FRONT VIEW OF MAIN BUILDING, UNITED STATES SIGNAL STATION,
POINT BARROW, ALASKA.

REPORT

OF THE

INTERNATIONAL POLAR EXPEDITION

TO

POINT BARROW, ALASKA,

IN RESPONSE TO

THE RESOLUTION OF THE HOUSE OF REPRESENTATIVES
OF DECEMBER 11, 1884.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

EXPEDITION TO POINT BARROW, ALASKA.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

In response to a resolution of the House, the report of the International Polar Expedition to Point Barrow, Alaska.

DECEMBER 16, 1884.—Referred to the Committee on Naval Affairs and ordered to be printed.

LETTERS OF TRANSMITTAL.

WAR DEPARTMENT,
Washington City, December 15, 1884.

The Secretary of War has the honor to transmit to the House of Representatives the report of the International Polar Expedition to Point Barrow, Alaska, together with the letter of the Chief Signal Officer of the Army, of this date, submitting the report to this Department, the same being furnished in response to the resolution of the House of Representatives of December 11, 1884, as follows:

"*Resolved*, That the Secretary of War be requested to transmit to the House of Representatives, if not inconsistent with the public service, the report of the International Polar Expedition to Point Barrow, Alaska, by Lieut. P. H. Ray, U. S. Army, for the years 1881, 1882, and 1883."

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington City, December 15, 1884.

SIR: I have the honor to transmit herewith the report of the International Polar Expedition to Point Barrow, Alaska, called for by resolution of House of Representatives of December 12, 1884.

I am, very respectfully, your obedient servant,

W. B. HAZEN,
Brigadier and Brevet Major General, Chief Signal Officer, U. S. Army.

The Hon. SECRETARY OF WAR, *Washington, D. C.*

LETTER OF TRANSMITTAL.

WASHINGTON, D. C., *November* 1, 1884.

SIR: I have the honor to transmit herewith a full report of the operations of the International Polar Expedition to Point Barrow, Alaska, under my command, for the years 1881, 1882, and 1883.

The work in meteorology and magnetism is as complete as it was possible to make it with the means placed at my disposal.

The work of geographical exploration, having been made of secondary importance, was confined to such short expeditions as I was able to make from the home station, without suspending or interfering with the regular work; but enough was done to demonstrate that the work of exploration in the Arctic can be carried on, at any season of the year, with the assistance of the natives, with comparative safety and but very little suffering, and I trust that our experience will tend to remove some of the prejudices now existing in the public mind against Arctic exploration.

I regret exceedingly that I was not given more time to prepare myself for this undertaking, as my previous training had not been of such a character as to fit me for it, except in the matter of command and equipment.

I cannot speak too highly of the faithfulness and devotion of the members of the expedition to their duty. To their cheerful assistance and ready obedience is due all credit for the success attending the expedition.

In preparing this report I have been placed under many obligations to Prof. Spencer F. Baird, Director of the United States National Museum, and to Prof. J. E. Hilgard, Superintendent United States Coast and Geodetic Survey, for advice, as well as valuable assistance in their departments; also to Mr. Charles A. Schott, assistant, United States Coast and Geodetic Survey, for the reduction and discussion of the magnetic observations; to Mr. R. S. Avery, United States Coast and Geodetic Survey, for the reduction and discussions of tides; to Private A. L. McRae, Signal Corps, U. S. Army, for the reduction and discussion of the ground currents; and to Sergt. John Murdoch, Signal Corps, U. S. Army, naturalist of the expedition, for his able and valuable assistance throughout the whole expedition, and in preparing this report.

I am, very respectfully, your obedient servant,

P. H. RAY,

First Lieutenant Eighth U. S. Infantry, A. S. O., Commanding Expedition.

CHIEF SIGNAL OFFICER, UNITED STATES ARMY,

Washington, D. C.

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PART I.

ORDERS AND INSTRUCTIONS.

[Special Orders No. 102.]

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., June 24, 1881.

[Extract.]

* * * * * * *

IV. By direction of the Secretary of War, the following-named officers, civilians, and enlisted men are assigned to duty as the expeditionary force to Point Barrow, Alaska Territory, viz: First Lieut. P. Henry Ray, Eighth Infantry, Acting Signal Officer; Acting Assistant Surgeon, George Scott Oldmixon, U. S. Army,; Sergt. James Cassidy, Signal Corps, U. S. Army, observer; Sergt. John Murdoch, Signal Corps, U. S. Army (A. M., Harvard), naturalist and observer; Sergt. Middleton Smith, Signal Corps, U. S. Army, naturalist and observer; Capt. E. P. Herendeen, interpreter, storekeeper, &c.; Mr. A. C. Dark, astronomer and magnetic observer (Coast Survey); one carpenter; one cook; one laborer.

V. First Lieut. P. H. Ray, Eighth Infantry, Acting Signal Officer, is hereby assigned to the command of the expedition, and is charged with the execution of the orders and instructions given below. He will forward all reports and observations to the Chief Signal Officer, who is charged with the control and supervision of the expedition.

VI. As soon as practicable, Lieutenant Ray will sail with his party from San Francisco for Point Barrow, latitude 71° 27′ north, longtitude 156° 15′ West (Beechey), and establish there a *permanent* station of observation, to be occupied until the summer of 1884, when he will return here, unless other orders reach him. On the way out and back, a stoppage of a few days only will be made at Plover Bay (latitude 64° 22′ 0″ north, longtitude 173° 21′ 32″ west), for the purpose of determining the error and sea rate of his chronometers. The vessel conveying him to his destination will not be detained at the *permanent* station longer than is necessary to unload the stores.

W. B. HAZEN,
Brigadier and Brevet Major-General, Chief Signal Officer, U. S. Army.

Official:
LOUIS V. CAZIARC,
First Lieutenant, Second Artillery, Acting Signal Officer.

[Instructions No. 76.]

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., June 24, 1881.

The following general and detailed instructions will govern in the establishment and management of the expedition organized under Special Orders No. 102, War Department, Office of the Chief Signal Officer, Washington, D. C., dated June 24, 1881.

The *permanent* station will be established at the most suitable point in the vicinity, and, if practicable, at or in the immediate neighborhood of Point Barrow, Alaska Territory, (latitude 71° 27′ north; longitude 156° 15′ west, as determined by Beechey).

The chronometers will be rated at San Francisco, and will have their sea rates determined by an observation of time at the United States Coast and Geodetic Survey station at Plover Bay (latitude 64° 22′ 0″ north; longitude 173° 21′ 32″ west).

The vessel should, on arrival at the permanent station, discharge her cargo with the utmost dispatch, and at once be ordered to return to San Francisco, Cal. Before permitting the vessel to leave, a careful examination of the vicinity will be made and the exact site chosen for the permanent station will be located in latitude and longitude, chronometrically, both by Lieutenant Ray and by the navigator of the vessel independently, and a report in writing will be sent by the returning vessel. By the same means will be sent a transcript of all meteorological and other observations made during the voyage, and also a list of apparatus and stores known to be broken, missing and needed, to be supplied next year.

After the departure of the vessel, the energies of the party should first be devoted to the erection of the houses required for dwellings, stores, and observatories.

Special instructions regarding the meteorological, magnetic, tidal, pendulum, and such other observations as were recommended by the Hamburg International Polar Conference, are transmitted herewith.

Careful attention will be given to the collection of specimens of the animal, mineral, and vegetable kingdoms. These collections are to be made as complete as possible, and are to be considered the property of the Government of the United States, and are to be at its disposal. The collections in natural history and ethnology are made for, and will be transferred to, the National Museum.

It is contemplated that the *permanent* station will be visited in 1882, 1883, and 1884 by a steam or sailing vessel, by which supplies for, and such additions to, the present party as are deemed needful will be sent. Lists of stores required to be sent by the next season's vessel will be forwarded by each returning boat.

The subject of fuel and native food-supply, its procurement and preservation, will receive full and careful attention, as soon after the establishment of the post as practicable. Full reports upon this subject will be expected.

A special copy of all reports will be made each day, which will be sent home each year by the returning vessel.

The full narrative of the several branches will be prepared with accuracy, leaving the least possible amount of work afterwards to prepare them for publication.

In case of any fatal accident or permanent disability happening to Lieutenant Ray, the command will devolve on the officer next in seniority, who will be governed by these instructions.

W. B. HAZEN,
Brigadier and Brevet Major-General, Chief Signal Officer, U. S. Army.

Official:

LOUIS V. CAZIARC,
First Lieutenant, Second Artillery, Acting Signal Officer.

INSTRUCTIONS FOR THE COMMANDING OFFICERS OF THE INTERNATIONAL POLAR STATIONS OCCUPIED BY THE SIGNAL SERVICE.

I. GENERAL.

1. Regular meteorological and other observations will be maintained uninterruptedly, both at sea and at the *permanent* station, in accordance with instructions issued to Signal Service observers and those contained in the accompanying extract from the proceedings of the Hamburg conference, to which special notes are appended where needed.

2. The original record of these observations will be kept in the blank books supplied for this purpose, and a fair copy of the corrected and reduced results will be made upon Signal Service and special forms, as supplied in bound volumes.

3. At sea a daily record will be kept, by dead reckoning and astronomical observations, of the latitude and longitude of the vessel, by which the positions at the times of meteorological observations will be deduced, and on arriving at the *permanent* station the local time and longitude will be immediately determined, whence the Washington and Göttingen times will be found by applying the correction for longitude.

4. All meteorological and tidal observations will be made at exact hours of Washington civil time. (The longitude of Washington Observatory is $5^h\ 8^m\ 12^s.09$ west of Greenwich.) The regular magnetic observations will be made at even hours and minutes of Göttingen mean time. (Göttingen is $0^h\ 39^m\ 46^s.24$ east of Greenwich, or $5^h\ 47^m\ 58^s.33$ east of Washington; whence 12 noon Washington time is simultaneous with $5^h\ 47^m\ 58^s.33$ p. m. Göttingen time, or $6^h\ 12^m\ 1^s.67$ a. m. Washington time is simultaneous with 12 noon at Göttingen.)

If hourly meteorological observations of all these phenomena cannot be taken, then, if possible, take bi-hourly observations at the hours 1, 3, 5, 7, 9, 11 a. m. and p. m., or *at least* six observations at 3, 7, and 11 a. m. and p. m. On no account will the meteorological observation at 7 a. m., Washington time, be omitted.

5. Upon arrival at the permanent station the local time and longitude will be determined at once, without waiting for the erection of permanent shelters which will be built for the meteorological, magnetic, and astronomical instruments, according to the plans and material as specified.

The meteorological and astronomical observatories will be located conveniently near to the dwelling of the observers, but that of the magnetic observatory will be determined by the consideration that these instruments must be removed from all danger of being affected by the presence of steel or iron, including galvanized and tinned iron. If needed to keep off intruders, a guard or fence should surround the magnetic observatory.

6. The observation of tides will be made as complete as possible in summer by a gauge on the shore, and in winter through an opening in the ice, according to the instructions furnished by the Superintendent of the United States Coast and Geodetic Survey. The necessity for observing the tides will suggest that the dwelling-house should be located as near the sea as is safe and convenient.

7. In addition to the ship's log and the official journal of the party, to be kept by the commanding officer, and the official record of observations, to be kept by the meteorological, magnetic, tidal, and astronomical observers, each member of the party will be furnished with a diary, in which he will record all such incidents as specially interest him. This diary will not be open to inspection until delivered to the Chief Signal Officer for his sole use in compiling the full record of the expedition.

8. Accurate representations, either by the photographic process or sketching, will be made of all phenomena of an unusual character, or of whatever is characteristic of the country.

9. Carefully prepared topographical maps will be made of as much of the surrounding country as is practicable.

II. Detailed instructions concerning observations, instruments, and time, by the International Polar Conference, Hamburg, 1879, October 1 to 5.

[Translated at the office of the Chief Signal Officer, with added notes in brackets.]

1. Obligatory observations in the domain of meteorology

No. 17. *Temperature of the air.*—The mercurial thermometers should be graduated to two-tenths degrees Centigrade, and the alcohol thermometers to whole degrees, and both verified at a central meteorological station to within one-tenth degree Centigrade.

[The thermometers furnished are graduated to Fahrenheit; they have been compared with the Signal Service standard, and are provided with correction cards.]

No. 18. The instruments should be placed at an altitude of between 1.5 and 2.0 meters (5 to 6 feet), and it is recommended that they be exposed in a double shelter of lattice work, according to

Wild's method. The outer shelter to be of wood, the inner of metal. The observations of minimum thermometers can be made under various conditions.

[The shelters furnished consist of an outer wooden louvre work and an inner galvanized iron shelter, both framed so as to be easily set up. The minimum temperatures at various altitudes above ground will be observed, and under such various conditions as circumstances suggest.]

No. 19. The alcohol thermometers ought to be compared at the station of observation with the standard mercurial thermometer at the lowest possible temperatures.*

No. 20. Sea temperatures should be observed, whenever possible, at the surface and at each 10 meters (about 33 feet) of depth; as instruments, proper for this observation, the following may be specified: deep-sea thermometers, as manufactured or invented by Ekmann; Negretti & Zambra: Miller-Casella: Jansen.

[While at sea the temperature of the surface water will be observed hourly, with the Signal Service water thermometer, by the ordinary methods, and the temperature at each 33 feet of depth, whenever practicable; for greater depths, one of the above deep-sea instruments will be used.]

No. 21. The point 0° Centigrade (32° Fahrenheit), for all the thermometers should be determined from time to time.

[The testing of thermometers will be made quarterly, according to the usual Signal Service rules.]

No. 22. *Pressure of the air.*—At each station there must be at least two well-compared mercurial barometers, a reserve barometer, and an aneroid.

No. 23. The standard barometer ought to be compared or read once each day.

[Several mercurial and aneroid barometers are furnished, and all regular observations will be made from a mercurial barometer, selected from among them, which will be compared, once each day, with the standard barometer. All barometers will be fully compared with the standard once each month; such comparative readings will be entered on the regular Signal Service forms for this purpose.]

No. 24. *Humidity.*—The psychrometers (*i. e.*, dry and wet bulb) and hair hygrometer will be used with Regnault's dew-point apparatus as a check, according to Wild's instructions.

[Comparative readings, with these instruments, will be frequently made and carefully preserved for future study.]

No. 25. *The wind.*—The wind-vane and Robinson's anemometer are to be read from within the house (see the method of construction of the apparatus of the Swedish station at Spitzbergen), at the same time; the force of the wind will be estimated according to the Beaufort scale and the wind-direction to sixteen compass points, referred to the true meridian.

[The points of the compass on the wind-dial will be adjusted to the true meridian as is ordered for all Signal Service stations; self-registering instruments of the Signal Service pattern for the velocity and direction of the wind to eight points will be used. A record of wind-force on the Beaufort scale (0 to 12), and wind-direction to sixteen points will also be kept and will be entered in the special column.]

No. 26. To aid in deciding the question whether the Robinson's anemometer, with large or with small cups, should be used for determining the force of storms in the Polar zone, it is recommended that both such be subjected to preliminary experiments.

[Anemometers of the Signal Service pattern, having small cups and short arms, are the only ones that it is convenient to furnish. For comparative purposes keep two of these in permanent daily use, exposing them in different but good localities. The extra anemometers should be compared with these during twenty-four hours on the first Monday of each month, and a full record be kept of such comparisons.]

No. 27. *The clouds.*—The amount of cloudiness and the direction of the movement of all clouds should be observed to sixteen compass points.

[In addition, the kinds of clouds will be noted, and the record kept in the usual Signal Service form.]

* For notes on special thermometers, prepared for the Signal Service stations, see Section III of these instructions

No. 28. *Precipitation.*—The commencement and duration of rain, snow, hail, &c., and, when possible, the amount of precipitation, is to be observed. As to the amount, however, this is not obligatory in winter.

[There will be recorded regularly, and, if practicable, hourly, the amount of precipitation, measured if possible, otherwise estimated.]

No. 29. *The weather.*—Storms, thunder-storms, hail, fog, frost, dew, &c., and the optical phenomena of the atmosphere ought to be recorded.

2. OBLIGATORY OBSERVATIONS IN THE DOMAIN OF TERRESTRIAL MAGNETISM.*

No. 30. *Absolute determinations.*—For declination and inclination it is necessary to attain an accuracy of 1.0 minute, for horizontal intensity of 0.001. The proper instruments are, for example, the portable theodolite of Lamont and the ordinary dip-needles.

No. 31. The absolute observations must be executed in close connection and synchronous with the readings of the variations instruments, in order to be able to reduce the data given by the latter to an absolute normal value, and to determine the zero point of the scales. The determinations must be made so frequently that the changes in the absolute value of the zero point of the scales of the variations apparatus can be accurately checked thereby.

No. 32. *Observations of variations.*—These ought to include the three elements and be made by means of instruments, with small needles, in contrast to the apparatus of Gauss. In order to obtain an uninterrupted reciprocal control, two complete sets of variations instruments are desirable, and recommended, in order to avoid any interruption of the observations, by reason of breakage, derangement, &c.

[One set of these instruments is now provided, but a second set may be sent in 1882.]

No. 33. The horizontal intensity in one, at least, of these systems should be observed with the unifilar apparatus. Because of the magnitude of the perturbations to be observed, the scales of the variations instruments must have at least a range of ten degrees, and the arrangements are to be so made that the greatest possible simultaneity of the readings may be achieved.

No. 34. During the entire period of occupancy of the station the variations instruments will be read hourly. It is desirable that two readings be made; for instance, just before and after the full hour, with an interval of a few minutes between.

No. 35. Weyprecht presented the following separate note on this point:

"Since it appears to me that in these regions of almost perpetual disturbances, hourly readings, made at moments not well defined, are insufficient to establish mean values accurately expressing the local perturbations for a given epoch (which data ought to serve as a means of comparison with other localities), and in consideration of the slight increase of labor which will be caused by taking readings at precise moments, I cannot agree with the views of the majority of the Conference."

"I state that at least the expedition conducted by myself will take readings hourly of all three variations instruments at $58^m\ 0^s$, $59^m\ 0^s$; $60^m\ 0^s$; $61^m\ 0^s$; $62^m\ 0^s$; Göttingen mean time."

"WEYPRECHT."

[Observations will be taken as specified by Weyprecht.]

No. 36. As term days, the first and fifteenth day of each month will be observed from midnight to midnight, Göttingen time. The readings will be taken at intervals of five minutes, always on the full minutes, and the three elements are to be read with all possible rapidity, one after the other, in the following order: 1. Horizontal intensity; 2. Declination; 3. Vertical intensity.

No. 37. For these term days, the plan of magnetic work should comprehend continuous readings, for instance, readings every twenty seconds—throughout one whole hour—even though only one magnetic element be observed. It is the opinion of the Conference that the observations should begin so that one of the hours of observation shall agree with the first hour of the 1st of January, and that during the entire period of magnetic work the hours devoted to this continuous observation should be changed on each successive semi-monthly term day.

*For special instructions in magnetic work, furnished by the Superintendent of the United States Coast and Geodetic Survey, see Section IV of these instructions.

No. 38. The accuracy of the magnetic observations should be such as to give the declination to the nearest minute and the horizontal and vertical intensity in units of the fourth decimal place.

No. 39. On the term days, observations of auroras are also to be made continuously. Moreover, auroras are also to be observed from hour to hour throughout the period of magnetic observations, and especially in reference to their form and momentary position in altitude and true azimuth. The intensity of the light is to be estimated on a scale of 1, 2, 3, 4.

No. 40. Isolated auroral phenomena must be made the subject of thorough observations in connection with which the various phases are to be noted simultaneously with readings of the magnetic variations instruments.

[Those of the party not engaged at the magnetic instruments will observe and record auroral phenomena.]

No. 41. Since the greatest possible simultaneity in the readings is a point of the highest importance, the determinations of the location and of the time are to be made with instruments having firm foundations (such as the universal instrument or astronomical theodolite, the vertical circle, zenith telescope, astronomical transit, &c.); this, however, does not exclude the use of reflecting instruments of a superior class. By all means, therefore, must efforts be made to determine the geographical position, and especially the longitude of the station, as soon as possible after it has been occupied.

[The first approximate longitude of the station, as determined by chronometers, will be checked as frequently as possible by lunar distances, occultations, &c., and the value adopted in the daily work of the station will be revised as often as necessary, preferably at the end of each quarter. The details of the magnetic observations will be regulated according to the instructions published by the Superintendent of the United States Coast and Geodetic Survey.]

3. ELECTIVE OBSERVATIONS.

No. 42. The Conference recommends the following observations and investigations most earnestly to the consideration of all those to whom is intrusted the preparation of instructions for an expedition or who themselves are assigned to such work.

No. 43. *Meteorological.*—The diminution of temperature with altitude, the temperature of the earth, of the snow, and of the ice at the different depths should be determined.

[The forms of the snow-crystals should be recorded by careful drawings; the amount of hoarfrost accumulated on some well-exposed object should be measured by the use of the scales furnished by the medical department. Apparatus is ordered to be provided for the preservation of air and of air-dust for future analysis.]

No. 44. Observations of insolation (or solar radiation) are to be made, as well as observations on spontaneous evaporation, which latter can be made during the winter by weighing cubes of ice, and during the summer by the evaporimeters.

[A shallow circular vessel of water, whether fluid or frozen, exposed to the open air and sunshine, should have its loss of weight determined, daily or oftener, by delicate scales.]

No. 45. *Magnetical.*—From time to time absolute simultaneous readings of all three elements of terrestrial magnetism must be made in order to accurately determine the ratio between the simultaneous changes of the horizontal and those of vertical intensity.

No. 46. *Galvanic earth currents.*—Observations are desired of earth currents in intimate connection with magnetic observations and the auroral phenomena.

[Telegraph lines of well-insulated wire, extending a short distance north and south and also east and west, and furnished with resistance coils and deflection needles, are supplied, and every effort should be made to carry out these observations.]

No. 47. *Hydrographic investigations.*—Observations of the direction and strength of the ocean currents and the movements of the ice.

No. 48. *Deep sea soundings* and observations upon the physical properties of the sea water, for instance, determination of the temperature, specific density, gaseous contents, &c., and these objects should be especially kept in view in the selection of a vessel for the expedition. Observations on tides, when possible, should be made with the self-registering apparatus.

[With regard to tidal observations, the instructions published by the United States Coast and Geodetic Survey are to be followed. Glass-stoppered bottles are provided for preserving specimens of sea water to be brought back for examination.]

No. 49. *Parallax of the aurora.*—Determination should be made of the altitude of the aurora by means of measurements made for example with the meteorograph, which must be made by small detached parties of observation, having also, if possible, one party observing simultaneously the variations of magnetic declination.

[Particular attention will be paid to determining the apparent position in altitude and azimuth of bright meteors and shooting stars and of definite portions of the aurora borealis, and to drawings of the appearances presented by the phenomena, as seen by observers situated as far apart (say one-half to five miles) as possible; in these drawings the auroral phenomena should appear in their proper positions relatively to the horizon, meridian, fixed stars, &c., and to that end each member of the party, without exception, will learn the names and configurations of the stars shown upon the map of stars furnished you. A supply of these maps is furnished, sufficient to allow of using them as base charts upon which to enter the observed phenomena in special cases. Attention is called to the points of inquiry suggested in the Annual Report of the Chief Signal Officer, 1876, pp. 301–335.]

No. 50. Observations of, 1, atmospheric electricity; 2, astronomical and terrestrial refractions; 3, length of the simple second's pendulum; 4, observations on the formation and growth of floating ice and glaciers.

[Attention is called to the observations on the formation of ice made by Nares and other explorers. The pendulum observations will be made in accordance with special Coast Survey instructions.]

No. 51. Observations and collections in the realms of zoology, botany, geology, &c.

[The instructions given by Prof. Spencer F. Baird to the naturalist will be followed by him.]

No. 52. There will also be made special observations relating to the whole polar problem, such as the flight of birds, presence of drift-wood, and from what direction it came, and other matters as may suggest themselves from time to time and be found practicable.

III. Special instructions relative to care and use of special thermometers.

[See paragraph 19, page 10.]

The construction of the minimum standard thermometers designed for the Arctic stations having been intrusted to the Thermometric Bureau of the Winchester Observatory of Yale College, the astronomer in charge of that institution furnishes the following special instructions, which will be carefully followed:

"New Haven, *May* 30, 1881.

"GENERAL REMARKS AND DIRECTIONS CONCERNING THE SIGNAL SERVICE MINIMUM STANDARDS, NOS. 1 TO 12 INCLUSIVE, CONSTRUCTED BY THE WINCHESTER OBSERVATORY OF YALE COLLEGE.—J. AND H. J. GREEN, MECHANICIANS.

"*Materials.*—The alcohol, carbon di-sulphide, and ethyl oxide used are as pure as the chemical processes will admit. For thermometric purposes they may be assumed chemically pure. There is no more air above the liquid columns than is accidentally admitted in the process of sealing the tubes. In this respect these standards are different from the ordinary spirit thermometers. It is probable that the great purity of the alcohol will render it nearly as valuable for temperatures below—80° Fahrenheit—as the carbon and ether thermometers.

"*Directions for carriage.*—It is highly desirable that these thermometers should be kept, as nearly as possible, in the same condition as on leaving the observatory. For this purpose they have been carefully packed in a vertical position, and care must be taken to see that they are so repacked, with the *bulb* down. Owing to the low boiling points of the ether and carbon di-sulphide they are not (probably) accurate at temperatures above + 60° Fahrenheit, but they will remain clear and limpid at temperatures below zero, at which the alcohol thermometers may (but hardly probably) show viscidity. It is desirable, therefore, that preference be given to these standards over any other standards for extremely low temperatures, and in establishing the meteorological observatory at which the greatest cold is expected, special attention should be given to the ether and carbon di-sulphide thermometers.

"*Suggestions in their use.*—Before mounting these thermometers in their stations, they should be carefully swung or jarred so that no spirit can be detected (with a magnifying glass) adhering to their upper ends. They should be inclined (with the bulb end nearest the ground) as far as it is safe, and have the index stand in its place, by its own friction against the side of the tube, so that the drainage may be as perfect as possible.*

"*All readings should be recorded in millimeters*, and it should be remembered that the accompanying tabular corrections (see the correction cards) are meant to give only approximate temperatures. A careful comparison of all the thermometers from 1 to 12 has been made between 0 and 90° and Nos. 1, 5, and 9 have been kept by the observatory for experiments at temperatures below 0° F.

"These are probably the best thermometers ever sent into the Arctic regions, and special care should be taken to insure the safe return of the records, and, though less important, the instruments."

IV. Special instructions prepared by the United States Coast and Geodetic Survey for observations in terrestrial magnetism at Point Barrow and Lady Franklin Bay.

[These instructions will be applied, when suitable, to the observations ordered in preceding pages, but they will also furnish a guide to the minimum number of observations to be taken in case of accidents occurring to prevent full compliance with the plan proposed by the International Polar Commission.]

As soon as the quarters of the expedition have been fixed upon, a magnetic house will be erected, in which the regular magnetic observations, as described below, will be made; other observations will be made when on boat or sledge trips.

Instruments.—For use at the magnetic observatory, there will be provided a magnetometer, for absolute and differential declination and for horizontal magnetic intensity, to be permanently mounted on a stone pier. In connection with this instrument a meridian or azimuth mark will be established a short distance off the observatory, and visible from it through an opening in the wall. The astronomical bearing of this mark will be carefully determined by means of an alt-azimuth instrument and solar or stellar observations.

In the same house, but on a separate pier, will be mounted a Kew dip circle, and in the case of Point Barrow, a third instrument, a bifilar magnetometer, will also be permanently mounted on its pier. At Point Barrow the magnetometer (or unifilar) and the bifilar instruments will be mounted in the magnetic meridian and at a distance of not less than twelve feet, and the dip circle will be mounted equidistant from these instruments, forming an equilateral triangle. At Lady Franklin Bay the two instruments will be mounted in the plane of the magnetic prime vertical, and not less than twelve feet apart. No iron is to be used in the construction of these buildings, and they should be not nearer than fifty yards to any other building, or double that distance to any large mass of iron. Special reading-lamps (of copper) must be provided for use with the instruments, and they must be tested to make sure that they do not affect the position of the magnets. The use of candles stuck into wooden blocks is preferable to using lamps.

When on boat or sledge journeys the party will carry a chronometer, a small alt-azimuth instrument with circles of about three inches diameter (as constructed by Fauth & Co., of Washington, or by Casella, of London), provided with a magnetic needle or compass mounted over its vertical axis, and a dip circle.

Observations at the permanent station.—Hourly observations will be made, for declination and diurnal variation, with the magnetometer on three consecutive days about the middle of each

* This method conforms to that followed at all signal stations with minimum thermometers, except as to degree of inclination, wherein these suggestions should be most carefully followed.

month; besides these observations, extending over seventy-two hours, there will be made at any convenient intermediate time *each* day (of the three) one set of deflections, followed immediately by a set of oscillations for the determination of the horizontal intensity. At Point Barrow the bifilar will be read immediately after the unifilar. There will also be made at any intermediate time *each* day (of the three) a set of dip observations. In connection with the declination, the mark will be read once each day (unless the instrument should accidently be disturbed), but it suffices to determine the magnetic axis of the declination magnet on one of the three days. The instrumental constants of the magnetometer will be determined before leaving Washington, and the observers will use the Coast and Geodetic Survey magnetic blank forms for their records, or, in case no special forms are provided, they will use small (octavo) note books; they will also compute, as soon as the observations are completed, each month, the magnetic mean declination, diurnal range, and turning hours, also the horizontal force in absolute measure (English units) and the dip, tabulating the results for each day.

Extra observations on other than the three days about the middle of each month will be made during all occurrences of auroral displays, but as they are likely to be very numerous at Point Barrow, observers there may confine their extra observations to the more conspicuous displays only. On these occasions the declinometer (and the bifilar at Point Barrow) will be read, say, every ten minutes, or at shorter or longer intervals, as the state of the needle may appear to demand, the object being to establish a connection between the appearances of the aurora and the motion of the magnetic needle.

When landing on a boat journey, or during a sledge journey at suitable stations (not less than ten or fifteen miles apart), the time, latitude, and azimuth will be determined by the alt-azimuth instrument, and the declination by the same instrument (the hour and minute of the observation is to be noted, in order that the diurnal variation may be allowed for); the dip will also be observed, and in case time is pressing, reversal of circle, reversal of face of needle, and reversal of polarity may be dispensed with, but the needed correction to the result, from the single position of the instrument, must be ascertained at the permanent station. Observations of deflections (with magnetic needle and with weights) will be made with the dip circle, as arranged for relative and absolute total force, the data for the latter to be supplied at the permanent station.

It is highly desirable, especially in the case of the Lady Franklin Bay party, that all stations within reach and formally occupied by other parties for magnetic purposes be revisited, in order to furnish material from which to deduce the secular change during the interval; besides, all opportunities should be taken when landing on the way up to secure observations for declination, dip, and intensity—the latter best by oscillations of the intensity magnet. The winter quarters of the late English expedition should be connected magnetically with the present quarters.

[All magnetic observations will be made on Göttingen time, as provided for by the Hamburg Conference.]

All magnetic records will be kept strictly in conformity with "Notes on Measurements of Terrestrial Magnetism," United States Coast Survey, Washington, 1877, and other records in connection therewith should be equally clear and complete, and all computations should be made by the observer in separate books. Duplicates of all records will be made, compared with the original, and the latter returned, annually, if practicable, to the Chief Signal Officer for the Superintendent of the Coast and Geodetic Survey, Washington, D. C. The observers should also provide themselves with copies of the "Admiralty Manual of Scientific Enquiry," the "Arctic Manual and Instructions," 1875, and "Auroræ, their characters and spectra," by J. R. Capron, 1880, also with "Terrestrial and Cosmical Magnetism," by E. Walker, 1866, and any other work they may require for their information.

V. Additional special instructions.

The rules prescribed in "Instructions for the Expedition toward the North Pole," as published (in pamphlet) by authority of the Hon. George M. Robeson, Secretary of the Navy, and those contained in "Suggestions Relative to Objects of Scientific Investigation in Russian America," both of which are furnished, will be followed as closely as circumstances permit.

VI. Memorandum of outfit.

LIST OF APPARATUS TO BE FURNISHED TO POINT BARROW, AND WITH SOME EXCEPTIONS AND ADDITIONS TO LADY FRANKLIN BAY.

GEOGRAPHICAL AND ASTRONOMICAL APPARATUS.

One surveyor's compass and tripod; one 100-feet chain or steel tape; one prismatic compass; one set of pins; one altitude and azimuth, 6-inch circles; one meridian transit, about 2 or 3 inches aperture; two extra level tubes for low temperatures for meridian transit; three sextants; three artificial horizons; eight marine chronometers (mean time);* one marine chronometer (sidereal);* two pocket chronometers (mean time);* one house (astronomical observatory), plan to be supplied; charts of the Alaska coast from the United States Coast and Geodetic Survey.

Magnetic apparatus.—One complete magnetometer—Fauth & Co.—unifilar declinometer—catalogue No. 70, price $400, extra light needles and mirror for auroral disturbances; one Kew dip circle, large size; one bifilar magnetometer; one magnetic observatory building. (See plan.)

Tidal apparatus.—One level and staff; two pulleys and weight and float; fifty glass-stoppered bottles for specimens of sea-water.

Pendulum apparatus.—Pendulum apparatus will be carried and used by a special temporary party from the United States Coast and Geodetic Survey.

[*Deep sea sounding.*—Will be left to the United States Coast Survey.]

Meteorological apparatus.—One instrument shelter of open wooden louvre work, made in sections (see plan); one inner thermometer shelter of open galvanized iron louvre work, made in sections (see plan); twelve mercurial thermometers, ordinary stem divided; two metallic thermometers; twelve spirit thermometers, ordinary stem divided; six mercurial thermometers, maximum stem divided; six spirit thermometers, minimum stem divided; six special minimum thermometers, from Yale College; four psychrometers, mercurial, wet-bulb; one dew point apparatus; Regnault's as modified by Alluard, with extra thermometers for low and high temperature; six water thermometers and three cases, Signal Service pattern, for surface temperatures; two pairs Marie-Davy's conjugate thermometers for solar radiation; two pairs Violle's conjugate bulbs for solar radiation (will be sent next year); two Hicks's thermometers for terrestrial radiation (will be sent next year); two mercurial marine barometers; four mercurial cistern barometers (Green, Signal Service pattern), large bore, reading to thousandths; three aneroid barometers (Casella's make); two hair hygrometers; two self-registers, one double and one single, for anemometers and anemoscopes (Signal Service pattern—Gibbon or Eccard); six extra attached thermometers for barometers; six extra barometer tubes for barometers; four rain-gauges, two copper and two galvanized iron; six divided sticks for measuring rain and snow; ten pounds pure mercury; four anemometers (Robinson's); four arms and cups and four spindles, for Robinson's anemometer, for repairs; two vanes, small; one large vane, complete; one Eccard contact (interior); ten battery cells (Eagle) and supplies for same for three years; two thousand yards insulated wire; four telephones and two call bells; one galvanometer for obstruction of ground currents; one hundred feet cable for the double self-register; four box sounders; one delicate scale and one medicine chest (from medical department); apparatus for collecting air and atmospheric dust; six dark lanterns for observers' use (brass or copper).

Signal apparatus.—Two Grugan's heliographs; four sets signal kits complete; six signal code cards.

Blank books and forms.—Twelve diaries for 1881, 1882, and 1883, respectively, one to be kept by each man; two hundred and fifty books for original record of meteorological observations; fifty blank books for magnetic observations, allowing two pages daily and extra pages on special days; fifty blank books for daily journal, for miscellaneous observations; twenty-five blank books for tidal observations, allowing one page daily; twenty-five blank books for astronomical obser-

* If practicable these will be rated at various temperatures at the Horological Bureau of the Observatory of Yale College.

vations; fifty volumes, Form 4, for copy of original record; three hundred star charts, for auroras, &c.; one hundred forms for comparison of barometers; eight hundred forms for anemometer register.

Books.—Instructions to Observers, Signal Service, U. S. Army; Annual Reports of the Chief Signal Officer, from 1873 to 1880, inclusive; Loomis's Treatise on Meteorology; Buchan's Handy Book of Meteorology; Kämtz's Meteorology (Walker's translation); Mohn's Meteorology (original German); Schmid's Meteorology (original German); Smithsonian Instructions for register of periodical phenomena; Smithsonian Miscellaneous Collections, Vol. I; Guyot's Meteorological and Physical Tables; Crelle's Multiplication Tables; Blanford's Indian Meteorologist's Vade Mecum, Parts I, II, III; Loomis's Practical Astronomy; Church's Trigonometry; Chauvenet's Practical Astronomy; Bowditch's Navigator; Bowditch's Useful Tables; Lee's Collection of Tables and Formula; American Nautical Almanac for 1881, 1882, and 1883; Admiralty Manual of Scientific Inquiry, 4th ed.; Admiralty Manual and Instructions for Arctic Expedition, 1875; Nares's, &c., Reports of English Arctic Expedition; Nares's Narrative of Voyage to Polar Sea, London, 1878; Dall's Meteorology of Alaska from Pacific Coast Pilot, United States Coast Survey; Dall's Resources of Alaska; Harkness on Sextants, United States Naval Observatory, observations for 1869, Appendix 1, pages 51 to 57; Charts, United States Hydrographic Office, No. 68, and British Admiralty, Nos. 593, 2164, 2435; Chambers's Descriptive Astronomy; Bremiker's edition of Vega's Logarithmic Tables; Barlow's Tables; W. S. Harris's Rudimentary Magnetism; Coast Survey Papers on Time, Latitude, Longitude, Magnetics, and Tidal Observations; Everett's Translation of Deschanel; Jenkin—Electricity and Magnetism, 4th ed., New York, 1879; Reports of the United States Fish Commission on Dredging; Sigsbee on Deep-Sea Sounding, &c. (United States Coast Survey Report); Markham's Collection of Papers Relating to Arctic Geography, London, 1877; Schott's Reduction of Observations of Hayes and Sonntag; Schott's Reduction of Observations of Dr. Kane; Schott's Reduction of Observations of McClintock; Manual of Military Telegraphy; Myer's Manual of Signals; J. R. Capron, Auroræ: their characters and spectra; E. Walker, Terrestrial and Cosmical Magnetism; Pope's Modern Practice of the Electric Telegraph; Instructions for the Expedition toward the North Pole, from Hon. George M. Robeson, Secretary of the Navy; Suggestions Relative to Objects of Scientific Investigation in Russian America; stationery as ordinarily supplied; drawing paper and instruments.

All officers and observers of the expedition are charged to at once familiarize themselves in detail with these instructions, and in the practice of the duties they prescribe, together with a thorough knowledge of the instruments and their use; and commanding officers are specially charged to see that these requirements are observed.

Official memorandum to accompany instructions No. 76.

W. B. HAZEN,
Brigadier and Brevet Major-General,
Chief Signal Officer, U. S. Army.

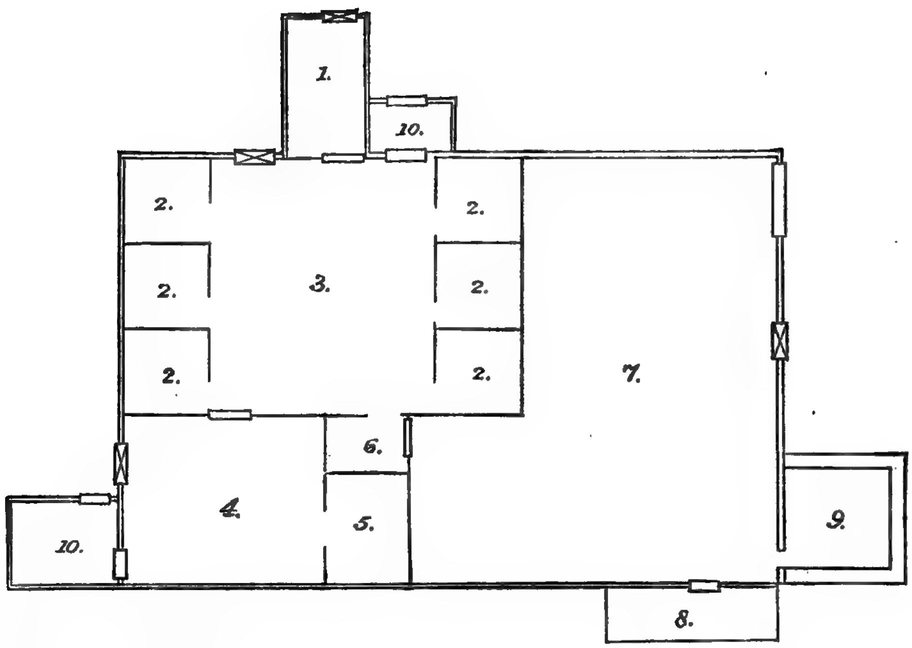
Official:

LOUIS V. CAZIARC,
First Lieutenant, Second Artillery, Acting Signal Officer.

PART II.

NARRATIVE.

By LIEUT. P. H. RAY.



Scale: .7 inch = 10 feet.

GROUND PLAN, U. S. SIGNAL STATION, UGLAAMIE, ALASKA.

1. Commanding officer.
2. Sleeping-rooms.
3. Office and dining-room.
4. Kitchen.
5. Sleeping-room.
6. Wash-room.
7. Storehouse.
8. Instrument-shelter.
9. Bastion.
10. Storm-doors.

Official.

P. H. RAY,
First Lieutenant Eighth Infantry, A. S. O.

NARRATIVE.

On the 18th day of July, 1881, at ten o'clock in the forenoon, we sailed from San Francisco, Cal., on board the schooner Golden Fleece, a staunch little schooner of one hundred and fifty tons burden, and, being towed outside the heads, we began our voyage in the teeth of a strong northwest gale; and it was three days before the reefs were shaken out of our sails.

The expedition, on the day of sailing, was organized as follows: First Lieut. P. H. Ray, Eighth Infantry, commanding; Act. Asst. Surg. George S. Oldmixon, U. S. Army, surgeon; E. P. Herendeen, interpreter; Sergt. James Cassidy, Signal Corps, U. S. Army, observer; Sergt. John Murdoch, Signal Corps, U. S. Army, observer; Sergt. Middleton Smith, U. S. Army., observer; Mr. A. C. Dark, astronomer; Vincent Randit, carpenter; Albert Wright, cook; Frank Peterson, laborer. With one exception, all were strangers to me, and I subsequently had occasion to regret that more time was not given and care exercised in selecting the *personnel*, especially those intended for the scientific work. For even with experienced observers it is very difficult to do accurate work in this high latitude.

The voyage was uneventful. Owing to adverse winds and calms, it was not until August 9 that we raised the high lands of the Aleutian peninsula to the eastward of Ounimak Pass. A succession of calm days left us at the mercy of the currents, which here are strong to the eastward, and carried us in sight of Kadiak, before a breeze sprung up that would enable us to bear up for the pass. We entered it on the afternoon of the 15th, when the wind fell, but the tide serving, we drifted through during the night. After entering Behring Sea we had stronger winds, and after clearing the pass we were enabled to stand on our course, which carried us about sixty miles to the eastward of the Pribyloff Islands.

On the morning of the 19th we sighted the island of Saint Mathews, passing three miles to the eastward of it, its highest peaks only showing above the fog. We were favored with fair, strong winds from this time on until we arrived at Plover Bay, Siberia, where we anchored at 6 p. m. August 21. The weather being stormy, we were unable to get a sight of the sun until the 24th, when a series of excellent observations were obtained. This delay proved fortunate for us, for on the 22d the U. S. revenue steamer Corwin came into the harbor for coal. Her master, Captain Hooper, reported the ice very light in the lower latitudes of the Arctic Ocean; so much so that he had been enabled to reach Wrangel Land, a point never heretofore attained. To him we became indebted for a fine supply of reindeer clothing and tents, which he had collected in view of a possibility of his wintering in the Arctic. The supply came very opportunely, as we had been unable to obtain any deer-skins at San Francisco and were depending upon sheep-skins for our winter clothing.

We found that our chronometers were running steadily and well, and, after laying in a supply of fresh water, were towed outside the harbor by the Corwin on the morning of the 25th. The wind dying away suddenly, left us at the mercy of the current, which was setting strong to the northward, and during the night we drifted through the straits, getting only a glimpse of the Diomede Islands and East Cape as we passed, as we were enveloped in a dense fog the most of the time. While at Plover Bay we obtained from the natives a quantity of most excellent trout, which proved an agreeable addition to our sea fare.

After passing the straits we encountered strong northeasterly winds, which retarded our progress very much. We sighted Cape Lisburne on the afternoon of August 31, and soon after it came on to blow so heavily that the vessel was hove to, and in that position rode out the gale. For over forty-eight hours we were unable to have fires on board for any purpose whatever. The force of the gale having abated on the 3d of September, we stood to the southeast, the weather remaining so thick that we were unable to obtain a sight of the sun to determine our position. On the 7th we sighted Icy Cape, and then stood along shore to the northeast, keeping the land aboard until we sighted the point on the afternoon of September 8, and came to anchor about one mile to the northeast of Cape Smythe, thus successfully accomplishing the first and most important stage of our work.

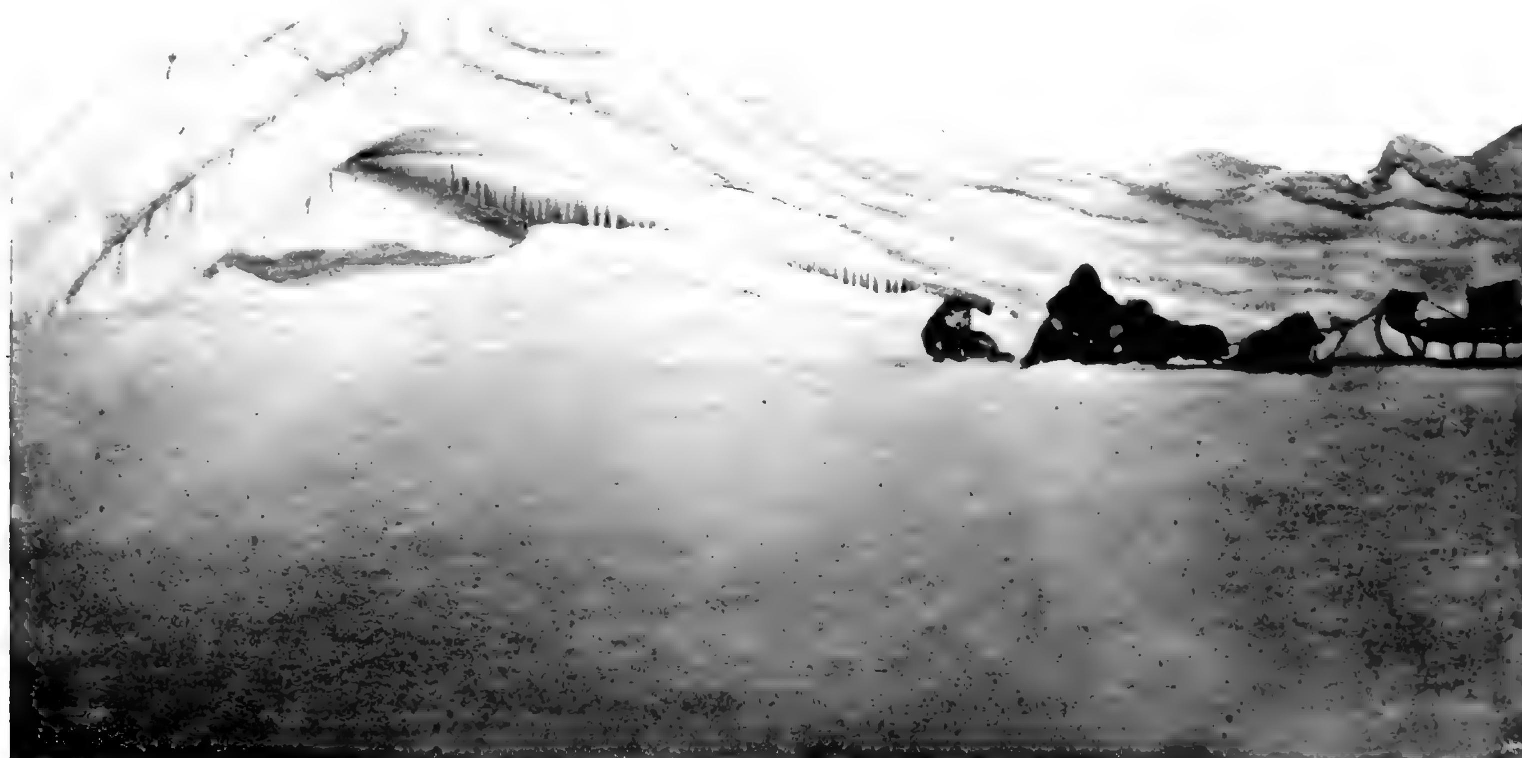
The voyage, though long and tedious, had been remarkably free from any accidents, and the meager comforts of our little schooner grew wonderfully luxurious when compared with the low desolate shore, which we could occasionally catch a glimpse of through the drifting snow.

Point Barrow, situated in latitude 71° 23′ north, longitude 156° 40′ west, the destination of the expedition, was first discovered by Mr. Elson, master in H. M. S. Blossom, commanded by Captain Beechey, in August, 1826; and is graphically described by him in his report of his memorable voyage, made to the Pacific and Arctic Sea, during the years 1825, 1826, 1827, and 1828.

In the lapse of sixty years but few changes have taken place on this coast. The people of the generation that Captain Beechey met have all passed away, and the story of the coming of the first white man is one of the legends of the band of Nuwŭkmeun. The next visit made by white men was that of Captains Dease and Simpson, of the Hudson's Bay service, who, in July, 1837, started from Fort Good Hope, and by boat passed down the Mackenzie to the sea, and along the northern shore as far as Return Reef, the point where Franklin was turned back by meeting with impassable ice, in 1826. They here found the ice fast on the land, and further progress by boats being impossible, Captain Simpson accomplished the remaining distance on foot, and thus succeeded in determining the coast line of the northern shore from Behring Straits to the mouth of the Mackenzie. H. M. S. Plover, Captain Maguire, wintered at Point Barrow the winters of 1852, 1853, and 1854, since which time the coast has been frequently visited by vessels of the American whaling fleet.

Upon arriving at the point we at once set about finding a suitable location for the observatory. At the extremity of the point is the village of Nuwŭk, which occupies all the land that is free from inundation by the sea. To locate the observatory among their huts would entail endless trouble and annoyance. Between the village and the mainland, three miles away, is a low, barren sandbank, from forty to one hundred yards wide, across which, during a westerly gale, the sea breaks when open. To the south and west of this the land gradually rises, until at Cape Smythe it is fully thirty feet above the sea; but here again we found the most suitable ground occupied by the village of Ŭglaamie, a cluster of about twenty-three winter huts. We were unable to go any distance back from the beach, as we had no means of transporting our stores by land, and the marshy condition of the country would have prevented us from going any distance back from the beach even if we had the facilities. A point about twelve feet above the sea level, lying between the sea and a small lagoon three-fourths of a mile northeast from Ŭglaamie, was finally selected. The soil was firm and as dry as any unoccupied place in that vicinity, and, as it was marked by mounds of an ancient village, would be free from inundation. The lateness of the season gave us but little time for deliberation. The young ice was already forming, and the migration of the birds about over. It was on the morning of the 9th of September that the work of debarkation was commenced in a driving storm of snow and a northeast gale.

The lumber for the house and observatories was rafted alongside the vessel and warped ashore. This work was difficult and arduous, owing to the heavy surf on the beach, and the ice being some distance off shore, the strong northeast wind blowing at the time got up considerable sea, the spray froze wherever it struck, so the lumber was coated with ice as soon as it was taken out of the water. There was too much surf to use our boats, and it was not until the 13th, when the wind fell, that we were able to commence putting the stores ashore. A temporary wharf was constructed, so the boats could be discharged without putting them on the beach. The natives, who at first appeared bewildered at the idea of our coming to stay, showed every disposition to be friendly now, and rendered us valuable assistance with their large skin boats (umiaks), and also



ICE-ARCH, JUNE, 1883.

in carrying stores up from the beach. After one or two attempts at petty thieving had been firmly and quietly checked, they showed no disposition to commit any depredations upon our property. Though it was snowing heavily, the work of landing stores was pushed with the utmost vigor, as the wind was very light from the southwest and the sea was quiet, and we could land the umiaks on the beach without the fear of staving them, so that on the morning of the 15th the party was moved on shore into tents. We landed the last of the cargo during that afternoon, and the Golden Fleece was cleared the following morning, and sailed at 12 o'clock. She was the last link that bound us to civilization, and we knew that nearly a year must roll around before we could hope to hear from the civilized world again; but I did not see a single despondent face among the little party as they turned from watching the gallant little vessel out of sight to their work.

At the same time the stores were being landed the foundation of the house was laid. This was made safe and solid by excavating down to the frost, a distance of a little over one foot, and the sills and floor timbers firmly shored with blocks cut from pieces of drift-wood. Plates 1 and 2 give a ground plan and elevation of house. The bastion on the northwest corner was constructed from pieces of wreckage and drift-wood, and was pierced for musketry below and for the Gatling gun above. As soon as the house was inclosed and roofed the stores were all moved in, except a supply for about six months, which was placed in a tent as a reserve in event of the loss of the main building by fire. The party moved in on the 22d, to put up the ceiling and partitions. We were obliged to bring the lumber in and pile it around the stove, so as to melt off the ice before we could work it.

Winter came on rapidly; the lagoon, near the station, was closed entirely on the 26th; the weather continued stormy and thick until the sea closed toward the last of November. The work of carrying the stores and coal from the beach up to the site of the station (a distance of about one hundred yards) was very laborious, there being over one hundred tons of it besides the lumber, and we never for one moment caught sight of the sun from the time we landed until the 28th of September, and then only for a few moments. As soon as the house was made inhabitable we turned our attention to getting the instruments into position. We commenced taking hourly observations in meteorology on October 15, and in magnetism on December 1.

The transit and magnetic instruments were temporarily mounted on wooden piers, which were constructed in the following manner: Timbers sixteen inches square were cut to the proper length and placed on end in position in the observatories, the earth being removed so that the lower end rested on the perpetually frozen earth; they were cemented in their place by pouring water around them and allowing it to freeze. They remained firm and never altered their position in the slightest degree. The ice was found to be intact when the piers were taken down the following July, to be replaced by brick.

Every clear night the sky was illuminated by the most beautiful displays of aurora it has ever been my fortune to witness; they always commenced in the northeast and northwest, and seemed to spring from a dark low bank of clouds. The lights were never stationary for a single second, neither did they ever take the form of bows or arches so often seen in other latitudes, but great curtains of light flashing with all the prismatic colors seemed to be drawn across the heavens, ever rising and changing and often culminating in a corona at the zenith, falling like a shower of meteoric fire. As the winter advanced these displays were more brilliant, and were always of a character that defies description, either by pen or pencil, as they were never for two seconds alike. They were unaccompanied by any sound so far as we were able to observe, and the deadly stillness that always prevails in this region when the sea was closed gave us an excellent opportunity to detect any sound had there been any.

During the last days of September, when the ice on the fresh-water ponds and lakes was from ten inches to one foot thick a sufficient quantity was cut, hauled to the house and conveniently piled, for winter use.

In December, as soon as the drifted snow was sufficiently hard to cut into cakes, covered ways were constructed leading to the observatories, and the ice piled so that during severe weather no person was obliged to go into the open air to carry on the regular work of the station.

Life at the station now settled down into the dull monotony of the routine work; hourly observations in meteorology and the three elements of magnetism were carried on without interruption. To insure the health of the party each member was required to take exercise daily in the open air.

In January, 1882, work was commenced on a shaft for the purpose of getting the temperature of the earth, the results of which are given in Part V. The formation for the whole distance was sand and gravel, mingled with a deposit of drift-wood and marine shells, showing that each stratum represented the successive lines of ancient sea-shores. The earth was saturated with water. At a depth of thirty-five feet a deposit was found of clear water, unmixed with earth, too salt to be congealed at a temperature of + 12, which was the unvarying temperature of the earth at this depth. At a depth of twenty feet a tunnel was run to the east a distance of ten feet, and at the end of it a room ten by twelve was excavated out of the hard frozen ground. In this the temperature never rose above 22°. The walls were always dry and free from moisture, and the accumulation of hoar frost was very light. Here we stored whatever fresh meat, in the way of ducks, reindeer, walrus, or seal, that we were able to accumulate beyond our daily consumption. Our main supply was eider-ducks, which, during the spring flight in May, were easily killed. We took four hundred in 1882, and five hundred in 1883; we found them excellent food, and when stored in the subterranean store-house they were at once frozen solid, and would keep for any length of time.

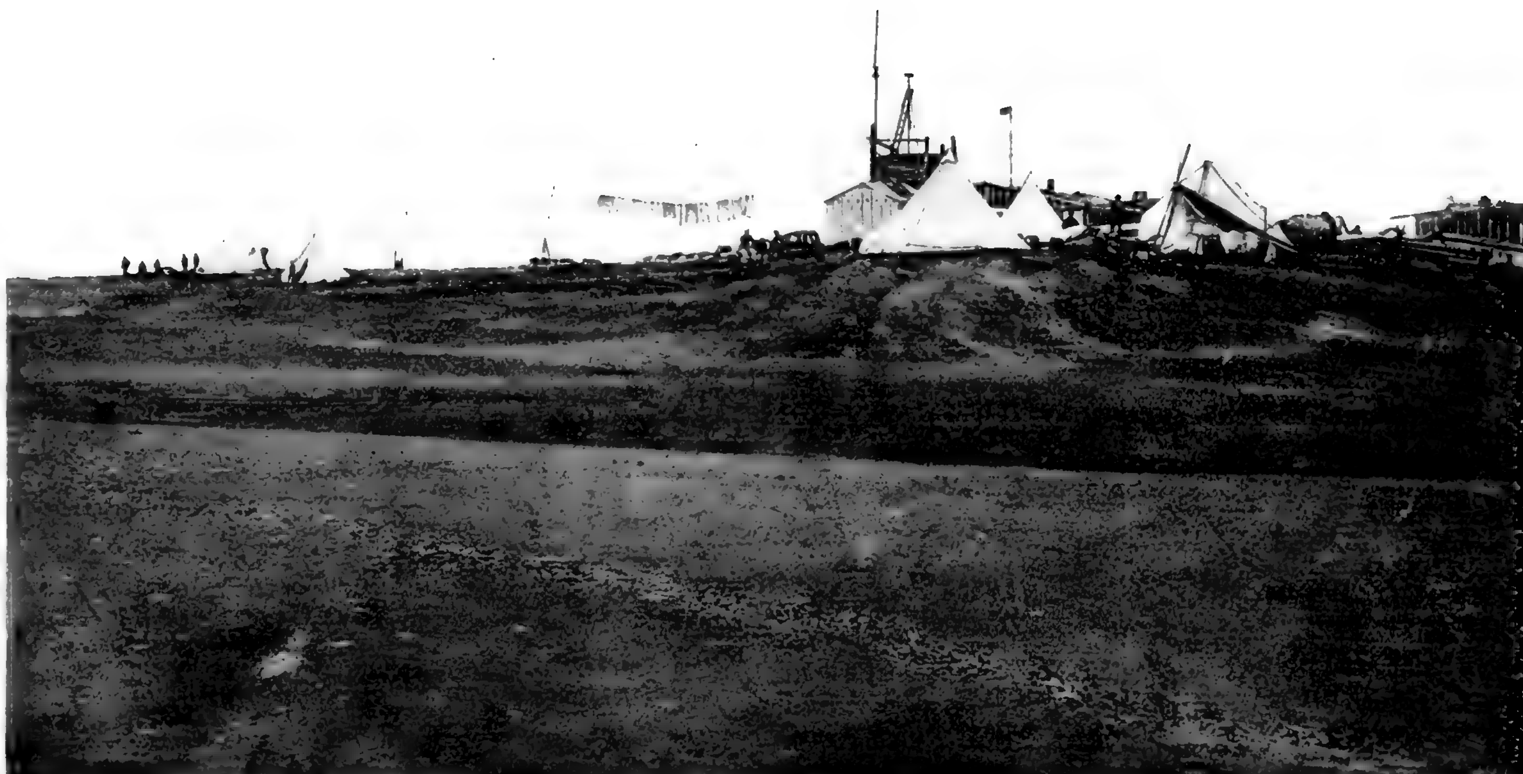
Fresh meat is the great safeguard against scurvy in this region; I never saw a trace of it among the natives, and meat is their only food. The immunity of my party from all disease or sickness of any kind I deemed was owing to the fact that through our own exertions, and with some assistance from the natives, we were seldom without it.

In March, 1882, I made a trip into the interior, an account of which I submitted in my report of last year. Some narrow leads opened in the ice to the north and west of the point on the 20th of April, and the natives reported seeing whales passing to the northeast on the 23d of the same month, and they were seen passing in the same direction every day from that time until June 15; that seemed to terminate their northern migration, as we saw no more of them until August 15, when they were seen going to the southwest along the edge of the pack. It is at this season that most of the whales are taken, as it is impossible for the vessels to follow them into the ice during their northern migration.

In the spring of 1882 eider-ducks were first seen on the 27th of April flying to the northeast, far out over the ice, and a few straggling flocks were seen from time to time until May 12, when they appeared in immense numbers flying low along the shore ice to the northeast. This migration continued until about June 1, and then almost entirely ceased.

About the time the first flights along shore were seen a number of male king eider were found on the land, apparently exhausted from long flight and want of food. Some were caught and brought in alive, but they were generally dead when found, and always in an extremely emanciated condition. All species were represented in this flight, the king, Pacific, spectacled, and stellers. The Canada goose was never seen; but a few brent, white-fronted, and snow or arctic geese came at this season and stopped with us through the hatching season, bringing forth their young on the mainland. The eider-duck, with but few exceptions, continued their flight to the north and east. During July and August large numbers of the males were constantly flying to the westward over Perigniak, a point about four miles to the southwest of Point Barrow. The fact that they came from the breeding-grounds was shown in the naked condition of the breast of some of those taken, the down having been plucked away to construct their nests. Those killed at this season were poor and unpalatable compared to those killed in the spring. But the natives take great numbers of them at this point at this season of the year; one often sees half a dozen families here in camp for that express purpose. Their methods of taking them will be found fully described in the chapter devoted to ethnology.

By the last of June the tundra was nearly free from snow, and narrow leads of water were open along shore. The few hardy flowers indigenous to this high latitude were in bloom, and conspicuous among them were the buttercup and dandelion. There was also a small yellow poppy, named by the natives "tûkälûkäd jaksûn," which is also the name given by them to a small



PHOTOTYPE. F. GUTEKUNST. PHILAD'A.

VIEW OF THE STATION FROM THE WEST, WITH THE CREW OF THE "NORTH STAR" IN CAMP.

butterfly that appears at this season. The butterfly appears as the poppy fades, and they believe that the poppy is transformed, takes wings, and flies away.

On the afternoon of the 25th of June a vessel hove in sight to the southwest. She appeared to be in the solid pack, as there was no water in sight, but we soon discovered she was working her way along a narrow lead, about six miles from shore, which was not visible to us. At about 8 o'clock that night she was bearing about west true from the station, when she came to a halt; I at once dispatched interpreter Herendeen off to her. He returned the next day at 11 a. m., and reported that it was the steam-whaler North Star, (Captain Owen), on her first voyage from New Bedford. He brought a few letters and a file of New York papers, giving us news from the outer world. It was the first information we had of the death of President Garfield and loss of the Rogers. On the 27th I went out to her; found her fast in the ice, with no sign of open water in sight from her mast-head. Captain Owen reported she had suffered a severe nip the night before, and she was raised up bodily about four feet while I was on board of her. I visited her again on the 4th of July and she was still uninjured. During the night of the 6th the wind hauled around to the eastward, causing the pressure to slacken up, and several large cracks opened in the ice, one of them in close proximity to the ice-bound ship. Early on the morning of the 7th we saw she was afloat and working through the broken ice toward shore; when about two and a half miles from the station she again became fast, and lay there all night. The following day (July 8) the pressure again slacked and a lead opened along shore past where she was laying; she got under way and steamed slowly along the lead to the southwest. After proceeding a couple of miles she again became fast; the ice closing in from the west, she was now caught between the ground-ice and the great pack which was setting bodily to the northeast. She remained immovable from about noon until 4 p. m., when our attention was suddenly attracted to her by a great outcry raised by her crew, and we could distinctly hear the cracking of her timbers as her sides were crushed in by the ice; her masts fell a few moments after, and her crew escaped to the ground-ice. I at once set off to their assistance with what men could be spared from the station; we found they had saved nothing but their clothing, a cask of bread, and three boats; the few remaining fragments of the wreck were fast disappearing in the distance, being carried away by the moving pack. The crew all safely reached the land that night, being ferried across the open leads by the boats from the station; tents were pitched to shelter them, and every care given to their comfort. Captain Owen subsequently went out with his crew and brought in the bread, and boats to be used in moving to the southward along the shore-lead, in the event that no other vessel should be able to reach the station. On July 14 other ships fortunately hove in sight, and the wrecked people were distributed through the fleet, between that time and August 2, the last going on board the bark Thomas Pope, bound for San Francisco. Different vessels of the fleet remained in sight of the station off and on until September 23, the steamer Bowhead being the last to visit the station. We sent by her our last mail to the United States.

On August 2 a small schooner was seen coming around the point to the north and east, which proved to be the relief vessel Leo, Lieutenant Powell in charge. She had been carried out of her course to the northeast by the current, in a thick fog; her master, being ignorant of the dangers attending navigation along this shore, having allowed her to drift into a position where, but for the providential springing up of a light breeze, she would certainly have been lost. By her we received three additional observers, Sergt. J. E. Maxfield and Privates Charles Ancor, and John Guzman, of the Signal Corps, U. S. Army; a year's additional supply of provisions and coal; also the new magnetic instruments. With the help of the natives, she was discharged on the 26th, and sailed the following day. I relieved and sent back by her Sergt. James Cassidy, Signal Corps, U. S. Army.

The new magnetic observatory was at once put up and the instruments mounted upon permanent brick piers, and observations with them commenced September 12.

Now that the ships were gone and all connection severed with the outside world, we had nothing to break the old routine of our duty at the station but the occasional visit of a native from some distant village. The faces of those living at Nuwŭk and Ŭglaamie had become as familiar to us as those of our own people; they had ceased to be intrusive, but visited us almost daily with some curio or game for barter; and as the season advanced and water became scarce we were daily besieged by the seal-hunters coming in from the sea and begging for a drink of water, of which there is a great scarcity after the frost has sealed up all sources of supply. The scarcity of fuel, together with their inadequate means for melting ice and snow, causes them to suffer under a constant water famine from October to July, and they seemed to think that our supply was never failing.

During the fall of 1882 we experienced none of the heavy westerly gales so common in 1881, and the main pack, though always in sight, did not come close in, and the sea along shore froze over comparatively smooth save for the small floes that were always drifting to and fro with the current. This remained unbroken until January, when a heavy westerly gale drove in the old ice to the three-fathom bar, which here lies parallel with the coast and about one and one-half miles from it. Inside this bar the ice formed to a thickness of five and one twenty-fourth feet, and a vessel might have wintered with perfect safety at the anchorage off the station in four fathoms of water. Both the winters we were there, about two and one-half miles to the southwest and three miles to the northeast, the old ice came in on the land with great force. In November and December the snow galleries were again constructed to the observatories, and the winter's work went on uninterruptedly. Observations of temperature in sea-water ice were carried on, and a series of tidal observations were made extending through a period of one hundred and twelve days. These observations were taken on the open coast, and go to show that the open Arctic Sea is practically tideless, the mean rise and fall being only about two-tenths of a foot. (Report on tides.)

A peculiar disturbance was observed frequently during these observations. There would be a sudden rise and fall of from three to five hundredths of a foot, like a sudden wave. These occurred when the sea was entirely closed, with not a trace of open water in sight, and apparently in no way connected with the regular action of the tide. There would also be a variation in the height of the water of from four to five feet, often extending through a period of from seven to ten days, but in no manner affecting the normal rise and fall.

During the winter of 1882-'83 temperature of the sea-ice was taken in the following manner: The thermometer was secured in a wooden box 6 by 6 by 15 inches, with a sliding door; this was placed in the ice one hundred yards from the beach, where the sea was smoothly frozen over, one foot below the surface, and frozen in so that the bulb was frozen solid in the ice.

The temperature of the sea-water was taken top and bottom through the hole at the tide-gauge in three fathoms of water. The results are given in the meteorological tables submitted with this report. I found that the second winter with its long night was much more trying upon the spirits and strength of the party than the first; the novelty had now worn off; there was no longer anything new or strange to interest them and there was no relief from the monotony of the routine of the regular work, and there is none so wearisome and wearing as this, without any change and without hope, for we had positive knowledge that there could be no change for us until our work was finished; so the slow time dragged on; days into weeks, months into years; so that exploration, or any work that required action, would have been hailed with joy. After the return of the sun I made preparations for a trip into the interior, to locate geographically some of the discoveries made last year. I had by this time secured one excellent team of eight native dogs, and the sled made at Saint Michael's, given me by Sergeant Nelson in 1881, still being strong and serviceable, I was well equipped for inland work.

Everything being ready, I left the station at 5.30 a. m., March 28, with Mr. A. C. Dark, assistant, a native guide Apaidyao, and his wife. A team of eight dogs and one sled was our only means of transportation; and on it we carried our instruments, arms and ammunition, camp equipage, twenty days' supply of coffee, sugar, hard bread, and pemmican, a small kerosene stove, and one gallon of oil. The sled was rigged with a small lug sail, which was a great help with a fair wind. We traveled along the smooth shore ice to the southwest about eight miles after leaving the station, when we came to where the pack had come in onto the land, and the ice on the sea was too rough and broken for our sled. We here took to the tundra and traveled parallel to the shore until we reached the mouth of a small stream about ten yards wide, coming in from the southeast, called Sĩñaru, which has its source in a lake seven miles inland. We here left the coast, our general course being south, crossing the lake at the head of Sĩñaru, which I found to be seven miles across, and camped at 6 p. m. on a small stream flowing to the northeast; marched thirty-seven miles. The country after leaving the coast was flat, and in the summer must be almost entirely covered with water, as we traveled the whole afternoon over a series of small lakes without seeing a single elevation of land that was over five feet above the surrounding country. Saw but few signs of reindeer and no natives, but saw where a hunting party had been in camp a few days before. Our dogs hauled their load with ease, though there was over seven hundred pounds weight on the sled. Weather clear, with light northeast wind.

March 29.—Snowing heavily this morning when we broke camp at 6 a. m. After traveling four miles we struck a stream about thirty yards wide, within a narrow valley, flowing to northeast. Natives gave it the name of Iuáru. The storm broke at ten o'clock and the sun came out by eleven. The country grew more rolling and broken, and at 12 m. we came in sight of Meade River, which here flows through a valley about one and one-half miles wide, with bold bluffs on either bank from forty to sixty feet high; obtained a meridian sight of the sun at noon for latitude and a fair sight for time during p. m. Traveled up the river on the ice six miles and then left it on our right; crossed a neck of land eight miles wide and struck it again at a point where a large stream called Usûuktu comes in from the eastward, with a channel about forty yards wide and high, bold banks. Here we again traveled on the ice to a point four miles above the mouth of Usûktu, and camped at 4.30 p. m. on the left bank of the river; marched fifty-three miles. I found an Ŭglaamie native here in camp; he was engaged in fishing, and told us his nets were set just opposite to the camp. We obtained from him some fine whitefish; having no rifle he had been unable to take any deer. I ascended the bluffs on the right bank, which were here fifty feet high. On them found the ruins of several winter huts, built entirely of turf; the natives say that three generations ago all this region was inhabited by a people that lived by fishing and hunting reindeer, and did not come to the coast, but that the deer and fish grew scarce and there came a very cold season and the people nearly all died from cold and starvation; the few that survived went away to the Colville or joined the little bands on the coast, so that now this whole region is not inhabited and is never visited except by the hunters from Nuwŭk and Ŭglaamie, who come here for deer during the months of February and March; each year a few fish are also taken with gill-nets in the deep holes along Meade River, the fish being here confined by the river freezing solid on the bars: all movement of water on this water-shed is suspended during the winter, there being no rainfall or melting of snow from October to May, and springs are unknown.

March 29.—Broke camp at 6 a. m.; weather clear and moderate. Continued the march in a southerly direction along the river-bed four miles, when we left it, climbing some high bluffs on the left bank to get on the level plain above and avoid the windings of the river; traveled parallel with its general course all day, crossing it twice, and camped at 5 p. m. on a small tributary of Meade River, and about six miles from the main stream. Marched twenty-five miles; during the afternoon passed a high bluff which is a noted landmark among the natives and known as Nŭa-suk-nan; it is in latitude 70° 37′ N., longitude 157° 11′ W., and rises from fifty to seventy-five feet above the surrounding country and is visible for many miles around. Camped to-night with Mû′ñialu, a native whom I had furnished with a rifle and ammunition to kill deer for the station. Found he had a fine supply on hand, and he very proudly showed us ten as our share. Got excellent sights of the sun during the day for latitude and longitude. Saw several large bands of reindeer and our guide succeeded in killing two. Temperature last night + 16°; during day rose to 29°.2.

March 31.—Weather cold and stormy, and as we are in a very comfortable snow-house we conclude to lie over for the day. My guide has never been beyond this camp, and I can see he has no desire to add to his knowledge of the geography of this region, so I have made arrangements with Mû′ñialu to go on with me. They were busy at work to-day preparing their sleds to haul in their venison to the settlement on the coast; their manner of doing it I have never before seen noted. The sleds which they use for this purpose are made from drift-wood fastened with whalebone and raw-hide lashing; they are about ten feet long, two feet wide, and the runners eight inches wide and one and one-half inches thick, straight on top and no rail; they are shod for ordinary use with strips of bone cut from the whale's jaw-bone, and sometimes with walrus ivory; but this would not do in hauling a heavy load over the snow where there is no beaten trail, so they are shod with ice in the following manner: From the ice on a pond that is free from fracture they cut the pieces the length of a sled runner, eight inches thick and ten inches wide; into these they cut a groove deep enough to receive the sled-runner up to the beam; the sled is carefully fitted into the groove, and secured by pouring in water, a little at a time, and allowing it to freeze. Great care is taken in this part of the operation, for should the workmen apply more than a few drops at a time, the slab of ice would be split and the work all to do over again; after the ice is firmly secured the sled is turned bottom up and the ice-shoe is carefully rounded with a knife, and then smoothed by wetting the naked hand and passing it over the surface until it becomes perfectly glazed; the sled when ready for use will weigh over three hundred pounds, and they load them with the carcasses of from seven to nine deer, weighing over one hundred pounds each. Men, women, and children harness themselves in with the dogs to haul these loads to the coast, often the distance of one hundred miles and over, seldom making more than eight or ten miles each day.

April 1.—The weather being clear, we improved the opportunity to determine accurately our position. Observations were made for time, latitude, and declination.

April 2.—Broke camp at 8 a. m. with Mû′ñlalu for guide; traveled south thirteen miles parallel with Meade River, which we struck at the confluence of a small stream coming in from the westward. For the last six miles the country had become much more rolling and broken, and at the point where we struck the river to-day the bluffs were over one hundred feet high and showed successive layers of turf and sand, where the action of the river had cut them away during the freshets in the summer. I noticed one stratum of turf five feet thick fifty feet below the surface. There was not sufficient moisture in the sand between the strata of turf to cause it to solidify under the action of the frost. On the bars in the river we found a few fragments of fossil ivory; a fringe of scrub arctic willow skirted the bank of the stream, but no drift-wood of any size was seen. Traveling now became quite difficult, as the river was too winding for us to follow its course by traveling on the ice, so we kept a southerly course, climbing the bluffs, where practicable, to cut off the bends. The dogs became tired out early in the afternoon, and we were finally obliged to go into camp on the ice under the lee of a high bluff on the right bank of the river. Marched twenty-three miles. Before dark I climbed to the summit of the bluff, which was one hundred and seventy-five feet above the river, and could see a low range of mountains, running nearly east and west, about fifty miles away. From the break of the country, I have no doubt Meade River has its source in that range, so I named them Meade River Mountains. The native guide notified me upon my return to camp that he did not wish to go further south; that he was unacquainted with the country, never having been so far in the interior before. Beyond this he peopled the country with imaginary enemies. Nothing I could offer would induce him to go further. As I could not well get along without their help in dragging the sled up the hills, I was obliged to make this my turning point, much against my will. We saw no signs of deer, wolves, or any game after we struck the foot-hills; the range of the reindeer seems to be the flat country we had crossed to the north.

April 3.—Broke camp at 8 a. m. and returned to Mû′ñlalu's camp, reaching there at 4 p. m. Weather clear. The sun on the snow fields affected our eyes very seriously in spite of the shaded glasses we wore, and the natives were affected equally as bad as ourselves.

April 4.—Lay over in camp, having our boots dried and repaired and getting ready for the return journey. Weather clear and cold.

April 5.—Broke camp at 5.30 a. m. Traveled on our outward trail to camp No. 2 and slept in the hut we used on our way out. Weather clear and cold, with very little wind.

April 6.—Broke camp at 6 a. m. Followed old trail back to camp No. 1. Weather bright and clear; suffered intensely all day from my eyes, becoming so inflamed I could scarcely see. Mr. Dark does not seem to be so seriously affected. Temperature fell last night to —13°.4; during the day, —24°.

April 7.—Broke camp at 5.30 a. m., and reached the station at 5 p. m. Was obliged to travel with my eyes bandaged; Apaidyao was also nearly blind. No person can be exempt from this terrible suffering who travels in this region at this season of the year; the blinding glare of the sun upon the snow affects the strongest eyes, and we found no preventive. We had several varieties of shaded glasses and goggles, but found as much protection in the wooden shades made and worn by the natives as we did in our own improved glasses, and they were much more comfortable, as the moisture from the face did not congeal upon them so readily as upon the wire gauze and

frames of the goggles. Other than this, there are but few hardships attending travel to a small party properly equipped in this region at this season of the year, and the nearer one conforms to the habits of the natives the less liable he is to meet with disaster, and the less he will be burdened with unnecessary camp equipage and blankets.

The snow hut (iglu) of these people is very quickly and easily constructed, and ordinarily does not consume more time than is required to pitch a wall tent, and is constructed in the following manner: A place where the snow is about four feet deep is selected for camp and a space 5 by 9 feet is laid off; the upper surface is cut into blocks two feet square and eight inches thick and set on edge around the excavation for side walls; at one end three feet of the space is dug down to the ground or ice; in the balance about eighteen inches of snow is left for a couch; sides and ends are built up tight and the whole is roofed with broad slabs of snow six feet thick, cut in proper dimensions to form a flat gable roof, loose snow thrown over all to chink it, and at the end which is dug down to the ground a hole is now cut just large enough to admit a man crawling on his hands and knees; the hut is now finished, sleeping-bags, provisions, and lamp are passed inside, dogs are fed and turned loose after everything they would be liable to eat or destroy is secured by caching them in the dry snow. Arms, instruments, and ammunition should never be taken into the hut; it is always best to leave them on the sled in the open air. After all outside work is done everybody goes into the hut and the hole is stopped from the inside with a plug of snow which has been carefully fitted, and no one is expected to go out until it is time to break camp the next morning. The combined heat from the bodies of the inmates, together with the lamp, soon raises the temperature up to the freezing point, and a degree of comfort is obtained that is not attainable in any other manner of camping in this region. The more permanent snow huts of the deer hunters, which they often occupy for a month or more, are much more elaborate. They are usually built where the snow is six or eight feet deep, so the room is high, and is approached by a covered way and an ante-room, in which the heavy outside clothing is stored, and when fuel is obtainable a kitchen is added to the structure, with a fire-place cut out of the solid walls of snow, with jambs and chimneys of the same perishable material. I saw fire-places in use that had had a fire in them for at least one hour each day for a month or more and were still intact; the parts that were exposed had softened a little under the effects of the first fire and at once hardened into ice, and remained unchanged so long as the temperature in the open air remained below zero.

By the latter part of April or the first part of May snow houses are no longer tenable and natives take to their tents (túpĕks). Their winter huts at this time are also vacated, as they become too damp for comfort. After the snow began to soften so it was no longer practicable to build a snow hut I camped very comfortably by digging a hole in the snow 6 by 8 feet, building up side walls three to four feet high, and stretching over it a deer-skin blanket or the sled sail, using the sled mast for a ridge-pole and our showshoes for rafters. The natives in their excursions usually carry a small stone lamp and a supply of seal blubber for illuminating purposes; they use no blankets or sleeping bags when traveling, but carry a deer-skin or a piece of walrus hide to lay on the snow underneath them; on this they huddle together without any covering other than the clothing they travel in. At such times their food (meat or fish) is eaten raw, except where they have provided themselves with a kind of pemmican, which is made by mixing chewed deer meat with deer tallow and seal oil. This food is not agreeable to the taste, probably owing to the fact that the masticators are inveterate tobacco chewers.

The sled we used on all our journeys was made by a native at Saint Michael's, and presented to the expedition by Sergeant Nelson when at Plover Bay; it was twelve feet long and twenty inches between the runners; had side rails, with a steering handle at the rear end, and was fastened throughout with rawhide lashings; the runners were shod with steel, and it was far superior to any sled I ever saw on the northern coast; it was still in excellent condition after two years' service; its carrying capacity was about 800 pounds, and I think it was the best pattern of a sled I ever saw for Arctic work; it was light (weighing only about fifty pounds), strong, and durable, and could always be repaired with the material at hand among the natives, should it at any time become damaged.

Early in May the hunters began to come in, and altogether I succeeded in getting from them eighteen deer, which together with five hundred eider-ducks killed by the party during the spring flight, gave us a large reserve supply of fresh meat, which was carefully stored in the cellar.

Sergeants Murdoch and Smith were indefatigable in their work, completing the collection so far as practicable in natural history, and many valuable specimens were obtained. Cracks opened in the ice to the north and west of the point, and whales were reported seen by the natives April 12; the leads were narrow, often closing entirely, with no water in sight for days, and the natives reported hearing or seeing whales nearly every day up to June 12.

The spring was very backward and we experienced a great deal of cold, disagreeable weather; the shore leads opened slowly. In Elson Bay and along shore to the eastward of Point Barrow the ice held on until late in August, and this prevented my getting along shore to the eastward with the whale-boat before the arrival of the relief vessel, as I had intended. It was my desire to explore the coast as far as the boundary at least, and had the season been as favorable as that of 1882 I could have left the station by June 12.

On June 9 the natives succeeded in killing a large whale, the first they had taken since we had been on the coast, and was the cause of considerable excitement among them for several days; they came in from all points to join the general feast on the carcass, which was free to all who cared to come and partake.

By the first of August we were becoming extremely anxious about a vessel reaching us this season, as the ground ice was still intact from Point Barrow to the Sea Horse Islands, and it was impracticable to work a small boat along shore. The whale-boat was fitted and provisioned for a voyage and held in readiness for a move as soon as the ice would let us out; outside the bar there was one narrow open lead extending as far as the eye could reach to the southwest, but there was no break in the ground ice to let us into it; besides, it closed under a westerly wind or when the prevailing northeast wind slacked up. On the morning of August 1 a thick fog hung over the ocean, and when it lifted, about 7 o'clock, our eyes were gladdened by the sight of three steamers six miles away, working slowly up the lead from the southwest. With Captain Herendeen I at once crossed the ground ice and went on board the nearest ship, reaching her about 11 a. m. Found it to be the Orca, Captain Colson, from San Francisco, a new vessel on her first voyage. From her we received our first mail, and from private letters learned that the station was to be abandoned as soon as a vessel could reach us. Captain Colson reported the balance of the whaling fleet lying at anchor along the coast between Point Hope and Cape Belcher; not being so well fitted as the new vessels, they would not venture into the pack. The Orca tied up to the ground floe off the station until along in the afternoon, when, in company with the Bowhead, Balæna, and Narwhal (all steamers that had now come up), she proceeded on up to the Point; the lead here was closed and the pack was solid to the north and east, and fast on the land to the eastward of Point Barrow; they tied up under the lee of a large floe berg that had grounded in four fathoms of water.

The following day the steamers Belvidere, Lucretia, and Mary and Helen, came up bringing considerable mail, but no orders, except one from the Chief Signal Officer directing me to dispose of such stores as could be sold to advantage. I sold what I could to the fleet, packed everything not required for immediate use, and as far as possible, without discontinuing the work of observation, made everything ready to embark, so that when the vessel sent to our relief should arrive she would be delayed as short a time as possible.

By August 15 several sailing-vessels had worked up to the station, and all were at anchor behind the ground ice which had now broken away in several places; there was also an open lead along shore. On the 16th the bark Sea Breeze (Captain McDonald) anchored off the station and reported that he had spoken the schooner Leo at anchor off Point Belcher, eighty or ninety miles to the southwest, with orders for the station. He also reported the ice close in off Sea Horse Islands, and that he thought the master of the Leo did not care to venture into the ice, as he had been lying there over a week. I at once prepared to go to her in the whale-boat by working along shore, but a heavy gale springing up from the northeast on the 17th prevented our sailing. In the mean time Capt. L. C. Owen, of the bark Rainbow (who was master of the North Star when she was wrecked in 1882), came to the station and tendered me the services of his steam whale-boat for the trip, which was very gratefully accepted. He sent it down to me on the 19th, with Mr. Rogers, his first mate, in charge, and a crew of three men. I left the station at 6.40 p. m. the same day, with Sergeant Murdoch and Interpreter Herendeen. The weather was clear and warm,

PHOTOTYPE. F. GUTEKUNST. PHILAD'A.

ARCTIC OCEAN FROM THE STATION, AUGUST, 1883.

with little or no wind when we started, so we steamed along shore about one-fourth mile from it, keeping inside the ground ice. At 8 p. m. a strong breeze came out from the northeast, when all sail was set, and we made great speed, so that by midnight we were off Sea Horse Islands; by this time there was a heavy sea running, and the wind had increased to a gale, and we were running before it under close-reefed mainsail and all steam, to avoid being pooped and swamped, as the sea was breaking heavily on the shoals off Point Franklin. The heavy pack was aground on the outer bar, but there was room for a vessel to pass between it and the shoals.

After rounding Point Franklin we headed for Point Belcher, and at 2 a. m. sighted several vessels at anchor off the point, apparently making very bad weather of it, as there was no shelter here from the wind and sea. As we neared them we were able in the dim twilight to make out the Leo by her peculiar rig, she being a topsail schooner, and we bore up to her and succeeded in getting a line on board as we swept past, and with considerable difficulty were taken on board. The gale increased in fury, and before we could hoist in the launch the Leo dragged her anchor and drifted rapidly to the leeward. The captain ordered the cable to be slipped, and the vessel got under way, and I requested him to keep her on a northwest course until he came up with the ice. While the vessel was being got under way, Mr. Rogers, who saw his launch was in danger of being swamped, sprang into her with his crew, cut the painter, and they disappeared from our sight in the storm. We were extremely anxious for his safety, and we had seen that all of the whalers had been obliged to put to sea at the same time we did, and that it would be impossible for him to land north of Wainwright's Inlet without losing the boat, and it was doubtful if he could keep her afloat until he reached that point. At 4 a. m. we came up with the main pack, and the vessel was hove to under the lee of a large field of ice that seemed to be nearly stationary. Here she safely rode out the gale, which abated during the night, so that on the morning of the 21st we were able to stand in toward the land, which we sighted at 7 a. m., and stood in in search of the launch and the anchor which had been slipped and buoyed the day before. At 10 a. m. the captain recovered his anchor, and we stood to the southwest along shore in search of the launch, but were unable to find any trace of her that day.

The next morning, when off Wainright's Inlet, we spoke the bark Helen Mar, and found she had the boat and party safe on board, having picked them up that morning. We then learned that Mr. Rogers had succeeded in making Wainright's Inlet after he went adrift from the Leo, and had ridden out the gale at anchor there, and, sighting the Helen Mar before he did the Leo, had gone on board of her. The wind being southwest, strong and favorable, I directed Captain Jacobson to put the Leo on her course for Ŭglaamie, which he did, and we came to anchorage off the station at 7 p. m., on the 22d, passing through and past considerable pack on our way. I at once landed Mr. Marr, an assistant of the United States Coast and Geodetic Survey who had been sent up to make a series of pendulum observations, with a part of his instruments; gave them all the assistance I could. At the same time I pushed the preparations for embarking, as the ice was liable to close in at any moment. We suspended work at 10 p. m. It came on to blow heavily from the southwest during the night, sending the pack in. The Leo slipped her cable, and escaped around the Point to avoid being crushed or forced ashore. We could see her spars above the ice to the eastward of the Point when we got out in the morning. Private Clarke, of the Signal Corps, and Mr. Schindler (Mr. Marr's assistant), who remained on the Leo, came down to the station overland during the day, and reported the Leo uninjured. During the night of the 23d the wind came out from the northeast and blew heavily, setting the ice about one and one-half miles off the western shore, allowing the Leo to work around to the westward of the Point during the following day, where she came to anchor at 10 p. m., the wind being too light for her to stem the strong northeast current that was setting along the shore. The wind hauled to the southeast and freshened during the night of the 24th, so that she was enabled to get under way and reach the station, anchoring there at 7 a. m. I at once caused the balance of Mr. Marr's instruments and material to be landed, but was unable to embark any stores, as Captain Jacobson in his efforts to recover his cable and anchor which he had slipped on the 23d, had gotten so far off shore that we were unable to run a line to the vessel for the purpose of warping our boats to and fro. This was necessary, as I had not sufficient men to fully man the boats and handle the stores, and the natives' boats could not be with safety used in the sharp ice that was running with the current and piled high on the beach. We worked all day trying to kedge the schooner in, but the wind blowing a gale off-shore rendered all our efforts futile. I placed Interpreter Herendeen on board that night, so that Captain Jacobson could have the benefit of his experience and advice should she again be driven away from her anchorage, as Captain Jacobson was totally inexperienced in Arctic navigation.

Just before dark five whaling barks came around the Point and anchored one and a half miles above the station. We all spent an anxious night for, the wind increased to a gale and hauled to the southwest and we could hear in the darkness the grinding of the pack as it came in, and were not surprised in getting up the next morning to find that the Leo was gone again, and that the sea was closed as far as the eye could reach. The Leo had escaped again around the Point, but three of the whaling barks had not been so fortunate; they were all fast in the pack, the crews were passing and repassing from the ship to the land over the ice. Two of the vessels had gotten foul of each other, and one, the Abraham Barker, had lost her rudder. With a glass from the lookout we could make out the Leo to the eastward of the Point, looking like a speck among the great ice fields. During the day the gale abated, the pressure slackened up, and toward night several small leads were visible. The wind came out from the southeast during the night, and early the next morning the Leo was seen to be under way slowly working her way back to the station through a narrow shore lead that opened during the night; she came to anchor off the station two hundred yards from the beach. Upon going on board I found her considerably damaged; she had been nipped, her stem partly knocked off, her rudder post split, and she was leaking badly.

In view of these facts, and orders having been received for the return of the party to the United States, I determined to abandon the station at once. During the past two days I had caused all the subsistence and quartermaster stores worth saving to be carried down from the house to the beach; a whale-line was run from the shore to the vessel, so one man could haul the boats to and fro, and the embarking was commenced at once, the first boat-load going on board at 8 a. m. Mr. Marr discontinued work on the pendulum, and took down the parts he had placed; the work went on rapidly with the two whale-boats belonging to the station. It was still impossible to use the native boats with safety, as there were great masses of loose pack-ice running with the current, and the beach was piled high with broken ice; at 2 a. m. the instruments were taken down and packed, and observations on shore ceased; the last boat-load was sent off at 10 p. m., and at 12 midnight the party went on board, leaving one man on shore, to see that the natives did not carry off anything that might have been accidentally left.

The ice was too heavy and compact the next morning to enable us to get under way, so the captain improved the time in grappling for the anchor and cable he had slipped the night of the 25th; he succeeded in recovering it, which was extremely fortunate for it was his best, the remaining one being very light. I took a party on shore and brought off the few remaining articles of any value that I did not intend to give to the natives. I left them the house and furniture intact with the stoves, and about 12 tons of coal, a grindstone, some old canvas, and a few worn-out tools, were about all that was left; but these were of great value to the natives, and after giving them a feast of hard bread and molasses we bade them good bye, amid many expressions of regret at our departure. I placed the buildings in charge of some of the most influential men, who promised they would not allow them to be torn to pieces, but be kept as a place of refuge for any shipwrecked people who may chance to be cast ashore on this barren coast. A whale-boat passed up during the day with Captain McKenna, of the bark Cyanne. He reported that his vessel was driven ashore off Point Belcher, in the gale of the 25th, and would prove a total loss. He came up to get assistance from vessels at the Point in saving her valuable cargo of whalebone.

On the morning of the 29th, the lead to the southwest being open and the wind being favorable, the captain took his anchor and got under way at 6 a. m., and we commenced our homeward voyage. The familiar shore and village and the house that had been so good and comfortable a home to us for two long years soon faded in the distance. After sailing two miles we got clear off the loose ice that was running with the current and into clear water, with the old pack close in to the northwest, arriving off Point Franklin at 9.30 p. m., when the wind fell, and we came to anchor in company with eleven ships of the whaling fleet that had worked out and had come down

FLOEBERG ON THE BEACH, AUGUST, 1883.

the same time we did. The wind came out from the westward during the night, and the captain got under way; stood off and came up with the pack about six miles from the land, when he tacked and stood in towards land; but again the current was setting so strong to the northeast that we could not make any headway on our course, and we were very glad to get back to our our anchorage under the lee of Point Franklin, where we lay until the next day, when we again got under way with a light southeast breeze, which let go after we had gotten around the Point, and we were again obliged to anchor at 10 a. m., to prevent being carried off to the northeast by the strong current setting along shore here.

Sailing-vessels navigating this sea should never allow themselves to get off soundings north of Point Belcher, except in a strong, steady wind, nor allow the vessel to drift during thick, calm weather, if it is possible to get an anchor down. The needle is useless here; the land or lead line is the only safe guide, for, should a sailing-vessel be carried off soundings off Point Barrow with light winds or calm, she runs great danger of being lost; this has been the fate of nearly all vessels so caught, especially late in the season.

At 4 p. m., the breeze freshening, we got under way again and stood on our course along the coast and about four miles from it. We experienced light, baffling winds, making but little headway from that time until the afternoon of September 2, when the wind came out strong and steady from the northeast. We sighted and passed Cape Lisburne that day and sighted the Diomede Islands at noon on the 3d. During the day the wind increased to a gale and the weather grew thick and cold, with considerable snow; sail was shortened, and at 3 p. m. we passed Cape Prince of Wales, running at great speed before the wind; after passing through the straits the vessel was headed for Norton Sound, it being necessary that I should go to Saint Michael's to land Private E. Clarke, of the Signal Corps, who had been sent out to relieve Sergeant Leavitt, an observer on that station. As soon as we hauled under the high land to the south and east of Cape Prince of Wales we ran out of the wind, and our progress was slow.

On the 4th of September the fog lifted and we sighted Kings Island and Cape York, and on the 6th passed close to the southward of Sledge Island, but, owing to a head wind, did not sight the high land near Saint Michael's until the 8th. We stood in towards it and came to anchor off the fort at noon on that day, where we were received by a salute fired from a couple of old ship guns. Soon after a boat came off to us bringing, very much to our surprise, Lieut. Frederick Schwatka, Third Cavalry, who reported that he had made the passage of the Yukon on a raft, exploring its course from its source to its mouth, making one of the most remarkable raft voyages on record. He had been at Saint Michael's since the last of August, and was extremely anxious to get away with his party. Though we were very much crowded on the Leo I did not think it would be right to refuse him passage, as there would be no opportunity for him to return to the United States before another year, this station being visited only by vessels of the Alaska Commercial Company, and there would be none due before the following June. So I directed him to hold his party in readiness to come on board as soon as we were ready to sail. We were short of fresh water and had to lay in a supply before again putting to sea. For the first two days we were in port it blew a gale from the southeast, so it was impossible to get any water off to the ship; on the afternoon of the 10th the captain reported he had succeeded in getting enough on board to last us until we could reach Ŭnalaska or Plover Bay, whichever place I should conclude to go to, so at daylight on the 11th Lieutenant Schwatka and his party were taken on board and we put to sea at 10 a. m. Found it was blowing a gale from the northwest when we got outside, and after making a few tacks under close-reefed sails, found we were making no headway, so we were glad to run back into the harbor, where we came to anchor at 3 p. m.

The following morning, the wind having hauled more to the north, we again put to sea, and the next morning sighted Cape Darby, a high headland on the northern shore of Norton Sound. We were obliged to make this northing to avoid a dangerous shoal that makes out from the mouth of the Yukon; in running out of Norton Sound it is not safe to run west, south of 64 Lat. During the afternoon of the 13th the wind settled in the northwest and blew hard and steadily all that night, and we found it would be slow work beating up to Plover Bay. The ship was leaking so badly that the pumps were kept going one-third of the time and the slightest accident to them would soon send her to the bottom; and as I knew that the meridian of Ŭnalaska had been as well, if not better, determined than that of Plover Bay, I decided not to go to the latter place, but to proceed direct to Unalaska and there make an effort to repair the vessel, as I was told that there was sufficient tide at that place to enable us to get at her bottom by discharging her cargo and placing her on the beach at high tide and working on her during low water; so as soon as we were clear of the Yukon flats she was put on her course for that place. The wind increased to a heavy gale from the northwest on the 15th, and we made excellent time as we were running nearly before it. During the night of the 16th, the vessel was hove to to wait for daylight, as we knew we were near land, and on the morning of the 17th we sighted the island of Unalaska to the south and about twenty miles away; the wind had fallen so light during the night we were able to make but little headway and did not get into the harbor and at anchor until 10 o'clock that night.

