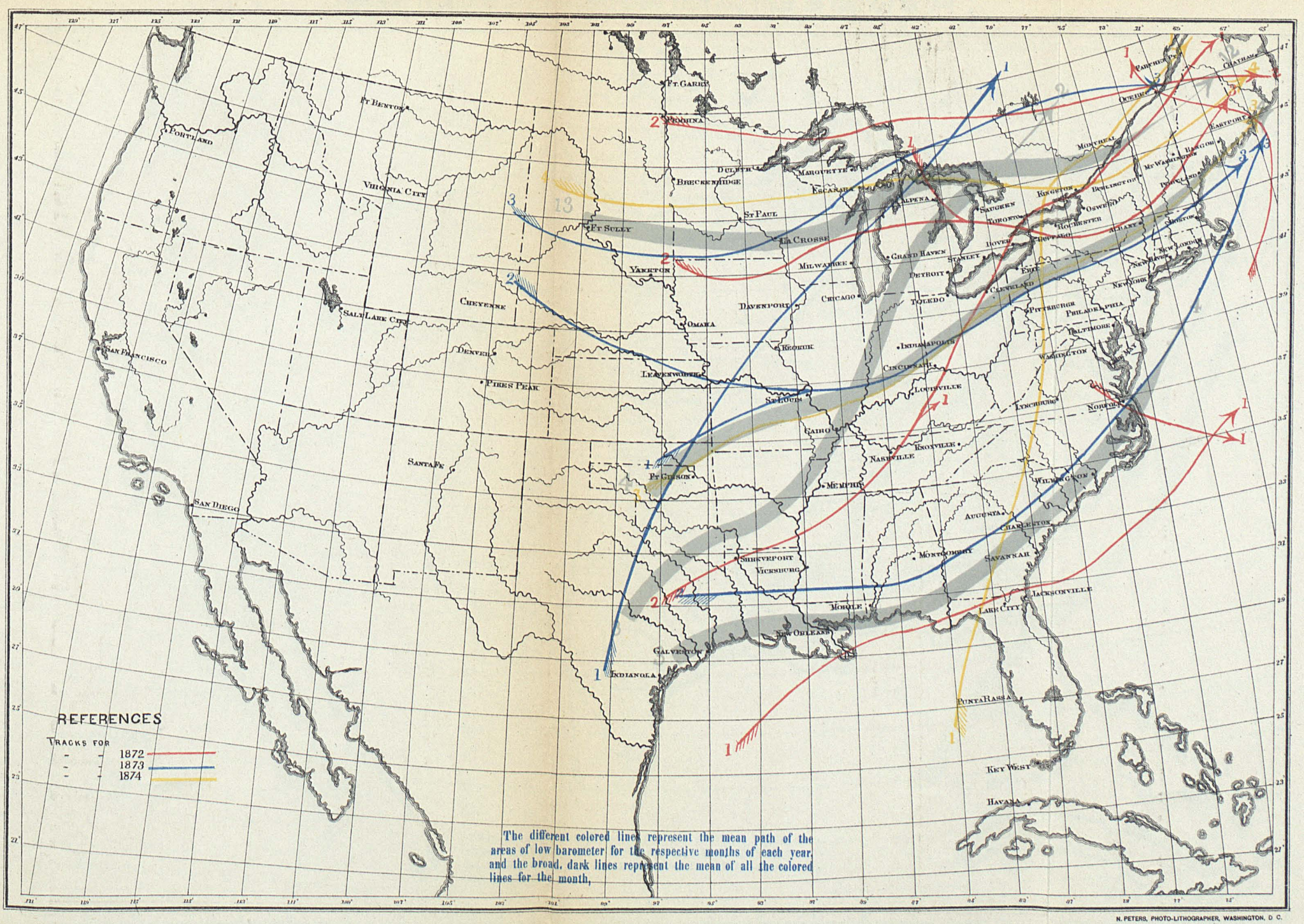
MEAN TRACKS OF LOW BAROMETER FOR JAN. 1872, 73 & 74.



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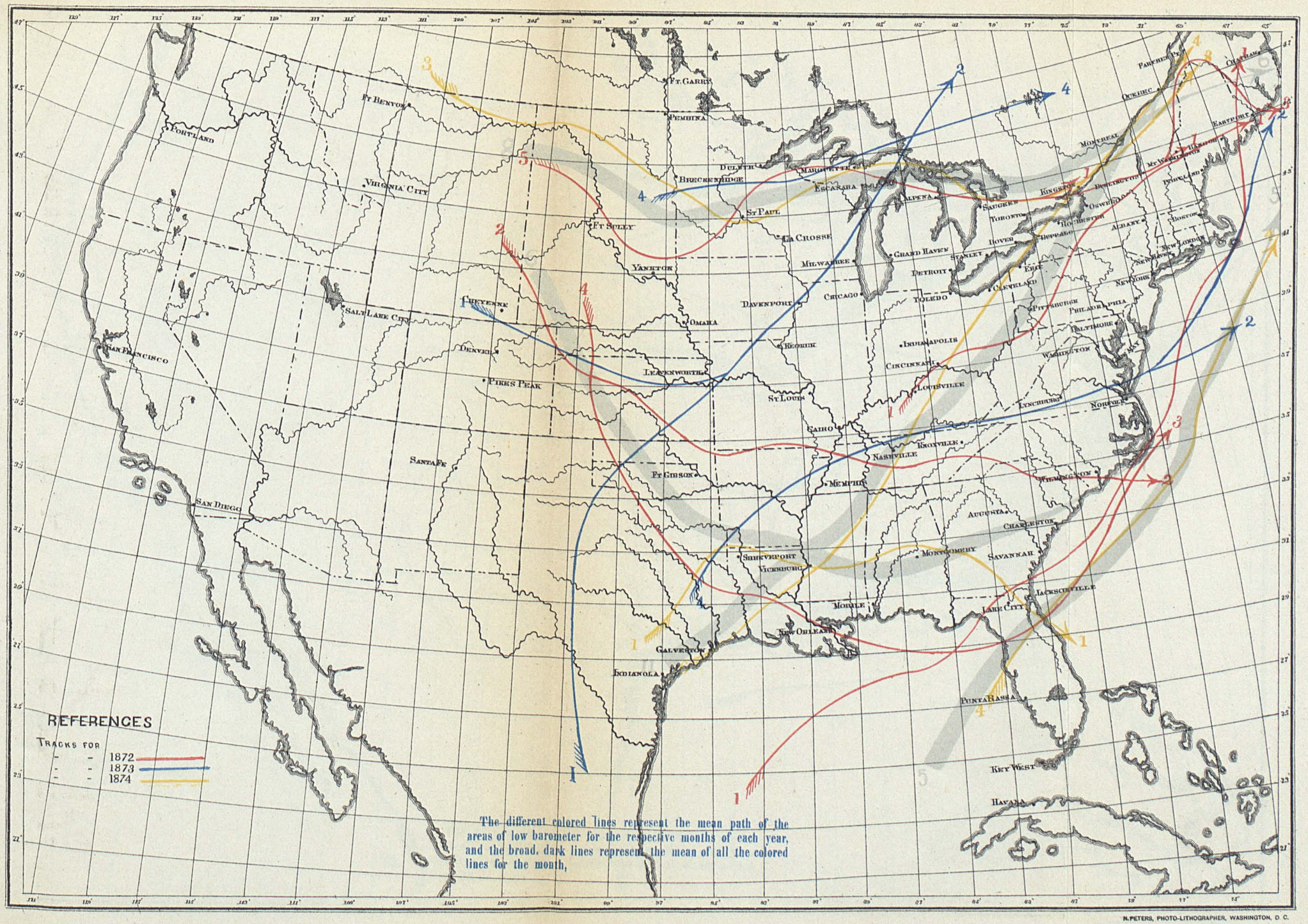

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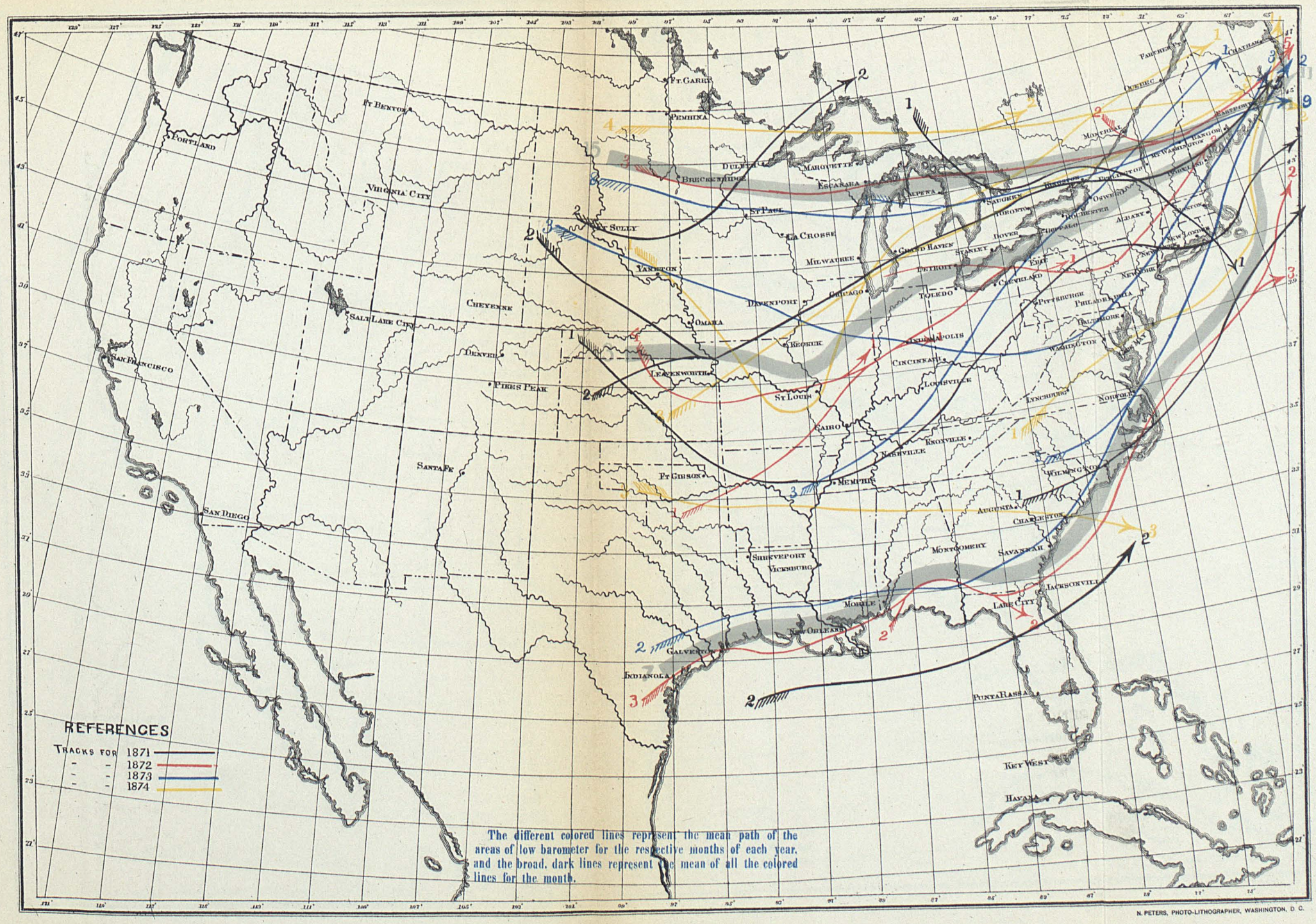
MEAN TRACKS OF LOW BAROMETER FOR MARCH 1871.72.73 & 74.