We found the United States steamer Corwin and the Alaska Commercial Company's steamer Dora at anchor here, the former on her return from Kotzebue Sound and the latter on her annual voyage to the Aleutian Island stations. The wind not being favorable to sail into the inner harbor, which was the only place where the vessel could be safely beached, I made application to Captain Healy, commanding the Corwin, for the assistance of the cutter to tow the Leo in; he very readily complied with the request, and at once got up steam, and at 11 a. m. placed the Leo at the company's wharf, where the bulk of her cargo was discharged; owing to a severe wind storm prevailing at this time we were unable to haul her up until the afternoon of the 20th, when she was beached at high tide; we improved the time in getting observations of the sun, and determining the declination of the needle. We were unable to get at the leak on the first ebb, but on the 21st the water fell sufficiently low to enable the workmen to repair the damage, which was found to be about four feet below her water line, where a butt had been started, and the water was so clear that we could see that she had sustained no damage below that point, and we were pleased to find upon floating her off on the next high tide that the leak was entirely stopped.

Such stores as had not been disposed of were re-embarked on the 22d and the vessel warped out to her anchorage ready for sailing. The 23d was too stormy to admit of our going to sea, but the wind having abated slightly toward night, I directed the captain to get under way on the morning of the 24th, which was done at 8 a. m., being towed outside the heads by the Corwin, whose services had again been kindly placed at our disposal by Captain Healy. We found the wind blowing strong from the northwest when we got outside, and a very heavy sea running; we parted company with the Corwin as soon as we passed the capes by the breaking of our tow-line, and the Leo was at once headed for the pass of Akoutan, through which we passed out into the Pacific at 12 m. From this time the wind continued fair during the whole of the voyage across the North Pacific. We followed nearly in the track of the great circle route, and made such remarkably good time that the Farallones were sighted at 3 p. m.

On October 6 the wind fell as we ran in toward land, and we drifted through the Golden Gate in a dead calm that night at 12 o'clock, coming to anchor off the Presidio at 2 a. m. October 7, and reporting to the Chief Signal Officer by telegraph the same day.

The object for which the expedition was organized being accomplished, it was formally disbanded October 15; its work having extended through a period of over twenty-seven months, during which time the expedition had sailed over 7,500 miles, had established and maintained itself at the northern extremity of this continent in latitude 71° 16′ north, and successfully carried out the instructions received from the Chief Signal Officer, and brought back the record of an unbroken series of hourly observations in meteorology, magnetism, tides, and earth temperatures, besides a large collection in natural history and ethnology, and penetrated into the interior to a point never before visited by civilized man.

During the whole period all the members of the expedition enjoyed excellent health, not having a single man on the sick report for two years.

To the individual members of the expedition who returned with it to the United States great credit is due for their obedience to orders, faithfulness, and intelligence in performance of their duties, and for their patient endurance of the many trials they were called upon to suffer; for the work of scientific observations in these high latitudes is one of patient endurance on the part of the observer, confined, as he is, within narrow limits, without the excitement incident to travel. The unvaying monotony of the work is necessarily very wearing, but during the whole time no murmur or complaint was ever heard.

PART III.

ETHNOGRAPHIC SKETCH OF THE NATIVES OF POINT BARROW.

By LIEUT. P. H. RAY.

MÛMMÛÑĪ́NÁ, "PRINCESS OF NUWŬK."

ETHNOGRAPHIC SKETCH OF THE NATIVES.

I.

During our stay we improved each opportunity to add to our knowledge of the peculiar people inhabiting this coast. A want of sufficient knowledge of their language at first made the work difficult, as we had no interpreter. So our first energies were devoted to learning their language sufficiently well to communicate with them, as none of them could speak a word of English, neither did they show any disposition to learn.

Of their origin and descent we could get no trace, there being no record of events kept among them. Even the sign record of prominent events in individual life, so common among some of the natives in the lower latitudes, is almost unknown among them. Their language abounds in legends, but none of these gave any data by which we could judge how long these desolate shores have been inhabited.

That the ancestors of those people have made it their home for ages is conclusively shown by the ruins of ancient villages and winter huts along the sea-shore and in the interior. On the point where the station was established were mounds marking the site of three huts dating back to the time when they had no iron and men "talked like dogs"; also at Perigniak a group of mounds mark the site of an ancient village. It stands in the midst of a marsh; a sinking of the land causing it to be flooded and consequently abandoned, as it is their custom to select the high and dry points of land along the sea-shore for their permanent villages. The fact of our finding a pair of wooden goggles twenty-six feet below the surface of the earth, in the shaft sunk for earth temperatures, points conclusively to the great lapse of time since these shores were first peopled by the race of man. That they have followed the receding line of ice, which at one time capped the northern part of this continent, along the easiest lines of travel is shown in the general distribution of a similar people, speaking a similar tongue, from Greenland to Behring Straits; in so doing they followed the easiest natural lines of travel along the water-courses and the sea-shore, and the distribution of the race to-day marks the routes traveled. The sea-shore led them along the Labrador and Greenland coasts; Hudson's Bay and its tributary waters carried its quota towards Boothia Land; helped by Back's Great Fish River, the Mackenzie carried them to the northwestern coast; and down the Yukon they came to people the shores of Norton Sound and along the coast to Cape Prince of Wales. They occupied some of the coast to the south of the mouth of the Yukon, and a few drifted across Behring Straits on the ice, and their natural traits are still in marked contrast with their neighbors, the Chuckchee. They use dogs instead of deer, the natives of North America having never domesticated the reindeer, take their living from the sea, and speak a different tongue. Had the the migration come from Asia it does not stand to reason that they would have abandoned the deer upon crossing the straits.

The following table will show that physically the Inyu of North America coast does not conform to the typical idea of the Eskimo. They are robust, healthy people, fairer than the North American Indian, with brown eyes and straight black hair. The men are beardless until they attain the age of from twenty to twenty-five years, and even then it is very light and scattering, and is always clipped close in the winter; at this season they also cut off their eyebrows and tonsure their crown like a priest, with bangs over their forehead. Their hands and feet are extremely small and symmetrical; they are graceful in their movements when unincumbered by heavy clothing; they are kind and gentle in disposition and extremely hospitable to strangers; though they may rob a stranger of every means of obtaining a subsistence one moment, they will divide with him their last piece of meat the next. They have no form of government, but live in a condition of anarchy; they make no combinations, either for offensive or defensive purposes, having no common enemies to guard against, nor have they any punishment for crimes. I never knew one to attempt to reclaim stolen property, though they might see it in the hands of the thief or left on his cache; though given to petty pilfering they rarely, if ever, break into a cache (except into one of meat when driven to it by hunger) or enter a tent or hut for that purpose. During the first winter we had stores, of which they were in great need, in a Sibley tent, and they all knew they were there; and although the tent was only tied, with no regular guard over it, nothing was ever disturbed, though if anything was carelessly left out it would be stolen at once. They never made the slightest resistance to our reclaiming property when discovered, and would laugh about it as though it were a good joke. They are very social in their habits and kind to each other; we never witnessed a quarrel between men during the whole time we were on the coast, neither did we ever see a child struck or punished; and a more obedient or better lot of children cannot be found in all Christendom. I never saw one of any age do a vicious or mean act, and while they were always around the station during the fall and winter, they did no mischief, but, on the contrary, would busy themselves in shoveling the snow out of the tunnels and running on errands and doing any work they could for a little food each day. The children would wait around the door for members of the party to come out to take their daily exercise, and, even more, would accompany each member, and every few moments they would say "naumi-tanity" (now let me see), and would scan the traveler's face for frost-bites, and were ever ready with a handful of snow to be applied should they detect the slightest sign of freezing; for when the temperature gets below —45°, and there is a light breeze, it cuts every exposed part of the body as though white hot metal were applied, causing no pain. Their games were very alike what we see played among children of our own race, and in imitating the pursuits of the elders, we often saw them with snow play-houses cut into the hard snow, with snow images set up, and the little fur-clad mites of humanity bustling around, playing at keeping house and making calls, with the temperature at — 40°.

All the people on that coast from Wainwright Inlet around to the mouth of the Colville are comprised in the following villages whose population comprise all the inhabitants of this coast:

Name of village.	Location.	No. of families.	Total population.
Kuñmoum	Wainwright Inlet	10	80
Sidárn	Southwest Point Belcher	8	50
Ŭglaamie	Cape Smythe	23	130
Nuwŭk	Point Barrow	31	150
Total			410

Between Point Barrow and the Colville the country is uninhabited in the winter. The resources of this region are so limited that in the struggle for existence, these people are obliged to devote all their energies and time to procuring necessary food and clothing to maintain life, never being able to get a sufficient supply of meat ahead to lay in a reserve; famine always stares them in the face should they relax their efforts.

With the return of the sun each year their active life commences. Those that have arms and dogs go into the interior about the 1st of February to hunt reindeer; those belonging to the villages of Nuwŭk and Ŭglaamie go to the south and hunt along the Meade and Ĭk-pĭk-pŭñ; those from the vicinity of Wainwright Inlet hunt along the Ku; the others scatter along the western shore for the purpose of taking seal, and ducks as the season advances. Their tents, one or two in a place, seen by summer voyagers in this sea, has given rise to the belief that this coast is much more densely populated than it is in fact. For when the tents are out the villages are empty.

SCENE IN ŬGLAAMIE. TENT WITH NATIVES AT WORK. SUMMER CAMP.

The hunters return to the winter huts between the 1st and 10th of May, and the omélĭks or boat-headers make up their crews for the whaling season. A boat-header (omélĭk) is one who is noted for his success in taking whales, and of course is a man of experience and considerable influence. The crews are made up of men and women, generally ten to each boat; some crews are paid by the omélĭk, who feeds them and pays them in deer skins or other articles of native traffic; others ship on a lay, each member furnishing his own supplies and they all share alike in the catch, the boat-header furnishing the gear. The women who are tabooed and the children cook and carry food out to the crews, who come in to the land as seldom as possible, and never go into a house, if it can be avoided. At this season, too, no work is done that will necessitate pounding or hewing or in fact any noise, neither shall there be work of any kind carried on in the tent (tupĕk) of any member of a crew. Should their garments be accidentally torn, the woman must take them far back on the *tundra* out of sight of the sea and mend them; they have little tents, in which just one person can sit, in which this work is done. During the spring of 1882 they came to me and asked that I stop the work on the shaft, saying that it would offend the whales at this season. Early in March all hands turn to and build a road through the pack over which the boats can be hauled out to the lead; this often necessitates a great deal of labor, especially when the lead opens far off shore, as it did in 1882.

The village and camps are in a constant state of bustle and excitement at this season of the year; boat covers are being renewed or repaired; harpoons and lances are gotten out and every part of the woodwork carefully scraped; seal-skin pokes are lying about, looking like bloated seals, and the skulls of wolves, raven skins, or eagle skins are in great demand, for no no boat would be considered equipped without some such talisman. Daily the old men, especially those who are successful in curing the sick, meet on the sea-shore and (abawa) talk for an east wind, so the ice will be driven off shore and a lead, favorable for whales, opened; and their faith remains unshaken through repeated failures, and when questioned as to the reason why their supplications remained unanswered they always attributed it to some offense they had given to the spirit. When the lead opens there is great rejoicing, and for a few days they display the utmost vigilance; but should the whales fail to appear in a few days, they soon grow careless and cease cruising, haul their boats up on the ice and patiently wait for a whale to come to them, taking turns in standing watch while the others sleep or shoot seal and duck, which abound in the open leads at this season.

As the season advances the boat crews are gradually broken up, and by the middle of June all boats are brought to the land, when parties are made up to go to Nĭgalĕk, a place at the mouth of the Colville, where the people from Nuwŭk and Ŭglaamie go to meet a band called Nu-na-tá′ñ-meun (inland people), where they barter oil and blubber for deer, fox, and wolverine skins. They sometimes meet here the Kûñ-mû′d′-lĭñs and It-kû′d′-lĭñs, bands that live along the coast between the Colville and Mackenzie. This meeting breaks up about the 15th of August, when they slowly return along the coast, hunting by the way, and reach their winter villages from the 15th of September to the 1st of October, about the same time the traders go to the eastward.

A few of the leading families from both villages pitch their tents at Perigniak, a point on the sand spit, about five miles from Nuwŭk, where the eider ducks fly over, and spend the summer there, living entirely upon ducks and whitefish. The ducks they take with slings and guns and the fish with gill-nets made from sinews of the reindeer. Those who are too poor to own a gun or to have oil for trade scatter through the interior, carrying their kaiaks on their heads to cross the numerous lakes and rivers, and gain a precarious livelihood by catching the young reindeer, the young and moulting ducks which are found in great numbers in the lakes and along Meade River, where they also take a few whitefish with gill-nets. The ducks are taken with a light ivory-headed spear, which has a shaft seven feet long, one-half inch in diameter, with three long ivory barbs in the middle. It is thrown with a hand-board from a kaiak, the barbs catching the birds by the neck when missed by the lariat stroke.

Their usual mode of travel along the shore in summer is by the umiak, the large skin boat; with a fair wind they hoist a small lug sail, but the boats being flat bottom will not sail on the wind, so with a head wind or calm weather the boats are towed by dogs, using the walrus harpoon line for a towing line; they never resort to the labor of paddling except when in pursuit of game or in some emergency. When a landing is made the boat is hauled up above high water, and turned over and serves temporarily for a tent. By the 1st of October all have returned to their winter huts, and are busy getting them in order for the winter; all the inside timbers and floors are carefully scraped, the passages which have become filled with ice during the summer are picked out, windows of walrus intestines are stretched over the openings, and by the 15th all are housed for the winter. And the seal-nets and spears are repaired and made ready, and, as soon as the ocean is frozen over, parties are constantly out on the ice, hunting for air-holes where the seal come to get air. As soon as one is discovered a number of families go off to it in the following manner: the nets are twenty-five feet long and fourteen feet deep, with meshes large enough to admit a seal's head, and are rigged with stone sinkers along the bottom, and at the two upper corners are attached two rawhide thongs about forty feet long, one of which has a light weight attached to the end. Holes twelve inches in diameter, about thirty-five feet apart, are drilled through the ice about sixty feet back from the air-holes; the weighted line is dropped through one hole, and hauled up through the other by a long pole with a hook attached; this pole is made from small pieces of drift-wood carefully spliced together with lashings of whalebone; by this line the net is hauled underneath the ice, hanging down like a curtain between one of the holes and held in its place by the lines being attached to a wooden pin. In this manner the air-hole is surrounded by nets as far as practicable; one man or boy is left to attend to each net, and the strictest silence enjoined; no word is spoken; the watcher, wrapped in his heaviest coat, patiently awaits through the long hours; he occasionally scratches the surface of the ice with a scratcher, which is made of a set of seal claws attached to a piece of wood. The seal, in coming to the hole for air, strikes into the net; the strain loosens the lines from the peg and he entangles himself and soon drowns, when he is hauled out through one of the sealing holes and the net reset. Over one hundred seal are sometimes taken at a single air-hole within twenty-four hours, but they can be taken in this manner only during the dark of the moon—any light will betray the presence of the net. During May quite a number are taken at their breathing-holes, which have become enlarged, and through which they haul out on the surface of the ice at that season, by removing the weights from the nets and setting it across the hole with four lines on the under side of the ice.

At this season, also, many seals are taken with the hand spear, at the "adlu," the breathing-hole of a single seal. It is usually detected by an excessive deposit of hoar-frost on the surface of the snow over the hole; the snow is cleared away down to the solid ice, and in the hole, which is about one inch in diameter at the surface, is placed an ivory needle about one foot long and one-eighth of an inch in diameter; to the upper end a small cross-bar is attached, to prevent it dropping through, and a small feather, and the hunter takes his stand on a three-legged stool, which is always a part of his regular equipment, and patiently awaits the coming of the seal, of which the feathered needle gives warning; after the stroke is delivered, if he succeeds in fastening to the seal, he proceeds to enlarge the hole until it will admit hauling him to the surface; this is usually done with an ivory pick attached to the shaft of his spear; as soon as a seal is taken its mouth is fastened open with a piece of ice, and a slot cut through the lower jaw before it becomes frozen. Should he be far out in the pack, where the ice is too rough for a sled to be used, the seal is dragged home by a hand drag, which is a strong loop about two feet long, made of walrus hide thong, fitted with an ivory toggle or handle, generally carved in imitation of two seals fastened together; this loop is passed through the slot in the seal's jaw and over the toggle; each hunter must be supplied with at least one of these drags, as it is not considered proper to fasten to a seal with a line that is used for any other purpose; when they get near shore the drag is removed and a few drops of fresh water is poured into the mouth of each seal before it is taken from the ice to the land; they generally go through with the same ceremony with ducks that have been killed at sea, but never with those that have been killed over the land, and the bones of seals are carefully preserved unbroken and returned to the sea, if possible, either by being left in a crack in the ice, far out from the land, or dropped through some open hole in the ice. By so doing they believe that good fortune will follow them in pursuit of seal, which is their main dependence, for from its skin they make their summer boots and soles for their winter boots; its blubber supplies the oil for their lamps during the long night, and with any surplus they may have they purchase deer-skins for clothing from the natives from the interior, and its flesh when cooked is an excellent article of food. The few reindeer and water fowl they take are looked upon more as a luxury than a necessity, and the flesh of the reindeer is the greatest luxury of all; those who have it carefully hoard it, and when they knew that we had some in store they would often come and beg for a small piece to be used as medicine for some sick person.

Immediately after the departure of the sun, when food is plentiful, it is customary for each village to hold a kind of high carnival for three days; friends are invited from the neighboring villages, and the time is passed in dancing, singing, and feasting; the "kûdyĭgĭn" (council-house) is fitted up with a new roof of ice, and crowded day and night, fresh dancers taking the places of those tired out, and the dull tum-tum of the drum, mingled with snatches of song and shouts of laughter can be heard coming from almost every iglu.

It is customary at this season to exchange presents, especially among the more wealthy and influential ones; but the giver expects value received in return, and should he fail to receive a satisfactory present he does not fail to let his wants be known, and he often announces beforehand what articles would be most desirable in case he should make a present. In 1883 I was invited to attend one of these gatherings at Numŭk, and the old omélĭk who was sent as bearer of the invitation brought a statement of what they were going to give me; after waiting around the station for an hour or two he called me to one side and called over a long list of articles that they expected me to give in return, but as rum (tûñ-a), rifles, and ammunition were leading items in the list, the visit was never made. A trade is made a matter of grave debate, and frequent discussions asking for a little more, no matter how much has been offered, and when an offer has been made they will go away and send the article by another person; and often when a trade has been completed they will come and demand their goods back, often leaving the articles they had received on the door-step, and when asked what they will take have great difficulty in making up their minds; and in making boots and clothing they will slight their work in every imaginable way unless carefully watched. I had occasion to purchase seal-oil, and they commenced bringing it to me in old tin cans that they had picked up at the station, and after a few honest deliveries they commenced bringing us cans filled with two-thirds ice and a little oil on top, and betrayed themselves by being over-anxious to get their pay before we emptied the cans.

My first invitation to one of their ceremonies came in December, 1881, through old Nikawáalu, of Ŭglaamie, who came over to the station with a small delegation and in a grave, dignified manner said that the people of Ŭglaamie would be made glad if Captain Herendeen and myself would come with him and see the dance. We at once started over, and as we approached the village we found a crowd upwards of 200 people collected around the council house; besides the Ŭglaamie people, there were delegations from Nuwŭk and Sidaru. They were silently watching a pantomime that was being enacted by five men and two women who were standing in a row with the women on the right and left, facing the south, with the council-house behind them, and the crowd in front. They were attired in new suits of deer-skin worn with the flesh side out, dressed perfectly white; the men wore tall conical hats of seal-skin, ornamented with dentalium shells and tufts of ermine and Arctic fox fur. The women were bareheaded, with their hair neatly plaited. Behind the dancers sat a drummer and two singers, to whose doleful chant the dancers kept time with their feet, at the same time swaying their bodies from right to left with spasmodic jerks, the women occasionally joining in the song, while the men one at a time would spring a few paces to the front and in wild gestures portray how they had taken seal, bear, or deer, being cheered by the crowd as they finished and took their place in the line. The day was clear, and their grotesque figures showed in sharp relief against the southern sky that glowed with the twilight of a winter noon; their wild surroundings, backed by a frozen ocean, made up a picture peculiar only to the Arctic, and, once seen, not soon to be forgotten. After each had danced in turn, and it seemed a long time to us standing waiting in the snow in a temperature of 18°, they adjourned to the council-house, where as many crowded in as could find standing room, in a room 16 by 20; the air was redolent with odors from the lamp and the unwashed crowd, and, as the frost had hermetically sealed the roof and walls, there was no ventilation and the heat and stench soon became almost unbearable to us who were unaccustomed to such life. Two large stone lamps lit up the low room with a hazy light; across the side opposite to the entrance a space 6 by 8 feet was curtained off with deer-skins, and in front of it was a model of a tree suspended from the ceiling, and, as the knowledge of the native who designed it was confined to the few pieces of drift-wood found on the beach and some pieces of timber cast ashore from wrecks, the specimen was unique; it consisted of two oblong boxes open at both ends loosely attached together endwise with seal thong; the part representing the body was 2 feet long, 8 inches square, and that representing the top 18 inches long and 6 inches square, and was suspended by a thong with the lower end two feet from the floor. On the right and left of the tree hung the skull of a wolf and the dried carcass of a raven; two of the singers sat flat upon the floor with their legs extended, one close behind the other, the foremost one with his nose just touching the tree. As soon as all were in position the drummers, accompanied by the women, struck up a doleful chant to which the man at the tree kept time in his supplications to (Tuña) the Great Spirit to give them success in pursuit of whales, deer, seal, &c., and to send white men with plenty of rum and tobacco; and he particularly dwelt upon certain articles he knew we had at the station; at the same time he beat the body of the tree with a wand. As he completed his schedule of wants the lower edge of the curtain was raised and five natives crawled forth on their hands and knees. They were dressed in the skins of the bear, wolf, lynx, fox, and the dog,t he heads being dressed complete, showing the grinning teeth. On their hands were large mittens of dried seal-skin, with shells and small pieces of copper attached with pieces of thong, so that they swung and rattled as they moved their heads. They crawled slowly forward, swinging their heads in unison, keeping time to the music in hoarse growls, and by shaking their huge mittens until their heads touched the singers by the tree, when they all sprang to their feet with a loud shout, and the performance was brought to a close by all joining in a wild shout accompanied by spasmodic gestures that seemed to threaten a dislocation of their joints.

As we came out in the open air we found another party just commencing the out-door dance, and so they kept it up night and day. Each party as they completed their dance were feasted by friends in different iglus. The invisible spirit (Tuña) peoples the earth, sea, and air; we never could find that they gave it any place of fixed abode; visible at times, as many of the old men insisted that they had seen him, and described him as resembling the upper part of a man, but very wide, with an extremely large head and long fangs; he is the creator of all things, and also the destroyer, is ever to be feared, especially in the night, and men and women, when out at such a time, usually carry a large knife to defend themselves should they meet him. That they believe in ghosts was apparent in the case of a woman who had been doing some work for our party. Coming to the station one day and being asked to mend a pair of gloves, said she dare not, as there was a dead man in the village, and his body had not yet been carried out; that he would see her and some evil would befall her. Upon being urged, she first obtained her husband's permission, and then seating herself in the middle of the floor, she drew a circle around her with a bone snow-knife she carried, and remarked that now he could not see her; she was very careful to keep her work all inside the circle, and would not leave it until all was completed.

They dislike to go out on a dark night, but if obliged to, they generally carry a bone or ivory snow-knife or a long bladed steel knife, to keep off Tuña and Kïolya (Aurora), which they believe to be equally evil; but Tuña especially is concerned in producing all the evils of life. Should the whales fail to put in an early appearance, the birds fly high or far out over the pack, the shore lead open late, a gale blow down their caches and break their gear and boats, the old and wise would meet in solemn conclave to devise some means whereby the works of Tuña shall be exorcised and he shall be driven forth from the village. Various means are resorted to; the most common one is for the principal men to meet and (abawa) talk, chanting together in a loud tone, accompanied by beating of drums; they call for the east wind (nigyû) to blow on the ice (siko) to open it. Individual wants are by personal supplication, and to them, earth and air are full of spirits. The one drags men into the earth by the feet, from which they never emerge; the other strikes men dead, leaving no mark, and the air is full of voices; often while traveling they would stop and ask me to listen, and say that Tuña of the wind was passing by. With the return of the sun he is hunted out of each iglu by incantations that would daunt the boldest spirit. A fire is built in front of the council-house, and at the entrance to each iglu is posted an old woman wise in ghost lore; the men gather around the council-house while the young women and girls drive the spirits out of the iglu with their knives, thrusting them under the bunk and deer skins in a vicious manner, calling upon Tuña to leave the iglu; after they think he has been driven out of every nook and corner,

PHOTOTYPE F. GUTEKUNST PHILAD'A.

SCENE IN ŬGLAAMIE.

they drive him down through the hole in the floor and chase him out into the open air with loud shouts and frantic gestures. While this was going on the old woman at the entrance, who was armed with a long knife used for cutting snow, made passes over the air with it to keep him from returning. Each party drove the spirit towards the fire and invoked him to go into it; all were by this time drawn up in a half circle around the fire, when several of the leading men made specific charges against the spirit; and each, after his speech, brushed his clothing violently, calling upon the spirit to leave him and go into the fire; two men now stepped forward with rifles loaded with blank charges while a third came with a vessel of urine, which was thrown upon the fire; at the same time one fired a shot into it; and, as the cloud of steam rose, it received the shot, which was supposed to have finished him for the time being. While they were ever threatening or supplicating Tuña we never knew them to offer thanks or be grateful for any benefits he was supposed to bestow; everything they received was taken as a matter of course, and as the result of some particular incantation.

I saw a very ingenious contrivance an old man had rigged up to keep Tuña from entering his iglu. He had his seal drag, which was fitted with a carved ivory handle, suspended over the entrance inside his hut; the thong was fastened by his hunting knife being driven through it into the roof; he explained to me that Tuña in coming in would catch hold of the handle of the seal drag to help himself through the hole and would pull the knife down upon his head and be frightened away. He contemplated his contrivance with a great deal of satisfaction, and assured me that Tuña was very much afraid of his iglu.

Their dead are carried out and laid on the tundra without any ceremony other than the near relatives following the body to its last resting place; it is usually wrapped in deer skins, and if a man, his sled and hunting gear are broken and laid over the body; if a woman, her sewing kit and some few household utensils are placed at her head, but everything so left is broken and rendered useless. With but few exceptions I never knew them to pay any attention to their dead after they were carried out, and all showed great reluctance about speaking of them. The bodies are usually eaten by the dogs, especially in the winter, and it is no uncommon sight to see them gnawing the bones on the roofs of the iglus. The sled used to carry the body out on the tundra is not brought back to the village at once, but left out on the tundra not less than two moons, and while they all claim that it is bad to use anything that belonged to the dead, I noticed that no matter how good an outfit he had while living his was the most worthless sled and gun that could be found, and I knew of a number of cases where there was a general division of a dead man's effects on a basis of first come first served. As a rule the dead (Nu′nami-sinik, on the ground asleep) are soon forgotten, and the names of the noted whalemen or hunters only live in legend.

There is no marriage ceremony among them, but children are often betrothed by their parents at an early age, and this promise is very faithfully kept, and they enter upon their marriage relations at the age of twelve to fifteen years; where there has been no childhood engagement the mother makes a selection of the wife for her son, and the girl selected is invited to the house, where she takes the place of a servant for a short time, doing the housework and cooking, generally returning to her father's iglu to sleep. They usually avail themselves of the summer trip along the coast or into the interior, and take upon themselves the full obligations of marriage. They often have family disagreements, the husband resorting to blows when the wife is sulky and disobedient, sometimes with the result of her running away; and we knew of one instance where, owing to a slight mistake the husband had made in his estimate of his wife's character, he obtained results not anticipated, for while out on a deer hunt he attempted to chastise her for some fancied neglect of duty when she retaliated, and, being the stronger of the two, she gave him a severe thrashing, and then taking with her an adopted child she fled to a village seventy-five miles away. She subsequently gave up the child, but would not return to him, and soon after became the wife of another man. At the time we landed at Ŭglaamie this same woman carried on her back a box of lead weighing two hundred and eighty pounds a distance of over two hundred yards.

The women as a rule seem to have an equal voice in the direction of affairs, when once admitted to the position of wife, and in each village there are a number of old women who are treated with the greatest consideration by all, they being credited with wonderful powers of divination, and are consulted in all important affairs. And the wives are treated with more consideration by their husbands than they are by savages of the lower latitudes, though to her falls the drudgery of housekeeping, dressing skins, and making boots and clothing; his task is equally hard, as he is exposed to the dangers of the ice and storms in the pursuit of seal and deer, often returning to his iglu completely exhausted. She aids and assists him by following his trail with the dogs and sleds to bring in the game which the hunter catches in the snow where he kills it, setting up a cake of snow or ice with his mark upon it, to mark the place. The wife is invariably consulted when any trade is to be made, and the husband never thinks of closing a bargain of any importance without her consent. When traveling they take turn about in leading out ahead of the team, and all assist in building the snow hut when camp is made. The wife also has the care of the dogs, with whom she often shares her food, giving as much care to the puppies as she would to a child, carrying them in the back of her ahtega or wrapped in skin on the sled when traveling, until they are old enough to be harnessed into the team, when by their faithfulness and endurance they make full return for all kindness shown them in their childhood (puppyhood), and although a dog team would try the patience of a saint, they never use a whip and rarely strike them; they coax and encourage them along by the voice; and often toward the end of a journey they hasten their pace by dragging a piece of fresh meat by a string in front of the team, being careful to keep it just beyond their reach. They give the most careful attention to their foot-gear, especially when traveling during the winter; and here a woman's services are invaluable, as she is very expert in the use of her needle, and she dries and repairs the boots of the party before she sleeps; this is necessary owing to the frail character of the skins used in making their winter boots. Men do such work when alone, but not so well as the women. She also carries a sealskin water-bottle on her back under her "alige," which is replenished with snow after each draught, and is their sole dependence for water on long, rapid journeys during the winter.

Large families are very rare, and children are born at intervals of from two to four years; they do not often bear children before twenty, and a couple is very seldom met with that has a family of more than three, though upon inquiry they may have some that "nuna-mi-sinĭk, "sleep on the ground," and where the people are poor it is not unusual for a mother to give away all but the first-born to some couple that have no children; boys are in greater demand than girls for adoption, and the adopted mother gives it all the care she would a child of her own, and will rarely if ever tell who the real mother is. So it is very difficult to trace the antecedents of any one man, for during his childhood he may have passed into two or three different families by adoption, and many of them do not know who their mother is, much less their father, and matters are still further complicated by a custom of exchanging wives. This is often done when a man is obliged to make a long trip, and his wife from any cause is unable to accompany him. He will exchange with some friend who has an able-bodied wife, each entering upon their new relations with the greatest cheerfulness.

Polygamy is not common, being confined to the leading influential men; even then, they are taken into the family more as assistants for the first wife, as she rules over them, treating them as servants; the system is not popular among the women, and we knew instances where the first wife abandoned the iglu in a rage when a second was brought home.

When a man of matured years loses his wife, either by death or from incompatibility of temper, he selects one for himself, and that they sometimes use force to coerce them, when they have no near relations to protect them, I am well satisfied from an incident that occurred at the station. A native from a village to the westward, whose wife had left him, came up to Ŭglaamie to obtain another; one day we were attracted by loud outcries from a woman who had been waiting around the station for food, and upon going out to see what the difficulty was, we found our friend from Sidàru vigorously cuffing her ears, and it was some time before we could make him desist; as soon as she got free from him she ran off, and he explained that he wanted her for a wife, but that she was not willing to go with him, and he was persuading her. His courtship was certainly unique, and I never heard that he succeeded in winning the affections of an Ŭglaamie maiden, and it is but just to add that he was very unpopular among both men and women.

The tie of relationship binds them to deeds of kindness that they would not show to people outside of the family; if a brother dies the survivor takes the family to his iglu until he can find another husband for the widow, and we know of an instance where a man lost his wife, and his

UNALINA "PRINCE OF NUWŬK."

brother who had two (who were sisters) gave him one. Their efforts to get husbands for the widows of dead relatives were often very amusing. Mû'ñialu, a hunter employed at the station, was supporting his widowed mother, who was a great scold; he brought to his iglu several candidates for her hand, who had been induced to take the step by Mû'ñialu offering to make them presents provided they would take her, but a few days or weeks was about all the most patient could bear; after several trials and failures among the men of Nuwŭk and Ūglaamie, he finally gave it up, but on one of his trips to the eastward he brought back with him a Nunatáñ-meuñ from Colville; as he was quite deaf and could not understand the Ūglaamie language very well, her shrewishness had no effect upon him, and Mûñi was happy; he would laugh immoderately when talking about it; but never, through it all, was he disloyal to his mother; she always had a place in his iglu, plenty to eat, and was always treated with the greatest respect.

In the treatment of their aged and infirm parents, the example set by these people could well be followed by many of the more civilized nations to their advantage; they never forget the tender care they received in their childhood, and as their parents grow old and are unable to maintain themselves the children display the greatest devotion. The first fruits of the chase is freely given up to them, and no project undertaken without their approval; and in all things the son remains obedient to the father so long as he lives, and speaks of him with the greatest respect after his death. In their summer journeyings, should they wish to remain at home they fit them up a tent (tupĕk) in some pleasant locality, and leave them an abundant supply of provisions, but more often accompany them in their wanderings, being comfortably transported by sled or boat; but the old people are rarely idle, for while the father busies himself making new seal spears and nets the mother assists in providing clothing and boots and dressing skins. We often had our day's journey brought to a sudden termination by some old woman in the party announcing that it was time to go into camp because she was tired or cold, and nothing we could say would overrule her decision.

Owing to the exposure and hardships they are obliged to undergo in the struggle for existence they very rarely attain a very great age, and the majority by far die under the age of forty years, and a man at sixty becomes very decrepit. They have no means of keeping a record of their age, and it is generally calculated from some event connected with their history, as the coming of some ship, or a time of famine or pestilence. There was one man at Ūglaamie, on board H. M. S. Plover, Captain Maguire, in 1853 and 1854, who, Captain Hall (who was master under Maguire) informs me, was about thirty years of age when the Plover passed her winters there; at the time of our visit he was very decrepit, was bent nearly double, and crawled rather than walked, with a staff in each hand; his shriveled skin, toothless gums, and shrunken limbs gave him the appearance of great age, but he could have seen but little more than sixty years, if that. I met several who said they were children in Maguire's time, and they had every appearance of men of forty-five or fifty.

That the race is rapidly decreasing is shown by the fact that during the two years we were on the coast, in the village of Ūglaamie alone, there were eighteen deaths and only two births in a population of one hundred and thirty souls; and Dr. Simpson states that in 1854 the village had a population of over two hundred. He also reports forty iglus, while we found only twenty-six. At Nuwŭk, he reports forty-eight iglus, and two hundred and eighty-six people. We found this village had dwindled to thirty iglus, and less than one hundred and fifty people; and the freshly-cached bodies and numerous half-ruined iglus bore silent testimony to the fact that famine and disease had quite recently been at work. This is undoubtedly owing to the fact that the food-supply is rapidly growing less, and that the great number of whales taken off the coast by the American whaling fleet during the last twenty years has nearly exterminated that valuable animal. That they are decreasing in numbers is well known among the whalemen, and the fact that Dr. Simpson reports that during the time the Plover was at Point Barrow there were twenty-four whales taken by the natives, while only two were taken during our stay, one of which was a calf, goes to prove that they will soon be classed among the extinct mammals, and with them will soon pass away many of the people inhabiting this shore; they are slow to take up with an innovation, and they do not really adapt themselves to the new condition of affairs which the loss of this great food-supply has brought about. The seal are not numerous, and often leave this coast entirely for a season. When this occurs, famine with all its horrors is upon them, and they have no place to flee to for help. During the first winter at the station, food became very scarce, and scarcely a day passed but some poor native, with starvation written in every line of his face, hung around our doors begging for a mouthful of food. We gave them all we could spare with safety to ourselves, and undoubtedly saved many lives. Walrus hide and pieces of old boat-covers were considered delicacies, but we never knew them to resort to violence to obtain food, and cannibalism is looked upon by them with horror, and I could not find that a case had ever occurred. They will not even eat their dogs. Some seasons a few white whales (Beluga) are taken. The skins of this animal are in great demand for soles to water-proof boots, and often bring a high price.

Dr. Simpson reports that quite a number of narwhal were taken on the coast during the stay of the Plover, but I could find but one Indian that had ever seen one, and they are not common in this ocean at the present time.

Physically, both sexes are very strong, and they possess great powers of endurance; are capable of making long journeys on foot, with a very small allowance of food; in fact, when food is at all scarce, or while traveling, they never eat but once each day, and it was a surprise to us to see them when on a journey get out before daybreak, and, without taking a mouthful of food, make a journey of thirty or forty miles before breaking their fast; and they treated their dogs in the same manner, saying that they traveled better when fed only at the end of the day's journey; sometimes they would give them a mouthful apiece toward the middle of the day, but the practice was looked upon as bad.

The flint and steel is the most common method of procuring fire, using for tinder the down from the seeds of plants, impregnated with mealed powder or charcoal. Sometimes two pieces of iron pyrites are used, and we found the ancient fire drill still in use among some of the old, conservative men; the drill was a shaft of spruce eighteen inches long and three-fourths inch in diameter, the lower end terminating in the frustum of a cone, the upper end made to fit the socket of a stone rest that is held between the teeth; a block of hard wood with a small cavity in the center is used as a friction block; a small quantity of tinder is placed in the bottom of the cavity and the drill pressed down by the mouth-rest and turned rapidly with a small bow like a jeweler's bow. They are anxious to obtain matches, but they are not considered a necessity, and will not buy them as a rule. Flints are an article of traffic, and are brought from Cape Lisburne and the Romanzoff Mountains, there being none indigenous to this part of the coast. They believe that the pyrites come down from heaven in the form of meteors, and they call it fire-stone for that reason.

The children receive the tenderest care, and we never saw one punished by its parents. It is no unusual sight to see a child nourished at the breast until it is four or five years of age; this is especially the case with boys, who, as a rule, receive more care than girls. His food is carefully selected by his mother, and he is enjoined from eating certain articles that have been tabooed by some old woman, usually a relative; and this prohibition extends through life. With each individual there is always one or more article of food from which they carefully abstain, though the pangs of hunger may be upon them, and, as an old man expressed it, when declining a piece of bear meat, "It may be good for all men but me," shows the individuality of the custom.

To us the treatment the women receive during confinement seems harsh in the extreme, and it is a matter of surprise that either mother or child ever survives the ordeal. Several days before her confinement the mother is placed in a small snow hut, if in the winter, and in a small tent, if in the summer; no one is allowed to go near her, except her husband, who brings her food and passes it in to her without entering the hut. Here she remains entirely alone until the child is one moon old. Should the child die, then she can return to her husband and iglu after eight or ten days. No person will knowingly drink from the same cup or eat from the same dish that a woman has used during her confinement until it has been purified by certain incantations. And any woman who has suffered from premature childbirth, or given birth to a child during the winter, is allowed to go into a canoe or out into the pack during the spring. Premature childbirth is of frequent occurrence among them, and we frequently noticed the greatest solicitude on the part of the husband to guard the wife from any accident during pregnancy.

A NATIVE OF NUWŬK, POINT BARROW.

During the long winter night, when food is plenty, they delight to meet at the council-house, or at different iglus, and over their work recount, recall, different events of their lives, and repeat the legends of their race, which have been handed down from father to son, to which the young people listen with rapt attention. These legends go back to the origin of man, and they tell with care full detail of a time when there were no men in all the land, but that a spirit called "á-sé-lu" dwelt here alone, and that he made the image of a man in clay, set it up by the shore of the sea to dry, and after it was dry he breathed upon it and gave it life and sent it out into the world. And he called the dog from a long way off to go with man, that he might have help in traveling. After a time the spirit made the Tuk-tu (reindeer) and sent him out into the land, and the teeth of the deer were like the teeth of the dog. After many days man came to the spirit and said, "The deer is bad, he devours man." Whereupon the spirit called in all the deer and removed all the front teeth from their upper jaws, since which time men have lived on deer, and the deer have lived on moss and grass. Then the man asked the spirit that there might be fish in the rivers and sea. And the spirit took a piece of pine and a piece of balsam and sat by the river where it emptied into the sea, and he whittled long shavings from the pieces of wood, and the shavings fell into the water, and the shavings from the yellow wood became salmon, and those from the white wood became whitefish and swam away.

Their faith in these legends is very strong, and they are extremely opposed to any expressions of doubt or ridicule, and it is only by gaining their confidence and abstaining from any expressions of doubt in their presence that they can be induced to talk about their people or repeat their legends. We heard but one legend that referred in any way to the regions to the northward. It was said that many generations ago a man from Nuwŭk was caught in the moving pack that was setting to the northward so rapidly that he was unable to return to the land. After a great many days, more than he could count, he came to a land where dwelt a strange people; they spoke a strange language, and dressed in deer skins like the inyu. He remained with them a long time, but, wishing to return to his people, he left them one winter and started south over the ice, living upon the seal he caught by the way, and renewing his boots with their skins. The journey was so long that he wore out fifteen pairs of boots in returning to Nuwŭk. Dr. Simpson reports a similar legend told him during his stay.

They all have a natural craving for rum and tobacco; it is always the first thing they ask for when they come to trade, and they are never satisfied unless they can get sufficient rum to make them dead drunk. The old men deprecate its use, and will tell how bad it is, and how certain men were killed in drunken fights, and will be very strong in their denunciations of its use so long as they cannot get it, but generally fail to resist the temptation when it is offered to them, or an opportunity occurs for them to get it. Fortunately there is but little to tempt the trader to this region, and the little they get from the whale ships is consumed on the spot, so there is no drunkenness after the sea is closed. Their tobacco they hoard carefully, and it is used by old and young in quantities only limited by the supply; they prefer a black-leaf Russian tobacco, but this is hard to get, as only small quantities of it reach this coast by the way of Behring Straits and the Diomede Islands. Next to this they prefer the black navy-plug of the commonest kind. Men and women both smoke and chew, and the children are given tobacco in their earliest infancy. It is no uncommon sight to see a child not old enough to walk lying asleep with its cheek distended with a huge chew, or to see a woman with an old quid behind each ear which has been thoroughly masticated, and put up to dry, for the future use of her lord and master. Chewing does not seem to have the slightest deleterious effect upon the children, while smoking affects the men very seriously. Their pipes are made of either stone, wood, or ivory, and consist of a flanged bowl, from one and one-half to two inches in length, with a bore one-fourth of an inch in diameter, attached to a curved wooden stem made from two pieces of wood grooved and lashed together with seal thong; the bottom of the bowl they fill with deer hair and place on top of it a piece of tobacco about the size of a pea. It is all consumed at one whiff, and they hold the smoke in their lungs until they become nearly suffocated; a violent fit of coughing follows each smoke, and with the old men it frequently so prostrates them that they are quite unable to walk for some little time after each indulgence. From what the old men told us, and from some ancient stone pipes found in the ruins of ancient iglus, it would seem that they smoked before tobacco was known among them, and they used a kilikinick made from the catkins and bark of the arctic willow, which they now use to adulterate their tobacco. They all seem to have a natural appetite for this weed in any form. The men would often beg the privilege of cleaning the deposit from the stem and bowls of our pipes, which they ate with great relish, and, strange to say, without being nauseated in the slightest.

That these people have not yet made the transition from the stone to the iron age is shown by the large number of stone and bone implements still in use among them at the present time. Many of the old conservative men still cling to the habits of their fathers, and believe that stone arrow and lance heads possess virtues that makes them superior to those made of iron. They still teach the young men the art of chipping flint, and over their work tell them of the happy days before the white men came to drive away the whales and walrus, and when food was always plenty. An old man, when asked what he would do without the things the white men brought them, answered it would be very hard, and then to show us what he could do he showed a pair of boots he had on, and told us with great pride how, when his boots gave out while hunting, he killed a deer, made a needle from a piece of his bone, thread from the sinew, and made himself a new pair of boots from the skin, and asked, Could a white man do that? In the spring of 1883, when they came to prepare their boats for whaling, they decided after many grave debates that the bad luck of the previous year was owing entirely to their having equipped their boats with white man's gear, of which they had abundance, obtained from wrecked whalers; so it was decided that they would go back to the implements of their fathers, and the old ivory and stone harpoon and lance heads were brought forth and repaired, and that they took one whale was attributed entirely to this change; the fact that the whale was killed by a shot from a bomb gun we loaned them to the contrary notwithstanding.

From the head of Kotzebue to the mouth of the Mackenzie there is not found any timber of any size indigenous to that region, and the Colville, Ĭk-pĭk-pûñ, and Meade River bring down no drift of any size, only the arctic willow. The drift cast up by the sea consists chiefly of spruce, birch, and poplar; it often comes ashore with the bark and roots intact and but slightly water-worn. That this drift comes principally from the Mackenzie is shown by the fact that it is found in great abundance to the eastward of Point Barrow, while to the west of it not so abundant. We occasionally saw large trunks of trees, from two to three feet in diameter, stripped of roots and branches, generally of cottonwood, which seemed to have been a very long time at sea. What little drift we saw coming from the westward was always old.

The streams that have their source in Meade River Mountains bring down no drift larger than the arctic willow, and we saw no drift along the arctic shore that resembled that from the Yukon, found along the shore of Norton Sound. The natives in the vicinity of Point Barrow are always on the lookout for pieces of drift wood, and every piece that can be utilized in building hut or boat is at once marked and placed above high water. At leisure they work them down to the size required, stick them up so as to show above the snow in winter, when they are hauled to the iglu and placed on the cache. It is often a work of from three to five years to accumulate enough timber to construct a boat or iglu. Every cache shows a store of neatly dressed sticks, that are highly prized, and that have a commercial value.

In the small inlets along the coast drift wood was found from ten to fifteen feet above the high-water mark of the sea, and at first we were led to believe that such drift represented an unusually high tide, but we subsequently learned that it was caused by the heavy ice pack, which, in the winter, is forced in on the land by the violent gales, and makes a dam across the entrance to the inlets. The water from the melting snows in the spring fill up the inlets and finds no outlet until it overflows this barrier, when, running down rapidly, it leaves the drift high above the sea level.

These openings, seen in the early summer, have often been mistaken for the mouths of rivers by people passing on ships. It is very doubtful if this vast stretch of country contains anything that will ever render it of any commercial value to the world. But on our voyage south we were struck with the fertile appearance of the Aleutian Islands where we halted for a few days to repair our vessel. On the island we visited, though late in September, we found a luxuriant growth of grass still untouched by frost. All the islands we saw were high and rolling, intersected by beau-

UNALASKA.

tiful valleys, watered by streams that abound in excellent trout. They were destitute of timber, but we could see no reason why they should not be valuable as grazing lands. The climate is similar to that of Ireland, and in about the same latitude; the lowest recorded temperature in seven years is —6° F., and the annual mean is.

The great Japan current gives to these islands a climate peculiarly mild and equitable for so high a latitude, and I think a careful geological and geographical survey would develop valuable resources.

II.

APPROXIMATE CENSUS OF ESKIMOS AT THE CAPE SMYTHE VILLAGE.

[Each brace includes one household. A dash indicates that the person's name was not obtained.]

Man.	Wife.	Male children.	Female children.
Nĭk-a-wá-a-lu.	At-kak-sá.		Nĕt-tû-pûñ.
O-we-ĭ-nä.	———	Ä-lĭ brá ru.	
Pú-kä.	Nĕ't-ú-lu.	———	
A-ka-bĭ-ä-nä.	Ä-lĭ-bra-nä.		
(Ĭ't-ú-ma-lu, deceased.)	Mä mûñ-ĭ'n-ä.		Yu-kû'l-ya-lu.
Tá-gaⁿ.	———	Seak-a bwu'n ä.	
	———	———	
Ăm-ai yú-lä.	Seak-a-bwûn-ä.		
	(Iñ-kăg-i cá, mother-in law.)		
Kai-yá-nä.	Säg-wa-dyu-ä.	Ĭ gû cä.	
Túñ-a-zu.	Ak-sĭ-gû't-tä.	Añ nú iw. [illegible]ä.	
Añ-nú'k-sä.	Pû'-si-myú.		Mûl-i-gi-á-ra.
A-bă'k-ka-ná.	Mû't-u-mi-ä.	Mûn i k-si.	
Ai'-bwûk.	Paú-sĕn-ä.		
Taú-yu'-ä.	———	———	
I-ga-lá.	Añ-nú'bw'-gä.		
Kú-ma-sia.	Ĭ-dro.		
Ăk-qlá-nä.	Al-á-li.	Kût-yĕ.	———
A'ñ-o-ru.	Ni-ăk sá-rä.		
Tú-kû.		Kĕ-pĭ'ñ a su.	Ĭ'd-ri-gû ti-ä.
Teuñ-añ-rä.	———		I g-nĭ-bĭn-ä.
U-já-lu.	Ĭa-xo-xú'n-ä.		
Yö'k-sa.	Áñ nig-ä-la.	Ĭ-tá qlu.	
		———	
I-ga-la-tĭ ä.	———		
Ir-ĭ ti-ä-la.			
Mú'ñ-ĭ-a-lu.	Ka-ka-gu-nä.		Pĕ-gá+-lu.
A-pai-dyá-o.	Ku ná-nä.		
I-lû'bw'-gai.	A-ke b ú xû.	———	
Añ-o-ai-já.	———	———	Tĕ r-ĭ'g'-lu.
Nû'g-ĕ-ru.	———	Ĭ n yu ti ä.	Pĕ gá+-lu.
Tû'k-a-lûñ.	Súk-sa-nä.		
U-já-lu.	Túok-qlûñ.		N i-ta.
			———
			Ki ñ a-lu-ku-ná.
Ýu-wai-á-lu.	Al á-li.	Ku ná lu.	
Yu-wai a-lá.	A l-a-lu.		
Nĭ-a-yu.		Kĭñ'a.	Ad-wú'n-ä (adult).
Äd-yu lu' ä.	———	Ĭ'n-yu-ti ä.	
Sĭ-sa-nä.	Ku-sĭ brú nä.		
Áñ-o-a.	Tai-pa-nä.	Ĭ't tú.	Kúd li lu.
	(——— mother-in-law.)	———	
Áb-wûm-lĭñ.	———	Kok'-la.	
Ád-yĭ-gi-ä.	Ú-su.		Kĭb-vä.
Kúg-rau-tä.	———	Ko-ko-lĕ'n ä.	
		Pûn-ĭ-yú-nä-yu.	
Käx-yo-lĭ'n ä.	———		
	Mû't-u-mi-ä (wife's sister).		
(Näga-waú-rä, deceased.)	———		
Nĕ't-ú-na.	———	———	
A-bă'k-ka-ná.	Á-no-u.	———	
A-múp-ka-ná.	———		
Kă'k-ăk-pa.	Nĭ'p pĭñ.		
Ad-rĭ-gaúd'-lo.			
Pau-yú-nä.	Kú-pi-dro.	———	
(Ne-cä'g-a-lo, deceased.)	A-tûñ-ú'n-ä.		
	Ni-yu-ĭ-sú'n-ä.	Ĭs-ĭ-gai-ú'.	
	Tuok-qlûñ.		
	Nu-syûñ-ĭ'n-ä.		

Totals: 45 men, 52 women, 27 boys, 14 girls; in all, 137 souls.

MEASURES AND WEIGHTS OF THE ESKIMOS OF CAPE SMYTHE AND POINT BARROW.

[Collected by George Scott Oldmixon, acting assistant surgeon, United States Army.]

No.	Name.	Age.*	Height. Ft.	Height. In.	Weight. Lbs.	Occipito-frontal circumference. Inch.
	MALES.					
1	O-re-i-nä	30	5	6	161	23
2	Añ-o-ru, "Big"	45	5	7½	182	23¼
3	Áñ-núk-sä	35	4	11	126	22
4	U-jä'-la	26	5	2	142	22½
5	U-na-li-nä	32	5	7¾	171	23
6	A'ñ-o-á	50	5	7½	186	23½
7	Sa-pin-yá-o	30	5	7¼	146	22½
8	Tá-gaⁿ, "Shadow"	30	5	0½	145	22
9	Yú'k-siñ-a	65	5	2	147	23¼
10	Nĕt-tú-ná	33	5	7	156	22
11	Nú'g-ĕ-ru, "Antlers"	40	5	5	150	22¼
12	Tu-kü, "Walrus-harpoon head"	40	5	0¾	146	22
13	Yö'k-sa, "cheek"	20	5	3	143	20¼
14	Näg-a-wañ-rä, "Little Näg-a-wü'n-ä"	35	5	3½	149	20½
15	Ab-wúm-ïñ	40	5	0	135	19
16	A-bä'k-ka-ná	23	5	5½	159	23
17	A-mup-ka-ná	33	5	8	165	22¼
18	Ì-tú-ma-lü	40	5	2	137	20¾
19	A-bä'k-ka-nä	20	5	5½	156	22½
20	U-já-ra	50	5	5½	154	22¼
21	Nu-cún-ï'n-ä	45	5	3	170	23
22	At-ká-nä	20	5	3¼	137	20¼
23	Nïk-a-wá-a-lu, "Big Näg-a-wü'n-ä"	45	5	6½	161	22
24	Mü'ñ-ï-a-lu	28	5	6	148	22
25	Sí-na, "Beach"	40	5	5	149	22½
26	Nä's-su-ä	35	5	4½	144	21
27	U-já-lu	30	5	7¼	161	22
28	Yö'k-sa, "Cheek"	30	5	7¾	174	22½
29	I-gä-la-tï-ä, "Little Igalá"	35	5	6½	138	20½
30	Äm-ai-yü-nä	40	5	4	163	20¼
31	Nïk-a-wá-a-lu, "Big Näg-a-wü'n-ä"	45	5	8¼	173	22
32	Áx-lo, "Grampus"	55	5	7½	204	22
33	Añ-na-ti-na	55	5	7	147	21¼
34	Túñ-a-zu	35	5	6	155	19
35	Pú-kä	23	5	2	131	19½
36	At-ká-nä	22	4	11½	132	19
37	Tcuñ-aú-rä, "Beads"	60	5	2¼	132½	19½
38	I-ga-lá, "Window"	40	5	5¼	147	22½
39	Paú-yu-nä, "Sooty"	35	5	4	169	21
40	Näg-á-wü'n-nä	48	5	6½	151½	22
41	A-pai-dyá-o	22	5	3½	136	21½
42	Nau-já-li	23	5	5¾	165	22
43	I-péak-sï-na	45	5	8¾	188	23¼
44	A-túñ-aú-rä	30	5	0	130	21¼
45	A-pai-dyá-o	45	5	3½	160	21½
46	Nud'-lúñ	36	5	4	156	21
47	A-bä'k-ka-ná	27	5	3	147	21¾
48	Áñ-a	19	5	3½	144	22
49	Säg-ä-bwaú-tyä	38	5	4	137	20¾
50	Yú'k-sïñ	25	5	4¾	166	21¾
51	An-ät-ká-nä	20	5	4	149	21
	FEMALES.					
1	Ni-ăk-sá-rä	35	5	3	148	22½
2	Pü'-si-myú	26	4	10	124	22½
3	Mú-múñ-ï'n-ä	30	5	1½	131	21¾
4	Taí-pa-nä	26	5	1	139	20½
5	A-sï-saú-nä	25	5	2	128	20
6	A-lá-li	30	5	3	172	22¼
7	U-nï-rí-ma	40	4	10	130	21¾
8	Á-no-u	35	4	0½	100	18¼
9	Á-lä-ri-ä	35	4	8½	120	20
10	Sü'k-sa-nä	25	4	9	124	19
11	A-na-rï't-tï	30	5	2	152	21¼
12	Ak-sï-gü't-ä	33	5	3	156	20½
13	Nu-ta, "Young"	40	4	9	144	19½
14	Ni-yu-ï-sú'n-ä	28	4	10½	142	21
15	Mú't-u-mi-ä	18	5	0	127½	21¼
16	Túd-wi-a-lu	27	5	1¾	148	20¾
17	Sur-wĕ'n-a	35	5	0	132	18¾
18	At-kak-sá	28	5	2¾	146	19
19	Nĕ't-ú-lu	23	4	1½	150	18½
20	Ku-mï-yĕ'-nä	30	5	1¼	143	19
21	At-ká-nä	20	5	2	127	19¼
22	Sĕ-mí-ya	40	5	0½	122	20¼
23	Ku-ná-nä	18	4	11	117	21
24	Säg-wä-dyú-ä	20	4	11½	106	22
25	Kak-a-gú-nä	22	5	1	135	21
26	Tai-pĕ-rú-nä	38	5	0½	139	20½
27	A-túñ-ú'n-ä	20	4	9	128	20¾
28	Tuok-qlûñ	28	5	3	153	20¾
29	Pú'n-ïk-púñ	22	5	2¼	148	22
30	Äk-pa-lú	23	5	2	141	22

*Estimated.

Average height	5 ft. $2\frac{113}{324}$ in.
Average weight	$146\frac{76}{81}$ lbs.
Average height of males	5 ft. $3\frac{21}{204}$ in.
Average height of females	4 ft. $11\frac{61}{90}$ in.
Average weight of males	$153\frac{29}{51}$ lbs.
Average weight of females	$135\frac{11}{15}$ lbs.
Tallest male	5 ft. 8¾ in.
Tallest female	5 ft. 3 in.
Shortest male	4 ft. 11 in.
Shortest female	4 ft. 0½ in.

III.

VOCABULARY COLLECTED AMONG THE ESKIMOS OF POINT BARROW AND CAPE SMYTHE.

[This vocabulary is arranged according to the schedules given in the second edition of the "Introduction to the Study of Indian Languages," by Maj. J. W. Powell. The alphabet (which will be found on page 87) used in writing the words is that given in the same work, with the addition of the character ö for the sound of the French *eu*. A sound indistinctly or occasionally heard is put in parentheses.]

English.	Eskimo.
Persons.	
1. Man.	áñ-un.
2. Woman.	áñ-na.
3. Old man.	añ-aid-yo-kwák-to, -sä.
4. Old woman.	a-ko-ák-sa.
5. Young man.	nu-kŭ't-pi-ä.[1]
6. Young woman.	ni-vi ŭ'k-sï-a.
7. Boy.	nu-kŭt-pi-á-ru.[2]
8. Girl.	ni-vi-ŭk-sá-ru.[3]
9. Child, able to walk.	mŭk-qlŭ'k-to.
10. Child, creeping.	pá-mök-tu-ä.
11. Infant, nursing.	mŭk-qlŭk-to-a-yá.
12. Male infant.	añ-u-tï'k-sa.
13. Female infant.	añ-nŭ'k-sa.
14. Twins.	mád-ri ïñ, mád-re-ru ä, a-no-kŭ't-i-gĕ.
15. Married man.	ŭ-lïñ-a.
16. Married woman.	nu-lï ŭ'ñ-ä.
17. Widower.	nu-lï ŭ k-so.
18. Widow.	nu-lï-ŭ'k-sŭñ, u-i-dï-ŭ'k-to.
19. Bachelor (old).	nu-lï-gŏ't-to.
20. Maid (old).	u-wi-gŏ't-to.
21. A mother.	öñ-ni'a-rä.
22. The young people.	u na-nu tï'-kun.
23. A great talker.	u-ka-lú-tu-ru.
24. A silent person.	i-mŭñ-i-ä'k-to, ma-kï-ma't-tu-a.
25. Thief.	tïg-a-li-a-yŭ'k-tu-o.
26. An active person.	yŭk-ï't-yu-ä.
27. A lazy person.	yŭk ï-a-su-ru ä.
28. A fair Eskimo.	mi-su ĕ't-yu-ä.
29. A name.	át-ka.
Parts of the body.	
1. Head.	ni-ŭ'k-o-ä.
2. Hair.	nu't-yĕ, mï't-ko.
3. Crown of the head.	nu-yŭ'g-i-a.
4. Scalp.	ki-si á.
5. Face.	kï-na.
6. Forehead.	kau.
7. Eye.	ï-dlu.
8. Pupil of the eye.	tŭ'k-u-vi-ä.
9. Eyelash.	kïm-mĕr-ïd-yĕ'n.
10. Eyebrow.	kă'b'-lun, kă'b'-lu-ï.
11. Upper eyelid.	káñ-a, ïr-rïp-kód-lä.
12. Lower eyelid.	ïr-rï-bŭ't-a.
13. Ear-lobe.	a-ki-á-go-a, pú-wa.
14. Ear.	sï-u, pl. sï-u-tïn.
15. Perforation in ear.	pu-tú-ä.
16. External opening of ear.	cub'-lú-a.
17. Nose.	kï'ñ-a.
18. Ridge of nose.	núñ-a.
19. Nostril.	kïñ-un.
20. Septum of nose.	pi-tú-ta, kŭ'k-i-vi-a.
21. Perforation of septum of nose.	pu-tu-gá.
22. Alae nose.	at-kát-yu.
23. Cheek.	yiök-sa.
24. Beard.	kŭ-kŭg-lú-ĕ-tïn.
25. Moustache.	úm ñyïn.
26. Mouth.	káñ-a.
27. Upper lip.	u-mi-drú-ïn, úm-ni.
28. Lower lip.	kák-quñ.
29. Tooth.	kï'g-u, kï'g-u-tai.
30. Tongue.	ó-ka.
31. Saliva.	nú-wa, mï'-wŭñ.
32. Palate.	kï'l-ta, u-kaú-ra.
33. Throat.	túák-qlu-ra.
34. Chin.	táb'-lu-a.
35. Neck.	kuñ-a-si-na, kăk-éa-lu.
36. Adam's apple.	tup-kú-ra.
37. Body.	ká-ti-gai.
38. Shoulder.	tu-ïn-yä, twï-twï'n-yă, nïg-ä-blú-ä.

English.	Eskimo.
Parts of the body—Continued.	
39. Shoulder blade.	kï-a-sï-a.
40. Back.	tu nú a.
41. Breast of a man.	i-bi ŭ'ñ-ni ä, sŭ't-ka.
42. Breast of a woman (mamma).	mï'l u.
43. Nipples.	múdr' ga.
44. Hip.	múk-ï-sá.
45. Belly.	nád-dra.
46. Navel.	kul a-si-a.
47. Arm.	tud lï a.
48. Armpits.	úñ a.
49. Arm above elbow.	ák-sút kwa.
50. Elbow.	ï ku si-a.
51. Wrist.	ï'n-ni brún nŭb gu-ŭ'ñ-a.
52. Hand.	á drï gai.
53. Right hand.	tŭl ŭ k-pi-ä.
54. Left hand.	saá mi ä.
55. Palm of hand.	ï t u-ma.
56. Back of hand.	a-drï gau tu-nu-a.
57. Fingers.	ï'n yu gai
58. Thumb.	kúb' lu.
59. First finger.	tïk ï rá,-tï'k-a(l).
60. Second finger.	ka-tŭ k qluñ.
61. Third finger.	mik ï l yĕ ra.
62. Small finger.	yiŭ kut ko.
63. Finger-nail.	kú-kin.
64. Knuckle.	nab-vu dlu.
65. Space between knuckles.	ná-lïk-kï.
66. Finger tips.	nú-bu-a.
67. Rump.	núd'l-u.
68. Leg.	nï-uñ ä.
69. Leg above knee.	kök-pa.
70. Knee.	sit-kwuñ a.
71. Knee-pan.	sït-kwa.
72. Leg below knee.	kúm-a-gá.
73. Calf of the leg.	na-ka-súñ-nä.
74. Shin.	kïñ-a.[4]
75. Ankle.	si-sï ñ ne-rïñ, sïñ-nï-ŭ'ñ-nĕ-rïñ.
76. Ankle-bone.	kú'm-a.
77. Instep.	kö ni.
78. Foot.	ï's-ï-gai.
79. Sole of foot.	al-ú-a, al-ú-na.
80. Heel.	kï ñ-mi-ä.
81. Toe.	pu-tu-gú-a.[5]
82. Large toe.	pu-tu gú-a, tud-lï-á.
83. Second toe.	tïk ï rá.[6]
84. Third toe.	mï k ï l-yé-rá.[6]
85. Fourth toe.	yïuk-ut-ko.
86. Toe-nail.	kú-kin.
87. Blood.	au.
88. Vein or artery.	tú'k-kŭñ.
89. Brain.	káx-za.
90. Bladder.	nä ka su(n).
91. Caul.	ká-pis-i yŭñ-ä.
92. Heart.	ú ma-ta.
93. Kidney.	tăk-tu.
94. Lung.	pú-wi.
95. Liver.	tï'ñ-u.
96. Stomach.	a-ké-a-xo.
97. Rib.	túd-lï-múd-rïn.
98. Vertebræ.	pï'k kwiu.
99. Spine.	ku-ya-pï k-kŭn.
100. Sternum.	sŭ'k ï ŭñ ïñ.
101. Clavicle.	kú-tú ä.
102. Humerus.	ák-sat-ko-(a).
103. Femur.	kúk-tu-ä.
104. Radius and fibula.	a-mï'l-ya-rŭñ.
105. Ulna.	sŭk-ï'b ru-ta.
106. Foot-print.	tú-min ? pl. tú-mai.
107. Skin.	á-mia.
108. Bone.	saú-nä.
109. Intestines.	i-na-lu-úñ a.
110. Penis.	ŭ-su, u-sú-ä.
111. Vulva.	út-yu.
112. Fist.	yá-kït-kai.

[1] "Youth."
[2] Dim. of "youth."
[3] Dim. of "young woman."
[4] Same as nose.
[5] ï'n-yu-gai toes, = fingers.
[6] All natives do not give names for these toes. These correspond to the names for the fingers.

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

English.	Eskimo.
Dress and ornaments.	
1. Cap attached to frock.	n[illegible]-s-ū.
2. Tunic.	a ti-[illegible]-ge.[1]
3. Outer tunic.	ka-lu-ru-a.
4. Inner tunic.	[illegible]-lu-pá.
5. Knee-breeches.	k[illegible]-k-a-lix.
6. Fur socks.	a-lak-sin.
7. Pair of moccasins, reaching to knee.	ka-m[illegible]-n-ūñ.
8. Pair of moccasins, reaching to knee, water-proof.	yu-k[illegible]-k-glūñ.[2]
9. Shoes.	ki-b[illegible]-a-ty-i-ā.[3]
10. Woman's moccasins.	ka-m-muñ.[4]
11. Girdle.	ta-pe-se.
12. Rain-frock, of walrus-gut.	s[illegible]-n-a.[5]
13. Mittens, deerskin.	at-ka-t[illegible].
14. Mittens of bearskin.	pu-a-lu.[6]
15. Gloves.	ad-li-[illegible]-ri-n.
16. Blanket.	ú-n[illegible]-ru-a.
17. Robe of deerskin.	[illegible]
18. Buckskin.	ye-[illegible]-k-sa.
19. Fringe of skin.	[illegible]-ka.
20. Sinew.	ne-[illegible]-u-a.
21. Thread (of sinew).	[illegible]-la.
22. Paint, black lead.	mi'ñ-un.
23. Tattoo marks.	tab-[illegible]-tin.
24. Pouch.	puk-[illegible].
25. A ring.	ka-tu-k-qie-rañ.
26. An earring.	[illegible]-g-lu.
27. Labret.	tu-ta.
28. Barehead.	n[illegible]-su.
29. Barefoot.	u-se-[illegible]-su, u-sī-lák-to.
30. Naked.	mut-[illegible]-ák-to.
Dwellings.	
1. Village.	[illegible]-yu-gi-u-k-to, ĭ'g-a-lon.
2. Wigwam (permanent dwelling).	[illegible]-lu.
3. Doorway.	p[illegible]-ñ, [illegible].
4. Wooden trap-doorway.	k[illegible].
5. Smoke hole.	pu-[illegible]-k-o-vi-a, i-gát-ik-la.
6. Fire-place.	[illegible]-a-ga-run.
7. Fire.	[illegible]
8. Fire-wood.	kau-u[illegible]-tá-kin.
9. Blaze.	ka-mūn-i-su-a.
10. A light.	[illegible]-a-ru-a.
11. Living coals.	ki-rik-tu-ga.
12. Dead coals.	[illegible]-é-to.
13. Ashes.	kau-ni-ú'm-na-rīñ.
14. Smoke.	[illegible]-ik.
15. Soot.	[illegible]
16. Poker.	[illegible]-g-nia-kun.
17. Bench or bed-place.	[illegible]-g-la-ré, ĭ'g-li-sin.
18. A post.	[illegible]-k[illegible]-a-rūn.
19. Ridge-pole or joist.	tu-run.
20. Roof.	k[illegible]-sīñ.
21. Wall.	kát-ye.
22. Short beams below window.	[illegible]-kań-rín.
23. Opening for window.	i-ga-lá.
24. Window-frame.	k[illegible]-lu.
25. Window-stretchers.	[illegible]-rt-kuñ.
26. Window-skin.	[illegible]-a-lu.
27. Floor.	pān-[illegible]-k-sā, nát-kyīñ.
28. Pole hung up for drying clothes.	i-máv-wīñ.
29. Frame for same.	[illegible]-ni-tūn.
30. Lower frame for same.	[illegible]-nī-sat-yá[illegible].
31. Lodge (temporary dwelling) tent.	tu-pek.
32. Bed.	si-ni'g-wi.
33. Snow house.	a-pú-yā.[7]
34. Little house.	ĭ'g-lo-yu, ĭg-lú-rā.
35. Little tent.	tu-pe-'k-o-yu, aú-rūk-tú, ka-lox-wīñ.
36. Sewing-tent.	sud-li-vwīñ.
37. A ladder.	tu-mai-kún.
38. A stone.	u-ja-rūñ.
39. Spring.	[illegible]-ak-su-ĭn.
40. Water.	[illegible]-mé-ak, i-mūk.
41. Passage-way.	ap-ko-át-tä, kaī-nīt-tīn.
42. Trail or path.	áp-ko-tin.
43. Seat, chair.	ĭt-si-bān-tīn.

English.	Eskimo.
Implements and Utensils.	
1. Bow of wood.	pi-zī'k-sī.
2. Bowstring.	nu-kă'k-ta.
3. Sinew on back of bow.	kă'k-u-tai, kám-ni-gai.
4. Arrow.	kă'k-a-ru.
5. Notch in end of arrow for bow-string.	ág-glu-a.
6. Notch in end of arrow for arrow head.	ĭ't-er-o.
7. Arrow-head of stone.	kú-kin.
8. Arrow-head chipper (made of horn, &c.).	kĭ'g-li(x).
9. Point of arrow-head.	ĭ'g-ni-ä.
10. Arrow shaft of wood.	i-pú-a.[8]
11. Arrow feathers.	su-lú-in.
12. Quiver.	pi-zī'k-si-zaq.
13. Quiver strap.	mú-n-nau-ta.
14. Wrist-guard.	mú'n-gĭd-zīñ.
15. War club, small.	ti-g-a-lun.
16. Sling shot.	tu-b-lu-kúñ.
17. Fish spear.	kak-i-bu-a.
18. [illegible] shaft.	n[illegible]-yă'k-pai.
19. [illegible] lance.	k[illegible]-p-un.
20. [illegible] lance.	pú'n-nú.
21. Seal harpoon (stabbing).	ú-nú.
22. Head of same.	nań-lú.
23. Line of same.	tá-kăk-tīn.
24. "Loose shaft" of same.	i'-gi-mú.
25. Fore shaft of same.	ka-tú.
26. Wooden shaft of same.	i-pú-ä.
27. Lines on the same.	sa-bro-mi-a.
28. Ivory [illegible]-pick of same.	tú-u.
29. Seal harpoon darting.	nań-lī-gú.
30. Head of same.	nań-lu.
31. Short "loose-shaft" of same.	i'-gi-mú.
32. Heavy fore shaft of same.	u-ku-maī-lu-ta.[9]
33. Short line to "loose-shaft" of same.	ĭp-i'-u-ta.
34. Long wooden shaft of same.	i-pú-ä.
35. Lashing of same.	nīm-xa.
36. Ivory [illegible]-pick of same.	tú-u.
37. Ivory finger-rest of same.	ti-k[illegible].
38. Ivory peg for line of same.	k[illegible]-le-bwīñ.
39. Bone seal spear head.	a'k-[illegible]-li-gúk.
40. Head of walrus harpoon.	t[illegible]-kú.
41. Whale harpoon.	[illegible]-úñ.
42. Head of same.	k[illegible]-a-gron.
43. "Poke" for same.	a-[illegible]-o-tú'k-púñ.
44. Line or rope.	á-k-qlu-na.
45. Knife of stone.	u-[illegible]-úm-i-ga.
46. Knife handle.	i-pāñ-a, sá-vik-i-pú-ä.
47. Woman's round knife.	u-l[illegible]-ra.
48. Sling.	[illegible]-lu.
49. Bird bolas.	k[illegible]-l-au-wī-tań-tīn.
50. Canoe, single.	kar-a (k).
51. Large skin-boat.	ú-mi-ä (k).
52. Paddle.	áñ-un.
53. Mast.	n[illegible]-pák-sä.
54. Sail.	tīñ-ī-di-aú-tä.
55. Harpoon rest.	kú'n-nú.
56. Canteen made of seal skin.	i'-mu-tīn.
57. Fish-line.	ĭp-i'-u-ta.
58. Fish or seal net.	kú-bra.
59. Fish-hook.	n[illegible]-k-sīn, i'ük-qlúñ.
60. Net for catching fish.	sá-p-o-tīn.[10]
61. Pipe.	ku-i'n-yä.
62. Pipe of stone.	ni'-a, si-u-na.
63. Pipe stem of wood.	i-pú-ä.
64. Sledge.	ka'm-o-tīn.
65. Flat sledge.	[illegible]-ä.
66. Dog-harness.	[illegible]-un.
67. Seal-dart.	ku-ki-gú.
68. Snow-shovel.	pi'k-sun.
69. Walrus harpoon.	u-nak-púk.

English.	Eskimo.
Wooden-ware.	
1. Cup or dipper.	i'-mo-syú.
2. Meat tray.	i'-li-bi-ä, nú'l-u-ĭn.
3. Bowl.	pi't-túñ-o.
4. Fire-drill.	ni'-o-o-tīn.
5. Bucket.	kút-aú-ä.

[1] "parka," Russian territory.
[2] Lit. "sealskins."
[3] Deer, or sealskin.
[4] Trousers and shoes in one piece.
[5] f. silā, "weather."
[6] Also of dogskin for children.
[7] apun = "snow."
[8] "Shaft" in general.
[9] "Weight."
[10] Set-net.

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

English.	Eskimo.
***Wooden-ware*—Continued.**	
6. Tub (large).	ī̆l-u-lī̆'k-pūñ.
7. Tub.	kád-lī-vwīñ.
8. Tub.	kăk-ī-tá.
9. Tub (urinal).	kú-o-vwīñ.
10. Oil tub.	ŭ'k-si-vwīñ.
11. Deep dish for cooked meat.	u-ré-nea-vwīñ.
Stone implements.	
1. Adze.	úd-lī-mau.
2. Knife-point.	ī'g-ni-ä.
3. Knife-edge.	ki'-na.
4. Scraper.	i'-kun.
5. Borer.	i'-taun, i'-tŭg-et-sau.
6. Curved knife for wood.	mī'd-līñ.
7. Curved knife for ivory.	sa-vīx-rón.
8. Whalebone tool.	sá-vix-ŭ.
9. Lamp.	kód-lö.
10. Bridge or partition in lamp.	sá-po-tīñ.
11. Blubber stick for lamp.	i'-pĕk-tŭn.
12. Kettle.[1]	út-ku-zīn.
Utensils of shell, horn, bone, &c.	
1. Horn cup.	i'-mo-syŭ.
2. Horn ladle.	kīl-ī-yŭ-tŭ.
3. Fossil-ivory dipper.	kīl-īg-wŭ'g-a-ro.[2]
4. Ivory oil-cup.	ó-ho-vwīñ.
5. Ivory needle case.	ú-ya-mī.
6. Bow-drill of bone.	ni-ă'k-tun.
7. Drill-bow.	pi-zīk-su-á.
8. Drill mouth-piece.	kī'ñ-mi-ä.[3]
Food.	
1. Food, meat.	n'ia-kĕ.
2. Soup.	u-ī't-yu-a n'ia-kĕ.
3. Milk.	i'-muñ.
4. Juice of meat.	úk-lĕ-ru.
5. Whale skin.	mŭ'k-tŭk.
6. Juice of meat cooked.	ŭ-run.
7. Whale's gum.	mŭ'm-a.
8. Dish of deer-tallow.	a-kŭ'-to.
Colors.	
1. Black.	măñ-ă'k-tu-ä.
2. Blue.	u-mu-drák-tu-ä, kaú-ma-ru-ä.
3. Green.	u-mu-drák-tu-ä.
4. Red.	ka-bĕ'k-su-ä, ka-nă'k-tu-ä, i-pi-sá.
5. White.	ka-tŭ'k-tu-ä.
6. Yellow.	ka-nŭñ-ea-su-ī't-yu-ä.
7. Spotted.	ăg-lŭ'k-tu-ä.

Numerals—Cardinal numbers.

	SUBSTANTIVE.	ADJECTIVE.
1. One.	a-taú-zi-ä.	a-taú-zīk.
2. Two.	aī'-pa.	mád-ro.
3. Three.	pīñ-ä-yŭ-ä.	pī'ñ-a-sun.
4. Four.	sĕ-sa-má.	sĕ-sa-mán.
5. Five.	tŭ'd-lī-ma.	tŭ'd-lī-man, tŭ'd-lī-mŭt.
6. Six.	a-taú-tcim-īñ a-ka-bīn-ī'd-ī-gīn, tŭd-lī-ma.[4]	
7. Seven.	mad-ró-nīñ, &c.	
8. Eight.	pīñ-a-sún-īñ, &c.	
9. Nine.	kod-līn-o-o-tai-la.[5]	
10. Ten.	kód'-līn.	

English.	Eskimo.
***Numerals—Cardinal numbers*—Continued.**	
11. Fourteen.	a-kī-miar-ot-ai't-yŭñ ä.[6]
12. Fifteen.	a-kī mi'-ä.
13. Twenty.	ī'n-yu-ī'n-ä.
14. Twenty-five.	ī'n-yu-ī'n a tŭd-li-mŭ'n-ŭñ a-ka-bīn-ī'd-ī-gīn.
15. Thirty.	ī'n-yu-ī'n-a kod'-lī'n-īñ, a-ka-bīn-ī'd-ī-gīn.
16. Thirty-five.	ī'n-yu-ī'n-a ak-ī-mia-nīñ aī'-pŭ-līñ.
17. Forty.	mád-ro īn-yu-ī'n-ä.
18. One hundred.	tŭd-lī-mŭ'b-ī pi-ä.
19. One-half.	nŭ'b-va.
20. All.	mŭ'k-wä.
***Numerals* (answering the question, "How many?")**	
1. One.	a-taŭ'tch-m-īñ.[7]
2. Two.	mad-ró-nīñ.
3. Three.	pīñ-a-sun-īñ.
4. Four.	sé-sá-ma-nīñ.
5. Five.	tŭd-li-mŭ'n-īñ.
6. Ten.	kod'-lī'n-īñ.
7. Fifteen.	a-kī mia-nīñ.
8. How many?	kap-si-nīñ?
9. A great many.	a-ma-drák-tŭ(k).[8]
Division of time.	
1. A moon.	tŭ't-kŭñ a-taú-zīk.
2. Fourth quarter of moon.	nīp-ta-kák-tu-ä.
3. Winter.	u-kī-o.
4. Summer.	u-pīñ-ák-sa.
5. One winter ago.	u-kī-o.
6. Two winters ago.	u-ki-o-si-bwŭ-a-ni.
7. Night.	ta.[9]
8. Dawn.	ŭg'-lu.
9. Sunrise.	sŭk-ŭn-yŭk-paŭñ-a.
10. Dusk.	nī'p-ī-ru.
11. Day before day before yesterday.	ī's-fa.[10]
12. Day before yesterday.	īk-pŭ'k-sa.
13. Yesterday.	u-nŭñ-mŭn, uñ-a-lī-a-nă.
14. To-day.	kŭñ-mŭ'm-ī.
15. To-morrow.	u-blá-xo.
16. Day after to-morrow.	īk-pŭ'k-sa.
17. Day after day after to-morrow.	i's-fa.[11]
18. Now (adverb).	tŭ'd-wä.
19. Past time (adverb).	ai-pá-ni.[12]
20. Future time (adverb).	ná ná-ko.[13]
21. Anciently.	a-drá-ni.
22. When? (in past).	kŭ'ñ-ä?
23. When? (in future).	ká-ko-go?
24. { Autumn moons, when the women work on deerskins in the sewing-tent.	súd-lī vwīñ.
25. }	súd-lī-vwīñ kīñ-ó-li-ä, s.-ai'-pa.
26. Dark winter moon.	i-dás-u-gä-ru.
27. Moon when sun returns.	kai-bwī'd-a-wī.
28. Moon to start deer-hunting.	aud-lák-to-bwī.
29. Next moon.	sŭk-ŭn-yá-su-ga wi.
30. Whaling moon.	u-mi-sŭ r'-bwīñ, sŭk-sī-lá-bwi.
31. Duck moon.	kaŭ-ker'-bwīñ.
32. Egg moon.	yö'g-ni-a-bwīñ.
The rest of the year—"No moon, sun only."	
Animals—Mammals.	
1. Bear, polar.	nă'-nu.
2. Bear, cinnamon (barren ground).	ă'k-qlak.
3. Caribou (barren ground).	tŭ'k-tu.
4. Caribou fawn.	nó-xa.
5. Caribou young buck.	nú-ka.[14]
6. Caribou, old hornless doe.	aī-nŭñ.

[1] Stone or iron.
[2] Kīlīgwă, fossil ivory.
[3] "Heel."
[4] 1 added to 5.
[5] "10 reduced." (?)
[6] "I don't get to fifteen."
[7] "One in number," "to the number of one."
[8] The common reply for any number over five.
[9] Lit. "darkness."
[10] And preceding days.
[11] And succeeding days.
[12] More than four years ago.
[13] Lit. "by and by."
[14] Under five years.

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

English.	Eskimo.
Animals—Mammals—Continued.	
7. Dog.	kĭ'm-mer, kĭ'ñ-múk.
8. Dog puppy which can walk.	kĭm-mĭ-á-ru.
9. Dog puppy, blind.	kĭ'm-mĭ-yu.
10. Ermine.	tér-i'-ä.
11. Fox.	kai-á'k-túk.
12. Fox (red).	ka-nă k-tu ä.
13. Fox (black).	kai-áñ-a, kai à k-túk măñ-ă'k-tu-ä.
14. Fox, Arctic.	tér-i'g-ún-i-ä.
15. Lemming.	áv-wĭñ-ü.
16. Marmot (Parry's).	sĭ'k-siñ.
17. Moose.	tŭ'k-tu-wúñ.
18. Narwhal.	tu-gá-liñ.
19. Ox, musk.	ú-miñ-mau.
20. Sable.	kà'b-we-a-ti-a.
21. Seal, ringed.	nĕ't-yi.
22. Seal, ringed, young.	nĕt-yi-á-ru.
23. Seal, harbor.	ka-sĭ-gĭ-ä.
24. Seal, ribbon.	kai-xó-lĭñ.
25. Seal, bearded.	úg'-ru.
26. Sheep, mountain.	ĭ'm-nea.
27. Wolf.	a-má-xo.
28. Walrus.	ai'-bwúk.
29. Whale.	ák'-bwúk.
30. Whale, killer.	áx-lo.
31. Whale, white.	kĭl-ĕ'l-yu-ä.
32. Wolverine.	káb-wiñ.
33. Mammoth (fossil).	kĭl-ĭ'g'-wä.
34. Fœtus.	i'-blau.
Parts of the body, &c., of mammals.	
1. Antlers.	nŭ'g-ĕ-ru.
2. Bone.	saú-nä.
3. Brain.	káx-za.
4. Claw.	kú-kin.
5. Dung.	án-na.
6. Entrails.	i-na-lu-úñ-a.
7. Fat.	úk-suk.
8. Hair.	mí't-ko.
9. Heart.	ú-ma-ta.
10. Meat.	nía-kĕ.
11. Milk.	i'-muñ.
12. Paw.	ĭs-ĭ-gai'.
13. Penis.	u-sú-a, ú-su.
14. Stomach.	a-ké-a-xo.
15. Skin.	á-mia.
16. Tail.	pûm-i-ú-nä.
17. Tendon or leader.	i'-va-lu.
18. Teeth.	kĭ'g-u-tá.
19. Walrus-tusk or ivory.	tú-ga.
20. Tongue.	ó-ka.
21. Testicles.	ĭ'g-gru.
22. Whale-bone (a "slab").	cú-kúk, cú-kai (pl.).
23. Seal's breathing-hole (in ice).	a(d)-lu.
Birds.	
1. Bird.	kaú-we.[1] tĭ'ñ-mia.[2]
2. Auk.	át-pa.
3. Bunting (Lapland).	nĕs-aúd-lĭ-gä, ♀ nĕs-aúd-lĭ-ga-bi-ä.
4. Bunting (snow).	a-maú-lĭ-ga, ♀ a-maú-lĭ-ga-bi-ä.
5. Crane (little sandhill).	tût-ĭ'd-rĭ-gú.
6. Curlew (Eskimo).	tu-rá-tu-rá.
7. Duck.	kaú-we.[3]
8. Duck (pintail).	i'v-wú-gû.
9. Duck (king).	♂ kĭ'n-a-liñ, ♀ añ-na-bi-ä.
10. Duck (Pacific eider).	♂ a-maú-lĭñ, ♀ cu-gä-lŭ'k-tun.
11. Duck (Steller's).	ĭg-nĭ-kaúk-to.
12. Duck (Spectacled eider).	ká-wa-so, ♂ tú-tû-lu, ♀ yŭ'k-qlu-lu.
13. Duck (long-tailed).	á-bád-lĭñ, ád-yĭ-gi-ä.
14. Eagle (golden).	tĭ'ñ-miak-pûk.
15. Finch or any little passerine bird.	sŭ'k-sa-xi-ä.
16. Goose (white-fronted).	nŭ'g'-lúg'-ru-ä.
Birds—Continued.	
17. Goose (white).	kŭ'ñ-o.
18. Goose (brant).	núg'-lŭ'g-nû.
19. Grouse (white), Ptarmigan.	a-kŭ'd-a-gĭn.
20. Gull.	naú-yä.
21. Gull, Sabine's.	yûk-kúd-rĭ-gúg-i'-ä.
22. Gull, Ross' Rosy.	kă'ñ-max-ä-lu.
23. Ivory gull.	naú-ya-bwûñ.
24. Gerfalcon.	kĭ'd-rĭ-gûm-ĭñ.
25. Loon (white-billed).	túd'-lĭñ.
26. Loon (red or black throated).	kă'k-sau.
27. Owl (white snowy).	úk-pĭ(k).
28. Phalarope, red.	sá-bra[n].
29. Phalarope, northern.	sa-bráñ-na.
30. Pigeon (sea).	séak-bwúk.
31. Plover (black-bellied).	ki-rai-ón.
32. Plover (golden).	túd'-lĭñ.
33. Raven.	tu-lú-ä.
34. Sandpiper (pectoral).	aí-bwúk-i-ä.
35. Sandpiper (Bonaparte's).	kaíñ-i-a-lu.
36. Sandpiper (red-backed).	méa-ka-pĭñ.
37. Sandpiper (semi-palmated).	nĭ-wĭl-ĭ-wĭ'l-ûk.
38. Sandpiper (buff-breasted.)	núd-lu-a-yu.
39. Snipe, robin.	tú-a-wí-a.
40. Swan.	kúg'-ru.
41. Skua.	ĭ-suñ-ü.
42. Tern.	ut-yu-tá-kĭn.
43. Turnstone.	tûl-ĭ'g-u-ä.
Parts of the body, &c., of birds.	
1. Beak, or bill.	sí-go.
2. Mouth.	káñ-a.
3. Eye.	ĭ'd-drúñ.
4. Neck.	kó-mo-zĭn.
5. Feathers.	tu-lú-gä.
6. Wings.	ĭ's-a-xo, ĭ's-a-xu-lu.
7. Wing-feathers.	sú-lu.
8. Tail.	pûp-kĭn-éa-ko-ko.
9. Tail-feathers.	pŭ'p-kĭ.
10. Legs.	mĭ'p-kwo.
11. Toes.	ĭs-ĭ-gai.
12. Claws.	kú-kin.
13. Gizzard.	a-ké-a-xo.
14. Vent.	ĭ't-ka.
15. Egg.	mŭ'n-ni.
16. Shell (of egg).	saú-nañ-a.
17. Yolk (of egg).	ká-nuñ-ra.
18. White (of egg).	ĭ'k-tĭ-a.
19. Bird's nest.	ú-glu(n).
20. He flies.	tĭñ-i-ru-ä.
Fish.	
1. A fish.	yú-ka-lu.
2. Burbot.	tĭ-tá-lä.
3. Cockle.	si-ú-tĭ-go.[4]
4. Crab.	ki-naú-ra.[5]
5. Lycodes.	kúx-rau-nä.
6. Sculpin.	kŭ'l-ai-o, kŭ'n-ai-o.
7. Smelt.	ĭt-ho á-nĭñ.
8. Whitefish.	a-nák-qlûñ.
Parts of the body, &c., of fish.	
1. Mouth.	káñ-a.
2. Eye.	íd-rúñ.
3. Gills.	más-si.
4. Breast-fin.	añ-u-taú.[6]
5. Back-fin.	sít-ka.
6. Tail-fin.	pûm-i-ú-nä.
7. Scales.	káp-ĭ-si.
8. He swims.	añ-o-ák-tu-ä.
9. Claw of a crab.	pú-dju-tĭn.

[1] "Fowl."
[2] "Small bird."
[3] Lit. "fowl."
[4] Siu-"ear."
[5] *Hyas latifrons.*
[6] From añun "paddle."

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

English.	Eskimo.
Insects.	
1. Bee (humble).	í-gu-tyai.
2. Butterfly.	tûk-ä-lû′k-ĭ-ca, tûk-ä-!ûk-ĭ-dják-sûn.[1]
3. Fly.	nĭ-bra-ru-ä.
4. Horse-fly.	í-gyu-ta (?).
5. Louse.	kú-mûk.
6. Mosquito.	kĭ′k-to-ri-ä.
7. Spider.	pi-drai-ru-ra.[2]
8. Worm.	kú-pi-dro.
9. Branchipus (aquatic).	í rí-túñ-a.
Plants.	
1. Leaf.	kĭñ-mĕ-ré.
2. Willow catkins.	kĭ′m-mi-u-ru.[3]
3. Limb.	kwa-ré.
4. Body or trunk.	núñ-a.
5. Root.	kĭ′l-yĕn-ĕ-ra.
6. Tree, willow.	ŭ′k-pĭ(k).
7. Wood.	kĕ′-ru.
8. Small wood.	na-kĭ′t-yu-ä kĕ-rú.
9. Large wood (timber).	na-pák-tu.[4]
10. A flower, yellow poppy or buttercup.	tûk-a-lû′k-ĭ ca, &c.[5]
11. Flowers.	naú-ru-un.
Geographic terms.	
1. North.	ú-na-ni.
2. Northeast.	a-kĭl-yúñ-ná-mĭ.
3. East.	ká-ba-ni.
4. Southeast.	ka-wa-ni-kû′n-nä.
5. South.	pá-ni.
6. West.	á-wa-ni.
7. Southwest.	a-wa-ni-kú′n-nä.
8. Northwest.	wăl-úñ-ná-mĭ.
9. Northward.	u-núñ-ä.
10. Northeastward.	a-kĭl-yúñ-ná-mun.
11. Eastward.	ka-wú′ñ-ä.
12. Southeastward.	ka-wú′ñ-ä-kú′n-nä.
13. Southward.	paúñ-ä.
14. Westward.	a-wú′ñ-ä.
15. Southwestward.	a-wu′ñ-ä-kú′n-nä.
16. Northwestward.	wăl-úñ-ná-mun.
17. Here.	má-ni.
18. Hither.	maúñ-ä.
19. Where. (?)	cú-mĭ. (?)
20. Whither?	cú mun. (?)
21. Sea.	táx-ai-o.
22. Bay.	tû′ñ-ûk-qlûñ.
23. Strait.	tĕ′d-át-kóñ.
24. Lake.	i-meak.[6]
25. Island.	kĭk-yú′k-tû.
26. Point.	nú-wŭk.
27. River, stream.	ku.
28. River mouth.	páñ-a.
29. Cape.	ú-lĭk-to.
30. Sandspit.	ten-ăk-á-ru.
31. Sandy island.	tú′p-kún.
32. Beach, shore.	sí-na.
33. Peninsula.	í-su.
34. Cliff.	Í′k-pĭk.
Geographical names.	
1. Point Barrow and village.	Nú-wŭk.[7]
2. Summer camp, Elson Bay.	Pérn-yû.
3. U. S. signal station.	I-sû′t-kwa.[8]
4. Village at Cape Smythe.	Út-k(l)ĭ-áv-wĭñ.[9]
Geographical names—Continued.	
5. Land below village, southwest.	A-múñ-ná.
6. Next piece of land.	Kĭ′k-ku.
7. Land at double lagoon.	Nu-na-vá.
8. First camp below.	Séak-qlu-ka.
9. Second camp below.	Na-kĕ′d rĭ-xo.
10. Third camp below.	Ku-o-sug′-ru.
11. Fourth camp below.	Nu-ná′k-tu-au.
12. Fifth camp below.	Í′p-per-su-a.
13. Sixth camp below.	Wa′l-ak pa.
14. Seventh camp below.	Ér-nĭ-vwĭa.
15. Eighth camp below.	Sĭ′n-a-ru.
16. Ninth camp below.	Sá-kam-na.
17. Wainwright's Inlet.	Nu-ná-ri-ä.[10]
18. Wainwright's Inlet.	Si-dá-ru.[11]
19. Wainwright's Inlet.	Á-tûn-é.[12]
20. Village, southwest of the inlet. (?)	Kĭl-au é-tá wĭñ.
21. Point Hope.	Tĭk ĕ-rá.[13]
22. Elson Bay.	Tá′s-yûk.[14]
23. Little pond at Pern-yú.	Kĭk-yûk-tû′k-tu-ro.[15]
24. First beach lagoon (salt).	I-meak-pú′n-ĭg lu.[16]
25. Second beach lagoon (fresh).	I-mĕak-puñ.[17]
26. Third beach lagoon (fresh).	Sĭ′n-ñyú.[18]
27. Fourth beach lagoon (salt).	Í′k-pĭ-lĭñ.[19]
28. Fifth beach lagoon (goose-pond).	I-mérn-yä.
29. Sixth beach lagoon (at station).	I-sû′t-kwa.
30. Little village-ponds.	Tûs-ĕ-rá-ru.
31. Little stream east of Point Barrow.	Ku-á-ru aĭ-pa.[20]
32. First large river east of Point Barrow.	Ku-á-ru.
33. Second large river east of Point Barrow (Meade).	Ku lú-gru-ä.
34. Third large river east of Point Barrow.	Í′k-pĭk-púñ.[21]
35. Great Lake connected with this.	Tá′s yûk-púñ.[22]
36. Mackenzie River.	Kû′-púñ.[23]
37. The Colville River was always spoken of as "Nĕg-a-lĕñ-mĭ-ku," "the river at Negalek," and we did not obtain the name.	
38. River at Wainwright's Inlet.	Ku.[24]
39. River of the Nunatañ-mĕun.	Nû-(n)a-tŏk.[25]
40. Locality for gypsum, one day's journey east.	Tú′t-yĕ.
41. "Fair-ground" at mouth of Colville River.	Nĕ′g-a-lĕk.[26]
***The Firmament.*—Meteorological and other physical phenomena and objects.**	
1. A cloud.	a-no-wi-ĕ′k-sa-xo.
2. The clouds.	nu-bú-yä.
3. Clear sky.	a-lû′k-tu-ä.
4. Sky, weather, "all out-doors."	si′-lä.
5. Sun.	sû′k-ĭn-yû(k).
6. Moon.	tû′t-kûñ.
7. Full-moon.	ĭm-ĭg lúk-tu-ä.
8. Half-moon.	náx-ák-to.
9. Crescent-moon.	a-mĭ′t-yu-ä.[27]
10. Stars.	u-glú-rĭ-ä.
11. Meteor.	u-glú-ri-ä a-nă′k-tu-ä.