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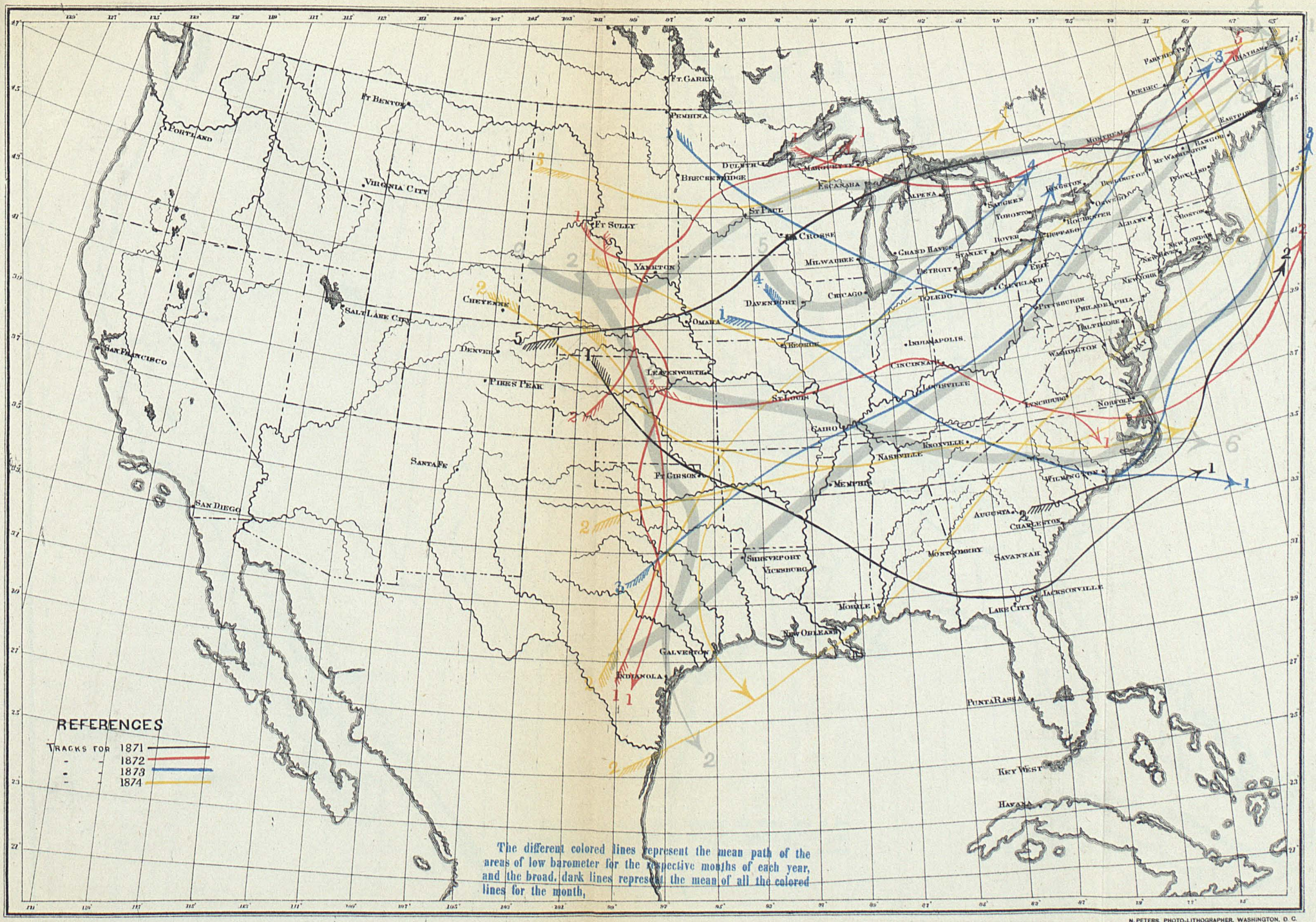
MEAN TRACKS OF LOW BAROMETER FOR APRIL 1871.72.73 & 74.



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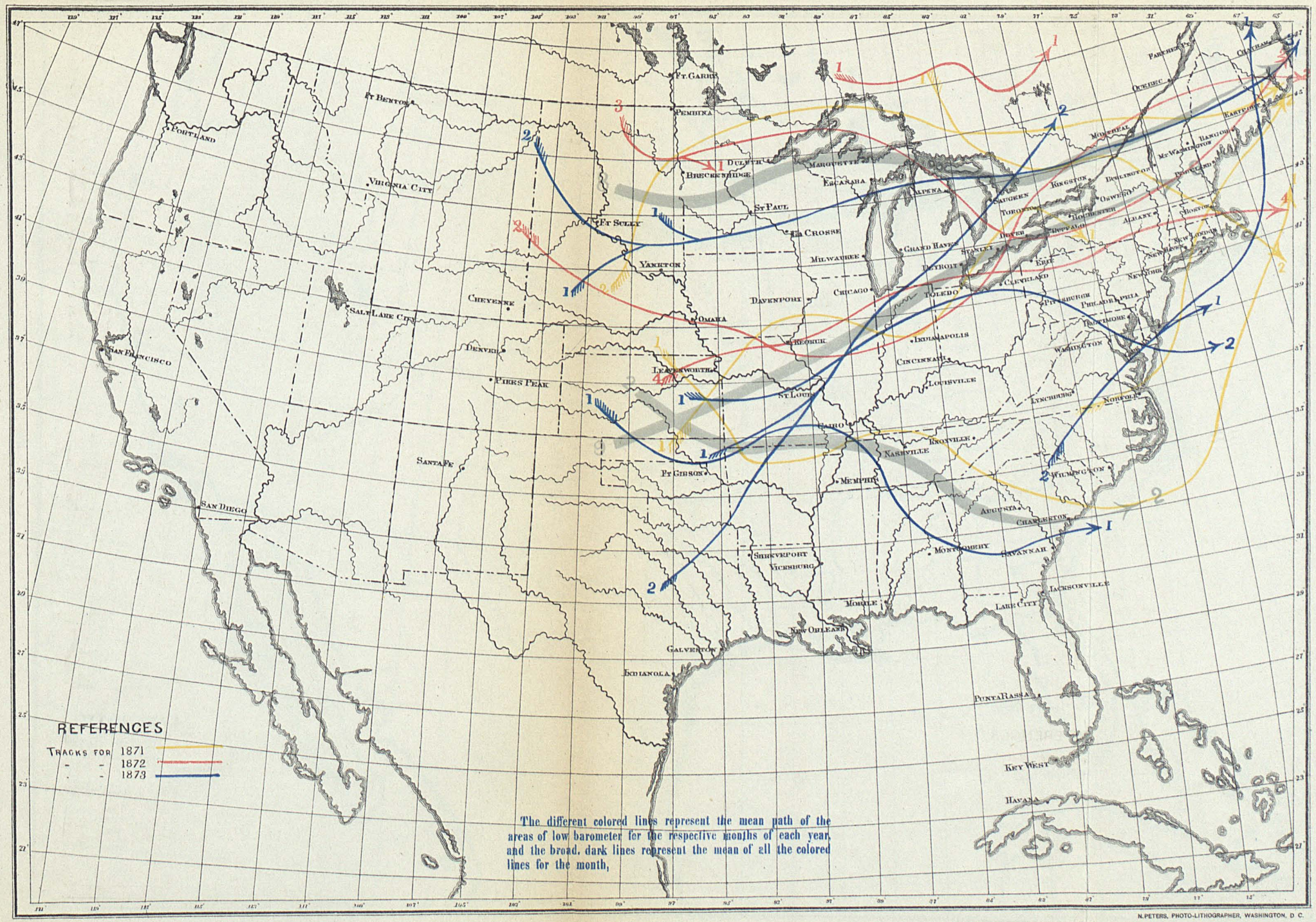
MEAN TRACKS OF LOW BAROMETER FOR MAY 1871.72 & 73.



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MEAN TRACKS OF LOW BAROMETER FOR JUNE 1871.72 & 73.

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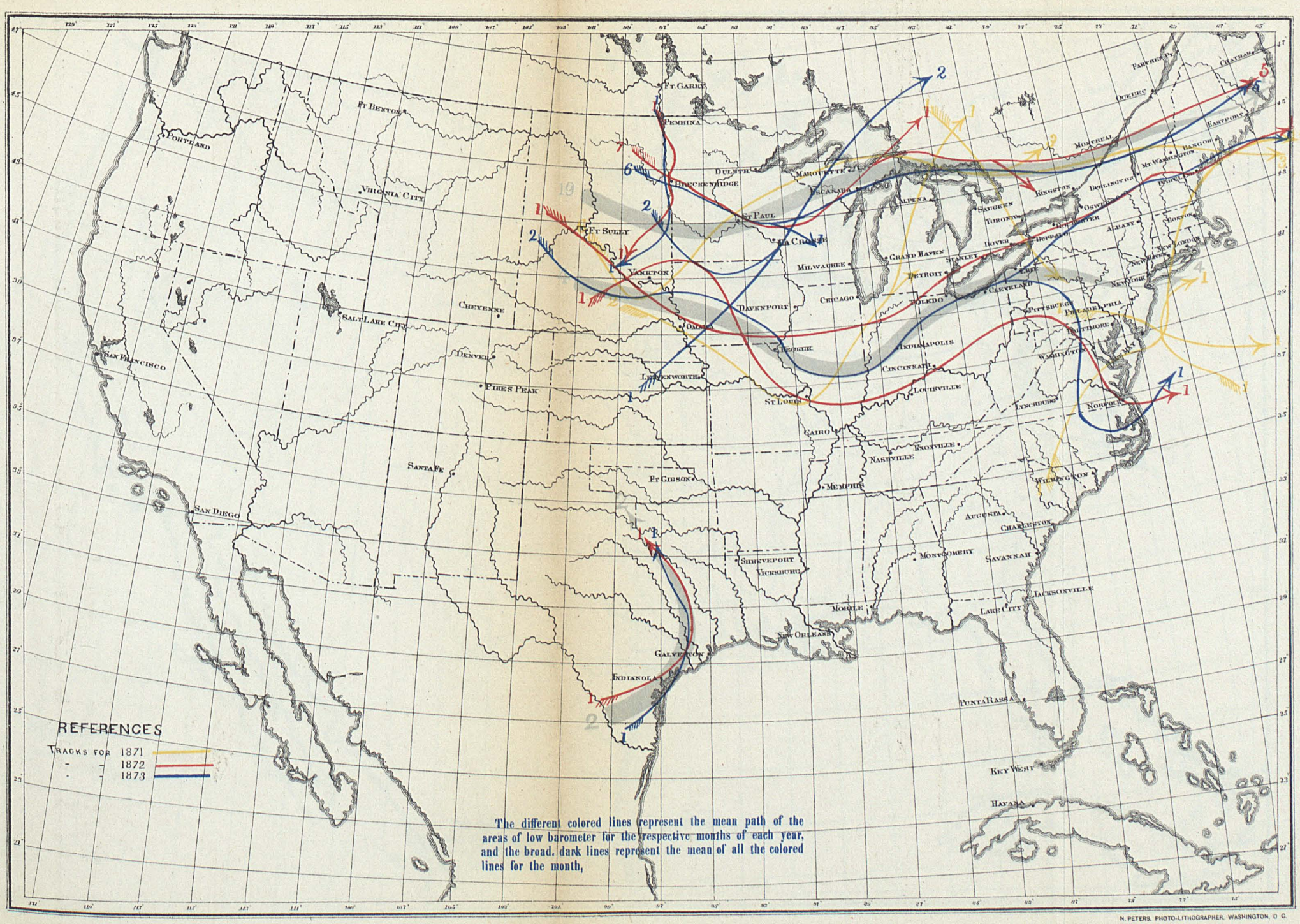

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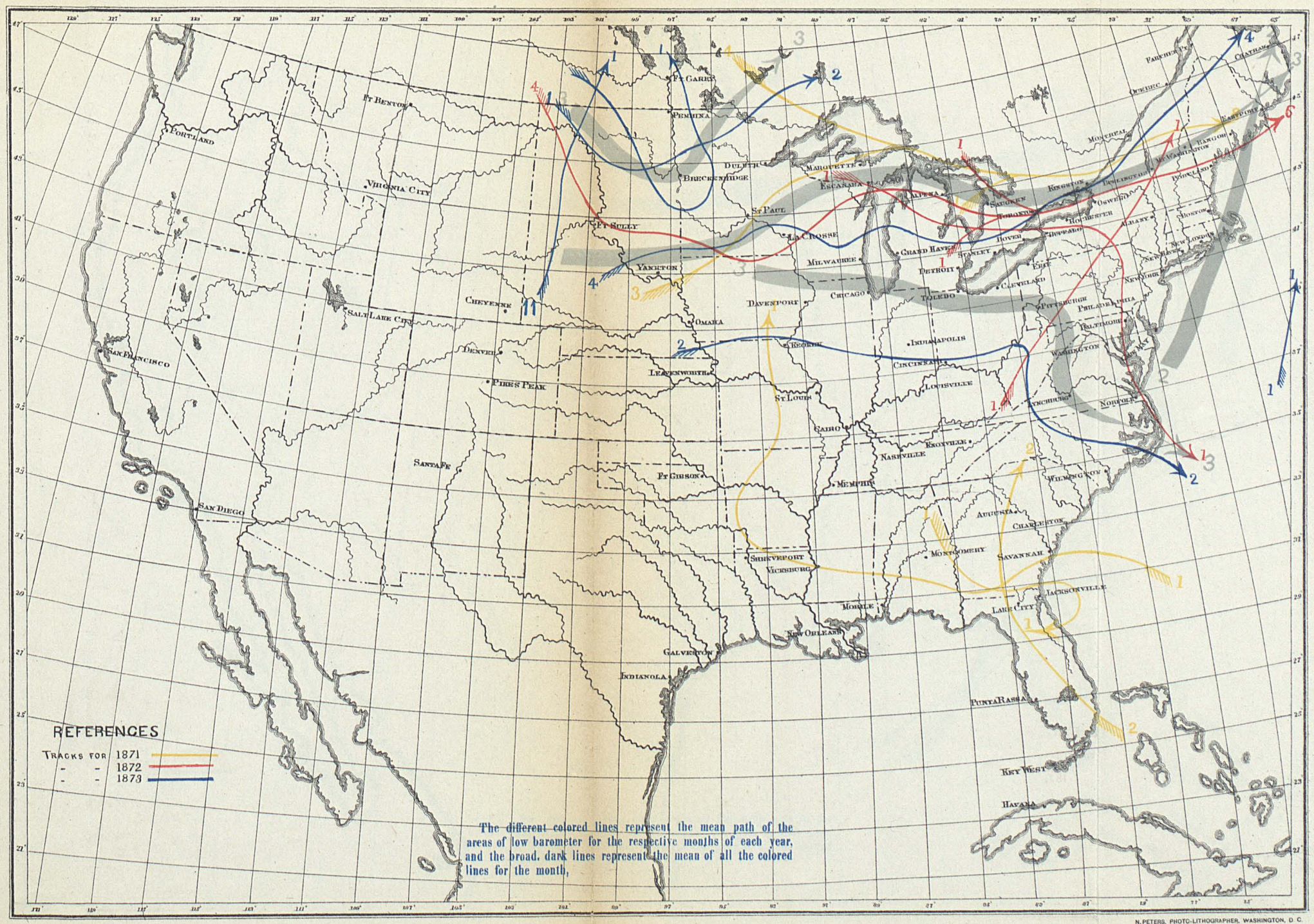

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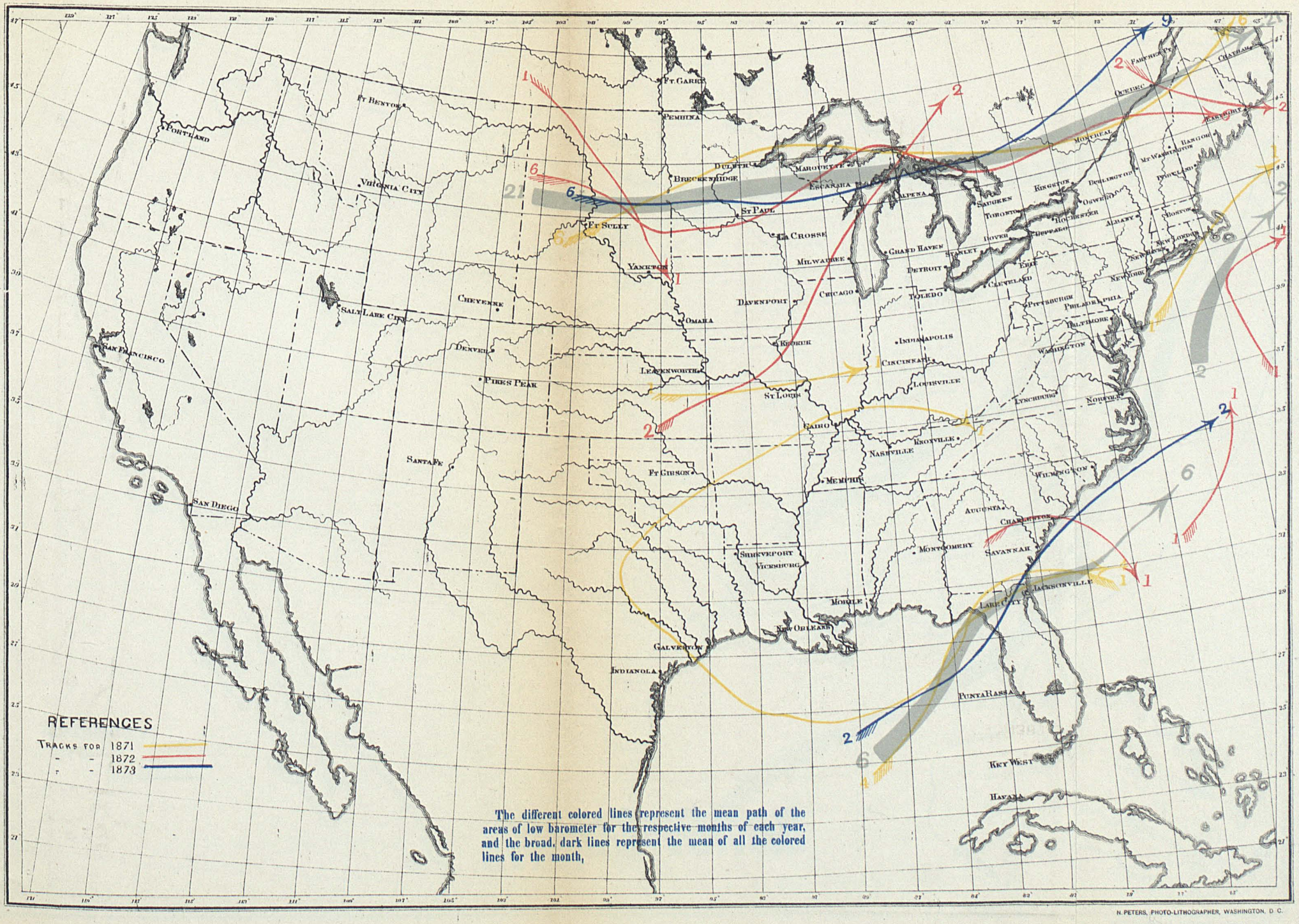