[1] Cf. túk-ú-ya, "flag."
[2] "Little braider."
[3] "Puppies."(?)
[4] Cf. na-pák-sä, "mast."
[5] Same as "butterfly."
[6] "Water."
[7] "The Point."
[8] Also name of lagoon.
[9] "The Cliffs."
[10] Deserted village.
[11] New village.
[12] A few houses.
[13] "The Forefinger."
[14] "Enclosed water."
[15] "Island Pond."
[16] "Big water, too."
[17] "Big water."
[18] "Shoestring." (?)
[19] "With high banks."
[20] "The Second Kuáru."
[21] "The Great Cliffs."
[22] "Great enclosed water."!
[23] "The Great River."
[24] "The River."
[25] "Inland."
[26] "Goosetown."!
[27] Lit., "thin."

VOCABULARY COLLECTED FROM THE ESKIMOS, &c.—Continued.

English.	Eskimo.
The Firmament—Continued.	
12. Aurora.	ki-ó(l)-yä.
13. Rainbow.	ni′-gû.
14. Fog.	tû′k-tu.
15. Hoar-frost.	si′-ko nûg-ĕ-rû′k-to.
16. Snow.	á-pun.
17. Falling snow.	ka-nín.
18. Drifting snow.	pĕ′q-su.
19. Hail.	tĕg-mit-ko-sák-to.
20. Ice.	si-ko.
21. Icicle.	ku-sú-gû, ko-ko-lu-tín-yä.
22. Water.	i′-meak, i′-mûk.
23. Deep water.	i′t-i-ra.
24. Shallow water.	i′-ka-to.
25. Image reflected by water.	tá-gaⁿ.
26. Foam.	ká-pak-qlu.
27. Wave.	mû′l-lĭñ, mû′l-lûk-so.
28. Current.	seak′-bwû.
29. Northeast current.	kai-jäñ-nä.
30. Southwest current.	pi-ro-ä′ñ-nä.
31. North current.	ait-täñ-nä.
32. South current.	tûk-sû′ñ-nä.
33. Eddy.	ki′d-lä. [1]
34. Whirlpool.	i′-cûk-a-ru-ä.
35. Overflow of river.	cu-pi-rú-a.
36. Flood tide.	u-li′k-tu-a.
37. Ebb tide.	kiu-i′k-tu-a.
38. Rain.	si′-la-lu.
39. Thunder.	kû′d-lu.
40. Lightning.	i′g-ni-ä. [2]
41. Wind.	á-no-ĕ.
42. Strong wind.	a-näk-lû′k-so.
43. North to east wind.	ik-û′ñ nä.
44. Southeast wind.	ni′-gyû.
45. South wind.	kil-u-û′ñ-nä.
46. Southwest wind.	úñ-a-lú.
47. Northwest wind.	kûn-û′ñ-nä.
48. Whirlwind.	u-ya-lú-nä.
49. The ground.	nú-nä.
50. Dust or sand flying.	pi-yû′k-so.
51. Mud.	a-kúte-i-ni-a.
52. Sand.	si′na.
53. Salt.	táx-ai-o. [3]
54. Rock.	uj-yá-rûñ, á-li-go.
55. Stone (jadeite, pectolite).	kaúd′-lo.
56. Coal.	al-lú ä.
57. Soapstone.	tu-nä′k-tû.
58. Pitch.	ä′du-gún.
59. Amber.	aú-mä.
60. Eclipse of sun or moon.	púd la-ru.
61. Earthquake.	i-bwa-rú-a.
62. Storm.	u-ma-lä′k-pûk.
63. Surf.	i′n-i-u-lĭñ.
64. Bubbles.	púb′-lûn.
65. Ursa major (tail).	tû′k-tu-o-ru-ín.
66. Pleiades.	pa-tû′k-tu-rín.
67. Arcturus.	si-bwúd′-li.
68. Altair.	á-gru.
69. Vega.	a-gin-lu-bwûk.
70. Cassiopea.	i′-bro-si.
71. Orion's belt.	tú-at-san.
72. Ice-hummock.	mŏ-ni′l-ya.
Kinship.	
1. My child!	á-pa! [4]
2. My daughter!	pû′n-i-û, pû′n-i-gû. [6]
3. My father.	áñ-o-ta.
4. My father's father.	a-dá-ta.
5. My mother's father.	á-na.
6. My grandfather!	a-ta′-ti-gû. [5]
7. My elder brother.	á-nĭñ-a.
8. My sister.	ni′-ya-ga.
9. My younger brother.	nú-ka. [8]
10. My uncle.	ák-ka-ka.
11. My father's sister.	áñ-na-ru-ä.
12. My mother's sister.	á-ta-ga.
13. My mother's brother.	áñ-a-gá. [7]
14. My mother's sister.	áñ-na-ru-ä.
15. My father's brother's wife, male speaking.	a-sai-ä.
16. My wife.	nu-li-û′ñ-ä.
17. A step-brother.	kût-ûñ-ú-tä. [8]
18. Orphan.	il-i-á-ru.

English.	Eskimo.
Social organization.	
1. Eskimo.	i′n-yu. [9]
2. White man.	ka-blú-na, tû′n-ñyĭn.
3. Negro.	ták-si-pûñ.
The following are local designations, signifying "men of such and such a place."	
1. Point Barrow.	Nu-wû′ñ-mĕ-un.
2. Cape Smythe.	Ut-ki-av-wi′ñ-mĕ-un.
3. Wainwright's Inlet.	Si-dá-rûñ-mĕun.
4. River "Ku."	Kúñ-mĕ-un.
5. Kil-au-i-tá-wiñ.	Kil-au-i-ta-wi′ñ-mĕ-un.
6. Point Hope.	Tik-ĕ-räñ-mĕ-un.
7. Hotham Inlet.	Si-la-wi′ñ-mĕ-un.
8. Hotham Inlet.	Ku-wû′ñ-mĕ-un.
9. Nú-a-ták and Colville Rivers.	Nu-na-täñ-mĕ-un. [10]
10. Mouth of Mackenzie River.	Ku-pû′ñ-mĕ-un.
Tribal names.	
11. Between Colville and Mackenzie.	Kûñ-mû′d′-lĭñ. [11]
12. Inland beyond Colville.	Ĭt-kû′d′-lĭñ. [12]
13. Inland beyond Colville (?).	Ĕn-a-ko-ti-na. [13]
Government.	
1. Captain of a boat.	u-mi′a-lĭk.
Religion.	
1. A demon or hobgoblin.	tû′ûñ-a.
Mortuary customs.	
1. Dead body.	i-lu-wûñ.
2. Dead, he is.	{ tu-kú-ru-ä. / nú-na-mi si-ni′k-to. [14] }
Medicine.	
1. Headache.	a-nûñ-náq-tu-ä.
2. Toothache.	ki-o-sû′k-i-ru-ä.
3. A cold.	nú-wûk.
4. Syphilis.	u-su-lû′k-i-ro.
5. A boil.	á-yu-á.
6. A cut.	pi-lûk-á.
7. A lame man, woman, or girl.	tu-si-ĕ′t-to.
8. A lame boy.	nu-pi-á-du.
9. A blind man.	ad-ri-gaúd′-lo.
10. A blind woman.	a-yañ-a-rú-ä.
11. A deaf man.	tu-sii-ák-to.
12. Breath.	an-ea-sák-tu-ä.
13. Sweat.	uk-nák-tu-ä.
14. Blood.	au.
15. Urine.	ku, kú-i-ru-ä.
16. Dung.	kók′-la, án-na.
17. A medicine man.	a-nûk-sá.
18. A medicine woman.	púu-lñ-ú-nä.
Amusements.	
1. Song.	a-tŏ′k-tu-ä. [15]
2. Dance.	ú-a-mi.
3. Mask.	ki-nau.
4. Gorget.	sû′k-i-mûñ.
5. Dance-cap.	kä′b-rû.
6. Drum.	kĕ′l-yau.
7. Whizzing-stick.	im-ig-lúk-tu-ä.
8. Teetotum or top.	kaip-sa.
9. "Beau-snapper."	mi-ti′g-li-gaun.
10. Playing-sticks.	ka-pú-tä.

[1] Lit. "hole."
[2] "Fire."
[3] "Sea."
[4] Address; also child to parent.
[5] Address.
[6] Nu-ka-rĭñ, "brothers."
[7] Female speaking.
[8] Of a different nation.
[9] Lit. "a human being."
[10] Come to Point Barrow every summer.
[11] Eskimos.
[12] Red Indians—"Tinné."
[13] Red Indians.
[14] Lit. "sleeps on the ground."
[15] "He sings.

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

New words.

English.	Eskimo.
1. Barrel.	i-mo-si-á-ru.
2. Large barrel, cask.	i-mo-si-á-ru-ru-ä.
3. Small barrel.	i-mo-si-á-ru-a-yu.
4. Whip.	i-pi-raú-tä, a-naú-tä (without lash).
5. Axe.	a-naú-tä, tu-kĭ'n-ga-ru-ä.
6. Iron-headed arrow.	sáv-id-lĭñ.
7. Nails of metal.	kĭ-ki-ĕñ.
8. Beads.	tcuñ-aú-rä.
9. Broom.	tĭ'l-ax-a-zi.
10. Button.	tu-taú-rä.[1]
11. Cloth.	u-kĭ-trá, á-tĭk-qluñ.
12. Cloth, sail.	tĭñ-ĭ-draú-tä.
13. Comb.	ĭ(d)-lai-u-tĭn.
14. Clock.	sûk-ûn-yaú-ra.[2]
15. Knife, pocket.	pĭñ-ä'k-tû.
16. Hammer.	kaú-tû.
17. Iron kettle.	ût-ku-zĭn.
18. Tin can or pannikin.	ut-ku-zĭ-aú-rä.[3]
19. Tin fish-horn.	ni-pák-qlûk-taun.
20. File.	á-gĭ-un.
21. Saw.	u-lu-ä'k-tun.
22. Glover's needle.	ko-ág-ru-lĭñ.
23. Scissors.	sû'd lĭ-sĭñ, pl.; sing. one blade, sû'd-lĭñ.
24. Watch chain.	kû'l-ĭm-nû.
25. Pistol.	eu-pûñ-aú-ra.[4]
26. Gun.	cú-pûñ.[5]
27. Rifle, Winchester.	a-ki-mĭa-lĭñ.[6]
28. Rifle, Sharps'.	sa-vĭx-ró-lĭñ.
29. Rifle, Spencer.	kai'p-sua-lĭñ.
30. Rifle cartridge.	kai'p-sĭ.
31. Cartridge shell.	ĭt-û'g-è-ru.
32. Bullet.	kă'k-a-ru.[7]
33. Cap, percussion.	kă'b'-lu.
34. Powder.	áx-ĕ-rä.[8]
35. Shot.	kăk-a-rú-rä.[9]
36. Iron.	sá-vĭk.
37. Lead.	ó-xa.
38. Bullet-mold.	kăk-a-ri'-bwĭñ.
39. Target.	nĕ k-sa-ra.
40. Cap or hat.	nĕs-a-rá.
41. Coat.	a-ti'-gĕ.
42. Pants or drawers.	kû'm-mûñ.
43. Bread (hard).	kăk-o-lá.
44. Flour.	"pû-laú-ä."
45. Match, friction.	kĭl-ĭ-ä'k-sa-gau.
46. Candle or white man's lamp.	nĕ'-nĕx-ron
47. Sugar.	"sĭú-rä."
48. Molasses.	tûñ-..'k-qlu.
49. Soap.	i'a-kak-kûn.
50. Tobacco.	taú-wak, tau-wák-o, "ti'-ba."
51. Spirits.	tû'ñ ä.
52. Finger-ring.	ka-tû'k-qlĕ-rûñ.
53. Mirror.	ki'-na-raun. ta-gák-tu-en.
54. House (our station).	ĭg-lú-kpûk.[10]
55. Door.	i-ka-rá, úp-kwa.
56. Pencil.	mĭñ-u ä'k-tun.[11]
57. Paper, book, newspaper.	mûk-pa-rá.
58. Steamboat.	ĭ g-nĭ-lĭñ.[12]
59. Ship.	u-mi-ä'k-pûk[13].
60. Ship, "three-master."	u-mi-ä'k-pûk pĭñ-a-sun-ĭñ-na-pák-sa-lĭñ.

Number and gender of nouns—pronouns.

English.	Eskimo.
1. One person.	ĭ'n-yu a-taú-zĭk.
2. Two persons.	ĭn-yu mád-ro.
3. Three persons.	pĭ'ñ-a-sun ĭ'n-nu-ĭn.
4. Few men.	ĭn-yu-ki-tu-än.
5. Many men.	ĭn-yu-gi-û'k-tu-än.
6. What a number of men!	ĭn-yu-kăk-pa-sĭ'l-yă!
7. All the men.	mû'k-wá ĭ'n-nu-ĭt.
8. Some men.	ĭn-yu-gi-û'k-tu-än.
9. No man.	ĭn-yu-ait-yo.[14]
10. Another man.	ĭ'n-yu ád-la.
11. One woman.	áñ-na a-taú-zĭk.
12. Two women.	añ-na-qĭ'ñ-na.
13. Three women.	añ-na-qaiñ-naiñ.
14. One boy.	nu-kût-pĭ-á-ru a-taú-zĭk.
15. Two boys.	nu-kût-pĭ-á-ru mad-ró.
16. Three boys.	nu-kût-pi-a-rú-ĭn pĭ'ñ-a-sun.
17. Many boys and girls.	mûk-qlûk-tu-a-rú-ĭn.
18. One dog.	kĭ'm-mea a-taú-zĭk.
19. Two dogs.	kĭ'm-mĭñ mad-ró.
20. Three dogs.	kĭ'm-mĭñ pĭ ñ-a-sun.
21. Few dogs.	kĭm-mĕr-ĭ-rûñ-ä.
22. Many dogs.	kĭm-mi-n-má-ru.
23. All the dogs.	mû'k-wá kĭ'ñ-mûk.
24. One arrow.	kă'k-a-ru a-taú-zĭk.
25. Two arrows.	kă'k-a-ru mad-ró.
26. Three arrows.	pĭñ-a-sun-kăk-a-rú-lĭñ.
27. Few arrows. (I have?)	kăk-a-ru-kĕ't-tûñ-ä.
28. Many arrows.	kak-a-ru-rûñ-ä.
29. One stone.	uj-yá-rûñ a-taú-zĭk.
30. Two stones.	uj-yák-kûñ.
31. Three stones.	pĭ'ñ-a-sun uj-yá-rûñ.
32. Many stones.	uj-yá-ga-ĭĭn.
33. All the stones.	uj-yá-ga ĭĭn, uj-yá-ra ĭĭn (mû'k-wá).
34. Male dog.	añ-u-sĕ'l-u.
35. Female dog.	añ-na-sĕ'l-u.
36. Male seal.	ti'x-gûñ.[15]
37. Female seal.	nú-nûq.[15]
38. Male bearded seal.	kád-ĭĭ-gûñ.
39. Male reindeer.	pú ñ núñ.
40. Female reindeer.	kú-lau-ûñ.
41. This man.	ĭ'n-yu ú-na.
42. I.	wûñ-ä.
43. To me.	u-û'm-nun.
44. Thou.	ĭ'lu-ĭt.
45. To thee.	ĭl-ĭ'ñ-nun.
46. He or she.	ú-na.
47. You two.	ĭl-ĭp-tĭk.
48. At your "place," household, &c.	ĭl-ĭp-tĭñ-ĭnĭ.[16]
49. To your "place," &c.	ĭl-ĭ'p-tĭñ-nun.
50. We.	u-û'g-un.
51. At our "place," &c.	u-ä'p-tĭñ-nĭ.
52. To our "place," &c.	u-ä'p-tĭñ-nun.
53. Ye.	ĭ-lĭ'p-sĭ.
54. At your "place," &c.	ĭ-lĭ'p-sĭñ-nĭ.[17]
55. To your "place," &c.	ĭ-lĭp-sĭñ-nun.
56. This, that.	ú-na, ó-kwa.
57. This here.	u-na-hé, mû'n-na, mûn-na-hé.
58. All this.	mû'k-wá-he.
59. Who?	ki-nä.!
60. What, what is it?	sú-nä.

Personal and article pronouns—transitive verbs.

English.	Eskimo.
1. I am striking him (now) with closed hand.	ka-ka-ta-rû'ñ-ä ú-nä.
2. He is striking with closed hand.	tĭ'g-lu-ka.
3. I am kicking (him).	wû'ñ-ä a-kĭ-gá.
4. He is kicking him.	ak-sûñ-ear-ú-nä.
5. Ittú killed one duck with the sling.	Ittú ataútcĭmĭñ kĕlauĭtaútĭnĭ kauwûksĭmero.
6. He kills deer.	tû'k-tu-tu-ä.
7. He kills ducks.	kau-wû'k-tu-ä.
8. He has killed no ducks.	kau-wûñ-ait-yo.
9. Who killed the crane?	ki'-ä tût-ĭd-rĭ-gaú-tä!
10. They kill walruses.	ai'-bwûk-twûn.
11. He kills seals.	nĕ't-yĭ(l)-su-ä.
12. He divides into portions.	pa-tûk-tu-á.
13. Are you making snow-shoes?	tûg-ä-lu'-lĭ-bi?

Possession.

English.	Eskimo.
1. My hands.	wû'ñ-ä a-dĭ-gát-ka.
2. I have no tobacco.	ti-bax-ot-ait-yûñ-ä.
3. You have no tobacco.	ti-bax-ot-ait-tu-tĭn.
4. He has no tobacco.	ti-bax-ot-ait-yo.
5. Ye have no tobacco.	ti-bax-ot-ait-yu-sĕ.

[1] "Little labret."
[2] "Little sun."
[3] "Little kettle."
[4] "Little gun."
[5] "Onomatopœic.
[6] "15-er."
[7] Lit. "arrow."
[8] "paú-rä."
[9] "Little bullets."
[10] "big iglu."
[11] mĭ'ñ-un=black lead.
[12] ĭ'g-nĭ-a "fire."
[13] "big canoe."
[14] "There is nobody."
[15] Phoca fœtida.
[16] Where there are only two.
[17] Where there are more than two.

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

English.	Eskimo.
Possession—Continued.	
6. They have no tobacco.	ti-bax-ot-ait-yu-än.
7. I have plenty of tobacco.	ti-bax u-tĭ-kä′k-tûñ-ä.
8. You have plenty of tobacco.	ti-bax-u-tĭ-kă′k-tu-tĭn.
9. Whose dog is this?	ki′ä-ó-kwa-kĭ′m-mea?
10. Whose party is this?	kít-kun tŭ′d-wä.
11. This is Angoru's party.	Añ-o rút-kun tŭ′d-wä.
12. Here is Ittú's dog.	Ĭ′t-tûb kĭ′m-mea tŭ′d-wä.
13. Whose bow is this?	ki′ä ó-kwa pi-zĭ′k-sĭ!
14. Whose knife is this?	ki-ä ó-kwa sá-vĭk!
15. Whose are all these hands!	kít-kun mú′k-wá ád-ĭĭ-gai!
16. Nugeru's (possessions).	Núg ĕ-rút-kun.[1]
17. At Núgeru's.	Núg-ĕ-rút-kun-nĭ.
18. To Nugeru's.	Núg ĕ-rút-kun-nun.
19. A tern's bill.	ut-yu-tá-kĭb si′-go.
20. A woman of soapstone.	tu-năk-tû′p-ku-nĭ-ä.[2]
Intransitive verbs, &c.	
1. I am hungry.	kák-tûñ-ä.
2. I become hungry.	kák-sĭ-ruñ-ä.
3. I shall become hungry.	kák-sĭ-nĭ-ă′k-tûñ ä.
4. You are hungry.	kák-tu-tĭn.
5. You become hungry.	kák-sĭ-ru-tĭn.
6. You will become hungry.	kak-sĭ-nĭ-ă′k-tu-tĭn.
7. Ye are hungry.	kák-tu-sĕ.
8. Ye become hungry.	kák-sĭ-ru-sĕ.
9. Ye will become hungry.	kak-sĭn-ĭ-ă′k-tu-sĕ.
10. He is hungry.	kák-to.
11. He becomes hungry.	kák-sĭ-ro.
12. He will become hungry.	kak-sĭn-ĭ-ă′k-to.
13. They are hungry.	kak-tu-än.
14. They become hungry.	kák-sĭ-ru-än.
15. They will become hungry.	kák-sĭ-nĭ-ă′k-tu-än.
16. I am making water (urinating).	ku-i-jă′k-tûñ-ä.
17. I was making water.	ku-i-jăk-tû′ñ-ĕ-rûñ-ä.
18. I am going to make water.	ku-i-jăk-tu-nĭ-ă′k-tûñ-ä.
19. Ittú is making water.	ku-i-jă′k-to.
20. I am talking.	ŏk-hă′k-tûñ-ä.
21. I was talking.	ŏk-ha′k-tûñ-ĕr-ûñ-ä.
22. I will talk.	ŏk-hă′k-tu-nĭ-ă′k-tûñ-ä.
23. You were talking.	ŏk-hăk-tûñ-ĕ-rú-tĭn.
24. He is talking.	ŏk-hă′k-to.
25. It-tú is talking.	Ĭ′t-tu ŏk-hă′k-to.
26. I am singing.	a-tó′k-tûñ-ä.
27. I was singing.	a-tŏk-tûñ-e-rûñ-ä.
28. I will sing.	a-tŏk-tu-nĭ-ă′k-tûñ-ä.
29. You were singing.	a-tŏk-tûñ-e-rú-tĭn.
30. He is singing.	a-tŏ′k-to.
31. Ittú is singing.	a-tŏ′k to Ĭ′t-tû.
32. I am laughing.	Ĭg-lŭ′k-tûñ-ä.
33. He is laughing.	Ĭg-lŭ′k-to.
34. He is smiling.	ku-mu-yúk-tu-ä.
35. I am walking.	pi-so-ă′k-tûñ-ä.
36. He is walking.	pi-so-ă′k-to.
37. Ittú is running.	Ĭ′t-tú ak-paúk-tu-ä.
38. The bird is flying.	tĭ′ñ-mia ĭz-ĭ-kŭ′l-yĕ-ru-ä.
39. Ittú's knife is bad.	Ĭ′t-tûb sá-vĭk a-sí-ru-ä.
40. I am cold.	a-la-pák-tûñ-ä, ki-yĭn-ă′k-tûñ-ä.
41. He will become cold.	a-la-pak-sĭ-nĭ-ă′k-to.
42. I am getting warm.	u-nă′k-sĭ-rûñ-ä.
43. He will become warm.	u-năk-sĭ-nĭ-ă′k-to.
44. It is cold!	ki-yĭn-ăk-pa-sĭ′l-yä!
45. It is hot!	u-năk-pa-sĭ′l-yä!
46. It is dark!	ta-pa-sĭ′l-yä!
47. It will become cold to-morrow.	u-blá-xo al-a-pak-sĭn-ĭ-ă′k-to.
48. If it is cold to-morrow I shall not go.	u-blá-xo al-a-pák-pût, aud-lan-ĭ-ûñ-ĭ′t-yûñ-ä.
49. A stone sinks in the water.	uj-yá-rûñ kĭ′m-mĕ-ro i-mŭ′-mi.
50. Who is that (man)?	kin-aú-na?[3]
51. Lie down (to a dog)!	a-ko-wĭ′d′-lĭ.[4]
52. Lie low! pl.	a-ko-wĭ′t-yŏ!
53. Go away!	a-wŭ′ñ-a-rĭn (S.), a-wûñ-a-rĭ′t-yŏ (P.).
54. Go home! pl.	Ĭg-lú-mun-ĭ′t-yĕ!
55. Go home! (to the tent).	tu-pĕñ-mun-ĭ′t-yŏ!
56. Come!	kai(n) (S.), kait-yŏ (P.).
57. Let him come!	kaí-li.
58. You darken (the window).	ta′k-tu-tĭn.
59. He went in, entered.	Ĭs-ĭ′ñ-ĕ-ro.
60. Did he enter?	Ĭs-ĭ′ñ-a-ba?

English.	Eskimo.
Intransitive verbs, &c.—Continued.	
61. I did not enter.	Ĭs-ĭû-ai′t-yûñ-ä.
62. Shall I came in?	Ĭ′s-úk-lûñ-ä?
63. Come in!	Ĭs-a-rĭ′n-(go)!
64. Shall I come?	kai′-lûñ-ä?
65. What shall I (do)?	cú-lûñ-ä?
66. What do you (want)?	cú-ru-tĭn?
67. Where are you going?	su-nĭă′k-pĭn (S.), su-nĭ-ă′k-pĭ-sĕ (P.)!
68. I am not going (any) where.	su-nĭ-ûñ-ĭ′t-yûñ-ä.
69. I am going home.	Ĭg-lu-mun-ai-nĭ-ă′k-tûñ-ä.
70. When will you go south?	ká-ko-go pauñ-a-nĭ-ă′k-pĭ?
71. To-morrow I will go east.	u-blá-xun-go ka-wuñ-a-nĭ-ă′k-tûñ-ä.
72. Whither will ye go?	cú-mun Ĭl-ĭp-si al-ûk-ta-ni-ă′k-pĭ-si!
73. When it becomes good or gets well.	na-kuo-sĭ′k-pût.
74. It will become good.	na-kuo-sĭn-ĭ-ă′k-to.
75. —— will be plenty.	a-ma-dra-nĭ-ă′k-to.
76. If or when —— shall be plenty.	a-ma-drák-pût.
77. When —— was plenty.	a-ma-dráñ-mût.
78. I forget.	wŭ′ñ-ä pu-i′-gu-a.
79. You forget.	Ĭ′l-u-ĭt pu-i-gĭ.
80. I forgot completely.	pu-i-găk-sim-ĕr-ŭ′ñ-ä.
81. They will come, be here.	pĭn-ĭ-ă′k-tun.
82. They will not come.	pĭn-ĭ-ûñ-ĭ′t-tun.
83. I am going to stay.	a-kût-pĭn-ĭ-ă′k-tûñ-ä.
84. It has gone out (pipe, &c.).	kam-ĭv-waú-nä.
85. They dive (ducks).	ă′g-lûk-tu-än.
86. They come up (ducks).	kŭ′k-ĭ-myu-än.
87. There will be a dance.	u-a mĭ-nĭ-ă′k-to.
88. Dance!	u-ŏ′-mĭ-tĭn (S.), u-ŏ′-mĭt-yĕ (P.).
89. I am drunk.	tûñ-ă′k-tûñ-ä.
90. I cut.	wŭ′ñ-ä pi-lûk-á.
91. I sew.	wŭ′ñ-ä ki-lé-ä.
92. I've hurt my shin.	kĭñ-a-drák-tuñ-ä.
93. I hit my nose, make it bleed.	pu-sĭ-kák-tuñ-ä.
94. I bump my head.	a-pók-tuñ ä.
95. I bump my forehead.	ka-ti-ruñ-ä.
96. I hurt my knee.	sĭt-ko-ák-tuñ-ä.
97. I crack my crazy-bone.	Ĭt-kut-sĭ-ák-tuñ-ä.
98. My foot's asleep.	ka-kĭl-ĭ-sák-si-ruñ-ä.[5]
99. He falls in the snow.	ná-kok-to.
100. He falls backwards.	ni-wéak-to.
101. He falls sideways.	ĭn-nă′k-to.
102. He falls forward.	pu-tu-kĭ′t-to, pa-sák-to.
103. He falls into the water.	i-mák-to.
104. He falls by slipping on his heels.	ko-ai-ja-kŏ′t-yu-ä.
105. He falls by slipping on his toes.	ko-ai-jañ-nă′k-tu-ä.
106. He almost falls by slipping on his heels.	ko-ai-ja-kĕt-kai-ák-to.
107. He shoots at a target.	nĕk-sa-rák-tu-ä.
108. He (the deer) has no antlers.	núg-ĕ-ru-ĭ′t-yo.
109. What are you laughing at?	cú-bĭ Ĭg-lŭ′k-pi?
110. You strut with your elbows out.	añ-u-tau-kwák-tu-tĭn.[6]
111. It is bad.	pi-lŭ′k-tu-ä.
112. It is very bad.	pi-lu-pĭ′k-su-ä.
113. It is done with, over.	pi-yŭ′k-so. Interrog. pi-yŭ′k-pa?
114. I want.	wûñ-ä pi-sú-kĭ-ga.
115. I want my jacket.	a-ti′-gĭ-lûñ-ä.
116. I want some water.	i′-mûk-lûñ-ä.
117. I want a chew (of tobacco).	wi′-lăk-sûm-nĭñ.
118. He puts on his boots.	kûm-mik-tă′k-to.
119. He puts on his jacket.	a-ti-gĭ-ró.
120. He puts on his mittens.	ait-kăt-ĭ-ró.
121. He puts on his breeches.	kă′k-a-lik-só.
122. Wake up!	Ĭt-ûg-ĭ-cá!
123. Give me a light! I want to smoke.	Ĭ′g-nyûñ-mĭñ! ku-kúg-lûñ-ä.
124. Where have you been to?	cú-mun kĭd-lĭ-ĭñ-a-bwi?
125. How long will you be? (on a journey).	kap-si-ník-si-nik-tá-lu-tĭn?
126. Is it far?	u-ma-sĭ′k-pa?
127. Is it near?	kai-nĭ t-pa?
128. It has sunk, fallen under (water).	ka-tûk-sí-mĕ-ro tă-sŭ′m-mä.
129. He (the bird) has flown.	tĭñ-ĭk-sĭ′m-ĕr-o.
130. Your shoe-string is broken.	sĭñ-yŭ′k-su-tĭn.

[1] Household, party, &c.
[2] "Ku-nĭ-ä," jargon for woman. Danish.
[3] = kí-na ú-na?
[4] Third person singular.
[5] "I become numb."
[6] Cf. añ-u-tá-o, breast-fin.

VOCABULARY COLLECTED AMONG THE ESKIMOS, &c.—Continued.

Intransitive verbs, &c.—Continued.

English.	Eskimo.
131. Tie your shoe-strings!	sĭñ-yĕr-ĭ'n!
132. I have no shoe-strings.	sĭñ-yĭ'k-tûñ-ä.
133. He weighs.	u-ko-mai-sĭ-lák-to.
134. Take one! (one of two).	aí-pa pĭ'k-sa-rĭñ!
135. Get out of the way!	ka-ki-dĭ-li-ă'k-sĭ-ga!
136. He sits down.	et-tú-ä.
137. He is angry.	sa-perg-nă'k-to, sa-perg-sák-to.
138. He is raving.	u-mĭ-năk-to. Inter. u-mĭ-nă'k-pa.
139. They are copulating.	ku-yú'k-tu-ăn.
140. I come.	kai'-rúñ-ä.
141. Thou comest.	kái-ru-tĭn.
142. He comes.	kai'-ro.
143. We come.	kaí-ru-xun.
144. Ye come.	kaí-ru-sĕ.
145. They come.	kaí-ru-än.
146. I came.	kai-mĕ-rúñ-ä.
147. Thou camest.	kaí-mĕ-ru-tĭn.
148. He came.	kaí-mĕ-ro.
149. We came.	kai'-mĕ-ru-xun.
150. Ye came.	kaí-mĕ-ru-sé.
151. They came.	kaí-mĕ-ru-än.
152. I shall come.	kai-nĭ-ă'k-túñ-ä.
153. Thou wilt come.	kai-nĭ-ă'k-tu-tĭn.
154. He will come.	kaí-nĭ-ă'k-to.
155. We two will come.	kai-nĭ-ă'k-tu-xu.
156. You two will come.	kai-nĭ-ă'k-tu-xun.
157. They two will come.	kai-nĭ-ă'k-tu-xu.
158. We shall come.	kai-nĭ-ă'k-tu-xun.
159. Ye will come.	kai-nĭ-ă'k-tu-sĕ.
160. They will come.	kai-nĭ ă'k-tun.
161. If, when, &c., he shall come.	kai'-pút.[1]
162. When or because he came.	kaiñ-mút.[2]
163. I came not.	kaiñ-aít-yúñ-ä.
164. Thou camest not.	kaiñ-aít-tu-tĭn.
165. He came not.	kaiñ-aít-yo.
166. Ye came not.	kaiñ-aít-yu-sĕ.
167. I shall not come.	kai-nĭ-úñ-ĭ't-yûñ-ä.
168. Wilt thou come?	kai-nĭ-ă'k-pi?
169. Will he come?	kai-nĭ-ă'k-pa?
170. Will ye come?	kai-nĭ-ă'k-pĭ-sĕ?
171. I eat.	nĕ'x-ĕ-rúñ-ä.
172. Thou eatest.	nĕ'x-ĕ-ru-tĭn.
173. He eats.	nĕ'x-ĕ-ru-ä.
174. Ye eat.	nĕ'x-ĕ-ru-sĕ.
175. They eat.	nĕ'x-ĕ-ru-ăn.
176. I sleep.	si-nĭ'k-túñ-ä.
177. Thou sleepest.	si-nĭ'k-tu-tĭn.
178. He sleeps.	si-nĭ'k-tu-ä.
179. We two sleep.	si-nĭ'k-tu-ú'ñ-nĭ.
180. They two sleep.	si-nĭ'k-tu-ûn.
181. We sleep.	si-nĭ'k-tu-ú'ñ-nĭ.
182. Ye sleep.	si-nĭ'k-tu-sĕ.
183. They sleep.	si-nĭ'k-tu-ûn, si-nĭ'k-tun.
184. I shall sleep.	si-nĭñ-nĭ-ă'k-túñ-ä.
185. When, because, he slept.	si-nĭ'g-mút.[1]
186. I do not sleep.	si-nĭñ-ĭ't-yúñä.
187. I shall not sleep.	si-nĭñ-nĭ-úñ-ĭ't-yúñ-ä.
188. Are you asleep?	si-nĭ'k-pi?
189. Is he asleep?	si-nĭ'k-pa?
190. I am scared.	ku-ga-lúk-túñ-ä.
191. Thou art scared.	ku-ga-lúk-tu-tĭn.
192. He is scared.	ku-ga-lúk-tu-ä.
193. Ye are scared.	ku-ga-lúk-tu-sĕ.
194. I am not scared.	ku-ga-luñ-aít-yúñ-ä.
195. Art thou scared?	ku-ga-lúk-pi?
196. Is he scared?	ku-ga-lúk-pa?
197. Are ye scared?	ku-ga-lúk-pĭ-sĕ.
198. I lie (tell a —).	tcúk-a-lu-rú'ñ-ä.
199. Thou liest.	tcúk-a-lú-ru-tĭn.
200. He lies.	tcúk-a-lu-rú-ä.
201. Ye lie.	tcúk-a-lú-ru-sé.
202. They lie.	tcúk-a-lú-tu-ru-ä.
203. When, because, he lied.	tcú'k-a-lo-mút.[2]
204. I do not lie.	tcúk-a-lo-wĭ't-yúñ-a.
205. I steal.	tĭg-a-lĭ'k-túñä.
206. Thou stealest.	tĭg-a-lĭ'k-tu-tĭn.
207. He steals.	tĭg-a-lĭ'k-tu-ä.
208. Ye steal.	tĭg-a-lĭ'k-tu-sĕ.
209. They steal.	tĭg-a-lĭ'k-tu-än.
210. I will not steal.	tĭg-a-lĭk-nĭ-ûñ-ĭ'k-tuñ-ä.
211. I go.	a-lúk-túk-tú'ñ-ä.
212. He goes.	a-lúk-ták-to.
213. I went.	a-lúk-tá-mĕ-rúñ-ä.
214. I have gone.	a-lúk-túk-sĭ'-me rúñ ä.
215. I shall go.	a-lúk-ta-nĭ-ă'k-túñ ä.
216. I did not go.	a-lúk túñ-aít-yúñ-ä.
217. I do not know.	nĕl-u-rú'ñ-ä.
218. I do not know it.	wú'ñ ä nĕl-u-ga-gä.
219. You did not know.	ĭ'l-uĭt nel-u-gi, nĕl-u-ĭ'.
220. I hear.	tu-sá-rúñ-ä.
221. I heard.	wú'ñ ä tu-sá-ga-ga.
222. You heard.	ĭ'l-u-ĭt tu-sá-gi.
223. I saw.	wú'n-ä tau-tú'k-ki-ga.
224. I do not see.	tau-túñ-aít-yúñ-a.
225. I did not see.	tau-túñ aí t-kĭt-ka.
226. Did you see?	tau-tú'k-pi-u?
227. Did ye see?	tau-tú'k-pi-u-sé?
228. I killed.	wú'ñ-ä tu-kú't-kĭ-ga.
229. Thou killedst.	ĭ'l-u-ĭt tu-kút-k-kĭ.
230. He killed.	tu-ku't-ka.
231. I die, am dead.	tu-ku-rú'ñ-ä.
232. I am not dead.	tu-kuñ-aít-yúñ-ä.
233. Kakaguna nearly died.	nu-na mĭ-si-nĭk-kai-ák-to Ka-ka-gú-nä.
234. It is spoiled.	pi-lúk-sĭ'm-é-ro.

Adjectives and participles.

English.	Eskimo.
1. Thick.	si-lĭ'k-tu ä.
2. Thin, slender.	a-mĭ't-yu-ä.
3. Square.	ĭt-kaú-rä.
4. Round.	kai-û'k-su-ä.
5. New, young.	nú-ta.
6. Old.	ú-tä-ka.
7. Near.	kai-ni't-yu-ä.
8. Far.	u-ma-zĭ'k-su.
9. Good.	nä-kú-rúk.
10. Bad.	a-si'-rúk.
11. Heavy.	u-ko-maít-yu-ä.
12. Light.	a-kĕ't-yu ä.
13. Clean.	ĭp-kĭ't-yä.
14. Strong.	sú'ñ-ĭ-ru-ä, cu-ä'ñ-ĭ-ru-ä.
15. Killed.	tu-kú t-kä.
16. Landed, on top.	ka-kĭ't-kä.
17. Frozen.	kĭ-kĭ't-kä.
18. Lost.	ta-mú'k-tä.
19. Big.	áñ-o-ru, -ä.
20. Little.	mĭ'k-ĭ-ru-ä.
21. Long.	tú'k-i-ru-ä.
22. Short.	nait-yu-ä.
23. Elongated in shape, but short.	túk-ĭ-tĭ'g-ĭ-ru-ä.
24. Pretty long.	túk-ĭ-gál-o-ä'k-to.
25. Cold.	al-a-ná.
26. Hot.	u-nä'k-tu-ä.
27. Full.	sí-la-wĭ't-tu.
28. Broken.	na-wĭ't-kä.
29. Returned, brought back.	kai-li-wĭñ-ĭ't-kä.
30. For sale.	a-kí tcú(k), a-kí-tä.
31. Netted.	na-pĭ't-to.
32. Blown away.	tĭñ-ĭ't-kä.
33. Inside-out.	ud-lĭ-lú-go.
34. Fast.	cu-kaí-ro.
35. Hard.	ait-yu-ĭ't-yu-ä, aĭ-s-ĭ-ru ä.
36. Slow.	cu-kaít-to.
37. Soft.	a-kĭ't-yu-ä.

Adverbs.

English.	Eskimo.
1. Not.	pi'-djúk, pi'-căk, pi-tco, pĭd-la, pi'ta
2. Up.	púñ-mä.
3. Upwards.	pún-mu'ñ-ä.
4. Down.	sú'm-mä
5. Downwards.	súm-ma'ñ-ä.
6. Underneath.	tä-su'm mä.
7. Yonder.	tá-mä (in sight). tai'ñ-ä (out of sight).
8. Indoors.	tát-ka-mä.
9. This way!	ta-maúñ-a-lu.
10. Thus.	tai-mä-nä.
11. Here, in the house.	ta-má-nĭ ĭg-lú-mĭ.

[1] Future subjunctive.

[2] Past subjunctive.

VOCABULARY COLLECTED FROM THE ESKIMOS, &c.—Continued.

English.	Eskimo.
Interjections.	
1. Yes, here, take it, come (to a dog).	añ!
2. No.	ná-gä.
3. Where's?	nau, nau ——-mĭ, nau ——ĭ'm-nä?
4. Come on!	kĕ'-tai![1]
5. Get out! Go on!	a-tai! a-tai-já.
6. Stop! Stay!	á-kún! a-kû-já.
7. Hark!	á-tú.
8. Get on!	kŭ! kŭ![2]
9. Come!	tú'l-lä![2]
10. Encore!	ki, ki!
11. Bless me! (surprise, &c.).	à'k-qlá!
12. Holloa!	kwau!
13. What?	ca! cú-ä!
14. Indeed, alas!	naú-mĭ.[3]
15. Don't know!	ai-tcu.[4]
16. Don't know, perhaps?	a-ki-ä! a-ka-nó.[4]
17. Make haste!	kĕl-ĭ'm-ä!
18. Oh!	a-na-ná.[5]

English.	Eskimo.
Conjunctions.	
1. And, also (enclitic).	—lu, —lu; —mĭ'g-lu, —mĭ'g-lu.
2. More, again (enclitic).	—su-lĭ.
3. Thus, then, so.	á-sĭ.
4. Only.	kĭ-sĭ'm-ĭ.
Prepositions (enclitic.)	
1. In, on, with.	—mĭ, -nĭ.[6]
2. To, for (motion, purpose.)	—mun, nun.[7]
Intensive, diminutive, &c., terminations.	
1. Big.	—pûk, —pûñ.[8]
2. Very.	—pai-yá.[9]
3. Little.	—pa-lu, —ka-lu.[10]
4. Bad.	—pĭ-lu.
5. Terminations of emphasis.	—go.[11] —a-mi.[11]

[1] French, "allons."
[2] Driving and leading dogs.
[3] With a negative idea frequently.
[4] Exclamation of ignorance or possibility.
[5] Cry of pain.
[6] Example, sĭ-kó-mĭ, "on the ice."
[7] Example, ĭg-lú-mun, "to the house;" nä-nú-mun, "for bears."
[8] Example, u-mĭ-äk-pûk, "ship." Ku-pûñ, "Great river."
[9] Example, na-kur-pai-yá! "It is very good."
[10] Caressing, example, "kĭ'm-mĭ-pa-lu!" "Dear little puppy!"
[11] One or both appended to a word for emphasis, "kapsingóami?" "How many, pray?" "Amadráktungo," "Very many, indeed."

IV.

CATALOGUE OF ETHNOLOGICAL SPECIMENS COLLECTED BY THE POINT BARROW EXPEDITION.

Prepared by JOHN MURDOCH, A. M., *Sergeant Signal Corps, U. S. Army.*

[Arranged according to the plan given in Prof. Otis T. Mason's "Ethnological Directions Relative to the Indian Tribes of the United States." The collection is in the United States National Museum.]

III.—CULTURE.

(1) FOOD OR ALIMENT IN GENERAL.

C. *Narcotics.*

TOBACCO (*tau-wak*, "*ti-bá*").—One specimen. Prepared for smoking—cut up and mixed with willow bark.

Collectors' number	889
Museum number	89803

E. *Drugs, &c.*

MEDICINE.—One specimen. Apparently earth from the cemetery—administered internally.(?)

Collectors' number	262
Museum number	56723

(3) VESSELS AND OTHER UTENSILS OF HOUSEHOLD USE.

A. *For holding and carrying water, food, &c.*

MEAT BOWL (*pĭ't-tûñ-o*).—Four specimens. Large round bowl, carved from one block.

Collectors' numbers	408	1321	1322	1320
Museum numbers	73570	89865	89864	89863

WOODEN BUCKET (*kû-táu-a*).—Three specimens. With ivory "ears" for attaching handle of wire, thong, &c. Used for water, &c.

Collectors' numbers	369	370	1753
Museum numbers	56763	56764	89890

BUCKET "EAR."—One specimen. Made of ivory, for attaching the handle.

Collectors' number	880
Museum number	89148

WOODEN TUB (*ĭl-u-lĭ'k-pûñ*).—One specimen. Made of bent wood.

Collectors' number	1735
Museum number	89891

B. *For serving and eating food, &c.*

STONE VESSEL (*út-ku zin*).—Four specimens. Broken oblong vessels of soapstone, obsolete, and superseded by iron or tin pots, which are called by the same name.

Collectors' numbers	680	1059	1096	1097
Museum numbers	89886	89885	89886	89883

POTTERY.—Three specimens. Pieces of a pot said to be made of clay, feathers, and blood, and baked. Obsolete.

Collectors' number	1589
Museum number	89697

C.

MEAT TRAY (*á-li-bi-a, ĭm-o-si-a' ru*).—Five specimens. Shallow tray, made of one piece of wood for carrying and holding food.

Collectors' numbers	223	392	1323	1376	1377
Museum numbers	73575	73576	89867	89866	89868

WHALEBONE CUP.—Six specimens. Cups and dippers of various sizes, made by bending a strip of whalebone round a wooden bottom.

Collectors' numbers	654	1199	1300	1301	1302	1303
Museum numbers	56560	89850	89851	89852	89853	89854

IVORY FORK.—One specimen. Small and two-pronged.

Collectors' number	325
Museum number	56731

STONE MAUL (*kaú-tû*).—Twenty eight specimens. Head, a cylinder of stone, generally massive *pectolite;* when hafted, lashed to a wooden or bone handle with thong.

Collectors' numbers	83	112	118	131	132	161	196
Museum numbers	56634	56651	56633	(?)	56667	56639	56637
Collectors' numbers	205	206	213	217	218	221	222
Museum numbers	56658	56630	56653	56632	56655	56656	56631
Collectors' numbers	2 2	243	245	264	809	877	906
Museum numbers	56636	56635	56654	56629	89664	89657	89654
Collectors' numbers	1063	1103	1120	1179	1181	1241	1727
Museum numbers	89667	89668	89665	89669	89656	89655	89666

BONE MAUL (*kaú-tû*).—Five specimens. Head, oblong piece of hard bone, secured by lashings on the end of a short haft.

Collectors' numbers	1045	1046	1047	1048	1049
Museum numbers	89848	89847	89849	89846	89845

WOODEN SPOON.—One specimen. Large spoon, or ladle, neatly carved from soft wood.

Collectors' number	1352
Museum number	89739

BONE DIPPER (*kĭl-ĭ-yú-tû*).—Seven specimens. Oblong shallow dipper, or ladle, for water, &c.

Collectors' numbers	774	934	1013	1070	1102	1294	1397
Museum numbers	89739	89413	89414	89415	89412	89411	89416

IVORY DIPPERS (*í-mo-syû, kí-lĭg-pû, kĭl-ĭg-wû'g-a-ro*).—Three specimens. Large dipper, with handle, made of one piece of fossil ivory. One from each village, Nuwŭk, Utkiávwĭn, and Sidáru.

Collectors' numbers	371	933	1259
Museum numbers	56535	89833	89830

WATER DIPPER (*ím-o-syû*).—Three specimens. Made of a single piece of mountain-sheep horn.

Collectors' numbers	28	1293	1577
Museum numbers	56534	89831	89832

PIPE (*ku-ĭ'n-ya*).—Eleven specimens. Wooden stem, with metal, bone, ivory, or stone bowl, for smoking tobacco, sometimes mixed with willow bark.

Collectors' numbers	10	[1]170	705	834	864	915
Museum numbers	56737	56652	89288	89291	89290	89286
Collectors' numbers	954	1129	1385	1582	1752	
Museum numbers	89285	89287	89284	89289	89292	

[1] Unfinished stone bowl.

PIPE-CASE.—One specimen. Long pouch of white ermine skins for holding tobacco-pipe.

Collectors' number	55
Museum number	56744

TOBACCO-POUCH.—Three specimens. Made of deer-skin trimmed with fur and worsted.

Collectors' numbers	889	1341	1350
Museum numbers	89803	89804	89805

TOBACCO-BOX OF ANTLER.—One specimen. Carved into the shape of a sleeping reindeer.

Collectors' number	2
Museum number	56512

D. *Ornamental and miscellaneous.*

LAMP (*kó-dlö*).—Six specimens. Shallow dish of soapstone or sandstone, nearly half-moon shaped, for burning oil, with a wick of moss. Large for house use; small for traveling.

Collectors' numbers	133	872	1208	1209	1298	1731
Museum numbers	56673	89879	89884	89881	89882	89880

HOLDER FOR LAMP BLUBBER-STICK.—One specimen. Rude wooden effigy of a human head and body, made to fasten upon the wall over the lamp, with a hole in the middle, in which can be stuck the pointed stick for holding the lump of blubber to feed the flame.

Collectors' number	108
Museum number	56492

(4) CLOTHING.

A. *Raw material.*

HARE-SKINS.—Five specimens. Native dressed skins—raw material for clothes.

Collectors' numbers	1754 1755 1756 1757 1758
Museum number	89915

C. *Suits of clothing.*

TOY CLOTHES.— One specimen. Models of Eskimo garments.

Collectors' number	907
Museum number	89808

DOLLS.—Four specimens.—Faces, heads, and whole men and women, made of wood and dressed.

Collectors' numbers	1123	1138	1304	1358
Museum numbers	89724	89727	89728	89726

D. *Head clothing.*

WOODEN MASK (*ki'-nau*).—Fourteen specimens. Worn in ceremonial dances.

Collectors' numbers	6	73	235	258	762	773	856
Museum numbers	56499	56498	56497	56496	89810	89809	89817
Collectors' numbers	1037	1050	1056	1057	1063	1074	1583
Museum numbers	89811	89815	89814	89819	89812	89813	89816

DANCING CAP (*kà'b-rû*).—One specimen. Conical skin cap trimmed with rows of teeth of the mountain sheep. Worn in ceremonial dances.

Collectors' number	863
Museum number	89820

E. *Body clothing.*

MAN'S JACKET (*a-ti'-gĕ*).—Three specimens. Hooded frock of fur, worn with the hair out (called "parka" in those parts of Alaska occupied by the Russians).

Specimens.	Collectors' numbers.	Museum numbers.
Ermine skins	11	56757
Mountain-sheep skins	87	56752
Deerskin	184	56751

MAN'S CLOAK.—One specimen. "Circular" cloak of deer-skin, worn as an outside wrap.

Collectors' number	94
Museum number	56760

F. *Arm clothing.*

GLOVES (*á-drĭ-gûd-rĭ'n*).—Two specimens. Made of deer-skin—hair in.

Collectors' numbers	128	974
Museum numbers	56747	89829

MITTENS (*ai't-kăt-i*).—One specimen. Made of deer-skin.

Collectors' number	973
Museum number	89828

G. *Leg and foot clothing.*

MAN'S FUR BOOTS (*kû'm-mûñ*).—Four specimens. Boots reaching to the knee, made of some short-haired skin; hair out; soles of white-dressed seal-skin.

Collectors' numbers	91	110	111	770
Museum numbers	56759	56749	56750	89834

Toy boots.—One specimen. Made of seal-skin, in miniature.

Collectors' number	1724
Museum number	89555

Man's breeches (*kà'k-a-lux*).—One specimen. Knee breeches of fur, generally deer skin; worn fur out or in.

Collectors' number	91
Museum number	567

Woman's trousers (*kâ'm-mâñ*).—One specimen. Tight-fitting trousers, ending in shoes with seal-skin soles; made of short-haired skin.

Collectors' number	136
Museum number	56748

II. *Parts of dress.*

Eagles' feathers.—One specimen. Worn in bunches as ornaments to the fur jacket.

Collectors' number	1150
Museum number	89529

Belt-buckle.—One specimen. Oblong piece of ivory, perforated with a large hole.

Collectors' number	1055
Museum number	89718

Man's belt (*táp-sĭ*).—Two specimens. Neatly woven of feather-shafts, black and white, in a regular pattern, and bound with leather.

Collectors' numbers	1419	1420
Museum numbers	89544	89543

Woman's belt (*táp-sĭ*).—One specimen. Made of pieces of skin of wolverines' toes, with claws, sewed together. Fashionable and highly prized.

Collectors' number	1421
Museum number	89542

(5) Personal adornments.

A. *Skin ornamentation.*

Labret lancet—Two specimens. Little slate blade, shaped like a lance-head, for cutting the holes for the labrets; sometimes put up in a little wooden case.

Collectors' numbers	1153	1200
Museum numbers	89721	89579

B. *Head ornaments.*

Ear-rings (*nó-go-lo*).—Two specimens. Ivory hooks to fit into the holes in the ears.

Collectors' number	[1]1340
Museum numbers	89386, 89387

[1] Two pairs.

LABRETS (*tú-tú*).—Sixteen specimens. Stone, ivory, or bone studs, worn by men in the corners of the mouth.

Collectors' numbers	[1]197	866	1031	1042	1142	1163	1166
Museum numbers	56716	89705	89717	89716	89711	89706	89719
Collectors' numbers		1169	1187	1207	1210	[2]1215	1713
Museum numbers		89712	89710	89713	89714	89707 89708 89709	....

[1] Pair. [2] Three specimens.

LABRET PLUGS.—Two specimens. Small plugs for enlarging and keeping open the labret-holes when first made; bone or ivory.

Collectors' number	[1]1211
Museum number	89715

[1] Two specimens.

E. *Ornaments of the limbs.*

BRACELETS.—One specimen. Leather thong sewed into a ring and ornamented with a bead of soapstone.

Collectors' number	[1]1355
Museum number	89388

[1] Pair.

F. *Toilet articles.*

IVORY HAIR-COMB (*id-laí-u-tĭñ*).—Ten specimens. Small, with a hole at the top for the forefinger.

Collectors' numbers	174	[1]182	183	[1]194
Museum numbers	56568	56566	56567	56569
Collectors' numbers	210	238	1006	1242
Museum numbers	56572	56570	89785	89385

[1] Two specimens.

G. *Other personal ornaments.*

AMBER BEADS (*aú-mú*). One specimen. Made by natives.

Collectors' number	1716
Museum number	89700

DENTALIUM SHELLS (*pû't-tú*).—Five specimens. Used for ornaments.

Collectors' number	1357
Museum number	89530

(6) IMPLEMENTS OF GENERAL USE, OF WAR AND THE CHASE, AND OF SPECIAL CRAFTS.

(I) FOR GENERAL USE.

IRON KNIFE (*sú-vĭk*).—Seven specimens. Straight knives, of various shapes and sizes, with wood, bone, or ivory hafts, used by the men.

Collectors' numbers	810	901	970	1056	1125	1162	1330
Museum numbers	89295	89294	89296	89821	89297	89298	89293

KNIFE-BLADE.—Twenty-four specimens. Made of slate, ground, sometimes fastened by lashings to a wooden haft.

Collectors' numbers	168	226	228	367	776	874
Museum numbers	56693	56712	56684	56719	89601	89604
Collectors' numbers	984	1002	1009	1011	1016	1035
Museum numbers	89590	89592	89603	89581	89584	89609
Collectors' numbers	1052	1053	1054	1060	1061	1107
Museum numbers	89597	89594	89589	89593	89597	89591
Collectors' numbers	1168	1180	1305	1587	1710	1714
Museum numbers	89588	89582	89583	89587	89585	89608

WHALEBONE-BLADED KNIFE.—One specimen. Ancient knife, made of a bit of antler, with a deep groove cut in it, into which a piece of whalebone is let for a blade, said to have been used for cutting fat.

Collectors' number	1422
Museum number	89477

CURVED KNIFE (*sav-ĭ-xrón, mĭ'd-lĭñ*).—Thirty specimens. Short curved steel or stone blade in bone or ivory handle—long, for working on wood (*mĭ'd-lĭñ*); short, for working on ivory, &c. (*savixrón*).

Collectors' numbers	145	152	289	787	818	827	862
Museum numbers	56616	56618	56551	89278	88274	89632	89280
Collectors' numbers		882	884	967	992	1004*d*	1061
Museum numbers		89276	89279	89283	89282	89780	89586
Collectors' numbers		1062	1076	1083	1159	1172	1183
Museum numbers		89580	89281	89271	89272	89277	89275
Collectors' numbers		1196	1198	1212	1218	1231	1234
Museum numbers		89633	89273	89636	89242	89635	89639
Collectors' numbers		1235	1248	1254	1255	1256	1297
Museum numbers		89640	89638	89634	89643	89641	89644

WHALEBONE KNIFE (*sá-rĭ-xú*).—Ten specimens. Like a little spokeshave, blade of steel or stone, handle of bone or ivory, used for scraping whalebone.

Collectors' numbers	885	896	1077	1213	1219
Museum numbers	89306	89305	89307	89649	89650
Collectors' numbers	1225	1226	1236	1237	1238
Museum numbers	89652	89647	89648	89645	89646

WHALEBONE-SCRAPER.—One specimen. Small oblong flint chipping, used for scraping whalebone, without a handle.

Collectors' number	1176
Museum number	89616

WOMAN'S KNIFE (*u-lú-ra*).—Twenty-six specimens. Half-moon-shaped blade, of iron, flint, or slate, rarely jade, mounted like a chopping-knife, in a handle of wood, bone, or ivory; used by the women for cutting everything.

Collectors' numbers	12	14	129	191	[1]871	886	894
Museum numbers	56690	56646	56660	56072	89693	89684	89681
Collectors' numbers	957	958	971	985	1057	1078	1093
Museum numbers	89687	89682	89679	89689	89383	89677	89674
Collectors' numbers	1094	1106	1121	1122	1170	1178	
Museum numbers	89688	89680	89683	89686	89675	89692	
Collectors' numbers	1291	1311	1360	1584	1585	1586	
Museum numbers	89384	89690	89691	89678	89685	89676	

[1] Handle.

ADZE (*úd-lĭ-mau*).—Eighteen specimens. Head made of iron (sometimes a hatchet-head), bone with an iron or stone blade let in. When hafted, lashed with thong to a short handle.

Collectors' numbers	244	260	286	309	696	752
Museum numbers	56642	56640	73573	56638	89876	89877
Collectors' numbers	769	785	808	869	878	895
Museum numbers	89839	89872	89870	89871	89869	89878
Collectors' numbers	964	972	1072	1109	1295	1317
Museum numbers	89874	89873	89653	89838	89651	89840

STONE ADZE-BLADE (*úd-lĭ-mau*).—Twenty-three specimens. Made of jadeite, black or dark green, partially ground.

Collectors' numbers	69	70	71	125	130	185
Museum numbers	56675	56678	56685	56664	56666	56665
Collectors' numbers	214	215	219	246	247	248
Museum numbers	56628	56667	56669	56670	56688	56674
Collectors' numbers	251	261	792	900	931	1092
Museum numbers	56670	56696	89659	89662	89663	89670
Collectors' numbers	1155	1184	1362	1363	1423	
Museum numbers	89661	89660	89671	89672	89673	

BONE ADZE-HANDLE.—One specimen.

Collectors' number	3
Museum number	56641

CHISEL (*kĭñ-nu-sá*).—Nine specimens. Short square blade wedged in ivory handle for working on antler.

Collectors' numbers	894	1000	1028	1039	1040
Museum numbers	89302	89301	89300	89299	89304
Collectors' numbers	1115	1257	1290	1292	
Museum numbers	89303	89637	89653	89308	

SAW (*u-lu-ă'k-tun*).—One specimen. Made by filing teeth on the edge of a common case-knife.

Collectors' number	15
Museum number	56559

BONE SAW (*u-lu-ă'k-tun*).—One specimen. Made of a reindeer's scapula (*ki'asia*). Newly made on the ancient pattern.

Collectors' number	1206
Museum number	89476

HAMMER.—One specimen. An oblong green pebble (*kau'-ď'lo*) has been used as a hammer without a handle.

Collectors' number	274
Museum number	56061

FLINT HAND-DRILL (*i'-taun*, *i-tûg-ĕt-saú*).—Four specimens. Long chipped flint mounted in a wooden shaft, for boring out whale-harpoon heads.

Collectors' numbers	870	912	937	1068
Museum numbers	89626	89628	89627	89630

Bow-drill (*ni-ă'k-tun*).—Fifteen specimens. Drill of steel or bone, mounted in a wooden shaft.

Collectors' numbers	819	[1]836	853	875	956	960
Museum numbers	89497	89501 89493 89494	89496	89495	89498	89629
Collectors' numbers	968	[2]1004*a*	1174	1182	1258	[3]1217
Museum numbers	89499	89779 89778	89516	89520	89519	89625

[1] Three specimens. [2] Two specimens. [3] Without shaft.

Drill-bow (*pi-zĭ'k-su-a*).—Sixteen specimens. Flat bow of ivory or bone, often carved or engraved, with a string of rawhide.

Collectors' numbers	72	298	[1]836	[1]861	914	920
Museum numbers	56518	56506	89512 89514	89513 89515	89509	89516
Collectors' numbers	941	956	[1]961	1004*d*	1260	[1]1732
Museum numbers	89517	89508	89510 89511	89777	89421	89422 89425

[1] Two specimens.

Drill-mouthpiece (*kĭ'ñ-mi-a*).—Seven specimens. Made of wood, to be held in the teeth with a socket of stone or metal let into it for the drill to work in.

Collectors' numbers	800	876	891	892	908	956	1004*c*
Museum numbers	89500	89504	89503	89505	89507	89506	89787

Sheath for drill.—One specimen. Ivory scabbard with a loop on one side for fastening it by a thong to the handle of the drill.

Collectors' number	1112
Museum number	89447

Drill-cord handles.—One specimen. Small bones, used for handles to the drill-cord instead of a bow.

Collectors' number	1022
Museum number	73571

Whetstone (*i'-pik-saun*).—Ten specimens. Slender tapering rod of jadeite.

Collector's numbers	186	220	393	757	801	[1]837	865	951	1262
Museum number	56682	56663	56662	89621	89618	89619 89624	89620	89622	89617

[1] Two specimens.

Small whetstone.—Two specimens. Small oblong bit of stone (slate).

Collectors' number	[1]1004*f*
Museum number	89786

[1] Two specimens.

Slate tools.—Three specimens. Broken.

Collectors' number	[1]1728
Museum number	73572

[1] Three specimens.

Marlinspike (?).—One specimn.e Slender rod of hard bone, with a point like a graver Perhaps a marlinspike for working lashings.

Collectors' number	1282
Museum number	89459

TOOL-BOX.—Six specimens. Long narrow box hollowed out of a single block, with cover fastened on by studs and strings.

Collectors' numbers	1144	1151	1152	1318	1319	1593
Museum numbers	89858	89861	89860	89859	89858	89862

TOOL-BAG (*i'k-cug'-bwiñ*).—Four specimens. Made of wolverine-skin or the heads of wolves and foxes, with an ivory handle (*nix-o-mi'-a-bwi*).

Collectors' numbers	1004	1018	1118	1309
Museum numbers	89776	89794	89796	89795

BUCKET OR BAG HANDLE (*nix-o-mi'-a-bwi*).—Three specimens. Arched bar of antler or ivory for carrying bucket or bag.

Collectors' numbers	43	996	1111
Museum numbers	56513	89423	89420

WORKBAG.—One specimen. Made of leather.

Collectors' number	1075
Museum number	89798

BAG (*i-pi-á-ru*).—One specimen. Made of a bear's stomach.

Collectors' number	1329
Museum number	89799

(2.) WEAPONS OF WAR AND THE CHASE.

A. *Striking.*

HAND-CLUB (*tĭ'g-a-lun*).—One specimen. Short blunt-pointed piece of bone held in clenched hand for striking a blow.

Collectors' number	1310
Museum number	89492

SLUNGSHOT (*tû'b-lu-kûñ*).—One specimen. Lump of bone, with a loop of thong through it. Weapon (?).

Collectors' number	905
Museum number	89472

B. *Throwing weapons.*

HANDBOARD.—Three specimens. Narrow grooved board with hole for forefinger, for throwing javelins.

Collectors' numbers	528	1325	1326
Museum numbers	89234	89906	89902

KNOB OF BIRD-SLING (*kĕ-lau-ĭ-taú-tĭn*).—Five specimens. Oval or round knobs of ivory or deer's ankle bones, to be tied together with strings and make a "bolas" for catching ducks.

Collectors' numbers	1251	[1]1342	[1]1318
Museum numbers	89537	89491	89490

[1] Two specimens.

D. *Thrusting.*

WHALE LANCE.—One specimen. Long shaft and large flint head.

Collectors' number	537
Museum number	56765

BEAR LANCE (*pŭ′n-nŭ*).—One specimen. Stout lance, larger than deer lance (*kà′-pun*), with chipped flint head.

Collectors' number	1230
Museum number	89893

DEER SPEAR (*kà′p-un*).—Six specimens. Spear about 6 feet long, with metal or stone head for stabbing deer from the *kaiak*.

Collectors' numbers	524	525	[1]1157	[1]1324
Museum numbers	73183	89247	89898 89899	89896 89897

[1] Two specimens.

HEAD OF WHALE LANCE (*kal-u-i′-a*).—Eleven specimens. Chipped black flint, used for killing whales.

Collectors' numbers	5	49	209	239	394	913
Museum numbers	56681	56667	56695	56679	56680	56597
Collectors' numbers	[1]1032	1034	....	1069	1361	1373
Museum numbers	89596	89597	....	89600	89598	89599

[1] And part of shaft.

POLISHED STONE LANCE-HEAD (*i′s-ĭñ-nŭ*).—One specimen. Beautiful head of polished jade for a deer lance.

Collectors' number	1154
Museum number	89610

STONE LANCE-HEAD (*ŭn-ma*).—Seven specimens. Chipped flint, of two sizes, for deer and bear lances.

Collectors' numbers	[1]114	648	1034
Museum numbers	56708	58711	89611

[1] Five specimens.

BRONZE LANCE-HEAD (*kă′p-un*).—Two specimens. For deer lance.

Collectors' number	166
Museum number	56699

BIRD TRIDENT (*nu-yă′k-pai*).—Nine specimens. Light wooden shaft, with one, two, or three ivory prongs on the end, and usually three in the middle, darted at ducks, &c., with a hand board.

Collectors' numbers	63	[1]106	526	527	529	530	[2]793	1325	1326
Museum numbers	72794	56587	89242	72830	72832	89243	89380	89244	89905

[1] Prongs only. [2] Fragment of head.

SPEAR-HEAD (*nu-yă′k-pŭk, nŭt-kăñ*).—Nine specimens. Long, barbed, ivory point for bird or fish javelin.

Collectors' numbers	13	35	103	107	122	284	948	1041	1281
Museum numbers	56588	56589	56586	56591	56590	56592	89373	89375	89374

WHALE HARPOON (*áj-yûñ*).—One specimen. Reduced model (size of a walrus harpoon) of a whale harpoon, complete, with pole, head, and short line for attaching floats. Made for sale.

Collectors' number	1023
Museum number	89909

WALRUS HARPOON, COMPLETE (*ú-nak-pûk*).—Six specimens. Heavy harpoon, with short "loose-shaft" and detachable "toggle-head," for harpooning walrus from the boat.

Collectors' numbers	531	532	533	534	535	536
Museum numbers	56767	56768	58769	56770	56771	56772

THROWING-SPEAR (*naú-lĭ-gû*).—Two specimens.—Long shaft, with ivory ice-pick on one end and heavy knob on the other, fitted with a short "loose-shaft," head and line, for securing seals which have been shot in the water.

Collectors' numbers	1058	1095
Museum numbers	89908	89907

SEAL SPEAR (*ú-nû*).—Two specimens. For stabbing seals at their breathing-holes.

Collectors' numbers	1	1094
Museum numbers	72833	89910

SEAL DARTS AND THROWING-BOARD (*kú-ki-gû*).—Three specimens. Light ivory-headed darts, head detachable, and attached to shaft by short line so that shaft acts as a float. In sets of three, with a grooved hand-board for throwing them.

Collectors' numbers	60	522	523
Museum numbers	72792 [1]89235	89248 72793	72790 89249 [1]89233

[1] Board.

FORE-SHAFT OF WHALE HARPOON.—One specimen. Ivory, for connecting head with pole.

Collectors' number	97
Museum number	56537

HARPOON FORE-SHAFT (*u-ku-mái-lu-ta*).—Two specimens. Bone or ivory cap for end of pole, with socket for "loose-shaft."

Collectors' numbers	98	[1]105
Museum numbers	56538	56516

[1] For seal spear.

"LOOSE-SHAFT" OF SEAL SPEAR (*i'-gi-mû*).—One specimen. Bone.

Collectors' number	802
Museum number	89489

NARWHAL IVORY SEAL-SPEAR SHAFT.—Three specimens. Three long "loose-shafts" (*i'-gi-mû*) for the stabbing seal spear (*ú-nû*), made of twisted narwhal ivory.

Collectors' number	95
Museum number	73577

HEAD OF WHALE HARPOON (*ki'-a-drun*).—Eleven specimens. Detachable head, with barb of ivory, and blade of metal, slate, or chipped flint.

Collectors' numbers	137	157	[1]867	[2]888	927
Museum numbers	56601	56602	89751 89752 89755	89753	89746
Collectors' numbers	928	969	[3]998	[4]1044	1065
Museum numbers	89742	89744	89754	89745 89747	89749

[1] Three barbs only. [2] One barb. [3] Barb. [4] Two specimens.

WALRUS-HARPOON HEAD (*tú-kû*).—Forty-four specimens. Detachable harpoon head, made of ivory and iron or brass, like seal harpoon but larger.

Collectors' numbers	53	[1]123	[2]192	193	199	[2]211	283
Museum numbers	56613	56616	56517	56623	56620	56618	56621
Collectors' numbers	[3]873	[1]940	943	[4]947	1036	1140	
Museum numbers	89771 89774 89788 89789 89791 89793	89760 89769	89790	89756 89759	89750	89770	

[1] Ten specimens. [2] Two specimens. [3] Nine specimens. [4] Four specimens.

SEAL-SPEAR HEAD (*naú-lû*).—Six specimens. Detachable harpoon head, made of ivory and steel.

Collectors' numbers	39	[1]89	[1]216	1008
Museum numbers	56614	56611	56612	89784

[1] Two specimens.

IVORY SEAL-HARPOON HEAD (*à'k-qlĭ-gûk*).—Six specimens. Detachable barbed harpoon head, wholly of ivory or bone. Ancient.

Collectors' numbers	760	766	795	932	1261	1383
Museum numbers	89372	89377	89379	89381	89378	89382

HARPOON BLADES.—Twenty-five specimens. Triangular blades of ground slate, jadeite, or brass to be wedged into ivory barb. Different sizes for whales, &c.

Collectors' number	[1]139	[1]141	[2]144	[2]169	[2]188	265
Museum number	56709	56689	56706	56698	56697	56722
Collectors' number	316	775	[1]981	[2]995	1418	1729
Museum number	56718	89607	89730	89604 89605	89623	89606

[1] Four specimens. [2] Two specimens.

BRASS HARPOON BLADE.—Two specimens. Triangular blade of brass for wedging into ivory barb.

Collectors' number	[1]1146
Museum number	89740

[1] Two unfinished.

BOX FOR HARPOON BLADES (*úd-lun*).—Twelve specimens. Wooden box, with cover attached by strings, for holding spare slate blades for harpoons. Made in shape of whale, walrus, or large seal.

Collectors' number	124	127	[1]138	142	189	198
Museum number	56503	56489	56505	56501	56500	56502
Collectors' number	777	859	869	981	1161	
Museum number	89720	89731	89732	89730	89733	

[1] Two specimens.

BONE DAGGER.—Six specimens. Made of split leg-bone of a bear. Ancient. Said to have been a weapon.

Collectors' numbers	767	965	988	1141	1175	1709
Museum numbers	89484	89485	89475	89480	89481	89482

E. *Projectile weapons.*

BOW (*pi-zi'k-si*) **AND ARROWS** (*kă'k-a-ru*).—Fifty-five specimens. Bow of spruce reinforced with sinew. Arrows, shafts of (generally) soft wood; heads of iron, flint, bone, or ivory, sharp pointed for killing large game, blunt for birds.

Collectors' numbers	[1]25	[2]68	[3]74	[4]119	[5]162	[3]163	[4]164	[4]165	[6]23[illegible]	[4]241	[7]786
Museum numbers	[8]89245 [8]89238 [8]89241 [9]72754 [9]72755 [9]72757 [9]72758 [9]72760 [9]72765 [9]72767	89236 89240	72768	89239 89241	89238 89241	89236	89237 72763	72766 72764	72771 72787	89236 72770	89904

[1] Bow and twelve arrows. [2] Three arrows. [3] One arrow.
[4] Two arrows. [5] Nine arrows. [6] Bow and sixteen arrows.
[7] Bow and two arrows. [8] Bow. [9] Arrows.

STONE ARROW-HEAD (*kú-kin*).—Twenty-four specimens. Chipped flint and jasper of various colors and patterns, some ancient and some newly made for trade; used for bears or any dangerous game.

Collectors' numbers	26	62	[1]64	[2]67	[1]113	143	230	232	[3]240	[3]256	[3]817
Museum numbers	56686	56694	56691	56717	56702	56692	56710	56704	56721	56761 56762	89614

[1] Five specimens. [2] Three specimens. [3] Two specimens.

BONE ARROW-HEAD (*nû't-kăñ*).—Three specimens. Detachable head for deer-arrow.

Collectors' numbers	115	1147	1263
Museum numbers	56599	89376	89460

QUIVER AND BOW-CASE (*pi zi'k-sĭ-zar*).—One specimen. Made of black-dressed sealskin; sometimes together, sometimes separate.

Collectors' numbers	25	234
Museum numbers	89245	72788

QUIVER ROD.—One specimen. Rod of wood or antler, sometimes carved; fastened into the quiver or bow-case to keep it stiff after the bow or arrows are withdrawn.

Collectors' number	231
Museum number	56505

"BRACES" (*mú'n-gĭd-ziñ*).—Three specimens. Small curved oval disks of bone or horn, with holes for strapping on the left forearm or wrist to protect it from being hurt by the string in shooting the bow.

Collectors' numbers	[1]123	1382
Museum numbers	89410	89550

[1] Two specimens.

(3) IMPLEMENTS OF SPECIAL USE.

A. *Flint and other stone-working.*

FLINT-FLAKER (*kĭ'g-lir*).—Nine specimens. Short rod of metal, bone or stone, in ivory handle, for chipping flints.

Collectors' numbers	77	794	796	[1]979	1001
Museum numbers	56551	89260	89263	89265	89264
Collectors' numbers		1004e	1216	1223	[1]1380
Museum numbers		89265	89782	89262	89259

[1] Handle.

B. *Fire-making and utilizing.*

FIRE-DRILL (*ní-o-o-tĭñ*).—One specimen. A stick like a drill-shaft, made to revolve on the flat surface of a cleft soft wood stick, by means of a thong. A deer's ankle-bone held in the teeth serves to steady the drill. Newly made, but of the pattern with which fire used to be obtained.

Collectors' number	1080
Museum number	89822

WILLOW CATKINS (*kĭm-mí-u-ru*).—Two specimens. Used for tinder.

Collectors' numbers	1133	1722
Museum numbers	89825	89825

WILLOW-TWIGS (*ŭ'k-pĭk*).—One specimen. Used for kindlings.

Collectors' number	1725
Museum number	89824

C. *Bow- and arrow-making.*

SINEW-TOOLS.—Two specimens. Flat ivory pins for working the sinew reinforcements on a bow.

Collectors' number	[1]1021
Museum number	89466

[1] Two specimens.

ARROW-TOOL (*ĭ'g-u-gwau*).—One specimen. Slender, flat rod of ivory, with wedge-point, for fixing feathers on arrows.

Collectors' number	1285
Museum number	89486

D. *Fishing implements other than weapons.*

FISH-HOOK (*iak-qlûñ*).—Seven specimens. Oblong, narrow, flat piece of ivory, with a metal hook (either a regular barbed white man's fish-hook, or a barbless hook of iron or copper, native made) at broader end; used for catching burbot in rivers.

Collectors' numbers	32	149	167	764	780	841	887
Museum numbers	56594	56594	56594	89553	89550	89552	89549

SMALL FISH-HOOKS (*nĭ'k-sĭn*).—Thirteen specimens. Small piece of ivory, generally discolored, with a barbless hook, forming a rough imitation of a shrimp or minnow; sometimes inlaid with beads.

Collectors' numbers	[1]150	[2]153	158	[2]160	950	1007
Museum numbers	56705	56609	56700	56610	89554	89783

[1] Three specimens. [2] Four specimens.

FISH "JIGGERS" (*ai'k-sin*).—Two specimens. Little pear-shaped piece of white ivory, with four barbless, generally copper, hooks at large end, for "jigging" polar cod without bait.

Collectors' number	154
Museum number	56607

FISH-LINE COMPLETE.—Ten specimens. Lines of whalebone strips, knotted together, of different lengths, provided with hooks and jigs of different sorts, for large or small fish.

Collectors' numbers	33	57	151	155
Museum numbers	56543	56608	....	56701
Collectors' numbers	156	187	[1]946	[2]1733
Museum numbers		56544	89545, 89546	87547, 89548

[1] Two specimens baited. [2] Two specimens.

HAIR-LINE (*à'k-qlu-ná*).—One specimen. Long fish-line of braided human hair.

Collectors' number	410
Museum number	56545

FLIPPER "TOGGLES" (*kà'g-o-tiñ*).—Two specimens. Two ivory whales, perforated so as to be fastened together by a stout thong. Said to be buttoned through holes in a whale's flippers to keep them in place while towing.

Collectors' numbers	227	407
Museum numbers	56580	56598

IVORY SINKER (*kía-bi-ca*).—Five specimens. For burbot-lines.

Collectors' numbers	[1]132	149	200	887
Museum numbers	56594	56594	56577	89549

[1] Two specimens.

NET-SINKER.—One specimen. An ancient black stone adze-blade, rigged for a net-sinker, with a whalebone lashing around it, making a becket.

Collectors' number	308
Museum number	56668

WHALING FLOAT (*a-po-tû'k-pûñ*).—One specimen. Seal-skin to be inflated and attached to harpoon-line.

Collectors' number	538
Museum number	73578

FISH "GRAINS" (*kàk-i'-bu-a*).—One specimen. Three-pronged, of whalebone, wood, and iron. Short handle for striking fish in shallow water.

Collectors' number	1227
Museum number	89901

FISH-NET (*kú-bra*).—Four specimens. Made of whalebone strips or twisted sinew.

Collectors' numbers	147	171	172	190
Museum numbers	56754	56752	56753	56755

SEAL-NET (*kú-bra*).—One specimen. Made of seal-thong, about 15 feet long; usually set under the ice.

Collectors' number	109
Museum number	56756

SEAL DETECTOR.—Three specimens. Slender rod of ivory, placed in breathing-hole to indicate the approach of the seal.

Collectors' numbers	104	1114	1581
Museum numbers	56507	89454	89453

SEAL DECOY (*á-drĭ-gau-tĭn'*).—Six specimens. Seal claws mounted on a wooden handle, for scratching on the ice to attract seals.

Collectors' numbers	51	90	93	100	1312	1354
Museum numbers	56538	56535	56537	56536	89467	89468

SEAL RATTLE.—Two specimens. Piece of wood cut roughly in shape of seal's head, with a becket of thong in one end and a staple in the other, with three padlock-shaped pieces of iron hung on it. Rattle to attract seals into ice-nets.

Collectors' number	[1]409
Museum number	56533

[1] Two specimens.

SEAL-DRAG (*ŭk-si-u-tĭñ*).—Seven specimens. Thong, with knobs for hauling dead seals.

Collectors' numbers	36	44	45	81	212	755	1337
Museum numbers	56622	56624	56627	56625	56626	89469	89470

SEAL-DRAG KNOBS (*uk-si'-u*).—Seven specimens. Perforated knobs of ivory, generally carved into the heads of animals (bears, seals, &c.), for confining the two parts of raw-hide line used for dragging in dead seals, &c.

Collectors' numbers	[1]18	[2]84	[2]949
Museum numbers	56525	56600	89450

[1] Three specimens. [2] Two specimens.

HANDLE FOR DRAG-LINE (*kŭ'ñ-i*).—Six specimens. Ivory bar, ornamented with carving (heads of seals, &c.).

Collectors' numbers	23	86	835	925	929	930
Museum numbers	56527	56526	89458	89457	89455	89456

THREE-LEGGED STOOL (*nĭk-a-waú-o-tĭn*).—Two specimens. Made of wood, to stand on when watching seal holes.

Collectors' numbers	1411	1412
Museum numbers	89887	89888

E. *Hunting implements, other than weapons.*

WOLF-KILLERS (*ĭs-ĭ'b-ru*).—Nineteen specimens. Pointed rods of whalebone, about 6 inches long. They are doubled up, wrapped in fat, and frozen. When swallowed by a wolf or bear the fat melts and the whalebone straightens out, piercing the coat of the stomach and causing death.

Collectors' numbers	[1]1229	[2]1232	[2]1316	[2]1588
Museum numbers	89538	89541	89540	89539

[1] Seven specimens. [2] Four specimens.

SNOW GOGGLES (*íd-yĭ-gúñ*).—Four specimens. Cover for the eyes, made of wood or antler, with long, narrow, horizontal slits, to protect the eyes from the glare of the snow.

Collectors' numbers	754	763	1296	1708
Museum numbers	89703	89701	89702	89804

MARK FOR CÂCHE (*tú'k u-si-a*).—One specimen. Rod of ivory, with bunch of feathers at the top. Stuck in the snow to indicate where meat is buried.

Collectors' number	978
Museum number	89531

F. *Leather-working tools.*

SKIN-SCRAPER (*i'-kun*).—Nineteen specimens. A chipped flint or ground stone blade, mounted in a handle of wood or ivory, used for dressing skins.

Collectors' numbers	4	29	[1]48	[1]54	[1]748	[2]820	[1]858
Museum numbers	56550	....	56549	56548	89317	89612	89321
Collectors' numbers		955	1071	1079	1135	1156	1171
Museum numbers		89313	89310	89311	89309	89318	89320
Collectors' numbers		1177	1336	1364	1365	1426	[1]1780
Museum numbers		89316	89312	89319	89315	89322	89314

[1] Handle. [2] Blade.

BONE SCRAPER.—One specimen. Made of a piece of long bone, with faces carved on the condyles.

Collectors' number	1578
Museum number	89488

IVORY OIL-CUPS (*ó-ho-rwĭñ*).—Ten specimens. Small oblong ivory cups, with sharp edges, used for scraping blubber from skins to save it.

Collectors' numbers	38	1088	1090	1190	1287
Museum numbers	[1]56603	89257	89258	89254	89251
Collectors' numbers		1288	1289	1416	1417
Museum numbers		89256	89255	89253	89252

[1] Two specimens.

DEERSKIN COMBS (*kú-mo-tĭn*).—Nine specimens. Short cylindrical hollow piece of antler, with comb-teeth cut on one or both ends. Used for combing loose hair out of deer-skin.

Collectors' numbers	34	897	902	983	993
Museum numbers	56585	89360	89358	89357	89359
Collectors' numbers		1005	1017	1029	1579
Museum numbers		89781	89336	89355	89354

G. *Builders' tools.*

MATTOCK.—Six specimens. Made of whale-rib, lashed to haft. Used for digging in the gravel.

Collectors' numbers	285	297	768	879	1043	1315
Museum numbers	56494	73574	89842	89841	89843	89844

PICK-AXE (*sí-klû*).—Two specimens. Made of a piece of walrus-tusk, following the natural curve of the tusk. When hafted, attached to a wooden handle like an adze by lashings of seal-thong.

Collectors' numbers	17	[1]96
Museum numbers	56542	56539

[1] Two specimens.

SNOW-KNIFE (*sav-i-ú-ra*).—Two specimens. Long, flat, curved knife of ivory, for cutting snow.

Collectors' number	82	759
Museum number	56508	89478

Bone snow-pick.—One specimen. Small drill-like tool of bone, set into a handle of antler just large enough to grasp conveniently in the hand. Ancient.

Collectors' number	1249
Museum number	89521

Snow-shovel edge.—One specimen. Made of ivory, and grooved on upper edge for attachment to edge of wooden snow-shovel.

Collectors' number	16
Museum number	56541

Snow-shovel (*pi'k-sun*).—Two specimens. Short, broad blade and short handle made of wood; either one piece or several spliced together with whalebone withes; edge of ivory.

Collectors' numbers	27	30
Museum numbers	56738	56739

Snowshovel, bone (*pi'k-sun*).—One specimen. Made of a whale's scapula, painted and soiled to look old.

Collectors' number	1250
Museum number	89775

Ice-pick (*tú-u*).—One specimen. Bayonet-shaped blade of bone or ivory, to be attached to seal harpoon or to a pole.

Collectors' number	1313
Museum number	49483

Ice-drill (*kăk-aí-ya-xi-on*).—One specimen. Of antler, to be mounted on a long pole.

Collectors' number	1064
Museum number	89479

Ice-scoop.—One specimen. Made of antler netted with whalebone mounted on long pole, for dipping up fragments of ice in cutting a hole.

Collectors' number	1696
Museum number	89903

K. *Procuring and manufacturing food.*

Slate whale-spade (*ú-yúm-ĭ-gá*).—Two specimens. Broad blade of slate, to be attached to bone haft, which is fastened to a long pole, for "cutting in" a whale.

Collectors' numbers	893	1081
Museum numbers	89602	89631

Fish-scaler.—One specimen. Little ivory knife.

Collectors' number	1279
Museum number	89461

Slate blubber-knife.—One specimen. Long, broad blade, double-edged.

Collectors' number	204
Museum number	56676

BLUBBER-HOOK (*nĭ'k-sĭ-gû*).—Three specimens. Wooden handle with bone or ivory barb at end, for pulling around pieces of blubber, &c., long-handled to use from a boat in "cutting in" a whale, and short-handled to use in the storehouses ashore.

Collectors' numbers	126	1203	1353
Museum numbers	56766	89836	89837

N. *Making and working fiber.*

NETTING-NEEDLE (*ĭ'n-mu-rwing*).—Twelve specimens. Of ivory or antler. Different sizes, for making fish and seal nets.

Collectors' numbers	7*a*	8	24	42	101	102
Museum numbers	56575	56573	56574	56571	56670	56581
Collectors' numbers	942	[1]959	1283	1286	1333	1381
Museum numbers	89433	89426, 89432	89427	89430	89429	89428

[1] Two specimens.

MESH-STICK (*kú-brĭn*).—Five specimens. Of ivory or antler. Various sizes, for fish or seal nets.

Collectors' numbers	102	942	983	1019	1284
Museum numbers	56581	89437	89439	89435	89436

NETTING-WEIGHTS (*nĕp-ĭ-taú-ra*).—Eleven specimens. Little ivory fish hung on to meshes of net to make it hang properly while netting.

Collectors' numbers	[1]202	[1]207	[1]778	[1]899	[1]854	1020
Museum numbers	56597	56596	89443, 89445	89440, 89441	89442, 89444	89446

[1] Pair.

SINEW SHUTTLE.—One specimen. Short shuttle of bone or ivory for twisting and holding sinew-thread.

Collectors' number	1332
Museum number	89431

WEAVING-TOOLS.—One specimen. Bone shuttle, spatula, and mesh-stick for weaving feather belts.

Collectors' number	1338
Museum numbers	89434, 89438, 89462

BONE-NEEDLES (*mĭ'k-sun*).—Fifty-one specimens. Made of reindeer's fibula (*a-mĭ'l-ya-rûñ*). Obsolete.

Collectors' numbers	[1]1191	1195	1201	1202	[2]1204
Museum numbers	89389	89392	89369	89391	89397
Collectors' numbers	[2]1205	[2]1214	[3]1220	1221	1222
Museum numbers	89398	89399	89400	89390	89360
Collectors' numbers	[4]1228	1239	[5]1240	[6]1245	[7]1246
Museum numbers	89401	89361	89394	89395	89396

[1] Two specimens.
[2] Three specimens.
[3] Four specimens.
[4] Five specimens.
[5] Six specimens.
[6] Thirteen specimens.
[7] Seven specimens.

NEEDLE-CASE (*ŭ-ya-mi*).—Thirteen specimens. Hollow cylinder of ivory or bone, with a strip of raw-hide in which the needles are stuck, run through it, and held by an ivory knob at the end. Fastened to the belt by an ivory hook.

Collectors' numbers	7	1033	1089	1105	1137	1201
Museum numbers	56575	89370	89368	89363	89366	89369
Collectors' numbers	1222	1239	1243	1276	1277	1339
Museum numbers	89360	89361	89364	89371	89365	89367

THIMBLE (*tĭ'k-kĭ(l)*).—Ten specimens. Of three patterns, viz: a simple rather broad band of walrus-hide sewed into a ring to fit the tip of the finger; a ring and lappet cut out of one piece of seal-skin; and a ring of antler with a broad piece on one side.

Collectors' numbers	1191	[1]1194	1195	1202	1240	[2]1245	1246
Museum numbers	89389	89393	89392	89391	89394	89395	89396

[1] Three specimens. [2] Two specimens.

THREAD-CASE.—Nine specimens. Tube of antler with wooden ends for holding thread, &c., sometimes engraved with pictures or patterns.

Collectors' numbers	41	47	59	1128	1136
Museum numbers	56615	56606	56605	89404	89406
Collectors' numbers	1158	1335	1359	1371	....
Museum numbers	89407	89405	89402	89408	....

IVORY BOX.—Three specimens. Used for holding beads, needles, and trinkets.

Collectors' numbers	37	1372	1425
Museum numbers	56583	89409	89403

WICKER-BOX (*i-pĭ-á-ɪ u*).—Four specimens. Little round basket of woven osier, with bag-top of black-dressed seal-skin (*yukă'kqlĭñ*) and a draw-string, for holding tobacco or trinkets.

Collectors' numbers	88	135	1366	1427
Museum numbers	56564	56565	89801	89802

(7) MEANS OF LOCOMOTION AND TRANSPORTATION.

A. *Traveling by water.*

CANOE AND PADDLE (*kai'-ak*).—One specimen. Full-sized single canoe and double-bladed paddle.

Collectors' number	539
Museum numbers	[1]89246 [2]57773

[1] Paddle. [2] Canoe.

MODEL CANOE (*kai'-ak*).—One specimen. Small model of man's single canoe with paddle.

Collectors' number	2[illegible]4
Museum number	56561

MODEL SKIN BOAT (*u-mi'-a(k)*).—One specimen. Small model of the large traveling and whaling boat, with paddles.

Collectors' number	2[illegible]5
Museum number	56563

ROWLOCK FOR UMIAK.—One specimen. A long straight piece of antler lashed on the gunwale of the boat. The oar plays on it in a loop of thong.

Collectors' number	1197
Museum number	89696

BAILING DIPPER FOR UMIAK (*sá-nai-un?*).—Two specimens. Long, slender, curved dipper of ivory or antler.

Collectors' numbers	40	1010
Museum numbers	56536	89335

CROTCH FOR WHALING HARPOON (*kû'n-nä*).—Five specimens. Made of ivory or walrus lower jaw, in shape of a large row-lock, usually carved and engraved. Fastened in the bow of the whaling umiak to rest the harpoon in.

Collectors' numbers	116	117	926	1104	1224
Museum numbers	56511	56510	89419	89417	89418

D. *Land conveyances and other means of locomotion.*

MEAT-SLED.—One specimen. Little flat sled of wood, with ivory runners, for dragging provisions.

Collectors' number	1140
Museum number.	89889

WHALEBONE SLED.—One specimen. Little sled made of strips of whalebone placed side by side lengthwise, and sewed together with whalebone withes.

Collectors' number	772
Museum number	89875

C. *Traveling on foot.*

SNOWSHOES (*tûg'-lu*).—Three specimens. Wooden frame netted with raw hide.

Collectors' numbers	1736	1737	1738
Museum numbers	89912	89913	89914

(10) GAMES AND PASTIMES.

A. *Gambling implements.*

PLAYING-STICKS (*ka-pú-tä*).—Nine specimens. Two ivory pegs and a bundle of ivory sticks for playing a game.

Collectors' numbers	9	[1]249	[2]842	[3]962
Museum numbers	56532	56521	89464	89465

[1] Two sticks. [2] Two sticks and peg. [3] Four sticks.

IVORY CARVINGS.—Twenty five specimens. Twenty-five little ivory carvings, representing a fox and twenty-four geese, made by the Asiatic Eskimos ("Tuski," "Sedentary Chukches") of Plover Bay, Eastern Siberia. Said to be a game like "jack-straws."

Collectors' number	21
Museum number	56531

B. *Games and pastimes.*

WOODEN GORGET (*sú'k-i-mūñ*).—Three specimens. Half-moon shaped piece of flat board, serrated on the curved edge, and painted with figures of men, whales, &c. Suspended round the neck with strings in ceremonial dances.

Collectors' numbers	265	855	1132
Museum numbers	56493	89817	89818

MOUNTED FOX-SKIN.—One specimen. Skin of an Arctic fox stuffed and mounted on a board, with a whalebone spring in him, and worked by strings so that he darts his head at a bunch of fur made to represent a lemming; and made, by means of strings, to run in and out of two holes in the board. For theatrical performances.

Collectors' number	1378
Museum number	89893

C. *Sports and toys for children.*

"SNAPPER" (*mi-tig-li-gaun*).—One specimen. Rod of whalebone with a hollow on one end, for "snapping" little pebbles or shot at people. Boy's toy.

Collectors' number	181
Museum number	56687

"WHIRLIGIG," OR TOP (*kaíp-sa*).—Two specimens. A large conical piece of wood or horn, with a slender axis of bone at the base thrust through a hollow cylinder of antler. The top is made to spin by a string passing through a hole in the side of the cylinder to the axis. Toy.

Collectors' numbers	1198	1356
Museum numbers	89806	89807

WHIZZING STICK (*ĭm-ig-lúk-ta*).—One specimen. Oval piece of flat board, with serrated edges, attached to a stick by a string. Makes a loud whizzing sound when swung around.

Collectors' number	1331
Museum number	89800

TEETOTUM (*kraíp-sa*).—One specimen. Disk of wood, with a short stick through the middle. Toy.

Collectors' number	46
Museum number	56491

"BUZZ" TOY.—One specimen. Square flat piece of wood, with serrated edges, made to spin by two pieces of string.

Collectors' number	1087
Museum number	89722

TOY MAN IN KAIAK.—Two specimens. Kaiak carved from a block of wood; man sitting in it paddling; arms worked by strings.

Collectors' numbers	[1]783	1351
Museum numbers	89856	89855

[1] Unfinished.

TOY DRUM AND STICK.—One specimen. Small model of the ordinary drum.

Collectors' number	1186
Museum number	89797

TOY SPEAR (*kàp ú-ra*).—One specimen. Miniature deer-lance (*kà'p-un*) made of antler.

Collectors' number	1280
Museum number	89595

MODEL WHALE HARPOON (*a'j-yûñ*).—One specimen. Small model made of wood and ivory of a complete whaling harpoon, rigged, with line and two floats, or "pokes" (*a'-po-tû'k-pûñ*).

Collectors' number	233
Museum number	56562

TOY SPEAR (*u-ná-ra?*).—One specimen. Miniature model of seal-harpoon, made of wood and ivory.

Collectors' number	1082
Museum number	89551

(11) MUSIC.

A. *Instruments for beating.*

DRUM (*kĕ'l-yau*).—Four specimens. A large hoop of wood, with a short ivory handle, and parchment (walrus intestine) stretched over it. Held by handle in left hand and struck on rim with a stick held in right hand.

Collectors' numbers	31	79	80	514
Museum numbers	56743	56741	56740	56742

DRUM HANDLE.—Seven specimens. Carved from walrus ivory.

Collectors' numbers	65	76	784	881	898	911	975
Museum numbers	56514	56515	89266	89270	89267	89268	89269

(12) ART.

A. *Art materials.*

FOSSIL IVORY (*kĭl-ĭ'g-wă*).—One specimen. Section of a large tusk from interior.

Collectors' number	1779
Museum number	80892

B. *Works of art.*

IVORY CARVINGS.—Thirty-seven specimens. Small images, human figures, seals, [illegible] &c. Works of art or amulets.

Collectors' numbers	78	85	92	120	[1]140	[1]173	201
Museum numbers	56519	56520	56524	56522	56584	56582	56578
Collectors' numbers	220	254	444	756	953	980	989
Museum numbers	56530	56529	56732	89720	89340	89349	89342
Collectors' numbers	[1]990	991	992	994	999	[1]1024	1067
Museum numbers	89346, 89347	89327	89341	89332	89330	89323, 89324	89334
Collectors' numbers	1084	1085	1086	1098	1099	1100	1101
Museum numbers	89723	89351	89326	89338	89339	89352	89320
Collectors' numbers	1113	1124	1273	1274	1384	......	......
Museum numbers	89451	89343	89345	89337	89533	......	......

[1] Two specimens.

IVORY BUTTONS.—Two specimens. Carved in shape of "bowhead" whale.

Collectors' number	[1]66
Museum number	56619

[1] Two specimens.

IVORY CARVINGS.—Four specimens. Walrus teeth carved into human faces, seal and bear heads, &c.

Collectors' numbers	152	56
Museum numbers	56523	56528

[1] Two specimens.

CRUCIFIX (?).—Two specimens. Slender *crux ansata* of ivory surmounted by a human head of soapstone or bone, neatly secured by lashings. Made for sale, probably a mere "curio," perhaps suggested by a crucifix which the maker may have seen.

Collectors' numbers	1012	1091
Museum numbers	89741	89742

ENGRAVINGS ON IVORY.—Six specimens. Pieces of flat walrus ivory, old shovel edges, &c., on which are scratched various pictures, hunting records, &c., colored with soot or red ochre.

Collectors' numbers	99	121	891	1026	1334	1339
Museum numbers	56559	56517	89424	89437	89474	89473

BONE CARVINGS (*saú-nä=bone*).—Eleven specimens. Small images, seals, human figures, &c. Works of art or amulets.

Collectors' numbers	75	997	1025	1066	1127	1143
Museum numbers	56579	89471	89353	89449	89348	89331
Collectors' numbers	1160	1167	1172	1175	1369	.....
Museum numbers	89325	89328	89344	89335	89336	.....

WOODEN WHALES, &C.—Five specimens. Seals, whales, and walruses carved in soft wood. Old and probably for good luck.

Collectors' numbers	[1]857	987	1036	1299
Museum numbers	89736, 89737	89734	89735	89524

[1] Two specimens.

WOODEN IMAGES.—Six specimens. Men or women, more or less roughly whittled out of wood. Work of art or toys.

Collectors' numbers	[1]203	655	1185	1192	1193
Museum numbers	56495	56490	89725	89726	89727

[1] Two specimens.

GYPSUM CARVINGS.—Three specimens. Man, beluga, and bear. Made for sale.

Collectors' numbers	1014	1015	1027
Museum numbers	89575	89573	89574

SOAPSTONE CARVINGS.—Seventeen specimens. Little images, men, beasts, and monsters, carved in soapstone (*tu-nä'k-tû*).

Collectors' numbers	904	966	986	1095	1108
Museum numbers	89567	89576	89563	89569	89568
Collectors' numbers	[1]1116	[1]1188	1252	1253	1266
Museum numbers	89571, 89572	89559, 89560	89566	89561	89558
Collectors' numbers	1267	1268	1269	1270	1271
Museum numbers	89557	89562	89564	89565	89570

[1] Two specimens.

BEAR'S JAWS.—One specimen. Mounted in seal-skin for sale by a native taxidermist.

Collectors' number	1130
Museum number	89823

FRESH-WATER SCULPIN.—One specimen. Carefully put up dry in a little wooden case by a native and brought in for sale.

Collectors' number	1145
Museum number	89536

(17.) RELIGION.

STONE AMULETS.—Seven specimens. Flint, jasper, crystal, or thick glass, flaked into a rude image of a whale or bear.

Collectors' numbers	61	159	208	771	929	1051	1247
Museum numbers	56683	56707	56713	89613	89577	89578	89533

CHARMS.—Thirteen specimens. Dried birds, bits of antler, fawns' feet, bits of earth, pebbles, feathers, teeth, &c., worn or carried in the boat, &c., for good luck, each generally with some specific purpose.

Collectors' numbers	656	779	1110	1148	1173	1244	1306
Museum numbers	56547	89699	89743	89452	89522	89535	89534
Collectors' numbers	1307	1308	1314	1327	1328	1580	......
Museum numbers	89532	89525	89523	{89527 / 89528}	89526	89698	......

"ICE-MEDICINE."—One specimen. Indurated sand, probably from some special (sacred?) place. Small particles thrown, with ceremony, from the village bank will make the ice go away.

Collectors' number	273
Museum number	56725

ALPHABET.

a, as in *far, farther;* Gm. *haben;* Sp. *ramo.*
ă, nearly as in *what, not;* Gm. *man:* as *oi* in Fr. *loi.*
ä, as in *hat, man.*
â, as in *law, all, lord;* Fr. *or.*
ai, as in *aisle*, as *i* in *pine, find;* Gm. *Hain.*
âi, as *oi* in *boil, soil;* Sp. *oyendo, coyote.*
au, as *ou* in *out*, as *ow* in *how;* Gm. *Haus;* Sp. *auto.*
b, as in *blab;* Gm. *beben:* Fr. *belle;* Sp. *bajar.*
c, as *sh* in *shall;* Gm. *schellen;* Fr. *charmer.*
ç, as *th* in *thin, forth.*
ȼ, as *th* in *then, though.*
d, as in *dread;* Gm. *das;* Fr. *de;* Sp. *dedo.*
e, as in *they;* Gm. *Dehnung;* Fr. *dé;* Sp. *qué.*
ĕ, as in *then;* Gm. *denn;* Fr. *sienne;* Sp. *comen.*
f, as in *fife;* Gm. *Feuer;* Fr. *feu;* Sp. *fumar.*
g, as in *gig;* Gm. *geben;* Fr. *goût;* Sp. *gozar.*
h, as in *ha, he;* Gm. *haben.*
i, as in *pique;* Gm. *ihn;* Fr. *île;* Sp. *hijo.*
ĭ, as in *pick;* Gm. *will.*
j, as *z* in *azure; j*, in Fr. *Jacques;* Portuguese *Joao.*
k, as in *kick;* Gm. *Kind;* Fr. *quart;* Sp. *querir.*
l, as in *lull;* Gm. *lallen;* Fr. *lourd;* Sp. *lento.*
m, as in *mum;* Gm. *Mutter;* Fr. *me;* Sp. *menos.*
n, as in *nun;* Gm. *Nonne;* Fr. *ne;* Sp. *nada.*
ñ, as *ng* in *sing, singer;* Sp. *luengo.*
o, as in *note;* Gm. *Bogen;* Fr. *nos.*
ŏ, nearly as in (N. E.) *home;* Gm. *soll:* Fr. *sotte;* It. *sotto*, Sp. *sol.*
p, as in *pipe;* Gm. *Pappe;* Fr. *poupe;* Sp. *popa.*
q, as *ch* in Gm. *ich*, or *ch* in *ach*, if the former is not found.
r, as in *roaring;* Gm. *rühren;* Fr. *rare;* Sp. *razgar.*
s, as in *sauce;* Gm. *Sack;* Fr. *sauce;* Sp. *sordo.*
t, as in *touch;* Gm. *Tag;* Fr. *tâter;* Sp. *tomar.*
u, as in *rule;* Gm. *du;* Fr. *doux;* Sp. *uno.*
ŭ, as in *pull, full;* Gm. *und.*
ü, as in Gm. *kühl;* Fr. *tu.*
û, as in *but;* Fr. *pleuvoir.*
v, as in *valve;* Fr. *veux;* Sp. *volver;* and as *w* in Gm. *wenn.*
w, as in *wish;* nearly as *ou* in Fr. *oui.*
x, nearly as the Arabic *ghain* (the sonant of *q*).
y, as in *you;* Sp. *ya;* as *j* in Gm. *ja.*
z, as *z* and *s* in *zones:* Gm. *Hase;* Fr. *zèle;* Sp. *roza.*
dj, as *j* in *judge.*
hw, as *wh* in *when;* Sp. *huerta.*
hy, as in *hue.*
ly, as *lli* in *million;* as *ll* in Fr. *brilliant;* Sp. *llano:* and as *gl* in It. *moglié.*
ñg, as in *finger, linger.*
ny, as *ni* in *onion;* as *ñ* in *cañon;* Fr. *agneau;* Sp. *maraña.*
tc, as *ch* in *church*, and *c* in It. *cielo;* Sp. *achaque.*

Excessive prolongation of a vowel should be marked thus: *a*+, *â*+, *ü*+.

Nasalized vowels should be written with a superior *n*, thus: *e*ⁿ, *ö*ⁿ, *û*ⁿ, *a*ⁿ, *ai*ⁿ.

An aspirated sound should be marked by an inverted comma, thus: *b*ʻ, *d*ʻ.

An exploded sound or hiatus should be marked by an apostrophe, thus: *b*', *d*'.

Synthetic sounds should be written with the letter which represents the sound which seems to be most commonly emitted.

Syllables should be separated by hyphens. In connected texts hyphens should be omitted.

The accented syllable of every word should be marked by an acute accent, thus: *tcu-ar'-u-ûm-pu-rûn-kûnt.*

ETHNOLOGY.

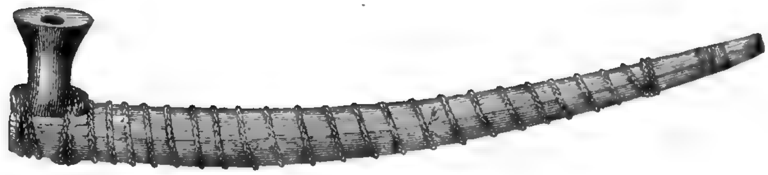
PLATE I.

PIPES, ETC. POINT BARROW ESKIMOS.

1. Tobacco-pipe with bowl of brass, inlaid with copper; stem of wood in two sections, held together by sealthong. Steel picker attached by a thong. $\frac{1}{3}$. No. 89288.
2. Similar pipe with bowl of antler, wound with twine of braided sinew. $\frac{1}{3}$. No. 89291.
3. Tobacco pouch of reindeer skin, trimmed with fur. $\frac{1}{3}$. No. 89805.
4. Man's bracelet of walrus-hide, ornamented with a bead of soapstone. Natural size. No. 89388.

(Drawn by C. F. Trill.)

1.



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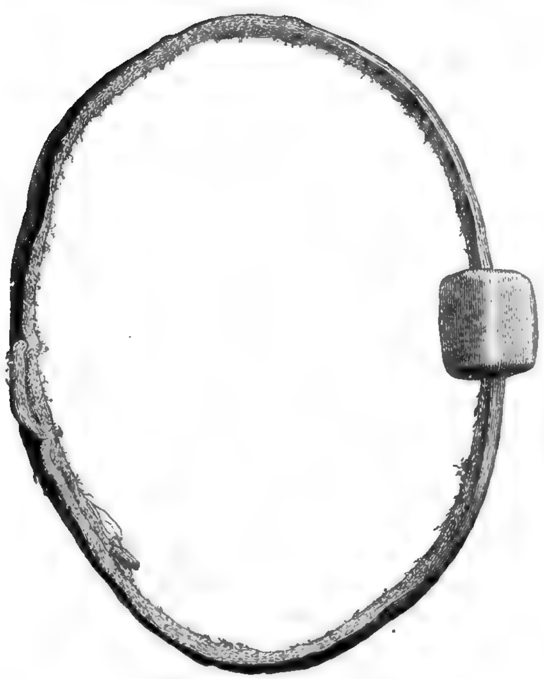

4.

3.

PLATE II.

TOOLS. POINT BARROW ESKIMOS.

1. Steel-pointed bow-drill, with ivory sheath. $\frac{1}{3}$. Nos. 89502 and 89447.
2. Ivory drill-bow. $\frac{1}{3}$. No. 89515.
3. Wooden mouth-piece, with stone socket for drill. $\frac{1}{3}$. No. 89500.
4. Flint-pointed hand-drill. $\frac{1}{3}$. No. 89626.
5. Ground adze-head of jade. $\frac{1}{2}$. No. 56667.
6. Stone maul, with wooden haft. Head of light greenish, massive pectolite. $\frac{1}{3}$. No. 56635.

(Drawn by C. F. Trill.)

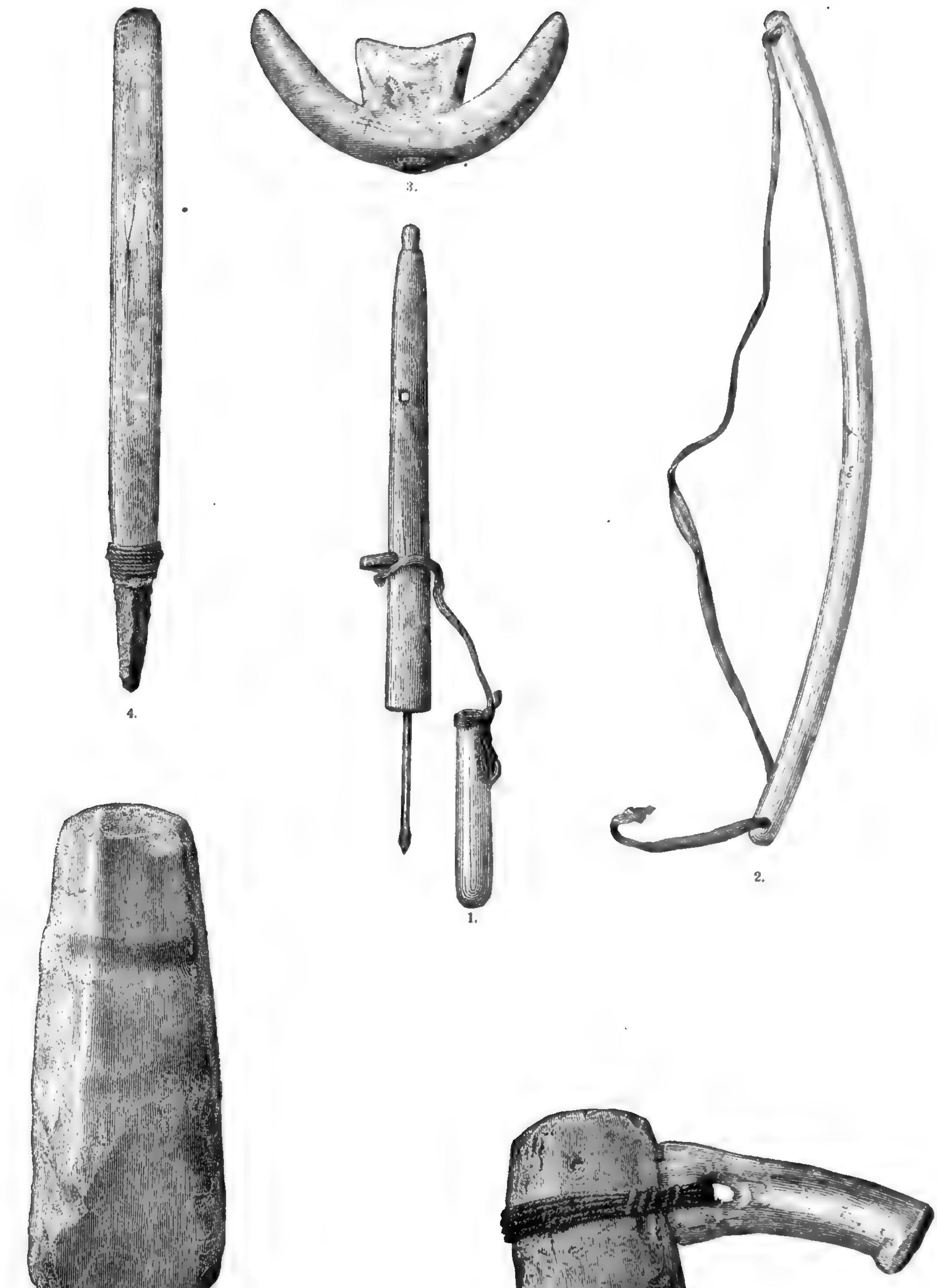
3.
4.
1.
2.
5.
6.

PLATE III.

TOOLS. POINT BARROW ESKIMOS.

1. Large "crooked knife" for wood-working. Steel blade, antler handle. *Left-handed.* $\frac{1}{3}$. **No. 89283.**
2. Small "crooked knife" for cutting bone or ivory. $\frac{1}{3}$. No. 89632.
3. Man's knife of slate, with wooden handle. Antique. $\frac{1}{2}$. No. 89584.
4. Woman's knife of black slate, handle of antler. $\frac{1}{2}$. No. 89682.
5. Blade of a similar knife of polished light green jade. $\frac{1}{2}$. No. 56660.
6. "Shave" for scraping whalebone, with steel blade and ivory handle. **Natural size. No. 89306.**
7. Tool for flaking flints. A rod of hard bone, mounted in an ivory handle. $\frac{1}{2}$. **No. 89262.**

(Drawn by C. F. Trill.)

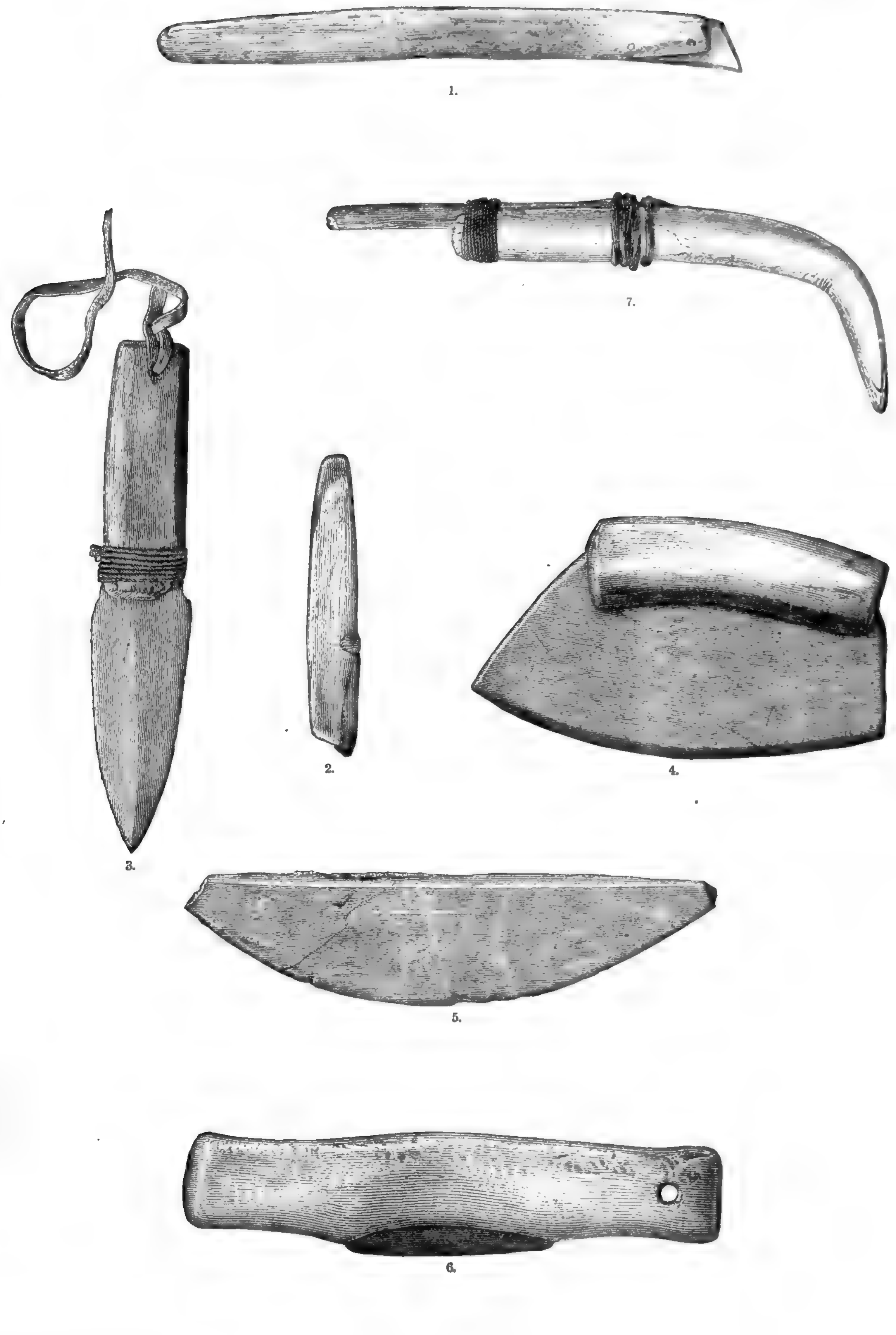
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PLATE IV.

SPEAR-HEADS, ETC. POINT BARROW ESKIMOS.

1. Black flint whale-lance head. $\frac{1}{2}$. No. 56679.
2. Similar head with part of shaft. $\frac{1}{3}$. No. 89596.
3. Head for deer-lance, of polished olive-green jade. $\frac{1}{2}$. No. 89610.
4. Ground slate blade for whaling harpoon. $\frac{1}{2}$. No. 89606.
5. Antique bone toggle-head for seal harpoon. Back and side view. $\frac{1}{2}$. No. 89378.
6. Drinking-cup of fossil ivory. $\frac{1}{3}$. No. 89830.

(Drawn by C. F. Trill.)

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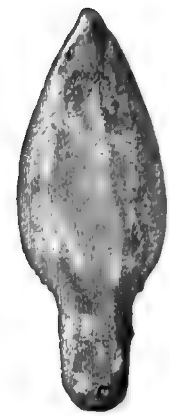

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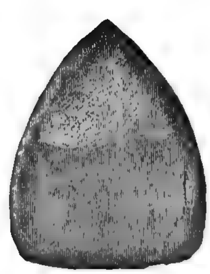

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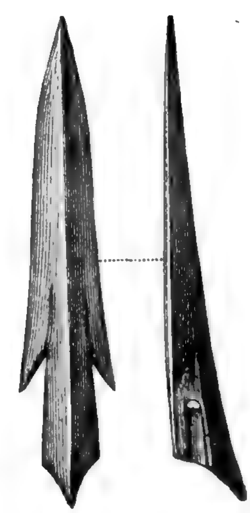

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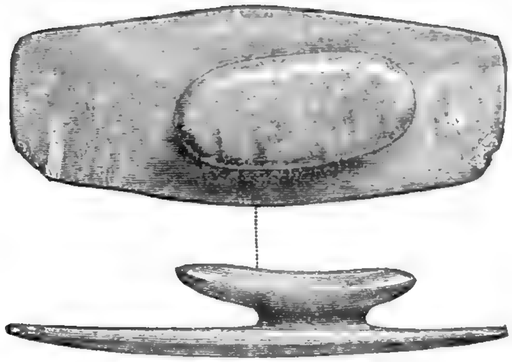
PLATE V.

LABRETS AND WORKS OF ART, POINT BARROW ESKIMOS.

1. Antique single labret of polished light green jade. Back and side view. Natural size. No. 89705.
2. Sienite labret, one of a pair. Back and side view. Natural size. No. 56716.
3. Plug labret of bright green stone (jade?). Front and side view. Natural size. No. 89706.
4. Slate lancet for cutting labret-holes, with wooden case. Natural size. No. 89721.
5. Polar bear carved in soapstone. $\frac{1}{2}$. No. 89566.
6. Ivory carving, dead seal with drag-line. $\frac{1}{2}$. No. 89330.
7. Ivory carving, grotesque figure, "walrus-man." $\frac{1}{2}$. No. 89332.

(Drawn by C. F. Trill.)



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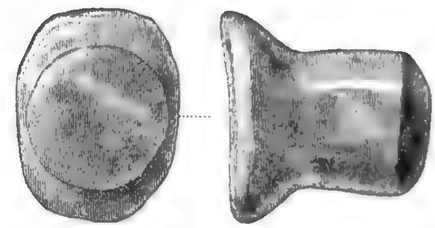

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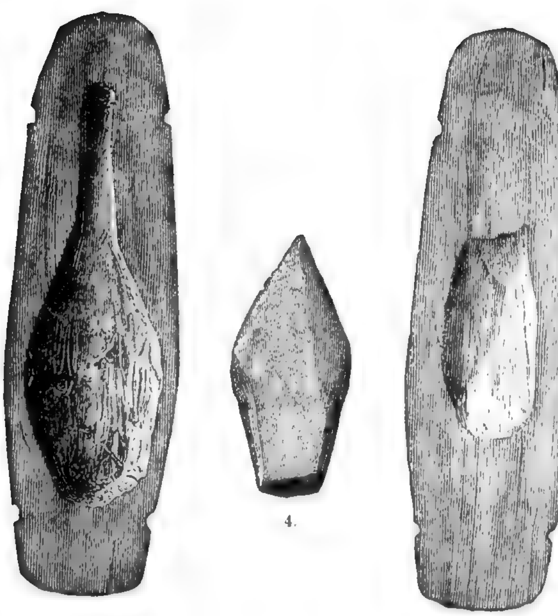

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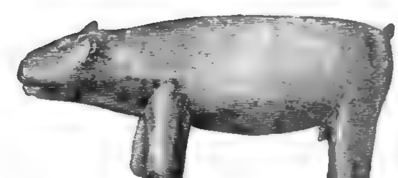

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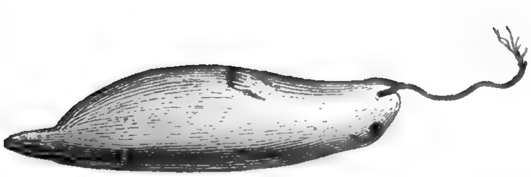

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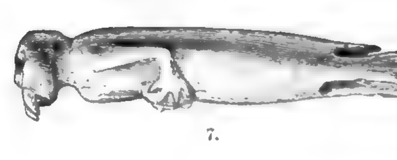

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PART IV.

NATURAL HISTORY.

By JOHN MURDOCH, A. M., Sergeant Signal Corps, U. S. Army.

NATURAL HISTORY.

By JOHN MURDOCH, A. M., *Sergeant Signal Corps, United States Army.*

INTRODUCTORY.

The following report on the Natural History of the Point Barrow Expedition is presented by the writer, to whose charge the collections and notes were intrusted. Part of the material has been turned over to specialists for study, and part has been worked up by the writer himself.

The writer desires to express his thanks to Prof. S. F. Baird, director of the United States National Museum, for affording him every possible convenience in the way of laboratory accommodation at the Smithsonian Institution, and access to the libraries of the Institution, as well as for much valuable assistance and advice. He is indebted to the curators and assistants of the Museum, especially to Messrs. Robert Ridgway, Richard Rathbun, W. H. Dall ,and T. H. Bean, for much willing and valuable assistance and advice. To Mr. Dall he is also particularly indebted for access to his valuable library.

He desires especially to acknowledge the assistance rendered him by Mr. James E. Benedict, naturalist of the U. S. Fish Commission steamer Albatross, who placed his books and his time at the writer's disposal, for the identification of the collection of Worms.

Prof. Asa Gray, of Cambridge, Prof. C. V. Riley, of the Department of Agriculture, Mr. W. H. Dall, of Washington, and Mr. J. W. Fewkes, of Cambridge (the last as a personal favor to the writer), have kindly prepared special reports on the Plants, Insects, Mollusks and Acalephs, respectively.

Professors A. E. Verrill and O. Harger, of Yale College, and A. S. Packard, jr., of Brown University, and the Hon. Theodore Lyman, of Massachusetts, have kindly furnished the writer with valuable assistance and many suggestions.

The Eskimo name of each animal has been appended wherever it was possible to obtain it.

The report consists of the following divisions:

I.—Mammals.
II.—Birds.
III.—Fishes.
IV.—Insects.
V.—Marine Invertebrates, exclusive of Mollusks.
VI.—Mollusks.
VII.—Collecting-localities and dredging-stations.
VIII.—Plants.

APPENDIX.

A.—Notes on Surface Life under the Sea-ice.
B.—Notes on Surface Life, observed during the voyage from San Francisco to Point Barrow, and during the season of open water at Point Barrow.
C.—List of Birds noticed at Plover Bay, Eastern Siberia.

I.—MAMMALS.

By John Murdoch, A. M., *Sergeant Signal Corps, United States Army.*

The following report contains all the information we were able to gather concerning the mammals inhabiting that portion of Northwestern Alaska traveled over by the Eskimos of Point Barrow in their hunting and trading expeditions.

From the character of the country and the necessarily confining nature of our duties at the station, much of it was obtained by hearsay from the natives, though the exploring and hunting expeditions made by Lieutenant Ray and Captain Herendeen added considerably to our knowledge of some species.

Marine mammals, of course, predominated in the immediate vicinity of the station, the Arctic Fox and the two species of Lemming being the only land mammals that were at all abundant. Of the larger mammals the most abundant are the Reindeer and the Ringed Seal, which form the staple food of the natives.

LIST OF MAMMALS.

1. **Canis occidentalis griseo-albus** Bd. Wolf (*Amáxo*).
2. **Vulpes fulvus** (Desm.) DeKay. Red Fox (*Kaiă'ktûk, Kană'ktua*).
2*b*. **Vulpes fulvus argentatus** Aud. & Bach. Black Fox (*Kaiă'ktûk*).
3. **Vulpes lagopus** (Linn.) Aud. & Bach. Arctic Fox (*Terĭ'gûnia*).
4. **Gulo luscus** (Linn.) J. Sab. Wolverine (*Ka'bwiñ*).
5. **Putorius erminea** (Linn.) Griff. Ermine (*Tĕri'a*).
6. **Ursus arctos**? Barren-ground Bear (*Ă'kqlak*).
7. **Ursus maritimus** Linn. Polar Bear (*Nă'nu*).
8. **Phoca vitulina** Linn. Harbor Seal (*Kasigi'a*).
9. **Phoca fœtida** Fabricius. Ringed Seal (*Nĕ'tyĭ*).
10. **Erignathus barbatus** (Fabricius) Gill. Bearded Seal (*U'g'ru*).
11. **Histriophoca fasciata** (Zimm.) Gill. Ribbon Seal (*Kaixóliñ*),
12. **Odobænus obesus** (Ill.) Allen. Pacific Walrus (*A'ibwûk*).
13. **Ovibos moschatus** (Gmel.) Blainv. Musk Ox (*Ŭmíñmau*).
14. **Ovis montana** (?) Cuv. Mountain Sheep; Bighorn (*I'mnea*).
15. **Rangifer tarandus grœnlandicus** (Kerr.) Reindeer (*Tŭ'ktu*).
16. **Elephas**? sp. Mammoth. (*Kĭli'gwa*).
17. **Beluga** sp. White Whale (*Kilĕ'lyua*).
18. **Orca** sp. Killer (*A'xlo*).
19. **Monodon monoceros** Linn. Narwhal (*Tuga'lĭñ*).
20. **Balæna mysticetus** Linn. Polar Whale; Bowhead (*A'k'bwûk*).
21. **Sorex forsteri** Rich. Forster's Shrew Mouse (*Ug'ru'nû*).
22. **Myodes obensis** Brants. Tawny Lemming (*A'rwiñû*).
23. **Cuniculus torquatus** (Pall.) Coues. Hudson's Bay Lemming.
24. **Spermophilus empetra** (Pall.) Allen. Parry's Spermophile (*Sĭ'ksĭñ*).
25. **Lepus timidus arcticus** Allen. Polar Hare.

1. CANIS OCCIDENTALIS GRISEO-ALBUS Bd.

WOLF (*Amáxo*).

The Wolf never appears to come near the coast in the vicinity of Point Barrow. The natives, however, have a good many of their skins and prize them very highly for trimming their deer-skin clothes, especially for making the frill round the hood of the jacket.

The skulls also are highly valued as amulets or fetishes, and no whaling *umiak* is regarded as properly fitted out unless provided with one or more wolf-skulls.

The natives speak of them as rather plenty inland along the rivers where the reindeer abound, and say they chase the deer in packs.

Our hunting and exploring parties which went inland in the spring of 1882 and 1883 saw wolves several times but were unable to secure any specimens. The only skin we obtained, a very large male, was shot by a native hunter near Meade River in the spring of 1883.

One of the Eskimo trading parties which went east in the summer of 1882 succeeded in catching a couple of male cubs alive. These were brought home early in September, and carefully fed till late in December, at which time their fur was supposed to be fit for use. They were then killed with much ceremony, with a stone-headed arrow.

The natives appear to regard the Wolf with a certain amount of superstitious reverence. A man who has killed a Wolf must sleep out of doors in a tent or snow *iglu*, for one "moon" from that time.

We obtained one skin and six skulls.

2. VULPES FULVUS (Desm.) DeKay.

RED FOX (*Kaiŭktûk, Kanà'ktua*).

2*b*. VULPES FULVUS ARGENTATUS Aud. & Bach.

BLACK OR SILVER FOX (*Kaià'ktuk*).

A few skins of Black and Red Foxes came in among the furs obtained by the trader at the station. They were all, however, said to have been obtained by trade from the tribes further to the east.

One of our native deer-hunters last spring (1883), however, came in with a report that he had seen and wounded a Black Fox near the hill Nuasŭ'knan, which is close to the upper Meade River.

No skins of the cross fox (*V. fulvus decussatus*) were found among the trade fox-skins.

3. VULPES LAGOPUS (Linn.) Aud. & Bach.

ARCTIC FOX (*Teri'gûnia.*)

The White Fox is quite abundant near the station, especially in winter, when their tracks are to be seen in the snow all over the tundra. They are, however, so exceedingly shy, and so well protected by their white covering that the animals themselves are seldom seen at this season.

During the egg season, that is, through June, they may be frequently seen "quartering" the tundra in search of eggs and sitting birds, particularly at night, and are occasionally found running along the beach. Their speed when alarmed is very great. They seem almost to fly over the ground instead of running.

Though usually very wild, hunger sometimes renders them quite bold and familiar. In the spring of 1882, one of the women at the hunting camp on Meade River found one in the meat house and easily killed him with a stick.

They are, in general, pretty widely scattered over the country, but sometimes gather in large numbers where there is any particular supply of food.

The Eskimos reported in February 1882, that there were great numbers of them one day's journey to the east feeding on the carcass of a whale that had been washed ashore. Any game that is left out over night must be carefully covered up with slabs of snow or it will be soon eaten by the foxes.

A good many of them are caught by the Eskimos, either with steel traps or "figure-of-four" traps of their own construction. In using a steel trap they do not bait the trap itself, but place the bait in a little house made of slabs of snow. The trap is set and carefully buried in the snow at the doorway of the house so that the fox must step on it in his endeavors to reach the bait.

They build a similar house for their "deadfall" or "figure-of-four" trap, and arrange the log above the door of the house so the fox brings it down across his back when he reaches in for the meat.

The trader obtained a large number of White Fox skins, mostly in fine condition with very heavy thick fur. Out of the number there were two or three in the "blue" condition, also heavy winter skins.

The summer pelage seems to be completely assumed by the middle of July. A female shot close to the station, July 8, 1882, had the brown summer coat very short and thin, with bunches of white fur still adhering to it, and a few scattered white hairs still remaining. She was very thin and dirty, and about as miserable a looking creature as could well be imagined.

In 1883, a female in nearly the same pelage was taken at Woody Inlet with her two blind cubs, about the size of new-born kittens. They were the color of a Maltese cat.

They were very rarely seen after the middle of July until well into October, when they became quite plenty and by that time had again become completely white.

Their tracks were occasionally seen out on the sea-ice, where they had wandered, perhaps in the hopes of pickings of seal offal, after some bear, or perhaps in pursuit of stray lemmings or ptarmigans, that every now and then get out upon the ice.

4. GULO LUSCUS (Linn.) J. Sab.

WOLVERINE (*Ka'bwĭñ*).

The Wolverine was never seen by any of our parties nor reported by the natives. Wolverine-skins, however, are very plenty among the Eskimos, and highly valued for trimmings. The tail is especially sought for as an ornament to be worn at the back of the belt.

All these skins are brought from the interior, and are generally obtained by trading.

5. PUTORIUS ERMINEA (Linn.) Griff.

ERMINE (*Tĕría*).

Skins of Ermines, both in summer and winter pelage, are common among the natives, and are occasionally worn as trimmings or amulets. During the winter their tracks and droppings were occasionally to be seen on the tundra. An adult male in full summer pelage was shot close to the station early on the morning of July 16, 1883.

6. URSUS ARCTOS?

BARREN-GROUND BEAR? (*Ă'kqlak*).

There is a brown bear in the interior, of which we were unable to secure a specimen, and which is probably Richardson's "Barren-Ground Bear". The natives had several more or less mutilated skins, which in color closely resembled the cinnamon bear.

The Eskimos say that the "land bear" is abundant during the summer in the neighborhood of Meade River.

7. URSUS MARITIMUS Linn

POLAR BEAR (*Nä'nu*).

Polar Bears are by no means so abundant about Point Barrow as might be expected, and they appear to confine themselves almost entirely to the ice-field at some distance from the shore, only coming in to the land when driven by hunger. During the whole of our stay at the station we knew of not more than eleven or twelve being taken, and they were killed by the Eskimos. Our party frequently saw bear-tracks on the ice, but nobody as much as saw a living bear except Lieutenant Ray, who had the good fortune to catch a glimpse of one as he made his escape into the moving ice pursued by all the dogs and half the men and women of the village.

The bears seemed generally anxious to escape when they encountered men and dogs. Only one or two showed fight or came to bay.

Bears were wandering about the ice all the year round, as the natives occasionally reported them, and twice during the winter of 1882–'83, impelled by hunger, they came boldly into the village, once at night and once in broad daylight, and made an attack on somebody's storehouse of seal-meat. Of course the natives immediately turned out and killed the bear.

Towards the end of April, 1883, a native who belonged at the Point Barrow village, when returning from the spring deer-hunt, met a she-bear and her cub, some 20 miles inland, at the point where the Eskimo trail crosses the river Kuaru, and killed them both. We obtained their skins by purchase.

The bears killed in winter were beautifully clean and white, but in summer they become exceedingly brown and dirty. One killed in August, 1883, was so dirty as to be almost black about the legs.

8. PHOCA VITULINA Linn.

HARBOR SEAL. (*Kasigía*).

The Harbor Seal is well known to the Eskimos, who have several skins of this species, among their "pokes" or floats for whaling. They said that they occasionally captured it at Perguiak in Elson Bay, and down the coast at Wainwright's Inlet, where it is said to "haul out" on land.

This species is represented in our collection by a single skull brought in for sale by a native, who did not know where it came from.

9. PHOCA FŒTIDA Fabricius.

RINGED SEAL (*Nètyi*).

Ti'xgûñ, OLD STINKING MALE; *Núnăq*, FEMALE; *Netyiă ru*, YOUNG OF THE YEAR.

This is the only seal that is at all common at Point Barrow, and is the main staple of food of the Eskimos. It remains the whole year through, and is to be found anywhere in the icefield that there are sufficient cracks for it to find a breathing place.

They especially affect the ice, and consequently are rarely to be seen in summer, when the sea is clear of ice. When, however, there is much loose ice running, seals are always to be found in plenty, and are captured by the Eskimos from their *umiaks* with rifle and harpoon. They occasionally come into the shoal water of Elson Bay in the summer, and are taken in nets set along the shore.

When the ice comes in and the sea begins to freeze over in October they become quite abundant, haunting the open pools in the pack and making breathing-holes (*adlu*) in the "young ice." At this season the natives take them entirely with the rifle and harpoon, either shooting them as they swim in the open pools, and darting a harpoon into them before they sink, or else watching at the breathing-hole with the rifle and stabbing-harpoon.

As the season advances into November and December and the sun disappears, so that there are only a few hours of daylight, the seal-netting begins. This can only be carried on in the darkest nights when there is no moon. The natives say that even a bright aurora interferes with their success.

At this season of the year there are very often large temporary cracks in the ice-field a mile or two from the shore, which remain open for several days at a time, and are a great haunt of the seals. When such a crack is discovered the hunters from the village turn out in force, and skirt along the edge of the crack till they find a suitable place for setting their nets.

They select a place where the ice is level and not too thick for about a hundred yards from the edge of the crack and then proceed with their ice-picks to cut three holes parallel to the crack. The middle hole is large enough to admit the passage of a seal, and the other two are smaller and serve to allow the stretching lines of the net to pass through. They are about five yards, the length of the net, apart. The stretching lines are let down through these holes, and grappled and drawn up through the center hole with a long slender hooked pole. They are then attached to the upper corners of the net, which is thus drawn down through the middle hole and hangs like a curtain underneath the ice. The end-lines are loosely fastened to lumps of ice, and the hunter sitting down near the net begins to rattle on the ice with the butt of his pick; scratch with a little tool made of seals' claws mounted on a wooden handle, whistle softly, or make some continuous gentle noise which excites the curiosity of the seals, who are swimming round in the open water.

These come swimming in under the ice in the direction of the sound and of course come in contact with the net, which, hanging loosely, soon completely entangles them. The running out of the end-lines warns the hunter that there is a seal in the net, and when he thinks it is sufficiently entangled, he hauls it up through the middle hole by means of a line attached to the middle of the net. The seal is frequently drowned by the time it is hauled up, but sometimes has to be killed by bending the head back sharply so as to break the neck.

After disentangling his catch, the hunter sets his net again and waits for another seal. I have known a single hunter to catch as many as thirty seals in the course of one night. The dead seals of course freeze stiff very rapidly, and if there is snow enough on the surface of the ice, they are stacked up, by sticking them up on their tails in the snow to prevent their being snowed over, until they can be brought in by the dog-sleds.

When there is no suitable water for netting on a large scale, the natives are constantly on the watch for small cracks and breathing-holes, where the seals come regularly. Two or three men will surround such a place with four or five nets, so that every seal that comes to the hole is sure to be caught. These nets are kept permanently set and are visited every day or two.

Later in the season when the sun has returned, and the hunters find regularly established breathing-holes in the ice-field, the nets are stretched flat across the holes by cutting four holes round the *adlu*, and stretching the corners of the net out to these. Each hunter will have several nets set in this way and will visit them every day or two.

When the "leads" of water open off shore in April, seals are always quite abundant there and the whaling *umiaks* usually catch a good many. They continue abundant all through the whaling season. Towards the end of June and through the month of July, when the ice, especially the level ice inshore, is growing rotten and wearing into holes, they begin to come up through these holes to sleep on the ice. They sleep however with extreme caution, waking up and raising their heads to see if all is safe every four or five minutes. They are so exceedingly shy at this season of the year that none of us ever succeeded in getting within decent rifle-shot of one of them.

There is considerable variation in the color of this species. Individuals were seen which were almost white, being quite unspotted on the belly, and there was a complete gradation from these to specimens like one noted on January 7, 1883, of which the following is a description:

Ground color, *black*, belly no lighter than the back. Marked all over with ring-like, sometimes 8-shaped spots, white, numerous on the back, large and scattered on the belly, small and thickly crowded on the upper breast and throat. Flippers and claws very black.

10. ERIGNATHUS BARBATUS (Fabricius) Gill.

BEARDED SEAL (*U'g'ru.*)

This species is far less common than the preceding (*P. fœtida*), but is by no means rare, occurring even during the winter when the ice is broken.

They are also occasionally killed at the "leads" of open water during the spring whaling, but are most abundant during the summer and autumn when the loose ice is running with the current, swimming around among the broken floes, and occasionally crawling out upon a cake to sleep. They almost invariably sink when shot at this season. Early in the season they are frequently seen close inshore, especially where there is open water between the shore and the "land floe" or "barrier."

The Eskimos pursue them in their *umiaks* with the rifle and walrus-harpoon provided with a short line and seal-skin floats, but did not capture many during our stay at the station. The skins are very highly prized for making *umiak*-covers, as they make a very fine and durable hide which is beautifully white. It takes six good-sized ug'ru-skins to cover one *umiak*. The hide is also used for making walrus-lines and also for boot-soles when whitewhale skin cannot be obtained.

11. HISTRIOPHOCA FASCIATA (Zimm.) Gill.

RIBBON SEAL (*Kaixo'lĭñ*).

This is the first record of this species north of Bering Strait, but it can hardly be considered as anything more than a straggler of somewhat regular occurrence at Point Barrow.

It is, however, well known to the natives, who call it by a name which bears a striking resemblance to the names "Karoluk" and "Kioluk," which the natives of Pond's Bay and Cumberland Inlet apply to *Phoca grœnlandica*, which animal would hardly be distinguished from this species by the Eskimos.

The only individual we saw was a finely marked male, taken in a seal-net close to the village at Cape Smythe, November 21, 1881. Unfortunately, we knew nothing of the capture until several days afterward, when the hunter brought the skin over for sale. He had mutilated it by cutting off the nose and flippers, and we were unable to procure the skull.

We heard of no more till the end of November, 1882, when a native reported that he had killed one at a breathing hole, but that it was carried away by the current. None were seen at any of the great catches of *Phoca fœtida* during the winter of 1882, although all the natives, both at Cape Smythe and Point Barrow, were especially on the lookout for them.

This species must be more abundant than is generally supposed on the Siberian coast of Bering Sea. Their skins are frequently to be seen among the seal-skin clothing worn by the American whalemen, which is procured at Plover Bay, Indian Point, and other places on the Siberian coast.

12. ODOBÆNUS OBESUS (Ill.) Allen.

PACIFIC WALRUS (*Aibwŭk*).

Walruses are of rather frequent occurrence off Point Barrow during the season of open or partially open water, but are never very abundant.

In the spring of 1882, one or two were reported by the natives as early as the end of May, out at the "lead" of open water, but in 1883 they were very much later. We heard of none until July 3, when many old bulls were reported to be traveling up to the northeast at the "lead."

During the summer herds are occasionally seen swimming among the broken ice outside of the barrier, or asleep on a large cake.

They were quite plenty during the month of September, 1882, when there was much heavy loose ice from one to three miles off shore, moving rapidly with the current to the northeast. Many herds and solitary walruses floated up past the station on cakes of ice. We saw none returning, and none were seen or reported after September 28.

They were rather more plenty outside the land-floe in 1883 than they had been the preceding season, and the Eskimos had taken about a dozen up to the middle of August, pursuing them with the rifle and harpoon in their *umiaks*.

During the autumn of 1881 the ice was a very long distance off from the shore, and consequently there were no walruses. On October 17, while the sea was still open, three walruses came swimming in towards the land close to the station. They appeared fatigued, as if they had come a long distance, and evidently wished to land on the beach, but were frightened away by the natives.

The whalemen complain very much of the increasing scarcity of walrus on their usual walrus-hunting grounds, the ice-field just north of Bering Strait. Where they were formerly accustomed to get a hundred walrus a day by shooting on the ice, they now consider eighteen a good day's work. Not only have the walruses been killed off by the indiscriminate slaughter which has been the custom, but they have grown cautious, and have learned to withdraw to inaccessible parts of the ice fields, where they cannot be reached with a boat. This habit will go a good way towards preserving the species from utter extinction.

There seems to be some diversity of opinion as to the ferocity of the Pacific Walrus. Capt. E. P. Herendeen, who has killed a great many walruses, especially when "hauled out" on the land, insists that he never saw one show fight, that they are only anxious to escape from their pursuers, and that the chase is attended with no danger, except sometimes from the blundering efforts of the animals to escape.

Capt. L. C. Owen, on the other hand, one of the veterans of the whaling fleet, who commanded the first steam whaler in the Arctic, and who has probably had as much experience as any one in shooting walruses on the ice, asserts that he has frequently been attacked by wounded walruses, and that his "dinghy" or walrus-boat has often been in great danger from their "pecking" at it, as he expressed it, with their tusks.

13. OVIBOS MOSCHATUS (Gmel.) Blainv.

MUSK OX (*U'miñ mau*).

A skull of this animal was brought in by one of the trading parties from the eastward, just as we were getting ready to abandon the station. In the hurry and excitement of the time, we neglected to find out more accurately the locality from which it came. The party had been as far east as the mouth of the Colville, and the skull may have been brought from there.

The natives knew the animal well, and called it by nearly the same name as the eastern Eskimos, but none had ever seen it alive.

The skull obtained appeared very old and much weathered.

14. OVIS MONTANA (?) Cuv.

MOUNTAIN SHEEP; BIGHORN (*I'mnea*).

The Eskimos had many implements, especially water dippers, made of Mountain Sheep horn, and there were a good many garments made of the skin which is especially used for trimming deer-skin clothes.

Most of the horns and the skins were obtained by trade from the natives to the east and south. The Point Barrow natives were, however, well acquainted with the animal, and several of them said that they had killed them, a great way off to the eastward, in very high broken land (Romanzoff Mountains ?).

I have called the species *Ovis montana* (?), because there is a question as to the species of Mountain Sheep inhabiting Alaska, and we obtained no specimen that could be identified.

15. RANGIFER TARANDUS GRŒNLANDICUS (Kerr).

REINDEER (*Tŭ'ktu*).

Pŭ'ññŭñ, BUCK WITH LARGE ANTLERS; *Nu'ka*, YEARLING BUCK; *Kŭ'lauŭñ*, DOE; *Ainŭñ*, OLD, HORNLESS DOE; *No'xa*, FAWN.

Reindeer do not come down to the coast near Point Barrow in any large numbers. Straggling individuals and small parties are occasionally to be seen during the summer, wandering around the tundra and sometimes come down to the beach and the lagoons, especially on calm, sunny days when the flies are troublesome.

Large herds have been seen down the coast, 25 or 30 miles from the station, and near the mouths of the rivers at the east, but only stragglers reach the Point.

During the rutting season, in the latter part of October, a good many are to be seen roaming round a few miles inland, though they are very wild. The rutting bucks, however, are rather inclined to be curious and to come towards a man if he keeps perfectly still. Later in the winter, from January on, they were continually seen and reported, and their tracks and the places where they had scraped away the snow to get at the moss were frequently seen.

The natives from the village go out on snow-shoes to hunt them, and when a herd of deer is seen the hunter moves straight towards them at a rapid pace. When the deer begin to run the hunter runs after them as fast as he can, trying to keep them in sight. His pertinacity is generally too much for the curiosity of the deer, and in a short time one or more of them will usually swerve from the line of flight and gradually circle back to see what this is that is following them so closely.

The hunter generally opens fire as soon as the deer gets within five or six hundred yards and keeps it up till he either kills the deer or frightens it out of range. Strange as it may seem, a good many deer are obtained in this way. The natives are very lavish of their ammunition, and by their reckless shooting have rendered the deer very wild.

Most of the deer obtained by the natives, however, are killed along the valleys of the large rivers, Kuaru, Meade River, and Ikpikpung, which empty into the Arctic Ocean east of Point Barrow.

Many of the natives go in to these rivers, 50 to 100 miles to the south and southeast, as soon as enough snow has fallen to make sledging practicable, and there remain camped in snow huts until the days grow too short for hunting. At this season the deer are quite plenty in this region, and go in large herds. Captain Herendeen describes the alluvial flats of Meade River as "looking like a cattle-yard" from their tracks.

The Eskimos seem to be of the opinion that most of the deer leave this region and go further inland when the winter night sets in, returning about the first of February.

The great season for deer hunting is in the months of February and March. With the return of the sun, about the last week in January, most of the natives of both villages start off for the rivers, and are to be found camped in small parties, consisting of two or three families, over a large extent of country. They stay until the end of March, or sometimes as late as the middle of April, and secure a good many deer.

Two men who were hunting for the station in the spring of 1883 killed upwards of ninety, while they were out. Most of these deer are shot with the rifle, but a few are still taken in pitfalls dug in the snow-drifts, as described by Captain Maguire, of the English depot-ship Plover, in his report of his first winter at Point Barrow, 1852–'53.

A female killed January 30, 1883, contained a fœtus about six inches long. Large numbers of well-developed embryos are brought in from the spring deer-hunt by the natives, who consider them a great delicacy. They are also very fond of the contents of the rectum.

16. ELEPHAS ? sp.

MAMMOTH (*Kilĭ'g'wa*).

Much fossil ivory in a badly decayed condition is found on the sandbars of Meade River, and the natives have a good many implements of a much better quality of ivory. This, however, was probably obtained from the Nunatangmeun.

The natives had many stories about bones of the *Kiligwa*, "the great dead reindeer"; "there are no longer any more on earth, only their bones remain." We endeavored to get some of the hunting parties to bring us in some of these bones, but we did not succeed in obtaining any.

17. BELUGA sp.

WHITE WHALE (*Kilĕlyua*).

White Whales were never very plenty near the station, but large schools occasionally passed up within sight of the shore during the season of open water.

A school of a hundred or more passed up within 200 yards of the beach September 28, 1881, and then turned and went back again. There were many gray individuals in this school.

The whaling *umiaks* captured one or two each season we were at the station, and each year as soon as there was open water between the land-floe and the beach a large herd passed up to the northeast.

About a week or ten days later another large herd of several hundred passed up each season, and these were all that were seen.

The last herd in 1882 came close to the beach, and one was killed with a rifle. There was no opportunity to make a careful study of it or to obtain its complete skeleton, as it was immediately cut up for meat. The skull was unfortunately destroyed by the ice while being cleaned in the water by the sand-fleas.

The following are the measurements of this specimen:

ADULT FEMALE.

	Feet.	Inches.
From fork of tail to tip of lower jaw	12	8¼
Girth behind flippers	7	4
Breadth of tail	2	6½
Breadth between angle of lower jaw	1	0
Length of head from ear	1	4
Length of vulva	1	10
Length of flipper	1	3

Color, white, grayish on flukes and flippers, with a yellowish tinge on the back; mammæ opposite the lower third of the genital sulcus, which includes the anus; mammary sulcus about two inches long; blubber thick.

These animals are much prized by the natives, who value the skin very highly for making the finest quality of water-proof soles for their seal-skin boots. They are also sometimes used for making very fine walrus or whale lines.

The flesh is quite palatable, though rather tasteless.

18. MONODON MONOCEROS Linn.

NARWHAL (*Tugálĭñ*).

No living Narwhals were seen during our stay at Point Barrow, but we found the ivory in the possession of the natives. They recognized drawings of the animals, and said that they were occasionally seen and killed. The name is essentially the same as one of those applied by the Greenlanders and eastern Eskimos to this animal.

19. ORCA sp.

KILLER (*A'xlo*).

The natives described a whale which they sometimes saw, and which was "bad" and had large teeth. From the resemblance of the name to the ordinary Eskimo word for "Killer" I am inclined to believe that a species of *Orca* was meant. None were seen during our stay at the station.

20. BALÆNA MYSTICETUS Linn.

POLAR WHALE, "BOWHEAD" (*A'k' bwûk*).

Whales' jawbones, skulls, and vertebræ are plenty—scattered along the shore and in the villages, where jawbones and ribs are used for staging timbers, and they are also sometimes found buried in the turf, indicating considerable age. There is also much decaying whalebone in the ruined *iglus* which have been laid open by the sea at Cape Smythe, pointing to the time when whalebone had no commercial value, and more was obtained than could be used for ordinary purposes in the village.

About the middle of April, when the "leads" of open water begin to form off shore, the whales appear—a few stragglers at first, but gradually increasing in numbers—all traveling to the northeast even when the lead is much clogged with loose ice. Indeed, the whales seem to have learned that they are much safer in the ice than in the open water, and may be heard "blowing" in the loose pack when there is plenty of open water for them to travel in.

The "run" lasts until about the 1st of July, after which, during the season of open water, there are no whales until about the middle or end of August, when they begin to "come out," as the whalemen say, generally moving back at some distance from the shore.

The whaling fleet generally catch a few whales in Bering Strait and outside of the ice early in the season, when they first come into the Arctic. They then endeavor to reach Point Barrow by the middle or end of July so as to meet the whales when they come out.

Some ships work as far to the eastward of the point as the ice will permit and follow the whales out. Many whales were taken in 1882 between Point Barrow and Return Reef. Other ships, if the whales do not appear soon after their reaching the point, turn back and go off to the western whaling in the neighborhood of Herald Island. The fall whaling is carried on as late as the ice will permit. In 1882 some of the ships staid in the neighborhood of Point Barrow until nearly the end of September.

The season of 1883 was very unfavorable for the whaling fleet. The ships were unable to get any distance east of the point, and although whales had been plenty in the spring migrations they did not begin to come out till the end of August, and then in comparatively small numbers. None of the ships accomplished much.

The natives pursue the whales during the spring migrations, hauling their boats on sleds across the rough ice to the open water. About twenty *umiaks*, carrying each a crew of from eight to ten men, are fitted out for whaling from the two villages, and when there is open water and any prospect of whales they spend all the time out at the edge of the "lead" on the lookout for whales while the women travel backwards and forwards with their food.

Each boat is supplied with several harpoons, to each of which is attached a short line and a pair of floats made of inflated seal-skins, and they endeavor to get so many of these floats fastened to the whale that he can no longer sink, when they paddle up and dispatch him. They formerly used stone-headed lances for this purpose, but are all now provided with regular steel whale lances, and many of them also have bomb-guns which they have bought of the whalemen or obtained from wrecks.

They have also plenty of iron harpoons of the best pattern, but it was decided in 1883 that they would have no luck in whaling unless the first harpoon darted at the whales was of the old-fashioned stone-headed kind, such as their grandfathers killed so many whales with.

When the "lead" of water is narrow the whales are sometimes shot with a bomb-gun from the edge of the ice.

As soon as a whale is killed it is towed to the edge of the solid ice-floe, and there all hands—men, women, and children—go to work at once with "spades" and knives to cut off all the blubber and meat they can get at. The whale frequently sinks or is carried off by the current under the ice before they have succeeded in saving more than a portion of the blubber. Every one is entitled to all he can get of the blubber and "blackskin," but the whalebone (*shukuk*), which is the great staple of trade with the white men, is portioned out according to a regular rule. The crews of all the *umiaks* that were in sight at the time the whale was struck have an equal share of the whalebone.

The "blackskin" mentioned above, which is the epidermis of the whale, and has been very often described, is considered as great a delicacy by these natives as it is by the eastern Eskimos. They would go anywhere or do anything to secure a feast of "muktuk," as they call it.

It is the custom on most whaleships, when "boiling out" near shore, to allow the natives to come on board and cut off the blackskin, provided they do not take off too much blubber with it, and I have seen boat-loads carried off from one ship. They are also very fond of the tough, white gum round the roots of the whalebone, which goes by the name of "mum-ma." These are almost invariably eaten raw, for very few Eskimos would be able to wait for their *muktuk* to be cooked.

They are not very expert or very bold in their whaling, and consequently do not capture many whales. Only three were killed in the two seasons we were there. Capt. L. C. Owen, however, informs me that one season ten whales were taken by the boats of the two villages.

In speaking of whales to the white men the Eskimos call them *Pu'ahi*, which is an attempt to pronounce the word "Bowhead."

The stripped carcase of a female which drifted ashore September 1, 1882, was found to contain a fœtus about three feet long.

21. SOREX FORSTERI Rich.

FORSTER'S SHREW MOUSE (*Ug'ru'nû*).

A little Shrew which was brought home in alcohol and identified as this species was brought in by a native who had been off to Meade River on the spring deer hunt. This was the only one observed.

22. MYODES OBENSIS Brants.

TAWNY LEMMING (*A'vwĭñû*).

This species, like the succeeding, though abundant around Point Barrow, is not equally plenty every season. We saw none in 1882, and none were brought in by the natives, who were in the habit of bringing in all sorts of birds and animals for sale.

None were obtained until June 11, 1883, when a good sized young one, probably born the year before, in full summer pelage, was picked up dead on the tundra. During the rest of June and in July they were often seen, and many were caught. Early in the season they were often found running in tunnels under snow-banks.

This species and the next make shallow burrows and galleries in the tussocks of turf on the tundra, and spend a good deal of time under ground.

A mother and seven blind young were taken June 27.

23. CUNICULUS TORQUATUS (Pall.) Coues.

HUDSON'S BAY LEMMING (*A'vwĭñû*).

Like the last, this Lemming, though abundant, is not equally plenty every season. During the whole year of 1882 we did not see a single Lemming, although signs of them were very plenty. The tundra was completely riddled with their galleries and burrows, and we occasionally saw tracks on the snow or mud. Their droppings, besides, were very thick in many places on the tundra, and the numerous owl's castings scattered over the tundra were made up almost wholly of Lemmings' skulls, bones, and hair.

In 1883, the natives began to bring them in early in January, and all the rest of that season they were quite abundant. Their habits are quite the same as those of the Tawny Lemmings. In summer they are only to be seen when running from one gallery to another, and in winter their tracks generally lead to a burrow in the snow-bank.

They are seldom seen in winter, except during drifting snowstorms, when the snow over their tunnels is probably blown away. This has given rise to a curious fancy among the Eskimos, who say that in stormy weather they come down from the sky, whirling around and running around in spirals as soon as they touch the ground. The first one we obtained was brought in, during a violent snowstorm, by a native, who informed us, "There are none here on the land. As it was bad weather he fell down from above." This superstition is interesting in connection with the notion of the Norwegians that the great hordes of Norway Lemmings come down from the clouds.

They appeared to be spread over a pretty wide extent of country in 1883, as we obtained specimens from near the station and from various deer-hunters' camps in the interior.

Up to April all the specimens taken were in winter pelage, but none of them were completely white, all showing faint rufous spots indicating the position of the ears, and usually more or less rufous suffusion on the back. The white, moreover, has a grayish cast, due to the fact, probably, that the tips of the hairs only are white, while the rest is a slaty gray. One specimen, taken in February, and, from its size, probably a young one of the preceding year, is much marked with gray and brownish on the back of the head and nape and between the shoulders. It has well-marked rufous ear-spots. A specimen taken in April can hardly be distinguished from this, though a little larger.

Specimens taken towards the end of April and in May show considerable darkening on the back and much rufous on the sides, but we obtained none like those in the National Museum, which show the winter-coat partly shed, exposing the shorter bright-colored summer dress.

All June specimens were in full summer pelage.

24. SPERMOPHILUS EMPETRA (Pall.) Allen.

PARRY'S SPERMOPHILE (*Sĭ'ksĭñ*).

This is only a straggler anywhere near the station, though the whalemen, who are in the habit of landing at Woody Inlet for wood and water, report it abundant in the neighborhood. The natives are well acquainted with it.

We first noticed its tracks in the snow in May, 1883, and a single rutting male was killed running about on the high banks below Cape Smythe.

25. LEPUS TIMIDUS ARCTICUS Allen.

POLAR HARE.

There were absolutely none near the station, and the natives were unacquainted with the animals. Capt. E. P. Herendeen, however, reports seeing traces of hares among the willows on Meade River in March, 1882.

Just as we were on the point of abandoning the station in August, 1883, a party of Nunatangmeun Eskimos brought in half a dozen roughly-prepared skins of this species, showing the occurrence of the animals somewhere in the Colville region.

II.—BIRDS.

By John Murdoch, A. M., *Sergeant Signal Corps, United States Army.*

The birds and eggs brought home by the expedition were collected, with a few exceptions, within a circle of fifteen miles from the station, and, it is believed, give a tolerably complete representation of the bird-fauna of this limited region. This it will be seen is arctic in its character, with the addition of a few species like *Somateria v-nigra*, peculiar to the western parts of the continent. The range of a few species heretofore recorded only from the eastern part of the continent has been found to extend to this point.

The country in this region is a low slightly rolling tundra, interspersed with higher and drier patches, and covered with lakes and ponds of all sizes, sometimes connected by insignificant streams. The lower portions of the tundra are wet and marshy, and thickly covered with grass. On the higher portions the covering of grass is more scanty and the ground often bare, muddy, and black, partly covered with black and white mosses and lichens.

This we were in the habit of calling the "black tundra," and it was the special breeding-ground of certain species of birds, for example the Golden Plover, while others were to be sought for in the marshy lowlands, and others again on the dry grassy banks.

The birds breeding in this region are two or three species of land-birds and most of the waders. The great majority of the water-birds, the ducks, gulls, &c., pass on to more favorable breeding-sites on the sandy islands fringing the northern shore of the continent, and on the banks of the great rivers running into the Arctic Ocean east of Point Barrow.

Most of the birds and eggs were collected by the writer and Sergeant Middleton Smith, though valuable additions to the collections were made by Lieutenant Ray, Captain Herendeen, and other members of the party.

The nomenclature employed is that of Ridgway's Catalogue (Bull. U. S. Nat. Museum, No. 21, 1881), to which the numbers refer, and the Eskimo names have been appended wherever possible.

[21.] SAXICOLA ŒNANTHE (Linn.) Bechst.

STONECHAT (*Sá'ksaxia*).

As Mr. Nelson remarks, this species appears to be very erratic in its occurrence in Northern Alaska, being quite common some seasons and wholly absent the next.

Early in the spring migrations of 1882 we had these birds in comparative abundance near the station for a few days, but none remained to breed, and in the season of 1883, though a careful lookout was kept for them, not a single one was noticed.

Curiously enough, this alternation of seasons appears to have held good for the two preceding years. In 1880 Dr. Bean found them not uncommon from Kotzebue Sound to Cape Lisburne, while Mr. Nelson, visiting the same region the following season, failed to find a single individual.

The first one seen was taken May 19, 1882, when very little of the snow had melted and there were but a few patches of bare ground near the coast. It was a male, and feeding on the bare grassy spots near the house, and was very shy. The stomach contained much digested material.

For three days they were with us in considerable numbers, scattered along the edge of the tundra, not going far inland, and exceedingly shy. They appeared to be traveling towards the northeast. The sexual organs of the only female taken showed no signs of development, but a male was shot on the 22d with testes well enlarged.

After this date they disappeared completely, and were not seen again during the season, or in the return migrations.

The natives appeared unfamiliar with the bird, and gave it the name which we afterward found them to apply to the Redpolls, and, in fact, to all the little passerine birds, except the Snow-buntings and Lapland Longspurs.

157. COTILE RIPARIA (Linn.) Boie.

BANK SWALLOW.

On the evening of July 29, 1882, we were surprised to see a swallow flying round the station, but unfortunately failed to secure it, and it went off up the beach.

Swallows were seen again on the 31st and on August 10 flying round the station and going off up the beach. The last time they were pretty well recognized as this species.

No more were seen alive, but early in September one was picked up on the beach dead and frozen, but unfortunately too much dried up for skinning. It was, however, preserved in alcohol and is the only representative of the species in our collection.

A party of natives, who were with us when the bird was picked up, failed to recognize it as anything they had ever seen before.

These birds were undoubtedly stragglers from the Yukon region, where they breed in great numbers, which, after the cares of raising their brood were over, had drifted carelessly further and further north, following the flies and the sunshine till they reached this extreme point.

178a. ÆGIOTHUS CANESCENS EXILIPES (Coues) Ridgw.

WHITE-RUMPED REDPOLL (*Sú'ksaxia*).

This species appears to be not common, and rather irregular in its occurrence at Point Barrow.

Early in June, 1882, the natives spoke of seeing *Súksaxia* and promised to secure them for us. Accordingly on the 13th a lad brought in three eggs with the female, snared on the nest.

These were the only eggs secured, and we obtained or saw very few birds. Those that were seen appeared to have a preference for the muddy banks and gullies of the "black tundra," and the neighborhood of the village. None were noticed after July 3, and none were seen or reported in the season of 1883.

The season of 1881 must have been one of unusual abundance for this bird, as Mr. Nelson (Arctic Cruise of the Revenue Steamer Corwin, 1881) speaks of finding it one of the commonest birds at Point Barrow. It certainly was not common in 1882. Nor did *Ægiothus linaria*, which he speaks of finding in the same localities, occur at all in either of the two seasons that our station was occupied.

186. PLECTROPHANES NIVALIS (Linn.) Meyer.

SNOW-BUNTING (*Amau'liga*).

This and the next species were our commonest passerine birds; in fact, the only ones which could be said to be at all common.

Our first warning of spring, before the snow had fairly begun to show signs of melting, was always the appearance of the little *Amauliga* hopping and twittering around the wind-blown spots and the cook's refuse heap, a little explorer, come on to spy out the land far ahead of the main body of the migration.

In 1882 the first Snow-bunting and the first bird of the year, a male in full breeding plumage, appeared on Easter Sunday, April 9, a pleasant and warm day for the season. The snow had not really begun to melt, but the ground had blown bare near the house and there had perhaps been a little melting on the sunny side of the hillocks, where the little fellow was running and picking.

They were a little later the next season. The natives reported seeing one or two at Point Barrow April 16, but we saw none near the station till the 19th. Stragglers continued to arrive through April and May, but they were not really plenty either season till about May 20.

They began to sing about the middle of May, and by the 23d or 24th were well established and in full song.

Three or four pairs made their home near the station, and several more in the village, while the rest were scattered along the edge of the tundra, but few going any distance inland. They especially affected the broken muddy banks and gullies below the village and along the shore of the lagoons, and the cook's refuse heap was from the first a great attraction.

The males spend a great deal of time singing perched on the highest point they can find. The ridge-poles of our buildings and the wind-vane were favorite resorts for these jolly little singers. They continued singing until about the first week in July.

Early in June they begin to build in holes and crevices in the banks, where the nest is always completely concealed, raising occasionally, at any rate, two broods in the season. The full complement of eggs appears to be six, though I found one nest containing seven eggs in 1883.

In 1882 one pair established themselves in a hogshead of bricks close to the station, unfortunately too much exposed to the curiosity of the Eskimo children, who caught and killed the male bird just as the female had completed her full set of eggs. Of course under the circumstances the nest and eggs were added to our collection. Nothing daunted, the female immediately secured another mate and went to work on a new nest, but was again doomed to disappointment, for when she had finished her second nest and laid two eggs she was again robbed by the natives. We succeeded, however, in protecting the third nest; and the young hatched and were beginning to fly by the end of July, by which time earlier broods were already pretty well grown. During the early part of July, after the males have ceased singing, they keep together in broods, and keep pretty well out of sight, as they are beginning to moult and take on the fall plumage. About July 25, however, they appear in considerable numbers, mostly young of the year in the gray plumage, associating with the young Longspurs around the empty village and about the native camps. They continue quite abundant in large loose flocks, generally through August, gradually becoming scarcer in September. The last one was seen in 1882, on September 20. We left them still comparatively plenty when we abandoned the station in 1883.

187. CENTROPHANES LAPPONICUS (Linn.) Caban.

LAPLAND LONGSPUR (*Nessaúdliga*).

The Longspurs, though, if anything, more abundant than the last species, arrive later and depart earlier. They arrived both seasons at very nearly the same date, and were equally abundant.

On May 20, 1882, which was a comparatively warm day with a fresh southwest wind, they suddenly appeared in considerable numbers, having probably arrived during the night, apparently all males, in full song.

They were to be found on all the bare spots on the tundra, near the station, along the coast, and near the cemetery at the head of the lagoon. Several were secured, and their stomachs were found to contain beetles. The sexual organs were fully developed. They were rather less abundant early in the season of 1883, as there was much less bare ground than the year before at the time of their arrival, May 21.

Though abundant a short distance inland, these birds were seldom seen around the station or along the edges of the beach and the lagoons, like the Snow-buntings. In accordance with what appears to be their general habit elsewhere, they are specially to be looked for on the higher and drier parts of the tundra, where the nest is built in the grass, and not concealed in holes or crevices, like those of the snow-buntings.

During the breeding season, that is, from the time of their arrival till July 1, the males keep up a continual song, frequently soaring up and singing in the air like a bobolink. Their note at other times is a metallic chirp, not unlike that of the Titlark.

Notwithstanding the lateness of the season in 1883, a complete set of six eggs, already showing signs of incubation, was found on June 6, a week earlier than in 1882. This nest was the only one found on a mud-bank, and partially concealed by a clod, though not so completely as a Snow-bunting's nest would have been. They appear to raise sometimes two broods in a season, as a nest has been found as late as June 21 containing only two eggs. We never found more than six eggs in any nest of this species, and sets of five were frequently found far advanced in incubation.

The first newly-hatched young were noticed about the middle of June. Like the Snow-buntings they keep themselves pretty well out of sight during the first half of July, but from then through August appear in considerable numbers, congregating with the Snow-buntings round the village and native camps. The young, some of which are fully fledged by the middle of July, gather in large loose flocks, and appear to remain later than the adults. They go off gradually near the latter part of August, and were last seen in 1882 on the 4th of September. We left them still quite abundant in 1883, when we abandoned the station.

207a. ZONOTRICHIA GAMBELI INTERMEDIA Ridgw.

INTERMEDIATE WHITE-CROWNED SPARROW.

This bird, which is common in the Yukon region and on the lower Mackenzie, occurs at Point Barrow only as a straggler. A single individual, which Mr. Ridgway has identified as the young of the year of this species, was caught in one of the tents at the station September 14, 1883, a solitary instance to be compared with the northward autumnal wanderings of the Bank-swallows.

217. JUNCO HYEMALIS (Linn.) Scl.

BLACK SNOWBIRD (*Sû'ksaxia*).

This is another straggler from the Yukon region and the wooded interior of Alaska, where Mr. Dall found it not uncommon during his stay at Nulato.

The solitary instance of its occurrence near Point Barrow was on May 24, 1883, when a male, apparently ready to breed, was taken not far from our station.

406. NYCTEA SCANDIACA (Linn.) Newt.

SNOWY OWL (*Ûkpĭk*).

This bird may be fairly considered a resident of these regions, although in the depths of the winter it retreats with the ptarmigan back to the "deer country," that is, the valleys of the large rivers running into the Arctic Ocean east of Point Barrow.

Its abundance in the spring and summer near the coast appears to depend on the presence or absence of its favorite food, the Lemming, as has been noted elsewhere by Mr. Nelson.

During the season of 1882 we saw no Lemmings, though signs of their presence in the shape of droppings, and their skulls and skeletons in owl's castings, were numerous all over the tundra. During that season we saw but very few owls. On the other hand, in 1883, Lemmings were exceedingly plenty all round the station, and owls were proportionately abundant; scarcely a day passed without one or more being seen sitting on the tundra, generally on the top of a bank or small knoll, on the lookout for Lemmings.

They were exceedingly shy and watchful, and, though seen and pursued nearly every day, only two were taken.

One of these made a regular habit of coming every afternoon at about the same time and settling himself in plain sight of the station on the opposite bank of the lagoon. For nine days he came regularly, and afforded much sport to several members of our party, who would go out regularly to capture him with rifle or shotgun, and as regularly return baffled. He was at last secured by two men, one of whom attracted his attention while the other managed to creep up within gunshot under cover of a bank.

These birds showed no signs of breeding while in our neighborhood. Some of the Eskimos said they could get the eggs from a camping-ground towards the southwest, but they failed to do so.

412b. HIEROFALCO GYRFALCO SACER (Forst.) Ridgw.

McFarlane's Gyrfalcon (*Ki'drigûmĭñ*).

The only hawk obtained by the expedition has been identified by Mr. Ridgway as this form, and was taken at the station, where he had alighted on the flagstaff, in the autumn of 1882. Hawks were occasionally seen during both seasons, 1882 and 1883, but were always very wild and difficult to approach. Occasionally they were seen close enough to be recognized as Gyrfalcons, probably of the same form as the one captured.

The natives say that they are abundant on the rivers flowing into the Arctic Ocean, where they feed on young wild-fowl and ptarmigan. They say they breed "*umasiksu*," "a long way off." One man said that he had seen the nest and eggs.

449. AQUILA CHRYSÆTUS CANADENSIS (Linn.) Ridgw.

Golden Eagle (*Tiñmĭûkpûk*).

We never saw this bird alive during our stay at Point Barrow, and it is only included in this list because we obtained a native-made skin from some natives who went last summer to the eastward of the Colville River, where they secured the bird.

There were one or two other skins in the two villages, where they were in great repute as talismans or charms for securing good luck in whaling. There were also many wing and tail feathers among the natives, who use them as ornaments to their fur jackets.

474. LAGOPUS ALBUS (Gm.) Aud.

Willow Ptarmigan (*Akû'dagĭn*).

This species is resident but never very plentiful. Tracks were always to be seen on the snow during the winter, but the birds themselves were less often seen, while they were frequently seen in pairs during the breeding season, though the nest was never found.

They were always wild and difficult of approach, so that comparatively few were obtained. They were found to be quite abundant among the willow shrubs inland along the rivers, and Lieutenant Ray found them numerous at the mouth of Meade River, May 1.

An occasional male begins to show traces of brown feathers about the head and neck as early as the first week in April, and the change is very gradual.

The last that was seen (July 10) still showed a considerable amount of white in the plumage, and it is possible that the change is never complete. The females taken all appeared more completely changed than the males.

We found the meat as tasteless and insipid as other observers have found it.

These birds in the fall were occasionally seen sitting on the broken ice along the beach.

475. LAGOPUS RUPESTRIS (Gm.) Leach.

Rock Ptarmigan (*Akû'dagĭn*).

The Rock Ptarmigan is a much less plentiful resident than the foregoing, from which the natives do not distinguish it.

As far as we could judge its habits are the same. One or two were obtained, one a female, which had evidently bred not far from the station, though the nest was not found.

509. STREPSILAS INTERPRES (Linn.) Illig.

Turnstone (*Tûlĭ'gua*).

This species was found to be decidedly scarce, both years, during the spring migrations and the breeding season. We occasionally saw one or two inland, but were unable to secure any till about the 10th or 11th of July, at which time they appeared at Perguiak, straggling adults, who had finished breeding and were beginning to molt. Early in August, the young appeared in considerable numbers along the coast, near the station and round the muddy puddles in the village, and were quite abundant for two or three weeks.

They were exceedingly tame, and for several nights in the middle of August, 1882, three or four came round the back door and the cook's refuse heap, making themselves perfectly at home, and allowing one to approach within a few feet of them before they took flight.

Towards the end of August they grew scarcer, and finally disappeared, in 1882, about the 30th.

As the Black Turnstone (*S. melanocephala*) is such a common bird in the Yukon region and south of Bering Strait generally, one would naturally expect to find it at Point Barrow, particularly as Mr. Nelson reports it from Wrangel Island. Nevertheless, during the two seasons of our stay at Point Barrow, we did not obtain the slightest evidence of its occurrence in the region.

513. SQUATAROLA HELVETICA (Linn.) Cuv.

BLACK-BELLIED PLOVER (*Ki-raiōn*).

This plover is quite rare. It was occasionally seen and heard in the season of 1882, but none were noticed the next summer, and none were secured.

The natives are perfectly familiar with the bird, and use the dried skins as amulets or talismans to secure good luck in deer-hunting.

Two such skins tied to a stick represent the species in our collection. The natives told us this bird would arrive later than the Golden Plovers, and this appeared to be the case.

515. CHARADRIUS DOMINICUS Mull.

AMERICAN GOLDEN PLOVER (*Tu'dliñ.*)

A large series of Golden Plovers collected at Point Barrow, where they are among the commonest waders, all proved upon careful examination, to belong to this species. It is probable that *C. dominicus fulvus* does not range so far north on the American coast.

Indeed, Mr. Nelson's note of the occurrence of this form on Wrangel Island seems to me to be rather doubtful, as from his account the bird was only seen and not captured, rendering identification amost impossible.

They are among the earlier waders to arrive, as stragglers generally appear about the 20th to the 25th of May, before there is much bare ground. In 1882 a small party in full breeding plumage, and apparently all males, arrived May 21, but no more arrived until June 11. The tundra was at this time bare only along the edge of the beach, and the ice and snow was not yet gone from the lagoons.

This party remained in nearly the same place for a couple of weeks, feeding on small red worms which they found in marshy spots, and all but two of them were taken, although they were very wild.

Along through the first and second week in June they continue to arrive in small parties, and from that time on are quite plenty scattered in pairs and threes all over the tundra. They are very wild and difficult to approach, and very noisy. In addition to their ordinary well-known call-note, they have in the breeding season a loud but very melodious cry of "Tud'ling!" many times repeated, uttered as the bird flies along rather high, with long slow strokes of the wings.

They were evidently nesting both seasons before June 20, but neither season were we able to find the nest before the 22d or 23d. The nest is exceedingly hard to find, although it is not concealed at all, but is simply a depression in the bare black clayey tundra lined with a little dry moss. The only vegetation on this part of the tundra is white and grayish moss, which harmonizes so extraordinarily with the peculiar blotching of the eggs that it is almost impossible to see them unless one knows exactly where to look. A favorite nesting site is on the high banks of the gullies or small streams. No nests were ever found in the grass or in swampy ground.

The sitting birds show great solicitude when disturbed, feigning lameness, and trying to attract one away from the nest. They are shrewd enough always to keep quite a distance from the nest, as long as the collector is anywhere in the vicinity of it, and it is simply time wasted to attempt to find the nest by looking for it, as I know by hard experience. The only way to make sure of the eggs is to withdraw some distance, and sit down patiently and wait for the bird to go back to her eggs, watching her if necessary with a field-glass. Having marked her on to the nest, one must walk towards it in a straight line, looking neither to the right nor the left and keeping his eyes fixed upon the spot she rises from. He is then pretty sure of the eggs. However, the surface of the tundra is so uniform that a careless glance to one side or the other after the bird is flushed may throw the collector wholly off the track, and then he has to go back and wait for the bird to return again.

Both males and females take a share in the incubation. In 1882 the sitting bird was frequently secured with the eggs, and in every case turned out to be a male; but in 1883 a number of sitting females were taken, and finally, in one or two cases, both parents were taken with the eggs, and both males and females had their breasts bare, as if incubating.

The nesting season continues till the first or middle of July, about which time the adults begin to collect in flocks, feeding together around the ponds on the higher tundra, associated sometimes with a few Knots or a straggling Curlew.

The old birds leave for the south about the end of July, and no more Plovers are to be seen till about the middle of August, when the young, who heretofore have been keeping out of sight, scattered over the tundra, gather into flocks, and for several days are quite plenty on the dryer hills and banks, after which they depart. Stragglers may be seen up to the end of August.

528*a*. MACRORHAMPHUS GRISEUS SCOLOPACEUS (Say) Coues.

RED-BELLIED SNIPE; GREATER GRAY-BACK.

A few of these birds bred near the station, but they are decidedly rare during the breeding season. The young of the year, however, appear in large flocks about the middle of August and stay for a few days about the small ponds on the tundra, especially on the high land below Cape Smythe.

At this season they are rather plenty, and when feeding associate with the young Dunlins and Grass-birds. They were much less abundant in 1883 than they were the previous season.

The nest was never found, although a pair were taken June 28, 1883, that were evidently nesting, as both had their breasts plucked and bare, showing that, as in the case of the Golden Plover, the male does his share of the work of incubation.

In the spring of 1882 a native boy brought in a female of this species, and what, he said, were the eggs. This was accepted without question at the time, although the eggs seemed rather small for the size of the bird.

A further acquaintance with the eggs of some of the smaller waders led to considerable doubt, which was justified by comparison of the set with authentic eggs of this species in the National Museum.

The eggs are certainly not those of this species, but closely resemble those of the Dunlin.

The bird appears but little known to the natives, and as usual in such cases we had various names applied to it. Many thought it was a Northern Phalarope (*Sabrañna*).

529. TRINGA CANUTUS Linn.

KNOT; ROBIN SNIPE (*Túa-wía*).

The Knot appears to be quite rare about Point Barrow. Only a few of the natives to whom one was shown recognized it and had a name for it.

In the season of 1883 only one was seen, appearing with a rather large flight of small waders. They were rather more abundant during the preceding season, and evidently bred somewhere in the vicinity, as a female was taken on July 11, with full-sized yolks in her ovaries. The nest, however, was never found.

The adults were not seen after July 5, and not one of the young appeared in the flocks of young waders in the fall.

534. ACTODROMAS MACULATA (Vieill.) Coues.

PECTORAL SANDPIPER (*Aibwûkia* = *Walrus-bird*).

Though this species is very common over the whole continent, and in fact over the greater part of the world, its eggs and breeding habits have hitherto been undescribed.* We had the good fortune to find them breeding in considerable abundance in the neighborhood of the station, and were able to bring home a good series of authentic eggs.

It is one of the commonest of our waders, occurring all over the tundra in all sorts of situations, though never found on the beach.

There is frequently a great disparity of size between the two sexes. A comparison of the large series we collected shows that the average length of the female is about three-quarters of an inch less than that of the male, but that the smallest adult female was fully an inch and a half shorter than the largest male. The difference in size is so marked that the natives noticed it and insisted that the small females were not *Aibwûkia*, but *Niwíliwilûk* (*Ereunetes pusillus*).

They arrive about the end of May or early in June, and frequent the small ponds and marshy portions of the tundra along the shore, sometimes associated with other small waders, especially with the Buff-breasted Sandpipers on the high banks of Nunava. Early in the season they are frequently in large-sized flocks feeding together around and in the Eskimo village at Cape Smythe, but later become thoroughly scattered all over the tundra.

They begin pairing soon after their arrival, and are frequently to be seen chasing each other in the air with a loud chatter. The male has a curious habit at this season of the year. The skin of the throat is much distended and loaded with slimy fat, and can be puffed out like the throat of a pouter pigeon. During the breeding season, that is from the first of June to the first of July, the male may frequently be seen taking short, low flights, with the wings held high and beaten stiffly, while the throat is puffed out to its fullest extent, and the bird utters a most peculiar muffled hoot "hoo, hoo, hoo, hoo," many times repeated. There is something ventriloquial about the sound, which makes it seem as if uttered by some creature a long distance off, and it was some time before we could be certain that it was the Pectoral Sandpipers that were making the noise. This hoot is only uttered on the wing as far as I was able to observe, though the males may be often seen to puff out their throats as they sit on the little knolls.

They get their native name "*Aibwûkia*," the "walrus bird," from this habit of swelling out their throats, like "*Aibwûk*," the walrus.

After the breeding season, they keep very quiet and retired, like the rest of the waders, and the adults appear to slip quietly away without collecting into flocks, as soon as the young are able to take care of themselves.

As soon as the young have assumed the complete fall plumage, that is about the 10th of August, they gather in large flocks with the other young waders, especially about the small ponds on the high land below Cape Smythe, and stay for several days before they take their departure for the south. Stray birds remain as late as the first week of September.

The nest is always built in the grass, with a decided preference for high and dry localities like the banks of gulleys and streams. It was sometimes placed at the edge of a small pool, but always in grass and in a dry place, never in the black clay and moss, like the Plover and Buff-breasted Sandpipers, or in the marsh, like the Phalaropes. The nest was like that of the other waders, a depression in the ground lined with a little dry grass.

All the complete sets of eggs we found contained four. The following is a description of the eggs, obtained from the examination of eighteen sets. They are pointedly pyriform like those of the other small waders.

*Since the above was written, Mr. E. W. Nelson, formerly United States Signal Service observer at Saint Michael's, Alaska, has published (*Auk*, Vol. I, No. 3, pp. 218–224) an excellent detailed account of the breeding habits of this species, as observed by him in the delta of the Yukon. His observations agree very closely with ours, except that he observed the male bird "hooting" while on the ground. The observations of Dr. Adams, quoted by Mr. Nelson, had escaped my notice as well as his. The note, however, merely states that drawings made by Dr. Adams, and representing the male bird with his throat puffed out, were exhibited at a meeting of the Zoölogical Society, so that to Mr. Nelson belongs the credit of first making and publishing complete observations on the subject.

The following measurements, in inches, indicate the size, shape, and limits of variation: 1.58 by 1.06; 1.44 by 1.11; 1.42 by 1.08; 1.54 by 1.02.

In color and markings they closely resemble the eggs of the other small waders. The ground color is drab, sometimes with a greenish tinge, though never so green as in the egg of *P. alpina americana* and sometimes a pale bistre-brown. The markings are blotchings of clear umber brown, varying in intensity, thickest and sometimes confluent around the larger end, smaller and more scattered at the smaller end. Some of the eggs with brown ground are thickly blotched all over. A single egg in one set of four has the markings almost as fine as in *A. bairdi*, but the egg is larger and has not the characteristic ruddy hue. All the eggs have the usual shell markings of pale purplish gray and light neutral tint.

The eggs may be distinguished from those of the Buff-breasted Sandpiper, which they closely resemble, by their warmer color.

Most of the eggs obtained were collected in 1883. The first nest was taken on June 20, a full set of eggs slightly incubated. Although eggs were found to contain large embryos as early as June 28, perfectly fresh eggs were found July 6, and the last eggs brought in, July 12, contained only small embryos.

536. ACTODROMAS FUSCICOLLIS (Vieill.) Ridgw.

BONAPARTE'S SANDPIPER (*Kai'ñialu*).

This is the first record of the occurrence of this species west of the Mackenzie River region, where McFarlane found it breeding, and it appears to be hardly more than a straggler at Point Barrow.

It was not observed in the spring of 1882, and an accident revealed its presence in 1883. A shot fired June 6 into a flock of Pectoral Sandpipers brought down one of these birds along with four or five of the other species.

After this, of course, a careful lookout was kept for this species, but only one other was seen, just a month later, alone on the tundra. The bird was also secured. Both were males and apparently breeding birds.

537. ACTODROMAS BAIRDI Coues.

BAIRD'S SANDPIPER (*Ai'bwûkia*).

Though this little sandpiper is by no means uncommon, the natives seem to make no distinction between it and *A. maculata*, calling both by the same name.

They arrive about May 30, while there is still a good deal of snow remaining on the tundra, and are usually to be found along the edges of the pools at the top of the beach. After the tundra becomes clear of snow, they retreat back from the beach and are especially to be looked for on dry grassy portions of the tundra, particularly along the shores of our lagoon.

They are never very common and always solitary or in pairs, a quiet retiring little bird that never indulges in any of the conspicuous breeding antics noticed among the other waders.

The nest was always well hidden in the grass, and never placed in marshy ground or on the bare black parts of tundra, and consists merely of a slight depression in the ground thinly lined with dried grass. All the eggs we found were obtained from the last week in June to the first week of July, a trifle later than the other waders.

The sitting female when disturbed exhibits the greatest solicitude, running about with drooping outspread wings, and loud outcry, and uses every possible wile to attract the intruder from the eggs.

The nest is so well concealed, and forms so inconspicuous an object that the only practical way to secure the eggs is to withdraw to one side and allow the sitting bird to return, carefully marking where she alights. Having done this on one occasion and failing to find the eggs, after flushing the bird two or three times, I discovered that I had walked on the eggs, though I had been looking for them most carefully.

They leave after the breeding season in the same unobtrusive way that they have conducted themselves during all their stay, never collecting into flocks. We saw them occasionally during July.

539a. PELIDNA ALPINA AMERICANA Cass.

REDBACKED SANDPIPER (*Mĕ'a-kapiñ*).

This species is common and breeds abundantly, although the nest is exceedingly hard to find, as the nesting birds are very wary and use every possible strategem to mislead one while looking for the eggs.

They arrive about the end of May. In 1882 they first appeared above the station in small flocks associating with the Golden Plovers, but the next spring the snow was slow in going off from this part of the tundra, and they were first noted below the village.

Some of them, perhaps, arrive paired, but the majority are pairing soon after their arrival, to judge by their actions. They scatter in pairs and threes all over the tundra, where there is still at this time a good deal of snow, and chase each other with much noise, taking wing suddenly without cause for alarm.

One will occasionally "set" his wings while in the air and soar for some distance, uttering a note quite different from the usual hoarse, rolling call.

As the tundra gradually clears of snow, they become more scattered and spread farther inland, deserting the shores of the beach lagoons, although they hardly confine themselves as much to the dry portions of the tundra as the Baird's Sandpipers are in the habit of doing.

Their rolling call through June is to be heard all day and every day, and reminds one of the notes of the frogs in New England in spring. In fact, some members of the party came home the first spring convinced that they had heard the frogs piping.

The nest, which is like that of all the rest of the waders, is always placed in the grass, sometimes in dry and sometimes in rather swampy places, but never on the black tundra or on the isthmuses between the ponds like the Phalaropes.

The eggs were first described from the Mackenzie region, by Richardson (Fauna Boreali-Americana, II, 383), but appear to be still little known in collections.

Both parents share in the work of incubation, though we happened to obtain more males than females with the eggs.

The young are pretty generally hatched by the first week in July, and both adults and young keep pretty well out of sight till the first of August, when they begin to show about the lagoons and occasionally about the beach, many of the young birds still downy about the head.

The autumn flight of young birds appears about the middle of August, associating with the young *A. maculata* and *M. griseus scolopaceus*, in good-sized flocks, particularly about the pools on the high tundra below Cape Smythe.

They continue plenty in these localities, sometimes appearing along the beach, for about a week, when the greater part of them depart, leaving only a few stragglers that stay till the first few days of September.

540. PELIDNA SUBARQUATA (Guld.) Cuv.

CURLEW SANDPIPER.

The Curlew Sandpiper has never been before noted as occurring anywhere in America except upon the Atlantic coast, where it is a rare straggler.

I had the good fortune to capture a male in full breeding plumage, the only one seen, on June 6, 1883. It was in company with a good-sized flock of *Actodromas maculata*.

541. EREUNETES PUSILLUS (Linn.) Cass.

SEMIPALMATED SANDPIPER (*Niwiliwilûk*).

This species is a regular and fairly abundant fall visitor at Point Barrow, coming apparently from the east in large flocks.

None were seen either season during the spring migrations or the breeding season, but about the end of July they appeared in large numbers, arriving at Pergniak first and spreading down the coast.

They were then quite abundant for two or three days about the village ponds and in the village itself, and a few stragglers staid on until the middle of August.

Though a great many of them were shot, no adults were found either season.

544. LIMOSA LAPPONICA NOVÆ-ZEALANDIÆ Gray.

PACIFIC GODWIT.

This species, which is an abundant summer resident at the Yukon mouth and Saint Michael's, where it breeds, only occurs at Point Barrow as a straggler after the breeding season, appearing in August with the flocks of young *Macrorhamphus*, *Pelidna*, &c.

It is probably a quite regular though rare visitor, as we saw a few both in 1882 and 1883. Nevertheless, the natives appeared not well acquainted with the bird. Some called it "Turá-turá" (*Numenius borealis*), while others thought it was "Sabrañna" (*Lobipes hyperboreus*).

The two that were obtained were both young of the year.

This bird has not been previously recorded from the American coast north of Bering Strait.

556. TRYNGITES RUFESCENS (Vieill.) Caban.

BUFF-BREASTED SANDPIPER (*Núdluayu*).

This is an abundant summer resident, and was more plenty in the season of 1883 than it was the year before.

They arrived both seasons in a body at about the same date (June 6 to 8), and were first seen on the dry banks below the village feeding greedily on the flies and beetles which were out sunning themselves.

By the middle of June they had spread pretty well over the dryer parts of the tundra, both above and below the station. They were never seen on the lower marshy portions of the tundra, but always confined themselves to the high and dry banks, or what we called the black tundra.

The eggs, as might be inferred from their colors, are laid in the latter locality, as a rule, where they harmonize very well with the black and white of the ground and moss. We were unable to find the nest in 1882, but the next spring we collected the eggs in considerable abundance. Like the rest of the waders they build no nest, but deposit the four eggs, small end down, in a shallow depression in the ground lined with a little moss. Four is the usual number of eggs in a complete set, though we collected one set of five.

During the greater part of the breeding season, that is, from the time they arrive till the end of June, the males indulge in curious antics, which we had frequent opportunity of observing.

A favorite trick is to walk along with one wing stretched to its fullest extent and held high in the air. I have frequently seen solitary birds doing this apparently for their own amusement, when they had no spectators of their own kind. Two will occasionally meet and "spar" like fighting cocks for a few minutes and then rise together like "towering" birds, with legs hanging loose, for about thirty feet, then drifting off to leeward. A single bird will sometimes stretch himself up to his full height, spread his wings forward, and puff out his throat, making a sort of clucking noise, while one or two others stand by and apparently admire him. They are very silent, even during the breeding season. When they first arrive they are to be found associating with *Actodromas maculata* for a few days. After the breeding season they disappear gradually, never gathering into flocks, but quietly slipping away, and none are to be seen after the first week in August.

560. NUMENIUS BOREALIS (Forst.) Lath.

ESKIMO CURLEW (*Turá-turá*).

This is a rather irregular summer visitor and by no means common, although well known to the natives. In the spring of 1882 it was the first wader to arrive, but in 1883 we saw none at all.

Two flocks of about twelve each arrived on May 20, when there was still much snow on the tundra and in the lagoons, moving up the beach towards the northeast.

No others were seen till the first week in July, when two were noticed, one associating with a flock of Golden Plovers and Knots. One taken at the time was already molting.

563. PHALAROPUS FULICARIUS (Linn.) Bp.

RED PHALAROPE (*Sábraⁿ*).

One of the commonest birds, remaining till late in October, when the sea begins to close. They arrive early in June in considerable numbers, and already paired, in full breeding plumage. As with Phalaropes generally, the female is the larger and brighter bird of the pair. We found it hard to make the natives believe that she was not the male. Dissection, actually showing the eggs in the ovary, was necessary before they would admit the fact.

The whole duty of raising and taking care of the brood after the eggs are laid, falls upon the males, who hatch the eggs and take care of the young brood, while the female spends her time away feeding. We never found a female sitting on eggs, or took one with her breast plucked. It was invariably the male bird that was started off the eggs.

When these birds first arrive the sea is still closed, and the birds make themselves at home especially round the small ponds. As the snow melts away, they spread out over a greater extent of country, but never go far from the sea, and are always to be found in the wetter grassy portions of the tundra, particularly back of the beach lagoons, where they nest in large numbers.

The nest is always in the grass, never in the black or mossy portions of the tundra, and usually in a pretty wet situation, though a nest was occasionally found high and dry, in a place where the nest of the Pectoral Sandpiper would be looked for. A favorite nesting site was a narrow grassy isthmus between two of the shallow ponds. The nest is a very slight affair of dried grass and always well concealed.

Some of the pairs have their full complement of eggs laid by the middle of June, but others are much later, as fresh eggs were obtained as late as June 29, in 1882. Four is the usual number of eggs in a complete set, although sets of three incubated eggs are to be found.

They are exceedingly tame and attractive little birds during the breeding season, paddling about the little ponds on the tundra in their peculiarly graceful manner, having apparently no fear of man or beast, and keeping up a continual twittering, as if of conversation among themselves. They are at all times a noisy bird, especially when gathered into flocks.

They begin to collect in flocks, flying and lighting round the ponds, about the end of June, and continue in flocks through July, though as the sea opens they grow scarce, apparently roaming off inland, and out to sea. Late in July, when there were hardly any to be seen near the shore, I have found them 7 or 8 miles inland around the lakes in very large flocks, which were gradually assuming the gray winter plumage. The natives said that the Phalaropes went "south," which means "inland," and they would be plenty by and by. The adults appear to leave about the end of July, as the great flocks which stay so late in the fall seem to be all the young of the year.

These flocks come off the land about the first week in August, and are to be found along the shore and beach, occasionally feeding and swimming in the ponds back of the beach. Their abundance varies a great deal on different days, as they are apparently wandering back and forth a good deal from one feeding ground to another. They are apt to be specially abundant on days when there is much loose ice on and near the shore.

When in the fall plumage and collected into flocks, they spend most of the time floating and feeding with their peculiarly graceful dipping motion a few yards from the beach, while a flock will occasionally rise with a sharp twitter and move a few hundred yards to a new feeding ground.

They are exceedingly tame and unsuspicious at all seasons, and the Eskimo boys, although their archery is none of the best, succeed in killing a good many of them with their bows and arrows.