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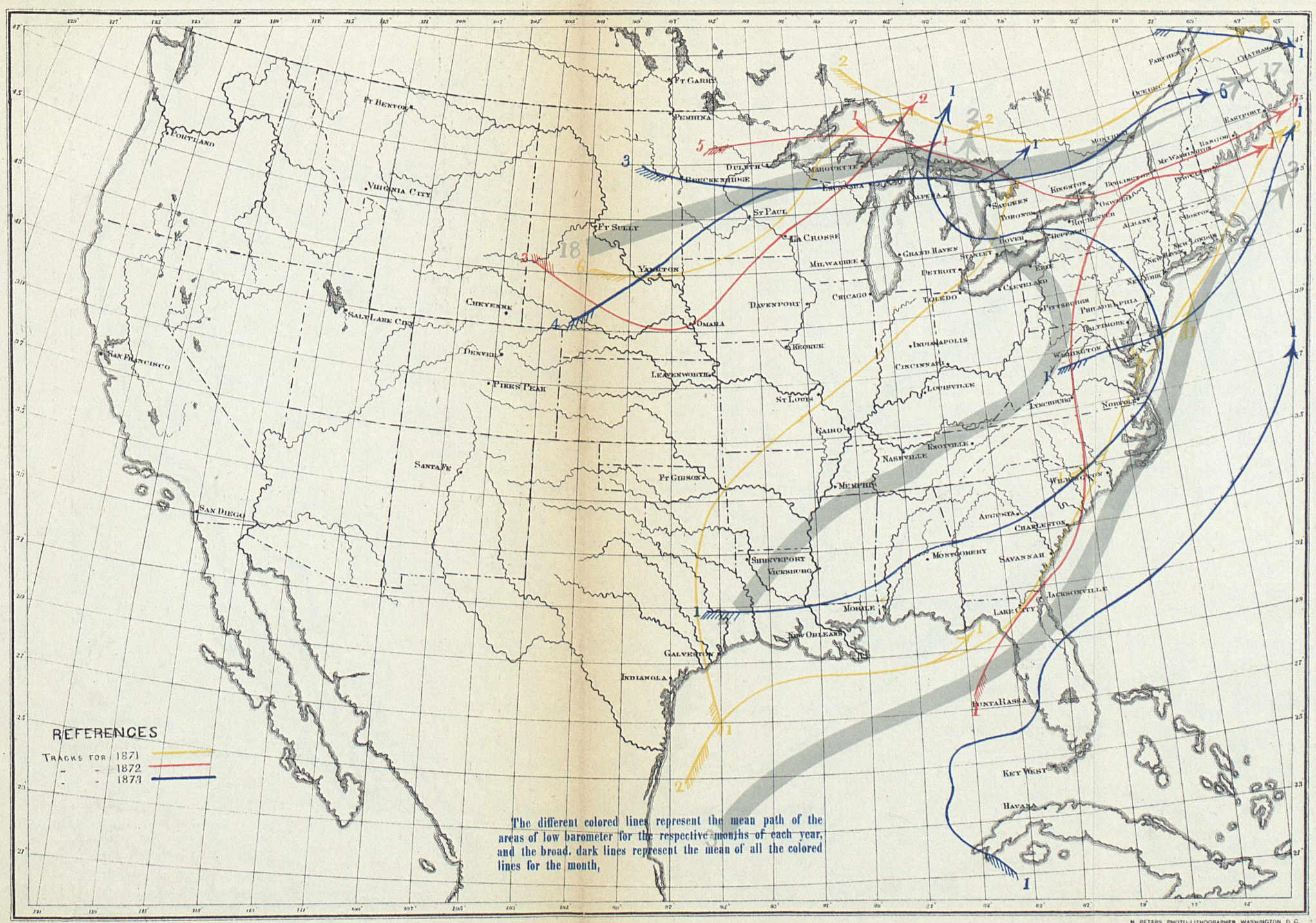

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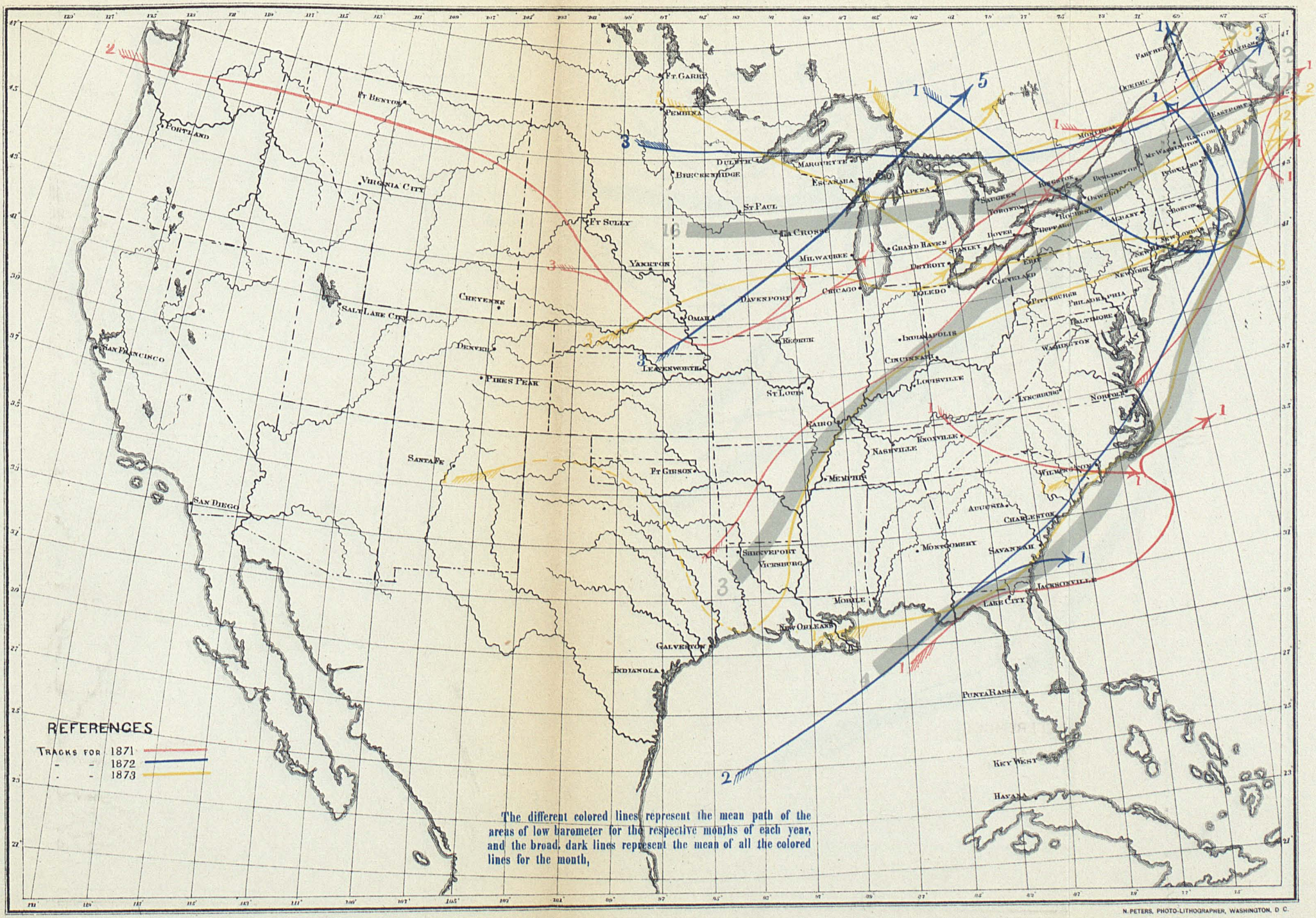

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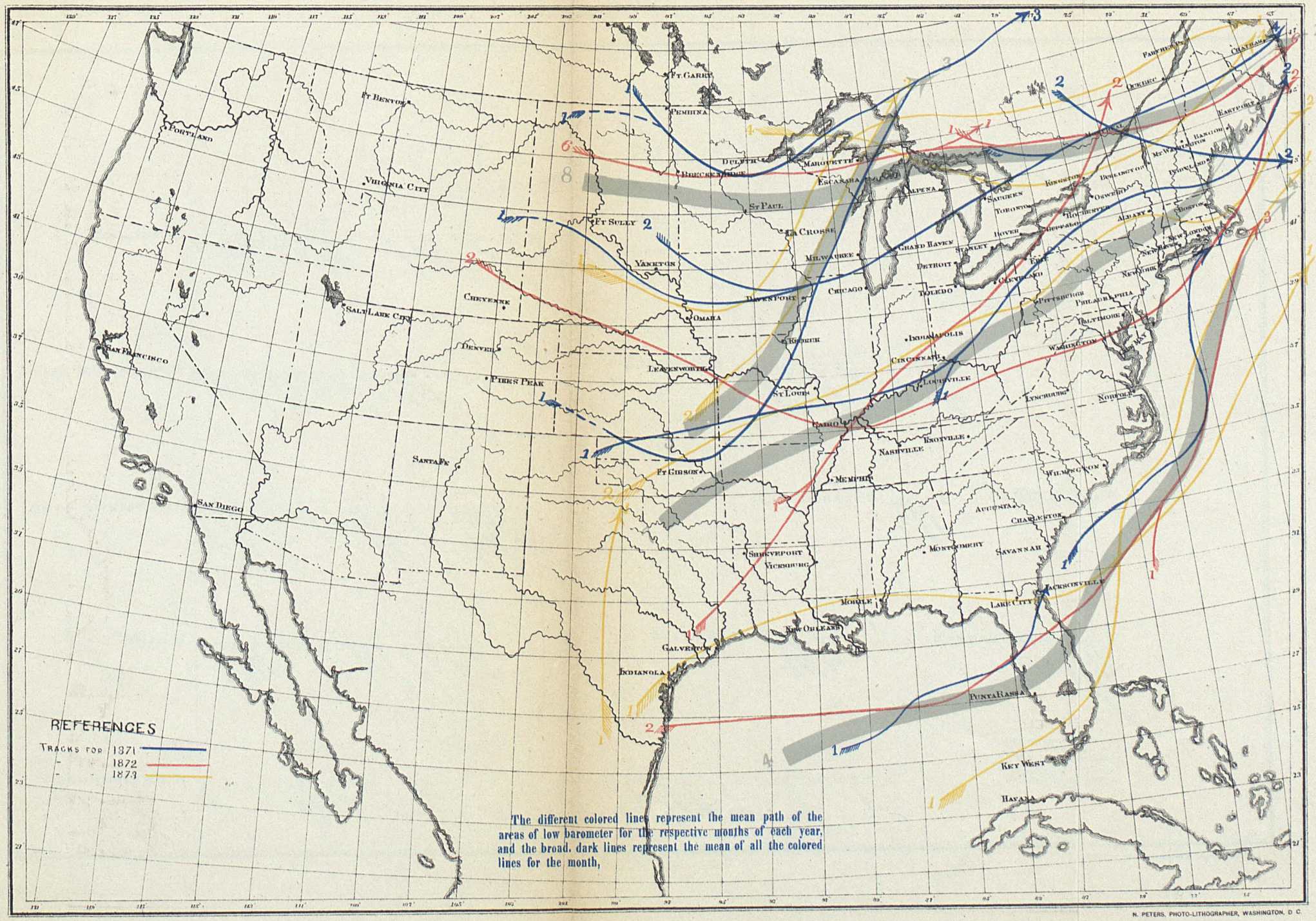
MEAN TRACKS OF LOW BAROMETER FOR DEC. 1871. 72 & 73.