564. LOBIPES HYPERBOREUS (Linn.) Cuv.

NORTHERN PHALAROPE (*Sabra'ñna*).

Mr. Nelson has already noted the increasing rarity of this species as we proceed towards the north in the Arctic Ocean, although it is the more abundant of the two Phalaropes on the shores of Bering Sea. When we reach Point Barrow it has become merely a rare straggler, although the natives know it well, having become familiar with it during their summer wanderings to the Colville.

It was only seen alive on one occasion, June 11, 1883, when a single pair was taken in one of the small tundra pools, such as are frequented by the Red Phalaropes. As usual the female was the larger and more brightly colored bird.

We also secured a native skin from a man who said he had shot the bird in the country of the Kûngmûdling people, east of the Colville River, where they are very plenty.

584. GRUS CANADENSIS (Linn.) Temm.

LITTLE CRANE (*Tût-tĭ'd-rĭ-gû*).

Though abundant about Norton Sound and even as far north as Kotzebue Sound, the Little Crane reaches Point Barrow only as a rare straggler. It was not observed at all during the season of 1882, but two pairs were seen in 1883 and one of each pair secured. Both of these occurrences were between the middle and end of June, and none were seen in the autumn.

The bird was well known to the natives, who say they find them very abundant at the mouth of the Colville.

588. OLOR AMERICANUS (Sharpless) Bp.

WHISTLING SWAN (*Ku'g' ru*).

The swans occasionally seen and frequently spoken of by the natives are probably of this species, as the large Trumpeter Swan is not known west of Fort Yukon (*teste* Nelson, "Arctic Cruise of the Revenue Steamer Corwin, 1881").

They were only noticed once or twice each spring, and the natives say they are uncommon at the sea-coast.

They say, however, that they are very plenty "*pani*" "south," by which they mean 75 or 100 miles inland on the rivers, where, they say, they catch a great many when they have molted their wing feathers.

591a. CHEN HYPERBOREUS ALBATUS (Cass.) Ridgw.

LESSER SNOW GOOSE (*Kŭ'ñ-o*).

All the snow geese taken were of this smaller form. They are not at all common, but are occasionally seen during the spring migrations, that is, from the middle of May to the end of June. They are usually in pairs and small flocks, and generally come off the land from the south and go out to sea, as if going out to feed.

Once or twice larger flocks came up in the morning and went back again in the afternoon, and occasionally stragglers were found alighting round the pools on the tundra. None of them bred in the neighborhood of the station.

593a. ANSER ALBIFRONS GAMBELI (Hartl.) Coues.

AMERICAN WHITE-FRONTED GOOSE (*Nû'g' lûg' rua*).

This was our most abundant goose. They are fairly plenty during the spring migrations and a few breed. Like the swans they are said to be extremely abundant "south," near Meade River, where many eggs are secured and many geese taken while molting and unable to fly.

They arrive about the middle to the end of May (May 16, 1882, and May 25, 1883), and for a couple of weeks are generally to be found in small parties along the lagoons and the small pools which have opened along the crown of the beach. We could be sure to find a few geese every day in a small marshy lagoon above the station, which we got into the habit of calling the "goose pond" from this fact.

As the snow cleared off—early in June—they scattered in pairs over the tundra, occasionally feeding together in small parties of half a dozen or so.

The eggs are always laid in the black, muddy tundra, often on top of a slight knoll. The nest is lined with tundra moss and down. The number of eggs in a brood appears subject to considerable variation, as we found sets of four, six, and seven, all well advanced in incubation. The last laid egg is generally in the middle of the nest, and may be recognized by its white shell unless incubation is far advanced, the other eggs being stained and soiled by the birds coming on and off the nest.

We never saw any young birds, and the adults disappeared early in July. Perhaps they go inland to the rivers to molt their flight-feathers.

In the fall migrations they were exceedingly rare, a flock or two being seen each season in August.

These birds are familiar objects, during the breeding season stalking around the level tundra, where the mirage makes them loom up as big as a man, and their peculiar laughing cry is frequently to be heard.

At this time they are exceedingly shy and difficult of approach, but when they first arrive can easily be called within gunshot by the rudest imitation of their cry.

596. BERNICLA NIGRICANS (Lawr.) Cass.

BLACK BRANT (*Nûg'lû'g'nû*).

The Black Brant appear at the end of the main spring migrations of the water-fowl, but in no very considerable numbers, following the same track as the eiders.

A few remain to breed and are to be seen flying about the tundra during June. The nest is placed in rather marshy ground and is a simple depression lined with down, with which the eggs are completely covered when the birds leave the nest. The birds sometimes begin to sit on four eggs and sometimes lay as many as six.

After the middle of August they begin to fly across the isthmus at Pergniak, coming west along the shore of Elson Bay, crossing to the ocean and turning southwest along the coast. Whenever during August the wind is favorable for a flight of eiders at Pergniak the brant appear also. They, however, frequently turn before reaching the beach at Pergniak, follow down the line of lagoons and cross to the sea lower down the coast.

The adults return first. No young of the year were taken till the end of August. During the first half of September, a good many flocks cross the land at the inlets as well as at Pergniak, and are to be seen resting and feeding along the lagoons and pond-holes.

At this season they are very shy and hard to approach, and all are gone by the end of September.

598. PHILACTE CANAGICA (Sevast.) Bannist.

EMPEROR GOOSE.

This bird did not occur at Point Barrow, and its name is only inserted here because the expedition received the gift of a skin at Saint Michael's from Lieut. Frederick Schwatka, U. S. A.

605. DAFILA ACUTA (Linn.) Bonap.

PINTAIL (*Ïkwûgû*).

The Pintail does not come to the coast in anything but small numbers, and probably none breed in the vicinity of the station.

One or two small flocks were occasionally seen during the spring migrations in 1882, but none in 1883, until the fall.

During the fall migrations, that is through August and early in September, several small parties came down into the little ponds near the village and several were taken. These returning birds were mostly young of the year, and very fat.

The natives say that they are very plenty in summer on the larger rivers running into the Arctic Ocean east of Point Barrow, and are very keen of sight and hearing.

623. HARELDA GLACIALIS (Linn.) Leach.

LONG-TAILED DUCK; OLD SQUAW (*A'hadliñ, A'dyigia*).

This was one of our commonest ducks, though never appearing in great flights like the eiders. They are first seen about the middle or end of May, and remain as long as there is any open water in the fall. The seal hunters in 1882 reported seeing these birds as late as December 9, in open holes in the ice-field.

Though the first ones arrive from the 15th to the 20th of May, they are not plenty till the first week in June, about which time there is a considerable flight, larger flocks passing up to the north-east in the afternoon or evening.

The flight-flocks are never so large as the flocks of eiders, and always go very high, making a great clamor. They are exceedingly noisy all through the spring migrations and the breeding season. The native name "Ahadliñ" is a capital imitation of their ordinary cry.

After this flight they are to be found in tolerable abundance in all the ponds and pools on the tundra which are free from ice. They appear to have paired before their arrival, and only seldom collect in small parties at some favorite feeding ground like the "goose pond."

During the breeding season each pair seems to adopt a pool for its own, and drive out all intruders. At this season they feed almost exclusively on vegetable food, and are fat and in excellent condition for food, with no fishy flavor.

They breed in considerable numbers all over the tundra, but the nests are scattered and not easy to find. The nest is always lined with down and generally near a pool.

As the open holes begin gradually to form at the outlets of the lagoons, and along the beach, the Old Squaws resort to them in increasing numbers, frequently sitting on the ice. By the first week in July they begin to abandon the tundra and collect in large flocks along the shore.

After the ice has broken up and gone away they are to be looked for especially along the shore, although a small party is generally to be found in each of the large lagoons. Through July and August they vary in abundance, some days being very plenty, while for two or three days at a time none at all are to be seen. At this season they fly up and down not far from the shore and light in the sea. Towards the end of August they are apt to form large "beds" near the station, and this habit continues in September whenever there is sufficient open water.

Many come from the east in September and cross the isthmus at Pergniak, and continue on down the coast to the southwest. We noticed them going southwest past Point Franklin, August 31, 1883, in very large flocks.

After October 1 they grow scarcer, but some are always to be seen as late as there is any open water.

They begin to lay about the middle of June, and downy young were found July 20.

625. POLYSTICTA STELLERI (Pall.) Brandt.

STELLER'S DUCK (*Ignikau'kto*).

Though not common in the sense that the King-ducks and Pacific Eiders are common, this beautiful little duck is far from a rare bird during the late spring and summer at Point Barrow and in the vicinity.

The breeding-ground, however, appears to be some distance off. Early in June they are to be found at the "leads" of open water at some distance from the shore, and perhaps the majority of them pass on in this way to their breeding-grounds. From the middle to the end of June they appear on land in small parties scattered over the tundra.

At this time they are in full breeding plumage, and the males are generally in excess in the flocks. They are generally to be found in small "pond-holes," frequently sitting on the bank asleep, and are very tame, easily approached within gunshot, and generally swimming together when alarmed, before taking wing, so that several can be secured at one discharge. I have stopped a whole flock of five with a single shot.

They appear to go off to breed about the end of June, although it is possible that the birds we have on the tundra are non-breeding birds.

Birds, however, that have bred, judging from the looks of the ovaries, begin to come back from the first to the middle of July, appearing especially at Pergniak and flying in small parties up and down the coast. They generally keep to themselves, but are sometimes found associating with small parties of King-ducks.

When the open water forms along shore, that is, in the latter part of July and early part of August, they are to be found in large flocks along the beach, collecting in "beds" at a safe distance from the shore, feeding on marine invertebrates, especially gephryean worms. These flocks consist almost exclusively of molting females, whose ovaries show that they have bred. The males appear to undergo a fall change of plumage like the other eiders, gradually putting on the brown dress of the females. We were, however, unable to secure any specimens to illustrate this change.

They disappear from the first to the middle of August, and when gathered in large flocks are exceedingly wild and hard to approach.

Though less abundant in the early part of the season of 1883 than they had been in 1882, they were, on the other hand, much more plenty after the sea opened, and staid considerably later.

626. LAMPRONETTA FISCHERI Brandt.

SPECTACLED EIDER (*Ka'waso; ♂ Tú́tûlu; ♀ Yú'kqlulu*).

This species has not been previously noted north of Bering Straits, but we found it to be a regular though rather rare summer visitor in the vicinity of Point Barrow. They evidently breed not far from the station, as a female was taken June 19, 1883, with an egg in the oviduct just ready for laying.

They arrive towards the end of the great spring migrations of eiders, as has been observed at Saint Michael's, in company with the King-ducks and Pacific Eiders, and are occasionally to be seen in pairs and small parties on the tundra, especially on the wetter portions back of the beach lagoons.

They were not observed either season in the fall migrations. The young, about three-fourths grown, were taken August 24, 1883, and had the eye-patches even then distinctly indicated.

The male in the breeding season has the green feathers of the back of the head developed into a decided nuchal crest, which I do not find mentioned in any of the published descriptions of the species.

I found the iris of the female white, and not hazel or blue as has been stated by other observers. This character is possibly variable.

628. SOMATERIA V-NIGRA Gray.

PACIFIC EIDER (*♂ Amau'lĭñ; ♀ Teu galŭ'ktun*).

This species appears to be decidedly less plenty than the succeeding, although it is often difficult to distinguish them, as during the great migrations they frequently associate in large mixed flocks, so that one shot may bring down birds of both species.

They arrive later than the King Eiders, not appearing before the middle of May, after which time they are to be taken in every flight, gradually increasing in numbers. Towards the end of the migrations there are occasional days when the flocks seem to be made up almost exclusively of this species. A few small parties are also to be seen loitering around the lagoons, and open pools in the shore ice towards the end of June.

During the migrations, they are exceedingly fat and excellent eating. In the autumn they associate with the King Eiders, following the same course at Elson Bay, and frequently sitting in good-sized parties close to the shore.

Towards the end of the fall migrations, the change to the fall plumage in the males is pretty well marked. This change of plumage has been noted in this species by Mr. Dall, but beyond his short note, I can find no reference to the change in any history of the species. Unfortunately, no specimens were secured to illustrate this.

This species does not breed anywhere near the station. The natives say they all go a long distance to the eastward, and there breed in large numbers. As well as we could make out, one extensive breeding-ground is on some sand island, rather more than half-way between Point Barrow and the mouth of the Colville River.

By a curious misnomer, these ducks are known to the whalemen as "canvas-backs"!

629. SOMATERIA SPECTABILIS (Linn.) Boie.

KING EIDER (♂ *Kí'ñaliñ;* ♀ *Áñnabia*).

This is by all means the most abundant bird at Point Barrow. Thousands hardly describes the multitudes which passed up during the great migrations, within sight of the station, and yet equally great numbers passed up along the "lead" of open water several miles off shore.

They appear in the spring before there is any open water except the shifting "leads" at a distance from the shore, and travel steadily and swiftly past Cape Smythe to the northeast, following the coast. Some flocks cross to the eastward below Point Barrow, but the majority follow the barrier of grounded ice past the point. It is probable, however, that they turn to the east after passing Point Barrow, because all the returning flocks in the autumn come from the east, hugging the shore of the mainland.

The first ducks in the spring of 1882 were seen on April 27, a comparatively warm day, with a light southerly wind blowing. They were flying parallel to the coast over the barrier of grounded ice. The natives said they were all "kingaling" "nosy birds" or males (referring to the protuberance at the base of the bill), and the first flocks of the migration appear to be composed exclusively of males.

During the first half of May, 1882, several males came from the south off the land, and gained the ice in a very exhausted condition, frequently so utterly worn out that the natives caught them and killed them with sticks. They were all found to be very much emaciated, and their stomachs were empty of food.

The season was later in 1883, and no ducks were seen till May 5. There were six great flights in 1882, the first on May 12 and the last on June 11, and five in 1883, the first on May 17 and the last on June 4. As a rule, these flights took place on comparatively warm days, with light westerly or southwesterly winds. On one day each year, however, there was a large flight with a light breeze from the east. A warm southwest wind is pretty sure to bring a large flight of eiders.

The flight seldom lasts more than two or three hours, beginning about eight or nine in the morning, or between three and four in the afternoon. More rarely a flight begins about ten in the morning and lasts till afternoon.

During the flights, the great flocks in quick succession appear to strike the coast a few miles from the station, probably coming straight across from the Seahorse Islands, and then follow up the belt of level ice parallel to the coast towards Point Barrow, going pretty steadily on their course, but swerving a little and rising rather high when alarmed.

Their order of flight was generally in long diagonal lines, occasionally huddling together so that several could be killed at one discharge. A few flocks in a great flight usualy followed up the line of broken ice a mile or two from the shore, and a flock occasionally turned in at the mouth of the lagoon and proceeded up over the land.

On the days between the flights and when the wind was east, a few flocks would struggle up against the wind either going up far off the shore or overland; but most of the birds on "off days" came off the land from the south, and either continued on towards the open water or turned to the northeast along the broken ice. These flocks were never so large as the great flight flocks, and generally flew in more compact order. A few were occasionally seen early in the migrations going back towards the southwest. On many days when there were no ducks in shore they flew abundantly at the "lead" of open water.

The majority of them are paired by the middle of May, and the flocks are made up of pairs flying alternately, ducks and drakes. If a duck is shot down, the drake almost invariably follows her to the ice, apparently supposing that she has alighted.

Early in June straggling pairs and small parties settle about the tundra pools and breed sparingly in the neighborhood of the station. A few nests were found. After the main flight and during the latter part of June a few stragglers and small flocks are to be seen almost daily.

Captain Owen, of the steam whaler North Star, who got up to the station June 25, 1882, reported that the day before there were myriads of eiders of both sexes in the open water off Point Belcher.

By the second week in July, before the ice is gone from the sea or from Elson Bay, the males begin to come back in flocks from the east, and from that time to the middle of September there is a flight of eiders whenever the wind blows from the east. The flocks are all males at first, but mixed flocks gradually appear, and the young of the year were first observed in these flocks on August 30, 1882.

Most of the flight birds make no stay but continue on to the southwest, generally a couple of miles out at sea, though they occasionally stop to rest, especially when there is much drifting ice. Between the regular flights they continue to straggle along, coming off the land, and occasionally sitting apparently asleep on the beach. Small flocks and single birds are to be seen till the sea closes, about the end of October, and in 1882 many were seen as late as December 2, when there were many holes of open water.

When the birds are flying at Pergniak, it is quite a lively scene, as there is a large summer camp of Eskimos close to the point where the ducks cross when the conditions are favorable. When the wind is east or northeast, and not blowing too hard, the birds come from the east and strike the land at a point which runs out on the shore of the bay about half a mile from Pergniak, close to where the lagoons begin.

They would be apt to turn and fly down these lagoons were it not for a row of stakes, set up by the natives, running round the semicircle of the bay to the camp. As soon as the flock reaches this critical point, all the natives, and there may be fifty of them on the watch with guns and slings, just at the narrowest part of the beach above the tents, immediately set up a shrill yell. Nine times out of ten the flock will waver, turn, follow round the row of stakes, and naturally whirl out to sea at the first open place, where of course the gunners are stationed. With a strong wind, however, the ducks do not follow the land, but come straight on from the east and cross wherever they happen to strike the beach, so that the shooting cannot be depended on.

The flocks during the fall flight are not so large and do not follow one another in such rapid succession as in the spring, and though they arrive from the east in the same stringing order, they huddle into a compact body as they whirl along the line of stakes and out over the beach.

The natives, although as a rule they are far from good shots, are provided with poor guns, and appear particularly averse to putting in enough powder and shot to kill a strong eider duck, nevertheless succeed in capturing a good many with guns and slings. They reap a plentiful harvest of them in the spring, when they are all at home, and the crews of the whaling *umiaks* out at the open water spend their leisure time while they are waiting for whales in shooting ducks, which form an important article of food. They of course always boil their ducks, as they do all the rest of their food, and usually skin instead of plucking them. They are very fond of the fat which adheres to the skin, scraping it off with their knives industriously till not a particle remains, licking their knives with great relish. The intestines, boiled by themselves, are also considered a great delicacy.

The males that appear at Pergniak at the beginning of the autumn migrations are at first in full breeding dress, perhaps a little faded, especially about the bill. As the season advances they show more and more extensive patches of brown feathers, until at the end of the migrations they cannot be distinguished from the females except by the white wing and back patches.

I do not find this autumnal change of plumage mentioned in any published account of the species, and it has been questioned on general principles by experienced ornithologists. I accordingly give a detailed description of three specimens brought home by our party, which illustrates this process very well. They were all taken on July 26, 1883, and exhibit three different stages of the change.

1. Museum No. 93,296. Compared with a drake in full breeding dress, all the colors are more dingy. The black of the back has lost its rich velvety gloss, and the remiges and tail-feathers are

faded and worn. The cream color of the throat and shoulders is much paler, fading almost to white on the back, and beginning to become mottled with darker patches between the shoulders. The white feathers on the neck are thin and sparse, and drop out very easily, while very young brown feathers are making their appearance among them. The black V on the throat has assumed a "spotty" appearance, caused by the dropping out of some of the black-tipped feathers, so as to expose their white roots. The green feathers of the cheeks are faded, thin, and hairy. The blue-gray of the crown and back of the head appears at first sight to be merely faded, but drawing aside the feathers discloses at their roots a crop of brown feathers rather more advanced than those on the neck. All the feathers of the head and neck except the brown ones fall out very easily and appear faded and worn. The bill has grown dark, the protuberance at its base much shrunken, and the epidermis is coming off the frontal processes, patches only remaining.

2. Museum No. 93,297. The head and neck now show about equal proportions of the new brown feathers and the old light-colored ones. The back between the shoulders and the front part of the throat shows a large proportion of new brown feathers (still growing from the capsule, as may be easily seen by pulling out one or two), and many of the white or cream-colored feathers of the throat have been lost. A few new brown feathers have also appeared at the flanks.

3. Museum No. 93,298. The white and light-colored feathers are nearly gone from the head and neck, remaining only in a few patches on the cheeks and forehead, while the brown feathers are fairly well developed, so that the fore part of the throat and back is nearly as in the female. The breast is still cream-colored.

The drakes grow almost entirely dark before the migrations are over, the wing-patches remaining white the longest. The Pacific eider and Steller's duck both undergo a similar change, but we were unable to secure any specimens to illustrate this.

None of the eiders of any species molt their wing-feathers so as to be incapable of flight until after leaving the neighborhood of Point Barrow.

657. PAGOPHILA EBURNEA (Phipps) Kaup.

IVORY GULL (*Nau'yabwûñ*).

The Ivory Gull is at best a rare visitor at Point Barrow. Early in the spring of 1882, Lieutenant Ray reported seeing two in full plumage out at the lead of open water, some six miles from the shore.

No others, however, were seen or reported until late in the fall, when large numbers of Rosy Gulls were flying up the coast and among them a few of this species, of which one was taken.

The bird was not observed in the season of 1883.

660. LARUS GLAUCUS Brünn.

GLAUCOUS GULL; BURGOMASTER (*Naúya*).

Large gulls, mostly in the immature plumage of this species, were plenty round the station from the time we landed up to the middle of October, flying up and down the beach, sitting on the water, or feeding at the edge of the beach. The first two of the large lagoons were always favorite resorts for the gulls at all seasons when they were open, and even after they were partially frozen gulls were to be seen sitting on the ice.

After the middle of October, they became scarcer, sometimes disappearing for days, but a few stragglers remained as long as the sea was open, up to the middle of November. In the autumn of 1882 none were seen after October 18, except one solitary straggler reported November 1.

They arrive in the spring, about the first week in May, and during May and June a few are to be seen nearly every day, though they sometimes disappear altogether for a day or two, and occasionally are rather numerous specially round the lagoons and near Pergniak. They always turn out in full force when there is a flight of eiders, and make themselves troublesome by picking up dead and wounded ducks.

If a duck be shot so that he fall in the water or any not easily accessible place, an hour is generally time enough for him to be reduced to a skeleton by the gulls. They are occasionally to be seen inland, but usually crossing to some particular point, sometimes lighting on the tundra.

None breed anywhere near the station, though they are to be seen every day during the breeding season. They are rather abundant after the sea opens, and continue so during August and September. The young appear in August. Towards the end of September, when numerous, they have a regular track near the station, flying in over the beach and out over the magnetic observatory.

The natives say they find them plenty at the rivers inland when they are killing deer in the summer.

They are a favorite bird with the natives, and many are shot in the autumn as they fly up and down the shore. They are also occasionally caught with a baited line in the autumn when there is a light snow on the beach. A little stick of hard-wood, about 4 inches long and sharpened at both ends, has attached to its middle a strong line of deer sinew. The stick is carefully wrapped in blubber or meat and exposed on the beach, while the short line is securely fastened to a stake driven into the sand and carefully concealed in the snow. The gull picks up the tempting morsel and swallows it and of course is caught by the stick, which turns sidewise across his gullet, and his struggles to escape fix it more firmly.

It was at first supposed that *Larus leucopterus* occurred at Point Barrow, and several gulls in the collection were identified as belonging to this species. Mr. Howard Saunders, however, the great English authority on the *Laridæ*, while in Washington last summer, carefully examined our series, and is of the opinion that they are all referable to *L. glaucus*, with the exception of one small and very brown immature bird, which he was unable to identify.

661a. LARUS KUMLIENI Brewster.

LESSER GLAUCOUS-WINGED GULL (*Naú-ya*).

The above-mentioned dark and small immature bird (Museum No. 93306), which Mr. Saunders was unable to identify, is considered by Mr. Ridgway as probably referable to Brewster's species *L. kumlieni*,* which has hitherto been obtained only from the eastern coast of America. It is not at all unlikely that the species should straggle westward along the northern coast of the continent as *Pelidna subarquata* and *Actodromas fuscicollis* were found to do.

Small and dark young gulls were observed quite often with the young Burgomasters in the autumn, but the above was the only one obtained in a state fit for preservation.

676. RHODOSTETHIA ROSEA (MacGill) Bruch.

ROSS'S GULL (*Kă'ñmax'lu*).

(Plates I and II.)

Our expedition succeeded in obtaining a large series of this rare and beautiful bird—more, in fact, than there were before in all the museums of the world put together—and a still larger series might have been obtained had the weather and other conditions been favorable.

Unfortunately, we were able to add very little to the biography of the species, as the birds are simply autumn visitors at Point Barrow, making no stay, but passing rapidly to the northeast. This, however, is the only locality where the birds have been observed in abundance even for a short time, all previous records referring to the capture of sporadic individuals.

In 1881, from September 28 to October 22, there were days when they were exceedingly abundant in small flocks—generally moving towards the northeast—either flying over the sea or making short excursions inshore.

Not a single one was seen during the spring migrations or in the summer, but two or three stragglers were noticed early in September—a few out among the loose pack-ice—and on September 21, 1882, they were again abundant, apparently almost all young birds.

* See Bull. Nuttall Ornithological Club, viii, No. 4, pp. 214-219, October, 1883.

They appeared in large, loose flocks, coming in from the sea and from the southwest, all apparently traveling to the northeast. Most of the flocks whirled in at the mouth of our lagoon and circled round the station with a peculiarly graceful, wavering flight, and many were shot close to the house. A cold easterly wind was blowing at the time.

They continued plenty for several days—while the east wind blew—all following the same track, moving up the shore, and making short excursions inland at each of the beach lagoons.

After September 28 they disappeared until October 6, when for several days there was a large flight. On October 9, in particular, there was a continuous stream of them all day long moving up the shore a short distance from the beach and occasionally swinging in over the land. *None were seen to return.*

The nature of our duties at the station prevented any investigation as to where they came from or whither they went. They appeared to come in from the sea, to the west or northwest, and traveled along the coast to the northeast.

They were not observed on Wrangel Island by either the Jeannette, the Corwin, or the Rodgers, and yet the direction from which they come to Point Barrow in the fall points to a breeding-ground somewhere in that part of the world. May it not be that some land yet to be discovered, and north of Wrangel Island, will one day yield a glorious harvest of the eggs of this splendid species?

It is difficult to form any idea of what becomes of the thousands that pass Point Barrow to the northeast in the autumn. It is certain that they do not return along the shore as they went. Nevertheless, at that season of the year they must of necessity soon seek lower latitudes.

Perhaps the most plausible supposition is that soon after leaving Point Barrow, perhaps when they first encounter the main ice-pack, they turn and retrace their steps so far out at sea as to be unnoticed from the land, and pass the winter at the edge of the ice-field, proceeding north to their breeding-ground as the pack travels north in the spring.

Capt. Everett Smith, of the steam whaler Bowhead, who is a trustworthy witness, reports that when he was in the loose ice, 70 miles northwest of Point Hope, on June 10, 1883, he saw large numbers of these birds.

The greater number of the birds we obtained were immature, and probably the young of the year, though in a stage slightly more advanced than the young bird taken by Mr. Nelson at St. Michael's. The few adults that we captured were in a plumage hitherto undescribed, and one in particular was especially beautiful. The following is a description of this specimen:

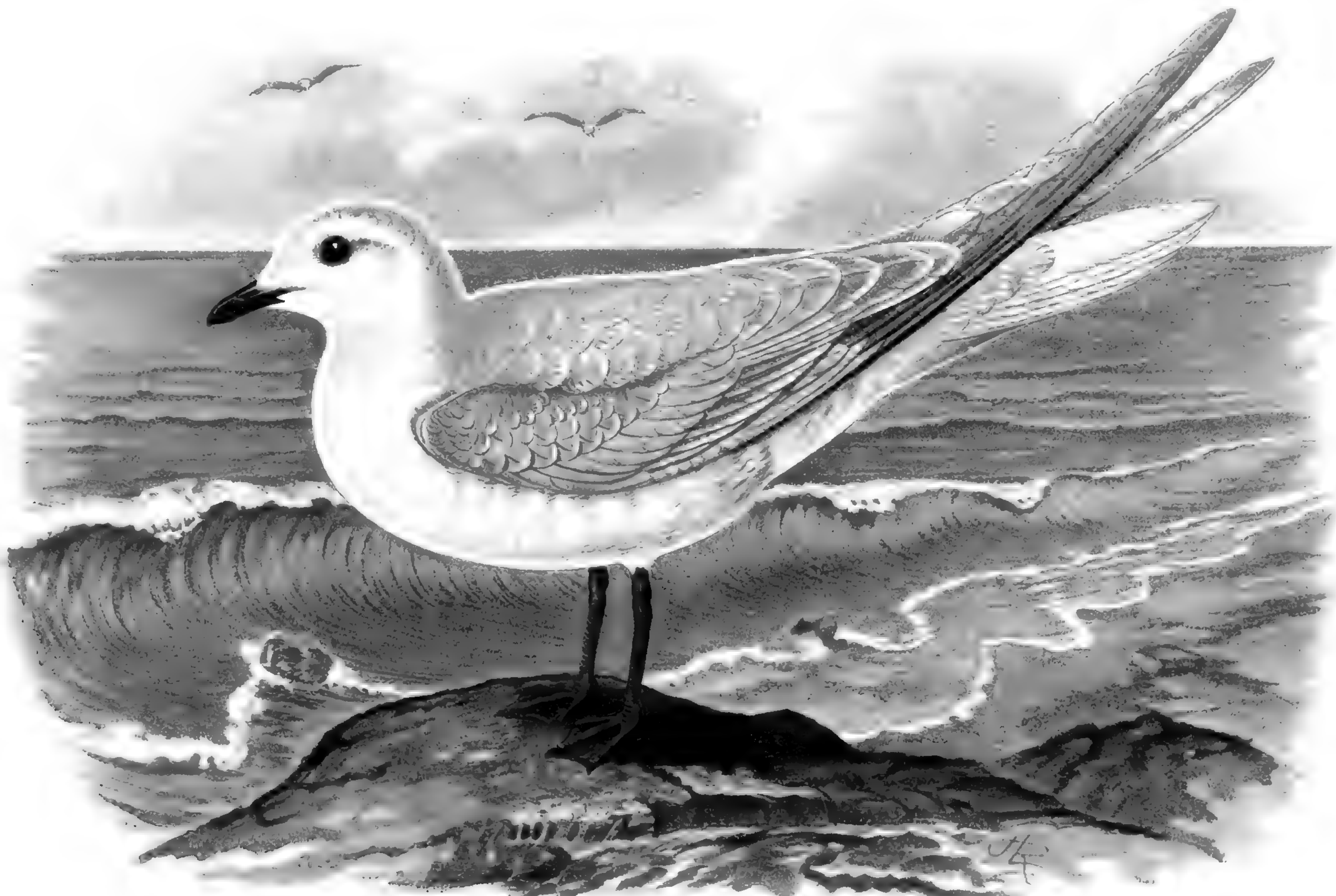
Museum No. 93321, *Rhodostethia rosea* ♂.—White parts everywhere tinged with rose color, except the tail feathers; rose color somewhat blotchy and approaching salmon color, especially on the crissum. Mantle pearly blue, extending as mottled markings to the back of the head. No traces of the black collar; a few black marks round the eye. Edge of wing from shoulder to wrist bright rose. First four primaries rose-shafted beneath, third the brightest; outer web of first primary black nearly to the tip; fifth to last primary and first secondary, white-tipped; remaining secondaries rose-tipped. A few small obscure black markings on the breast. Feet, "terra-cotta" red, with brown knuckles and webs. Bill, black.

The above description was taken from the freshly-killed bird. The beautiful blush-rose tinge had not, however, faded perceptibly, when the skin was examined a year later. The other adults were in almost the same plumage, but the rose color was much paler and confined to the under parts from the throat to the under tail-coverts. The only adult female secured was the least pink of any of the adults. One specimen, No. 93364, shows a few dark feathers among the upper wing-coverts. Mr. Ridgway makes the rather reasonable suggestion that this is a bird in its second year.

Mr. Howard Saunders, in "Ibis" for 1875, has given an excellent description of the immature plumage from two young birds in the Vienna Museum. As, however, these birds differ in some respects from those we collected, I will venture to give a detailed description of our large series.

Three specimens (Museum Nos. 93328 ♂, 93353 ♂, and 93354 ♂) present a stage of plumage which is possibly a little younger than the great majority of the birds collected.

The following is a description of this stage:



RHODOSTETHIA ROSEA. ♂. AD. WINTER PLUMAGE.

RHODOSTETHIA ROSEA ♀ JUV. FIRST AUTUMN.

Below, including lower tail-coverts, white, or *slightly* tinged with rose-color; mantle pale pearly blue, extending on to the sides of the neck and back of the head, which is faintly mottled with dark markings in one specimen; black and white mottled markings round the eye, extending to the corner of the mouth in one specimen; small black spot on each side of the neck, while in one case the dark collar of the adult is faintly indicated; forehead in every case white; rump more or less mottled with black feathers, occasionally edged with white or pale brown. Upper tail-coverts white, sometimes showing indistinct dark marks towards the tips of the feathers. Tail with a broad black tip about one-fourth of its length. Middle rectrices black-shafted, with this color extending more or less on the webs, continuous with the black of the tip. First, second, third, and fourth primary above, shaft, outer web, and about half of inner web including tip, black, the rest white; one specimen has a large white subapical spot on the fourth primary. Remaining primaries gray at the base, fading into white towards the tip, where there is an oblique black bar across the feather. This bar grows smaller on the successive primaries till the last is wholly white. Secondaries, white. Tertiaries and scapulars dusky black, with white or light-brown edges. Upper wing-coverts, alula, and lower primary coverts black, with white or light brown edges, lower secondary coverts like the mantle. Under surface of the wing nearly uniform, like the mantle.

The majority of those taken were in a very similar plumage, but always without the black shafts to the middle rectrices, though the tail is always black-tipped, and one or two show slight black markings on the upper tail-coverts. In two or three specimens the blue of the mantle extends completely around the neck, and two or three have the dark collar faintly indicated, especially on the back of the neck. Two have a few scattered dark feathers in the blue of the mantle, and two have a few on the sides of the neck where the black spots are invariably present. A few specimens have the upper wing-coverts indicating a change to the adult plumage. One has a few "mantle-blue" feathers mixed with the mottled ones, and three or four others have about the upper half of the coverts like the mantle. The white markings on the first four primaries are rather variable. One specimen has a small subapical spot on the outer web of the second, a large one on the third, and about half the outer web of the fourth, white. The fourth primary is frequently in this condition when the others are unspotted, and the spot appears occasionally on the third.

The outer web of the first appears always to be black.

About a third of the birds examined in this stage were more or less tinged with pink, and four-fifths of these were males, so that this may be more or less of a sexual character.

Both the specimens examined by Mr. Saunders lack the black tip to the tail so characteristic to this stage of plumage in the autumn. The date of capture of his specimens is unknown, but it is quite possible that they are the young of the previous year after the spring molt.

677. XEMA SABINEI (J. Sabine) Leach.

SABINE'S GULL (*Yúkû'drigûgía*).

Though by no means uncommon, this bird is somewhat irregular in its occurrence at Point Barrow. In 1881 the young birds of the year, easily recognized by the broad, black band from the shoulder to the tip of the wing, were quite abundant from the time we landed till the end of October.

In 1882, however, none were seen after August 3, and they were scarce during the breeding season. On the other hand, though equally scarce in the breeding season of 1883, they appeared in considerable numbers late in July and during the month of August, and were frequently seen in considerable flocks, young and adults together, about the lagoons, and with the other gulls collected round the whale-ships anchored at the Point.

They evidently breed somewhere in the neighborhood, probably on the sandy islands east of Point Barrow, for one was taken June 28, 1882, with the breast bare of feathers, as if incubating, but the eggs were never found.

They are usually to be seen flying singly up and down the shore with a peculiarly slow, wavering flight, zigzagging to right and left, and occasionally light upon the water close to the beach. Early in the season they are occasionally found flying some distance inland, and lighting among the tundra pools.

The first stragglers appear in the spring, about the first of June. An adult male, in full breeding plumage, taken in June, 1882, had the under parts as rosy as in the Roseate Tern.

687. STERNA MACRURA Naum.

ARCTIC TERN (*Utyutákĭn*).

The Terns appear about the 10th of June, but are never plenty about the station till the month of August, when they appear in good-sized flocks, fishing about the lagoons and among the broken ice, especially in the neighborhood of the sandspit at Point Barrow.

During the breeding season we only saw stragglers from the breeding grounds, which are probably the same as those of Sabine's gull, the sandy islands east of Point Barrow. None of our party succeeded in finding the nest, as we were unable to reach these islands, but eggs were brought us by the natives, who said they got them there.

The Terns leave early. None were seen after the end of August.

697. STERCORARIUS POMATORHINUS (Temm.) Vieill.

POMARINE JAEGER (*Ĭ'suñû*).

This is perhaps the least common of the three species of Skuas, although a regular summer visitor. They are to be seen flying about the tundra and occasionally lighting during the months of June, July, and August.

None of them breed anywhere near the station. The natives make no distinction between this and the two following species.

698. STERCORARIUS CREPIDATUS (Banks) Vieill.

RICHARDSON'S JAEGER (*Ĭ'suñû*).

This appears to be rather more plentiful than the last species, but is nowhere to be compared in abundance to the following. They are occasionally to be seen during the summer, both before and after the sea opens, flying about with the other Skuas.

None breed anywhere near the station, and from the looks of the sexual organs of some taken early in July, they are late breeders.

699. STERCORARIUS PARASITICUS (Linn.) Saunders.

LONG-TAILED JAEGER (*Ĭ'suñû*).

This is by all means the commonest of the Skuas at Point Barrow and is rather abundant, though none breed. They arrive in the spring, about the end of May, and are tolerably plenty from that time till the end of August.

Before the sea opens they are to be found on the tundra, where they have a habit of walking about in small parties, feeding on flies. At such times they are not at all shy, and if one be shot down the others are apt to fly back within gunshot, sometimes coming straight at the shooter.

They are sometimes to be seen traveling about in large, straggling parties, fifty or more together, moving slowly up or down the coast, occasionally alighting and then taking wing again.

The natives say they are "bad" and eat birds' eggs, and they point out the broken egg-shells which are to be found scattered over the tundra as the work of this bird. We never happened to see them eating any eggs, but they certainly act as if they were searching for nests, and they have been seen in suspiciously close proximity to ducks' nests which were found broken up.

Their bad reputation is probably well deserved, as the natives of the Norton Sound region are said to tell the same story.

After the sea opens they are rather less abundant, but are still seen occasionally both on land and at sea.

737. COLYMBUS ADAMSI Gray.

GREAT WHITE-BILLED LOON (*Tu'd'liñ*).

The Great Loon, which is curiously enough called by the same Eskimo name as the Golden Plover, is a regular summer visitor and probably breeds, though the eggs were never found.

They were not often noticed in the season of 1882, but were quite abundant in 1883. They are first to be seen about the end of May, or early in June, at the "lead" of open water and flying inland to their breeding grounds. As the sea opens along the shore and open holes are found in the lagoons they are to be looked for in such places, gradually going out to sea as the season advances.

They are generally to be seen alone or in pairs, seldom more than three or four together, and are silent birds compared with *C. torquatus.* I only heard this bird "laugh" once during the whole of my stay. The "laugh" appeared to be harsher than that of *torquatus.*

Fully fledged young were seen August 7, 1883. The breeding-grounds are probably around the swamps and lakes some distance inland.

C. torquatus, although reported by Mr. Nelson from the shores of the Arctic, was not observed at Point Barrow during our stay there.

739. COLYMBUS PACIFICUS Lawr.

PACIFIC DIVER (*Kă'ksau*).

All the black-throated loons we obtained proved upon examination to be this species, so that this is probably the only one that occurs.

The natives make no distinction between this and the next species, and they are both very common birds. Their peculiar harsh cry, "kok, kok, kok," from which they get their name, "Kăk-sau," is to be heard all summer, and the birds were seen nearly every day, flying backwards and forwards and inland from the sea.

During the breeding season these smaller loons have a habit of getting off alone in some small pond and howling like a fiend for upwards of half an hour at a time. It is a most blood-curdling, weird, and uncanny sort of a scream, and the amount of noise they make is something wonderful. They can be heard for miles.

They arrive early in June, and before the ponds are open are generally flying eastward as if they had come up along the open water at sea and were striking across to the mouths of the rivers at the east. As the ponds open they make themselves at home there, and evidently breed in abundance, though we were unable to find the nest. One of their breeding grounds was evidently a swampy lagoon some five or six miles inland, but the nests were inaccessible.

After the breeding season they are frequently to be seen in the open pools along the shore, especially when the lagoons have broken out. They are always very wild and difficult to secure. They are plenty through August and the greater part of September along the shore, and occasional stragglers remain round open holes well into October. Some appeared to be feeding young as late as the middle of September, 1882, as they were seen going inland from the sea carrying small fish.

740. COLYMBUS SEPTENTRIONALIS Linn.

RED-THROATED DIVER (*Kă'ksau*).

This species is quite as common as the foregoing, and appears to have precisely the same habits.

The only identified loons' eggs we obtained were of this species, and were brought in with the parent bird from a stream some miles east of the point. The natives also brought in from time to time both seasons a number of eggs of the *Kăksau*, and these all appeared to be this species.

760. URIA GRYLLE (Linn.) Brünn.

BLACK GUILLEMOT (*Sû'kûbwû*).

During the season of open water we only saw one or two of these birds, always in full black plumage, and at some distance from the shore. In November and December, however, in fact as long as there are any pools and "leads" of open water, these birds in winter plumage are to be found in considerable numbers, usually in small flocks. They only leave us when the ice becomes solidly packed by the winter gales, and curiously enough are not to be found during the spring migrations. A number were taken in the winter of 1882, and with one exception were all the young of the year.

764. LOMVIA ARRA (Pall.) Bp.

THICK-BILLED GUILLEMOT (*A'tpa*).

This species, the "Crowbill" of the whalemen, reaches Point Barrow only as a rather rare straggler. They were sometimes seen at the lead of open water in the early spring and during the summer at some distance from the shore. One was taken as late as December 9, 1882, out among the broken ice by one of the seal hunters. We found them quite plenty at the Seahorse Islands on our return voyage, and of course extremely abundant about Cape Lisburne.

III.—FISHES.

By JOHN MURDOCH, A. M., *Sergeant Signal Corps, United States Army.*

Fishes were scarce in the neighborhood of the station, and the shortness of the open season rendered collecting exceedingly difficult. The marine species were almost all obtained from the natives, who caught them while fishing for food through the ice.

The fresh-water ponds and small streams around Point Barrow are quite barren of fish life, and the fresh-water species in the collection come from the great rivers east of Point Barrow, whence they were brought in frozen in the fall and early spring.

Dr. Tarleton H. Bean has kindly identified the species of the difficult genera *Gymnelis*, *Lycodes*, *Liparis*, and *Cottus*, and has verified the writer's identification of the other species.

GASTEROSTEIDÆ.

1. GASTEROSTEUS PUNGITIUS L. subsp. BRACHYPODA Bean.

On December 1, 1882, Capt. E. P. Herendeen brought in a number of large burbot (*Lota*) from Meade River and Kuaru, both streams flowing into the Arctic Ocean east of Point Barrow.

On preparing these for the table, one or two were found to have their stomachs literally crammed full of sticklebacks, which on examination proved to belong to this species.

They were most of them fresh enough for preservation.

GADIDÆ.

2. BOREOGADUS SAIDA (Lepech.) Bean.

This species was found to be quite plenty close to the station at most seasons of the year. We first saw them early in October, 1881, when the natives brought down large numbers from Point Barrow, where they had been washed up on the beach.

Usually during the latter part of October and early in November, after the sea has closed, and when tide-cracks form along the shore, the natives generally catch a good many of them at the very edge of the beach in about a foot of water.

They use a short line of whalebone to which is attached a small lure made of blackened ivory, which roughly represents an amphipod crustacean, and is armed with a barbless hook.

After this, no more are caught till after the return of the sun, early in February. The natives say that they go away, and it is quite probable that they leave the shore and go off into deeper water. If there were any fish to be caught, the natives would undoubtedly fish for them during the winter months, as at this season they are frequently hard pressed for food.

Early in February, they become exceedingly abundant in about 15 fathoms of water, wherever there is a level field of the season's ice not over 4 feet in thickness, inclosed between rows of hummocks of broken ice. Such a field as this was formed in the winter of 1882, and remained unchanged from February till about the middle of May, when the ice began to soften and melt on the surface. Large numbers of the natives from the Cape Smythe village, especially women and children, resorted to this field nearly every day and caught these fish literally by the bushel. The method of winter fishing is as follows: A hole about 18 inches square is cut through the ice, and through this is let down a long line made of strips of whalebone, and provided with a sinker of lead or copper and two small pear-shaped "jigs" of bright copper or walrus-ivory, armed with four barbless copper hooks. The reel on which the line was wound and which is a stick about 18 inches long serves as a rod, being held in one hand, while a long-handled scoop is held in the other hand and is used to keep the hole clear of ice. The jigs are kept close to the bottom and the line is continually jerked up a short distance and allowed to sink again. The fish are attracted by the bright "jig," and "nosing" round it are caught by the upward jerk. The line is reeled up on the two sticks, held one in each hand, so that it never has to be touched with the fingers, and the fish is adroitly jerked off the hook on to the ice.

No such field, or "fishing ground," as we were in the habit of calling it, was formed in 1883, and only comparatively few fish were caught.

Early in July, when open holes of water form along the shore at the outlets of the lagoons, the fish are again to be found in considerable abundance. The young fry were first noticed about the middle of July, and were quite plenty in the shallow water at the edge of the beach.

Young fish, two to three inches long, were taken at the head of our lagoon, which is brackish, about the first of September, and at about the same time the full-grown fish were plenty along the beach in about 3 fathoms of water, swimming about in large, loose schools.

3. TILESIA GRACILIS (Tiles.) Swainson.

We found this species abundant along the shore at St. Michael's, and caught a good many with hook and line.

4. LOTA MACULOSA (Le S.) Rich

(*Tïtálĕ.*)

This species was abundant in Meade River and Kuaru. The natives catch many large ones through the ice with hook and line.

They are exceedingly voracious, and Captain Herendeen caught one in his net which had swallowed a white fish already caught in the net and then managed to entangle himself.

The season for catching them is in October and November, and again in February, March, and April. They are generally considered rather a refuse fish, and worthless for food, but we found that they made a very palatable chowder.

LYCODIDÆ.

5. GYMNELIS VIRIDIS (Fabr.) Reinhardt.

A small specimen was found washed up on the beach September 13, 1882. Its colors when fresh were two shades of orange, with the spot at the beginning of the dorsal fin black, edged with white.

6. LYCODES TURNERII Bean.

(*Kúxraunü.*)

Two specimens were obtained, having been caught by the natives while "jigging" Polar cod through the ice.

The following color-notes were made while the fish were fresh. Collector's No. (metal tag) 6; Museum No. 33,922 ♀: Ground-color a rather light-reddish chocolate, shading into a reddish brown on the belly. Head, underneath, white. Lower edges of pectorals and ventrals, rufous red. Interrupted band from eye to edge of operculum, brownish cream-color edged with chocolate. Crescent-shaped band on top of head, same color. Ten lateral bands of the same color with dark edges, broken on the side of the body and appearing as spots. Indistinct tip to caudal. Creamy spot on pectoral, near root.

Collector's No. 26, Museum No. 33924 ♂; Large. Marked on the same general pattern as the female, but with only seven lateral bands. All the markings smaller and obscured. General color a brighter red, approaching scarlet.

7. LYCODES COCCINEUS Bean.

(*Kúxraunä.*)

This species was obtained with the preceding, and one large specimen was washed up on the beach. A small specimen had the following colors when fresh:

Collector's No. 7, Museum No. 33,923 ♂ juv., 11.5 inches long. Paler than *L. turnerii*, with the contrast between the chocolate and cream color more strongly marked. Belly lighter, and the red more of a pale orange. Cheeks brownish orange. The second, fourth, and sixth bands end as roundish spots on the back; the alternate bands are continued down, widen, and nearly meet each other. Broad band on anal extending from origin about one-third the length of the fin.

LIPARIDIDÆ.

8. LIPARIS GIBBUS Bean.

On March 30, 1883, a small specimen much mutilated washed up in the tide-hole, covered with small amphipods (*Onisimus littoralis*). Radial formula: D. 43; A. 37; C. 12; P. 38. Museum No. 33,949.

COTTIDÆ.

9. COTTUS DECASTRENSIS Knerr.

(*Kû'n-ai-ó; kû'l-ai-ó*).

These were obtained wherever *Boreogadus saida* was taken, but always in comparatively small numbers.

10. COTTUS QUADRICORNIS Linn.

This species was taken with the preceding, and the young were plenty in our lagoon, close to the outlet, in September, and also in the shoal water of Elson Bay, at Pergniak. Captain Herendeen brought in a small specimen of this species taken in a tributary of Meade River, some 80 or 90 miles from the sea. Its colors when fresh were: Ventrals, lower edge of pectorals, branchiostegal membrane, and edge of mouth, bright vermilion. Back, dark olive, shading through dark slate to white on the belly.

MICROSTOMIDÆ.

11. OSMERUS DENTEX Steindachner.

(*Íthoánĭñ*).

In February, 1883, a Kungmeun Eskimo brought in a large number of these smelts, which he said were caught with hook and line in "The River" ("Ku"), supposed to run into Wainwright's Inlet. The species was well known to the natives at Point Barrow, who said that it occurred nowhere in the immediate neighborhood, and was always taken with hook and line.

12. MALLOTUS VILLOSUS (Müller) Cuv.

In 1882, after the sea was fairly opened, that is, about the 20th of July, these fish appeared along the beach in small numbers at first. A few days later they were passing up the shore close to the beach in very large schools, all moving northeast, and occasionally running into the mouths of the lagoons.

By July 25 they had all passed, and one female only was observed in the autumn. She was seined with a number of Polar Cod on September 5 close to the beach. None at all were noticed in the summer of 1883.

COREGONIDÆ.

13. CORECONUS LAURETTÆ Bean.

This species appears to be abundant in the large rivers (Meade River and Kuaru) flowing into the Arctic Ocean east of Point Barrow, as large numbers were brought in frozen by the Eskimo deer-hunters, generally badly mutilated and unfit for preservation.

The rivers are visited in October and early November, and again in February, March, and April, when the fish are caught in gill-nets set under the ice. Many natives also visit the rivers when they are open in summer and find fish plenty, but bring none home. The species also occurs in summer in the shoal-water bays east of Point Barrow, and is taken rather sparingly in gill-nets at Pergniak, Elson Bay, where we also caught a few young ones in our seine. Captain Herendeen visited the rivers in October, 1882, and brought in several specimens of this species in good condition, with other whitefish.

14. COREGONUS NELSONI Bean.

We obtained this species of large size from the rivers, where it appears abundant. It was not obtained at Elson Bay.

15. COREGONUS KENICOTTI Milner.

This species appears to be the most abundant at the rivers, and attains a large size. It was not obtained in Elson Bay.

SALMONIDÆ.

16. SALVELINUS MALMA (Walb.) Jordan & Gilbert.

In the autumn of 1882 we obtained from a native a piece of the dried skin of one of these fishes. He said that he took it in the sea, near the mouth of the Colville River, and that they were so plenty that they fed the dogs with them.

Just as we were preparing to abandon the station in August, 1883, the Eskimos brought in a couple of large specimens of this species which had been taken in the gill-nets at Pergniak. They were a very pale, "sea-run" form, with the spots hardly perceptible.

When we were at Unalaska, in September, 1883, Dr. Wilson, of Lieutenant Schwatka's party, and I found this trout plenty in the stream back of the village. They were rather pale and silvery as if in the habit of running to the sea, and took small, dark flies greedily.

They are also plenty and large in the small lakes at Plover Bay, Eastern Siberia.

17. ONCHORHYNCHUS sp.

A large salmon was brought down from Pergniak in July, 1882, but was mutilated and was used for food. The season of 1883 was so backward that we were unable to secure any specimens before abandoning the station.

I suspect this to have been *O. nerka*.

18. ONCHORHYNCHUS GORBUSCHA (Walb.) Gill and Jordan.

This species occurs sparingly in the salt water at Pergniak, Elson Bay, where it is taken in the gill-nets, in July and August.

IV.—INSECTS.

INTRODUCTORY—BY JOHN MURDOCH.

The shortness of the summer season rendered the collecting of insects difficult and unsatisfactory, and the difficulty was increased by the engrossing nature of the other zoölogical and physical work of the station. The season at which insects could be collected was precisely the time when the collecting of birds and their eggs was at its height, and the time of the party was pretty fully occupied.

Nevertheless, a small collection of insects was made and turned over to Prof. C. V. Riley, Curator of Insects, U. S. National Museum, for study. As will be seen by his report, which follows, insects were obtained belonging to the following orders and species:

NEUROPTERA.

Leptocerus sp.
Oligoplectrum morosum?

COLEOPTERA.

Amara obtusa.
Chrysomela montivagans.

DIPTERA.

Scatophaga sp.
Cordylura sp.
Chironomus spp.
Anthomyia spp.
Ctenophora spp.
Œdemagena tarandi.
Urocerus flavicornis.
A Tachinid fly.

LEPIDOPTERA.

Laria rossii.
An Arctian moth.

HYMENOPTERA.

Bombus moderatus.
Bombus sylvicola.

A species of Podurid and a spider were also turned over to Professor Riley.

The following is Professor Riley's report:

REPORT UPON A COLLECTION OF INSECTS MADE AT POINT BARROW, ALASKA.

By C. V. Riley, *Curator of Insects, United States National Museum.*

No. 1, found swarming around the dead bodies at the Eskimo cemetery, June 22, 1882, is a species of Scatophaga and, in all probability, undescribed. It comes nearest to the reddish-haired specimens of *S. stercoraria* Linn., a form common to both Europe and America, but Dr. S. W. Williston, to whom specimens were referred, considers it distinct. The arista is bare, the bristles are fewer, weaker, and shorter, and the cross-veins of the wing are narrowly but strongly clouded. In the twelve specimens examined there is some variation in these respects and in the coloration of the legs. Judging from the known habits of the genus to which the species belongs there can be little question that the larva would be found preying upon dead animal and stercoraceous matter.

No. 2, which is reported rather abundant near the pools all over the tundra, but keeping very quiet except on the occasional calm and warm days, represents three different species of *Chironomus*, most of the specimens too poor to identify. The observations of their habits correspond to the well-known aquatic habits of the genus.

No. 3, taken near the station, June 22, is also a species of *Scatophaga*, showing some points of difference from No. 1, but probably only varietal.

No. 4, found not commonly flying around sunny banks, is one of the Crane-flies (Tipulidæ) belonging to the genus *Ctenophora*. There are two species represented by the number, both apparently new. The larvæ of these flies dwell in meadows, feeding on the roots of grass.

No. 5, which hatched from a cocoon in the house, is a female, imperfectly developed, of *Laria rossii* Curt., one of the Bombycidæ, common in Europe and North America, and originally described under the genus *Dasychira*. It is a rare species.

Nos. 6 and 7, which are described as parasites from cocoons similar to that of No. 5, represent two very different Dipterous insects. No. 6 is a Tachinid the habits of which are well known to be parasitic upon Lepidopterous larvæ. The specimens are too much damaged for proper identification, and, in fact, the whole group needs proper working up, there being already upwards of 200 undetermined species in my own collection and in that of the Department of Agriculture. The species comes nearest to one I have reared from the beautiful Lepidopteron, *Eudryas grata*. No. 7 is, on the contrary, not parasitic, but a species of *Chironomus* and having, without doubt, similar aquatic habits to No. 2.

No. 8 is an *Anthomyia* that from the soiled material cannot well be identified, but is very near to *A. zeæ* Riley, the habits of which will be found recorded in the first Report on the Insects of Missouri, p. 154.

No. 9, taken June 27, is also a Tachinid identical with No. 6.

No. 10, which was found not uncommon in the dryer and sunny spots in the tundra from May till July, is *Amara obtusa* Le Conte; family *Carabidæ*. The species was originally described from Alaska and does not appear to extend further south and east. Among the seven specimens collected, Mr. E. A. Schwarz, to whom I referred them, finds the following variations which are of interest to record though parallel series are known to occur in other arctic Coleoptera. Two specimens have the elytra decidedly more parallel on the sides and consequently the apex more suddenly rounded; the basal punctation of the thorax is well marked in three specimens, while in the remaining four the middle of the base is more or less smooth, the sculpture of the elytral striæ is very strong in some and nearly obsolete in other specimens. The color of antennæ, elytra, and legs varies from red to piceous.

Under No. 11 there are three different insects: (1) the same Anthomyia included under No. 8; (2) a single specimen of a Neuropterous insect belonging to the Perlid genus *Leptocerus* Leach, very much damaged and unfit for study; (3) a single specimen of another species of crane-fly belonging also to the genus *Ctenophora*, but differing from No. 4, and also, according to Dr. Williston, a new species.

No. 12, taken July 11, 1882, near the house, is *Urocerus flavicornis* Fabr. (family Uroceridæ), a rather small specimen. This is an insect rather widely distributed, and its larva, as is the habit of the genus, doubtless either fed in the stem or trunk of some shrub or tree growing at Point Barrow, or may have issued from timber taken to the Point for building purposes.*

No. 13, taken along the dryer edge of the tundra, is again an Anthomyid, small, but allied to No. 8, but under the same number there is a single specimen of another Dipteron belonging to the genus *Cordylura*, and, so far as I have ascertained, undescribed but closely related to *C. gilvipes*. It belongs to the same family with *Scatophaga*, and, without doubt, has similar habits. There is also under this number a single, very much damaged, specimen of a Neuropterous insect belonging to the family Phryganidæ or caddis-flies. So far as the specimen permits an opinion, it comes near *Oligoplectrum morosum* McLachlan.

No. 14 contains two different species of Bumble-bees, the one *Bombus moderatus* Cresson, the other the common boreal form of *B. sylvicola* Kirby.

No. 15, found on the shore of the lagoon, is another specimen of the Tipulid genus *Ctenophora* and without much question the female of one of those of No. 4.

No. 16. I find no insect with this number.

†No. 17. A boreal Arctian (———); also common to Europe and America.

No. 18, caught near the house, is the well-known gad-fly (*Œdemagena tarandi* Linn.) of the reindeer (*Cervus tarandus* var. *arcticus*), which suffer much from the larvæ making their way through the skin.

Of the alcoholic material, No. 649, found in the stomach of a bird (*Centrophanes lapponicus*), belongs to the genus *Chrysomela* (family *Chrysomelidæ*, or leaf-beetles), and appears to be referable to *Ch. montivagans* Le Conte. Of this particular group of *Chrysomela* (*Chrysomela sens. str.*), characterized by the thickened thoracic margin, only a few species are known to occur in North America, in the majority of which the specific characters are very feebly expressed, the number of species thus becoming more or less opinionative. Whether or not the only specimen from Point Barrow is correctly referred to the above species must be left undecided until more complete material from different localities can be compared. Le Conte described *montivagans* from the high alpine region of Central Colorado, and the typical specimens are much larger and more brilliantly colored than that from Point Barrow.

Most of the species are quite interesting, as is generally the case with species collected in such regions, where proper notes are made in connection with them. The misfortune is, however, that most of the material is too poor for proper specific identification or description. It is for this reason that I do not care to accompany this report with descriptions of the new species, though I may send in descriptions of some of them before the report is published if I can find time to make the necessary critical comparisons. It is preferable, however, to leave them for the present undescribed until such time as some specialist shall work up the particular families or groups to which they belong. There is little gain to entomology in describing such fragmentary material, and it should not be done except where absolutely required.

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*The latter is probably the case, as there are no trees or shrubs large enough to maintain the insect growing at Point Barrow.—J. M.

†This insect, though perfect when turned in, was accidentally destroyed in the laboratory at the Agricultural Department.—J. M.

V.—MARINE INVERTEBRATES.

(EXCLUSIVE OF MOLLUSKS.)

By JOHN MURDOCH, A. M., *Sergeant Signal Corps, United States Army.*

The collections and observations upon which the following report is based were made by the writer and Sergeant Middleton Smith, naturalists and observers, assisted by the other members of the party, especially by Lieut. P. H. Ray, commanding, and Capt. E. P. Herendeen, who took especial care of the dredging and seining operations.

Collecting was attended with considerable difficulty on account of the short season during which the sea was free from ice, but it is believed that the collection gives a fair representation of the marine fauna of the region.

It will be seen to be purely Arctic in character, showing many striking points of resemblance to that of Greenland and the Arctic Ocean of the Old World, and offering but little analogy to the fauna of the North Pacific.

A report on the Medusæ observed by the writer, prepared by Dr. J. W. Fewkes, of Cambridge, has been incorporated with the following, which also includes a description of the few fresh-water invertebrates collected.

The Mollusks have been submitted to Mr. W. H. Dall, of the Smithsonian Institution, who presents a separate report on them.

NUMBER OF SPECIES COLLECTED OR OBSERVED.

Pycnogonida	2
Crustacea	44
Vermes	20
Echinodermata	17
Anthozoa	4
Hydrozoa	17
Mollusca	61
Tunicata	6
Brachiopoda	1
Polyzoa	5
Porifera	3
Total	180

CRUSTACEA.

DECAPODA.

BRACHYURA.

1. CHIONOECETES OPILIO (Fabr.) Kr.

Year.	Name.	Citations.
1780	*Cancer phalangium*, O. Fabricius	Fauna Grœnlandica, p. 234 (sp. 214) (not of J. C. Fabricius, 1775).
1788	*Cancer opilio*, O. Fabricius	Det Kongelige Danske Vidensk. Selskabs Skr., nye Samling, iii, p. 181, with plate.
1838, 1849	*Chionoecetes opilio*, Kröyer	Naturhistorisk Tidsskrift, i Række, ii, p. 249 (1838); in Gaimard, Voyages en Scandinavie, en Laponie, au Spitzberg et aux Féroë, Crust. pl. 1.
1856	*Peloplastus pallasii*, Gerstaecker	Carcinologische Beiträge. Archiv für Naturgeschichte, xxii, p. 105, pl. 1, fig. 1.
1857, 1858	*Chionoecetes behringianus*, Stimpson	Proceedings Boston Society of Natural History, vi, p. 84 (1857); Journal Boston Soc. Nat. Hist., vi, p. 448 (8) (1857); Proceedings Academy of Natural Sciences, Philadelphia, 1857, p. 27 (23) (1858) (young).
1867	*Chionoecetes opilio*, Packard	Memoirs Bost. Soc. Nat. Hist., i, p. 302.
1873	*Chionoecetes opilio*, Whiteaves	Report on a second deep-sea dredging expedition to the Gulf of St. Lawrence (in 1872), p. 15.
1875	*Chionocetes phalangium*, Lütken	(Nominal) List of the Crustacea of Greenland, Arctic Manual, p. 146.
1879	*Chionoecetes opilio*, Smith	Transactions Connecticut Academy of Arts and Sciences, v, p. 41.
1882	*Chionoecetes opilio*, Stuxberg	Vega-Expeditionens Vetenskapliga Iakttagelser, i, pp. 714, 715.
1882	*Chionoecetes opilio* (?), Elliott	A Monograph of the Seal Islands of Alaska, p. 137.
1883	*Chionoecetes opilio*, Smith	Proceedings U. S. National Museum, vi, p. 224.

Two small males were captured in the rich haul of the dredge, made ten miles west of Point Franklin, in 13½ fathoms of water, August 31, 1883. Nordenskiöld found this species very abundant in Bering Strait and in the Arctic Ocean north of the strait. According to Elliott (loc. cit.) this crab is very abundant on the island of St. Paul, of the Pribyloff group, though not found on St. George, and is of great value as an article of food.

The species is well known from Greenland, where it was originally described, Labrador, and as far south on the American coast as New England (in deep water), from Siberia, the Arctic Ocean, and Bering Strait.

The specimens obtained agree in proportions with Stimpson's *C. behringianus*, from nearly the same locality. This species, however, according to Smith, was based on young specimens of *C. opilio*, such as ours are.

The specific name *phalangium*, originally applied to this species, was rejected by Otho Fabricius himself, on the ground, as he expressly states, that he found it preoccupied by *Cancer phalangium* J. C. Fabricius (*Stenorhynchus phalangium* M. Edw.). Having been able to consult O. Fabricius's original description of *Cancer opilio*, I find that it was published in 1788, which settles the question of priority over *C. opilio* J. C. Fabricius (1793), and establishes the specific name *opilio* for this species.

2. HYAS LATIFRONS Stimpson.

Year.	Name.	Citations.
1857	*Hyas latifrons*, Stimpson	Proc. Acad. Nat. Sci., Phila., p. 217.
1879	*Hyas latifrons*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 45.

Three large males were picked up on the beach near the station, one dry, in the spring of 1883, and the other two fresh, August 23, 1882. One small male was also dredged in 13½ fathoms, on the rich bottom of small pebbles, sand, and broken shells, ten miles west of Point Franklin, August 31, 1883. This crab was well known to the natives of Point Barrow, who called it by the name "*Kinaura*."

I have carefully examined Dr. Stimpson's types of *Hyas latifrons* in the National Museum, and compared our specimens with them. I find our specimens indistinguishable from Dr. Stimpson's types, and differing from a typical *Hyas coarctatus* from Greenland only in the shape of the rostrum, which is slightly shorter and less acute.

Smith (loc. cit.) pronounces *H. latifrons* a good species, and I have accordingly followed his authority in recording the species.

ANOMOURA.

3. EUPAGURUS TRIGONOCHEIRUS Stimpson.

Year.	Name.	Citations.
1858	*Eupagurus trigonocheirus*, Stimpson	Proc. Acad. Nat. Sci., Phila., 1858, p. 249.

This species was found washed up on the beach near the station in considerable abundance during the months of July and August, after the sea had opened completely. It was also found in the gullet of *Somateria spectabilis* shot near the station. Comparatively few were dredged off Point Franklin in 13½ fathoms, and a few were also dredged at the head of Norton Sound in 5 fathoms on a pebbly bottom.

Our series of specimens have been carefully compared with identified specimens of *E. pubescens* and *E. Kröyeri* from the eastern coast (its nearest allies). The species is very closely related to *E. Kröyeri*, but shows the following well-marked and constant differences in the form and proportions of the chelipeds: Hand of right cheliped in *Kröyeri* twice as long as broad; in *trigonocheirus*, generally less than twice as long as broad, often much less. Outer or right-hand margin of hand in *Kröyeri* slightly concave; in *trigonocheirus* strongly arched, except in very large specimens, almost exactly as in *E. pubescens*. Hand of left cheliped in *trigonocheirus* nearly the same as in *Kröyeri*, but stouter in proportion, and with the outer surface, between the keel and the margin, more concave than in *Kröyeri*.

Stimpson's types of *E. trigonocheirus* appear to have been destroyed in the Chicago fire, and consequently the only means we have left of identifying the species is his Latin description (loc. cit.). Our species differs so much from *E. Kröyeri* that it must be considered at least a well-marked variety.

As, however, it agrees so closely with Stimpson's description quoted above, it seems preferable to regard it as Stimpson's *E. trigonocheirus*, especially as Stimpson described the species *Kröyeri* after he had described *trigonocheirus*.

Stimpson gives as the habitat of this species, "In Oceano Arctico et in freto Beringiano vulgaris; sublittoralis, et ad profund. 10–20 org. inventus."

4. EUPAGURUS SPLENDESCENS (Owen).

Year.	Name.	Citations.
1839	*Pagurus splendescens*, Owen...............	Zoölogy of Beechey's Voyage, p. 81, pl. xxv, fig. 1.

This species is easily recognizable by its long, slender left hand, and the beautiful iridescent colors of the carapace and claws.

One small specimen was dredged in 15 fathoms on a muddy bottom off Point Barrow, August 8, 1883. Two other small ones were obtained off Point Franklin in 13½ fathoms August 31, 1883, and six good-sized individuals, four of them females bearing eggs, were dredged with the other Hermit Crabs at the head of Norton Sound in 5 fathoms, September 12, 1883.

Dr. Leonhard Stejneger also obtained this species at the Commander Islands.

MACROURA.

5. CRANGON VULGARIS J. C. Fabricius ex Linné.

Year.	Name.	Citations.
1839	*Crangon vulgaris*, Owen	Zoölogy of Beechey's Voy., p. 87.
1852	*Crangon vulgaris*, Dana	U. S. Exploring Expedition, Crustacea, p. 536, ii, p. 561.
1857	*Crangon nigricauda*, Stimpson	Proceedings California Acad. Nat. Sci., i, p. 89; Journ. Bost. Soc. Nat. Hist., vi, p. 56.
1863 / 1867	*Crangon vulgaris*, Packard..............	Canadian Naturalist and Geologist, viii, p. 425; Mem. Bost. Soc. Nat. Hist., i, p. 302.
1879 / 1883	*Crangon vulgaris*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 55. Proc. U. S. Nat. Mus., vi, p. 225.

A single specimen was dredged in 5 fathoms at the head of Norton Sound, September 12, 1883.

6. CHERAPHILUS BOREAS (Phipps) Kinahan.

Year.	Name.	Citations.
1774	*Cancer boreas*, Phipps	Voyage towards the North Pole, p. 235.
1780	*Cancer homaroides*, Fabricius	Fauna Grœnlandica, sp. 218; Mohr, Islands Naturhist., n. 245, t. 5.
1806	*Crangon boreas*, Müller	Zoölogia Danica, fas. iv, p. 14, pl. 132, fig. 1.
1824	*Crangon boreas*, Sabine	Supplement to the Appendix to Parry's Voyage, p. 235.
1835	*Crangon boreas*, Ross	Second Voyage, ii, p. lxxxi.
1839	*Crangon boreas*, Owen	Zoölogy, Beechey's Voyage, p. 87.
1842-1843	*Crangon boreas*, Kröyer	Nat. Tids., i R., iv, p. 218, pl. iv, f. 1-11.
1851	*Crangon boreas*, Brandt	Sibirische Reise, Zoölogy, p. 114 (teste Stimpson).
1852	*Crangon boreas*, Adams	In Sutherland's Journal of a Voyage in Baffin's Bay and Barrow's Straits, ii; App., p. ccv.
1855	*Crangon boreas*, Bell	In Belcher's "Last of the Arctic Voyages," ii, p. 402.
1860	*Crangon boreas*, Stimpson	Proc. Acad. Nat. Sci., Phila., xii, p. 25.
1864	*Cheraphilus boreas*, Kinahan	Proceedings Royal Irish Acad., viii, p. 68.
1874	*Crangon boreas*, Buchholz	Zweite Deutsche Nordpolarfahrt, ii, p. 271.
1875	*Crangon boreas*, Lütken	(Nominal list) Arctic Manual, p. 146.
1877	*Cheraphilus boreas*, Miers	Annals and Magazine of Natural History, ser. 4, xix, p. 133.
1877	*Cheraphilus boreas*, Miers	Annals and Magazine of Natural History, xx, p. 60.
1878	*Crangon boreas*, Heller	Denkschriften der kaiserliche Akadem. der Wissenschaften, Wien, xxxv, p. 26.
1879	*Crangon boreas*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 56.
1881	*Crangon (Cheraphilus) boreas*, Miers	Annals and Magazine of Natural History, ser. 5, vii, p. 46.
1882	*Crangon boreas*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 695, 713.
1883	*Ceraphilus boreas*, Smith	Proc. U. S. Nat. Mus., vi, pp. 219, 224.

One good-sized specimen was picked up on the beach near the station. The species was dredged in considerable numbers, both large and small, in 13½ fathoms, off Point Franklin, and a few large ones were the only crustacea taken off Port Clarence. It is well known from Arctic and northern seas generally.

7. NECTOCRANGON LAR (Owen) Brandt.

Year.	Name.	Citations.
1839	*Crangon lar*, Owen	Zoölogy of Beechey's Voyage, p. 88, pl. xxxviii, fig. 1.
1842	*Argis lar*, Kröyer	Nat. Tids., i R., iv, p. 255, figs. 45-62.
1851	*Nectocrangon lar*, Brandt	Sibirische Reise, Zoöl., 115 (teste Stimpson).
1860	*Nectocrangon lar*, Stimpson	Proc. Acad. Nat. Sci., Phila., xii, p. 25.
1867	*Argis lar*, Packard	Mem. Bost. Soc. Nat. Hist., 1, p. 302.
1874	*Nectocrangon lar*, Whiteaves	On recent deep-sea dredging in the Gulf of St. Lawrence, from Amer. Journ. of Science and Arts, vii, p. 215 (5).
1875	*Argis lar*, Lütken	(Nominal list) Arctic Manual, p. 146.
1879	*Nectocrangon lar*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 61.
1882	*Argis lar*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, p. 713.
1883	*Nectocrangon lar*, Smith	Proc. U. S. Nat. Mus., vi, pp. 219, 225.

One single specimen was picked up on the beach near the station. This species has been quoted from Greenland, along the eastern coast of America as far as Cape Sable, Nova Scotia; also, from the Arctic Ocean, north of Bering Strait, and in Bering Sea.

8. HIPPOLYTE FABRICII Kr.

Year.	Name.	Citations.
1841	*Hippolyte fabricii*, Kröyer	Nat. Tids., i R., iii, p. 571; Det Kongelige Danske Videnskabernes Selskabs Afhandlingar, ix, p. 277, tab. I, figs. 12-20.
1860	*Hippolyte fabricii*, Stimpson	Proc. Acad. Nat. Sci, Phila., xii, p. 35.
1863 1867	*Hippolyte fabricii*, Packard	Can. Nat. and Geol., viii, p. 421 (24). Mem. Bost. Soc. Nat. Hist., i, p. 302.
1871	*Hippolyte fabricii*, Stimpson	Annals Lyc. of Nat. Hist. of New York, x, p. 126.
1875	*Hippolyte fabricii*, Lütken	(Nominal list) Arctic Manual, p. 147.
1879 1879 1883	*Hippolyte fabricii*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 63. Bulletin U. S. Nat. Mus., No. 15, p. 139. Proc. U. S. Nat. Mus., vi, p. 225.

A single individual of this species was dredged among the other *Hippolytes* off Point Franklin, August 31, 1883. It has been found on the Atlantic coast of America from Massachusetts Bay to Greenland, and also in Avatscha Bay, Kamschatka.

9. HIPPOLYTE GAIMARDII M. Edw.

Year.	Name.	Citations.
1837	*Hippolyte gaimardii*, Milne Edwards	Histoire Naturelle des Crustacées, ii, p. 378.
1841	*Hippolyte gaimardii et gibba*, Kröyer	Nat. Tids., i R., iii, p. 572.
1842	*Hippolyte gaimardii*, Kröyer	Kong. Dan. Vidensk. Selsk. Afhand., ix, p. 282, pl. 1, figs. 21–29.
1842	*Hippolyte gibba*, Kröyer	Op. cit., p. 288, pl. i, fig. 30; pl. ii, figs. 31–37.
1853	*Hippolyte panduliformis*, Bell	British Stalkeyed Crustacea, p. 294.
1855	*Hippolyte Belcheri*, Bell	In Belcher's "Last of the Arctic Voyages," ii, p. 402, pl. 34, fig. 1.
1860	*Hippolyte gibba*, Stimpson	Proc. Acad. Nat. Sci., Phila., xii, p. 35.
1863	*Hippolyte gaimardii*, Goës	Öfversigt Vetenskaps-Akademiens Förhandlingar, xx, p. 168.
1863	*Hippolyte gaimardii*, Packard	Canad. Nat. and Geol., viii, p. 424.
1867	*Hippolyte gaimardii*, Packard	Mem. Bost. Soc. Nat. Hist., i, p. 302.
1871	*Hippolyte gaimardii*, Stimpson	Annals Lyc. Nat. Hist. of New York, x, p. 126.
1875	*Hippolyte gaimardii*, Lütken	(Nominal list) Arctic Manual, p. 147.
1877	*Hippolyte gaimardii*, Miers	Annals and Magazine of Natural History, ser. 4, xix, p. 134.
1879	*Hippolyte gaimardii*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 67, pl. x, figs. 8 and 9.
1882	*Hippolyte gaimardii*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 698 *et seq.* (passim.)
1883	*Hippolyte gaimardii*, Smith	Proc. U. S. Nat. Mus., vi, pp. 219 and 225.

One specimen was picked up on the beach near the station in the autumn of 1882.

We found this species very plentiful off Point Franklin in 13½ fathoms of water, August 31, 1883. Of ninety-one individuals taken in a single haul of the dredge, one only was a female bearing eggs.

The species is known from Grinnell Land south to Massachusetts, from Spitzbergen, Norway, the southern Baltic, and Scotland; also from Bering Strait and the Arctic Ocean north of the strait.

10. HIPPOLYTE SPINUS White.

Year.	Name.	Citations.
1805	*Cancer spinus*, Sowerby	British Miscellany, p. 47, pl. 23.
1813, 1814	*Alpheus spinus*, Leach	Edinburgh Encyclopædia, vii, p. 431; Amer. ed., vii, p. 271; Trans. Linnæan Soc. of London, xi, p. 347.
1817	*Hippolyte Sowerbæi*, Leach	Malacostraca Podolphthalmata Brittanniæ, pl. 39.
1835	*Alpheus spinus*, Owen	App. Ross' Voyage, p. 83, t. B, fig. 2.
1841, 1842	*Hippolyte Sowerbæi*, Kröyer	Nat. Tids., i R., iii, p. 573 (1841); Kong. Dan. Vidensk. Selsk. Afhand., xx, p. 298 (1842).
1847	*Hippolyte spinus*, White	List of Crustacea in the British Museum, p. 76.
1853	*Hippolyte spinus*, Bell	British Stalkeyed Crustacea, p. 284.
1860	*Hippolyte spina*, Stimpson	Proc. Acad. Nat. Sci. Phil., xii, p. 34.
1863	*Hippolyte Sowerbæi*, Goës	Öfvers. Vetensk. Akad. Förhand., xx, p. 169.
1871	*Hippolyte spina*, Stimpson	Annals Lyc. of Nat. Hist. of New York, x, p. 126.
1874	*Hippolyte spina*, Whiteaves	Recent deep-sea dredging operations in the Gulf of St. Lawrence, p. 5—from Am. Journ. Sci. and Arts, vii.
1875	*Hippolyte spinus*, Lütken	(Nominal list) Arctic Manual, p. 147.
1879	*Hippolyte spinus*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 68.
1883	*Hippolyte spinus*, Smith	Proc. U. S. Nat. Mus., vi, pp. 219, 225.

Two small specimens which have the spine of the third pleonal segment less strongly developed than it is in the typical specimens of *H. spinus* in the National Museum, were dredged among the other *Hippolytes* off Point Franklin in 13½ fathoms, August 31, 1883.

It is known from the Atlantic coast of North America from Massachusetts to Greenland; from Spitzbergen, Norway, and Scotland, and Stimpson found it in Bering Strait.

11. HIPPOLYTE PHIPPSII Kr.

Year.	Name.	Citations.
1841	*Hippolyte phippsii*, Kröyer	Nat. Tids., i R., iii, p. 575 (♂).
1841	*Hippolyte turgida*, Kröyer	Nat. Tids., i R., iii, p. 575 (♀).
1842	*Hippolyte turgida*, Kröyer	Kong. Dan. Vidensk. Selsk. Afh., ix, p. 308, pl. ii, figs. 57–58, and pl. iii, 59–63.
1842	*Hippolyte phippsii*, Kröyer	Op. cit., p. 314, pl. iii, figs. 64–68.
1860	*Hippolyte turgida*, Stimpson	Proc. Acad. Nat. Sci. Phila., xii, p. 34.
1863	*Hippolyte phippsii*, Goës	Öfv. Vetensk. Akad. Förhand., xx, p. 169.
1867	*Hippolyte phippsii et turgida*, Packard	Mem. Bost. Soc. Nat. Hist., i, p. 301.
1871	*Hippolyte vibrans*, Stimpson	Ann. Lyc. Nat. Hist. New York, x, p. 125 (♂ var.).
1874	*Hippolyte phippsii*, Whiteaves	Recent deep-sea dredging operations in the Gulf of St. Lawrence, from Am. Journ. of Sci. and Arts, vii, March, 1874, p. 5.
1877	*Hippolyte phippsii*, Miers	Ann. and Mag. Nat. Hist., ser. 4, xx, p. 62 (12).
1879	*Hippolyte phippsii*, Smith	Trans. Conn. Acad. Arts and Sci., v, p. 73.
1883	*Hippolyte phippsii*, Smith	Proc. U. S. Nat. Mus., vi, pp. 220, 225.

Dredged in considerable numbers off Point Franklin in 13½ fathoms, August 31, 1883. Out of nineteen specimens taken at one haul of the dredge, four were females carrying eggs.

This is a circumpolar species, extending as far south as Massachusetts.

12. PANDALUS DAPIFER Murdoch.

(Plate —, figs.—.)

1884, *Pandalus dapifer*, Murdoch. Proc. U. S. Nat. Mus. vii, p. 519.

DESCRIPTION.—Length of carapace (including rostrum) contained about 2⅓ times in total length. Rostral carina beginning about the middle of the carapace, and armed with two or three teeth. Rostrum exceedingly long, nearly 1½ times the length of the carapace, slender and tapering, slightly curved up, with 5 to 7 teeth on the upper edge, running only about one-third of the length of the rostrum, leaving the rest unarmed to the tip. Lower edge with 4 or 5 teeth, the anterior tooth a short distance from the tip. Eyes large, pyriform, and black. Peduncle of antennule reaches about to middle of antennal scale, and its distal segment is about one-third the length of the preceding. Internal flagellum of antennule slender, reaching nearly to end of rostrum; external about two-thirds as long as internal, much thickened nearly to the tip, where it suddenly becomes slender. Antennal scale a little more than half as long as the rostrum. External maxillipeds long and slender, reaching nearly to the tip of the antennal scale, or about to the middle of the rostrum. First pair of legs very slender, reaching to the tips of the outer maxillipeds. Second (chelate) legs unequal: left very long and slender, reaching to the tip of the rostrum, carpus multiarticulate, with about 25 joints, of which the distal twenty or so are separated by distinct articulations; right leg much shorter, reaching only to the tip of antennal scale, with a carpus of about 7 joints only; distal joint of carpus in each leg equal in length to preceding two, the rest about as long as broad. Right chela a little the larger, both alike otherwise, hardly stouter than the carpus; digits equal, slightly gaping, and a little shorter than the basal portion. Third, fourth, and fifth pairs of legs long and slender, reaching nearly to the tip of the antennal scale. Abdomen rounded above, except the third segment, which is compressed and keeled. This keel is produced into a blunt backward-pointing hook in the male. Sixth segment once and a half as long as the fifth, and equal in length to the telson. Telson rounded at the tip, and armed with three pairs of spines. Dredged in abundance off Point Franklin, in 13½ fathoms, August 31, 1883. Museum No., 7881.

SCHIZOPODA.

13. MYSIS RAYII Murdoch.

(Plate —, figs. —).

1884, *Mysis rayii*, Murdoch. Proc. U. S. Nat. Mus. vii, p. 519.

This was dredged in rather large numbers, not far from the shore, about half a mile above the station, in about 5 fathoms of water, on a bottom of mud and sand mixed, August 13, 1882. Some of the females were still carrying eggs in the brood-pouches. This species belongs to the same division of the genus as *M. vulgaris*, having the telson entire and the antennal scale fringed on both sides with setæ. It may at once be distinguished from *M. vulgaris* by the shape of the rostrum, which is quadrangular, with rounded corners.

DESCRIPTION.—Rather slender, with the cephalothorax a little narrower in front than the rest of the body. Carapace of medium length, exposing only the dorsal portion of the last thoracic segment. Rostrum lamellar, quadrangular, with the antero-lateral angles rounded, about as broad as long, reaching half the length of the ocular peduncles. Eyes not large, hemispherical; peduncles clavate, stout. Peduncle of antennule about one-third the length of the carapace, bearing two flagella, about equal to the carapace in length. Antennal scale sharply lanceolate, about as long as the carapace, bearing setæ on both edges, and armed at the tip with a sharp spine. Antennæ about as long as the body. Legs medium, with tarsi of eight or nine joints. Telson about half the length of the cephalothorax, lanceolate, channeled deeply above for its whole length, with apex truncated, entire, and fringed with short stout setæ. Uropods long, with the inner lamina as long as the telson, and the outer more than twice as long.

Transparent, with a few arborescent black pigment spots. Length between 60 and 65^{mm}.

The species is respectfully dedicated to the commanding officer of the expedition, Lieut. P. H. Ray, Eighth Infantry, U. S. A., who was superintending the dredging at the time it was taken. Museum Nos., 7880 and 7892.

CUMACEA.

14. DIASTYLIS RATHKII var.

Two individuals of a large species of *Diastylis* were obtained, one on the beach near the station and one in the rich haul of the dredge off Point Franklin. Both specimens were more or less battered, but as far as can be made out agree very closely with the published descriptions and National Museum specimens of *D. rathkii*, except in having the dorsal keel smooth anteriorly instead of serrated.

I have ventured to record these as possibly a variety of *D. rathkii*, which, as is well known, is circumpolar in its distribution, but dare not hazard any further conclusions on account of insufficiency of material.

15. DIASTYLIS sp.

16. DIASTYLIS sp.

Two other small species of *Diastylis* were also obtained by the expedition, one close to the station, in 2½ fathoms of water, and the other off Point Franklin.

I have been unable to identify them with any of the means within my reach, and am inclined to believe that they are undescribed. In view, however, of the difficulty of the group and the insufficiency of the literature at my command, I have concluded to record them simply as above.

ISOPODA.

17. ARCTURUS HYSTRIX G. O. Sars.

Year.	Name.	Citations.
1876	*Arcturus hystrix*, G. O. Sars	Archiv for Mathematik og Naturvidenskab, ii, p. 350 (250).

Three small individuals were dredged on the rich bottom off Point Franklin, in 13½ fathoms.

I am indebted to Mr. Oscar Harger, of New Haven, Conn., for the identification of this species.

18. CHIRIDOTEA ENTOMON (Lin.), Harger.

Year.	Name.	Citations.
1774	*Oniscus entomon*, Pallas	Spicilegia Zoölogica, fasc. 9, t. 14, pp. 64-66.
	Omiscus entomon, Tilesius	Mém. de l'Acad. de St. Pétersbourg, v, 93.
1774	*Idothea entomon*, Owen	Zoölogy of the Blossom, p. 91.
1839	*Idothea entomon*, Stuxberg	Vega-Exped., Vetensk, Iakt. i, pp. 695 et seq. (passim), fig. on p.
1882		719.

Only three specimens were obtained, and these were washed up on the beach. Stuxberg (loc. cit.) gives the distribution as confined to the northern coast of the Old World, from the Varanger Fjord in the west to Bering Strait in the east, thence extending down into Bering Sea to Kamtschatka and the Sea of Okhotsk; also in the Baltic, the lakes of Sweden and Russia, the Caspian Sea, the Sea of Aral, and Lake Baikal.

There are, however, many specimens in the National Museum (No. 2430) sent by Macfarlane, from the Anderson River region, thus extending the range much farther to the east. It was also collected by Nelson at Saint Michael's, Alaska.

19. CHIRIDOTEA SABINEI (Kr.) Harger.

Year.	Name.	Citations.
1824	*Idothea entomon*, Sabine	Suppl. App. Parry's Voy., p. 227.
1847	*Idothea sabinei*, Kröyer	Naturhistorisk Tidsskrift, ii R., ii, p. 395; Voyage, tab. 27, fig. 1.
1852	? *Saduria entomon*, Adams	In Sutherland's Journal of a Voyage in Baffin's Bay and Barrow Strait, ii, app., p. ccvii.
1855	*Idothea entomon*, Bell	Belcher's Last of the Arctic Voyages, p. 408.
1875	*Idothea entomon*, Lütken	(Nominal list.) Arctic Manual, p. 149.
1878	*Idothea sabini*, Heller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 22.
1882	*Idothea sabini*, Stuxberg	Vega-Exp. Vetensk. Iakt., p. 697 et seq. (passim), fig. on p. 716.

This species was rather abundant and of large size on the muddy bottom along the shore in 2½ to 15 fathoms. Only a few females were obtained. It was very often found washed up on the beach during the season of open water, and occurred in especially large numbers after the great gales of October, 1881.

It is circumpolar in its distribution.

20. SYNIDOTEA BICUSPIDA (Owen) Harger.

Year.	Name.	Citations.
1839	*Idothea bicuspida*, Owen	Zoölogy of the Blossom, p. 92, pl. xxvii, fig. 6.
1867	*Idothea marmorata*, Packard	Mem. Boston Soc. Nat. Hist., i, p. 296, pl. viii, fig. 6.
1874	*Idothea marmorata*, Whiteaves	Further Deep-Sea Dredging in the Gulf of Saint Lawrence, p. 15.
1877	*Idothea bicuspida*, Streets and Kingsley	Proc. Essex Institute, ix, p. 108.
1877	*Idothea pulchra*, Lockington	Proc. Cal. Acad. Sci., vii, p. 45.
1879	*Synidotea bicuspida*, Harger	Proc. U. S. Nat. Mus., ii. p. 160.
1880	*Synidotea bicuspida*, Harger	Report U. S. Fish Commission for 1878, p. 352.
1882	*Idothea bicuspida*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 695 et seq. (passim).
1883	*Synidotea bicuspida*, Smith	Proc. U. S. Nat. Mus., vi, p. 231.

This species occurred in very great abundance on the rich bottom 10 miles west of Point Franklin, in 13½ fathoms, and was rather plenty also at the head of Norton Sound, on a pebbly bottom, in about 5 fathoms.

The color when alive is a whitey-brown, clouded with bright crimson, generally forming crimson patches on the terga of the segments and on the edges of the epimera, which sometimes coalesce, forming bars across the head, the middle, and the end of the thorax. The peduncles of the antennæ and the middle third of the flagella are bright crimson.

The species was originally described by Owen (loc. cit.) from the "Arctic seas." Packard secured one specimen at Sloop Harbor, Labrador, and it has also been recorded from the Gulf of Saint Lawrence. Two specimens (Lockington's *Idothea pulchra*) were brought by W. J. Fisher from the "west coast of Alaska, north of Bering Strait," and two specimens have been obtained on the Grand Bank of Newfoundland. The Swedish expeditions obtained this species at various points along the northern coast of Siberia from Nova Zembla nearly to Bering Strait.

AMPHIPODA.

21. HYPERIA MEDUSARUM (Müll.) Bœck.

Year.	Name.	Citations.
1776	*Cancer medusarum*, O. F. Müller	Zoölogiæ Danicæ Prodromus, No. 2355, p. 198.
——	*Gammarus medusarum*, J. C. Fabricius	Reise nach Norwegen, p. 326.
1815	*Cancer (Gammarus) galba*, Montague	Linnæan Transactions, xi, p. 4, pl. 2, fig. 2.
——	*Hiella orbignii*, Strauss	Mém. du Muséum, t. xviii, pl. 4.
1830	*Hyperia latreillii*, M. Edwards	Annales des Sciences Naturelles, xx, p. 388, pl. xi, figs. 1-7.
1838	*Hyperia oblivia*, Kröyer	Grönlands Amphip. D. Vidensk. Selsk. Afhandl., vii, p. 298, pl. iv, fig. 19 (♀).
1838	*Lestrigonius exulans*, Kröyer	Op. cit., p. 296, pl. iv, fig. 13.
1862	*Lestrigonius Kinahani*, Spence Bate	Catalogue of Amphipodous Crustacea in the British Museum, p. 289, pl. xlviii, fig. 4.
1865	*Hyperia exulans* Goës	Crustacea amphipoda Maris Spetsbergiam alluentis, &c., Oefv. af K. Vetensk-Akad. Förhandl., xxii, p. 534.
1875	*Hyperia medusarum*, Lütken	(Nominal list.) Arctic Manual, p. 158.
1883	*Hyperia medusarum*, Smith	Proc. U. S. Nat. Mus., vii, pp. 221, 226.

Several were found under the disk of large medusæ (*Chrysaora*) in the summer of 1883. It has been recorded from Greenland, Spitzbergen, Norway, and Great Britain.

22. THEMISTO LIBELLULA (Mandt) Goës.

Year.	Name.	Citations.
1822	*Gammarus libellula*, Mandt	Observationes in historia naturale in itinere grœnlandico factæ, Diss., p. 32.
1835	*Themisto gaudichaudii*	Appendix to Ross' Voyage, p. lxxxvi.
1838	*Themisto arctica*, Kröyer	Grönl. Amphip. D. Vid. Selsk. Afhandl., vii, p. 291, pl. 4, fig. 16.
1838	*Themisto crassicornis*, Kröyer	Op. cit., p. 295, pl. iv, fig. 17.
1863	*Themisto arctica*, Stimpson	Proc. Phila. Acad. of Nat. Sci., p. 139.
1865	*Themisto libellula*, Goës	Oefv. af K. Vetensk-Akad. Förhandl., xxii, p. 533, pl. 44, fig. 33.
1870	*Themisto libellula*, Bœck	Crustacea Amphipoda borealia et arctica, p. 8; Skand. og Arkt. Amphip., p. 88, pl. 1, fig. 5.
1874	*Themisto libellula*, Buchholz	2te Deutsche Nordpolarf., ii, p. 385, pl. 15, fig. 1.
1875	*Themisto libellula*, Lütken	(Nominal list.) Arctic Manual, p. 158.
1877	*Themisto libellula*, Miers	Ann. and Mag. Nat. Hist., ser. 4, xix, p. 138.
1878	*Themisto libellula*, Heller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 29.
1881	*Themisto libellula*, Miers	Ann. and Mag. Nat. Hist., ser. 5, vii, p. 51.

A single individual was picked up on the beach near the station September 12, 1883.

The species has been found in Greenland, Spitzbergen, Finmark, Kennedy Harbor (Arctic America), and north of Nova Zembla during the voyage of the Tegethoff.

23. EURYTENES GRYLLUS (Mandt) Goës.

Year.	Name.	Citations.
1822	*Gammarus gryllus*, Mandt	Observ., &c., p. 34.
1848	*Lysianassa magellanica*, H. Milne-Edwards.	Ann. des Sci. Nat. Ser. 3, ix, p. 398.
1862	*Lysianassa magellanica*, Sp. Bate	Cat. Amph. Crust., p. 66, pl. x, fig. 5.
1865	*Eurytenes magellanicus*, Lilljeborg	Acta Upsal., ser. 3, p. 11, pls. 1–3, figs. 1–22.
1865	*Eurytenes gryllus*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl., xxii, p. 517, pl. 36, fig. 1.
1870	*Eurytenes gryllus*, Bœck	Crust. Amphip., p. 25; Skand. og Arkt. Amphip., p. 144.
1875	*Lysianassa gryllus*, Lütken	(Nominal list.) Arctic Manual, p. 151.

This species occurred washed up on the beach near the station in considerable numbers in the early part of September, 1882.

Two were dredged just outside the grounded ice in 15 fathoms, August 8, 1883. A few large specimens were also obtained off Point Franklin in 13½ fathoms.

It has been observed in Greenland, Spitzbergen, and Finmark.

24. ONISIMUS LITORALIS (Kr.) Bœck.

Year.	Name.	Citations.
1845	*Anonyx litoralis*, Kröyer	Nat. Tids., 2 R., i, p. 621.
1846	*Anonyx litoralis*, Kröyer	Nat. Tids., 2 R., ii, p. 36; Voyage, pl. 13, fig. 1.
1859–1860	*Anonyx litoralis*, Bruzelius	K. Svensk. Vetensk.-Akad. Handl., new series, iii, p. 46.
1862	*Alibrotus litoralis*, Sp. Bate	Cat. Amph. Crust., p. 86.
1865	*Lysianassa litoralis*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl., xxii, p. 521.
1870	*Onisimus litoralis*, Bœck	Crust. Amphip., p. 32.
1874	*Anonyx littoralis*, Buchholz	2te Deutsche Nordpolarf., ii, p. 302.
1875	*Onisimus littoralis*, Lütken	(Nominal list.) Arctic Manual, p. 152.
1878	*Onisimus litoralis*, Heller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 31, pl. ii, figs. 9–16.
1881	*Onesimus litoralis*, Miers	Ann. and Mag. Nat. Hist., ser. 5, vii, p. 51.
1882	*Oncsimus litoralis*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, p. 711.

This was always rather abundant in the shoal water along the beach. The specimens preserved in the collection floated up in the tide hole with a small dead fish on which they were feeding, March 30, 1883.

This species has been recorded from Greenland, Spitzbergen, Finmark, and the neighborhood of Franz Josef Land. "Rather plenty on the surface of the sea at the edge of the ice, as well as between the pack-ice" (Heller, loc. cit. tr.). The Vega Expedition obtained it on the northeast coast of Siberia, in longitude 177° 28′ E.

25. STEGOCEPHALUS AMPULLA (Phipps) Goës.

(*Nec auct.* = S. inflatus Kr.)

Year.	Name.	Citations.
1774	*Cancer ampulla*, Phipps	A Voyage, &c., App., p. 191, pl. xii, fig. 3.
1840	*Lysianassa* (?) *ampulla*, Milne-Edwards	Histoire Naturelle des Crustacées, iii, p. 22.
1865	*Stegocephalus ampulla*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl., xxii, p. 521, pl. xxxviii, fig. 9.
1870	*Stegocephalus ampulla*, (?) Bœck	(Part.) Forhandl. Vidensk. Selsk., p. 128. (Crust. Amphip.)
1877	*Stegocephalus ampulla*, Miers	Ann. and Mag. Nat. Hist., ser. 4, xix, p. 134.
1882	*Stegocephalus kessleri*, n. s., Stuxberg	Vega-Exp. Vetensk. Iakt., p. 713.