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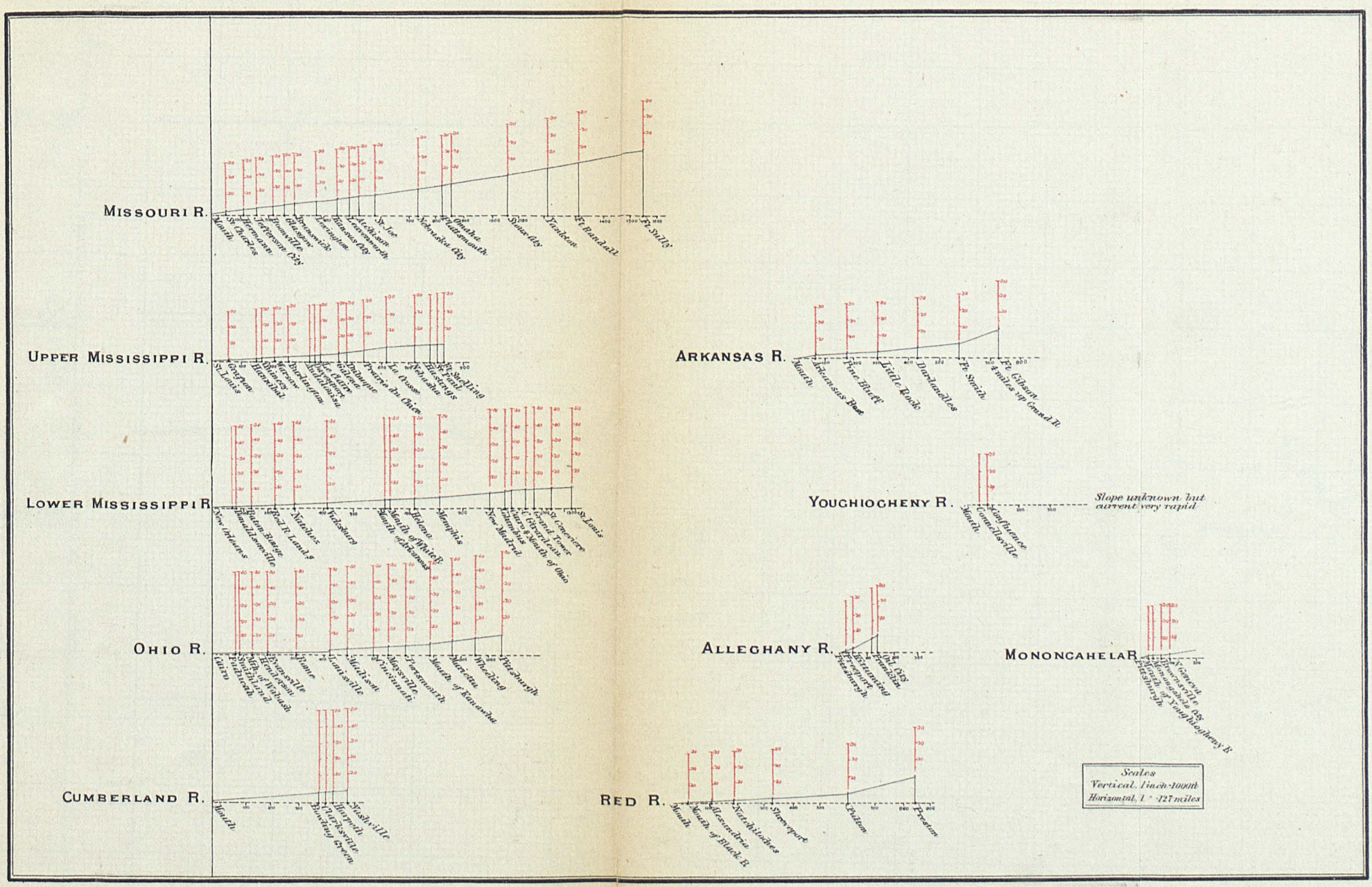

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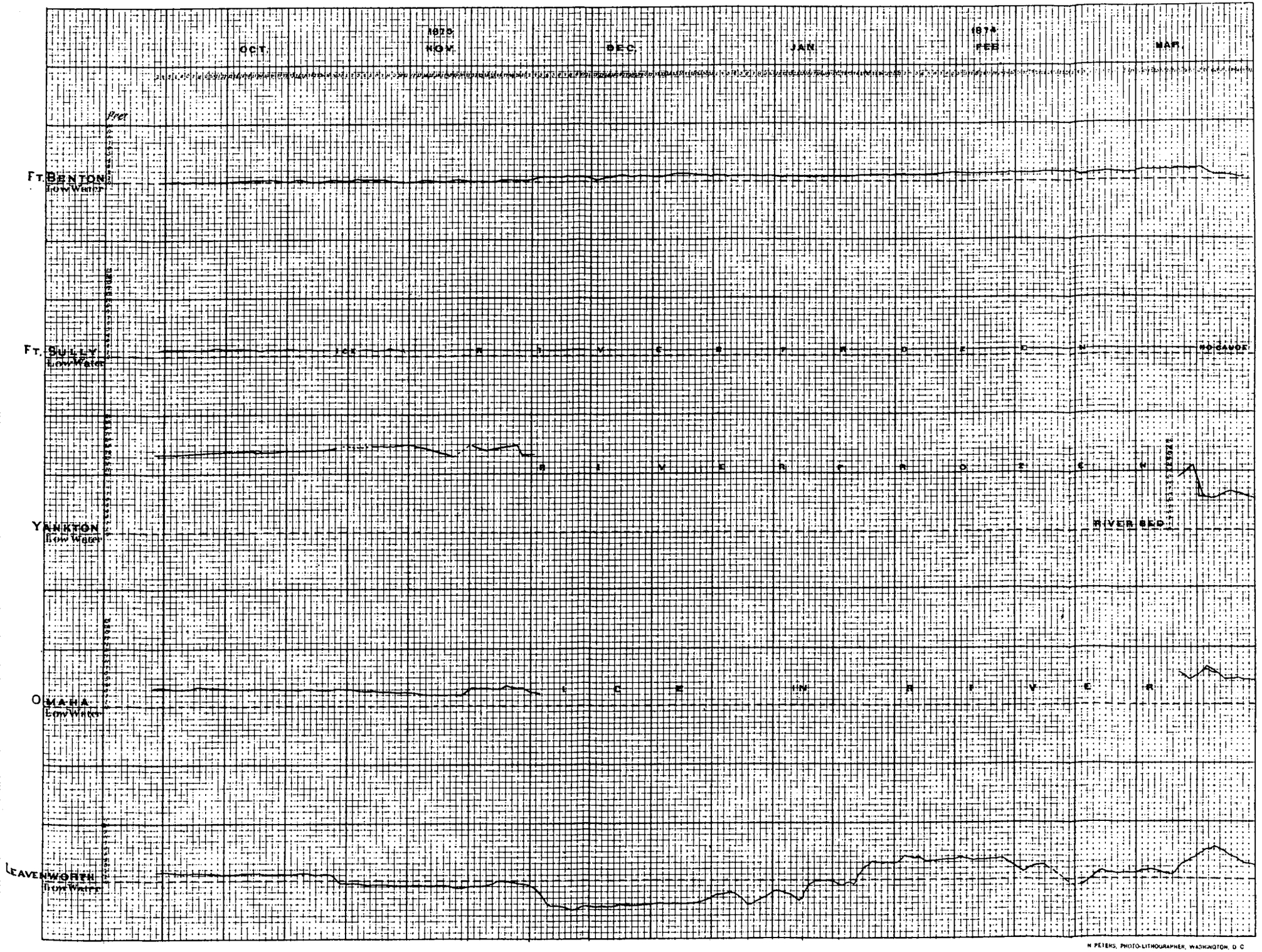
OSCILLATIONS OF THE MISSOURI RIVER.



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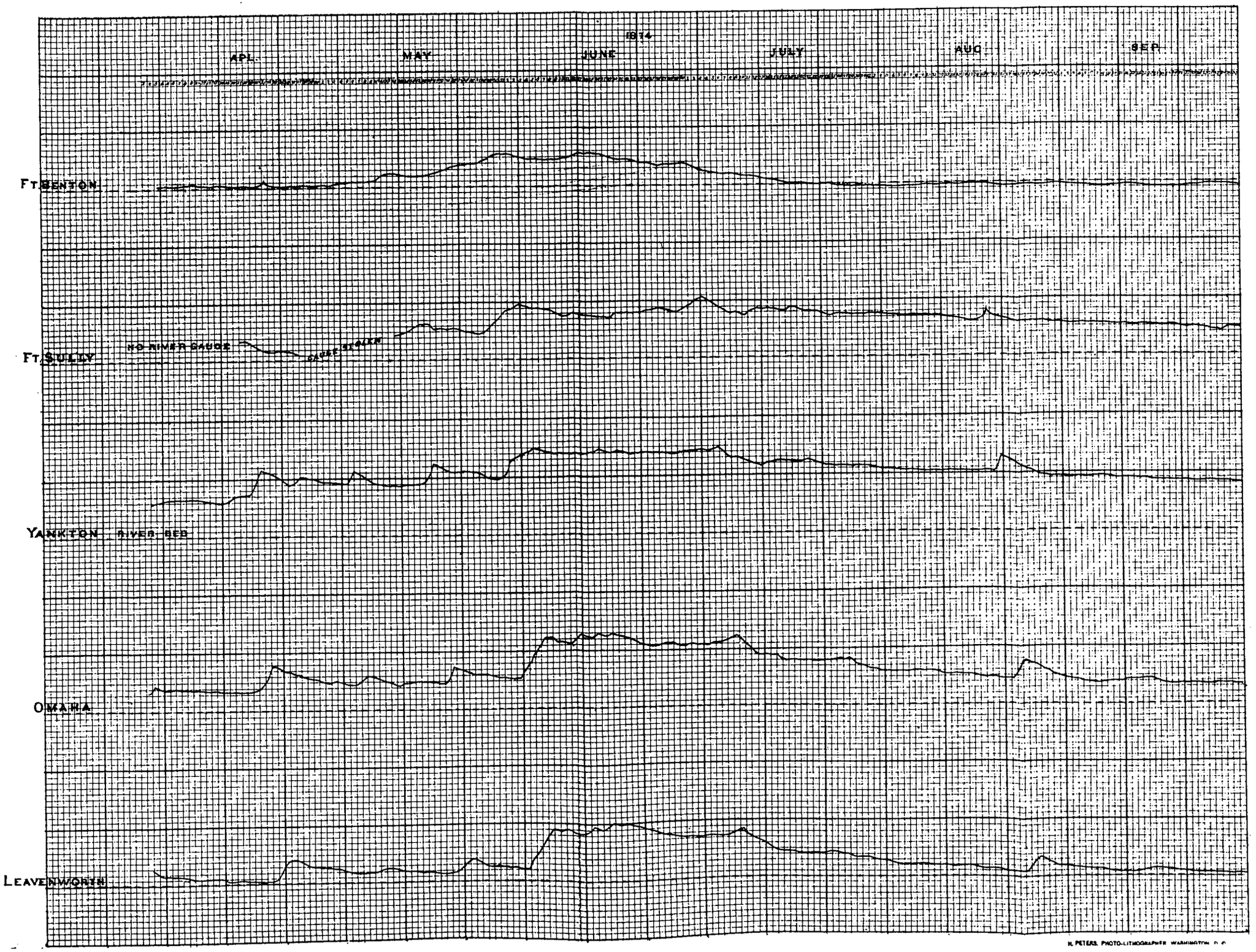
OSCILLATIONS OF THE MISSOURI RIVER. *(Concluded.)*



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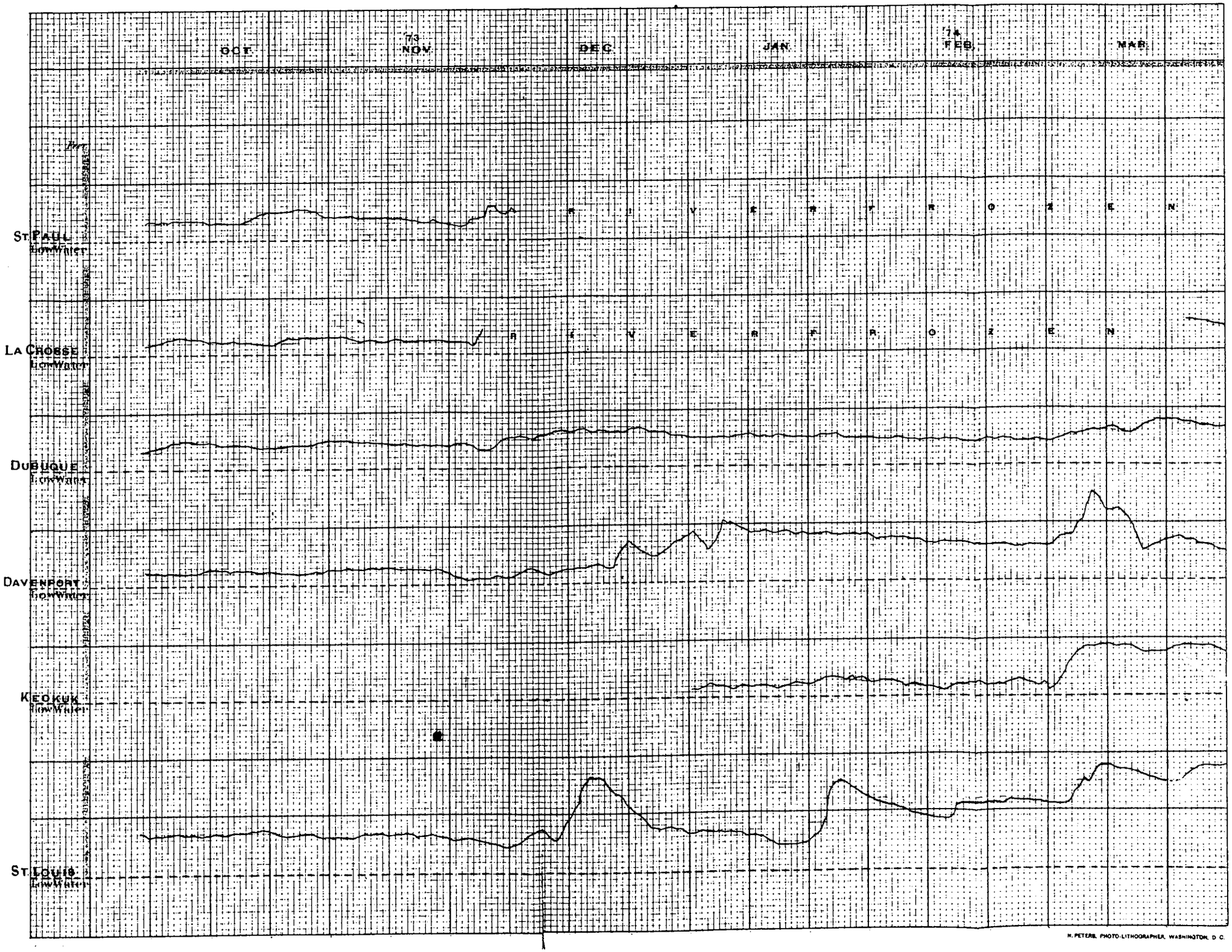
OSCILLATIONS OF THE UPPER MISSISSIPPI RIVER.



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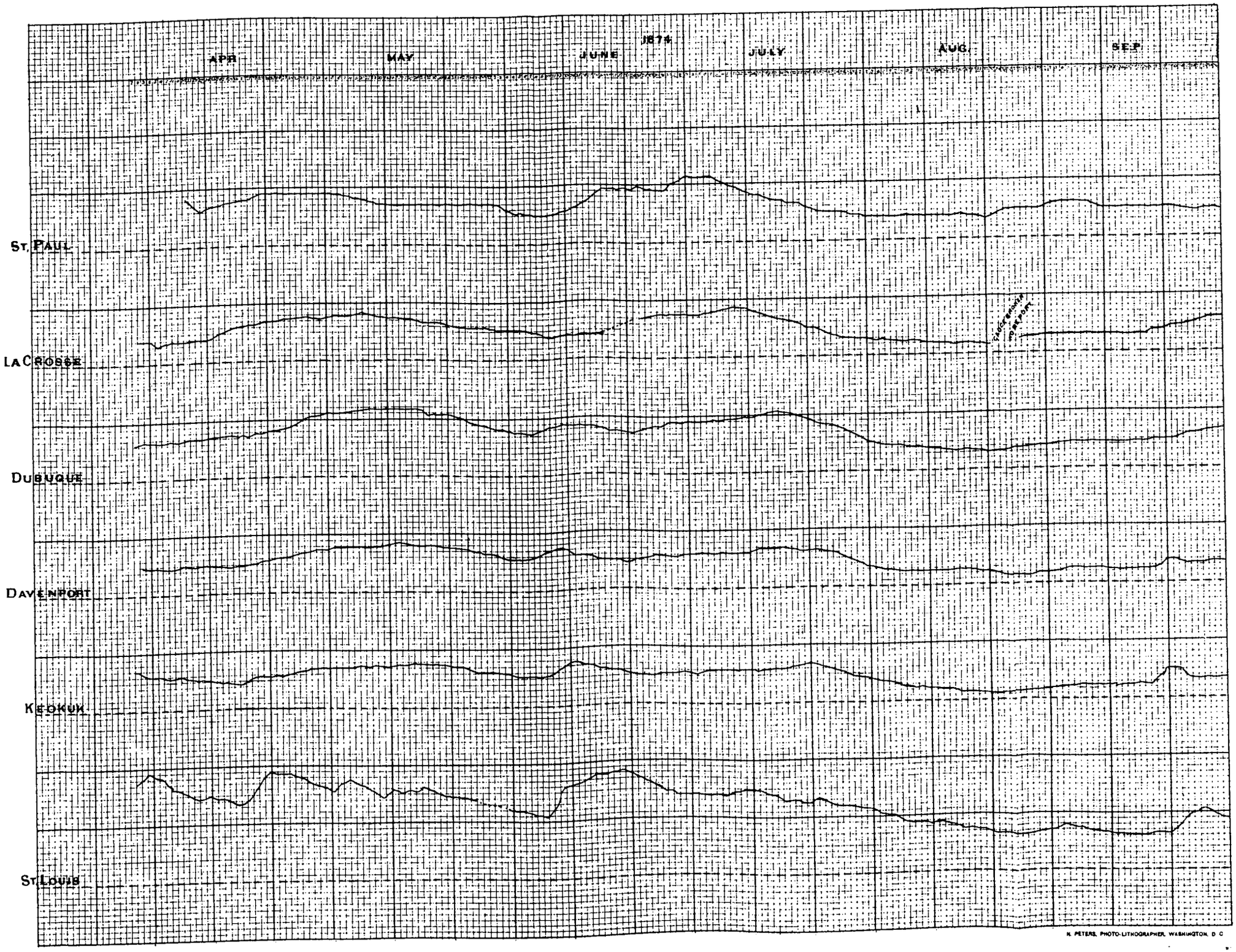
OSCILLATIONS OF THE UPPER MISSISSIPPI RIVER. (Continued)



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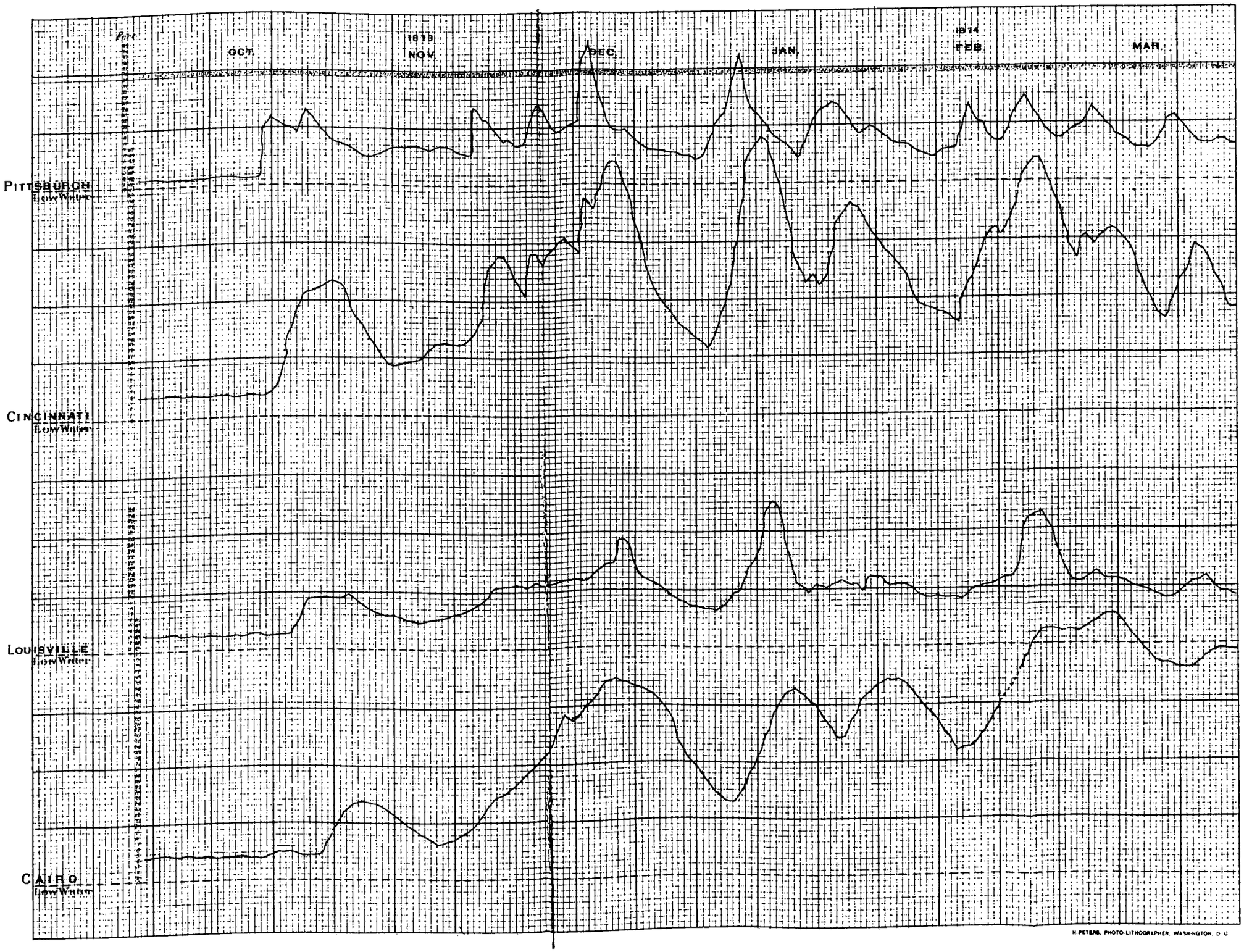
OSCILLATIONS OF THE OHIO RIVER.