In the synonymy above given I have only quoted such descriptions as can be undoubtedly referred to this species by good figures or otherwise, as two species have been confused under this name. Phipps first obtained it in the neighborhood of Spitzbergen and gave an excellent figure and description.

This form does not appear to have been observed again till the Rev. E. A. Eaton brought it from Spitzbergen, in the summer of 1873, except by Goës, who collected both species at Spitzbergen, but considered the difference as perhaps sexual.

In 1842 and 1844 Kröyer (Nat. Tids., 1 R., iv, p. 150, and 2 R., i, p. 522, pl. 7, fig. 3) established the genus *Stegocephalus* for an amphipod brought from Greenland, which he called *S. inflatus*. Most subsequent writers have considered this a synonym of *Cancer ampulla* Phipps, and Bell (in Belcher's "Last of the Arctic Voyages," ii, p. 406), under the name of *S. ampulla*, gives an excellent figure of *S. inflatus*, criticising Phipps's really very accurate figure as a bad one.

Miers (loc. cit.), having obtained the two species from Mr. Eaton, was the first to recognize the difference and to point out the fact that Kröyer's species was distinct from the one described by Phipps. *Stegocephalus ampulla* was obtained at many places on the Arctic shore of Siberia by the Vega Expedition, and Stuxberg, overlooking Miers's paper, considered it a new species which he proposed to call *S. kessleri* though he gave no description but only an excellent figure.

It is quite unlikely that the difference is a sexual one, as suggested by Goës (loc. cit.), because Phipps figures both male and female of *S. ampulla*, and there are besides well marked differences in color between the two species. Moreover, *S. ampulla* has never been obtained in Greenland, or on the eastern coast of North America, where *S. inflatus* is of comparatively frequent occurrence.

26. EUSIRUS CUSPIDATUS Kr.

Year.	Name.	Citations.
1845	*Eusirus cuspidatus*, Kröyer	Nat. Tids. ii R., i, p. 501, pl. 7, fig. 1; Voyage, &c., pl. 19, fig. 2.
1859-1860	*Eusirus cuspidatus*, Bruzelius	K. Svensk. Vetensk.-Akad. Handlingar, New Series, iii, p. 63.
1865	*Eusirus cuspidatus*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl. xxii, p. 529.
1870	*Eusirus cuspidatus*, Bœck	Crust. Amphip., p. 76.
1875	*Eusirus cuspidatus*, Buchholz	2te Deutsche Nordpolarf., ii, p. 313, pl. 3, fig. 2.
1875	*Eusirus cuspidatus*, Lütken	(Nominal list.) Arctic Manual, p. 156.
1877	*Eusirus cuspidatus*, Miers	Ann. and Mag. Nat. Hist., ser. 4, xix, p. 137.
1881	*Eusirus cuspidatus*, Miers	Ann. and Mag. Nat. Hist., ser. 5, vii, p. 49.

A single specimen was picked up on the beach near the station, September 12, 1882. It has been observed in Greenland, Spitzbergen, Finmark, and Franz Josef Land.

27. RHACHOTROPIS ACULEATA (Lepech.) Smith.

Year.	Name.	Citations.
1778	*Oniscus aculeatus*, Lepechin	Acta Petropolitana, 1778, i, p. 247, pl. 8, fig. 1.
1824	*Talitrus Edwardsii*, Sabine	Suppl. App. Parry's Voy., p. 233, pl. 2, figs. 1–4.
1835	*Amphithoe Edwardsii*, Owen	App. Ross' Voyage, ii, p. xc.
1846	*Amphithoe Edwardsii*, Kröyer	Nat. Tids., ii R., ii, p. 76; Voy. pl. 10, fig. 1.
1852	*Amphithoe Edwardsii*, Adams	In Sutherland's "Journal of a Voyage, &c.," ii, app. p. ccvi.
1862	*Amphithonotus Edwardsii*, Sp. Bate	Cat. Amph. Crust., p. 151, pl. xxviii, fig. 5.
1865	*Amphithonotus aculeatus*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl. xxii, p. 526.
1870	*Tritropis aculeata*, Bœck	Crust. Amph., p. 78.
1874	*Amphithonotus aculeatus*, Buchholz	2te Deutsche Nordpolarf., ii, p. 316, pl. iv.
1875	*Tritropis aculeata*, Lütken	(Nominal list.) Arctic Manual, p. 154.
1877	*Tritropis aculeata*, Miers	Ann. and Mag. Nat. Hist., ser. 4, xix, p. 137.
1878	*Tritropis aculeata*, Heller	Denkschr. d. K. Akad. d. Wiss. xxxv, p. 32.
1881	*Tritropis aculeata*, Miers	Ann. and Mag. Nat. Hist., ser. 5, vii, p. 49.
1882	*Tritropis aculeata*, Stuxberg	Vega-Exp. Vetensk. Iakt., pp. 704, 713, 779.
1883	*Rhachotropis aculeata*, Smith	Proc. U. S. Nat. Mus., vi, pp. 222, 229.

Two individuals were dredged off Point Franklin in 13½ fathoms.

The species has been recorded from Labrador, Greenland, the Parry Archipelago, Spitzbergen, Franz Josef Land, and the Kara Sea.

28. ACANTHOSTEPHEIA MALMGRENI (Goës) Bœck.

Year.	Name.	Citations.
1865	*Amphithonotus malmgreni*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl., xxii, p. 526, pl. xxxix, fig. 17.
1870	*Acanthostepheia malmgreni*, Bœck	Crust. Amphip., p. 83.
1874	*Acanthostepheia malmgreni*, Whiteaves	"On Recent Deep-Sea Dredging Operations in the Gulf of St. Lawrence," p. 4, from Am. Journ. of Sci. and Arts, vii.
1878	*Acanthostepheia malmgreni*, Heller	Denkschr. d. K. Akad. d. Wiss. xxxv, p. 32.
1882	*Acanthostephia malmgreni*, Stuxberg	Vega-Exp. Vetensk. Iakt., pp. 698 et seq. (passim). Fig. on p. 724.

Four or five specimens were dredged on the muddy bottom close to the station in about 2½ fathoms.

The species has been found in Spitzbergen, north of Nova Zembla, towards Franz Josef Land, and at several localities during the voyage of the Vega.

Stuxberg (loc. cit.) gives the range of this species as confined to the Old World from Franz Josef Land, Nova Zembla, and Spitzbergen, along the Siberian coast east to Bering Strait. Whiteaves records it from the Gulf of Saint Lawrence.

29. PARAMPHITHOE PANOPLA (Kr.) Bruz.

Year.	Name.	Citations.
1838	*Amphithoe panopla*, Kröyer	Kong. Danske Vidensk. Selsk. Afhand., vii, p 270, pl. ii, fig. 9; Voyage. pl. ii, fig. 2.
1853	*Amphithonotus cataphractus*, Stimpson	Marine Invertebrata of Grand Manan, p. 52.
1859	*Paramphithoe panopla*, Bruzelius	Skand. Amphip., Vetensk.-Akad. Handl., n. s. iii, p. 69.
1862	*Pleustes tuberculatus*, Sp. Bate	Cat. Amph. Crust., p. 62, pl. ix, fig. 8.
1862	*Pleustes panoplus*, Sp. Bate	Cat. Amph. Crust., p. 63, pl. ix, fig. 9.
1865	*Paramphithoe panopla*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl., xxii, p. 523.
1867	*Amphithonotus cataphractus*, Packard	Mem. Boston Soc. Nat. Hist., i, p. 298.
1867	*Paramphithoe panopla*, Packard	Op. cit., p. 297.
1870	*Paramphithoe panopla*, Bœck	Crust. Amph., p. 96.
1874	*Pleustes panoplus*, Buchholz	2te Deutsche Nordpolarf., ii, p. 334, pl. vi.
1875	*Paramphithoe panopla*, Lütken	(Nominal list.) Arctic Manual, p. 153.
1882	*Pleustes panoplus*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, p. 704, 779.
1883	*Pleustes panoplus*, Smith	Proc. U. S. Nat. Mus., vi, pp. 222, 228.

A few were dredged off Point Franklin in 13½ fathoms on the rich bottom.

The species has been obtained in Greenland, Labrador, Grand Manan, Spitzbergen, and the Kara Sea.

30. ACANTHOZONE POLYACANTHA Murdoch.

(Plate I, fig. 4.)

Year.	Name.	Citations.
1884	*Acanthozone polyacantha*, Murdoch	Proc. U. S. Nat. Mus., vii, p. 520.

DESCRIPTION.—Head rounded, with a very short, sharp rostrum and a small lateral spine at the base of the lower antennæ. Eyes round and prominent. Posterior edge of first five segments of pereion raised into a rounded ridge, developing into a median tooth on the fifth segment. Anterior edge of first segment also raised into a similar ridge, curving forward over the head. Last two segments of pereion and first four of pleon armed on the posterior edge with a large broad median tooth pointing backwards, largest on the third segment of the pleon, and very small, almost obsolete on the fourth. The last two segments of the pereion and the first two of the pleon also carry a small accessory tooth midway between the median tooth and the epimeral suture. The epimeral suture bears a deep lateral keel which becomes a sharp, posterior, backward-pointing tooth on the last two segments of the pereion and the first four of the pleon. The infero-posterior angle of the epimeron bears a spine (there are two on the second segment of the pleon). Upper antennæ about two-thirds the length of the lower. Gnathopods slender, subchelate. Telson rather long, entire.

A few specimens were dredged off Point Franklin, in 13½ fathoms, August 31, 1883.

Museum No. 7898.

31. ATYLUS SWAMMERDAMII (M. Edw.) Sp. Bate.

Year.	Name.	Citations.
1830	*Amphithoe Swammerdamii*, Milne-Edwards.	Ann. des Sci. Nat., xx, p. 378.
1852	*Amphithoe compressa*, Lilljeborg	Oefv. af K. Vetensk.-Akad. Förhandl., p. 8.
1857	*Dexamine Gordoniana*, Spence Bate	Ann. and Mag. Nat. Hist., p. 142.
1859	*Paramphithoe compressa*, Bruzelius	K. Vetensk.-Akad. Handl., p. 72.
1860	*Epidesura compressa*, Bœck	Förhandl. ved de Skand. Naturf., 8de Möde. p. 659.
1862	*Dexamine Loughrini*, Sp. Bate	Cat. Amph. Crust., p. 130, pl. xxiv, fig. 3.
1862	*Atylus Swammerdamii*, Sp. Bate	Op. cit., p. 136, pl. xxvi, fig. 2.
1862	*Atylus compressus*, Sp. Bate	Op. cit., p. 142.
1870	*Atylus Swammerdamii*, Bœck	Crust. Amphip., p. 111.

The species of Atylus dredged in 13½ fathoms off Point Franklin, where it was decidedly plenty, appears undistinguishable from *A. Swammerdamii*, although this species has hitherto been recorded only from the western coast of Norway and from the coast of England.

32. GAMMARUS LOCUSTA (Lin.) J. C. Fabr.

Year.	Name.	Citations.
1767	*Cancer locusta*, Linné	Systema Naturæ, ed. 12ma, p. 1055.
1767	*Cancer pulex*, Linné	*Ibidem.*
1774	*Cancer pulex*, Phipps	Voyage, &c., App., p. 193.
1775	*Gammarus locusta*, J. C. Fabricius	Systema entomologiæ.
1780	*Oniscus pulex*, O. Fabricius	Faun. Grœnl., p. 254, sp. 231.
1820	*Gammarus arcticus*, Scoresby	"An Account of the Arctic Regions," i, p. 541, ii, pl. 16, fig. 14.
1824	*Gammarus boreus*, Sabine	Suppl. App. Parry's Voy., p. ccxxix.
1838	*Gammarus locusta*, Kröyer	D. Vidensk. Selsk. Afhandl., vii, p. 27.
1843	*Gammarus locusta*, Rathke	Beiträge zur Fauna Norwegens, Nov. Act. Nat. Cur., xx, p. 67.
1851	*Gammarus sitchensis*, Brandt	Sibirische Reise, ii, pt. i, p. 133.
1853	*Gammarus mutatus*, Lilljeborg	K. Vetensk.-Akad. Handl., p. 447.
1853	*Gammarus pulex*, Stimpson	Mar. Inv. Grand Manan, p. 55.
1855	*Gammarus boreus*, Bell	Belcher's "Last of the Arctic Voyages," ii, p. 405.
1859	*Gammarus locusta*, Bruzelius	K. Vetensk.-Akad. Handl. p. 52.
1862	*Gammarus locusta*, Sp. Bate	Cat. Amph. Crust., p. 206.
1865	*Gammarus locusta*, Goës	Oefv. af K. Vetensk.-Akad. Förhandl., xxii, p. 531.
1870	*Gammarus locusta*, Bœck	Crust. Amphip., p. 124.
1874	*Gammarus locusta*, Buchholz	2te Deutsche Nordpolarf., ii, p. 343.
1875	*Gammarus locusta*, Lütken	(Nominal list.) Arctic Manual, p. 156.
1877	*Gammarus locusta*, Miers	Ann. and Mag. Nat. Hist., ser. 4, xix, p. 138.
1878	*Gammarus locusta*, Heller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 35.
1881	*Gammarus locusta*, Miers	Ann. and Mag. Nat. Hist., ser. 5, vii, p. 51.
1882	*Gammarus locusta*, Stuxberg	Vega-Exp. Vetensk. Iakt., pp. 711, 712, 715.
1883	*Gammarus locusta*, Smith	Proc. U. S. Nat. Mus., vi, pp. 222, 229.

Considerable numbers of this species were dragged up in the seaweed by a seine in the shoal water along shore at Pĕrgniak, Elson Bay, along with *Gammaracanthus loricatus*. A few were also dredged just above the station in about 3 fathoms, on a bottom of mud and sand mixed.

The species is recorded from Arctic seas generally, as well as from the temperate regions of the northern hemisphere.

33. MELITA FORMOSA Murdoch.

(Plate II, figs. 1, 1*b*.)

Year.	Name.	Citations.
1884	*Melita formosa*, Murdoch	Proc. U. S. Nat. Mus., vii, p. 520.

This species is very close to *M. obtusata*, but may be distinguished by the shape of the nail of the second gnathopods.

DESCRIPTION.—Antennules with the first joint of the peduncle not quite as long as the second.

Two anterior segments of pleon with infero-posterior angle acute; third segment with this angle acute and produced upwards. Second and third segments of pleon armed with a single tooth each on posterior margin, fourth with three, fifth with four teeth, all very small. Hand of first gnathopod oval and fringed with long hairs on the posterior margin. Hand of second gnathopod in male broadly oval, and armed on the edge with 3-4 blunt teeth and running out into a broad, blunt tooth; claw large, curved, and *acute*, shutting on the inside of the palm. Inner ramus of the last pair of saltatory feet ovate. Color purple with a lighter streak down the middle of the dorsal surface.

Picked up on the beach near the station in considerable numbers, late in the summer of 1882.

Museum numbers, 7893, 7894, 7895.

34. MELITA LEONIS Murdoch.

(Plate II, figs. 2, 2*b*.)

Year.	Name.	Citations.
1884	*Melita leonis*, Murdoch	Proc. U. S. Nat. Mus., vii, p. 521.

This species is closely allied to *M. dentata*, but differs in the dentition of the segments of the pleon, and in the length of the antennules.

DESCRIPTION.—Eyes small, oval, black. Antennules reaching to the first segment of the pleon, with the first joint of the peduncle a little shorter than the second. Third segment of the pleon with the infero-posterior angle acute and produced upwards. First and second segments of the pleon with one large median tooth on the posterior edge and eight fine denticulations, the latter larger on the second segment; third with nine teeth, of which the median one is the largest; fourth with five; fifth with six, lacking the median tooth; sixth with two small, blunt teeth. Hand of first gnathopod with infero-posterior angle of third joint not produced into a tooth; hand elongate-oval, edge not toothed. Color purple, with two lighter streaks along the dorsal surface.

I have named this species from the schooner Leo of San Francisco, from which vessel the specimens were obtained, by dredging in about five fathoms of water at the head of Norton Sound, September 12, 1883.

Museum numbers, 7896, 7897.

35. GAMMARACANTHUS LORICATUS (Sab.) Sp. Bate.

Year.	Name.	Citations.
1824	*Gammarus loricatus*, Sabine	Suppl. App. Parry's Voy., p. 23, pl. 1, fig. 7.
1835	*Gammarus loricatus*, Owen	App. Ross' Voy., ii, p. xxxix.
1838	*Gammarus loricatus*, Kröyer	Vidensk. Selsk. Skr., vii, p. 250, pl. 1, fig. 4.
1839?	*Gammarus loricatus*, Kröyer	Nat. Tids., i R., ii, p. 258.
1855	*Gammarus loricatus*, Bell	Belcher's "Last of the Arctic Voy.," p. 405.
1861	*Gammarus loricatus*, Lovén	Oefv. af k. Vetensk.-Akad. Förhandl., p. 287.
1862	*Gammaracanthus loricatus*, Sp. Bate	Cat. Crust. Amph., p. 202, pl. xxxvi, fig. 2.
1865	*Gammarus loricatus*, Goës	Oefv. af k. Vetensk.-Akad. Förhandl., xxii, p. 531.
1870	*Gammaracanthus loricatus*, Bœck	Crust. Amph., p. 135.
1875	*Gammaracanthus loricatus*, Lütken	Arctic Manual, p. 157 (nominal list).
1882	*Gammaracanthus loricatus*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 700 et seq. (passim).

A few were taken at Pergniak (in Elson Bay) among seaweed dragged up by the seine, August 11, 1883, and some were also picked up on the beach late in the summer of 1882.

It has been observed at Prince Regent's Inlet, Arctic America, abundant (Sir J. C. Ross) in the "Arctic Seas" (Sir Edward Parry and Sir Edward Belcher) and Greenland (Kröyer, quoted by Spence Bate). Bœck (loc. cit.) gives as its habitat "Grœnlandia, Spitsbergia, in lacubus Finlandiæ, et Sveciæ et Norvegiæ."

The Vega expedition obtained it at various points along the Arctic coast of Siberia from Nova Zembla nearly to Bering Strait.

36. DULICHIA ARCTICA Murdoch.

(Plate II, fig. 3.)

Year.	Name.	Citations.
1884	*Dulichia arctica*, Murdoch	Proc. U. S. Nat. Mus., vii, p. 521.

DESCRIPTION.—Head slightly produced, forming an obtuse angle. First epimeron produced into a sharp spine projecting forward, the rest unarmed. Body smooth. Basa of second gnathopods dilated and armed with two teeth; hand large, subtriangular, and armed on the edge with two long, stout teeth. Last three pairs of pereiopods not specially long; third joint as long as the fourth and fifth together. Second pair of saltatory feet with outer ramus nearly twice as long as the peduncle; inner a little longer. Eyes small, round, and black. Color grayish.

Dredged in rather small numbers off the station in 5 fathoms on a muddy bottom.

Museum numbers, 7899, 7900.

PHYLLOPODA.

37. LEPIDURUS GLACIALIS (Kr.) Baird.

Year.	Name.	Citations.
1847	*Apus glacialis*, Kröyer	Nat. Tids., ii R., ii, p. 431; Voy., pl. 40, fig. 1.
1852	*Lepidurus glacialis*, Baird	Monograph of the family Apodidæ. Proc. Zoo. Soc. Lond., pt. xx, p. 6; Annulosa, pl. xxii, fig. 2.
1878	*Lepidurus glacialis*, Packard	Phyllopods of N. America. Report of U. S. Geological and Geographical Survey of the Territories, pt. i, p. 316.

This species has been kindly identified by Dr. A. S. Packard, jr., of Brown University, who examined our specimens and compared them with a specimen from Greenland.

It was abundant on the pools on the tundra, where it lurked in the mud and algæ, but appeared slightly capricious in its distribution, as it was not found in every pool. They lived until the pools froze up in the autumn.

They were especially abundant in the pool near the station from which we obtained our drinking water. In 1882 they were observed for the first time on July 8, but the next year they were ten days later in appearing, and seemed scarce and sluggish.

The species has been obtained in Greenland and also near Cape Krusenstern, Alaska.

38. BRANCHINECTA PALUDOSA (Müll.) Verrill.

Year.	Name.	Citations.
1780	*Cancer stagnalis*, O. Fabricus	Fauna Grœnl., p. 247, sp. 224.
1788	*Branchipus paludosus*, Müller	Zoologia Danica, ii, p. 10, pl. 48, figs. 1–8.
1851	*Branchipus middendorffianus*, Fischer	Sibirische Reise, ii, p. 153.
1852	*Branchipus* (?), Baird	Proc. Zool. Soc. Lond., xx, p. 29.
1857	*Branchipus paludosus*, Reinhardt	Bidrag til en Beskrivelse af Groenland.
1869	*Branchipus paludosus*, Packard	Mem. Bost. Soc. Nat. Hist., i, p. 295.
1869	*Branchipus (Branchinecta) arctica*, Verrill.	Amer. Jour. of Sci. and Arts, ser. ii, xlviii, p. 253.
1869	*Branchipus (Branchinecta) grœnlandica*	*Ibid.*
1869	*Branchinecta arctica*, Verrill	Proc. Amer. Ass. Adv. Sci., xviii, p. 244.
1869	*Branchinecta grœnlandica*, Verrill	Op. cit., p. 245.
1878	*Branchinecta paludosa*, Packard	Phyllopods of N. A. Report U. S. Geological and Geographical Survey of the Territories, pt. i, p. 336, pl. ix, figs. 1–6, pl. x, figs. 1–5.

This species was very abundant in the fresh-water pools all over the tundra, first appearing about the middle of June in the small pools made by the melting snow along the edge of the tundra at the crown of the beach.

It has been found in Greenland and Labrador and at Cape Krusenstern, Alaska. (See Baird, loc. cit.)

Dr. Packard has kindly examined these specimens, and says that they do not differ from those brought by Dr. Bessels from Polaris Bay.

39. POLYARTEMIA HAZENI Murdoch.

(Plate II, figs. ', *4b*.)

Year.	Name.	Citations.
1884	*Polyartemia hazeni*, Murdoch	Proc. U. S. Nat. Mus., vii, p. 522.

Specimens of a species of Phyllopod, found in abundance near the station, were examined by Dr. Packard, who declared that they belonged to the genus *Polyartemia*, but were different from the single species (*P. forcipata*) of this genus, described by Fischer in Middendorff's Sibirische Reise, ii, pt. i, p. 154, pl. vii, figs. 24–28 (1851).

I therefore decided to describe this as a new species under the name of *Polyartemi hazeni*, after General W. B. Hazen, Chief Signal Officer, U. S. A., to whom the species is respectfully dedicated.

DESCRIPTION.—Body long (twice the length of the abdomen) and stout. Legs generally seventeen pairs, males usually with one pair more than the females. Head in the male prolonged anteriorly into a short, thin, lamellar process. Male "claspers" large, stout, broad, and palmate, strongly incurved. From the middle of the lower edge projects a large curved process armed on the tip and inner surface with numerous fine teeth. The extremity of the "clasper" is bifurcated into two short, blunt branches, also armed on the inner side with fine teeth. Feet short and broad. Caudal appendages small and slender, a little longer than the last abdominal segment. Ovisac voluminous, nearly as long as the abdomen; end rounded, with a short, tooth-like process on each side. Color, when living, a pale, iridescent green.

Museum numbers, 7929, 7930, 7931.

The species was first observed July 13, 1882, in large numbers, copulating, in the pools on the black tundra.

It is not so widely distributed as *Branchinecta paludosa*, which occurs in the same pools. It swims very swiftly and is very hard to catch.

CIRRIPEDIA.

40. BALANUS sp.

Small barnacles were quite plenty on gastropod shells near the station, and a single large one which I cannot identify was dredged off Point Franklin. (This is probably *B. porcatus*).

RHIZOCEPHALA.

41. PELTOGASTER PAGURI Rathke.

Year.	Name.	Citations.
1841	*Peltogaster paguri*, H. Rathke	Reisebemerkungen, Neueste Schriften der Naturforschenden Gesellschaft in Danzig, ii, p. 105, pl. vi, fig. 12.
1843	*Peltogaster paguri*, H. Rathke	Nov. Act. Acad. Cæs.-Leop. Car. Nat. Cur., xx, p. 245, pl. xii, fig. 17.
1859	*Peltogaster paguri*, Lilljeborg	Les genres Liriope et Peltogaster, H. Rathke. (Extrait des Nov. Act. Reg. Soc. Sci. Upsala, ser. 3, iii), p. 25, figs. 1, 2, 30–35.
1867	*Peltogaster paguri*, Packard	Mem. Bost. Soc. Nat. Hist., i, p. 295.
1875	*Peltogaster paguri*, Lütken	Arctic Manual, p. 163 (nominal list).
1883	*Peltogaster paguri*, Smith	Proc. U. S. Nat. Mus., vi, 222, 232.

Three specimens of this parasite were found on *Eupagurus trigonocheirus* picked up on the beach near the station. It appears to be quite rare.

The species has been obtained in Norway and Sweden, Greenland, Labrador, and Maine, on species of *Eupagurus* allied to the *E. trigonocheirus.*

CLADOCERA.

42. DAPHNIA sp.

A species of *Daphnia*, or some closely allied genus was very abundant in all the fresh-water pools on the tundra.

PYCNOGONIDA.

NYMPHONIDÆ.

1. NYMPHON LONGITARSE Kr.

Year.	Name.	Citations.
1844	*Nymphon longitarse*, Kröyer	Nat. Tids., ii R., i, p. 112, Voy., &c., pl. 36, figs. 2a-b.
1875	*Nymphon longitarse*, Lütken	Arctic Manual, p. 164 (nominal list).
1877	*Nymphon longitarse*, G. O. Sars	Archiv for Mathematik og Naturvidenskab, ii, pt. iii, p. 366.
1878	*Nymphon longitarse*, Wilson	Trans. Conn. Acad. Arts and Sci., v, p. 19, pl. vii, figs. 2a-h.
1880	*Nymphon longitarse*, Wilson	Report U. S. Commissioner Fish and Fisheries, pt. vi, p. 489.

Three specimens were dredged on the muddy bottom close to the station in 5 fathoms, August 14, 1882.

It has been recorded from Greenland, Norway, and the eastern coast of America as far south as George's Bank.

2. NYMPHON GROSSIPES (Lin.) J. C. Fabr.

Year.	Name.	Citations.
1762	*Phalangium marinum* (?), Ström	Söndmör, p. 208.
1767	*Phalangium grossipes* (?), Linné	Syst. Nat. ed. xii, p. 1027.
1784	*Pycnogonum grossipes*, O. Fabricius	Faun. Grœnl., p. 229.
1794	*Nymphon grossipes*, J. C Fabricius	Syst. Ent., iv, p. 217.
1824	*Nymphon grossipes* (?) Sabine	Suppl. App. Capt. Parry's Voy., p. 225.
1838	*Nymphon grossipes*, Kröyer	Grönl. Amfip., p. 92 (*teste* Kröyer).
1844	*Nymphon grossipes*, Kröyer	Nat. Tids., ii R., i, p. 108.
1844	*Nymphon mixtum*, Kröyer	Nat. Tids., ii R., i, p. 110; Voy., pl. 35, figs. 2a-f.
1844	*Nymphon brevitarse*, Kröyer	Nat. Tids., ii R., i, p. 115; Voy., pl. 36, figs. 4a-f.
1846	*Nymphon grossipes*, Kröyer	Oken's Isis, Jahrg. 1846, pt. vi, p. 442; Voy., pl. 36, figs. 1a-h.
1853	*Nymphon grossipes*, Stimpson	Mar. Inv. Grand Manan, p. 38.
1857	*Nymphon brevitarse*, Reinhardt	Nat. Bidrag til en Beskr. af Grönland, p. 38.
1867	*Nymphon grossipes*, Packard	Mem. Bost. Soc. Nat. Hist., i, p. 295.
1874	*Nymphon grossipes et mixtum*, Buchholz	2te Deutsche Nordpolarf., ii, pp. 396, 397.
1874	*Nymphon grossipes*, Verrill	Am. Jour. Sci., vii, p. 502.
1875	*Nymphon grossipes, mixtum, et brevitarse*, Lütken.	Arctic Manual, pp. 163, 164 (nominal list).
1877	*Nymphon mixtum*, G. O. Sars	Archiv for Mathem. og Naturvid., [illegible] pt. iii, p. 366.
1878	*Nymphon grossipes*, Wilson	Trans. Conn. Acad., v, p. 20, pl. vii, figs. 1a-q.
1880	*Nymphon grossipes*, Wilson	Rep. U. S. Commissoner Fish and Fisheries for 1878, pt. vi, p. 491.

We found this species rather plenty but small off Point Franklin in 13½ fathoms. A few good-sized ones, among them one egg-bearing female, were also dredged in about 5 fathoms on a pebbly bottom near the head of Norton Sound.

It has been recorded from Greenland, Norway, and the eastern coast of North America as far south as George's Bank.

VERMES.

CHÆTOPODA.

POLYNOIDÆ.

1. POLYNOE SCABRA (Fabr.) Sav.

Year.	Name.	Citations.
1780	*Aphrodita scabra*, Fabricius	Fauna Grœnlandica, p. 311.
1820	*Polynoe scabra*, Savigny	Systeme des Annelides, p. 26.
1843	*Lepidonote scabra*, Oersted	Grönlands Annulata Dorsibranchiata, p. 12, figs. 2, 7, 10, 12, 13, 17, 18.
1860	*Polynoe nodosa*, Sars	Forh. i Videnskabs-Selsk. i Christiania, p. 58.
1865	*Eunoe Oerstedii et nodosa*, Malmgren	Nordiska Hafs-Annulater, p. 61, pl. viii, figs. 3 and 4.
1875	*Eunoa Oerstedii et nodosa*, Lütken	(Nominal list.) Arctic Manual, p. 168.
1879	*Polynoe scabra*, Théel	K. Svensk. Vetensk.-Akad. Handl., vol. xvi, No. 3, p. 7.
1883	*Polynoe scabra*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 387, pl. 28, figs. 1 and 2; pl. 29, fig. 1.

Three specimens of this species were dredged off Point Franklin, in 13½ fathoms, August 31, 1883.

The species has been recorded from Spitzbergen, Finland, Iceland, Greenland, and from the North American coast as far south as Grand Manan. The Vega Expedition obtained it at various points on the northeast coast of Siberia from the mouth of the Taimyr River to Bering Sea.

2. POLYNOE ISLANDICA Hansen.

Year.	Name.	Citations.
1882	*Polynoe islandica*, Hansen	Den Norske Nordhavs Expedition, vii, Zoölogi. Annelida, p. 24.

Two specimens were dredged with the other *Polynoes* off Point Franklin, in 13½ fathoms, August 31, 1883.

This species has been united with *P. scabra* by Wirén (loc. cit.), but the specimens we obtained agreed so closely with Hansen's description, and differed so much from our specimens of *scabra*, that I have concluded it best to record it as a distinct species.

It was originally described by Hansen from specimens taken in the North Atlantic.

3. POLYNOE SARSI (Kinberg) Théel.

Year.	Name.	Citations.
1862	*Antinoe sarsi*, Kinberg	MS.
1865	*Antinoe sarsi*, Malmgren	Nordisk. Hafs-Ann., p. 75, pl. ix, fig. 6.
1867	*Antinoe sarsi*, Malmgren	Annulata Polychæta, p. 13.
1871	*Antinoe sarsi*, Ehlers	Sitzungsberichte Phys. Med. Soc. Erlangen, iii, p. 77-79.
1872	*Antinoe sarsi*, Sars	Nyt Magazin f. Naturvidensk., xix, p. 202.
1875	*Antinoe sarsi*, Lütken	(Nominal list.) Arctic Manual, p. 168.
1878	*Antinoe sarsi*, v. Marenzeller	Denkschr. d. K. Akad. d. Wissen, xxxv, p. 395.
1879	*Polynoe sarsi*, Théel	K. Svensk. Vetensk.-Akad. Handl., xvi, No. 3, p. 16, pl. i, fig. 8.
1883	*Polynoe sarsi*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 390.

Four small specimens of this species were obtained August 9, 1883, on one of the sandy patches near the station, in about 3 fathoms of water.

It has been recorded from the sea near England, the Baltic, Norway, Greenland, the Gulf of Saint Lawrence, and New England. The Swedish Expedition obtained it at various points along the northern coast of Siberia from the Kara Sea to the Vega's winter quarters.

4. MELÆNIS LOVÉNI Malmgr.

Year.	Name.	Citations.
1865	*Melænis lovéni*, Malmgren	Nordiska Hafs-Annulater, p. 78, pl. x, fig. 10.
1867	*Melænis lovéni*, Malmgren	Annulata Polychæta, p. 14.
1883	*Melænis lovéni*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 391, pl. 28, fig. 4; pl. 29, fig. 3.

A single specimen was dredged just outside the grounded ice, about 4 miles above the station, in about 15 fathoms of water. The bottom was an exceedingly tenacious and fetid black mud.

The species has been recorded from Spitzbergen and the neighborhood of Nova Zembla, and as far east as Bering Strait.

5. MELÆNIS LOVÉNI, *var.* GIGANTEA (Malm.) Wirén.

Year.	Name.	Citations.
1883	*Melænis lovéni*, var. *gigantea*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 391, pl. 28, fig. 3; pl. 29, fig. 4.

This variety of the preceding species, which was described by Wirén from two specimens obtained by the Vega Expedition near Bering Strait, was found in considerable numbers on the beach near the station.

NEPHTHYIDÆ.

6. NEPHTHYS CŒCA (Fabr.) Oerst.

Year.	Name.	Citations.
1780	*Nereis cœca*, O. Fabricius	Faun. Grœnl., p. 304.
1789	*Nephthys ciliata*, Müller	Zoöl. Dan., iii, p. 14, pl. lxxxix, figs. 1–4.
1843	*Nephthys cœca*, Oersted	Grönl. Ann. Dorsib., p. 193, figs. 73, 74, 77–86.
1843	*Nephthys longisetosa*, Oersted	Op. cit., p. 195, figs. 75, 76.
1865	*Nephthys longisetosa, ciliata et cœca*, Malmgren.	Nord. Hafs-Ann., p. 104, pl. xii, figs. 17 and 18.
1868	*Nephthys cœca, cirrosa et ciliata*, Ehlers	Die Borstenwürmer, i, p. 588, pl. xxiii, figs. 10–34, 6, 36, 37, 38.
1875	*Nephthys cœca, ciliata et longosetosa*, Lütken	(Nominal list.) Arctic Manual, p. 169.
1877	*Nephthys cœca*, McIntosh	Trans. Linnean Soc. London, series 2, i, p. 501.
1878	*Nephthys longosetosa*, v. Marenzeller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 395.
1879	*Nephthys cœca et ciliata*, Théel	K. Svensk. Vetensk.-Akad. Handl., xvi, No. 3, p. 24.
1883	*Nephthys cœca*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 392, pl. 30, figs. 1–3; pl. 31, figs. 1–3.

Two good-sized specimens and four smaller ones of the *ciliata* type and two medium individuals of the *longisetosa* type were dredged near the station, in about 3 fathoms, on the muddy bottom.

One smaller specimen of the *longisetosa* type was also obtained near the head of Norton Sound, in 5 fathoms, on a pebbly bottom.

It has been recorded from Labrador, Greenland, Norway, Spitzbergen, Nova Zembla (and northward toward Franz Josef Land, where it was obtained by the Austrian Expedition), and the Arctic coast of Siberia as far round as Saint Lawrence Bay. It also occurs on the British coast.

PHYLLODOCEIDÆ.

7. ETEONE sp.

A single specimen of a species of *Eteone*, in such bad condition as to render the specific determination impossible, was obtained near the station in 2½ fathoms.

8. PHYLLODOCE GROENLANDICA Oersted.

Year.	Name.	Citations.
1843	*Phyllodoce grœnlandica*, Oersted	Grönl. Ann. Dorsib., p. 192, figs. 19, 21, 22, 29, 32.
1865	*Phyllodoce grœnlandica*, Malmgren	Nord. Hafs-Ann., p. 96.
1867	*Phyllodoce grœnlandica*, Malmgren	Ann. Polych., p. 21, pl. ii, fig. 9.
1875	*Phyllodoce grœnlandica*, Lütken	(Nominal list.) Arctic Manual, p. 169.
1877	*Phyllodoce grœnlandica*, McIntosh	Trans. Linn. Soc. London, ser. 2, i, p. 502.
1878	*Phyllodoce grœnlandica*, v. Marenzeller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 395
1882	? *Phyllodoce arctica*, Hansen	Den Norsk. Nordhafs-Exp., p. 31, pl. iii, figs. 21–23.
1883	*Phyllodoce grœnlandica*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 400.

A bait set at the bottom of the tide-hole, in about 3 fathoms of water, on May 26, 1883, brought up a large number of these worms. They varied a good deal in color when alive, some being reddish and some dark green. They were also dredged on the muddy bottom near the station August 9, 1883, in about 3 fathoms.

It is quite possible that *P. arctica*, described by Hansen (loc. cit.), from the neighborhood of Spitzbergen, is only a variety of this species, as the distinction is based on the number of papillæ on the evaginated proboscis, which appears to be subject to great variation.

Among our specimens the same animal has been found to have twelve papillæ (characteristic of *grœnlandica*) in one row, and fifteen (characteristic of *arctica*) in another.

The species has been recorded from New England, Labrador, Greenland, Norway, Spitzbergen, between Nova Zembla and Franz Josef Land, and the Kara Sea.

9. PHYLLODOCE sp.

A single specimen of a species of *Phyllodoce*, evidently not *P. grœnlandica*, but too much mutilated for specific determination, was dredged near the station in about 3 fathoms.

HESIONIDÆ.

10. CASTALIA MULTIPAPILLATA Théel.

Year.	Name.	Citations.
1879	*Castalia multipapillata*, Théel	K. Svenska Vetensk. Akad. Handl., xvi, No. 3, p. 38, pl. iii, fig. 38.

A few very small specimens of this species were caught in the towing net set under the sea-ice about the end of March, 1883.

Théel described the species from specimens obtained at Nova Zembla.

SYLLIDÆ.

11. AUTOLYTUS sp.

We obtained males and egg-bearing females of a small species of *Autolytus*, which cannot be more accurately identified, swimming free under the ice about the end of March and the first of April, 1883. The "stem-form" was not obtained.

ARICIIDÆ.

12. ? ARICIA ARCTICA Hansen.

Year.	Name.	Citations.
1882	*Aricia arctica*, G. A. Hansen	Den Norsk. Nordhavs-Exp., vii, Zoölogi, p. 34, pl. v, figs. 20–26.

A fragment of a worm of this family, lacking both head and anal end, was obtained off the station, in about 3 fathoms, August 7, 1883. The body segments agree very well in the shape of the feet, gills, &c., with Hansen's figures, but as we were unable to obtain the characteristic hooked ventral setæ of the anterior region of the body, the species cannot be positively identified.

It was originally described from near the island of Jan Mayen.

OPHELIIDÆ.

13. TRAVISIA FORBESI Johnst.

Year.	Name.	Citations.
1840	*Travisia forbesi*, Johnston	Ann. Nat. Hist., iv, p. 373, pl. xi, figs. 11–18.
1843	*Ophelia mammillata*, Oersted	Grönl. Ann. Dorsib., p. 53, pl. viii, figs. 103, 112, 114, 119, 120.
1865	*Travisia forbesi*, Johnston	Cat. Brit. Mus., p. 220, pl. xix, figs. 11–18.
1867	*Travisia forbesi*, Malmgren	Ann. Polych., p. 75.
1874	*Travisia forbesi*, Möbius	2te Deutsche Nordpolarf., p. 225.
1875	*Travisia forbesi*, Lütken	(Nominal list.) Arctic Manual, p. 172.
1879	*Travisia forbesi*, Théel	Kongl. Svensk. Vetensk.-Akad. Handl., xvi, p. 49.
1883	*Travisia forbesi*, Wirén	Vega-Exp. Vetensk. Iakt., p. 406.

A single specimen of this species was obtained close to the station in about 3 fathoms on a muddy bottom.

It has been observed in Greenland, Iceland, Scotland, Western Scandinavia, Spitzbergen, Nova Zembla, and near the winter quarters of the Vega.

TELETHUSEÆ.

14. ARENICOLA GLACIALIS Murdoch.

Year.	Name.	Citations.
1884	*Arenicola glacialis*, Murdoch	Proc. U. S. Nat. Mus., vii, p. 522.

This species is closely allied to *Arenicola marina*, but has only 6 setigerous segments anterior to the gills, and 11 gill-bearing segments instead of 7 and 13, as in *A. marina*. These numbers are constant in the five specimens obtained.

The 6 abranchiate segments are each composed of 5 distinct annulations, and each bear a pair of simple tubercular feet. The dorsal setæ are all of one kind, about 18 in number; slender and slightly serrulate, the longest longer than the foot. The ventral setæ are 35 to 40 in number, and form a single row on each side of the ventral surface of the ring. They are short, slender, and simple, and barely project above the surface of the skin.

The branchiate segments are each composed of 6 annulations. Each branchia consists of one cluster of about 15 simple cirri annulated in contraction. The branchiæ increase in size from the first to the ninth pair; the tenth and eleventh pairs are slightly smaller. The feet are small and tubercular; the dorsal setæ, 7, similar to those of the abranchiate segments, but only about two-thirds of their length. The ventral setæ are the same as in the abranchiate segments.

The caudal portion is about one-third of the length of the animal, without tubercles or other appendages.

Color, in alcohol, blackish gray, lighter on the ventral surface.

Five specimens were picked up on the beach, after a fresh westerly wind, September 12 and 13, 1882.

A couple of mutilated specimens were also obtained from the gullet of an eider-duck which had been diving on one of the sandy patches in about 3 fathoms just above the station.

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CHLORÆMIDÆ.

15. BRADA GRANULATA Malm.

Year.	Name.	Citations.
1867	*Brada granulata*, Malmgren	Ann. Polych., p. 85, pl. xii, fig. 7.
1875	*Brada granulata*, Lütken	(Nominal list.) Arctic Manual, p. 172.
1883	*Brada granulata*, Wirén	Vega-Exp. Vetensk. Iakt., ii, p. 408.

This species was dredged in considerable numbers near the station, in about 3 fathoms, in August, 1883.

It has been recorded from Greenland, Spitzbergen, and the northern coast of Siberia near the mouth of the Taimyr River (Vega Expedition).

MALDANIDÆ.

16. ?

A long Maldanid worm, of a bright orange-scarlet color when living, was dredged on one of the patches of mud and sand close to the station, in about 2½ or 3 fathoms of water, August 7, 1883. The only specimen preserved is a fragment of the body without either head or tail, and cannot be identified.

AMPHICTENIDÆ.

17. PECTINARIA sp.

A good many empty tubes of a species of *Pectinaria* were dredged on the muddy bottom just outside the grounded ice, in about 15 fathoms, and near the station on the sandy patches in about 3 fathoms. No living specimens were taken.

This is perhaps *P. granulata*, as this species was obtained by the Vega Expedition as far east as Saint Lawrence Bay.

GEPHYREA.

ECHIURIDÆ.

18. ECHIURUS VULGARIS (Savigny) Forbes.

Year.	Name.	Citations.
1820	*Thalassema vulgare*, Savigny	Syst. des Ann., p. 102.
1835	? *Echiurus sitchænsis*, Brandt	Prodromus Descriptionis Animalium ab H. Mertensio obs., p. 262.
1841	*Echiurus vulgaris*, Forbes	History of British Star-fishes, p. 263.
1859	*Echiurus pallasii*, Diesing	Revision der Rhyngodeen, Sitzungs-berichte d. K. Akad. d. Wiss., xxxvii, p. 775.
1865	*Echiurus pallasii*, Quatrefages	Histoire des Annelés, ii, p. 502.

The specimens of *Echiurus* brought home by the expedition cannot be distinguished from the description of *E. pallasii* (=*E. vulgaris*) given by Quatrefages (loc. cit.).

This species has heretofore been recorded from Great Britain and France. Brandt's description of *E. sitchænsis* (loc. cit.) is not sufficiently detailed to enable me to tell whether it is the same species or not.

This worm was quite abundant on the beach, near the station, after the great gales of September and October, 1881, and two specimens were dredged on the muddy bottom, in about 3 fathoms of water, August 9, 1883.

SIPUNCULIDÆ.

19. PHASCOLOSOMA sp.

A good many specimens of a species of *Phascolosoma* were dredged near the station in about 3 fathoms of water. They are so badly contracted in alcohol as to entirely disguise the specific characters. I was able to determine by dissection that they belong probably to the genus *Phascolosoma*, but could make out nothing further.

NEMATODA.

CHÆTOGNATHA.

20. SAGITTA sp.

A species of *Sagitta* occurred very rarely in the neighborhood of the station. One or two specimens were caught in the towing-net set under the sea-ice March 1, 1883. A few were also observed after the sea opened in August, 1883.

ECHINODERMATA.

HOLOTHURIOIDEA.

1. PENTACTA FRONDOSA Jæg.

Year.	Name.	Citations.
1780	*Cucumaria frondosa*, O. Fabricius	Fauna Grœnlandica, pp. 343, 344.
1857	*Cucumaria frondosa*, Lütken	Videnskabelige Meddelelser fra den Naturhist. Foren. i Kjöben., p. 2.
1861	*Cucumaria frondosa*, M. Sars	Oversigt af Norges Echinodermer, p. 100.
1871	*Cucumaria frondosa*, Lütken	Vidensk. Meddel., 23, p. 306.
1875	*Cucumaria frondosa*, Lütken	(Nominal list.) Arctic Manual, p. 184.

One small *Pentacta* was dredged in the rich haul off Point Franklin, August 31, 1883, and, as well as can be made out in its present condition, it belongs to this species.

The species has been recorded from Massachusetts Bay to Labrador and Greenland, from Spitzbergen, and on the European coast as far south as Denmark and Great Britain.

2. LOPHOTHURIA FABRICII (D. & K.) Verrill.

Year.	Name.	Citations.
1780	*Holothuria squamata*, O. Fabricius	Faun. Grœnland., 348.
1788	*Ascidia squamata*, Pallas	Nova Acta Petropolitana, ii, p. 244, tab. vii, figs. 34–37.
1834	? *Cuvieria sitchænsis*, Brandt	Prodromus descriptionis animalium ab H. Mertensio observatorum. Récueil des actes de la séance publique de l'académie impériale des sciences de St. Pétersbourg, p. 247.
1851	*Cuvieria sitchænsis*, Brandt	Sibirische Reise, ii, p. 450.
1857	*Cuvieria sitchænsis*, Stimpson	Crustacea and Echinodermata of the Pacific Coast of North America, from Jour. of Bost. Soc. of Nat. Hist., vi, p. 85.
1857	*Psolus fabricii*, Lütken	Vidensk. Meddel., p. 13.
1875	*Psolus fabricii*, Lütken	(Nominal list.) Arctic Manual, p. 184.
1878	*Psolus fabricii*, v. Marenzeller	Denkschr. d. K. Akad. d. Wissenchaften, xxxv, pp. 359, 388.
1882	*Psolus fabricii*, Stuxberg	Vega-Expeditionens Vetenskapliga Iakttagelser, i, p. 713.

Dredged in great abundance off Point Franklin in 13½ fathoms, and also dragged up on cod-lines in about 18 or 20 fathoms off the mouth of Plover Bay, Eastern Siberia.

This species has been recorded from Greenland, south to Massachusetts Bay, from Bering Sea (St. Paul's Island, Brandt *teste* Lütken), Sitka (Brandt), and the Arctic Ocean north of Bering Strait (Stuxberg).

3. MYRIOTROCHUS RINKII Steenst.

Year.	Name.	Citations.
1851	*Myriotrochus rinkii*, Steenstrup	Vidensk. Meddel., p. 55, pl. iii, figs. 7–10.
1852	? *Chirodota brevis*, Huxley	Appendix to Sutherland's "Journal of a Voyage to Baffin's Bay and Barrow Strait," ii, p. ccxi.
1857	*Myriotrochus rinkii*, Lütken	Vidensk. Meddel., p. 22.
1867	*Myriotrochus rinkii*, Packard	Memoirs Bost. Societ. Nat. Hist., i, p. 269.
1871	*Myriotrochus rinkii*, Lütken	Vidensk. Meddel., 23, p. 306.
1874	*Myriotrochus rinkii*, Möbius	2te Deutsche Nordpolarfahrt, ii, p. 258.
1875	*Myriotrochus rinkii*, Lütken	(Nominal list.) Arctic Manual, p. 184.
1878	*Myriotrochus rinkii*, Stuxberg	Oefversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, 35, p. 28.
1882	*Myriotrochus rinkii*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 695, et seq.
1882	*Myriotrochus rinkii*, Danielssen and Koren	Den Norske Nordhavs-Expedition, vi, Zoölogi, p. 28, pl. v, figs. 1–4.

This species was dredged in abundance off the station, on the muddy bottom, interspersed with patches of mud and sand mixed, in 2½ to 15 fathoms.

It has heretofore been reported from Greenland (Steenstrup, Lütken), Labrador (Packard), and Nova Zembla (Stuxberg). [? Wellington Channel (Sutherland).]

Lütken considers the *Chirodota brevis* of Huxley to be this species, but Danielssen and Koren consider that as Huxley in his description says nothing of the calcareous wheels being pedunculated it must be considered as a distinct species (= *Oligotrochus vitreus* M. Sars), for which they propose the name *Myriotrochus brevis*.

4. ? TROCHOSTOMA BOREALE (M. Sars) Dan. and Ko.

Year.	Name.	Citations.
1858	*Molpadia borealis*, M. Sars	Forhandl. i Vidensk. Selsk. i Christiania, p. 173.
1861	*Molpadia borealis*, M. Sars	Oversigt af Norges Echinodermer, p. 116, pls. 12, 13.
1882	*Trochostoma (Molpadia) boreale*, Danielssen and Koren.	Den Norske Nordhavs-Expedition, vi, Zoölogi, p. 64, pl. x, figs. 7–11.

A single specimen was picked up on the beach near the station, in July, 1882. The perforated calcareous plates appear to have the perforations smaller in proportion than those figured by Sars and Danielssen and Koren, but in the absence of more specimens, and especially of identified material for comparison, I cannot venture to pronounce it different.

The species has been recorded from the Norwegian coast and the North Atlantic.

Molpadia violacea, which occurs in large numbers off Kerguelen Island, is considered by Danielssen and Koren (*op. cit.*, p. 65) to be identical with this species.

ECHINOIDEA.

5. STRONGYLOCENTROTUS DRÖBACHIENSIS (Müll.) A. Ag.

Year.	Name.	Citations.
1780	*Echinus saxatilis*, O. Fabricius	Fauna Grœnlandica, No. 368.
1834	*Echinus chlorocentrotus*, Brandt	Prodromus descriptionis, &c., p. 264.
1851	*Echinus chlorocentrotus*, Brandt	Sibirische Reise, ii, p. 34.
1852	*Echinus neglectus*, Forbes	In Sutherland's "Journal of a Voyage, &c.," ii, App., p. ccxiv.
1857	*Echinus dröbachiensis*, Lütken	Vidensk. Meddel., p. 24.
1861	*Echinus dröbachiensis*, M. Sars	Oversigt af Norges Echinodermer, p. 95.
1871	*Toxopneustes dröbachiensis*, Lütken	Vidensk. Meddel., 23, p. 306.
1874	*Echinus dröbachiensis*, Möbius	2te Deutsche Nordpolarfahrt, ii, p. 259.
1875	*Toxopneustes dröbachiensis*, Lütken	(Nominal list.) Arctic Manual, p. 184.
1878	*Strongylocentrotus dröbachiensis*, v. Marenzeller.	Denkschr. d. K. Akad. der Wissen., xxxv, pp. 359, 365.
1878	*Echinus dröbachiensis*, Stuxberg	Oefv. af K. Vetensk. Akad. Förhandl., 35, p. 29.
1882	*Echinus dröbachiensis*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 705, 706, 708.

A few dry tests were picked up on the beach near the station, during the summer of 1882. The living animals were dredged in very great abundance off Point Franklin in 13½ fathoms, and were also quite abundant off Port Clarence, in 7½ fathoms, on a pebbly bottom. A few were also taken in about 5 fathoms, on a similar bottom, at the head of Norton Sound.

This species is abundant all round the northern parts of both hemispheres.

ASTERIOIDEA.

6. ASTERIAS ACERVATA Stimpson.

Year.	Name.	Citations.
1861? 1862?	*Asterias acervata*, Stimpson	Proceed. Boston Society of Natural History, viii, p. 271.

Rather small specimens of this species, 3 or 4 inches in diameter, were washed up on the beach in considerable numbers after the great gale of October 4, 1881, but none were afterwards found in any of our dredging near the station. One large individual, however, was dredged at the head of Norton Sound, in 5½ fathoms, on a pebbly bottom.

This species was described by Stimpson from specimens brought by the North Pacific Exploring Expedition from Bering Strait and the Arctic Ocean north of the Strait. My specimens have been compared with one of Stimpson's own identification in the National Museum.

7. ? ASTERIAS VIOLACEA O. F. Müller.

Year.	Name.	Citations.
1789	*Asterias violacea*, O. F. Müller	Zoölogia Danica, pl. 46, figs. 4–5.
1841	*Uraster violacea*, Forbes.	British Starfishes, p. 91.
1842	*Asteracanthion violaceus*, Müller and Troschel.	System der Asteriden, p. 16.

Numbers of a large purple *Asterias* were dredged in about 5 fathoms, on a pebbly bottom, at the head of Norton Sound.

I refer it with extreme doubt to this species as I have been unable to see any identified specimens of *violacea* or *rubens* and the literature at my command is exceedingly unsatisfactory.

The species will probably turn out to be undescribed, but I do not feel sufficiently familiar with the group to venture on a description. It is undoubtedly closely allied to the common European forms *rubens* and *violacea*, if, indeed, the latter be a distinct species.

8. ASTERIAS sp.

A few specimens of a small *Asterias* with five arms were dredged in about 7 fathoms, on a pebbly bottom, off Port Clarence. They undoubtedly belong to the genus *Asterias*, but the species is not determinable with any means at my command.

9. LEPTASTERIAS ARCTICA (Stimpson).

Off Point Franklin, in 13½ fathoms, we dredged large numbers of a small starfish which cannot be distinguished from a dried specimen in the National Museum, brought from Bering Strait by the North Pacific Exploring Expedition and labeled in Dr. Stimpson's handwriting *Asterias arctica* var. a. I have been unable to find a published description of this species.

The size and position of the papulæ on the back and sides of the arms show that it belongs to Verrill's genus *Leptasterias*.

The following is a description of the species: Rays five, rounded above, elongated, tapering regularly to the tips. Radii as 1:3.5. Disk small, its radius about equal to width of ray at base. Interambulacral spines round and slender with rounded tips, usually two to each plate. No small spines between these and the ventral spines. Ventral spines form a double row of alternating spines, of which the upper are the smaller and the lower are larger and stouter than the interambulacrals. Lateral spines rather slender, forming a single row. No well-marked dorsal row, though the spines in the middle of the arm are rather the larger. The dorsal spines are short and stout, with rounded, almost capitate, tips. The spines of the disk are rather smaller than those of the arms and are arranged irregularly. The major pedicellariæ could not be well made out, but appeared to be lanceolate and not numerous. The minor pedicellariæ form close wreaths around the spines.

Diameter of the largest specimen about 75^{mm}.

10. CRIBRELLA SANGUINOLENTA (Müll.) Ltk.

Year.	Name.	Citations.
1776	*Asterias sanguinolenta*, O. F. Müller	Zoölogiæ Danicæ Prodromus, 234.
1780	*Asterias spongiosa*, O. Fabricius	Fauna Grœnlandica, 363.
1851	*Echinaster Eschrichtii*, Brandt	Sibirische Reise, ii, p. 32.
1857	*Cribrella sanguinolenta*, Lütken	Vidensk. Meddel., p. 31.
1861	*Echinaster sanguinolenta*, M. Sars	Oversigt af Norges Echinodermer, p. 84.
1871	*Cribella sanguinolenta*, Lütken	Vidensk. Meddel., **23**, p. 307.
1875	*Cribella sanguinolenta*, Lütken	(Nominal list.) Arctic Manual, p. 185.
1878	*Echinaster sanguinolentus*, Stuxberg	Oefv. af K. Vetensk.-Akad. Förhandl., 35, p. 32.
1882	*Echinaster sanguinolentus*, Stuxberg	Vega Exp. Vetensk. Iakt., i, pp. 707, 708, 713.

One large specimen and a number of very small ones were dredged off Point Franklin, but none were obtained elsewhere.

The species has been recorded from the eastern coast of North America, from Nantucket Shoals to Labrador and Greenland, and southward on the European coast to Norway and Great Britain, also from Nova Zembla, Spitzbergen, the Arctic Ocean north of Bering Strait, and the Sea of Ochotsk (Brandt *teste* Lütken, *op. cit.*, p. 62).

11. CROSSASTER PAPPOSUS (Phipps) Müll. and Tr.

Year.	Name.	Citations.
1774	*Asterias papposa*, Phipps	Voyage toward the North Pole, p. 196.
1780	*Asterias papposa*, O. Fabricius	Fauna Grœnlandica, p. 369.
1824	*Asterias papposa*, Sabine	Supplementary Appendix to Capt. Parry's Voyage, p. ccxxii.
1834	*Asterias affinis et alboverrucosa*, Brandt	Prodr. Descrip., p. 271.
1840	*Crossaster papposus*, Müller and Troschel	Wiegman's Archiv, Jahrg., vi, i, p. 321.
1842	*Solaster papposus*, Müller and Troschel	System der Asteriden, p. 26.
1852	*Solaster papposa*, Forbes	In Sutherland's "Journal of a Voyage, &c.," ii, App., p. ccxiv.
1857	*Solaster papposus*, Lütken	Vidensk. Meddel., p. 40.
1861	*Solaster papposus*, M. Sars	Oversigt af Norges Echinodermer, p. 76.
1871	*Solaster papposus*, Lütken	Vidensk. Meddel., 23, p. 307.
1875	*Solaster papposus*, Lütken	(Nominal list.) Arctic Manual, p. 185.
1878	*Solaster papposus*, Stuxberg	Oefv. af K. Vetensk.-Akad. Förhandl., 35, p. 31.
1882	*Solaster papposus*, Stuxberg	Vega Exp. Vetensk. Iakt., i, pp. 697, 700, 705.

A good many were found washed up on the beach after the great gales in the autumn of 1881, and a few were afterwards picked up during the season of open water of 1882. Three small specimens were dredged in 13½ fathoms off Point Franklin.

The species has been recorded from the eastern coast of North America (Massachusetts Bay to Greenland), Iceland and the Faroes, Scandinavia to the English Channel, Nova Zembla, Spitzbergen (Phipps and Lütken), and Bering Strait (Brandt).

12. SOLASTER ENDECA (Lin.) Forbes.

Year.	Name.	Citations.
1775	*Asterias endeca*, Linné	Systema Naturæ ed Gmel., p. 3162.
1834	*Asterias endeca* var. *decemradiata*, Brandt.	Prodromus Descr., &c., p. 271.
1839	*Solaster endeca*, Forbes	Memoirs Wernerian Society, viii, p. 121.
1853	*Solaster endeca*, Stimpson	Marine Invertebrata of Grand Manan, p. 14.
1857	*Solaster endeca*, Lütken	Vidensk. Meddel., p. 35.
1861	*Solaster endeca*, M. Sars	Oversigt af Norges Echinodermer, p. 75.
1875	*Solaster endeca*, Lütken	(Nominal list.) Arctic Manual, p. 185.

A few were washed up on the beach, after the gales in the autumn of 1881. No more were seen till the rich haul off Point Franklin, August 31, 1883, when three good-sized specimens were taken.

The species has been recorded from Greenland south to the Gulf of Maine, and from Iceland, the Färöes, Finland, Norway, and on the British coast to the south of Ireland; also from Sitka (*S. endeca* var. *decemradiata* Brandt).

OPHIUROIDEA.

13. OPHIOGLYPHA SARSII (Lütk.) Lyman.

Year.	Name.	Citations.
1854	*Ophiura sarsii et coriacea*, Lütken	Vidensk. Meddel., p. 101.
1857	*Ophiura sarsii*, Lütken	Vidensk. Meddel., p. 49.
1858	*Ophiura sarsii*, Lütken	Additamenta ad Historiam Ophiuridarum, p. 42.
1861	*Ophiura sarsii*, M. Sars	Oversigt af Norges Echinodermer, p. 23.
1865	*Ophioglypha sarsii*, Lyman	Illust. Cat. Mus. Comp. Zoöl., i, p. 41, figs. 2 and 3.
1866	*Ophioglypha sarsii*, Ljungman	Ophiuroidea viventia hucusque cognita. Oefv. af K. Vetensk.-Akad. Förhandl. xxxiii, p. 307.
1871	*Ophioglypha sarsii*, Lütken	Vidensk. Meddel., xxiii. p. 307.
1875	*Ophioglypha sarsii*, Lütken	(Nominal list) Arctic Manual, p. 185.
1878	*Ophioglypha sarsii*, v. Marenzeller	Denkschr. d. K. Akad. d. Wiss., xxxv, pp. 359, 382.
1878	*Ophioglypha sarsi*, Stuxberg	Oefv. af K. Vetensk.-Akad. Förhandl., xxxv, p. 34.
1882	*Ophioglypha sarsi*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 697 et seq.

A large and dark-colored form of this species was found very abundant off Point Franklin in 13½ fathoms.

The species has been recorded from New England, Gulf of St. Lawrence, Labrador, Greenland, England, Norway, Spitzbergen, Nova Zembla (and between Nova Zembla and Franz Josef Land during the drift of the Tegethoff), and as far east as longitude 65° 20′ east (Kara Sea), also from the sea of Ochotsk (*teste* Ljungman).

14. OPHIOGLYPHA ROBUSTA (Ayres) Lyman.

Year.	Name.	Citations.
1851	*Ophiolepis robusta*, Ayres	Proc. Bost. Soc. Nat. Hist., iv, p. 134.
1852	*Ophiura fasciculata*, Forbes	Sutherland's Journal of a Voyage, &c., ii, app., p. cciv.
1854	*Ophiura squamosa*, Lütken	Vidensk. Meddel., p. 100.
1857	*Ophiura squamosa*, Lütken	Vidensk. Meddel., p. 55.
1858	*Ophiura squamosa*, Lütken	Addit. ad Hist. Op., p. 46.
1861	*Ophiura squamosa*, M. Sars	Oversigt af Norges Echinodermer, p. 22.
1865	*Ophioglypha robusta*, Lyman	Illust. Cat. Mus. Comp. Zoöl., i, p. 45.
1866	*Ophioglypha robusta*, Ljungman	Oefv. af K. Vetensk.-Akad. Förhandl., xxxiii, p. 308.
1871	*Ophioglypha squamosa*, Lütken	Vidensk. Meddel., xxiii, p. 307.
1874	*Ophioglypha robusta*, Möbius	2te Deutsche Nordpolarf., ii, p. 259.
1875	*Ophioglypha robusta*, Lütken	(Nominal list) Arctic Manual, p. 185.
1878	*Ophioglypha robusta*, v. Marenzeller	Denskchr. d. K. Akad. d. Wiss., xxxv, pp. 359, 382.
1878	*Ophioglypha robusta*, Stuxberg	Oefv. af K. Vetensk.-Akad. Förhandl., xxxv, p. 34.
1882	*Ophioglypha robusta*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, p. 706.

This species was dredged in very great abundance off Point Franklin in 13½ fathoms. Some individuals have the papillæ of the arm-comb obsolete.

The species has been recorded from New England, the Gulf of St. Lawrence, Labrador, Wellington Channel, Greenland, the Faroes, the Shetland Islands, England, Denmark, Norway, Spitzbergen, Nova Zembla (and to the northward during the drift of the Tegethoff), and the Kara Sea as far east as longitude 65° 20′ east.

15. OPHIOGLYPHA NODOSA (Ltk.) Lyman.

Year.	Name.	Citations.
1854	*Ophiura nodosa*, Lütken	Vidensk. Meddel., p. 100.
1857	*Ophiura nodosa*, Lütken	Vidensk. Meddel., p. 51.
1858	*Ophiura nodosa*, Lütken	Addit. ad Hist. Oph., p. 48.
1865	*Ophioglypha nodosa*, Lyman	Illust. Cat. Mus. Comp. Zoöl., i, p. 49.
1866	*Ophioglypha nodosa*, Ljungman	Oefv. af K. Vetensk.-Akad. Förhandl., xxxiii, p. 308.
1871	*Ophioglypha nodosa*, Lütken	Vidensk. Meddel., xxiii, p. 307.
1875	*Ophioglypha nodosa*, Lütken	(Nominal list) Arctic Manual, p. 185.
1878	*Ophioglypha nodosa*, Stuxberg	Oefv. af K. Vetensk.-Akad. Förhandl., xxxv, p. 34.
1882	*Ophioglypha nodosa*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 695-713.

One good-sized specimen was obtained on the muddy bottom just outside the grounded ice in 15 fathoms, August 8, 1883, and one or two small ones near the station in 2½–3 fathoms. Twenty-five small specimens were obtained in the rich haul off Point Franklin August 31, 1883.

The color of this species when alive is a bright crimson above and white underneath.

It has been recorded from Newfoundland, Greenland, and Spitzbergen, and the Swedish expeditions obtained it at various points along the northern coast of Siberia from Nova Zembla to the Vega's winter quarters.

16. OPHIOPHOLIS ACULEATA (Retz.) Gray.

Year.	Name.	Citations.
1733	*Bellis scolopendrica*, Linck	De Stellis Marinis, p. 52, pl. xi, fig. 71.
1780	*Asterias ophiura*, O. Fabricius	Fauna Grœnlandica, p. 371.
1780	*Asterias aculeata*, Retzius	Asteriæ Genera, p. 246.
1840	*Ophiolepis aculeata*, Müller and Troschel	Wiegman's Archiv, Jahrg. 6, i, p. 328.
1842	*Ophiolepis* (*Ophiopholis*) *scolopendrica*, Müller and Troschel.	System der Asteriden, p. 96.
1848	*Ophiopholis aculeata*, Gray	Radiated Animals of the British Museum, p. 25.
1854	*Ophiopholis scolopendrica*, Lütken	Vidensk. Meddel., p. 103.
1857	*Ophiopholis aculeata*, Lütken	Vidensk. Meddel., p. 52.
1858	*Ophiopholis aculeata*, Lütken	Addit. ad Hist. Oph., pt. i, p. 60, pl. ii, figs. 15, 16.
1861	*Ophiopholis aculeata*, M. Sars	Oversigt af Norges Echinodermer, p. 14.
1866	*Ophiopholis aculeata*, Ljungman	Oefv. af K. Vetensk.-Akad. Förhandl., xxxiii, p. 325.
1871	*Ophiopholis aculeata*, Lütken	Vidensk. Meddel., xxiii, p. 307.
1875	*Ophiopholis aculeata*, Lütken	(Nominal list) Arctic Manual, p. 185.
1878	*Ophiopholis aculeata*, v. Marenzeller	Denkschr. d. K. Akad. d. Wiss., xxxv, pp. 359, 383.
1878	*Ophiopholis aculeata*, Stuxberg	Oefv. af K. Vetensk.-Akad. Förhandl., xxxv, p. 36.
1882	*Ophiopholis aculeata*, Stuxberg	Vega-Exp. Vetenksk. Iakt., i, p. 706.

We found this species very abundant and of large size off Point Franklin in 13½ fathoms. The specimens brought home are indistinguishable from *O. aculeata* from the New England coast, except for the fact that the small deciduous spines on the dorsal surface of the disk are a trifle larger and more numerous, and the skin round the mouth and on the under surface of the arms appears a little thicker.

This occurrence indicates a circumpolar distribution for the species. It would have been natural to suppose that the allied Pacific-coast species, *O. Kennerlyi* Lyman, would be found extending up from the temperate regions into the Arctic Ocean, as *O. aculeata* does on the Atlantic side.

The occurrence of this Atlantic form in this part of the Arctic Ocean may be compared with the occurrence at Point Barrow of two species of birds (*Pelidna subarquata* and *Actodromas fuscicollis*) heretofore supposed to be confined to the eastern coast of the continent.

O. aculeata occurs abundantly on the coast of New England, Newfoundland, the Gulf of St. Lawrence, Labrador, Greenland, Iceland, the Faroes, Norway, the Baltic, the British Islands, Spitzbergen, Nova Zembla (and north towards Franz Josef Land), and the Kara Sea as far east as longitude 65° 35′ east. (Swedish Expeditions.)

17. ASTROPHYTON sp.

While we were fishing for cod in about 18 or 20 fathoms off the East Head of Plover Bay, Eastern Siberia, on the voyage up in 1881, the hooks brought up several fragments of arms and two small, complete individuals of a species of *Astrophyton* of a bright orange red.

As the alcohol was out of reach in the hold, I endeavored to preserve these specimens dry, but they were unfortunately lost in the confusion of landing and building our house in unfavorable weather.

ANTHOZOA.

Alcyonaria.

ALCYONIDÆ.

1. ALCYONIUM RUBIFORME Dana.

Year.	Name.	Citations.
1834	*Lobularia rubiformis*, Ehrenberg	Corallen des Rothen Meeres, p. 158.
1835	*Lobularia rubiformis*, Brandt	Prodr. Descrip., &c., p. 7 (207).
1846	*Alcyonium rubiforme*, Dana	Zoöphytes, U. S. Exploring Expedition, p. 625.
1863	*Alcyonium rubiforme*, Verrill	Mem. Bost. Society Nat. Hist., i, p. 4.
1865	*Alcyonium rubiforme*, Verrill	Proc. Essex Inst., iv, p. 190.
1869 } 1870 }	*Alcyonium rubiforme*, Verrill	Notes on Radiata, from Trans. Conn. Acad. Arts and Sci., i, p. 459 (reprint 1869–'70).

This species was found washed up on the beach in considerable numbers after gales of wind, while the sea remained open. It was dredged in great abundance on the rich ground west of Point Franklin, in 13½ fathoms. Two small specimens were obtained on a pebbly bottom off Port Clarence, in 7½ fathoms, September 4, 1883, and one large and very pale specimen came from a similar bottom at the head of Norton Sound, in 5 fathoms. We also obtained this species on our fishing-lines when catching codfish in about 25 fathoms of water off the entrance to Plover Bay, Siberia. Its color when fresh is a bright strawberry red.

The species has been recorded as occurring in the Arctic Ocean north of Bering Strait, and on the west coast of the strait (North Pacific Exploring Expedition), also Seniavin Strait (Brandt). It also occurs on the banks of Newfoundland, where it is known to the American fishermen as "sea strawberries," according to Capt. J. W. Collins, of the U. S. Fish Commission, and in the Northern seas of Europe.

Alcyonium sp., mentioned in the Vega-Expeditionens Vetenskapliga Iakttagelser, i, as occurring in the Siberian Arctic Ocean, probably refers to this species.

Actinaria.

ACTINIDÆ.

2. URTICINA CRASSICORNIS Ehr.

Year.	Name.	Citations.
1776	*Actinia crassicornis*, Müller	Prodr. Zoöl. Danic., p. 231.
1780	*Actinia spectabilis*, O. Fabricius	Fauna Grœnlandica, 351.
1806	? *Actinia holsatica*, Müller	Zoöl. Danica, iv, p. 23, pl. 139.
1834 {	*Isacmæa (Urticina) crassicornis*, Ehrenberg	Corallen des Rothen Meeres, p. 33.
	? *Actinia elegantissima*, Brandt	Prodromus Descr. Anim., &c., p. 13.
	? *Actinia Laurentii*, Brandt	Op. cit., p. 13.
1847	*Rhodactinia Davisii*, Agassiz	Comptes-rendus, xxxv, p. 677.
1853	*Actinia obtruncata* and *carneola*, Stimpson	Invert. Grand Manan, p. 7.
1864	*Rhodactinia Davisii*, Verrill	Mem. Bost. Soc. Nat. Hist., i, p. 18, pl. i, fig. 9.
1869	*Urticina crassicornis*, Verrill	Synopsis of the Polyps and Corals of the North Pacific Expl. Exp., Part. iv, p. 28 (from Proc. Essex Inst., vi).
1869 } 1870 }	*Urticina crassicornis*, Verrill	Notes on Radiata, from Trans. Conn. Acad. Arts and Sci., i, p. 469 (reprint 1869–'70).
1875	*Actinia (Urticina) crassicornis*, Lütken	(Nominal List.) Arctic Manual, p. 186.
1878	*Urticina felina*, v. Marenzeller	Denkschr. der K. Akadem. der Wissen., xxxv, pp. 358 and 379.

The large sea anemones brought home by the expedition belong, in all probability, to this species, as well as can be made out from alcoholic specimens. The color, when living, varied from bright orange-red to crimson, frequently in splashy stripes on a paler ground.

Large numbers were washed ashore during the great gales in the autumn of 1881, and they were occasionally picked up on the beach during the season of open water of 1882. They appeared to be rather plenty on what was called the "fishing-ground," a place about two miles from the shore, where the natives were catching polar cod through the ice in 10 to 15 fathoms of water. A few large ones were dredged off Point Franklin, in 13½ fathoms.

This species is circumpolar in its distribution, and is recorded from Greenland, Norway, Iceland, England, the east coast of North America as far south as Cape Cod, Bering Strait, Sitka, Puget Sound, and the Arctic Ocean between Nova Zembla and Franz Josef Land.

Subfamily PHELLINÆ.

3. ?PHELLIA ARCTICA Verrill.

Year.	Name.	Citations.
1868	*Phellia arctica*, Verrill	Proc. Essex Inst., vol. v, p. 328.
1869-1870	*Phellia arctica*, Verrill	Notes on Radiata, p. 490 [from Trans. Conn. Acad. Arts and Sci., i], (reprint 1869–'70).

Several specimens of a rather small polyp, with a rough thickened epidermis and covered with grains of sand, were dredged off the station, in from 2½ to 5 fathoms, especially on the patches of mud and sand mixed.

All the specimens have the disk and tentacles retracted, and are much shrunk in the alcohol, so that identification is practically impossible.

They are very likely to belong to this species, which was described by Verrill from a single specimen brought home by the North Pacific Exploring Expedition from the Arctic Ocean north of Bering Strait, in 30 fathoms of water.

A species of *Phellia*, which is probably the same as this, was obtained by the Austro-Hungarian Expedition, in 1873, during their drift between Nova Zembla and Franz Josef Land.

A third species of Actinoid polyp also occurred on the beach in large numbers among the large sea anemones. Specimens were obtained, but were spoiled in the attempt at preservation. In contraction, it appears to be devoid of a sucking disk at the base, and takes a spherical form. The color is white and translucent like pure paraffine, and the radiating septa are visible through the walls, giving it the appearance of a large gooseberry.

HYDROZOA.

My drawings of *Medusæ* observed near Point Barrow, with the notes I made concerning them have been referred to Mr. J. W. Fewkes, of the Museum of Comparative Zoölogy, Cambridge, Mass., who has kindly examined them, and presents the following report:

LIST OF THE MEDUSÆ FROM NEAR POINT BARROW, ARCTIC OCEAN.

By J. Walter Fewkes, Ph. D.

CTENOPHORA.

Beroë roseola (sp. Ag.).
Mertensia ovum Mörch.
Pleurobrachia rhododactyla Ag.

DISCOPHORA.

Aurelia labiata? Cham. et Eyren.
Cyanea Postelsii? Br.
Chrysaora melanaster Br.
Large Discophore, "rich blue violet" in color.

TRACHYMEDUSA.

Ægina citrea Esch.
Aglantha Camtschatica Haeck. (sp. A. Ag.).

HYDROIDA (GONOPHORES).

Gemmaria ?
Melicertum sp. ?
Sarsia rosaria Haeck.
Staurophora Mertensii ? Br.
Medusa resembling *Turris*.

Chrysaora melanaster BRANDT.

Umbrella flat, disk-shaped; radius, a little more than height; diameter, 1 foot. Aboral surface marked with 16 radial stripes of brownish color; 32 marginal lobes, each rounded and destitute of marginal teeth. Sense lappets slightly broader than the tentacular. Oral arms 4 in number; length, 3°; stout at common origin, tapering to pointed extremity, and abundantly fringed with folds on inner margin. Sense bodies, 8. Tentacles, 24; length, 3′. There are 3 tentacles between each pair of sense bodies. Color, bell, mouth-arms, light brown; radial stripes of the umbrella darker; tentacles, dark brown; frills on the oral arms, reddish. Locality, Point Barrow. Taken in August, 1883.

From the colored sketches it is not difficult to distinguish this species as *C. melanaster.* Of other species which the drawings resemble might be mentioned the closely-allied *C. helvola* Brandt. They differ from the latter in not having teethed marginal lappets, in the tentacles being shorter (in *helvola* they are as long as the mouth-arms), and in the colors. The colors agree more closely with those of *C. melanaster* than of *helvola*. There are, however, several differences. The varieties of color in *C. mediterranea* from different localities have been described by Haeckel, and, considering the great variation which he has shown to exist in the same species, we must not lay any great stress on differences of color as a distinguishing feature of different species of *Chrysaora*.

The species (*C. melanaster*), according to Brandt, is never "less than a foot in diameter" (meaning, of course, the adult). Mr. Murdoch's drawings, therefore, represent small, perhaps young, specimens. The sixteen accessory, small, marginal lappets, which in older forms differentiate themselves from the sixteen ocular lappets, are not represented in the drawings. We may account for their absence from the youth of the specimens drawn.

Ægina citrea ESCH.

Since the original description of this species by Eschscholtz in 1829 it has never been reobserved. The locality from which the specimen which he described was taken is 34° N. lat., 201° W. long., North Pacific.

Eschscholtz described two species of *Ægina*, *A. rosea* and *A. citrea*. The *Ægina* collected by Mr. Murdoch resembles more closely the descriptions of the latter.

Alexander Agassiz, in "North American Acalephæ," described from Nahant, Mass., a new genus of hydroid jelly-fishes, which he called *Campanella* (sp. *pachyderma*); this genus is referred by Haeckel to *Ægina*, under the name of *A. pachyderma*. The anatomy of *Campanella* is very different from that of *Ægina*, and unless, with Haeckel, we regard these differences, following Alexander Agassiz's descriptions, as "Beobachtungs fehlern," we can hardly look upon the two as belonging to the same genus. If *Campanella* is generically different from *Ægina*, it is necessary to substitute the name *Æginaria* Haeckel for it, since, as Haeckel has well observed, *Campanella* was applied in 1820 to an Infusorian. A new description is necessary before we can certainly know that *Æginaria* is generically different from *Ægina*.

Of other species of *Ægina*, *A. rhodina* Haeck. and *A. Canariensis* Haeck. were found in the Canaries, and *A. Eschscholtzii* Haeck. in the Azores. The six known species, according to Haeckel, "gehören sämmtlich der wärmeren Zone der nördlichen Erdhälfte." Mr. Murdoch's observation of *A. citrea* in the Arctic Ocean shows, however, that the genus has a wider distribution as far as temperature is concerned. Considering, as Haeckel does, that "*Campanella*" is a species of *Ægina*, his remarks on its limitations in distribution do not hold, for the distribution as known when "Das System der Medusen" was written. The only locality where "*Campanella*" has been taken is Nahant, Mass., which certainly is washed by cold waters and belongs to the colder zone. It is a significant fact that "*Campanella*" has never been taken in the bays south of Cape Cod, where the water is much warmer. The medusæ of Massachusetts Bay are those characteristic of colder waters, while those of Narragansett Bay, which is south of Cape Cod, belong to the warmer zone of the North Atlantic. "*Campanella*" is found in the colder waters, and systematic fishing for a number of years in the latter locality has never brought it to light.

Locality.—Cape Smythe, Alaska.

Aglantha camtschatica Haeck.

The figures add a little to our knowledge of this species. Alexander Agassiz, in his description (North American Acalephæ) of the same from Galiano Island, Gulf of Georgia, says there are from 40 to 48 tentacles. Mr. Murdoch's notes record "96 tentacles." The "three-lobed manubrium," mentioned in the same notes, must have been observed in an abnormal specimen (normally there are never less than four lobes).

TIME OF YEAR WHEN JELLY-FISHES MENTIONED IN THE LIST ABOVE WERE TAKEN.

B. roseola, March 7, July 18.
M. ovum, August 2.
P. rhododactyla, July 18 (in all stages of growth).
A. labiata, August and September.
C. Postelsii, August to September 15, January 7, February 6.
Ch. melanaster, August 11 to October 13.
A. citrea, February 27 to May 31.
Ag. Camtschatica, July 18.
Gemmaria, August 2.
Melicertum, May 24.
S. rosaria, March 9, April 26.
St. Mertensii, August and September.
Turris-like Medusa, March 13.

HYDROZOA.

HYDROIDA (*Trophosomes*).

The Hydroid Medusæ observed by the expedition have been described above by Mr. Fewkes. The following species of Hydroids are represented in the collection by their trophosomes.

1. SERTULARIA VARIABILIS S. F. Clark.

Year.	Name.	Citations.
1876	*Sertularia variabilis*, S. F. Clark	Scientific Results of the Exploration of Alaska, i, p. 17, pl. viii, figs. 40-48, pl. ix, figs. 49, 50.

One large cluster and some fragments were dredged on a pebbly bottom in 5 fathoms near the head of Norton Sound.

Clark has described the species from various points on the coast of Alaska, both from among the Aleutian Islands and from Bering Sea.

2. SERTULARELLA TRICUSPIDATA Hincks.

Year.	Name.	Citations.
1868	*Sertularella tricuspidata*, Hincks	British Hydroid Zoöphytes, p. 239, pl. 47, fig. 1.
1874	*Sertularella tricuspidata*, Kirchenpauer	2te Deutsche Nordpolarf., ii, p. 416.
1875	*Sertularella tricuspidata*, Lütken	(Nominal list) Arctic Manual, p. 190.
1876	*Sertularella tricuspidata*, S. F. Clark	Scient. Res. of Expl. of Alaska, i, p. 20.

This was dredged in very great abundance off Point Franklin, in 13½ fathoms.

It has been recorded from the Aleutian Islands and the Shumagins, and also from Greenland.

3. THUIARIA CYLINDRICA S. F. Clark.

Year.	Name.	Citations.
1876	*Thuiaria cylindrica*, S. F. Clark	Scient. Res. of Expl. of Alaska, i, p. 22, pl. x, fig. 57.

Several specimens of a *Thuiaria* were dredged off Point Franklin in 13½ fathoms, which I refer with some doubt to this species.

It differs from Clark's types in the National Museum in having the longitudinal rows of hydrothecæ less obvious, and the apertures of the hydrothecæ directed alternately in opposite directions.

This species was originally described from the eastern shores of Bering Sea.

4. TUBULARIA sp.

A good-sized species of *Tubularia*, closely resembling *T. indivisa*, but apparently having more numerous oral tentacles, and of a bright crimson color, both stem and head, was quite abundant on the patches of mud and sand mixed, close to the station, in 2½ to 3 fathoms of water.

TUNICATA.

ASCIDIACEA.

ASCIDIÆ SIMPLICES.

1. ? BOLTENIA sp.

Several large *Boltenias*, in form closely resembling the ordinary *B. bolteni* of the Atlantic coast, were found washed up on the beach October 13, 1881, after a heavy westerly gale. They were a brilliant red in color.

The same (?) species was also dragged up by the cod-lines in about 18 or 20 fathoms of water off the mouth of Plover Bay, Eastern Siberia.

2. ? MOLGULA sp.

A small round Ascidian, always covered with sand, and probably a species of *Molgula*, was dredged in considerable numbers on the patches of mud and sand mixed, in about 2½ fathoms, close to the station.

3. HALOCYNTHIA PYRIFORMIS (Rathke) Verr.

Year.	Name.	Citations.
......	*Ascidia pyriformis*, Rathke	Zoöl. Danica, iv, p. 41, pl. clvi, figs. 1, 2.
1780	*Ascidia villosa*, O. Fabricius	Faun. Grœnl., 322 (*teste* Lütken).
1788	? *Ascidia aurantium*, Pallas	Nova Acta Petropolitana, ii, p. 246, pl. vii, fig. 38.
1842	*Ascidia pyriformis*, Möller	Nat. Tids., i R., iv, p. 95.
1871	*Cynthia pyriformis*, Dall	American Journal of Conchology, vii, pt. 2, p. 157.
1875	*Cynthia pyriformis*, Lütken	(Nominal list.) Arctic Manual, p. 138.

A single rather small specimen of this species was picked up on the beach near the station. Mr. Dall found it of large size and brilliant coloring at Plover Bay, Eastern Siberia, and at Petropaulovsk, Kamtschatka.

It is recorded on the eastern coast of North America from Massachusetts Bay to Greenland, and also from Norway.

Pallas (loc. cit.) records it from the Kurile Islands, but the specimens of *Lophothuria fabricii*, in association with which this species was brought to him, are believed to have come from St. Paul's Island, Bering Sea.

THALIACEA.

4. ? SALPA HERCULEA Dall.

Year.	Name.	Citations.
1871	*Salpa herculea*, Dall	American Journal of Conchology, vii, pt. 2, p. 158.

As we approached the Aleutian Islands in August, 1881, we observed many enormous solitary *Salpæ*, 4 or 5 inches in length.

Judging by their size and the red color of the viscera, they probably belong to the species provisionally described by Mr. Dall as above.

LARVACEA.

5. APPENDICULARIA sp.

From August 8 to 15, 1883, the water swarmed with myriads of a large *Appendicularia* floating backwards and forwards with the tide. The animals were extricating themselves from their "houses" and swimming free. The discarded "houses" continued to drift about for days, and were washed up on the beach in windrows.

POLYZOA.

The study of the Polyzoa brought home by the expedition has been attended with great difficulty on account of the absence of identified material in the National Museum for comparison.

I have been able to make out three species, which were preserved in alcohol. They are as follows:

CHILOSTOMATA.

1. GEMELLARIA LORICATA (Lin.) Busk

Year.	Name.	Citations.
1758	*Sertularia loricata*, Linné	Syst. Naturæ edit. x, p. 815.
1867	*Gemellaria loricata*, Smitt	Oefv. af K. Vetensk-Akad. Förhandl., xxiv, p. 286, pl. xvii, fig. 54.
1875	*Gemellaria loricata*, Lütken	(Nominal list.) Arctic Manual, p. 140.
1878	*Gemellaria loricata*, v. Marenzeller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 389.
1878	*Gemellaria loricata*, Smitt	Oefv. af K. Vetensk-Akad. Förhandl., xxxv, p. 18.
1882	*Gemellaria loricata*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 697-705 (*passim*).

One large cluster was found washed up on the beach near the station.

It has been recorded from the Baltic, Norway, Spitzbergen, Greenland, England, the Gulf of Saint Lawrence, New England, Nova Zembla, and northwards towards Franz Josef Land during the drift of the Tegethoff.

2. FLUSTRA PAPYREA (Pall.) Smitt.

Year.	Name.	Citations.
......	*Eschara papyrea*, Pallas	Elenchus Zoophyt., p. 56.
1867	*Flustra papyrea*, Smitt	Oefv. af K. Vetensk-Akad. Förhandl., xxiv, p. 359, pl. xx, figs. 9-11.
1875	*Flustra papyracea*, Lütken	(Nominal list). Arctic Manual, p. 140.
1878	*Flustra papyrea*, Smitt	Oefv. af Vetensk-Akad. Förhandl., xxxv, No. 3, p. 16.

This species occurred in very great abundance off Point Franklin, in 13½ fathoms.

It has been found on the eastern coast of North America north of Cape Cod, in Greenland, the Mediterranean (*teste* Smitt), and the Atlantic from the British islands to Spitzbergen and Nova Zembla.

3. LEIESCHARA SUBGRACILIS (D'Orb.) Smitt.

Year.	Name.	Citations.
1780	*Millepora truncata*, O. Fabricius	Fauna Grœnl., p. 435.
1863	*Myriozoum subgracile*, Packard	Can. Natur. & Geol., viii, p. 411, pl. ii, fig. 5.
1867	*Myriozoum subgracile*, Smitt	Oefv. af K. Vetensk-Akad. Förhandl., xxiv, Bihang, p. 18.
1875	*Myriozoum subgracile*, Lütken	(Nominal list). Arctic Manual, p. 140.
1878	*Myriozoum subgracile*, v. Marenzeller	Denkschr. d. K. Akad. d. Wiss., xxxv, p. 389.
1878	*Leieschara subgracilis*, Smitt	Oefv. af K. Vetensk-Akad. Förhandl., xxxv, No. 3, p. 20.
1882	*Leieschara subgracilis*, Stuxberg	Vega-Exp. Vetensk. Iakt., i, pp. 697–706 (*passim*).

This was very abundant off Point Franklin. It has been previously obtained in Labrador, (Packard), Greenland (Fabricius and Lütken), Spitzbergen, and Nova Zembla (Swedish expeditions), and north of Nova Zembla towards Franz Josef Land (Austro-Hungarian Expedition).

Membranipora sp. and *Discopora?* sp. were found incrusting the dead gastropod shells that washed up on the beach.

At least two other other species of Polyzoa, which at present cannot be determined, were dredged off Point Franklin.

PORIFERA.

At least three large species of sponges, one (probably) keratose and two (or three?) silicious were dredged off Point Franklin.

They were all obtained in considerable abundance, and are in a good state of preservation, but are quite indeterminable with the resources at my command. They will have to be reserved for future special study.

SUMMARY OF CRUSTACEA AND PYCNOGONIDA.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.
CRUSTACEA.				
Chionœcetes opilio		*		
Hyas latifrons	*	*		
Eupagurus trigonocheirus	*	*		*
Eupagurus splendescens	*	*		*
Cheraphilus boreas	*	*	*	
Nectocrangon lar	*			
Crangon vulgaris				*
Hippolyte fabricii		*		
Hippolyte gaimardii	*	*		
Hippolyte spinus		*		
Hippolyte phippsii		*		
Pandalus dapifer		*		
Mysis rayii	*			
? Diastylis rathkii var	*			
Diastylis sp	*			
Diastylis sp		*		
Arcturus hystrix		*		
Chiridotea entomon	*			
Chiridotea sabinei	*			
Synidotea bicuspida		*		*
Hyperia medusarum	*			
Themisto libellula	*			
Eurytenes gryllus	*	*		
Onisimus litoralis	*			
Stegocephalus ampulla		*		
Eusirus cuspidatus	*			
CRUSTACEA—continued.				
Rhachotropis aculeata		*		
Acanthostepheia malmgreni	*			
Paramphithoe panopla		*		
Acanthozone polyacantha		*		
Atylus swammerdamii		*		
Gammarus locusta	*			
Melita formosa	*			
Melita leonis				*
Gammaracanthus loricatus	*			
Dulichia arctica	*			
Lepidurus glacialis	*			
Branchinecta paludosa	*			
Polyartemia hazeni	*			
Balanus ? porcatus	*	*		
Peltogaster paguri	*			
Daphnia ? sp	*			
Cyclops ? sp	*			
PYCNOGONIDA.				
Nymphon grossipes		*		*
Nymphon longitarse	*			
Total, Crustacea, 44	29	21	1	6
Pycnogonida, 2	1	1	0	1

NOTE.—The locality (Point Barrow) includes the beach and sea near the station, Elson Bay, and the fresh-water ponds of the tundra.

SUMMARY OF WORMS.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.
Polynoe scabra		*			? Aricia arctica	*			
Polynoe islandica		*			Travisia forbesi	*			
Polynoe sarsi	*				Arenicola glacialis	*			
Melænis lovéni	*				Brada granulata	*			
Melænis lovéni var. gigantea	*				Maldane ? sp	*			
Nephthys cœca	*			*	Pectinaria sp	*			
Eteone sp	*				Echiurus vulgaris	*			
Phyllodoce grœnlandica	*				Phascolosoma sp	*			
Phyllodoce sp	*				Sagitta sp	*			
Castalia multipapillata	*								
Autolytus sp	*				Total, 20	18	2	0	1

SUMMARY OF ECHINODERMS.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Plover Bay, Siberia.[1]	Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Plover Bay, Siberia.[1]
Pentacta frondosa		*				Cribrella sanguinolenta		*			
Lophothuria fabricii		*				Crossaster papposus	*	*			
Myriotrochus rinkii	*					Solaster endeca	*	*			
? Trochostoma boreale	*					Ophioglypha sarsii		*			
						Ophioglypha robusta		*			
Strongylocentrotus dröbachiensis	*	*	*	*		Ophioglypha nodosa	*	*			* ?
Asterias accervata	*			*		Ophiopholis aculeata		*			
? Asterias violacea				*		Astrophyton sp					*
Asterias sp			*								
Leptasterias arctica		*				Total, 17	7	11	2	3	2 ?

[1] Dragged up on cod-lines.

SUMMARY OF ANTHOZOA.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Plover Bay, Siberia.[1]	Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Plover Bay, Siberia.[1]
Alcyonium rubiforme	*	*	*	*	*	?	*				
Urticina crassicornis	*	*									
Phellia sp	*					Total, 4	4	2	1	1	1

[1] Dragged up on cod-lines.

SUMMARY OF HYDROZOA.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.
Beroë roseola	*	*			Melicertum ? sp	*			
Mertensia ovum	*				Sarsia rosaria	*			
Pleurobrachia rhododactyla	*				Staurophora mertensii ?	*			
Aurelia labiata ?	*			*	Turris ? sp	*			
Cyanea postelsii ?	*			*	Sertularia variabilis				*
Chrysaora melanaster	*				Sertularella tricuspidata		*		
Ægina citrea	*				Thuiaria cylindrica		*		
Aglantha camtschatica	*								
Gemmaria ? sp	*				Total, 17	14	3	0	3
Tubularia sp	*								

SUMMARY OF TUNICATES.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Plover Bay, Siberia.[1]	North Pacific.[2]
Boltenia sp	*				*	
? Molgula sp	*					
Halocynthia pyriformis	*					
Chelysoma macleayanum		*				
? Salpa herculea						*
Appendicularia sp	*					
Total, 6	4	1	0	0	1	1

[1] Dragged up by cod-lines. [2] Gulf of Alaska.

SUMMARY OF POLYZOA.

Species.	Point Barrow.	Point Franklin.	Port Clarence.	Norton Sound.	Plover Bay, Siberia.[1]
Gemellaria loricata	*				
Flustra papyrea		*			*
Membranipora sp	*				
Leieschara subgracilis		*			
Discopora sp	*				
Total, 5	3	2	0	0	1

[1] Dragged up on cod-lines.

In the foregoing report I have endeavored to make the synonymy of the species as complete as possible for references to works on arctic and boreal zoology, and have generally confined myself to such references.

The following list does not undertake to be a complete bibliography of the subject, but contains the most important works, chiefly on arctic or boreal zoology, which I have been able to examine myself. They are arranged chronologically.

LIST OF WORKS CONSULTED IN THE PREPARATION OF THIS REPORT.

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1774. PHIPPS, CONSTANTINE JOHN. A Voyage towards the North Pole undertaken by his Majesty's command. 1773. By Constantine John Phipps, London.

1776. MÜLLER, O. F. Zoölogiæ Danicæ Prodromus, seu Animalium Daniæ et Norwegiæ indigenarum characteres, nomina et synonyma imprimis popularium. Auctore Othone Friderico Müller, Regi Daniæ a Consiliis Status, Acad. Scient. N. Curios. Holmens. et Boicæ, Havniens, Norv. Berolinens. aliarumque Societ. Liter. Sodali, Acad. Paris Corresp. Copenhagen.

1780. FABRICIUS, OTHO. Fauna Grœnlandica, systematice sistens Animalia Grœnlandiæ occidentalis hactenus indagata, quoad nomen specificum, triviale, vernaculumque; synonyma auctorum plurium, descriptionem, locum, victum, generationem, mores, usum; capturamque singuli, prout detegendi occasio fuit maximaque parte secundum proprias observationes Othonis Fabricii ministri evangelii, quondam Grœnlandis ad coloniam Friderichshaab, posthac norvagis Drangedaliæ, nunc vero Danis Hopunti Iutiæ, membri societate scientiarum quæ est Hafniæ. pp. xvi, 452, pl. 1. Hafniæ et Lipsiæ.

1788. FABRICIUS, OTHO. Beskrivelse over den store Grönlandske Krabbe, ved Otho Fabricius. Nye Samling af det Kongelige Danske Videnskabers Selskabs Skrivter. Tredie Deel. Kjöbenhavn.

1788–1806. MÜLLER, O. F. Zoölogia Danica seu Animalium Daniæ et Norwegiæ rariorum ac minus notorum Descriptiones et Historia. Auctore Othone Friderico Müller, Regi Daniæ a consiliis confer. Acad. Scient. et Cur. Bonon. Holm. et Boicæ, Havn. Norv. Berol. Bern. Dantisc. et Lond. sc. Societ. Lit. Sodali Acad. Paris. Corresp. Folio: Vols. i and ii, 1788; iii, 1789; iv, 1806. Copenhagen.

1788. PALLAS, P. S. Marina varia nova et rariora; descripsit P. S. Pallas. Nova Acta Academiæ Scientiarum Imperialis Petropolitanæ. Tomus ii, pp. 229–249, pls. v–vii. St. Petersburg.