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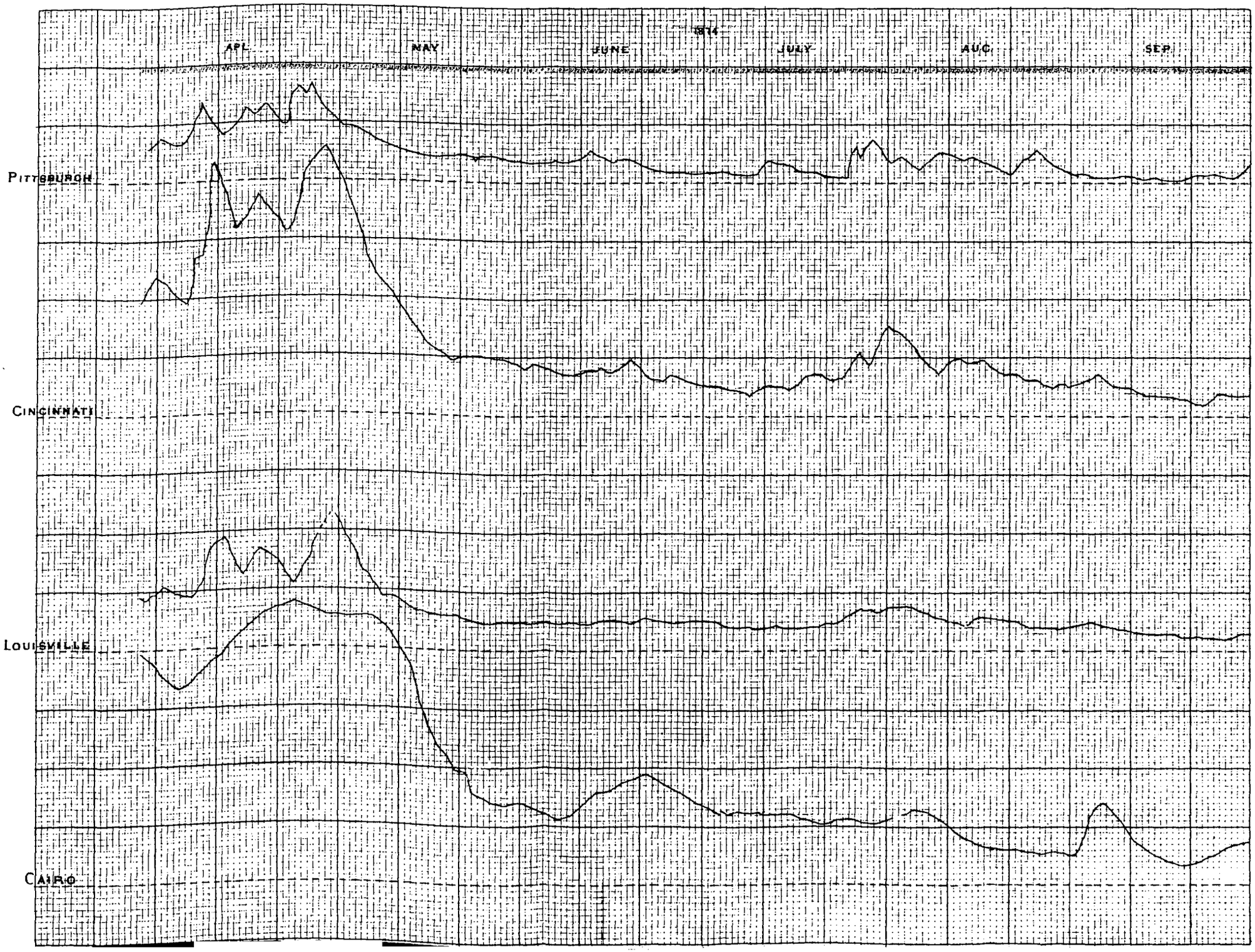
OSCILLATIONS OF THE OHIO RIVER. *(Concluded)*



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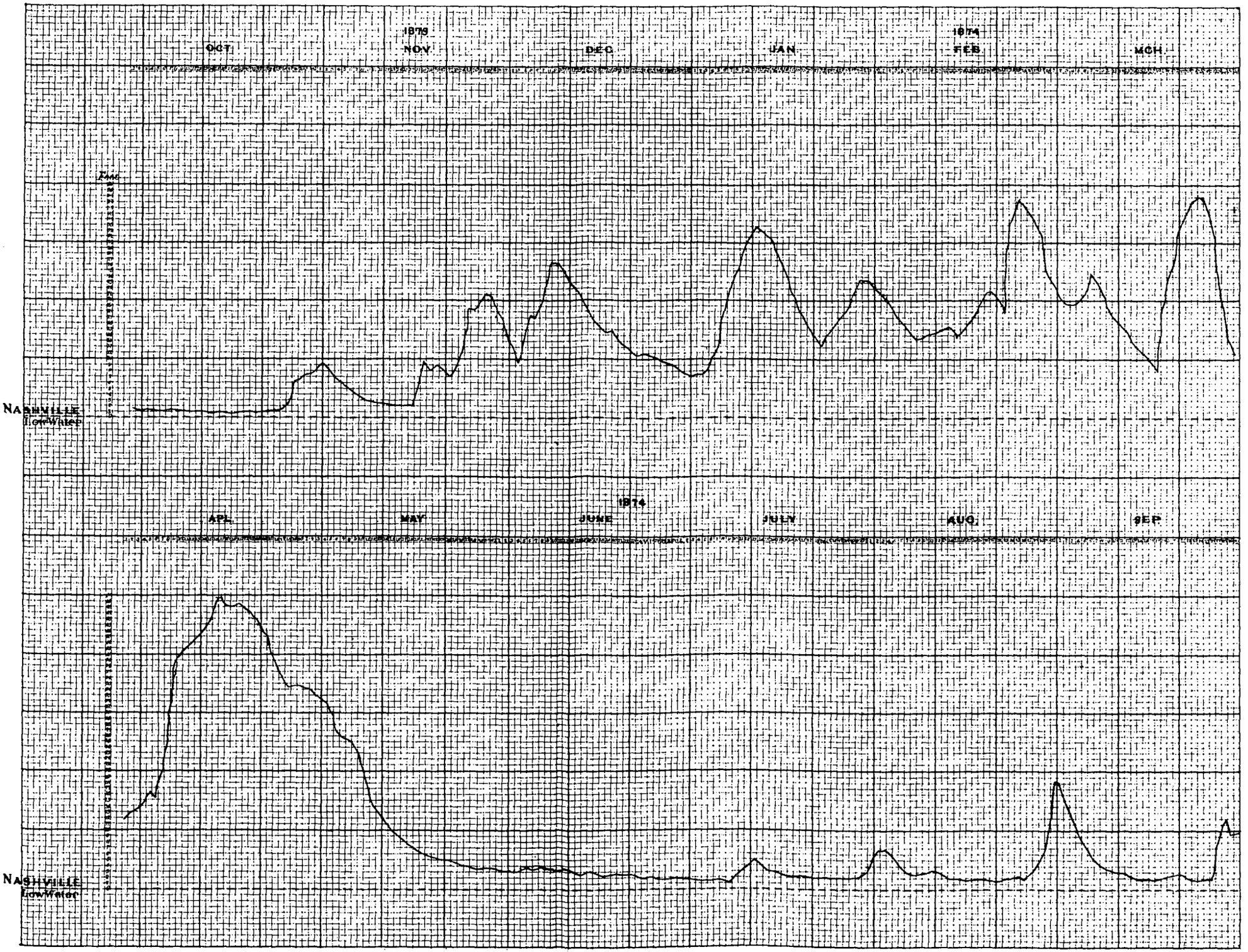
OSCILLATIONS OF THE CUMBERLAND RIVER.