1820. SAVIGNY, J. C. Système des Annelides principalement de celles des côtes de l'Égypte et de la Syria, offrant les Charactères tant distinctifs que naturels des Ordres, Familles et Genres, avec la description des Espèces; par Jules César Savigny, Membre de l'Institut de l'Égypte. pp. 128, pls. i–v. Paris.

1820. **SCORESBY, W., jr.** An Account of the Arctic Regions, with a History and Description of the Northern Whale Fishery. By W. Scoresby, jr., F. R. S. E. Illustrated by 24 engravings. In 2 vols. 8vo. Edinburgh: printed for Archibald Constable & Co.

1824. **SABINE, EDWARD.** (Marine) Invertebrate Animals, by Captain Edward Sabine. A supplement to the Appendix of Captain Parry's Voyage for the Discovery of the Northwest Passage, in the years 1819-'20, containing an account of the subjects of Natural History. pp. ccxix-ccxxxix, pls. i-ii. London.

1830. **EDWARDS, H. MILNE.** Extrait de Recherches pour servir à l'Histoire Naturelle des Crustacés amphipodes. Par M. H. Milne-Edwards. Annales des Sciences Naturelles, par MM. Audouin, Ad. Brongniart et Dumas, comprenant la physiologie animale et végétale, l'anatomie comparée des deux règnes, la zoologie, la botanique, la minéralogie et la géologie. Tome vingtième, accompagné de planches. pp. 353-399, pls. 10-11. Paris.

1835. **BRANDT, JOHANNES FRIDERICUS.** Prodromus descriptionis Animalium ab H. Mertensio observatorum auctore Johanne Friderico Brandt. Fascic. i. Polypos, Acalephas Discophoras et Siphonophoras, necnon Echinodermata continens. Récueil des Actes de la séance publique de l'Académie Impériale des Sciences de St. Pétersbourg, tenue la 29 Décembre, 1834. pp. 201-275. St. Petersburg.

1835. **ROSS, JAMES CLARK.** Account of the Objects in the several departments of Natural History, seen and discovered during the present expedition. By Capt. James Clark Ross, R. N., F. R. S., F. R. A. S., F. L. S., &c. Marine Invertebrate Animals. pp. lxxxiv-c, pls. B and C. Appendix to the narrative of the Second Voyage in Search of a Northwest Passage, and of a residence in the Arctic Regions during the years 1829, 1830, 1831, 1832, 1833. By Sir John Ross, C. B., K. S. A., K. C. S., &c., &c., Captain in the Royal Navy. Including the reports of Commander, now Captain, James Clark Ross, R. N., F. R. S., F. L. S., &c., and the discovery of the Northern Magnetic Pole. London.

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1841. **KRÖYER, HENRIK.** Udsigt over de nordiske Arter af Slaegten Hippolyte, ved Henrik Kröyer. Naturhistorisk Tidsskrift. Udgivet af Henrik Kröyer. iii, pp. 570-579. Kjöbenhavn.

1842. **KRÖYER, HENRIK.** Nye nordiske Slaegter og Arter af Amfipodernes Orden, henhörende til Familien Gammarina, (Forelöbigt Uddrag af et större Arbejde) ved Henrik Kröyer. Naturhistorisk Tidsskrift. Udgivet af Henrik Kröyer. iv, pp. 141-166. Kjöbenhavn.

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1843. **OERSTED, A. S.** Grönlands Annulata Dorsibranchiata beskrivne af A. S. Oersted. pp. 64, pls. viii. Kjöbenhavn.

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1844. **KRÖYER, HENRIK.** Bidrag til Kundskab om Pycnogoniderne eller Söspindlerne. Ved Henrik Kröyer. Naturhistorisk Tidsskrift. Udgivet af Henrik Kröyer. Andet Rœkke. i, pp. 90-139, pl. i. Kjöbenhavn.

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(Second title page.) Dr. A. Th. v. Middendorff's Reise in den Äussersten Norden und osten Sibiriens. Band ii Zoölogie Theil 1. Wirbellose Thiere: Annulaten. Echinodermen. Insecten. Krebse. Mollusken. Parasiten. Bearbeitet von F. Brandt, W F. Erichson, Seb. Fischer, E. Grube, E. Ménétries, A. Th. v. Middendorff (mit 32 lithographirten Tafeln). St. Petersburg.

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1852. BAIRD, WM. Monograph of the family Apodidæ, a family of Crustaceans belonging to the division Entomostraca; with a description of a new species of Apus, and two species of Ostracoda belonging to the genus Cypris. By W. Baird, M. D., F. L. S., etc. (Annulosa, pl. xxii, xxiii.) Proceedings of the Zoölogical Society of London, pt. xx, 1852, pp. 1-8. London.

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Insects:
Edwards, W. H.: Diurnal lepidoptera.
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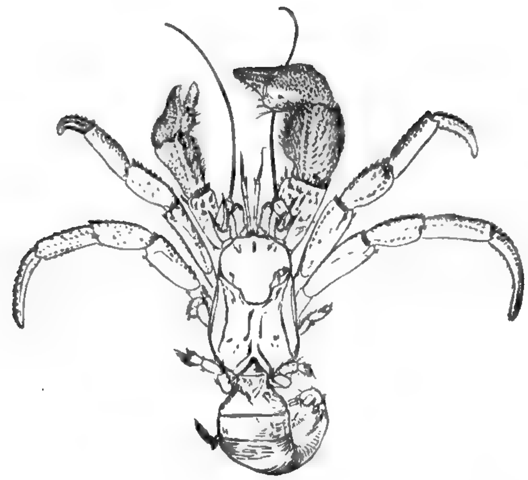
MARINE INVERTEBRATES.

PLATE I.

CRUSTACEA.

1. *Eupagurus trigonocheirus* Stimpson. $\frac{1}{1}$.
1*a*. Same. Right hand. $\frac{2}{1}$.
1*b*. Same. Left hand. $\frac{2}{1}$.
2. *Pandalus dapifer*, n. s. ♀. $\frac{3}{1}$.
2*a*. Same. Third pleonal segment of ♂. $\frac{3}{1}$.
2*b*. Same. Telson and uropods. $\frac{4}{1}$.
2*c*. Same. First and second thoracic legs. $\frac{5}{1}$.
3. *Mysis rayii*, n. s. $\frac{4}{1}$.
4. *Acanthozone polyacantha*, n. s. $\frac{4}{1}$.

(Drawn from nature by J. Henry Blake.)



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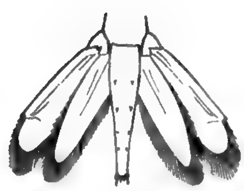

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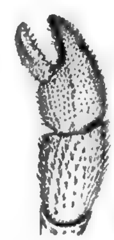

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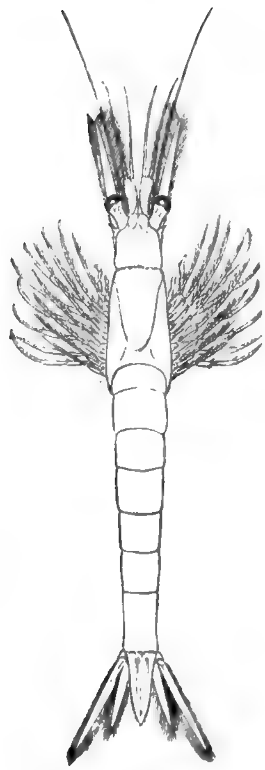

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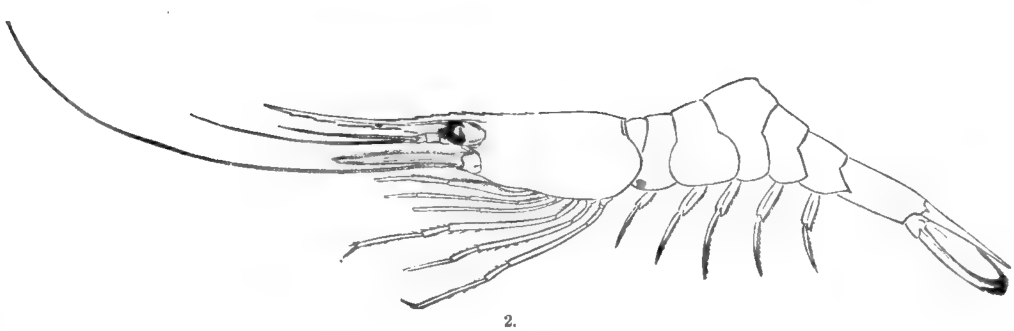

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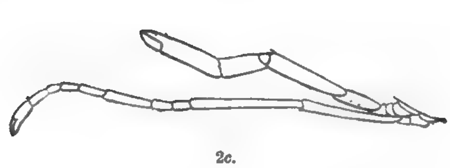

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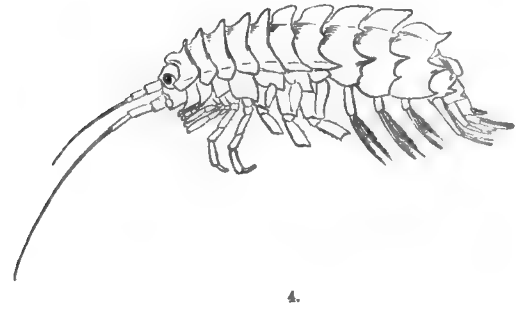


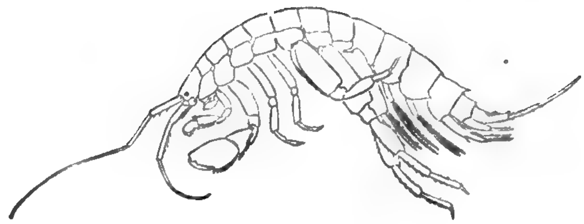
4.

PLATE II.

CRUSTACEA.

1. *Melita formosa*, n. s. $\frac{4}{1}$.
1*a*. Same. Pleon from above. $\frac{6}{1}$.
1*b*. Same. Hand of second gnathopod. $\frac{8}{1}$.
2. *Melita leonis*, n. s. $\frac{3}{1}$.
2*a*. Same. Pleon from above. $\frac{6}{1}$.
2*b*. Same. Hand of second gnathopod. $\frac{8}{1}$.
3. *Dulichia arctica*, n. s. $\frac{6}{1}$.
4. *Polyartemia hazeni*, n. s. $\frac{7}{1}$. ♀.
4*a*. Same. Abdomen and ovisac of ♀ from below. $\frac{10}{1}$.
4*b*. Same. Head and "claspers" of ♂. $\frac{8}{1}$.

(Drawn from nature by J. Henry Blake.)



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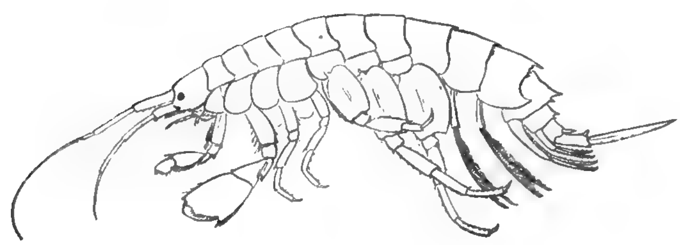

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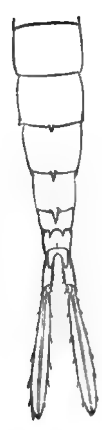

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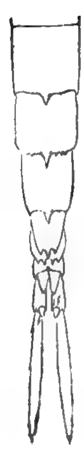


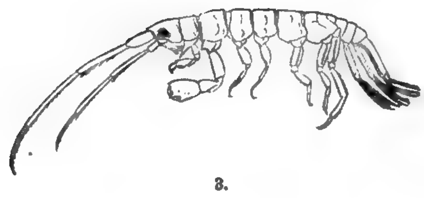
2a.

2b.

1b.

4b.

4a.



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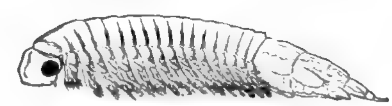


4.

VI.—REPORT ON THE MOLLUSKS.

By W. H. Dall.

Opportunities for collecting mollusks are not very good at this northernmost point of the United States. The shores are covered with snow during a large part of the year, and the waters with ice. The latter is frequently grounded and driven upon the beach or over the shoal water adjacent to the beach, so that mollusks must find it a rather disagreeable station to inhabit, provided they can secure themselves against freezing or crushing. There are no fresh-water shells, though it is probable that a few species occur at a not very great distance inland. The shore is composed of sand and gravel, which is constantly undergoing minor changes. There are few seaweeds, and the phytophagous littoral mollusks, so abundant at most stations more favorably situated, are altogether absent. There are some places along this stretch of coast where strong currents meet and ice seldom grounds; where eddies permit the deposition of a moderate amount of mud and occasional small seaweeds manage to exist, anchored on little pebbles or riding on the backs of crabs. In such places mollusks abound, individuals, if not species, being numerous. One such locality is well known as a good dredging ground, namely the vicinity of the Seahorse Islands or Cape Franklin, from a couple of hauls near which the best part of the present collection was obtained. A few additions were made to the list in Norton Sound, Unalashka Harbor, &c., but the opportunities for dredging or surface-collecting were not abundant. Considering the disadvantageous circumstances, the naturalists of the party must be commended for their energy and success.

SPECIES COLLECTED.

CEPHALOPODA.

Octopus grœnlandicus (Dew.) Mörch.

A fine specimen on the beach near the station. This has been examined by Professor Verrill, who agrees with the writer as to its distinctness from the *O. punctatus* Gabb, so common further south. Museum number, 40953.

PTEROPODA.

Limacina Pacifica Dall.

On the surface of the water off the station in July, 1882. Collectors' number, 650; museum number, 40954. This pretty species, which is very much larger than the Atlantic form, was originally described from the North Pacific.

GASTROPODA.

PULMONATA.

Cochlicopa lubrica Müller.

Cionella subcylindrica Lehnert, Science Record, vol. ii, No. 8, p. 172, Boston, June 16, 1884.

Two specimens in moss from the tundra near Uglaämi.

Zonites (Conulus) Stearnsii Bland.

Hyalina arctica Lehnert, l. c., p. 172.

Ten or twelve specimens from the tundra moss. This has been erroneously referred to the genus or section *Microphysa*.

H. Ex. 44——23

Zonites (Hyalina) radiatula Alder.

Hyalina pellucida Lehnert, l. c.

Three or four specimens with the preceding.

The above were obtained from moss used in packing and rejected as rubbish, which was examined by the Rev. E. Lehnert, of Washington, who published in Science Record an interesting list of plants obtained from it, together with a spider, a minute beetle, and the above-mentioned shells. By the kindness of Mr. Lehnert they have been carefully compared with authoritative specimens, and he joins in the identification above made.

Bela (exarata Möller ?).

This specimen is too dead and worn to be determined with certainty. It was obtained by dredging 10 miles west from Point Franklin August 31, 1883, in 13½ fathoms. Museum number, 40955.

Bela (scalaris Möller ?).

This specimen was in much the same state as the preceding. It was dredged in Norton Sound in 5 fathoms mud. Museum number, 40956.

Bela simplex Middendorff.

B. arctica A. Adams.

B. gigas Verkruzen.

One dead but perfect specimen from 5 fathoms mud and sand at Cape Smythe. This species has been confounded with *B. lævigata* Dall, which is about one-eighth as large when adult, and altogether different in color and form. *B. lævigata* has hitherto only been found in Norton Sound, where it is abundant. *B. simplex* has not yet been found in Norton Sound, but has a wide distribution in the boreal and Arctic region, reaching as far south as Chirikoff Island in the North Pacific. It has been obtained on the northern shores of Norway, and is not rare in Bering Sea. The present specimen is uni-colored, but it is usually prettily contrasted with white on the spire and plum-color anteriorly. Museum number, 40957.

Bela tenuilirata Dall.

Bela var. *tenuilirata*, Dall, Am. Journ. Conch., vii, p. 98, November, 1871.

? *B. simplex*, G. O. Sars, Moll. Reg. Arct. Nov., t. 17, f. 4, 1878, not of Middendorff.

This species, distinguished from the preceding by its spiral striæ and thinner shell, was originally described from a young specimen obtained in Norton Sound. Since then the writer has obtained it of much larger size from the Arctic, reaching nearly an inch in length. It was collected by Murdoch on the beach near the station, and also at Cape Smythe in 5 fathoms. Museum number, 40958.

Bela harpa Dall.

Bela harpa Dall, Proc. U. S. Nat. Mus. 1884, p. 523.

Shell fusiform, moderately thin, six-whorled; whorls rounded, suture distinct; sculpture consisting of (on the last whorl) 23 stout, uniform, slightly flexuous, rounded ribs, extending from the suture to the canal, with slightly narrower interspaces; lines of increase distinct, sometimes thread-like; these are crossed by numerous close-set spiral threads separated by narrower grooves, both faint near the suture; threads growing gradually stronger, regularly wider, and coarser toward the canal, near which they are stronger than the obsolete ends of the transverse ribs; anal fasciole indistinct, aperture narrow, elongated, with an acute posterior angle; outer lip thin, columella simple, canal rather wide; color of shell whitish, with a reddish tinge anteriorly, especially on the last whorl; interior of aperture reddish, of the canal pure white. Longitude of shell 17, of last whorl 12.5, of aperture, 10; latitude of shell 8, of aperture 3.5^{mm}. First found by the writer at Nunivak Island in 1874. One specimen, dredged by the Point Barrow Expedition in 13½ fathoms, 10 miles west of Point Franklin, Arctic Ocean. Museum number, 40959.

This species has been compared with the Belas in the chief museum and private collections of Northern Europe, and seems amply distinct from any of the species contained in them.

Bela murdochiana Dall.

Bela murdochiana Dall, l. c., p., 524, plate 2, fig. 8.

Shell whitish, stout, short, with rather coarse sculpture and very short spire; whorls about five, last much the largest; inflated, suture deep, almost channeled; sculpture of numerous (on the last whorl about two to the millimeter) narrow, backwardly convex, flexuous riblets, with about equal interspaces, strongest near the suture, not crossing the fasciole, and obsolete near the periphery; lines of growth distinct, crossed by numerous (about six to the millimeter) rather coarse threads, of which each alternate one tends to be smaller, separated by narrow grooves, and about uniformly distributed over the surface, with a tendency to a faint carina in front of the fasciole; fasciole indistinct, outer lip sharp, columella simple, white; aperture pinkish, canal short, wide; nuclear whorls eroded in the specimens; operculum light horn color, rather broad and short; soft parts pink. Longitude of shell 11.5, of last whorl 10; maximum latitude of shell 8.5^{mm}. Museum number, 40960.

Specimens from Cape Smythe in 2 to 5 fathoms mud and sand, with young *B. tenuilirata*, from which they differ in lighter color of shell, coarser sculpture, and stouter proportions. The operculum of *B. tenuilirata* is almost black, narrow, and claw-shaped. It is dedicated to Mr. Murdoch, naturalist of the Point Barrow party.

Admete Middendorffiana Dall.

Admete viridula Midd. Mal. Ross., ii, pl. ix, figs. 13–14, 1849; not of Fabricius.

This form is perfectly distinct from *A. viridula*, and may prove to be a *Cancellaria*. It is one of the characteristic forms of the Pacific Arctic, and ranges north from Nunivak Island. The present specimen was obtained in Norton Sound in 5 fathoms mud. Museum number, 40961.

Buccinum tenue Gray.

Beach near the station; also at the dredging spot 10 miles west of Point Franklin in 13½ fathoms. Museum number, 40962.

The specimens from the last station included some in which the characteristic broken ribbing was only represented by a few puckerings near the suture, the remainder of the shell being inflated and smooth, except for the fine spiral striation. At first sight these were very puzzling, and might readily have been taken as new without careful study.

Buccinum Baeri Middendorff.

One specimen from 10 miles off Point Franklin in 13½ fathoms, dead, and inhabited by a *Pagurus*. This is a very constant form, but probably only an extreme form of *B. cyaneum*. Museum number, 40963.

Buccinum ciliatum Fabricius.

One dead and two living specimens from 10 miles west from Point Franklin in 13½ fathoms. Museum number, 40964. This is always a very recognizable species, but rare in individuals. It extends in Bering Sea, south to Nunivak Island.

Buccinum glaciale Linné. Plate —, figs. 7–8.

Beach near station; also yith *Paguri* in various dredgings. Museum number, 40965. Common to the whole of the Arctic basin north of St. Laurence Island, as well as on the Atlantic side. Further south it assumes other forms, some of which, without the connecting links, appear very distinct, and have been described as species by Mörch and others. The strictly Arctic varieties are *B. carinatum* Phipps, and a form which in its coarser features so closely simulates *B. angulosum* var. *angulosum* Gray that it has been taken for it, and the consolidation with *B. glaciale* of *B. angulosum* suggested in consequence. The fine sculpture in perfect specimens will always serve to distinguish them. Normal specimens would never be confounded with each other.

Buccinum angulosum Gray. Plate —, figs. 1–4.

A. Var. *angulosum* Gray, Beechey's Voyage. Zoöl., p. 127, t. 36, f. 6, 1828.
B. Var. *normalis* Dall.
C. Var. *subcostata* Dall.

The normal form was obtained by the expedition on the beaches near the station and at Cape Smythe; thence to 5 fathoms. Museum numbers, 40966–7. The writer has also obtained it at numerous points in this part of the Arctic basin. The angulated form is less common, and every grade exists between them. The fine sculpture, and especially the sharp transverse striæ, always distinguish it from other species, especially the angulated varieties of *glaciale.*

Buccinum plectrum Stimpson. Plate III, figs. 9, 10.

Beaches near the station. Museum number, 40968. The variety collected by the expedition is a rather dwarfed form, with intensified sculpture. The metropolis of the species is further south, and I have seen fine specimens from the Shumagins. This is an excellent species and easily distinguished when in good order. It has been mistaken for a variety of *B. undatum*, which is not found in any shape on the Pacific side. A few fraudulent specimens were sent out as from this region by a recently deceased conchologist, but they bore all the marks of having come from London dealers. It is possible that the whalers, who carry and mix shells from all parts of the world, may have been the unintentional means of having distributed a few specimens with erroneous locality labels.

Buccinum polare Gray. Plate III, figs. 5, 6.

Beaches near station; also dredged in 13½ fathoms off Point Franklin. Museum numbers, 40969–70.

This species, which is also well characterized, varies from inflated, large, with fine, sharp carinæ to small, elongated, with obsolete carinæ, and is sometimes rather puzzling; but a good series makes the relations clear. It is frequently of a bright, clear orange color, and is generally quite thin. I have seen two specimens of a singularly thick and short variety *percrassum* from the Arctic north of Bering Strait. It must be exceedingly rare; the upper whorls are smaller, less inflated and less turreted than in the normal form. The operculum is also proportionally larger and more oval. It may prove distinct from *polare.*

Chrysodomus Kroyeri Möller.

C. Kroyeri, var. *Rayana* Dall, l. c., p. 525.

One small one in the state called *cretaceum* by Reeve, at Cape Smythe, on the beach; a very large living specimen of the normal form, in 5 fathoms, from the same locality, some with few ribs from 2½ fathoms at the same place. Museum numbers, 40971–2. This shell, when fresh and perfect, is of a plum color or dull purple, with fine, spiral striæ, recalling *B. tenue*, and strong transverse ribs. When dead and weathered, it turns nearly white—this is Reeve's form; an extraordinary variety *Rayana* has no ribs but is perfectly smooth, except for the fine sculpture which enables its true relations to be determined. This last, named in honor of Lieut. P. H. Ray, United States Army, who commanded the Point Barrow expedition, would be taken as distinct at first sight. The specimens were all rather young, which made their recognition still more difficult. It was also dredged at Cape Smythe.

Chrysodomus liratus Martyn.

C. tornatus Gould.

One specimen from the beach near the station. Museum number, 40973. The metropolis of this species is much further south.

Chrysodomus fornicatus (Gmel.) Gray.

Rare on the beach near the station; abundant near the Mackenzie River mouth, and at Nunivak Island, with innumerable varieties. Museum number, 40974.

Chrysodomus spitzbergensis Reeve.

C. terebralis Gould.

One young living specimen, Norton Sound, in 5 fathoms. Museum number, 40975.

Chrysodomus martensi Krause.

One specimen on beach near station. Museum number, 40976. This species was obtained by the writer in Bering Strait in 1880, in 30 fathoms; subsequently by Dr. A. Krause in the same region, in whose report it is about to be described.

Heliotropis harpa (Mörch) Dall.

Fusus deforme Midd. Mal. Ross, ii, p. 140, 1849, not of Reeve.

One young, living specimen in 13½ fathoms, 10 miles west of Point Franklin. Museum number 40977. This species is distinguished from *F. deforme* by its coarser spiral striæ and brighter colors. It extends south to the Aleutians, where it reaches a very large size. The undefined name *Pyrulofusus* was applied to the Atlantic species by Mörch.

Strombella Beringii (Midd.) Dall.

Tritonium Beringii Midd. Mal. Ross, ii, p. 147, pl. 3, figs. 5–6. 1849.

A dead specimen on the beach near the station. Museum number, 40978.

The genus *Strombella* Gray is slightly anterior to *Volutopsis* of Mörch, and has the advantage of a diagnosis. The *Strombella* of Schleuter, which has been unnecessarily assumed to exclude Gray's name, has no standing whatever, being a mere word in a catalogue without diagnosis or identified type or description of any kind.

This species has fewer transverse ribs than *Chrysodomus Kennicottii* Dall, with which it has been confounded, and wants the fine characteristic sculpture of the latter. From the following species it differs in its light color; rude, short spire, absence of carinæ, more rapidly increasing whorls, rounded concavities between more numerous ribs, and few coarse spiræ or threads.

Strombella malleata Dall.

Strombella malleata Dall, l. c., p. 525.

One specimen from the beach near the station. Museum number, 40979. The writer has collected this species at Icy Cape, Cape Lisburne, Point Lay, Kotzebue Sound, Point Spencer, at Port Clarence, and other localities within the Arctic basin.

It is long and slender, the young shell forming several whorls in an almost cylindrical coil before they begin to enlarge; the adult may reach six inches in length. The surface is covered with fine spiral striæ and a thin brown epidermis. It differs from the preceding in its dark purple color, its few (generally five) transverse ribs, between which the space is nearly flat rather than concave, and a sharp carina on the anterior periphery of the last whorl on which the suture is laid. The nucleus is large and blunt, the canal short, the form of the mouth variable in different stages and specimens; the outer lip thin, the aperture dark purple within the last whorl, less than half the length of the shell in nearly all cases. It is usually rude and more or less worn, even when living; the cylindrical tip is usually broken off, but the polygonal section of the whorl is very characteristic.

Trophon clathratus L.

A dead specimen at Cape Smythe, and another, rather stouter, at 10 miles west from Point Franklin, in 13½ fathoms, mud and sand. Museum number, 40980. This species is very variable in relative proportions and closeness of varices.

Turritella (Tachyrhynchus) polaris Beck.

T. erosa Couthouy.

One specimen, ten miles west of Point Franklin, in 13½ fathoms mud. Museum number, 40981.

Trichotropis borealis Broderip & Sowerby.

One specimen in 5 fathoms; Norton Sound; dead. Museum number, 40982.

Trichotropis (Iphinoë) arctica (Midd.) Dall.

Cancellaria arctica Midd. Mal. Ross, ii, p. 112, pl. ix, figs. 11, 12, 15, 1849.

Beach near station, also Norton Sound, in 5 fathoms. Museum number, 40983. It was originally brought by Wossnessenski from Bering Strait.

Crepidula grandis Middendorff.

One young specimen from 13½ fathoms, 10 miles west from Point Franklin. Museum number, 40984.

Natica clausa Broderip & Sowerby.

Common on the beach near the station: also at Cape Smythe, $2\frac{1}{2}$ to 5 fathoms; also off Point Franklin in $13\frac{1}{2}$ fathoms. Museum numbers, 40985–6. The specimens have the fine brown color which seems characteristic of those from more northern stations; a few show the white basal area characteristic of *N. russa*, but do not otherwise approach that species; all are of moderate size and rather thin.

The identification of Gmelin's *affinis* with this species does not seem sufficiently certain to render its adoption in place of *clausa* desirable.

Lunatia pallida Broderip & Sowerby.

Abundant in the same localities as the preceding. Museum numbers, 40987–8.

Lunatia (Bulbus) flavus Gould.

Natica flava Gould, Sill. Journ., xxxviii, p. 196.
Rep. Inv. Mass., p. 239, fig. 162, 1842.

A few fine dark brown specimens from the beach near the station. Museum number, 40989. This elegant species is quite distinct from the *Natica* (*Bulbus*) *Smithii* of the north of Europe.

Lunatia (Mamma) nana Möller.

One specimen from Norton Sound in 5 fathoms. Museum number, 40990.

Amauropsis purpurea Dall.

A. helicoides Middendorff, not Johnstone.

With *N. clausa*, but less common. Museum number, 40991.

Velutina coriacea (Pall.) Middendorff.

One specimen on beach near the station. Museum number, 40992.

Scala groenlandica Chemnitz.

One specimen with the preceding. Museum number, 40993.

Margarita striata Brod. & Sow.

One or two specimens from the beach near the station. Museum number, 40994.

Margarita vorticifera Dall.

One specimen with the preceding. Museum number, 40995.

This is much further north than the species was previously known to range.

Margarita obscura Couthouy.

Several specimens from 5 fathoms mud in Norton Sound. Museum number, 40996.

Patella (Helcioniscus) exarata Reeve.

A single specimen of this well-known Hawaiian species was collected dead on the beach. It was undoubtedly thrown overboard with ballast from some whaler which had refitted at Honolulu, and is interesting as showing an accident of distribution, like Mr. Lord's living *Orthalicus undatus* from Vancouver Island. Museum number, 40997.

Amicula vestita (Sby.) Dall.

Chiton Emersonii Couthouy.

Abundant 10 miles west of Point Franklin in $13\frac{1}{2}$ fathoms. Museum number, 40998.

Cylichna alba Brown.

A few specimens from 5 fathoms mud and sand off Cape Smythe. Museum number, 40999.

Cylichna propinqua M. Sars.

Rather abundant in $2\frac{1}{2}$ to 5 fathoms off Cape Smythe. Museum numbers, 41000–41001.

? Dendronotus Dalli Bergh.

One specimen of a species of *Dendronotus* was taken in the act of spawning, off Cape Smythe, in 5 fathoms, August 14. As the above species is the only one described from north of Bering Strait it is probable that it should be so identified. Museum number, 41002.

Aeolidia papillosa (Linné) Bergh.

With the last, and also crawling on the stones, at low-water near the station. Museum number, 41003.

NOTE.—This completes the list of gastropods, but it may be mentioned that a specimen of *Priene oregonense* Redf. was brought by the expedition from Unalashka, but, belonging to a different fauna, it has not been formally included in the list.

ACEPHALA.

Mya truncata Linné.

Living on the beach near the station of Uglaämi. Museum number, 41004.

Macoma sabulosa Spengler.

Beach near the station and at Cape Smythe in 2½ to 5 fathoms. Museum number, 41005.

Liocyma fluctuosa (Gld.) Dall.

Cape Smythe, 2½ to 5 fathoms; also 10 miles west of Point Franklin, in 13½ fathoms mud and sand. Museum number, 41006.

Cardium (Serripes) grœnlandicum Chemnitz.

Living near low-water mark to 2½ fathoms at the station; also Norton Sound at 5 fathoms, and at Cape Smythe in 2½ to 5 fathoms. Collector's numbers, 195 and 1761. Museum numbers, 41007–8.

Cardium islandicum Gmelin.

Norton Sound, in 5 fathoms mud. Museum number, 41009.

Cryptodon sericatus Carpenter.

At Cape Smythe in 5 fathoms; also off Point Franklin in 13½ fathoms, mud and sand. Museum number, 41010.

Astarte (Rictocyma) Esquimalti (Baird) Dall.

Crassatella Esquimalti Baird.
Rictocyma mirabilis Dall (young).

Two specimens, 10 miles off Point Franklin, in 13½ fathoms. Museum number, 41011.

Astarte fabula Reeve.

Norton Sound in 5 fathoms. Museum number, 41012.

Venericardia borealis Conrad.

One specimen of the variety *V. novangliæ* Morse was found on the beach near the station. Museum number, 41013.

Yoldia limatula Say.

One specimen from 15 fathoms, mud, off Point Barrow. Museum number, 41014.

Yoldia myalis Couthouy.

Off Cape Smythe in 2½ to 5 fathoms. Museum number, 41015.

Yoldia lanceolata Sowerby.

With the last. Museum number, 41015*a*.

Pecten islandicus Gmelin.

Living, off Point Franklin in 13½ fathoms; dead, on the beach near the station. The color of these northern specimens is apt to be of a peculiarly deep rich tint of red in various shades. The living specimen carried on its upper valve a fine specimen of *Chelysoma macleayanum*, an *Actinia*, numerous Sertularian hydroids, and several species of *Polyzoa*. Museum number, 41016.

BRACHIOPODA.

Rhynchonella (Hemithyris) psittacea (Ch.) D'Orbigny.

Attached to dead shells from 13½ fathoms off Point Franklin. Museum number, 41017.

SUMMARY.

Species.	Point Barrow.	Point Franklin.	Norton Sound.
Cochlicopa lubrica	*		
Zonites stearnsii			
radiatula	*		
Octopus grönlandicus			
Limacina pacifica	*		
Bela exarata		*	
scalaris			
simplex	*		
tenuilirata	*		(*)
harpa		*	
murdochiana	*		
Admete middendorffiana			
Buccinum tenue		*	
var. baeri		*	
ciliatum		*	
glaciale	*	*	*
angulosum	*		
var. normalis	*		
plectrum	*		
polare	*	*	
Chrysodomus kroyeri	*		
var. rayana	*		
liratus	*		
fornicatus	*		
spitzbergensis			*
mattonsi	*		
Heliotropis harpa		*	
Strombella Beringii	*		
malleata	*		
Trophon clathratus	*	*	
Turritella polaris		*	
Trichotropis borealis			*
Iphinoë arctica	*		*
Crepidula grandis		*	
Natica clausa	*	*	(*)

Species.	Point Barrow.	Point Franklin.	Norton Sound.
Lunatia pallida	*	*	(*)
Bulbus flavus	*		
Mamma nana			
Amauropsis purpurea	*	*	(*)
Velutina coriacea			
Scala grönlandica	*		
Margarita striata	*		
vorticifera	*		
obscura			*
Amicula vestita		*	
Cylichna alba	*		
propinqua	*		
Dendronotus dalli	*		
Aeolida papillosa	*		
Mya truncata	*		
Macoma sabulosa	*		
Liocyma fluctuosa	*		
Cardium grönlandicum	*		*
islandicum			*
Cryptodon sericatus	*	*	
Astarte esquimalti		*	
tabula		( )	*
Veneticardia borealis	*		
Yoldia limatula	*		
myalis	*		
lanceolata	*		
Pecten islandicus	*	*	
Hemithyris psittacea		*	
Chelysoma macleayanum		*	
Appendicularia sp	*		
Total mollusks, 61	44	21	12
Total Brachiopods, 1	0	1	
Total Ascidians, 2	1	1	

It is apparent from this list* that four families greatly preponderate, namely the *Pleurotomidæ*, *Buccinidæ*, *Naticidæ*, and *Trochidæ*, as represented by *Margarita*. While the party doubtless obtained a full representation of species resident at or near the station itself, it should be added that the mollusk fauna of the Arctic basin adjacent is considerably larger than the number of species included in the preceding list. There is practically but one fauna from Nunivak Island northward to the Polar region, though there are a number of species which do not occupy the whole area, especially littoral forms.

The writer has been gathering material for twenty years toward a faunal description of this region and hopes before long to be able to prepare it for publication, a task which, from the pressure of other duties, has hitherto been unavoidably deferred.

Towards such a complete description such contributions as this, made by the party under the command of Lieut. P. H. Ray, are particularly valuable, and to Mr. Murdoch and his companions, who went into practical exile for two years for the benefit of science, the sincere recognition and hearty thanks of all naturalists are unquestionably due.

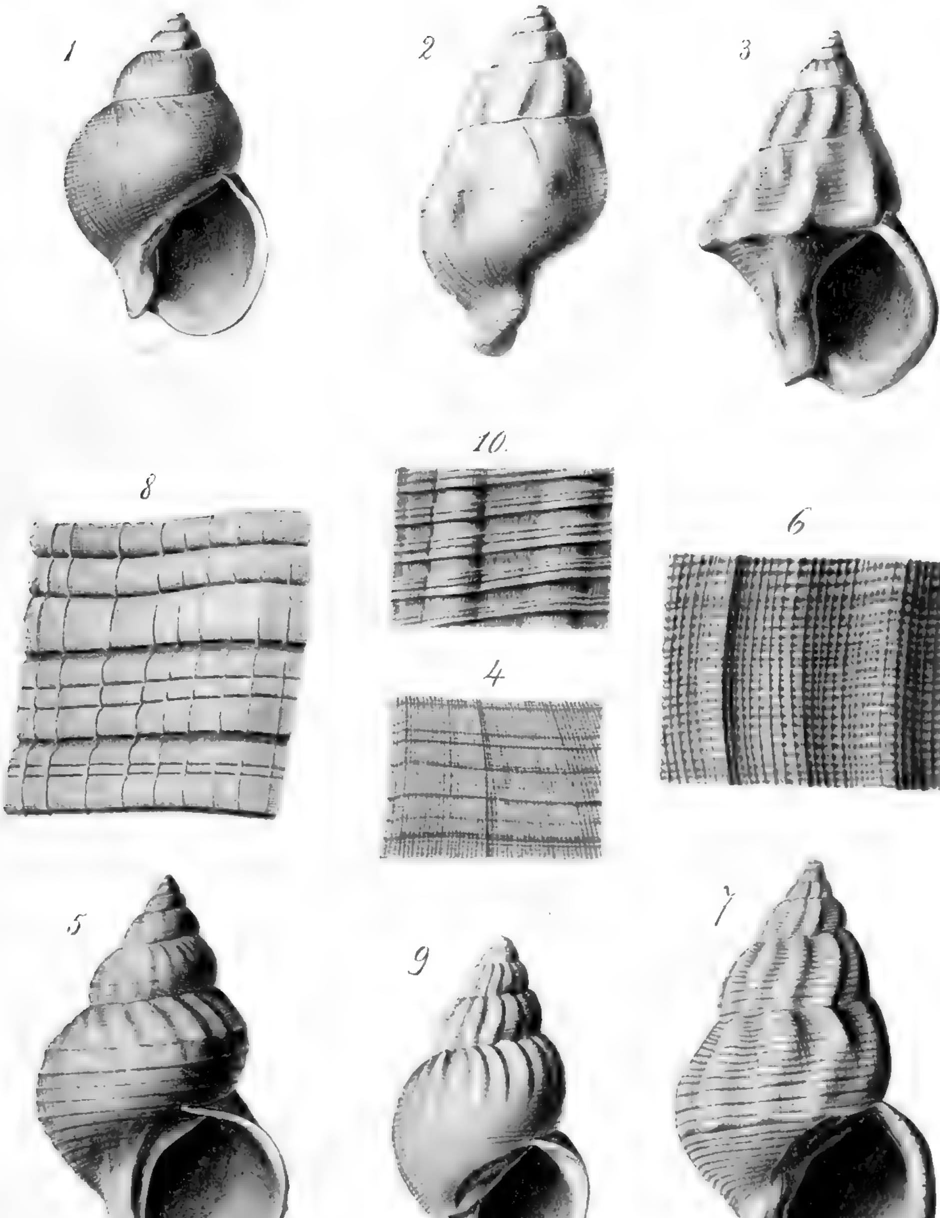
*In the list, species obtained at Cape Smythe, Point Barrow, and near the station Uglaami, all within a short distance of one another, are included under the heading "Point Barrow."

REPORT ON POINT BARROW MOLLUSCA.

EXPLANATION OF PLATE.

Fig. 1. BUCCINUM ANGULOSUM, Gray, *forma normalis.*
Fig. 2. BUCCINUM ANGULOSUM, Gray, *forma subcostata.*
Fig. 3. BUCCINUM ANGULOSUM, Gray, *forma angulata, typica.*
Fig. 4. BUCCINUM ANGULOSUM, Gray, *superficies,* × 10 *magnif.*
Fig. 5. BUCCINUM POLARE, Gray, *forma normalis.*
Fig. 6. BUCCINUM POLARE, Gray, *superficies,* × 10 *magnif.*
Fig. 7. BUCCINUM GLACIALE, Linne, *forma normalis.*
Fig. 8. BUCCINUM GLACIALE, Linne, *superficies,* × 10 *magnif.*
Fig. 9. BUCCINUM PLECTRUM, Stm., *forma percrassa, minor.*
Fig. 10. BUCCINUM PLECTRUM, Stm., *superficies,* × 10 *magnif.*

NOTE.—The figures of shells are all natural size.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VII.—COLLECTING LOCALITIES AND DREDGING STATIONS.

By John Murdoch, A. M., *Sergeant Signal Corps, United States Army.*

1. BEACH, CAPE SMYTHE.

This locality comprises the steep pebbly beach and the inlets of the lagoons from about a mile and a half above the station of Ooglaamie to about 3 miles below it.

This stretch of shore was pretty thoroughly patrolled nearly every day during the season of open water. The daily tide is so small that few animals were washed up by its means, and the occasional periods of low water, caused by long-continued off-shore winds, exposed no shore-dwelling animals. The sea was never low enough to uncover the mud flats which are close to the shore. Most of the animals obtained on the beach were washed up whenever there happened to be a strong breeze and heavy sea on-shore.

Soon after we landed in 1881 there occurred several heavy gales from the west and northwest, and, as the ice-pack was a remarkable distance from the land, an exceedingly heavy sea rolled in upon the beach, bringing vast quantities of material. We were unfortunately so busy providing ourselves with shelter against the rapidly approaching winter that we were unable to preserve any specimens, and so favorable an opportunity never recurred.

Most of the material showed signs of having been transported a considerable distance. The lamellibranch shells especially were crushed and ground into small fragments.

The following species were obtained at this locality:

CRUSTACEA.

1. *Hyas latifrons.*
2. *Eupagurus trigonocheirus.*
3. *Cheraphilus boreas.*
4. *Nectocrangen lar.*
5. *Hippolyte gaimardii.*
6. ? *Diastylis rathkii* var.
7. *Chiridotea entomon.*
8. *Chiridotea sabinei.*
9. *Hyperia medusarum.*
10. *Themisto libellula.*
11. *Eurytenes gryllus.*
12. *Onisimus littoralis.*
13. *Eusirus cuspidatus.*
14. *Melita formosa.*
15. *Gammaracanthus loricatus.*
16. *Peltogaster paguri.*

VERMES.

17. *Melœnis lovéni* var. *gigantea.*
18. *Arenicola glacialis.*
19. *Echiurus vulgaris.*

ECHINODERMATA.

20. ? *Trochostoma boreale.*
21. *Strongylocentrotus dröbachiensis.*
22. *Asterias acervata.*
23. *Crossaster papposus.*
24. *Solaster endecea.*

ANTHOZOA.

25. *Alcyonium rubiforme.*
26. *Urticina crassicornis.*
27. ? ?

ACALEPHÆ.

28. *Beroë roseola.*
29. *Aurelia labiata?*
30. *Cyanea postelsii?*
31. *Chrysaora melanaster.*
32. *Staurophora mertensii.*

MOLLUSCA.

33. *Octopus grœnlandicus.*
34. *Limacina pacifica.*
35. *Bela tenuilirata.*
36. *Buccinum tenue.*
37. *Buccinum glaciale.*
38. *Buccinum angulosum;* var. *normalis.*
39. *Buccinum plectrum.*
40. *Buccinum polare.*
41. *Chrysodomus kröyeri.*
42. *Chrysodomus liratus.*
43. *Chrysodomus fornicatus.*
44. *Chrysodomus martensi.*
45. *Strombella beringii.*
46. *Strombella malleata.*
47. *Trophon clathratus.*
48. *Trichotropis (Iphinoë) arctica.*
49. *Natica clausa.*
50. *Lunatia pallida.*
51. *Lunatia (Bulbus) flavus.*
52. *Amauropsis purpurea.*
53. *Velutina coriacea.*
54. *Scala grœnlandica.*
55. *Margarita striata.*
56. *Margarita vorticifera.*
57. *Patella (Helcioniscus) exarata.*
58. *Æolidia papillosa.*
59. *Mya truncata.*
60. *Macoma sabulosa.*
61. *Cardium (Serripes) grœnlandicum.*
62. *Venericardia borealis.*
63. *Pecten islandicus.*

TUNICATA.

64. *Boltenia* sp.
65. *Halocynthia pyriformis.*

POLYZOA.

66. *Gemellaria loricata.*
67. *Membranipora* sp.
68. *Discopora* sp.

PORIFERA.

69. One or two species of sponges, undetermined.

2. SHOAL WATER ALONG SHORE, PERGNIAK, ELSON BAY.

The large fish-seine was hauled three times from the shore, in the southwest bend of Elson Bay, close to the Eskimo summer camp of Pergniak, August 11, 1883. A few small whitefish and sculpins were caught, and the lead-line of the seine brought up a quantity of seaweed containing many amphipods of the following two species:

Gammarus locusta.
Gammaracanthus loricatus.

3. OFF CAPE SMYTHE.

Opportunities for dredging near the station were seldom offered on account of ice and bad weather. Most of the work was confined to a small area extending about a mile above and below the station, and from a depth of about 2½ fathoms, close to the shore, to 12 fathoms about a mile from the land. The bottom for the most part was an exceedingly tenacious and fetid black mud containing very little life except Worms and the large Isopods *Chiridotea entomon* and *sabinei.* Interspersed with this, however, were occasional patches of sand and mud mixed, which contained more life. During the season of open water these patches were generally pretty well indicated by the flocks of ducks swimming over them, attracted by the comparatively rich food.

Dredgings were obtained August 14, 1882, and August 7 and 9, 1883. On August 8, 1883, an opportunity occurred to dredge in 15 fathoms, about three miles above the station and about two miles from shore, just outside the barrier of grounded ice. Two hauls of the dredge were obtained with great difficulty as the current was too feeble to make our whaleboat drag the dredge. One haul was made by making the boat fast to a large cake of floating ice. The bottom was the same black mud and contained animals similar to those obtained at the inshore stations.

The following species were obtained in this locality:

PYCNOGONIDA.

1. *Nymphon longitarse.*

CRUSTACEA.

2. *Eupagurus splendescens.*
3. *Mysis rayii.*
4. *Diastylis* sp.
5. *Chiridotea sabinei.*
6. *Eurytenes gryllus.*
7. *Acanthostepheia malmgreni.*
8. *Gammarus locusta.*
9. *Dulichia arctica.*

VERMES.

10. *Polynoë sarsi.*
11. *Melænis lovéni.*
12. *Nephthys coeca.*
13. *Eteone* sp.
14. *Phyllodoce grœnlandica.*
15. *Phyllodoce* sp.
16. *Castalia multipapillata* (surface).
17. *Autolytus* sp. (surface).
18. ? *Aricia arctica.*
19. *Travisia forbesi.*
20. *Arenicola glacialis.*
21. *Brada granulata.*
22. ? *Maldane* sp.
23. *Pectinaria* sp. (tubes).
24. *Phascolosoma* sp.
25. *Sagitta* sp. (surface).

ECHINODERMATA.

26. *Myriotrochus rinkii.*
27. *Ophioglypha nodosa.*

ANTHOZOA.

28. *Urticina crassicornis.*
29. *Phellia* sp.

ACALEPHÆ (SURFACE).

30. *Beroë roseola.*
31. *Mertensia ovum.*
32. *Pleurobrachia rhododactyla.*
33. *Aurelia labiata.* ?
34. *Cyanea postelsii.* ?
35. *Chrysaora melanaster.*
36. *Ægina citrea.*
37. *Aglantha camtschatica.*
38. *Gemmaria.* ?
39. *Tubularia* sp. (dredged).
40. *Melicertum* sp.
41. *Sarsia rosaria.*
42. *Staurophora mertensii.*
43. *Medusa* resembling *Turris.*

MOLLUSCA.

44. *Bela simplex.*
45. *Bela tenuilirata.*
46. *Bela murdochiana.*
47. *Buccinum glaciale.*
48. *Buccinum angulosum* var. *normalis.*
49. *Chrysodomus kröyeri.*
50. *Chrysodomus kröyeri* var. *rayana.*
51. *Natica clausa.*
52. *Lunatia pallida.*
53. *Amauropsis purpurea.*
54. *Cylichna alba.*
55. *Cylichna propinqua.*
56. *Dendronotus* ? *Dalli.*
57. *Æolidia papillosa.*
58. *Macoma sabulosa.*
59. *Liocyma fluctuosa.*
60. *Cardium* (*Serripes*) *grœnlandicum.*
61. *Cryptodon sericatus.*
62. *Yoldia limatula.*
63. *Yoldia myalis.*
64. *Yoldia lanceolata*

TUNICATA.

65. *Molgula* sp.

4. OFF POINT FRANKLIN.

One haul of the dredge was made August 31, 1883, as the schooner drifted with the current about 10 miles west of Point Franklin, in 13½ fathoms of water.

The bottom consisted of small pebbles, sand, and dead shells, and the dredge came up filled with animals of the following species:

PYCNOGONIDA.

1. *Nymphon grossipes.*

CRUSTACEA.

2. *Chionœcetes opilio.*
3. *Hyas latifrons.*
4. *Eupagurus trigonocheirus.*
5. *Eupagurus splendescens.*
6. *Cheraphilus boreas.*
7. *Hippolyte fabricii.*
8. *Hippolyte spinus.*
9. *Hippolyte gaimardii.*
10. *Hippolyte phippsii.*
11. *Pandalus dapifer.*
12. ? *Diastylis rathkii* var.
13. *Diastylis* sp.
14. *Synidotea bicuspida.*
15. *Arcturus hystrix.*
16. *Eurytenes gryllus.*
17. *Stegocephalus ampulla.*
18. *Rhachotropis aculeata.*
19. *Paramphithoë panopla.*
20. *Acanthozone polyacantha.*
21. *Atylus swammerdamii.*

VERMES.

22. *Polynoë scabra.*
23. *Polynoë islandica.*

ECHINODERMATA.

24. *Pentacta frondosa.*
25. *Lophothuria fabricii.*
26. *Strongylocentrotus dröbachiensis.*
27. *Leptasterias arctica.*
28. *Cribrella sanguinolenta.*
29. *Crossaster papposus.*
30. *Solaster endeca.*
31. *Ophioglypha sarsii.*
32. *Ophioglypha robusta.*
33. *Ophioglypha nodosa.*
34. *Ophiopholis aculeata.*

ANTHOZOA.

35. *Alcyonium rubiforme.*
36. *Urticina crassicornis.*

ACALEPHÆ.

37. *Sertularella tricuspidata.*
38. *Thuiaria cylindrica.*

MOLLUSCA.

39. *Bela ? exarata.*
40. *Bela harpa.*
41. *Buccinum tenue.*
42. *Buccinum baeri.*
43. *Buccinum ciliatum.*
44. *Buccinum glaciale.*
45. *Buccinum polare.*
46. *Heliotropis harpa.*
47. *Trophon clathratus.*
48. *Turritella polaris.*
49. *Crepidula grandis.*
50. *Natica clausa.*
51. *Lunatia pallida.*
52. *Amauropsis purpurea.*
53. *Amicula vestita.*
54. *Cryptodon sericatus.*
55. *Astarte esquimalti.*
56. *Pecten islandicus.*

TUNICATA.

57. *Chelysoma macleayanum.*

BRACHIOPODA.

58. *Hemithyris psittacea.*

POLYZOA.

59. *Leieschara subgracilis.*
60. *Flustra papyrea.*

PORIFERA.

Two or three species of sponges, undetermined.

5. OFF PORT CLARENCE.

Three hauls of the dredge were made while drifting off the entrance to Port Clarence, September 4, 1883, in a depth of about 7½ fathoms. The bottom was pebbly and life scanty.

The following species were obtained:

CRUSTACEA.

1. *Cheraphilus boreas.*

ECHINODERMATA.

2. *Strongylocentrotus dröbachiensis.*
3. *Asterias* sp.

ANTHOZOA.

4. *Alcyonium rubiforme.*

6. HEAD OF NORTON SOUND.

The dredge was hauled from the vessel near the head of Norton Sound, not far from St. Michael's, September 12, 1883, in about 5 fathoms.

The bottom was pebbly and life rather scanty, comprising the following species:

PYCNOGONIDA.

1. *Nymphon grossipes.*

CRUSTACEA.

2. *Eupagurus trigonocheirus.*
3. *Eupagurus splendescens.*
4. *Crangon vulgaris.*
5. *Synidotea bicuspida.*
6. *Melita leonis.*

VERMES.

7. *Nephthys cœca.*

ECHINODERMATA.

8. *Strongylocentrotus dröbachiensis.*
9. *Asterias acervata.*
10. ? *Asterias violacea.*

ANTHOZOA.

11. *Alcyonium rubiforme.*

ACALEPHÆ.

12. *Sertularia variabilis.*

MOLLUSCA.

13. *Bela ? scalaris.*
14. *Admete middendorffiana.*
15. *Buccinum glaciale.*
16. *Chrysodomus spitzbergensis.*
17. *Trichotropis borealis.*
18. *Iphinoe arctica.*
19. *Mamma nana.*
20. *Margarita obscura.*
21. *Cardium grœnlandicum.*
22. *Cardium islandicum.*
23. *Astarte fabula.*

It will be seen from the above lists that the region immediately about Point Barrow (Stations 1, 2, and 3) though comparatively poor in individuals, is quite rich in number of species, at least 115 having been collected. Of these the most abundant are Mollusks (41 species exclusive of land shells), Crustacea (22 species, not counting fresh-water forms), and Worms (19 species).

At Point Franklin (Station 4), on the other hand, although fewer species were obtained (62 in all) the number of individuals was simply enormous. The Mollusks were most numerous in species (21 species) but comparatively few in individuals. Crustacea were plentiful, both species and individuals. The Echinoderms were most abundant in individuals, though only 11 species were obtained. Great quantities of the two species of Polyozoa also were collected.

At Stations 5 and 6 animal life was poor both in species and individuals, though 12 species of Mollusks were obtained at Station 6.

VIII.—PLANTS.

By Prof. ASA GRAY, *Cambridge, Mass.*

This collection probably comprises most of the Phanerogamous plants growing at that Arctic station; some of them not before received by us from that region, rich as our herbarium is in Arctic American plants.

One of these is *Ranunculus Pallasii*, a most peculiar white-flowered species, which we now for the first time possess in copious specimens. With it comes a very depauperate *R. multifidus*, *R. pygmæus* and *R. nivalis*, and a radicant form of *Caltha palustris*, with leaves hardly a half inch long at flowering-time.

Papaver nudicaule appears to be the most abundant, and perhaps the most showy, plant of that Arctic flora.

Parrya nudicaulis is not in the collection, but Miss Heppingstone found it on Cape Lisburne. The other Cruciferæ are *Cochlearia officinalis*, or some other of the ill-defined species, *Draba alpina*, and some related white-flowered species which are not determined for want of fruit.

Stellaria longipes, var. *Edwardsii*, *S. humifusa*, and a condensed form of *Cerastium alpinum* are the only *Caryophyllaceæ*, and *Astragalus alpinus* and *A. frigidus* are the only *Leguminosæ*.

The *Rosaceæ* are *Dryas octopetala*, var. *integrifolia*, and *Potentilla emarginata* Pursh., the latter in numerous and fine specimens. A very dwarf form of this species from Wrangel Island was inadvertently named *P. frigida* in the list of Muir's collection.

The *Saxifragæ* are *S. oppositifolia*, *S. hirculus*, *S. flagellaris*, *S. sileniflora*, *S. hieracifolia*, *S. punctata*, in a most reduced form, with some stems only a span high, a compact inflorescence, and small leaves which are crenately 7–9-lobed rather than dentate, which is here called var. *nana*, also *S. stellaris*, var. *convexa*, *S. rivularis*, var. *hyperborea*, and *S. cernua*.

Valeriana capitata of Pallas was sparingly collected.

The *Compositæ* are only three, *Petasites frigida*, *Senecio frigidus*, and Arctic forms of *Taraxacum officinale*, var. *lividum*.

The *Ericaceæ* are even fewer, being only *Vaccinium vitis-idæa* and *Cassiope tetragona*.

The remaining *Gamopetalæ* are only *Mertensia maritima* in a condensed form, *Pedicularis Sudetica*, and *P. Langsdorffii*.

The *Apetalæ*, *Polygonum viviparum*, *Oxyria digyna*, *Rumex salicifolius*, and the following willows, which have been examined and named by Mr. Bebb. An abstract of his notes upon them is here given:

Salix ovalifolia, Trautv., in both sexes, and with well-formed fruit. Clearly an Arctic modification of *S. myrtilloides*, with subsessile capsules.

Salix glacialis, Anderss., with female flowers, and young foliage, agreeing with the character in the want of a style.

Salix buxifolia, Trev. (*S. phlebophylla* Anderss.), with nervose lineate leaves and a manifest style.

Salix rotundifolia Trautv., which is probably only *S. polaris* with glabrous capsules.

Salix fulcrata Anderss., in both sexes. Distinguished from *S. chlorophylla* mainly by its stipules, which in these specimens answer to Siemann's plant, but not to Andersson's figure.

No petaloideous Monocotyledon was collected except *Luzula arcuata*; of *Glumaceæ*, only *Eriophorum Chamissonis* and an immature *Carex*, which may be *C. vulgaris*; and of grasses a fine stock of *Phippsia algida*, *Arctagrostis* (*Colpodium*) *latifolia*, *Alopecurus alpinus*, *Graphephorum* (*Dupontia*) *Fischeri*; and *G. fulvum*, *Poa benisia*, and *P. arctica*, also a true *Colpodium*, the species undetermined.

Dr. Farlow adds the following report upon the Lower Cryptogamia of the Point Barrow collections:

I would make the following report on the cryptogams collected at Point Barrow and submitted to me for examination. The lichens consisted of three packages, each containing a single tuft of unpressed material. Two of the tufts were composed of *Cetraria islandica* Ach., var. *Delisæi* Bor., and the third of *Alectoria divergens* (Ach.) Nyl., mixed with which were fragments of *Cetraria arctica* (Hook.) and *Thamnolia vermicularis* (Sw.) Schaer. There was a quantity of fungi preserved in a jar of alcohol, but without notes of color, habit, &c., so that the specific determination is in their present condition impossible. The specimens, as far as could be told, seemed to include two species of *Agaricus* and one of *Russula*.

The *Algæ* collected were in part marine and in part from fresh water, some of them rough-dried, and others prepared on mica.

The marine species were as follows:

Phyllophora interrupta (Grev.) J. Ag., in excellent condition, with fully-developed nemathecia; *Odonthalia dentata* Lyngb., rather a broad form, with slender supra-axillary tetrasporic branchlets; fragments of a sterile species which possibly belonged to *Rhodymenia pertusa* (Bail. and Harv.) J. Ag.; and fragments of an Ulva which could not be determined.

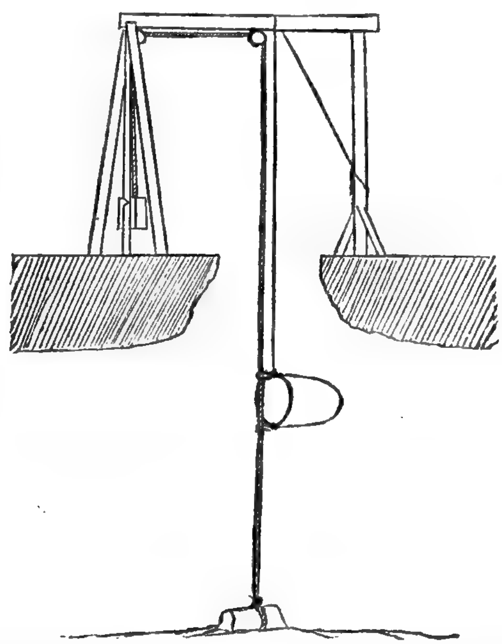
The fresh-water species included several specimens of a *Prasiola*, which may be referred with some doubt to *P. crispa* (Lightf.) Kg. The specimens were considerably larger than the type, some being nearly three inches long, but the habit was prostrate and bullate, and there was no distinct stipe as in *P. stipitata* Suhr., a species previously reported from the Arctic regions of America. It is possible that the species may prove to be new, but, as the specimens agree in microscopic structure with *P. crispa*, it would not be well without further information to separate them as a distinct species. Besides the *Prasiola* mentioned, the material on mica contained *Pediastrum Boryanum* Menegh, and two *Cyanophyceæ*, *Aphanothece stagnina* A. Br., and *Aphanacapsa Castagnei* (Breb.).

APPENDIX.

By JOHN MURDOCH, A. M., *Sergeant Signal Corps, United States Army.*

A.—NOTES ON SURFACE LIFE UNDER THE SEA-ICE, FROM FEBRUARY 27 TO JUNE 8, 1883.

At the suggestion of Lieutenant Ray, a towing-net was arranged so that it could be attached to the line of the tide-gauge and set at different depths under the ice (see diagram). The water was about 17 feet deep. When a strong current was running in either direction the net was distended and many animals captured.



The net was visited generally every day, unless the weather was too severe to handle it. Early in the season the bucket of water containing the washings of the net was so full of ice-crystals that it had to be thawed before the stove before it could be examined.

February 27.—Current NE. Temperature of the water, 29°.1 F., net set near the bottom.

Small copepods resembling *Cyclops*, a few.

Ægina citrea, 2 small ones.

Turris ? sp., a few small.

February 28.—Conditions as above.

Copepods; rather plenty.

Diastylis sp., 1, small.

Beroë roseola, 1, about 0.2 inch long.

Ægina citrea, 1 or 2, very small.

March 4.—Current and temperature as before, net set near surface.

Diastylis sp., 1, small.

Copepods; a few.

Beroë roseola, very abundant, from size of pin-head to about 0.3 inch in diameter.

March 5.—Conditions as above.
Copepods; plenty.
Beroë roseola; abundant and small.
Ægina citrea, 1, rather larger than before.
March 6.—Current SW.
Copepods; plenty.
Beroë roseola, plenty, same young brood.
March 7.—Conditions as above.
Copepods; rather fewer.
Sagitta sp., 1, adult.
Beroë roseola; plenty, no larger.
Sarsia rosaria, 1, small.
March 8.—Conditions as above.
Copepods; a few.
Beroë roseola; a few.
March 9.—Conditions as above, more life.
Copepods; a few.
Sagitta sp., 1, adult.
Beroë roseola; abundant, same brood.
Sarsia rosaria, 1, small.
March 10.—SW. current strong.
Copepods; a few.
Beroë roseola; plenty, same brood.
March 11.—SW. current very strong. Water very muddy.
Autolytus sp.; a few, very small.
Castalia multipapillata; a few, very small.
Copepods; a few.
Beroë roseola; a few.
March 12.—Conditions as above. Water still muddier.
Copepods; a few.
Autolytus sp., 1, small.
Beroë roseola, 1 or 2 apparently dead.
Noticed a *Beroë* in the tide-hole at least one inch long, and high
March 13.—Current NE. Water still muddy.
Copepods; rather abundant.
Autolytus sp., 1, rather larger than before.
Beroë roseola; increasing in numbers, small.
Ægina citrea, 1, ¾ inch in diameter, 1 very small.
Sarsia rosaria; several small.
Turris? sp.; several small.
March 14.—Conditions as above. Water less muddy.
Copepods; a few.
Beroë roseola; a few.
Turris? sp., 1, about 0.4 inch in length.
March 15.—Strong SW. current. Water clear, very little life.
March 18.—Slack NE. current.
Copepods; a few.
Beroë roseola, 1 or 2 small.
Ægina citrea, 3.
March 19.—Strong SW. current.
Copepods; a few.
? *Clione borealis*, larva, 1.
Sarsia rosaria, 1 or 2.

March 21.—Current slack.
Copepods; plenty.
Beroë roseola; plenty (one or two a little larger than before).

March 23.—Current NE.
Copepods; plenty.
Autolytus sp.; 2 egg-bearing females.
Beroë roseola; plenty; rather larger.
Ægina citrea; 1 or 2.
Sarsia rosaria; 1.

March 24.—Conditions as above. Water muddy.
Copepods; very plenty.
Autolytus sp.; 2 egg-bearing females.
Beroë roseola; a few.
Sarsia rosaria; 1.

March 25.—Conditions as above. Life scanty.

March 28.—Conditions as above, but water high.
Copepods; a few.
Beroë roseola; a few.
Sarsia rosaria; 1, small.

March 29.—Conditions as above.
Copepods; a few.
Autolytus sp.; 1 egg-bearing female.
Ægina citrea; 3 or 4.

April 4.—Net loaded with ice-crystals.

April 5.—Current SW. Temperature of water 29°.1 F. Water muddy. Net clear of ice. Life scanty.
Beroë roseola; a few; small.
Sarsia rosaria; a few.

April 7.—Conditions as above. Life very scanty.

April 10.—Conditions as above. Water muddy. Life scanty.
Copepods; a few.
Beroë roseola; a few and small.
Ægina citrea; 2 or 3; very small.
Sarsia rosaria; 1, small.

April 11.—Conditions as above. Life scanty.
Ægina citrea: 2, small.
Sarsia rosaria; 2 or 3 (one larger than usual, about 0.4 inch).

April 12.—Current NE., almost slack. Water muddy. Life very scanty.

April 14.—Current slack. Water and net very muddy. Life very scanty.

April 16.—Current slack. Water and net less muddy. Practically no life.

Until April 24 the current continued slack, and no life was observed. On that date there was a slight SW. current, but practically no life.

April 26.—Current NE., rather strong. Temperature continued the same.
Beroë roseola; 1; small.
Ægina citrea; 1; medium-sized.
Sarsia rosaria; rather plenty.

April 27.—Current NE., slight. Water decidedly milky.
Copepods; a few.
Beroë roseola; a few; small.
Conditions unfavorable for tending the net until May 6.

May 6.—Slight NE. current. Temperature unchanged. Water muddy. Life scanty.
Copepods; 1 or 2.
Sarsia rosaria; rather numerous.

May 8.—NE. current, rather strong. Water muddy.

? Clione borealis, larva; 1.

Sarsia rosaria: rather plenty; very small.

May 10.—Moderate NE. current. Water muddy. No life.

May 11.—Current slack.

May 14.—Current SW. in morning, slack at night.

Nothing in net. (Found a large *Beroë roseola* 4 inches long in tide hole, dead and much dilapidated.)

May 15.—Weak NE. current. Water very clear. No life.

May 18.—Strong NE. current. Water muddy. Life scanty.

Copepods; a few.

Beroë roseola; a few; small.

Ægina citrea; 1 or 2.

Sarsia rosaria; a few.

May 19.—Strong NE. current.

? Clione borealis, larva; a good many; no further developed.

Beroë roseola; plenty; very small.

Sarsia rosaria; 1 or 2.

May 21.—Strong NE. current. Water muddy.

? Clione borealis, larva; a few.

Beroë roseola; 2; about ½ inch long.

Sarsia rosaria; 1.

May 22.—No current.

May 23.—Strong NE. current. Life scanty.

? Clione borealis, larva; a few.

A few very small acalephs.

May 24.—Strong NE. current.

? Clione borealis, larva; plenty (some have grown larger).

Beroë roseola; very abundant, from very small to size of filbert. (Saw one very large one, 6 or 7 inches long, dead, and somewhat broken.)

Ægina citrea; 1; large.

Melicertum sp.; 1.

Sarsia rosaria; plenty and large (about .75 inch).

May 26.—Strong NE. current.

? Clione borealis, larva; a few.

Ægina citrea; 2 good-sized ones.

Sarsia rosaria; a few.

May 27.—Strong NE. current. Water muddy. Life scanty.

Beroë roseola; 1 or 2.

Sarsia rosaria; 1 or 2.

May 30.—Current slack.

? Clione borealis, larva; a few.

May 31.—Current slack.

Ægina citrea; 1; large.

June 2.—Rather strong NE. current. Life scanty.

? Clione borealis, larva; a few.

June 5.—Current slack. No life.

June 7.—Strong NE. current. Life scanty.

? Clione borealis, larva; a few.

June 8.—Current NE. Life scanty.

? Clione borealis, larva; a few. Net taken up.

During the whole period in which the net was set the surface temperature of the water remained very nearly constant at 29°.1 F.

The foregoing notes are presented as the first continuous series of observations on surface life during winter in the Arctic regions.

The only reference to any observation of the kind that I have been able to find in any of the accounts of Arctic exploration will be found in Dr. Sutherland's "Journal of a Voyage in Baffin's Bay and Barrow Strait," vol. 1, pp. 440–441. On December 3, 1850, the sea-water in the firehole was observed to be luminous, especially when agitated by the tide-line. * * * A minute acaleph was discovered which seemed to possess cilia. * * * The shape was perfectly globular, except when in a state of motion, and then it was rudely pyramidal." This was probably the young *Beroë roseola* which we found so abundant under the ice.

B.—NOTES ON SURFACE LIFE OBSERVED DURING THE VOYAGE FROM SAN FRANCISCO TO POINT BARROW, AND DURING THE SEASON OF OPEN WATER AT POINT BARROW.

PACIFIC OCEAN.

1881.

July 19.—Latitude 37° 6′ N.; longitude 124° 33′ W. (at noon).
Large numbers of *Velella* sp. floated past the vessel.

July 20.—Latitude 36° 51′ N.; longitude 126° 33′ W.
Velella sp.; less plenty.

July 21.—Latitude 37° 09′ N.; longitude 128° 44′ W.
A few *Velella* sp.

July 23.—Latitude 38° 11′ N.; longitude 134° 17′ W.
Large numbers of *Lepas* sp. floating in bunches.

July 24.—Latitude 39° 10′ N.; longitude 134° 54′ W.
Lepas sp.; plenty.

July 25.—Latitude 41° 17′ N.; longitude 135° 46′ W.
Lepas sp.; plenty.

July 26.—Latitude 42° 44′ N.; longitude 136° 18′ W.
Lepas sp. in unusually large numbers.

July 28.—Latitude 45° 18′ N.; longitude 136° 45′ W.
Water filled with the shells of dead *Velellæ*, to some of which were attached a single large blue barnacle (? *Lepas* sp.); *Lepas* sp. plenty.

July 29.—Latitude 45° 02′ N.; longitude 139° 37′ 45″ W.
Large numbers of *Velella* sp. dead or dying.

July 30.—Latitude 45° 30′ N.; longitude 141° 40′ W.
Dead or dying *Velella* sp.; still very plenty.

August 4.—Latitude 42° 29′ N.; longitude, no observation.
Salpa herculea; saw several.

August 11.—Latitude 54° 15′ N.; longitude 158° 58′ W.
Temperature of water at noon 52°.2 F. Water full of *Medusæ*.
? *Mertensia ovum;* saw one.
? *Aurelia labiata;* plenty and small.
? *Cyanea postelsii;* plenty.
? *Pelagia* sp.
Staurophora mertensii; very plenty and large.

In crossing Bering Sea we had rough weather and observed no surface life. *Aurelia labiata* was observed in Plover Bay, Eastern Siberia.

ARCTIC OCEAN.

August 31.—Latitude 69° 01′ N.; longitude 166° 25′ W. Temperature of water, 47° F.
Cyanea postelsii; rather plenty.

September 4.—Latitude 70° 21′ N.; longitude 165° 16′ W. (80 miles west of Icy Cape). Temperature of water, 43°.8 F.

Water full of *Beroë roseola*.

September 5.—Latitude 70° 24′ N.; longitude 163° 43′ W. Temperature of water, 44°.5 F.

Water full of *Acalephs;* large and healthy.

Beroë roseola; plenty.

Mertensia ovum; 1.

Pleurobrachia rhododactyla; very plenty.

Aurelia labiata; plenty.

Cyanea postelsii; plenty.

Staurophora mertensii: plenty.

Noticed a few *Pteropods*.

STATION, OOGLAAMIE, CAPE SMYTHE.

September 16.—Water full of *Cyanea postelsii* of large size and varying color.

October 13.—*Chrysaora melanaster* washed up on the beach.

November 10.—Water at noon filled with large medusæ, *Aurelia labiata* and *Cyanea postelsii.* Temperature of water, 29° F.

November 11.—At noon observed one small living *Cyanea postelsii.* Temperature of water, 30°.0 F.

November 28.—*Cyanea postelsii* and *Aurelia labiata* observed through a crack in the ice. Sea closed.

1882.

January 17.—*Cyanea postelsii* of large size observed in the hole cut for taking the temperature of the sea-water, which was 28°.7 F.

February 6.—*Cyanea postelsii* of large size taken in the temperature-hole. Temperature of water, 29° F.

April 29.—Three living and healthy specimens of *Beroë roseola* about two inches long were taken in the temperature-hole. Temperature of water, 29° F.

July 18.—Sea open between shore and grounded ice. Temperature of water, 39° F.

Water swarming with a small nauplius (*Balanus* sp.). Observed a few pteropods (*Limacina pacifica*).

Beroë roseola; very abundant; mostly small.

Pleurobrachia rhododactyla; very abundant, of all sizes.

Aglantha camtschatica; very plenty.

July 19.—Temperature of water, 40°.2 F.

Limacina pacifica; more abundant.

Beroë roseola; very abundant; mostly small.

Pleurobrachia rhododactyla; very abundant, of all sizes.

Chrysaora melanaster; two or three on bottom.

Aglantha camtschatica; quite plenty.

July 24.—*Limacina pacifica;* rather plenty. Observed only one or two acalephs.

July 31.—Temperature of water, 49° F. Observed comparatively few medusæ.

August 19.—Large *Chrysaora melanaster*, 18 inches across umbrella, washed up on beach.

August 29.—Picked up a large *Aurelia labiata* on the beach. Ovaries discharged.

August 31.—Saw another large *Aurelia* on the beach.

September 11.—Observed one red *Cyanea*.

September 15.—Observed two *Aurelia labiata*.

Cyanea postelsii very abundant; mostly dead or dying. Observed one or two very large ones.

Two or three *Staurophora mertensii* washed up on the beach, rather mutilated.

September 17.—*Beroë roseola* very plenty out among the loose ice, three or four miles from the shore.

September 20.—Observed a very large *Beroë roseola*, five inches long, and one *Aurelia labiata*, in the shoal water close to the shore.

September 28.—Much loose ice.

Beroë roseola and *Cyanea postelsii* abundant and large.

1883.

August 6.—Water open inside "barrier."

Beroë roseola; about three inches long; very plenty in the pools along the shore.

August 8.—Water outside the "barrier" full of acalephs. Strong NE. current.

Beroë roseola; large and very abundant.
Mertensia ovum; large and very abundant.
Pleurobrachia rhododactyla; large and very abundant.
Sarsia rosaria; plenty and large.
Turris? sp.; plenty and large.
Appendicularia sp.; in enormous numbers of large size.

No acalephs were observed inside the grounded ice.

August 9.—Temperature of water, 34° to 36° F. Inside of grounded ice found surface life abundant.

Sagitta sp.; one taken.
Appendicularia sp.; in myriads.
Beroë roseola; large and small, abundant.
Pleurobrachia rhododactyla; abundant.
Cyanea postelsii; not plenty.
Sarsia rosaria; plenty and large.
Turris? sp.; plenty and large.

August 10.—Strong NE. current. Temperature of water, 37° F.

Water filled with *Appendicularia* sp.; both animals and "houses."
Beroë roseola; large and small; very plenty.
Mertensia ovum; not plenty.
Gemmaria? sp.; not plenty.
Sarsia rosaria; plenty, large, and flourishing.

August 11.—*Beroë roseola*; in myriads.

Chrysaora melanaster; abundant in all stages, from *Ephyra*, about .75 inches in diameter, to adult.
Turris? sp.; very plenty.

August 12.—*Beroë roseola*; plenty. Water full of small white grains, apparently larvæ of some description, though their structure could not be made out under the microscope.

August 15.—Very strong NE. current. Many "houses" of *Appendicularia* sp. drifting about and a good many of the animals free or partially extricated.

Beroë roseola; plenty.
Pleurobrachia rhododactyla; a few.
Bolina sp.; a few.
Cyanea postelsii; one or two small yellow ones.
Chrysaora melanaster; a few dead or dying at the bottom.
Gemmaria? sp.; plenty.
Sarsia rosaria; plenty.
Turris? sp.; plenty.
Sagitta sp.; a few specimens.

August 16.—Life in water as yesterday, but less plenty.

Until August 28, the time of the party was so occupied with the work of closing the station that no zoological observations could be made.

August 28.—*Limacina pacifica*; abundant, and myriads of the "white grains" above noted.

August 29.—Crossing the mouth of Peard Bay. Temp. of water 42° F. Observed a few *Limacina pacifica*: "white grains" very plenty. *Beroë roseola* and other acalephs rather abundant at night.

BERING SEA.

September 4.—Latitude 65° 16′ N., longitude 161° 30′ W.
Aurelia labiata; not plenty.
Cyanea postelsii; not plenty.
Staurophora mertensii; not plenty.

September 8.—Anchored off St. Michael's.
Aurelia labiata: not plenty.
Cyanea postelsii; not plenty.

September 9.—Anchored off St. Michael's.
Aurelia labiata: not plenty.
Cyanea postelsii; not plenty (one *red* one).

September 12.—In Norton Sound. Water at noon full of *Aurelia labiata* of large size and apparently spawning. A few *Cyanea postelsii* observed.

September 13.—In Norton Sound. A few acalephs only observed. We had very rough weather from Norton Sound to Unalaska and observed no surface life.

September 21.—Unalaska. Observed in shoal water close to the beach a peculiar large acaleph about a foot across the umbrella. Closely allied to *Aurelia*, with very short marginal tentacles, and rather short labial lappets. Color, a rich violet blue.

The weather in crossing the Pacific Ocean from Unalaska to San Francisco was generally rough and no observations of any importance could be made.

C.—LIST OF BIRDS NOTICED AT PLOVER BAY, EASTERN SIBERIA, AUGUST 21 TO 25, 1881.

Anthus sp.;* rather common round the Eskimo village.
Corvus corax; abundant and remarkably tame round the houses.
Strepsilas interpres; fairly abundant.
Actodromas maculata: one taken.
Actodromas bairdi; one taken badly mutilated.
Pelidna alpina americana ?; one immature male taken.
Ereunetes pusillus; fairly abundant in small flocks.
Phalaropus fulicarius; one small flock seen.
Somateria v-nigra; quite plenty; mostly females and young two-thirds grown.
Phalacrocorax dilophus ?;* very plenty.
Rissa tridactyla; plenty.
Larus cachinnans ?;* plenty and very tame.
Stercorarius parasiticus; several seen flying around the bay in clear weather.
Fratercula corniculata; plenty; one taken.
Lunda cirrhata; plenty.
Ciceronia pusilla ?;* very numerous in good-sized flocks.
Uria grylle; very numerous.
Lomvia arra ?;* plenty.

These observations were confined to the immediate neighborhood of the "sandspit," where we lay waiting for clear weather to make time-observations at the United States Coast and Geodetic Survey station.

* Not taken.

PART V.

METEOROLOGY.

METEOROLOGY.

INTRODUCTORY.

I. Meteorological observations were begun on October 18, 1881, and continued without interruption until the station was closed on August 27, 1883. They were then renewed on board of the schooner Leo, and continued till 1 a. m., October 7, 1883, when the vessel was inside the Golden Gate.

From the opening of the station until June 5, 1882, the thermometers and hygrometers were exposed in a shelter placed on the north side of the back storm-porch (see plan of station, pl. 2). This consisted of a box of galvanized iron louvre-work, with a flat roof of the same material, 5 feet long and 4 feet broad, mounted on posts 3 feet above the ground. This was inclosed by wooden louvre-work blinds on the three exposed sides, reaching to the ground, and had a wooden floor. On June 5, 1882, the instruments were removed to a larger and more convenient shelter, farther away from the quarters, extending along the northern side of the building from the northwest corner, and entered by a door at this corner (see plan, as above). This was made of wooden louvre-work blinds, fastened to studding, with sealskin deprived of the hair fastened up inside, so as to inclose an air-space of 4 inches open above and below. The roof was of walrus-hide. The shelter was 16 feet long by 4 feet broad, and reached up to the eaves of the building.

The thermometers, &c., used in the observations on the voyage home, were mounted in a shelter of galvanized iron louvre-work, lashed on the starboard side of the quarter-deck.

The barometers were hung in the southeast corner of the quarters, near the window. The wind-vane was placed on the roof, north of the ridge-pole, so that the rod passed down through the ceiling of the wash-room. The anemometer was first mounted on the ridge-pole, at the west end of the building, but on the completion of the bastion, June 15, 1882, was removed to the top of this. The self-register of the anemometer was on the mantel-shelf in the quarters, and the batteries on the shelf in the wash-room. The rain-gauge occupied the place of the anemometer when this was removed.

During the extremely low temperatures it was found impossible to get satisfactory results with the wet- and dry-bulb hygrometer, and the relative humidity was accordingly observed with the hair hygrometer.

The highest temperature observed during the occupation of the station was 60°.5, the lowest —52°.6, giving a range of 113°.1.

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883.

[Barometer above sea 17 feet. Washington mean time. Correction for mean local time, — 5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1881														
Oct. 18 ..	29.815	29.826	29.816	29.747	29.722	29.713	29.783	29.770	29.735	29.719	29.709	29.766	29.812	29.694
Oct. 19 ...	29.662	29.689	29.739	29.757	29.805	29.825	29.828	29.831	29.808	29.858	29.873	29.857	29.961	30.038
Oct. 20	29.972	29.953	29.963	29.963	29.954	29.949	29.930	29.930	29.938	29.922	29.910	29.890	29.897	29.894
Oct. 21	29.828	29.817	29.833	29.838	29.845	29.856	29.828	29.822	29.838	29.838	29.853	29.853	29.861	29.857
Oct. 22 ..	29.898	29.898	29.908	29.926	29.921	29.915	29.860	29.857	29.835	29.830	29.825	29.823	29.841	29.811
Oct. 23 ..	29.763	29.749	29.730	29.739	29.740	29.763	29.718	29.726	29.726	29.720	29.716	29.729	29.738	29.716
Oct. 24 ..	29.711	29.707	29.703	29.696	29.729	29.709	29.689	29.655	29.618	29.596	29.597	29.628	29.615	29.639
Oct. 25 ...	29.517	29.512	29.516	29.518	29.511	29.499	29.494	29.480	29.466	29.465	29.486	29.472	29.472	29.475
Oct. 26 ...	29.453	29.450	29.471	29.470	29.473	29.460	29.428	29.423	29.408	29.402	**29.397**	29.427	29.432	29.426
Oct. 27 ...	29.660	29.670	29.680	29.681	29.695	29.741	29.723	29.727	29.734	29.742	29.751	29.771	29.772	29.775
Oct. 28 ...	29.752	29.751	29.772	29.759	29.761	29.745	29.740	29.740	29.739	29.722	29.717	29.707	29.698	29.673
Oct. 29 ...	29.712	29.714	29.699	29.697	29.695	29.685	29.701	29.697	29.694	29.694	29.701	29.702	29.707	29.700
Oct. 30	29.746	29.762	29.736	29.773	29.823	29.834	29.828	29.835	29.828	29.843	29.828	29.846	29.870	29.856
Oct. 31 ...	29.985	30.002	30.003	30.019	30.028	30.024	30.034	30.049	30.053	30.057	30.071	30.083	30.089	30.095
Means	29.747	29.750	29.755	29.756	29.765	29.766	29.756	29.753	29.747	**29.743**	29.745	29.754	**29.769**	29.761

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1881.														
Oct. 18 ..	29.689	29.689	29.681	29.660	29.654	29.661	29.645	29.640	29.649	29.647	29.723	29.826	29.640	.186
Oct. 19	29.933	29.943	29.954	29.961	29.949	29.956	29.978	29.940	29.962	29.956	29.879	30.038	29.652	.376
Oct. 20 ...	29.875	29.879	29.862	29.851	29.841	29.853	29.853	29.844	29.856	29.832	29.900	29.963	29.832	.131
Oct. 21 ...	29.860	29.867	29.871	29.869	29.877	29.864	29.887	29.897	29.898	29.895	29.855	29.898	29.817	.081
Oct. 22 ..	29.793	29.787	29.785	29.780	29.789	29.782	29.783	29.775	29.761	29.756	29.831	29.926	29.756	.170
Oct. 23 ...	29.741	29.727	29.725	29.735	29.733	29.728	29.721	29.720	29.709	29.709	29.730	29.763	29.709	.054
Oct. 24	29.589	29.594	29.589	29.581	29.569	29.578	29.571	29.564	29.533	29.539	29.625	29.729	29.533	.196
Oct. 25 ...	29.450	29.457	29.449	29.441	29.442	29.447	29.451	29.442	29.450	29.453	**29.474**	29.518	29.441	.077
Oct. 26	29.450	29.471	29.498	29.523	29.548	29.559	29.570	29.593	29.633	29.642	29.484	29.642	**29.397**	.245
Oct. 27	29.793	29.785	29.779	29.767	29.767	29.755	29.755	29.753	29.762	29.756	29.744	29.793	29.660	.133
Oct. 28 ...	29.667	29.674	29.678	29.669	29.666	29.676	29.674	29.695	29.694	29.711	29.712	29.772	29.666	.106
Oct. 29	29.719	29.717	29.720	29.721	29.717	29.726	29.737	29.728	29.735	29.743	29.711	29.743	29.685	.058
Oct. 30	29.890	29.901	29.908	29.920	29.932	29.935	29.954	29.973	29.972	29.981	29.866	29.981	29.736	.245
Oct. 31	30.100	30.100	30.108	30.121	30.117	30.106	30.122	30.125	30.138	**30.149**	**30.074**	**30.149**	29.985	.164
Means ..	29.755	29.756	29.758	29.757	29.757	29.759	29.764	29.764	29.768	**29.769**	29.758	29.839	29.680	.159

b.	Gravity correction.
28	+0.058
29	+0.060
30	+0.062
31	+0.064

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, 5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1881.														
Nov. 1...	30.150	30.153	30.157	30.155	30.150	30.173	30.145	30.133	30.113	30.105	30.078	30.077	30.073	30.031
Nov. 2...	29.860	29.845	29.835	29.817	29.806	29.796	29.751	29.722	29.706	29.686	29.674	29.664	29.670	29.663
Nov. 3...	29.600	29.603	29.632	29.636	29.654	29.648	29.600	29.597	29.597	29.610	29.622	29.606	29.617	29.616
Nov. 4...	29.618	29.608	29.614	29.601	29.583	29.571	29.578	29.579	29.572	29.551	29.549	29.540	29.543	29.551
Nov. 5...	29.487	29.473	29.476	29.477	29.476	29.480	29.480	29.483	29.479	29.470	29.478	29.481	29.493	29.497
Nov. 6...	29.677	29.694	29.708	29.723	29.746	29.777	29.793	29.803	29.821	29.833	29.875	29.870	29.890	29.898
Nov. 7...	30.085	30.085	30.083	30.085	30.089	30.131	30.145	30.158	30.170	30.165	30.183	30.142	30.178	30.180
Nov. 8...	30.175	30.170	30.157	30.149	30.141	30.131	30.116	30.108	30.098	30.083	30.080	30.080	30.082	30.078
Nov. 9...	29.948	29.937	29.953	29.956	29.947	29.932	29.891	29.873	29.889	29.875	29.867	29.868	29.877	29.872
Nov. 10...	29.942	29.955	29.966	29.968	29.981	29.987	30.014	30.028	30.042	30.041	30.078	30.079	30.081	30.113
Nov. 11...	30.254	30.277	30.292	30.313	30.310	30.325	30.325	30.335	30.346	30.359	30.378	30.396	30.386	30.405
Nov. 12...	30.539	30.551	30.561	30.564	30.555	30.566	30.589	30.591	30.592	30.585	30.593	30.597	30.600	30.619
Nov. 13...	**30.686**	30.683	30.672	30.675	30.670	**30.686**	30.668	30.664	30.643	30.649	30.662	30.642	30.612	30.586
Nov. 14...	30.431	30.404	30.382	30.369	30.360	30.337	30.308	30.284	30.245	30.215	30.197	30.191	30.143	30.120
Nov. 15...	29.954	29.949	29.969	29.958	29.964	29.955	29.939	29.941	29.928	29.922	29.910	29.907	29.897	29.880
Nov. 16...	29.986	29.993	29.980	29.992	30.003	30.011	30.029	30.043	30.063	30.073	30.073	30.095	30.109	30.121
Nov. 17...	30.290	30.301	30.317	30.317	30.327	30.321	30.319	30.304	30.328	30.307	30.334	30.314	30.284	30.291
Nov. 18...	30.133	30.122	30.081	30.045	30.048	30.048	30.020	29.993	29.979	29.968	29.952	29.945	29.941	29.926
Nov. 19...	29.631	29.623	29.630	29.617	29.607	29.596	29.582	29.577	29.563	29.532	29.530	29.516	29.490	29.484
Nov. 20...	29.427	29.414	29.398	29.385	29.374	29.365	29.390	29.380	29.372	29.372	29.374	29.374	29.377	29.389
Nov. 21...	29.530	29.546	29.569	29.588	29.614	29.647	29.714	29.749	29.782	29.846	29.874	29.905	29.937	29.969
Nov. 22...	30.306	30.318	30.321	30.336	30.325	30.350	30.385	30.394	30.396	30.404	30.406	30.411	30.418	30.410
Nov. 23...	30.301	30.286	30.279	30.276	30.263	30.259	30.227	30.196	30.204	30.195	30.160	30.150	30.140	30.122
Nov. 24...	29.989	29.989	29.992	29.967	29.917	29.880	29.888	29.893	29.871	29.869	29.881	29.851	29.831	29.822
Nov. 25...	29.763	29.760	29.748	29.740	29.728	29.722	29.698	29.686	29.691	29.674	29.436	29.631	29.615	29.615
Nov. 26...	29.608	29.611	29.597	29.598	29.607	29.606	29.610	29.619	29.605	29.602	29.598	29.590	29.587	29.592
Nov. 27...	29.466	29.457	29.444	29.437	29.413	29.378	29.350	29.329	29.298	29.271	29.225	29.207	29.210	29.192
Nov. 28...	29.230	29.230	29.219	29.212	29.201	29.200	29.200	29.191	29.183	29.171	29.167	29.154	29.143	29.146
Nov. 29...	29.112	29.114	29.118	29.118	29.114	29.112	29.124	29.110	**29.091**	29.100	29.125	29.180	29.253	29.309
Nov. 30...	29.441	29.429	29.424	29.423	29.430	29.444	29.459	29.470	29.469	29.477	29.496	29.505	29.525	29.547
Means..	**29.887**	29.886	29.886	29.883	29.880	29.881	29.878	29.874	29.871	29.867	**29.862**	29.866	29.867	29.868

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1881.														
Nov. 1...	30.027	30.024	30.003	29.996	29.982	29.979	29.963	29.940	29.878	29.857	30.056	30.173	29.857	.316
Nov. 2...	29.637	29.620	29.609	29.608	29.607	29.597	29.602	29.587	29.594	29.597	29.690	29.860	29.587	.273
Nov. 3...	29.621	29.631	29.624	29.630	29.632	29.634	29.633	29.633	29.626	29.616	29.622	29.654	29.597	.057
Nov. 4...	29.534	29.523	29.518	29.507	29.510	29.501	29.488	29.478	29.492	29.483	29.546	29.618	29.483	.135
Nov. 5...	29.509	29.528	29.532	29.550	29.564	29.577	29.571	29.574	29.640	29.649	29.518	29.649	29.470	.179
Nov. 6...	29.919	29.935	29.948	29.966	29.976	29.997	30.013	30.015	30.037	30.056	29.874	30.056	29.677	.379
Nov. 7...	30.208	30.210	30.220	30.223	30.218	30.221	30.218	30.225	30.198	30.177	30.167	30.225	30.083	.142
Nov. 8...	30.041	30.005	30.025	29.994	29.989	29.957	29.958	29.955	29.948	29.949	30.061	30.175	29.948	.227
Nov. 9...	29.893	29.891	29.901	29.894	29.898	29.911	29.912	29.919	29.930	29.936	29.909	29.956	29.867	.089
Nov. 10...	30.128	30.152	30.158	30.163	30.167	30.187	30.189	30.201	30.230	30.242	30.087	30.242	29.942	.300
Nov. 11...	30.443	30.444	30.463	30.470	30.488	30.487	30.490	30.504	30.523	30.533	30.398	30.533	30.254	.279
Nov. 12...	30.637	30.642	30.641	30.637	30.648	30.650	30.650	30.659	30.676	30.675	**30.609**	30.676	30.539	.137
Nov. 13...	30.591	30.567	30.567	30.538	30.535	30.533	30.526	30.509	30.480	30.459	30.604	**30.686**	30.459	.227
Nov. 14...	30.095	30.050	30.054	30.043	30.008	29.999	29.985	29.972	29.973	29.961	30.172	30.431	29.961	.470
Nov. 15...	29.896	29.903	29.921	29.941	29.981	29.975	29.967	29.983	29.985	29.978	29.942	29.985	29.880	.105
Nov. 16...	30.159	30.154	30.175	30.170	30.182	30.200	30.212	30.236	30.255	30.276	30.108	30.276	29.980	.296
Nov. 17...	30.275	30.272	30.251	30.246	30.249	30.200	30.205	30.195	30.172	30.154	30.274	30.328	30.154	.174
Nov. 18...	29.870	29.849	29.814	29.774	29.754	29.735	29.712	29.678	29.668	29.639	29.904	30.133	29.639	.494
Nov. 19...	29.498	29.496	29.487	29.486	29.487	29.485	29.473	29.453	29.432	29.423	29.529	29.631	29.423	.208
Nov. 20...	29.399	29.410	29.424	29.425	29.427	29.439	29.452	29.470	29.490	29.509	29.410	29.509	29.365	.144
Nov. 21...	30.045	30.091	30.108	30.129	30.146	30.170	30.176	30.214	30.247	30.263	29.909	30.263	29.530	.733
Nov. 22...	30.411	30.402	30.386	30.387	30.366	30.334	30.320	30.304	30.314	30.302	30.363	30.418	30.302	.116
Nov. 23...	30.137	30.120	30.094	30.086	30.078	30.067	30.055	30.036	29.995	29.996	30.155	30.301	29.995	.306
Nov. 24...	29.817	29.806	29.818	29.812	29.776	29.765	29.754	29.752	29.762	29.767	29.852	29.993	29.753	.240
Nov. 25...	29.619	29.623	29.611	29.616	29.620	29.608	29.607	29.614	29.616	29.611	29.652	29.763	29.607	.156
Nov. 26...	29.583	29.606	29.581	29.575	29.551	29.551	29.544	29.521	29.510	29.496	29.581	29.619	29.496	.123
Nov. 27...	29.188	29.186	29.179	29.184	29.182	29.186	29.186	29.188	29.200	29.209	29.274	29.466	29.179	.287
Nov. 28...	29.141	29.138	29.135	29.130	29.113	29.110	29.105	29.103	29.105	29.106	**29.160**	29.230	29.103	.127
Nov. 29...	29.347	29.407	29.435	29.438	29.454	29.460	29.470	29.465	29.454	29.437	29.264	29.470	**29.091**	.379
Nov. 30...	29.591	29.629	29.656	29.682	29.716	29.754	29.785	29.835	29.859	29.899	29.581	29.899	29.423	.476
Means..	29.875	29.877	29.878	29.877	29.877	29.876	29.874	29.874	29.877	29.876	29.876	30.007	29.755	.252