N. Peters's Photo-Lithographic Washington, D.C.

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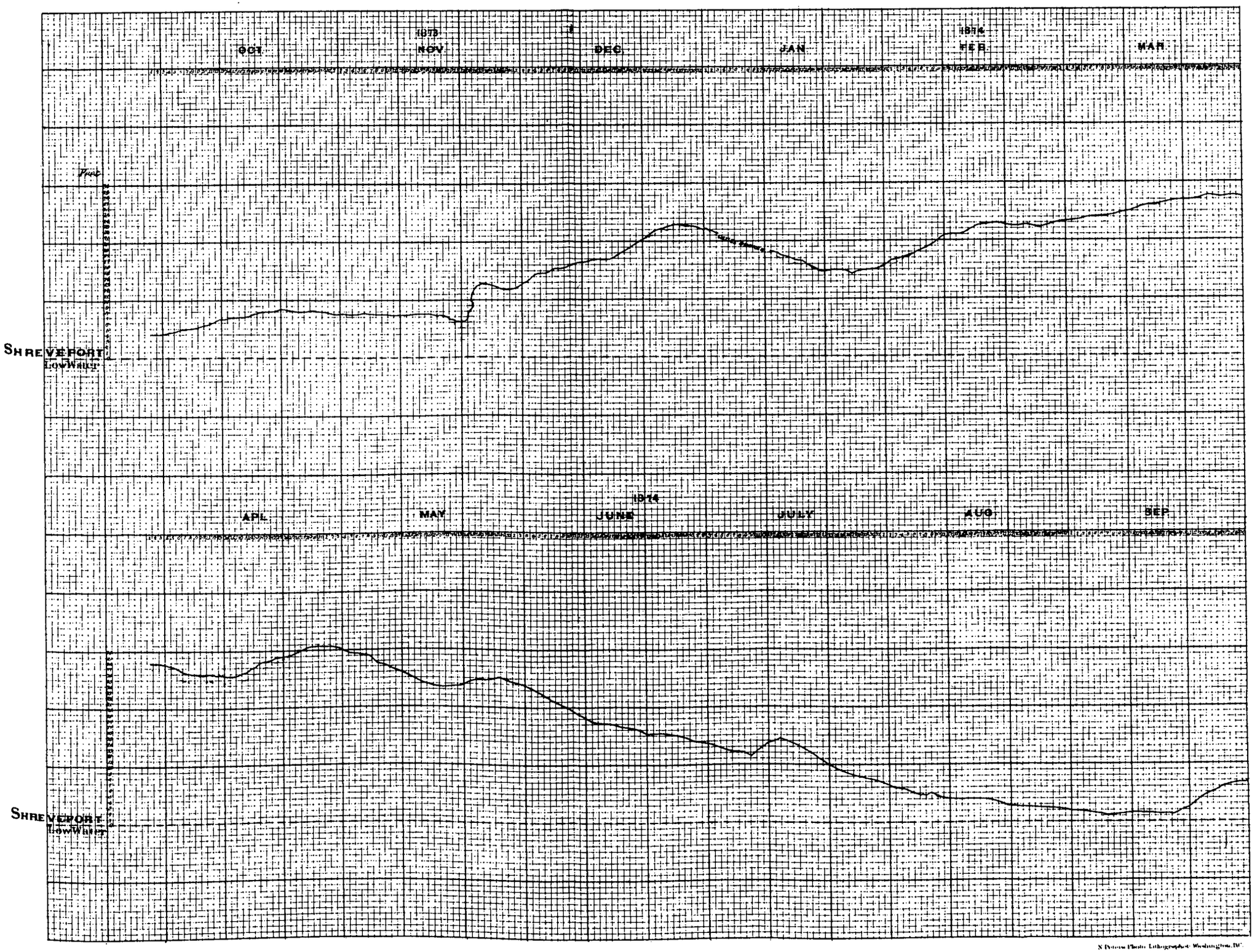
OSCILLATIONS OF THE RED RIVER



N. Poteau Photo. Lithographer, Washington, D.C.

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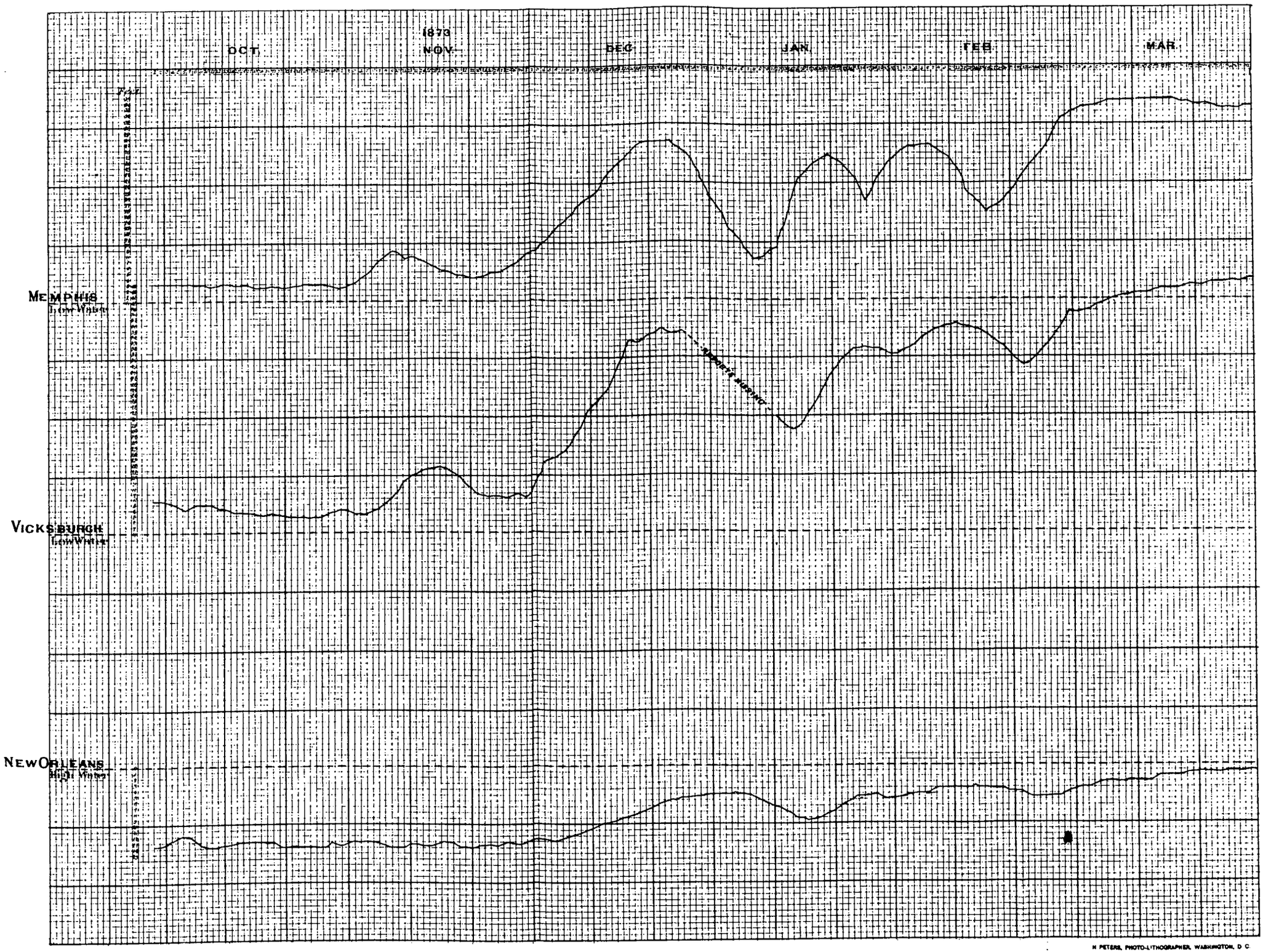
OSCILLATIONS OF THE LOWER MISSISSIPPI RIVER.



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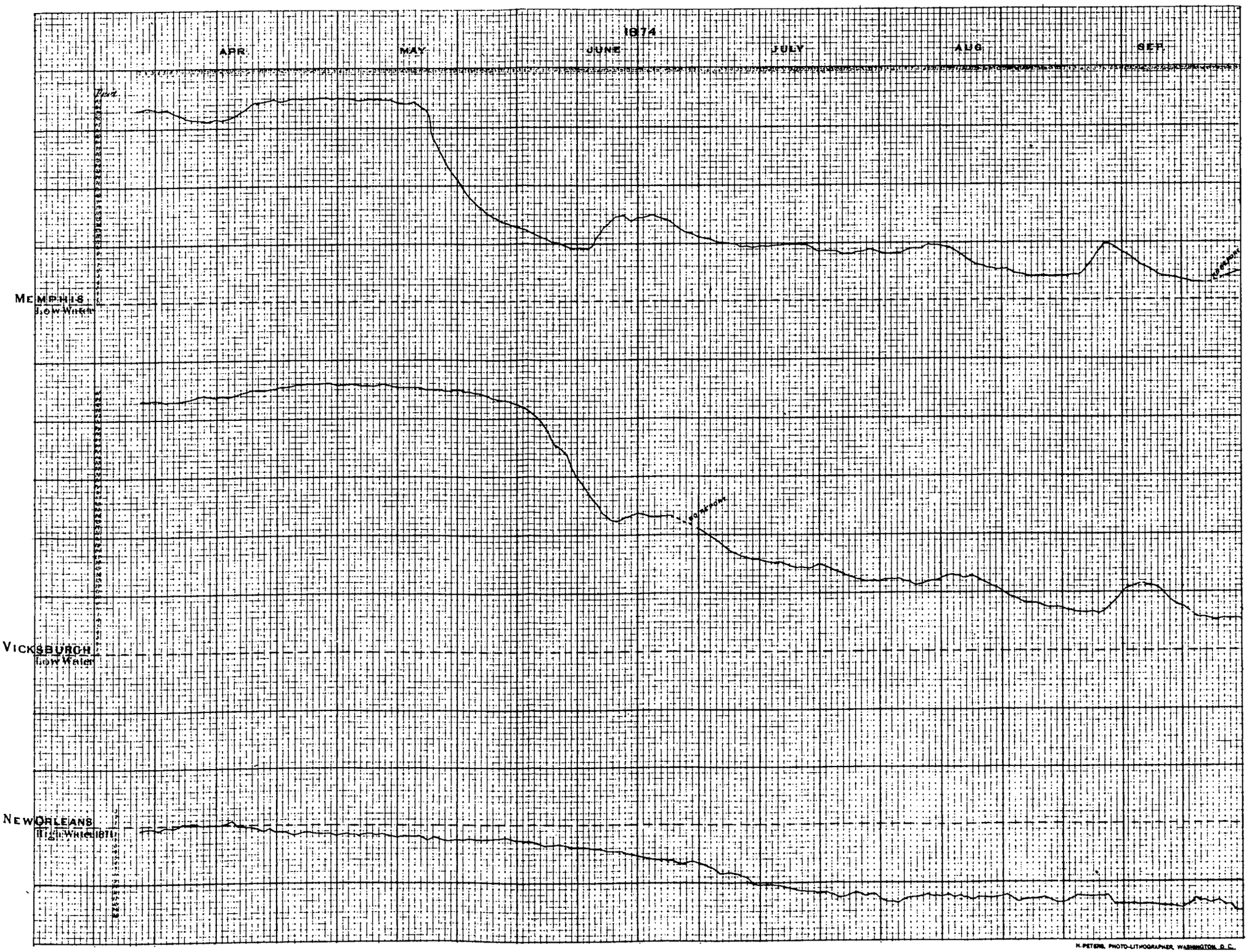
OSCILLATIONS OF THE LOWER MISSISSIPPI RIVER. (Concluded)



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