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, −5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1881.														
Dec. 1	29.929	29.958	29.977	30.024	30.049	30.084	30.080	30.085	30.100	30.121	30.115	30.117	30.111	30.112
Dec. 2	30.039	30.021	29.972	29.974	29.949	29.935	29.910	29.883	29.844	29.825	29.788	29.728	29.601	29.660
Dec. 3	29.259	29.251	29.265	29.267	29.259	29.272	29.288	29.300	29.328	29.394	29.397	29.475	29.537	29.564
Dec. 4	29.890	29.865	29.869	29.849	29.854	29.849	29.828	29.802	29.794	29.775	29.772	29.754	29.745	29.738
Dec. 5	29.690	29.694	29.697	29.700	29.710	29.715	29.725	29.736	29.736	29.748	29.758	29.763	29.770	29.773
Dec. 6	29.902	29.910	29.928	29.937	29.927	29.953	29.956	29.968	29.973	29.983	29.985	29.996	29.997	30.006
Dec. 7	30.000	30.011	29.999	30.006	30.010	30.020	30.029	30.037	30.032	30.027	30.037	30.030	30.032	30.047
Dec. 8	30.129	30.129	30.127	30.138	30.138	30.149	30.147	30.161	30.167	30.163	30.163	30.169	30.171	30.175
Dec. 9	30.171	30.176	30.159	30.169	30.178	30.171	30.171	30.168	30.151	30.150	30.141	30.129	30.115	30.124
Dec. 10	30.083	30.066	30.058	30.052	30.049	30.044	30.046	30.049	30.044	30.053	30.048	30.052	30.042	30.048
Dec. 11	30.103	30.117	30.108	30.103	30.102	30.103	30.100	30.097	30.088	30.076	30.047	30.035	30.028	30.044
Dec. 12	29.776	29.774	29.758	29.767	29.768	29.760	29.781	29.781	29.782	29.789	29.789	29.791	29.790	29.787
Dec. 13	29.703	29.694	29.686	29.697	29.703	29.696	29.710	29.724	29.729	29.743	29.743	29.759	29.766	29.787
Dec. 14	29.879	29.887	29.856	29.868	29.868	29.872	29.851	29.843	29.829	29.826	29.805	29.804	29.811	29.797
Dec. 15	29.746	29.753	29.754	29.755	29.776	29.770	29.776	29.778	29.768	29.776	29.759	29.763	29.772	29.773
Dec. 16	29.739	29.724	29.715	29.704	29.704	29.686	29.674	29.663	29.652	29.641	29.635	29.628	29.627	29.609
Dec. 17	29.591	29.594	29.596	29.582	29.582	29.582	29.588	29.600	29.602	29.603	29.602	29.601	29.611	29.631
Dec. 18	29.816	29.829	29.849	29.864	29.884	29.897	29.923	29.912	29.930	29.949	29.953	29.963	29.984	29.989
Dec. 19	30.123	30.129	30.136	30.134	30.139	30.136	30.131	30.137	30.128	30.091	30.088	30.081	30.074	30.062
Dec. 20	30.013	30.010	29.999	29.998	29.985	29.986	29.981	29.976	29.979	29.969	29.959	29.978	29.900	29.999
Dec. 21	30.095	30.106	30.092	30.097	30.102	30.094	30.103	30.107	30.101	30.116	30.081	30.067	30.064	30.066
Dec. 22	29.898	29.878	29.855	29.831	29.808	29.772	29.760	29.744	29.722	29.713	29.690	29.670	29.649	29.645
Dec. 23	29.475	29.439	29.424	29.415	29.408	29.400	29.403	29.383	29.368	29.366	29.355	29.345	29.329	29.342
Dec. 24	29.405	29.407	29.407	29.407	29.409	29.417	29.452	29.456	29.456	29.452	29.454	29.459	29.462	29.461
Dec. 25	29.389	29.377	29.368	29.336	29.330	29.339	29.324	29.325	29.330	29.322	29.287	29.271	29.254	29.256
Dec. 26	29.213	29.218	**29.208**	29.212	29.218	29.218	29.226	29.231	29.230	29.251	29.241	29.240	29.239	29.242
Dec. 27	29.415	29.444	29.451	29.476	29.488	29.517	29.552	29.575	25.597	29.609	29.634	29.668	29.677	29.716
Dec. 28	30.023	30.059	30.079	30.125	30.143	30.166	30.197	30.215	30.241	30.269	30.276	30.281	30.282	30.310
Dec. 29	30.324	30.320	30.280	30.276	30.266	30.264	30.260	30.235	30.221	30.215	30.180	30.155	30.151	30.134
Dec. 30	29.931	29.913	29.899	29.898	29.905	29.915	29.947	29.941	29.948	29.966	29.969	29.970	29.972	29.978
Dec. 31	30.038	30.039	30.040	30.044	30.052	30.057	30.046	30.047	30.045	30.040	30.035	30.033	30.035	30.047
Means	29.832	29.832	**29.826**	29.820	29.831	29.834	29.838	29.837	29.836	29.839	29.832	29.831	29.832	29.836

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1881.														
Dec. 1	30.123	30.159	30.155	30.155	30.138	30.130	30.101	30.120	30.098	30.096	30.080	30.159	29.929	.230
Dec. 2	29.606	29.566	29.514	29.477	29.406	29.369	29.349	29.324	29.307	29.276	29.684	30.039	29.276	.763
Dec. 3	29.654	29.706	29.766	29.793	29.803	29.842	29.839	29.877	29.900	29.880	29.538	29.900	29.251	.649
Dec. 4	29.723	29.729	29.709	29.714	29.710	29.693	29.678	29.678	29.683	29.676	29.766	29.890	29.676	.214
Dec. 5	29.794	29.798	29.816	29.823	29.823	29.849	29.863	29.863	29.877	29.896	29.776	29.896	29.690	.206
Dec. 6	30.026	30.020	30.019	30.019	30.001	30.006	30.000	29.995	30.012	30.000	29.980	30.026	29.902	.124
Dec. 7	30.063	30.079	30.083	30.089	30.086	30.088	30.098	30.114	30.117	30.124	30.052	30.124	29.999	.125
Dec. 8	30.175	30.177	30.185	30.168	30.163	30.168	30.167	30.175	30.157	30.160	30.159	30.185	30.127	.058
Dec. 9	30.136	30.135	30.133	30.135	30.132	30.083	30.078	30.091	30.090	30.083	30.136	30.178	30.078	.100
Dec. 10	30.064	30.064	30.058	30.071	30.071	30.061	30.081	30.085	30.090	30.099	30.062	30.090	30.042	.057
Dec. 11	29.998	29.974	29.948	29.939	29.907	29.878	29.852	29.816	29.819	29.791	30.003	30.117	29.791	.326
Dec. 12	29.785	29.782	29.702	29.766	29.753	29.751	29.744	29.719	29.711	29.708	29.766	29.791	29.708	.083
Dec. 13	29.809	29.820	29.836	29.847	29.853	29.864	29.866	29.880	29.883	29.868	29.778	29.883	29.686	.197
Dec. 14	29.799	29.789	29.792	29.787	29.781	29.767	29.765	29.754	29.756	29.751	29.814	29.887	29.751	.136
Dec. 15	29.781	29.775	29.783	29.767	29.767	29.768	29.750	29.749	29.744	29.735	29.764	29.783	29.735	.048
Dec. 16	29.629	29.619	29.622	29.614	29.610	29.600	29.598	29.591	29.588	29.586	29.644	29.739	29.586	.153
Dec. 17	29.653	29.665	29.673	29.686	29.708	29.719	29.739	29.761	29.776	29.806	29.648	29.806	29.582	.224
Dec. 18	30.030	30.046	30.052	30.059	30.060	30.068	30.085	30.089	30.102	30.120	29.977	30.120	29.816	.304
Dec. 19	30.073	30.050	30.057	30.057	30.048	30.040	30.024	30.014	30.028	30.016	30.083	30.139	30.016	.123
Dec. 20	30.037	30.053	30.063	30.057	30.052	30.050	30.051	30.068	30.082	30.087	30.018	30.087	29.959	.148
Dec. 21	30.068	30.064	30.049	30.023	29.999	29.981	29.963	29.952	29.941	29.928	30.052	30.116	29.928	.188
Dec. 22	29.645	29.638	29.615	29.590	29.577	29.560	29.531	29.508	29.505	29.485	29.679	29.898	29.485	.413
Dec. 23	29.353	29.359	29.356	29.359	29.353	29.350	29.361	29.360	29.377	29.392	29.378	29.475	29.329	.146
Dec. 24	29.452	29.457	29.462	29.431	29.430	29.426	29.435	29.415	29.403	29.395	29.435	29.462	29.395	.067
Dec. 25	29.278	29.264	29.250	29.244	29.229	29.222	29.219	29.215	29.220	29.218	29.286	29.389	29.215	.174
Dec. 26	29.271	29.286	29.291	29.301	29.312	29.325	29.332	29.357	29.398	29.415	**29.270**	29.415	**29.208**	.207
Dec. 27	29.750	29.776	29.799	29.843	29.851	29.877	29.911	29.950	29.903	30.005	29.691	30.005	29.415	.590
Dec. 28	30.350	30.348	30.348	**30.372**	30.366	30.349	30.344	30.347	30.359	30.340	**30.258**	**30.372**	30.023	.349
Dec. 29	30.145	30.127	30.107	30.080	30.064	30.019	30.006	29.974	29.966	29.941	30.155	30.324	29.941	.383
Dec. 30	29.981	29.993	30.002	30.017	30.014	30.015	30.025	30.027	30.031	30.048	29.971	30.048	29.898	.150
Dec. 31	30.043	30.027	30.025	30.021	30.015	29.994	29.988	29.975	29.986	29.965	30.027	30.057	29.965	.092
Means	29.818	**29.850**	29.849	29.849	29.841	29.836	29.834	29.834	29.839	29.835	29.837	29.949	29.723	.226

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, −5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Jan. 1....	29.963	29.957	29.953	29.935	29.952	29.920	29.926	29.909	29.909	29.895	29.923	29.897	29.918	29.887
Jan. 2....	29.906	29.904	29.907	29.907	29.909	29.912	29.912	29.892	29.897	29.888	29.857	29.845	29.869	29.875
Jan. 3....	29.797	29.792	29.763	29.749	29.761	29.767	29.764	29.751	29.750	29.753	29.749	29.749	29.747	29.733
Jan. 4....	29.754	29.761	29.759	29.770	29.769	29.768	29.759	29.773	29.764	29.753	29.767	29.754	29.758	29.768
Jan. 5....	29.791	29.792	29.784	29.785	29.789	29.801	29.810	29.818	29.814	29.818	29.814	29.820	29.832	29.828
Jan. 6....	29.759	29.755	29.774	29.795	29.822	29.842	29.861	29.851	29.838	29.834	29.829	29.820	29.825	29.833
Jan. 7....	29.858	29.871	29.873	29.861	29.870	29.871	29.888	29.892	29.887	29.893	29.943	29.948	29.949	29.934
Jan. 8....	29.978	29.987	29.993	29.999	29.995	30.007	30.027	30.016	30.015	30.022	30.026	30.028	30.033	30.032
Jan. 9....	30.081	30.083	30.085	30.084	30.093	30.093	30.108	30.109	30.106	30.115	30.108	30.100	30.112	30.121
Jan. 10....	30.169	30.167	30.170	30.189	30.184	30.184	30.185	30.171	30.153	30.139	30.138	30.145	30.151	30.145
Jan. 11....	30.008	30.063	30.040	30.017	29.978	29.950	29.892	29.848	29.801	29.726	29.665	29.590	29.540	29.479
Jan. 12....	28.821	28.770	28.721	28.662	28.597	28.548	28.488	28.413	28.364	28.334	28.276	**28.266**	28.298	28.323
Jan. 13....	28.766	28.797	28.837	28.874	28.918	28.970	28.999	29.046	29.094	29.131	29.169	29.209	29.246	29.285
Jan. 14....	29.890	29.930	29.997	30.056	30.102	30.151	30.196	30.225	30.271	30.286	30.326	30.370	30.402	30.421
Jan. 15....	30.475	30.482	30.446	30.430	30.425	30.412	30.390	30.374	30.353	30.344	30.316	30.295	30.281	30.241
Jan. 16....	30.005	29.981	29.965	29.935	29.927	29.919	29.896	29.880	29.874	29.836	29.834	29.822	29.819	29.817
Jan. 17....	29.780	29.787	29.786	29.780	29.768	29.764	29.750	29.734	29.724	29.717	29.717	29.713	29.713	29.730
Jan. 18....	29.777	29.779	29.776	29.777	29.760	29.747	29.744	29.708	29.689	29.652	29.620	29.605	29.602	29.584
Jan. 19....	29.520	29.528	29.513	29.515	29.523	29.532	29.524	29.532	29.535	29.542	29.548	29.555	29.570	29.579
Jan. 20....	29.775	29.794	29.809	29.850	29.861	29.880	29.888	29.905	29.911	29.931	29.951	29.968	29.988	30.003
Jan. 21....	30.171	30.171	30.171	30.167	30.136	30.130	30.033	30.059	30.029	29.984	29.938	29.891	29.849	29.803
Jan. 22....	29.382	29.344	29.302	29.264	29.232	29.191	29.136	29.086	29.074	29.034	29.034	28.997	29.034	28.986
Jan. 23....	29.717	29.718	29.723	29.748	29.769	29.790	29.800	29.823	29.843	29.869	29.916	29.936	29.965	29.975
Jan. 24....	30.115	30.156	30.177	30.224	30.251	30.273	30.286	30.301	30.312	30.321	30.352	30.351	30.351	30.365
Jan. 25....	30.332	30.307	30.295	30.268	30.253	30.197	30.150	30.100	30.063	30.007	29.968	29.908	29.869	29.836
Jan. 26....	29.630	29.633	29.628	29.633	29.641	29.656	29.656	29.666	29.681	29.697	29.719	29.724	29.741	29.741
Jan. 27....	29.730	29.728	29.734	29.744	29.750	29.757	29.754	29.753	29.753	29.759	29.774	29.788	29.799	29.809
Jan. 28....	29.986	29.984	29.989	29.996	30.000	30.017	30.009	30.009	30.004	30.004	29.983	29.989	29.983	29.977
Jan. 29....	29.993	29.984	29.978	29.976	29.985	29.995	29.985	29.972	29.980	29.980	29.981	29.981	29.998	30.001
Jan. 30....	30.113	30.125	30.134	30.133	30.149	30.161	30.161	30.158	30.158	30.159	30.155	30.144	30.131	30.123
Jan. 31....	29.873	29.837	29.797	29.756	29.722	29.693	29.628	29.566	29.539	29.501	29.472	29.438	29.408	29.364
Means..	29.838	29.837	29.835	29.835	29.835	29.835	29.828	29.817	29.812	29.804	29.802	29.795	29.800	29.793

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Jan. 1....	29.900	29.882	29.906	29.905	29.899	29.894	29.889	29.904	29.911	29.915	29.915	29.968	29.882	.086
Jan. 2....	29.809	29.854	29.857	29.859	29.848	29.830	29.819	29.823	29.809	29.817	29.809	29.912	29.809	.103
Jan. 3....	29.726	29.734	29.745	29.755	29.744	29.740	29.743	29.743	29.751	29.753	29.752	29.797	29.726	.071
Jan. 4....	29.775	29.776	29.780	29.788	29.774	29.779	29.780	29.803	29.799	29.799	29.776	29.803	29.753	.050
Jan. 5....	29.844	29.854	29.854	29.846	29.845	29.843	29.841	29.840	29.851	29.859	29.824	29.859	29.784	.075
Jan. 6....	29.850	29.853	29.854	29.851	29.850	29.850	29.850	29.847	29.856	29.863	29.831	29.863	29.755	.108
Jan. 7....	29.933	29.924	29.936	29.936	29.934	29.940	29.949	29.942	29.958	29.970	29.915	29.970	29.858	.112
Jan. 8....	30.057	30.063	30.071	30.069	30.064	30.063	30.063	30.074	30.069	30.072	30.034	30.072	29.978	.094
Jan. 9....	30.125	30.140	30.142	30.146	30.145	30.139	30.147	30.165	30.156	30.162	30.110	30.162	30.081	.081
Jan. 10....	30.143	30.131	30.133	30.128	30.120	30.113	30.100	30.095	30.082	30.075	30.142	30.185	30.075	.110
Jan. 11....	29.431	29.374	29.332	29.262	29.205	29.151	29.084	29.018	28.959	28.905	29.558	30.068	28.905	.163
Jan. 12....	28.352	28.398	28.447	28.485	28.517	28.536	28.590	28.642	28.690	28.716	28.511	28.821	28.266	.555
Jan. 13....	29.348	29.399	29.441	29.501	29.561	29.610	29.660	29.726	29.792	29.837	29.258	29.837	28.756	.081
Jan. 14....	30.462	30.485	30.488	30.489	30.518	30.516	30.533	30.519	**30.543**	30.516	30.325	**30.543**	29.890	.653
Jan. 15....	30.222	30.212	30.182	30.145	30.146	30.111	30.100	30.100	30.055	30.027	30.274	30.482	30.027	.455
Jan. 16....	29.828	29.824	29.818	29.827	29.816	29.837	29.828	29.839	29.797	29.802	29.864	30.005	29.797	.208
Jan. 17....	29.756	29.751	29.750	29.752	29.762	29.765	29.770	29.768	29.773	29.776	29.754	29.787	29.713	.074
Jan. 18....	29.509	29.584	29.570	29.560	29.558	29.535	29.540	29.522	29.522	29.519	29.639	29.779	29.519	.260
Jan. 19....	29.627	29.635	29.646	29.663	29.680	29.688	29.712	29.720	29.746	29.756	29.600	29.756	29.513	.243
Jan. 20....	30.027	30.040	30.060	30.071	30.108	30.117	30.134	30.141	30.171	30.161	29.981	30.171	29.775	.396
Jan. 21....	29.780	29.754	29.742	29.732	29.695	29.646	29.614	29.536	29.487	29.427	29.875	30.171	29.427	.744
Jan. 22....	29.084	29.194	29.313	29.412	29.477	29.560	29.604	29.649	29.676	29.690	29.281	29.690	28.986	.704
Jan. 23....	29.995	30.011	30.016	30.020	30.027	30.028	30.030	30.042	30.063	30.085	29.913	30.085	29.717	.368
Jan. 24....	30.376	30.381	30.386	30.395	30.392	30.389	30.374	30.367	30.360	30.314	30.317	30.395	30.115	.280
Jan. 25....	29.816	29.792	29.751	29.733	29.703	29.681	29.667	29.656	29.641	29.627	29.942	30.332	29.627	.705
Jan. 26....	29.750	29.759	29.752	29.749	29.751	29.750	29.750	29.739	29.741	29.734	29.705	29.759	29.630	.129
Jan. 27....	29.855	29.870	29.888	29.898	29.914	29.929	29.951	29.945	29.969	29.979	29.826	29.979	29.728	.251
Jan. 28....	29.994	30.005	29.994	29.984	29.984	29.980	29.979	29.989	29.998	29.996	29.993	30.017	29.977	.040
Jan. 29....	30.023	30.020	30.047	30.046	30.058	30.061	30.073	30.079	30.104	30.113	30.017	30.113	29.972	.141
Jan. 30....	30.006	30.110	30.099	30.071	30.048	30.023	30.004	29.980	29.955	29.923	30.098	30.161	29.923	.238
Jan. 31....	29.367	29.371	29.361	29.322	29.338	29.337	29.351	29.347	29.356	29.374	29.505	29.873	29.332	.541
Means..	29.807	29.812	29.818	29.820	29.821	29.821	29.824	29.825	29.827	29.826	29.820	29.981	29.655	.326

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Feb. 1....	29.379	29.389	29.397	29.410	29.428	29.433	29.452	29.450	29.456	29.458	29.468	29.465	29.475	29.470
Feb. 2....	29.432	29.417	29.414	29.407	29.418	29.418	29.411	29.393	29.383	29.370	29.355	29.346	29.330	29.327
Feb. 3....	29.313	29.309	29.310	29.310	29.316	29.328	29.323	29.825	29.325	29.332	29.335	29.344	29.345	29.355
Feb. 4....	29.413	29.415	29.427	29.442	29.452	29.470	29.470	29.479	29.501	29.532	29.532	29.549	29.574	29.609
Feb. 5....	29.836	29.834	29.837	29.829	29.826	29.811	29.793	29.794	29.769	29.751	29.714	29.704	29.689	29.667
Feb. 6....	29.522	29.520	29.520	29.510	29.531	29.530	29.523	29.515	29.515	29.516	29.501	29.500	29.501	29.514
Feb. 7....	29.577	29.582	29.574	29.569	29.576	29.589	29.589	29.584	29.587	29.593	29.576	29.571	29.583	29.584
Feb. 8....	29.650	29.641	29.641	29.622	29.636	29.632	29.621	29.624	29.631	29.635	29.635	29.635	29.651	29.654
Feb. 9....	29.641	29.635	29.620	29.624	29.625	29.629	29.619	29.614	29.617	29.622	29.617	29.621	29.630	29.641
Feb. 10....	29.656	29.631	29.624	29.602	29.588	29.577	29.563	29.554	29.548	29.544	29.542	29.528	29.540	29.554
Feb. 11....	29.819	29.833	29.849	29.869	29.880	29.904	29.915	29.925	29.927	29.949	29.950	29.953	29.981	29.992
Feb. 12....	30.083	30.071	30.076	30.073	30.074	30.065	30.049	30.040	30.029	30.016	29.993	29.969	29.969	29.948
Feb. 13....	29.830	29.820	29.814	29.807	29.807	29.803	29.796	29.796	29.804	29.812	29.812	29.821	29.833	29.829
Feb. 14....	29.962	29.976	29.991	30.016	30.051	30.086	30.084	30.100	30.119	30.125	30.121	30.130	30.132	30.149
Feb. 15....	30.237	30.236	30.240	30.250	30.237	30.219	30.194	30.179	30.142	30.099	30.078	30.084	30.064	30.048
Feb. 16....	29.973	29.990	29.956	29.928	29.914	29.875	29.839	29.777	29.730	29.685	29.624	29.614	29.589	29.539
Feb. 17....	29.476	29.477	29.459	29.470	29.490	29.485	29.512	29.538	29.577	29.613	29.620	29.650	29.673	29.690
Feb. 18....	29.482	29.450	29.420	29.370	29.361	29.324	29.300	29.266	29.224	29.209	29.171	29.153	29.145	29.142
Feb. 19....	29.269	29.271	29.298	29.311	29.350	29.358	29.385	29.402	29.426	29.442	29.464	29.479	29.513	29.522
Feb. 20....	29.658	29.660	29.664	29.676	29.703	29.712	29.717	29.725	29.727	29.741	29.741	29.736	29.758	29.759
Feb. 21....	29.885	29.894	29.902	29.915	29.921	29.941	29.946	29.965	29.982	29.984	29.989	29.994	29.994	29.998
Feb. 22....	30.113	30.107	30.101	30.101	30.108	30.119	30.126	30.126	30.134	30.142	30.149	30.155	30.158	30.161
Feb. 23....	30.254	30.263	30.263	30.257	30.257	30.262	30.268	**30.269**	30.259	30.250	30.232	30.211	30.199	30.175
Feb. 24....	30.053	30.046	30.034	30.030	30.021	30.013	30.003	30.004	29.987	29.988	29.988	29.979	29.963	29.963
Feb. 25....	29.935	29.933	29.932	29.923	29.926	29.919	29.901	29.887	29.878	29.856	29.820	29.802	29.785	29.772
Feb. 26....	29.677	29.668	29.670	29.665	29.665	29.667	29.662	29.662	29.654	29.637	29.621	29.608	29.581	29.549
Feb. 27....	29.348	29.333	29.339	29.333	29.330	29.324	29.332	29.353	29.387	29.429	29.451	29.494	29.529	29.562
Feb. 28....	29.604	29.591	29.551	29.513	29.489	29.431	29.389	29.337	29.289	29.237	29.168	29.109	29.032	29.051
Means..	29.712	29.714	29.712	29.708	29.714	29.712	29.706	29.703	29.701	29.699	29.688	**29.686**	**29.686**	29.687

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Feb. 1....	29.443	29.470	29.470	29.483	29.476	29.478	29.476	29.467	29.437	29.439	29.440	29.483	29.379	.104
Feb. 2....	29.332	29.346	29.350	29.353	29.354	29.345	29.341	29.332	29.316	29.316	29.367	29.432	29.316	.116
Feb. 3....	29.358	29.367	29.374	29.390	29.394	29.395	29.402	29.403	29.412	29.402	29.353	29.412	29.309	.103
Feb. 4....	29.630	29.646	29.691	29.721	24.748	29.766	29.788	29.806	29.812	29.831	29.596	29.831	29.413	.418
Feb. 5....	29.642	29.627	29.614	29.602	29.587	29.579	29.570	29.563	29.535	29.537	29.696	29.837	29.535	.302
Feb. 6....	29.526	29.538	29.555	29.562	29.568	29.572	29.575	29.580	29.569	29.567	29.535	29.580	29.500	.080
Feb. 7....	29.593	29.594	29.606	29.612	29.621	29.628	29.633	29.647	29.628	29.654	29.598	29.654	29.569	.085
Feb. 8....	29.657	29.669	29.701	29.704	29.693	29.689	29.685	29.670	29.656	29.641	29.653	29.704	29.621	.083
Feb. 9....	29.656	29.671	29.690	29.699	29.712	29.713	29.694	29.704	29.681	29.670	29.652	29.713	29.614	.099
Feb. 10....	29.591	29.617	29.659	29.687	29.707	29.728	29.750	29.762	29.766	29.781	29.629	29.781	29.528	.253
Feb. 11....	30.001	30.003	30.030	30.048	30.063	30.061	30.068	30.083	30.073	30.073	29.969	30.083	29.819	.264
Feb. 12....	29.946	29.909	29.935	29.929	29.923	29.898	29.895	29.884	29.852	29.853	29.978	30.083	29.852	.231
Feb. 13....	29.851	29.845	29.868	29.884	29.904	29.924	29.939	29.940	29.936	29.957	29.851	29.957	29.796	.161
Feb. 14....	30.166	30.156	30.190	30.218	30.219	30.227	30.224	30.233	30.221	30.241	30.131	30.241	29.962	.279
Feb. 15....	30.041	30.067	30.015	30.071	30.066	30.069	30.076	30.068	30.031	30.020	30.119	30.250	30.009	.241
Feb. 16....	29.514	29.520	29.523	29.533	29.534	29.534	29.527	29.512	29.507	29.496	29.677	29.990	29.496	.494
Feb. 17....	29.684	29.659	29.662	29.666	29.661	29.637	29.609	29.573	29.537	29.517	29.581	29.690	29.459	.231
Feb. 18....	29.146	29.149	29.161	29.165	29.181	29.193	29.196	29.211	29.224	29.244	29.246	29.482	29.142	.340
Feb. 19....	29.538	29.542	29.565	29.582	29.592	29.594	29.602	29.627	29.635	29.641	29.475	29.641	29.269	.372
Feb. 20....	29.757	29.779	29.793	29.800	29.817	29.821	29.841	29.860	29.854	29.860	29.757	29.869	29.658	.211
Feb. 21....	30.021	30.059	30.064	30.066	30.069	30.070	30.069	30.081	30.098	30.094	30.000	30.098	29.885	.213
Feb. 22....	30.175	30.189	30.187	30.183	30.191	30.202	30.230	30.248	30.255	30.257	30.163	30.257	30.101	.156
Feb. 23....	30.175	30.164	30.160	30.147	30.144	30.128	30.109	30.107	30.082	30.067	**30.196**	**30.269**	30.067	.202
Feb. 24....	29.959	29.959	29.956	29.956	29.971	29.971	29.959	29.956	29.956	29.963	29.987	30.053	29.956	.097
Feb. 25....	29.762	29.738	29.731	29.733	29.734	29.732	29.720	29.716	29.383	29.682	29.812	29.935	29.682	.253
Feb. 26....	29.538	29.508	29.502	29.480	29.455	29.429	29.408	29.392	29.360	29.348	29.559	29.677	29.348	.320
Feb. 27....	29.595	29.620	29.640	29.662	29.674	25.686	29.679	29.679	29.602	29.651	29.504	29.686	29.324	.362
Feb. 28....	29.033	28.999	**28.997**	28.999	29.007	29.014	29.032	29.041	29.047	29.051	**29.209**	29.604	**28.997**	.607
Means..	29.690	29.693	29.703	29.712	29.717	29.717	29.718	**29.719**	29.708	29.710	29.705	29.832	29.593	.239

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Mar. 1 ...	**29.072**	29.091	29.111	29.137	29.156	29.182	29.220	29.226	29.257	29.285	29.299	29.316	29.331	29.357
Mar. 2 ...	29.394	29.416	29.414	29.461	29.505	29.544	29.574	29.600	29.628	29.653	29.655	29.667	29.684	29.707
Mar. 3 ...	29.762	29.746	29.735	29.729	29.731	29.721	29.716	29.711	29.709	29.725	29.721	29.723	29.744	29.751
Mar. 4 ...	29.951	29.980	29.973	29.983	29.981	29.991	29.999	30.002	30.007	30.001	20.993	29.990	29.990	29.990
Mar. 5 ...	29.902	29.906	29.886	29.887	29.901	29.881	29.877	29.867	29.865	29.846	29.841	29.851	29.840	29.841
Mar. 6 ...	29.915	29.956	29.962	29.968	29.983	29.999	30.005	30.006	30.011	30.011	30.005	29.968	29.988	29.987
Mar. 7 ...	29.992	30.005	30.013	30.036	30.045	30.054	30.067	30.088	30.088	30.096	30.096	30.071	30.070	30.066
Mar. 8 ...	29.980	29.963	29.954	29.934	29.919	29.901	29.878	29.851	29.834	29.813	29.786	29.776	29.751	29.746
Mar. 9 ...	29.777	29.785	29.767	29.775	29.785	29.785	29.759	29.743	29.734	29.724	29.702	29.689	29.693	29.721
Mar. 10 ...	29.776	29.782	29.773	29.773	29.782	29.784	29.777	29.780	29.786	29.789	29.781	29.776	29.770	24.779
Mar. 11 ...	29.786	29.806	29.827	29.852	29.875	29.908	29.925	29.943	29.967	29.992	30.026	30.051	30.084	30.113
Mar. 12 ...	30.326	30.320	30.328	30.321	30.323	30.314	30.285	30.255	30.215	30.189	30.145	30.121	30.080	30.055
Mar. 13 ...	30.201	30.286	30.351	30.411	30.459	30.508	30.542	30.583	30.597	30.601	30.589	30.574	30.563	30.536
Mar. 14 ...	30.188	30.167	30.160	30.148	30.155	30.151	30.141	30.131	30.122	30.113	30.097	30.079	30.071	30.051
Mar. 15 ...	30.346	30.380	30.415	30.456	30.506	30.534	20.552	30.586	30.618	30.617	30.643	30.649	30.673	30.681
Mar. 16 ...	30.688	30.690	30.683	30.680	20.680	30.664	30.660	30.642	30.631	30.632	30.633	30.616	30.609	30.596
Mar. 17 ...	30.517	30.510	30.489	30.472	30.406	30.502	30.479	30.463	30.463	30.447	30.453	30.413	30.424	30.398
Mar. 18 ...	30.286	30.257	30.243	30.229	30.208	30.187	30.152	30.135	30.117	30.092	30.068	30.056	30.029	30.019
Mar. 19 ...	29.998	30.027	30.032	30.055	30.087	30.112	30.135	30.162	30.184	30.224	30.242	30.267	30.281	30.295
Mar. 20 ...	30.334	30.366	30.373	30.408	30.424	30.438	30.470	30.489	30.513	30.525	30.525	30.529	30.542	30.512
Mar. 21 ...	30.470	30.451	30.445	30.428	30.435	30.443	30.431	30.426	30.406	30.386	30.374	30.373	30.364	30.368
Mar. 22 ...	30.052	30.017	29.997	29.960	29.934	29.914	29.879	29.867	29.853	29.842	29.832	29.811	29.796	29.783
Mar. 23 ...	29.734	29.728	29.709	29.692	29.682	29.662	29.648	29.645	29.636	29.627	29.625	29.617	29.607	29.599
Mar. 24 ...	29.710	29.715	29.742	29.740	29.752	29.785	29.803	29.818	29.823	29.827	29.834	29.839	29.846	29.853
Mar. 25 ...	29.950	29.966	29.966	29.974	29.992	29.997	29.993	29.997	30.005	30.012	30.009	30.008	30.031	30.034
Mar. 26 ...	30.053	30.016	30.030	30.032	30.039	30.037	30.027	30.015	29.994	29.988	29.988	29.994	29.994	30.001
Mar. 27 ...	29.943	29.973	29.988	30.002	30.034	30.045	30.053	30.063	30.085	30.101	30.115	30.133	30.149	30.165
Mar. 28 ...	30.319	30.335	30.358	30.361	30.380	30.381	30.372	30.384	30.386	30.380	30.369	30.356	30.240	30.335
Mar. 29 ...	30.139	30.120	30.115	30.108	30.089	30.082	30.069	30.057	30.029	30.014	29.979	29.957	29.935	29.925
Mar. 30 ...	29.877	29.911	29.924	29.941	29.967	30.000	30.014	30.032	30.062	30.075	30.089	30.089	30.121	30.146
Mar. 31 ...	30.306	30.317	30.323	30.320	30.325	30.324	30.317	30.312	30.313	30.296	30.285	30.277	30.270	30.262
Means ..	**30.026**	30.032	30.035	30.041	30.053	30.059	30.059	30.061	30.063	30.062	30.058	30.053	30.054	30.055

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Mar. 1 ...	29.373	29.375	29.402	29.402	29.399	29.409	29.402	29.400	29.383	29.393	**29.291**	29.409	**29.072**	.337
Mar. 2 ...	29.737	29.744	29.756	29.769	29.771	29.777	29.786	29.793	29.788	29.767	29.649	29.793	29.394	.399
Mar. 3 ...	29.788	29.795	29.821	29.842	29.862	29.885	29.903	29.921	29.914	29.937	29.787	29.937	29.709	.228
Mar. 4 ...	29.997	29.988	29.960	29.976	29.973	29.969	29.954	29.916	29.912	29.923	29.977	30.007	29.912	.095
Mar. 5 ...	29.856	29.855	29.857	29.859	29.868	29.892	29.905	29.914	29.915	29.905	29.876	29.915	29.840	.075
Mar. 6 ...	29.983	29.956	29.961	29.971	29.979	29.979	29.979	29.985	29.967	29.971	20.981	30.006	29.945	.061
Mar. 7 ...	30.068	30.066	30.060	30.074	30.061	30.055	30.046	30.039	30.010	29.995	30.053	30.096	29.992	.104
Mar. 8 ...	29.749	29.754	29.764	29.763	29.773	29.776	29.776	29.781	29.796	29.801	29.826	29.980	29.746	.234
Mar. 9 ...	29.744	29.762	29.804	29.816	29.812	29.832	29.826	29.816	29.796	29.779	29.768	29.832	29.689	.143
Mar. 10 ...	29.795	29.791	29.796	29.795	29.793	29.793	29.793	29.792	29.790	29.787	29.785	29.796	29.770	.026
Mar. 11 ...	30.138	30.175	30.200	30.235	30.259	30.276	30.285	30.302	30.307	30.325	30.069	30.325	29.786	.539
Mar. 12 ...	30.030	30.005	29.969	29.922	29.904	29.877	29.896	29.954	30.054	30.131	30.126	30.328	29.877	.451
Mar. 13 ...	30.516	30.474	30.422	30.371	30.303	30.263	30.248	30.227	30.189	30.175	30.417	30.601	30.175	.426
Mar. 14 ...	30.067	30.059	30.076	30.091	30.100	30.138	30.177	30.216	30.251	30.306	20.136	30.306	30.051	.255
Mar. 15 ...	30.696	30.704	30.715	30.718	30.723	30.716	30.713	30.703	30.701	30.697	30.614	30.723	30.346	.377
Mar. 16 ...	30.587	30.582	30.586	30.573	30.570	30.553	30.541	30.538	30.524	30.519	30.612	30.690	30.519	.171
Mar. 17 ...	30.388	30.387	30.405	30.407	30.403	30.383	30.349	30.337	30.316	30.298	30.425	30.517	30.298	.219
Mar. 18 ...	30.069	29.993	29.999	29.987	29.978	29.978	29.981	29.986	29.991	30.000	30.082	30.286	29.978	.308
Mar. 19 ...	30.309	30.313	30.332	30.340	30.343	30.347	30.346	30.343	30.332	30.339	30.227	30.347	29.998	.349
Mar. 20 ...	**30.543**	30.536	30.535	30.534	30.534	30.531	30.522	30.504	30.482	30.469	**30.487**	**30.543**	30.351	.192
Mar. 21 ...	30.358	30.345	30.335	30.316	30.307	30.278	30.244	30.203	30.127	30.102	30.351	30.470	30.102	.368
Mar. 22 ...	20.779	29.773	29.766	29.764	29.759	29.757	29.756	29.751	29.749	29.734	29.839	30.052	29.734	.318
Mar. 23 ...	29.584	29.594	29.609	29.609	29.614	29.630	29.645	29.665	29.680	29.697	29.647	29.734	29.584	.150
Mar. 24 ...	29.868	29.871	29.876	29.882	29.883	29.899	29.909	29.937	29.932	29.956	29.838	29.956	29.710	.246
Mar. 25 ...	30.045	30.057	30.064	30.067	30.063	30.061	30.061	30.062	30.056	30.050	30.022	30.067	29.950	.117
Mar. 26 ...	29.983	29.981	29.977	29.972	29.971	29.969	29.972	29.977	29.958	29.959	29.997	30.053	29.959	.034
Mar. 27 ...	30.189	30.207	30.228	30.258	30.260	30.268	30.282	30.294	30.293	30.323	30.144	30.323	29.942	.381
Mar. 28 ...	30.325	30.312	30.309	30.293	30.270	30.249	30.229	30.213	30.171	30.145	30.316	30.386	30.115	.241
Mar. 29 ...	29.925	29.913	29.905	29.902	29.905	29.899	29.901	29.891	29.867	29.865	29.983	30.139	29.865	.274
Mar. 30 ...	30.176	30.201	30.226	30.248	30.265	30.275	30.186	30.295	30.293	30.295	30.117	30.295	29.877	.418
Mar. 31 ...	30.264	30.257	30.265	30.261	30.252	30.244	30.235	30.229	30.225	30.234	30.280	30.325	30.225	.100
Means ..	30.055	30.059	30.065	**30.097**	30.063	30.064	30.063	**30.097**	30.057	30.061	30.056	30.169	29.921	.248

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Apr. 1....	30.235	30.240	30.252	30.229	30.234	30.237	30.227	30.224	30.209	30.197	30.196	30.174	30.177	30.184
Apr. 2....	30.029	29.996	30.004	29.977	29.977	29.967	29.955	29.935	29.913	29.906	29.898	29.879	29.877	29.872
Apr. 3....	29.831	29.826	29.823	29.821	29.834	29.834	29.827	29.820	29.820	29.826	29.815	29.818	29.808	29.808
Apr. 4....	29.807	29.804	29.815	29.819	29.829	29.832	29.828	29.820	29.830	29.833	29.833	29.833	29.833	29.840
Apr. 5....	29.876	29.876	29.879	29.895	29.917	29.919	29.931	29.936	29.944	29.948	29.955	29.967	29.984	29.991
Apr. 6....	29.998	30.021	30.020	30.016	30.028	30.028	30.019	30.006	30.001	29.997	29.980	29.962	29.962	29.959
Apr. 7....	29.774	29.764	29.754	29.735	29.725	29.701	29.681	29.671	29.663	29.631	29.611	29.589	29.571	29.561
Apr. 8....	29.458	29.453	29.457	29.444	29.445	29.441	29.439	29.442	29.439	29.437	29.420	**29.406**	29.419	29.422
Apr. 9....	29.430	29.431	29.459	29.440	29.458	29.467	29.470	29.492	29.490	29.483	29.482	29.490	29.494	29.494
Apr. 10....	29.613	29.626	29.645	29.657	29.687	29.702	29.716	29.729	29.743	29.771	29.793	29.800	29.829	29.858
Apr. 11....	30.073	30.091	30.125	30.139	30.163	30.175	30.186	30.194	30.220	30.222	30.230	30.231	30.232	30.235
Apr. 12....	30.189	30.185	30.178	30.176	30.179	30.168	30.150	30.142	30.139	30.131	30.117	30.110	30.092	30.084
Apr. 13....	29.921	29.906	29.901	29.895	29.892	29.882	29.861	29.843	29.823	29.811	29.810	29.811	29.817	29.839
Apr. 14....	29.947	29.954	29.962	29.967	29.990	29.991	29.998	29.997	29.994	30.000	30.006	30.005	29.999	30.000
Apr. 15....	29.972	29.983	29.971	29.967	29.954	29.947	29.928	29.931	29.913	29.900	29.901	29.883	29.881	29.876
Apr. 16....	29.805	29.816	29.815	29.802	29.808	29.803	29.801	29.788	29.791	29.783	29.774	29.769	29.773	29.765
Apr. 17....	29.801	29.804	29.831	29.833	29.841	29.851	29.850	29.866	29.877	29.899	29.915	29.919	29.928	29.945
Apr. 18....	30.011	30.026	30.038	30.043	30.056	30.057	30.041	30.027	30.033	30.025	30.029	30.008	29.996	29.994
Apr. 19....	29.901	29.905	29.897	29.902	29.907	29.912	29.900	29.893	29.888	29.886	29.877	29.867	29.860	29.853
Apr. 20....	29.799	29.795	29.803	29.800	29.800	29.798	29.789	29.787	29.784	29.771	29.766	29.759	29.755	29.753
Apr. 21....	29.722	29.722	29.738	29.736	29.741	29.738	29.737	29.735	29.732	29.734	29.724	29.714	29.715	29.711
Apr. 22....	29.647	29.651	29.661	29.656	29.676	29.681	29.678	29.670	29.682	29.688	29.704	29.714	29.716	29.720
Apr. 23....	30.003	30.026	30.060	30.081	30.106	30.127	30.134	30.145	30.157	30.155	30.156	30.157	30.156	30.145
Apr. 24....	29.969	29.965	29.953	29.956	29.965	29.958	29.944	29.921	29.893	29.879	29.876	29.856	29.844	29.840
Apr. 25....	29.886	29.903	29.924	29.932	29.948	29.959	29.971	29.976	29.993	29.999	30.011	30.015	30.022	30.032
Apr. 26....	30.063	30.065	30.083	30.085	30.095	30.103	30.106	30.109	30.128	30.140	30.147	30.149	30.158	30.168
Apr. 27....	30.231	30.250	30.264	30.271	30.299	30.313	30.313	30.319	30.328	30.339	30.336	30.334	30.342	30.343
Apr. 28....	30.376	30.378	30.392	30.411	30.443	30.446	30.455	30.462	30.485	30.505	30.520	30.530	30.532	30.531
Apr. 29....	30.518	30.530	30.550	30.539	30.536	30.543	30.537	30.524	30.521	30.512	30.502	30.502	30.490	30.482
Apr. 30....	30.293	30.305	30.328	30.360	30.396	30.428	30.450	30.480	30.500	30.520	30.526	30.530	30.538	30.540
Means ..	29.939	29.943	29.951	29.953	29.964	29.967	29.964	29.963	29.965	29.964	29.964	29.960	29.960	29.962

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Apr. 1....	30.169	30.175	30.148	30.144	30.135	30.117	30.101	30.087	30.047	30.037	30.173	30.240	30.037	.203
Apr. 2....	29.862	29.854	29.857	29.867	29.866	29.865	29.842	29.845	29.827	29.824	29.904	30.029	29.824	.205
Apr. 3....	29.813	29.814	29.819	29.819	29.809	29.806	29.808	29.809	29.800	29.802	29.817	29.834	29.800	.034
Apr. 4....	29.851	29.848	29.853	29.863	29.863	29.864	29.869	29.869	29.847	29.863	29.840	29.869	29.804	.065
Apr. 5....	29.998	30.011	30.016	30.024	30.031	30.037	30.029	30.035	30.001	30.008	29.967	30.037	29.876	.161
Apr. 6....	29.933	29.937	29.939	29.931	29.922	29.909	29.887	29.877	29.801	29.800	29.956	30.028	29.800	.228
Apr. 7....	29.546	29.530	29.536	29.536	29.518	29.506	29.486	29.473	29.459	29.452	29.603	29.774	29.452	.322
Apr. 8....	29.430	29.436	29.438	29.429	29.425	29.424	29.430	29.442	29.420	29.424	**29.435**	29.458	**29.406**	.052
Apr. 9....	29.506	29.518	29.546	29.563	29.582	29.582	29.576	29.584	29.580	29.605	29.508	29.605	29.430	.175
Apr. 10....	29.881	29.905	29.928	29.949	29.973	29.991	30.018	30.026	30.046	30.060	29.831	30.060	29.613	.447
Apr. 11....	30.244	30.244	30.251	30.255	30.245	30.233	30.223	30.222	30.204	30.206	30.202	30.255	30.073	.182
Apr. 12....	30.082	30.072	30.057	30.039	30.014	30.005	29.998	29.979	29.942	29.936	30.090	30.189	29.936	.253
Apr. 13....	29.852	29.858	29.884	29.896	29.916	29.927	29.929	29.935	29.934	29.942	29.879	29.942	29.810	.132
Apr. 14....	30.013	30.019	30.017	30.011	30.009	29.996	29.981	29.983	29.965	29.970	29.991	30.019	29.947	.072
Apr. 15....	29.881	29.860	29.879	29.884	29.873	29.867	29.856	29.849	29.828	29.813	29.900	29.983	29.813	.170
Apr. 16....	29.770	29.778	29.785	29.788	29.776	29.777	29.790	29.796	29.785	29.796	29.789	29.816	29.765	.051
Apr. 17....	29.957	29.968	29.983	29.994	29.998	30.000	30.003	30.016	30.027	30.005	29.922	30.027	29.801	.226
Apr. 18....	29.984	29.982	29.980	29.971	29.970	29.965	29.955	29.951	29.918	29.915	29.999	30.057	29.915	.142
Apr. 19....	29.855	29.854	29.846	29.839	29.839	29.830	29.834	29.814	29.800	29.801	29.866	29.912	29.801	.111
Apr. 20....	29.754	29.753	29.761	29.761	29.751	29.751	29.741	29.754	29.734	29.733	29.769	29.803	29.733	.070
Apr. 21....	29.715	29.707	29.712	29.715	29.702	29.687	29.674	29.669	29.659	29.651	29.712	29.741	29.651	.090
Apr. 22....	29.741	29.757	29.797	29.816	29.848	29.878	29.900	29.939	29.951	29.980	29.757	29.980	29.647	.333
Apr. 23....	30.144	30.140	30.130	30.090	30.091	30.078	30.063	30.041	30.006	29.989	30.100	30.157	29.989	.168
Apr. 24....	29.854	29.862	29.876	29.867	29.862	29.865	29.858	29.875	29.860	29.881	29.895	29.969	29.840	.129
Apr. 25....	30.045	30.045	30.056	30.065	30.064	30.059	30.063	30.081	30.081	30.068	30.008	30.081	29.886	.195
Apr. 26....	30.181	30.194	30.210	30.205	30.201	30.221	30.211	30.226	30.221	30.231	30.154	30.231	30.063	.168
Apr. 27....	30.345	30.352	30.359	30.366	30.370	30.362	30.362	30.360	30.357	30.359	30.328	30.370	30.231	.139
Apr. 28....	30.541	30.545	**30.554**	30.541	30.539	30.537	30.534	30.541	30.526	30.516	**30.493**	**30.554**	30.376	.178
Apr. 29....	30.478	30.466	30.451	30.428	30.413	30.388	30.367	30.354	30.321	30.304	30.468	30.543	30.304	.239
Apr. 30....	30.553	30.550	30.548	30.534	30.523	30.510	30.500	30.481	30.432	30.430	30.469	30.553	30.293	.260
Means ..	29.966	29.968	**29.974**	29.973	29.971	29.968	29.963	29.964	29.947	29.947	29.961	30.037	29.864	.173

Tables showing pressure of air at Uglaamie from October, 1881, *to August,* 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
May 1....	30.398	30.398	30.361	30.352	30.321	30.292	30.262	30.223	30.175	30.152	30.141	30.093	30.075	30.052
May 2....	30.013	29.998	29.979	29.974	29.953	29.934	29.919	29.904	29.900	29.896	29.884	29.872	29.862	29.854
May 3....	29.832	29.829	29.832	29.837	29.847	29.848	29.844	29.853	29.818	29.838	29.829	29.807	29.827	29.828
May 4....	29.799	29.794	29.800	29.799	29.810	29.815	29.820	29.817	29.824	29.823	29.833	29.831	29.829	29.831
May 5....	29.834	29.821	29.826	29.829	29.827	29.825	29.825	29.820	29.825	29.823	29.810	29.810	29.801	29.807
May 6....	29.824	29.828	29.828	29.831	29.840	29.851	29.862	29.864	29.874	29.879	29.889	29.885	29.885	29.895
May 7....	29.945	29.947	29.947	29.947	29.970	29.985	29.980	29.976	29.977	29.979	29.983	29.987	29.987	29.987
May 8....	30.033	30.031	30.034	30.042	30.053	30.061	30.067	30.074	30.081	30.085	30.090	30.094	30.104	30.117
May 9....	30.164	30.169	30.174	30.179	30.191	30.197	30.206	30.215	30.217	30.214	30.222	30.235	30.250	30.254
May 10....	30.357	30.355	30.367	30.374	30.395	20.398	30.401	30.401	**30.402**	30.399	30.385	30.373	30.363	30.343
May 11....	30.188	30.186	30.173	30.167	30.168	30.173	30.168	30.166	30.163	30.162	30.156	30.149	30.149	30.151
May 12....	30.115	30.112	30.118	30.103	30.115	30.107	30.100	30.098	30.079	30.069	30.060	30.053	30.040	30.040
May 13....	30.022	30.022	30.030	30.037	30.941	30.043	30.046	30.052	30.056	30.059	30.061	30.065	30.065	30.065
May 14....	30.136	30.147	30.156	30.169	30.183	30.185	30.201	30.206	30.214	30.225	30.236	30.248	30.258	30.265
May 15....	30.300	30.310	30.303	30.310	30.299	30.291	30.290	30.287	30.280	30.282	30.277	30.261	30.267	30.255
May 16....	30.195	30.194	30.185	30.181	30.185	30.171	30.154	30.147	30.148	30.142	30.134	30.130	30.128	30.120
May 17....	30.053	30.053	30.049	30.054	30.071	30.076	30.079	30.084	30.093	30.092	30.108	30.113	30.122	30.130
May 18....	30.188	30.192	30.192	30.196	30.211	30.216	30.221	30.226	30.221	30.217	30.228	30.229	30.233	30.235
May 19....	30.257	30.267	30.275	30.280	30.297	30.292	30.294	30.298	30.302	30.291	30.282	30.280	30.280	30.280
May 20....	30.210	30.209	30.203	30.204	30.210	30.197	30.187	30.178	30.160	30.155	30.132	30.132	30.132	30.124
May 21....	30.097	30.094	30.100	30.124	30.143	30.146	30.165	30.178	30.178	30.181	30.191	30.203	30.208	30.214
May 22....	30.240	30.264	30.262	30.277	30.300	30.310	30.306	30.318	30.320	30.327	30.337	30.345	30.346	30.355
May 23....	30.324	30.317	30.318	30.309	30.304	30.299	30.291	30.285	30.271	30.262	30.258	30.241	30.234	30.221
May 24....	50.098	30.096	30.693	30.096	30.090	30.088	30.082	30.075	30.075	30.072	30.072	30.071	30.061	30.067
May 25....	30.035	30.038	30.038	30.031	30.042	30.036	30.031	30.031	30.025	30.025	30.025	30.025	30.023	30.030
May 26....	30.009	30.013	30.012	30.012	30.010	30.004	29.998	29.993	29.998	29.993	29.989	29.980	29.984	29.979
May 27....	29.953	29.951	29.951	29.954	29.953	29.949	29.952	29.956	29.957	29.945	29.939	29.937	29.945	29.943
May 28....	29.883	29.890	29.880	29.884	29.894	29.887	29.886	29.880	29.882	29.881	29.879	29.879	29.873	29.870
May 29....	29.842	29.841	29.839	29.839	29.849	29.838	29.838	29.838	29.834	29.824	29.814	29.813	29.805	29.798
May 30....	29.764	29.774	29.777	29.775	29.795	29.792	29.793	29.798	29.793	29.793	29.793	29.798	20.801	29.801
May 31....	29.809	29.809	29.827	29.822	29.837	29.840	29.847	29.848	29.848	29.844	29.843	29.843	29.847	29.849
Means..	30.062	30.063	30.062	30.064	**30.071**	30.069	30.068	30.067	30.065	30.062	30.061	30.058	30.058	30.057

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
May 1....	30.039	30.020	30.020	30.008	30.018	30.028	30.041	30.051	30.025	30.015	30.148	30.398	30.008	.390
May 2....	29.845	29.850	29.860	29.863	29.853	29.853	29.853	29.853	29.838	29.831	29.893	30.013	29.831	.182
May 3....	29.823	29.821	29.818	29.817	29.811	29.806	29.801	29.799	29.789	29.786	29.824	29.853	29.786	.067
May 4....	29.845	29.847	29.856	29.861	29.863	29.866	29.865	29.855	29.829	29.830	29.831	29.866	29.794	.072
May 5....	29.806	29.813	29.818	29.818	29.815	29.811	29.808	29.807	29.814	29.828	29.818	29.834	29.801	.033
May 6....	29.902	29.915	29.937	29.940	29.938	29.933	29.933	29.941	29.925	29.934	29.889	29.941	29.824	.117
May 7....	29.990	29.992	29.998	30.003	30.003	30.004	30.007	30.007	30.009	30.011	29.984	30.011	29.945	.066
May 8....	30.130	30.133	30.133	30.143	30.152	30.155	30.162	30.165	30.150	30.156	30.102	30.165	30.031	.134
May 9....	30.270	30.274	30.280	30.309	30.321	30.334	30.341	30.348	30.338	30.349	30.252	30.349	30.164	.185
May 10....	30.340	30.328	30.326	30.316	30.305	30.280	30.258	30.248	30.205	30.199	**30.338**	**30.402**	30.199	.203
May 11....	30.154	30.153	30.156	30.160	30.156	30.152	30.150	30.129	30.131	30.124	30.158	30.188	30.124	.064
May 12....	30.032	30.040	30.036	30.033	30.037	30.037	30.045	30.045	30.025	30.019	30.065	30.118	30.019	.099
May 13....	30.073	30.073	30.076	30.084	30.096	30.103	30.111	30.119	30.116	30.121	30.068	30.121	30.022	.099
May 14....	30.275	30.285	30.301	30.300	30.295	30.300	30.303	30.293	30.299	30.297	30.247	30.303	30.136	.167
May 15....	30.255	30.243	30.246	30.239	30.243	30.244	30.241	30.222	30.207	30.201	30.265	30.310	30.201	.109
May 16....	30.118	30.115	30.120	30.119	30.111	30.095	30.089	30.063	30.054	30.050	30.133	30.195	30.050	.145
May 17....	30.138	30.148	30.166	30.178	30.185	30.186	30.190	30.198	30.186	30.193	30.123	30.198	30.049	.149
May 18....	30.245	30.252	30.249	30.255	30.260	30.265	30.267	30.265	30.244	30.257	30.232	30.267	30.188	.079
May 19....	30.277	30.276	30.282	30.264	30.261	30.257	30.257	30.250	30.224	30.225	30.273	30.302	30.225	.077
May 20....	30.118	30.110	30.131	30.127	30.115	30.100	30.103	30.106	30.084	30.080	30.146	30.210	30.084	.126
May 21....	30.224	30.226	30.229	30.244	30.251	30.248	30.249	30.254	30.238	30.246	30.192	30.254	30.094	.160
May 22....	30.360	30.367	30.380	30.370	30.365	30.359	30.355	30.353	30.330	30.319	30.328	30.380	30.246	.134
May 23....	30.208	30.201	30.194	30.186	30.176	30.164	30.150	30.142	30.125	30.114	30.233	30.324	30.114	.210
May 24....	30.059	30.059	30.073	30.070	30.056	30.051	30.041	30.044	30.037	30.029	30.069	30.098	30.029	.069
May 25....	30.042	30.040	30.047	30.050	30.040	30.033	30.026	30.026	30.019	30.009	30.032	30.050	30.009	.041
May 26....	29.985	29.985	29.991	29.983	29.968	29.971	29.968	29.961	29.940	29.960	29.987	30.013	29.946	.067
May 27....	29.942	29.940	29.934	29.935	29.927	29.917	29.912	29.910	29.902	29.898	29.938	29.957	29.898	.059
May 28....	29.871	29.869	29.873	29.871	29.865	29.863	29.856	29.856	29.833	29.837	29.873	29.894	29.833	.061
May 29....	29.798	29.797	29.796	29.793	29.783	29.786	29.783	29.777	**29.755**	29.761	29.810	29.849	**29.755**	.094
May 30....	29.806	29.807	29.809	29.809	29.819	29.821	29.819	29.817	29.800	29.811	**29.799**	29.821	29.764	.057
May 31....	29.842	29.851	29.850	29.853	29.842	29.836	29.842	29.830	29.838	29.834	29.839	29.853	29.809	.044
Means..	30.058	30.059	30.064	30.065	30.062	30.060	30.059	30.057	**30.042**	30.043	30.061	30.114	29.990	.115

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—**Continued.**

(Barometer above sea 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.)

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
June 1...	29.847	29.841	29.840	29.845	29.848	29.850	29.845	29.845	29.842	29.837	29.835	29.833	29.833	29.820
June 2...	29.758	29.756	29.753	29.749	29.750	29.743	29.731	29.725	29.722	29.708	29.698	29.688	29.686	29.677
June 3...	29.621	29.622	29.619	29.623	29.629	29.627	29.623	29.630	29.637	29.638	29.639	29.647	29.660	29.665
June 4...	29.739	29.730	29.733	29.734	29.751	29.756	29.757	29.761	29.738	29.749	29.751	29.758	29.756	29.758
June 5...	29.837	29.845	29.860	29.870	29.890	29.913	29.918	29.924	29.935	29.941	29.944	29.950	29.948	29.960
June 6...	29.937	29.942	29.948	29.937	29.944	29.947	29.947	29.943	29.945	29.947	29.953	29.956	29.969	29.959
June 7...	29.991	29.985	29.997	29.999	30.022	30.030	30.042	30.037	30.041	30.043	30.053	30.053	30.053	30.062
June 8...	30.095	30.095	30.104	30.102	30.117	30.128	30.123	30.123	30.124	30.121	30.121	30.133	30.129	30.128
June 9...	30.080	30.078	30.080	30.068	30.075	30.067	30.066	30.059	30.057	30.048	30.048	30.037	30.032	30.026
June 10...	29.852	29.847	29.836	29.816	29.808	29.789	29.765	29.757	29.751	29.740	29.723	29.712	29.690	29.686
June 11...	29.566	29.563	29.559	29.556	29.552	29.550	29.555	29.556	29.545	29.546	29.545	29.545	**29.541**	29.549
June 12...	29.662	29.669	29.689	29.706	29.713	29.721	29.722	29.733	29.735	29.734	29.735	29.747	29.756	29.759
June 13...	29.743	29.747	29.739	29.741	29.752	29.752	29.749	29.752	29.756	29.754	29.754	29.751	29.751	29.759
June 14...	29.691	29.686	29.676	29.670	29.681	29.670	29.659	29.651	29.642	29.637	29.637	29.638	29.636	29.635
June 15...	29.643	29.666	29.674	29.658	29.665	29.662	29.665	29.665	29.670	29.674	29.672	29.679	29.684	29.683
June 16...	29.707	29.717	29.727	29.729	29.741	29.754	29.765	29.767	29.775	29.782	29.788	29.791	29.793	29.823
June 17...	29.928	29.946	29.955	29.973	29.990	30.001	30.012	30.024	30.027	30.041	30.050	30.060	30.069	30.079
June 18...	30.153	30.120	30.126	30.141	30.138	30.135	30.129	30.126	30.122	30.112	30.097	30.095	30.101	30.100
June 19...	30.055	30.073	30.044	30.056	30.059	30.063	30.057	30.051	30.051	30.053	30.053	30.051	30.059	30.047
June 20...	30.076	30.081	30.085	30.086	30.107	30.116	30.107	30.115	30.113	30.116	30.116	30.119	30.109	30.109
June 21...	30.082	30.086	30.086	30.091	30.096	30.098	30.097	30.096	30.101	30.114	30.116	30.134	30.154	30.164
June 22...	30.191	30.170	30.176	30.158	30.168	30.166	30.156	30.141	30.131	30.129	30.121	30.121	30.115	30.109
June 23...	30.097	30.102	30.108	30.116	30.153	30.133	30.137	30.143	30.146	30.149	30.150	30.148	30.147	30.158
June 24...	30.096	30.089	30.090	30.084	30.084	30.076	30.066	30.052	30.042	30.030	30.020	30.015	30.006	30.019
June 25...	29.926	29.923	29.918	29.911	29.911	29.899	29.880	29.866	29.855	29.842	29.833	29.818	29.813	29.795
June 26...	29.632	29.631	29.644	29.635	29.648	29.639	29.641	29.647	29.637	29.638	29.833	29.631	29.639	29.645
June 27...	29.636	29.629	29.615	29.606	29.609	29.599	29.603	29.610	29.616	29.618	29.618	29.633	29.638	29.641
June 28...	29.656	29.647	29.647	29.650	29.646	29.651	29.649	29.640	29.631	29.622	29.619	29.616	29.616	29.616
June 29...	29.628	29.624	29.642	29.642	29.601	29.672	29.678	29.680	29.694	29.704	29.704	29.717	29.727	29.726
June 30...	29.749	29.761	29.762	29.770	29.775	29.775	29.778	29.782	29.787	29.796	29.803	29.805	29.807	29.813
Means...	**29.855**	29.856	29.857	29.858	29.866	29.866	29.864	29.863	29.863	29.862	29.861	29.863	29.864	29.866

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 m.	Daily means.	Max.	Min.	Range.
1882.														
June 1...	29.830	29.811	29.815	29.807	29.805	29.790	29.780	29.775	29.758	29.752	29.820	29.850	29.752	.098
June 2...	29.670	29.660	29.651	29.652	29.658	29.648	29.646	29.643	29.620	29.631	29.693	29.758	29.620	.138
June 3...	29.666	29.685	29.688	29.695	29.700	29.715	29.715	29.720	29.710	29.722	29.662	29.722	29.619	.103
June 4...	29.761	29.768	29.773	29.781	29.785	29.793	29.800	29.795	29.805	29.820	29.765	29.820	29.730	.090
June 5...	29.965	29.976	29.976	29.970	29.960	29.958	29.955	29.955	29.934	29.933	29.930	29.976	29.837	.139
June 6...	29.967	29.965	29.966	29.960	29.965	29.979	29.980	29.989	29.969	29.973	29.958	29.989	29.937	.052
June 7...	30.081	30.080	30.079	30.084	30.087	30.086	30.081	30.085	30.091	30.087	30.052	30.091	29.985	.106
June 8...	30.131	30.134	30.136	30.133	30.142	30.131	30.111	30.109	30.090	30.079	30.118	30.142	30.079	.063
June 9...	30.023	30.014	29.997	29.980	29.970	29.947	29.928	29.906	29.885	29.866	30.014	30.080	29.866	.214
June 10...	29.674	29.659	29.639	29.628	29.623	29.608	29.606	29.588	29.571	29.563	29.765	29.852	29.571	.281
June 11...	29.561	29.565	29.573	29.587	29.603	29.616	29.628	29.630	29.647	29.641	**29.574**	29.647	**29.541**	.106
June 12...	29.764	29.768	29.762	29.768	29.761	29.747	29.753	29.744	29.735	29.744	29.734	29.768	29.662	.106
June 13...	29.759	29.757	29.752	29.752	29.739	29.739	29.726	29.717	29.695	29.709	29.744	29.759	29.695	.064
June 14...	29.632	29.632	29.639	29.643	29.648	29.654	29.653	29.656	29.644	29.651	29.653	29.691	29.632	.059
June 15...	29.696	29.699	29.702	29.703	29.708	29.706	29.709	29.714	29.713	29.706	29.663	29.714	29.643	.071
June 16...	29.836	29.848	29.860	29.867	29.891	29.885	29.889	29.897	29.905	29.920	29.811	29.920	29.707	.213
June 17...	30.101	30.110	30.112	30.117	30.122	30.127	30.127	30.126	30.133	30.149	30.058	30.149	29.938	.211
June 18...	30.096	30.074	30.074	30.079	30.074	30.079	30.076	30.066	30.065	30.051	30.100	30.141	30.051	.090
June 19...	30.047	30.053	30.059	30.059	30.067	30.070	30.074	30.074	30.086	30.078	30.060	30.086	30.044	.042
June 20...	30.119	30.119	30.125	30.133	30.125	30.121	30.109	30.104	30.091	30.090	30.108	30.133	30.076	.057
June 21...	30.172	30.192	30.190	30.192	30.200	**30.204**	30.200	30.197	30.194	30.182	**30.143**	**30.204**	30.082	.122
June 22...	30.102	30.101	30.109	30.107	30.102	30.097	30.096	30.089	30.084	30.097	30.126	30.191	30.084	.107
June 23...	30.165	30.174	30.168	30.163	30.155	30.148	30.138	30.137	30.115	30.125	30.140	30.174	30.097	.077
June 24...	30.012	30.015	30.012	30.002	29.984	29.961	29.956	29.918	29.946	29.948	30.023	30.096	29.946	.150
June 25...	29.782	29.767	29.755	29.735	29.710	29.688	29.678	29.666	29.644	29.640	29.802	29.926	29.640	.286
June 26...	29.657	29.667	29.662	29.677	29.679	29.675	29.675	29.675	29.672	29.662	29.652	29.679	29.631	.048
June 27...	29.656	29.660	29.654	29.654	29.666	29.668	29.666	29.659	29.666	29.656	29.636	29.668	29.599	.069
June 28...	29.609	29.609	29.611	29.608	29.613	29.614	29.616	29.620	29.622	29.606	29.626	29.656	29.600	.050
June 29...	29.744	29.750	29.749	29.746	29.744	29.743	29.751	29.753	29.749	29.747	29.707	29.753	29.624	.129
June 30...	29.819	29.823	29.825	29.822	29.827	29.825	29.823	29.814	29.817	29.821	29.799	29.827	29.749	.078
Means...	29.870	**29.871**	29.870	29.870	29.870	29.867	29.865	29.862	**29.855**	**29.855**	29.863	29.915	29.831	.114

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
July 1....	29.823	29.831	29.831	29.833	29.833	29.832	29.825	29.819	29.819	29.816	29.813	29.811	29.807	29.806
July 2....	29.819	29.819	29.817	29.821	29.828	29.840	29.841	29.840	29.843	29.845	29.845	29.845	29.850	29.850
July 3....	29.874	29.876	29.893	29.900	29.903	29.903	29.905	29.905	29.913	29.915	29.927	29.941	29.947	29.946
July 4....	30.027	30.030	30.042	30.046	30.044	30.040	30.046	30.054	30.056	30.063	30.065	30.067	30.079	30.079
July 5....	30.047	30.043	30.058	30.037	30.042	30.032	30.018	30.000	29.984	29.958	29.934	29.916	29.920	29.908
July 6....	29.822	29.814	29.810	29.805	29.801	29.796	29.791	29.787	29.778	29.768	29.765	29.766	29.766	29.762
July 7....	29.762	29.765	29.759	29.768	29.775	29.767	29.750	29.736	29.722	29.721	29.716	29.711	29.696	29.704
July 8....	29.612	29.607	29.597	29.574	29.584	29.571	29.556	29.533	29.527	29.521	29.519	29.511	29.506	29.494
July 9....	29.469	29.483	29.493	29.492	29.499	29.500	29.509	29.510	29.519	29.522	29.525	29.530	29.538	29.545
July 10....	29.558	29.551	29.560	29.551	29.555	29.576	29.573	29.578	29.593	29.599	29.604	29.617	29.619	29.624
July 11....	29.719	29.734	29.711	29.742	29.775	29.802	29.827	29.837	29.851	29.857	29.867	29.887	29.897	29.902
July 12....	29.964	29.966	29.980	29.977	29.987	29.989	29.982	29.967	29.957	29.952	29.918	29.934	29.903	29.905
July 13....	29.898	29.887	29.881	29.873	29.886	29.861	29.852	29.851	29.856	29.855	29.860	29.873	29.876	29.880
July 14....	29.739	29.717	29.702	29.689	29.686	29.681	29.666	29.645	29.629	29.621	29.616	29.609	29.592	29.589
July 15....	29.581	29.597	29.610	29.627	29.628	29.634	29.634	29.642	29.640	29.630	29.632	29.644	29.651	29.654
July 16....	29.595	29.591	29.591	29.576	29.581	29.576	29.564	29.545	29.534	29.518	29.515	29.509	29.496	29.489
July 17....	29.433	29.440	29.441	**29.429**	29.433	29.426	29.432	29.439	29.444	29.442	29.445	29.445	29.445	29.452
July 18....	29.572	29.580	29.595	29.621	29.635	29.642	29.664	29.667	29.671	29.675	29.681	29.691	29.701	29.711
July 19....	29.756	29.764	29.782	29.783	29.795	29.799	29.805	29.801	29.797	29.796	29.796	29.799	29.799	29.799
July 20....	29.829	29.835	29.839	29.845	29.854	29.850	29.853	29.846	29.845	29.848	29.853	29.853	29.847	29.841
July 21....	29.795	29.803	29.805	29.820	29.829	29.831	29.831	29.828	29.828	29.834	29.834	29.834	29.847	29.850
July 22....	29.905	29.908	29.926	29.921	29.931	29.924	29.916	29.911	29.906	29.898	29.905	29.913	29.920	29.930
July 23....	29.948	29.959	29.981	29.978	29.963	29.967	29.966	29.965	29.959	29.962	29.963	29.943	29.943	29.925
July 24....	29.787	29.785	29.783	29.775	29.783	29.773	29.759	29.754	29.739	29.741	29.736	29.726	29.726	29.715
July 25....	29.673	29.663	29.674	29.676	29.684	29.669	29.660	29.657	29.645	29.643	29.647	29.657	29.672	29.694
July 26....	29.768	29.773	29.776	29.777	29.777	29.774	29.774	29.767	29.756	29.755	29.745	29.742	29.739	29.736
July 27....	29.717	29.726	29.738	29.731	29.741	29.743	29.738	29.742	29.746	29.746	29.748	29.768	29.773	29.777
July 28....	29.855	29.865	29.880	29.895	29.922	29.922	29.029	29.952	29.967	29.980	30.003	30.015	30.032	30.037
July 29....	30.091	30.092	30.093	**30.098**	30.095	30.095	30.091	30.080	30.071	30.068	30.065	30.039	30.053	30.036
July 30....	29.964	29.944	29.945	29.949	29.958	29.960	29.953	29.936	29.941	29.933	29.928	29.923	29.911	29.903
July 31....	29.847	29.846	29.843	29.837	29.847	29.846	29.813	29.837	29.830	29.819	29.815	29.803	29.803	29.795
Means..	29.782	29.784	29.789	29.789	**29.795**	29.791	29.792	29.788	29.786	29.784	29.783	29.785	29.786	29.785

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 m.	Daily means.	Max.	Min.	Range.
1882.														
July 1....	29.806	29.810	29.816	29.820	29.817	29.816	29.814	29.811	29.814	29.821	29.818	29.833	29.806	.027
July 2....	29.855	29.865	29.861	29.858	29.856	29.863	29.863	29.865	29.866	29.876	29.847	29.876	29.817	.059
July 3....	29.965	29.979	29.973	29.991	29.099	30.001	30.001	29.999	30.019	30.023	29.946	30.023	29.874	.149
July 4....	30.079	30.082	30.075	30.072	30.071	30.066	30.062	30.057	30.050	30.059	**30.059**	30.082	30.027	.055
July 5....	29.906	29.899	29.894	29.891	29.885	29.869	29.859	29.842	29.843	29.824	29.942	30.058	29.824	.234
July 6....	29.772	29.787	29.784	29.782	29.779	29.776	29.777	29.769	29.767	29.760	29.782	29.822	29.760	.062
July 7....	29.688	29.676	29.668	29.658	29.650	29.638	29.631	29.626	29.632	29.621	29.702	29.775	29.621	.154
July 8....	29.489	29.485	29.490	29.481	29.471	29.459	29.462	29.457	29.478	29.475	29.519	29.612	29.457	.155
July 9....	29.547	29.518	29.549	29.547	29.545	29.542	29.537	29.552	29.543	29.549	29.525	29.552	29.469	.083
July 10....	28.649	29.651	29.648	29.659	29.689	29.691	29.693	29.689	29.699	29.704	29.622	29.704	29.551	.153
July 11....	29.907	29.910	29.912	29.925	29.933	29.043	29.953	29.963	29.966	29.961	29.866	29.966	29.711	.255
July 12....	29.903	29.896	29.887	29.892	29.885	29.883	29.895	29.905	29.892	29.905	29.930	29.989	29.883	.106
July 13....	29.861	29.898	29.878	29.876	29.867	29.862	29.844	29.821	29.791	29.763	29.858	29.898	29.763	.135
July 14....	29.582	29.586	29.570	29.562	29.570	29.572	29.575	29.574	29.577	29.577	29.622	29.739	29.562	.177
July 15....	29.644	29.656	29.648	29.641	29.641	29.641	29.634	29.631	29.616	29.611	29.632	29.656	29.581	.075
July 16....	29.487	29.480	29.475	29.467	29.455	29.455	29.448	29.443	29.438	29.437	29.511	29.505	29.437	.158
July 17....	29.457	29.469	29.465	29.466	29.472	29.488	29.491	29.516	29.531	29.547	**29.460**	29.547	**29.429**	.118
July 18....	29.720	29.744	29.746	29.751	29.759	29.762	29.762	29.761	29.759	29.760	29.693	29.762	29.572	.190
July 19....	29.805	29.815	29.811	29.810	29.815	29.823	29.825	29.823	29.822	29.821	29.802	29.825	29.756	.069
July 20....	29.840	29.837	29.830	29.825	29.825	29.826	29.826	29.821	29.802	29.823	29.837	29.854	29.802	.052
July 21....	29.858	29.861	29.863	29.881	29.890	29.906	29.911	29.911	29.911	29.906	29.853	29.911	29.795	.116
July 22....	29.938	29.940	29.948	29.951	29.952	29.950	29.946	29.945	29.937	29.943	29.928	29.952	29.898	.054
July 23....	29.920	29.920	29.908	29.892	29.885	29.857	29.855	29.837	29.817	29.805	29.922	29.981	29.805	.176
July 24....	29.710	29.708	29.700	29.698	29.693	29.695	29.691	29.690	29.690	29.688	29.731	29.787	29.688	.099
July 25....	29.729	29.737	29.744	29.742	29.746	29.752	29.761	29.762	29.759	29.765	29.701	29.765	29.643	.122
July 26....	29.737	29.732	29.732	29.735	29.735	29.732	29.729	29.720	29.720	29.710	29.748	29.777	29.710	.067
July 27....	29.788	29.799	29.797	29.798	29.805	29.813	29.818	29.825	29.828	29.850	29.773	29.850	29.717	.133
July 28....	30.046	30.055	30.063	30.071	30.082	30.080	30.087	30.091	30.073	30.084	30.000	30.091	29.855	.236
July 29....	30.036	30.032	30.014	29.999	29.993	29.987	29.974	29.969	29.966	29.961	30.042	**30.098**	29.961	.137
July 30....	29.894	29.889	29.879	29.863	29.877	29.876	29.874	29.863	29.855	29.854	29.911	29.964	29.854	.110
July 31....	29.800	29.790	29.787	29.785	29.780	29.775	29.757	29.730	29.724	29.696	29.801	39.847	29.696	.151
Means..	29.788	29.791	29.788	29.787	29.788	29.787	29.786	29.783	**29.780**	**29.780**	29.787	29.845	29.720	.125

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, - 5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Aug. 1...	29.680	29.676	29.662	29.644	29.654	29.666	29.674	29.669	29.669	29.676	29.666	29.670	29.666	29.669
Aug. 2...	29.684	29.679	29.684	29.679	29.676	29.669	29.659	29.648	20.635	29.614	29.601	29.581	29.557	29.536
Aug. 3...	29.372	29.377	29.404	29.424	29.447	29.466	29.487	29.503	29.523	29.540	29.552	29.578	29.591	29.621
Aug. 4...	29.756	29.760	29.762	29.759	29.761	29.747	29.739	29.721	29.709	29.698	29.694	29.706	29.729	29.751
Aug. 5...	29.980	29.990	29.987	30.005	30.018	30.024	30.042	30.043	30.052	30.055	30.055	30.039	30.025	30.025
Aug. 6...	29.703	29.720	29.697	29.687	29.684	29.657	29.652	29.655	29.651	29.651	29.649	29.641	29.638	29.626
Aug. 7...	29.545	29.541	29.535	29.545	29.593	29.627	29.636	29.655	29.668	39.682	29.692	29.713	29.738	29.763
Aug. 8...	29.815	29.815	29.813	29.815	29.820	29.812	29.801	29.791	29.774	29.748	29.734	29.690	29.649	29.621
Aug. 9...	29.417	29.397	29.402	29.405	29.410	29.408	29.409	29.400	29.390	29.387	29.372	29.372	29.366	29.363
Aug. 10...	20.658	29.662	29.675	29.683	29.696	29.677	29.666	29.651	29.626	29.601	29.576	29.554	29.528	29.506
Aug. 11...	29.320	29.306	29.300	29.282	29.272	29.269	29.259	29.244	29.235	29.221	29.205	29.195	29.190	29.204
Aug. 12...	29.194	29.193	20.206	29.213	29.230	29.241	29.253	29.267	29.282	29.293	29.300	29.325	29.349	29.384
Aug. 13...	29.684	29.699	29.722	29.746	29.776	29.787	29.804	29.814	29.817	29.820	29.830	29.838	29.845	29.865
Aug. 14...	29.900	29.901	29.908	29.910	29.918	29.925	29.914	29.915	29.913	29.907	29.900	29.896	29.896	29.888
Aug. 15...	29.855	29.863	29.861	29.855	29.865	29.865	29.855	29.850	29.845	29.835	29.833	29.824	29.826	29.818
Aug. 16...	29.790	29.796	29.802	29.806	29.821	29.830	29.830	29.834	29.840	29.846	29.856	29.861	29.867	29.879
Aug. 17...	29.921	29.931	29.933	29.954	29.955	29.956	29.955	29.949	29.952	29.952	29.943	29.940	29.934	29.934
Aug. 18...	29.863	29.863	29.866	29.866	29.860	29.869	29.870	29.861	29.854	29.853	29.848	29.848	29.854	29.855
Aug. 19...	29.827	29.828	29.825	29.821	29.831	29.831	29.831	29.825	29.820	29.828	29.835	29.837	29.837	29.833
Aug. 20...	29.780	29.778	29.770	29.772	29.780	29.770	29.762	29.760	29.757	29.753	29.753	29.757	29.772	29.757
Aug. 21...	29.793	29.805	29.810	29.810	29.831	29.832	29.836	29.828	29.830	29.830	29.833	29.833	29.834	29.827
Aug. 22...	29.845	29.847	29.864	29.859	29.871	29.871	29.876	29.873	29.873	29.872	29.872	29.880	29.887	29.890
Aug. 23...	29.836	29.831	29.831	29.831	29.833	29.836	29.824	29.832	29.840	29.848	29.855	29.856	29.861	29.871
Aug. 24...	29.898	29.898	29.906	20.906	29.907	29.906	29.906	29.900	29.899	29.892	29.880	29.875	29.867	29.864
Aug. 25...	29.828	29.830	29.828	29.828	29.834	29.833	29.837	29.807	29.795	29.785	29.780	29.780	29.780	29.780
Aug. 26...	29.805	29.815	29.827	29.840	29.855	29.863	29.863	29.873	29.883	29.898	29.906	29.908	29.927	29.936
Aug. 27...	30.036	30.050	30.059	30.066	30.057	30.086	30.079	30.074	30.073	30.077	30.077	30.078	30.089	30.092
Aug. 28...	39.102	30.110	30.131	30.134	30.139	30.139	30.138	30.136	30.135	30.134	30.128	30.128	30.126	39.123
Aug. 29...	30.023	30.036	30.041	30.029	30.032	30.022	30.016	30.009	30.011	30.010	29.991	29.988	29.978	29.978
Aug. 30...	29.935	29.946	29.961	29.963	29.980	29.990	29.996	30.004	30.017	30.023	30.034	30.042	30.041	30.063
Aug. 31...	30.171	30.186	30.204	30.208	30.228	30.243	30.247	30.257	30.268	30.282	30.293	30.306	30.308	30.313
Means...	**29.775**	29.778	29.783	29.785	29.795	29.797	29.797	29.795	29.795	29.794	29.792	29.792	29.792	29.795

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Aug. 1...	29.669	29.664	29.667	29.661	29.671	29.677	29.678	29.679	29.680	29.684	29.670	29.684	29.644	.040
Aug. 2...	29.522	29.502	29.493	29.463	29.445	29.432	29.412	29.390	29.376	29.359	29.551	29.684	29.359	.325
Aug. 3...	29.638	29.656	29.674	29.691	29.711	24.732	29.739	29.750	29.752	29.754	29.583	29.754	29.372	.382
Aug. 4...	29.769	29.793	29.813	29.843	29.862	29.890	29.908	29.920	29.940	29.957	29.791	29.957	29.694	.263
Aug. 5...	30.017	29.992	29.964	29.932	29.914	29.974	29.842	29.806	29.769	29.737	29.970	30.055	29.737	.318
Aug. 6...	29.629	29.615	29.602	29.594	29.593	29.592	29.582	29.575	29.572	29.559	29.634	29.720	29.559	.161
Aug. 7...	29.795	29.782	29.779	29.772	29.776	29.793	29.813	29.823	29.821	29.823	29.705	29.823	29.535	.288
Aug. 8...	29.589	29.564	29.547	29.524	29.512	29.499	29.492	29.464	29.446	29.432	29.657	29.820	29.432	.388
Aug. 9...	29.355	29.355	29.387	25.435	29.481	29.539	29.584	29.619	29.627	29.646	29.439	29.646	29.355	.291
Aug. 10...	29.486	29.465	29.455	29.449	29.425	29.407	29.373	29.363	29.335	29.320	29.535	29.690	29.320	.370
Aug. 11...	29.196	29.193	29.198	29.195	29.193	29.185	29.188	29.193	**29.181**	29.188	**29.226**	29.320	**29.181**	.139
Aug. 12...	29.414	29.439	29.474	29.497	29.530	29.577	29.599	29.621	29.651	29.663	29.383	29.663	29.193	.470
Aug. 13...	29.873	29.878	29.879	29.883	29.893	29.900	29.899	29.897	29.903	29.895	29.831	29.903	29.684	.219
Aug. 14...	29.891	29.891	29.886	29.884	29.889	29.889	29.880	29.867	29.861	29.852	29.895	29.927	29.852	.075
Aug. 15...	29.821	29.800	29.794	29.786	29.791	29.786	29.801	29.799	29.779	29.781	29.824	29.865	29.779	.086
Aug. 16...	29.882	29.884	29.882	29.884	29.894	29.900	29.905	29.905	29.908	29.911	29.859	29.911	29.790	.121
Aug. 17...	29.931	29.931	29.924	29.911	29.896	29.899	29.886	29.886	29.873	29.866	29.926	29.956	29.866	.090
Aug. 18...	29.859	29.851	29.848	29.844	29.846	29.842	29.839	29.837	29.827	29.820	29.852	29.870	29.820	.050
Aug. 19...	29.828	29.836	29.821	29.809	29.812	29.802	29.802	29.792	29.788	29.775	29.820	29.837	29.775	.062
Aug. 20...	29.759	29.759	29.759	29.763	29.761	29.766	29.776	29.779	29.788	29.787	29.767	29.788	29.753	.035
Aug. 21...	29.831	29.836	29.838	29.843	29.839	29.831	29.829	29.841	29.836	29.837	29.829	29.843	29.793	.050
Aug. 22...	29.875	29.872	29.872	29.874	29.872	29.867	29.865	29.856	29.848	29.845	29.868	29.890	29.845	.045
Aug. 23...	29.878	29.887	29.889	29.885	29.893	29.896	29.896	29.895	29.902	29.887	29.862	29.902	29.824	.078
Aug. 24...	29.867	29.865	29.862	29.857	29.853	29.850	29.849	29.844	29.836	29.828	29.876	29.907	29.828	.079
Aug. 25...	29.783	29.776	29.776	29.774	29.777	29.783	20.780	29.783	29.785	29.794	29.797	29.837	29.774	.063
Aug. 26...	29.944	29.958	29.968	29.974	29.975	29.985	29.994	29.998	30.018	30.028	29.918	30.028	29.805	.223
Aug. 27...	30.101	30.104	30.106	30.108	30.101	30.102	30.100	30.106	30.118	30.115	30.086	30.118	30.036	.082
Aug. 28...	30.111	30.107	30.106	30.096	30.088	30.077	30.066	30.069	30.061	30.048	30.110	30.139	30.048	.091
Aug. 29...	29.964	29.967	29.969	29.952	29.947	29.941	29.942	29.940	29.945	29.943	29.986	30.041	29.940	.101
Aug. 30...	30.076	30.089	30.107	30.117	30.119	30.126	30.133	30.154	30.172	30.188	30.053	30.188	29.935	.253
Aug. 31...	30.327	30.341	30.350	**30.355**	30.354	30.347	30.346	30.320	30.327	30.332	**30.288**	**30.355**	30.171	.184
Means...	29.796	29.795	29.796	29.795	29.797	**29.803**	29.800	29.799	29.798	29.795	29.793	29.875	29.700	.175

Tables showing pressure of air at Uglaamie from October, 1881, *to August,* 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, 5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Sept. 1...	30.321	30.322	30.314	30.313	30.315	30.315	30.322	30.336	30.346	30.361	30.360	30.369	30.386	30.406
Sept. 2...	30.430	30.428	30.426	30.429	30.446	30.441	30.440	30.432	30.436	30.424	30.412	30.394	30.378	30.367
Sept. 3...	30.200	30.200	30.183	30.177	30.179	30.171	30.162	30.158	30.147	30.146	30.149	30.140	30.127	30.122
Sept. 4...	30.040	30.048	30.039	30.051	30.048	30.044	30.040	30.031	30.027	30.027	30.030	30.024	30.025	30.025
Sept. 5...	29.923	29.934	29.924	29.912	29.910	29.895	29.887	29.875	29.859	29.826	29.830	29.818	29.804	29.789
Sept. 6...	29.649	29.647	20.644	29.627	29.623	29.611	24.610	29.609	29.591	29.586	29.587	29.581	29.563	29.568
Sept. 7...	29.578	29.606	29.609	29.611	29.634	29.636	29.642	29.647	29.656	29.674	29.663	29.672	29.677	29.679
Sept. 8...	29.785	29.793	29.807	29.818	29.830	29.835	29.837	29.835	29.842	29.846	29.854	29.861	29.861	29.863
Sept. 9...	29.878	29.888	29.882	29.898	29.903	29.907	29.913	29.913	29.913	29.915	29.907	29.905	27.897	29.893
Sept. 10...	29.818	29.807	29.794	29.787	29.782	29.772	29.760	29.749	29.729	29.717	29.705	29.687	29.668	29.652
Sept. 11...	29.545	29.546	29.541	29.552	29.548	29.546	29.543	29.541	29.545	29.549	29.553	29.540	29.543	29.543
Sept. 12...	29.596	29.611	29.612	29.621	29.636	29.644	29.644	29.649	29.664	29.667	29.674	29.681	29.681	29.684
Sept. 13...	29.699	29.694	29.696	29.702	29.712	29.714	29.719	29.722	29.721	29.720	29.722	29.725	29.718	29.714
Sept. 14...	29.704	29.707	29.707	29.703	29.714	29.714	29.716	29.718	29.725	29.722	29.710	29.731	29.736	29.741
Sept. 15...	29.812	29.817	29.830	29.834	29.837	29.829	29.829	29.827	29.836	29.827	29.815	29.823	29.817	29.823
Sept. 16...	29.699	29.695	29.670	29.846	29.641	29.631	29.606	29.581	29.566	29.543	29.521	29.491	29.478	29.385
Sept. 17...	29.213	29.214	29.189	29.174	29.151	29.139	29.125	29.095	29.086	29.072	29.065	29.048	**29.030**	**29.030**
Sept. 18...	29.133	29.160	29.150	29.159	29.185	29.195	29.205	29.210	29.227	29.230	29.236	29.241	29.241	29.248
Sept. 19...	29.300	29.304	29.320	29.334	29.352	29.380	29.399	29.414	29.434	29.456	29.464	29.486	29.506	29.518
Sept. 20...	29.792	29.808	29.833	29.860	29.910	29.940	29.955	29.980	29.996	30.012	30.030	30.052	30.066	30.081
Sept. 21...	30.064	30.053	30.036	30.036	30.035	30.019	30.011	30.004	29.992	29.991	20.982	29.980	29.957	29.945
Sept. 22...	29.913	29.918	29.929	29.923	29.929	29.939	29.939	29.939	29.946	29.952	29.948	29.956	29.952	29.952
Sept. 23...	29.949	29.939	29.945	29.943	29.933	29.930	29.915	29.901	29.892	29.880	29.860	29.862	29.835	29.813
Sept. 24...	29.621	29.637	29.631	29.606	29.590	29.576	29.563	29.543	29.541	29.528	29.521	29.514	29.494	29.489
Sept. 25...	29.624	29.657	29.678	29.701	29.748	20.773	29.793	29.820	29.836	29.858	29.886	29.894	29.900	29.905
Sept. 26...	29.955	29.957	29.950	29.953	29.953	29.950	29.937	29.923	29.912	29.897	29.868	29.847	20.821	29.809
Sept. 27...	29.918	29.953	29.943	29.945	29.966	29.965	29.948	29.948	29.935	29.918	29.913	29.901	29.880	29.876
Sept. 28...	29.777	29.773	29.767	29.767	29.775	29.782	29.783	29.777	29.789	29.798	29.801	29.820	29.829	29.841
Sept. 29...	29.851	29.880	29.915	29.939	29.970	29.992	29.985	29.988	29.988	29.993	30.000	30.000	29.998	30.000
Sept. 30...	30.062	30.066	30.057	30.067	30.052	30.032	30.007	29.984	29.972	29.946	29.918	29.895	29.864	29.830
Means..	29.795	29.802	29.801	**29.810**	**29.810**	**20.810**	29.808	29.805	29.805	20.802	29.799	29.798	20.791	29.786

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Sept. 1...	30.412	30.420	30.429	30.430	30.438	30.439	**30.452**	30.450	30.443	30.448	**30.381**	**30.452**	30.313	.139
Sept. 2...	30.357	30.344	30.334	30.319	30.298	30.272	30.259	30.241	30.224	30.210	30.364	30.446	30.210	.236
Sept. 3...	30.110	30.110	30.110	30.104	30.100	30.092	30.090	30.082	30.077	30.070	30.134	30.200	30.070	.130
Sept. 4...	30.026	30.036	30.024	30.017	30.006	29.996	29.973	29.961	29.955	29.945	30.018	30.051	29.945	.106
Sept. 5...	29.779	29.761	29.755	29.749	29.728	29.710	29.688	29.683	29.666	29.650	29.806	29.934	29.650	.284
Sept. 6...	29.574	29.563	29.571	29.571	29.571	29.571	29.582	29.582	29.582	29.592	29.594	29.649	29.563	.086
Sept. 7...	29.694	29.702	29.714	29.721	29.734	29.752	29.757	29.763	29.770	29.784	29.681	29.784	29.578	.206
Sept. 8...	29.873	29.876	29.880	29.680	29.882	29.680	29.883	29.879	29.890	29.892	29.853	29.892	29.785	.107
Sept. 9...	29.888	29.883	29.881	29.863	29.855	29.849	29.849	29.834	29.826	29.827	29.882	29.915	29.826	.089
Sept. 10...	29.641	29.626	29.619	29.610	29.600	29.586	29.572	29.564	29.555	29.549	29.681	29.818	29.549	.269
Sept. 11...	29.544	29.549	29.564	29.567	29.577	29.584	29.584	29.598	29.606	29.608	29.559	29.608	29.541	.067
Sept. 12...	29.690	29.697	29.702	29.702	29.607	29.695	29.710	29.699	29.704	29.707	29.669	29.710	29.596	.114
Sept. 13...	29.719	29.721	29.729	29.729	29.729	29.724	29.710	29.712	29.711	29.710	29.716	29.729	29.694	.035
Sept. 14...	29.748	29.765	29.782	29.789	29.792	29.788	29.800	29.791	29.800	29.799	29.746	29.800	29.703	.097
Sept. 15...	29.815	29.810	29.805	29.798	29.793	29.777	29.773	29.747	29.737	29.720	29.805	29.837	29.720	.117
Sept. 16...	29.372	29.377	29.401	29.374	29.352	29.319	29.292	29.280	29.255	29.245	29.484	29.699	29.245	.454
Sept. 17...	29.035	29.043	29.053	29.070	29.078	29.076	29.078	29.089	29.098	29.117	**29.090**	29.214	**29.030**	.184
Sept. 18...	29.256	29.259	29.271	29.275	29.271	29.268	29.264	29.266	29.283	29.291	29.230	29.291	29.133	.158
Sept. 19...	29.557	29.581	29.609	29.634	29.650	29.681	29.705	29.730	29.744	29.766	29.514	29.766	29.300	.466
Sept. 20...	30.088	30.105	30.110	30.110	30.100	30.093	30.082	30.086	30.078	30.066	30.010	30.110	29.792	.318
Sept. 21...	29.934	29.930	29.927	29.921	29.921	29.929	29.927	29.916	29.914	29.904	29.972	30.064	29.904	.160
Sept. 22...	29.956	29.951	29.958	29.954	29.959	29.959	29.957	29.956	29.955	29.953	29.946	29.959	29.913	.046
Sept. 23...	29.804	29.791	29.771	29.755	29.740	29.720	29.700	29.690	29.681	29.665	29.830	29.949	29.665	.284
Sept. 24...	29.477	29.477	29.490	29.500	29.516	29.528	29.550	29.558	29.588	29.621	29.548	29.637	29.477	.160
Sept. 25...	29.917	29.933	29.947	29.947	29.950	29.954	29.959	29.959	29.958	29.963	29.856	29.963	29.624	.339
Sept. 26...	29.779	29.768	29.769	29.777	29.805	29.838	29.861	29.886	29.901	29.918	29.876	29.957	29.768	.189
Sept. 27...	29.868	29.862	29.841	29.841	29.824	29.814	29.806	29.793	29.784	29.775	29.884	29.966	29.775	.191
Sept. 28...	29.841	29.834	29.816	29.807	29.793	29.793	29.790	29.809	29.831	29.843	29.802	29.843	29.767	.076
Sept. 29...	30.015	30.028	30.049	30.066	30.068	30.064	30.065	30.071	30.081	30.085	30.004	30.085	29.851	.234
Sept. 30...	29.786	29.764	29.748	29.734	29.697	29.699	29.644	29.607	29.594	29.594	29.859	30.066	29.594	.472
Means..	29.785	29.786	29.789	29.787	29.784	29.782	29.779	**29.776**	**29.776**	29.777	29.793	29.880	29.686	.194

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Oct. 1....	29.621	29.596	29.581	29.576	29.583	29.571	**29.564**	29.568	29.578	29.583	29.598	29.593	29.606	29.624
Oct. 2....	29.671	29.670	29.693	29.691	29.716	29.729	29.736	29.734	29.733	29.734	29.748	29.754	29.762	29.774
Oct. 3....	29.904	29.907	29.949	29.950	29.973	29.980	29.994	30.001	30.005	30.014	30.021	30.023	30.029	30.034
Oct. 4....	30.012	30.006	30.007	30.006	30.016	30.005	29.995	29.994	29.987	29.981	29.988	29.980	29.975	29.972
Oct. 5....	29.882	29.878	29.880	29.871	29.858	29.843	29.829	29.804	29.786	29.762	29.743	29.724	29.709	29.698
Oct. 6....	29.649	29.663	29.676	29.676	29.693	29.698	29.704	29.710	29.715	29.726	29.743	29.748	29.749	29.760
Oct. 7....	29.907	29.923	29.920	29.933	29.950	29.979	29.970	29.967	29.971	29.970	29.974	29.978	29.973	29.977
Oct. 8....	29.966	29.969	29.969	29.971	29.980	29.981	29.978	29.968	29.970	29.967	29.974	29.970	29.973	29.978
Oct. 9....	29.988	29.995	29.985	29.990	29.997	29.996	29.994	29.983	29.975	29.971	29.975	29.972	29.971	29.963
Oct. 10....	29.963	29.963	29.966	29.966	29.978	29.985	29.985	29.985	29.982	29.985	29.985	29.979	29.974	29.980
Oct. 11....	30.001	30.011	30.006	30.019	30.028	30.035	30.033	30.033	30.036	30.038	30.036	30.034	30.033	30.031
Oct. 12....	30.131	30.136	30.141	30.150	30.172	30.177	30.186	30.187	30.196	30.205	30.217	30.213	30.212	30.212
Oct. 13....	30.152	30.145	30.147	30.123	30.127	30.117	30.103	30.090	30.078	30.065	30.048	30.031	30.018	30.006
Oct. 14....	29.830	29.846	29.826	29.811	29.816	29.813	29.809	29.800	29.798	29.794	29.791	29.777	29.773	29.768
Oct. 15....	29.783	29.793	29.804	29.804	29.804	29.809	29.825	29.828	29.839	29.841	29.845	29.855	29.865	29.873
Oct. 16....	29.964	29.973	29.972	29.979	29.993	30.001	30.000	30.006	30.009	30.009	30.017	30.014	30.013	30.004
Oct. 17....	29.947	29.953	29.944	29.932	29.939	29.931	29.918	29.906	29.897	29.882	29.869	29.865	29.858	29.841
Oct. 18....	29.739	29.744	29.749	29.749	29.742	29.742	29.737	29.736	29.742	29.745	29.745	29.745	29.742	29.738
Oct. 19....	29.756	29.773	29.769	29.771	29.781	29.783	29.784	29.781	29.786	29.781	29.790	29.781	29.776	29.773
Oct. 20....	29.734	29.736	29.722	29.722	29.721	29.721	29.721	29.719	29.720	29.716	29.716	29.711	29.712	29.714
Oct. 21....	29.745	29.755	29.767	29.759	29.769	29.773	29.778	29.778	29.775	29.775	29.776	29.767	29.761	29.756
Oct. 22....	29.733	29.741	29.736	29.741	29.755	29.745	29.743	29.733	29.737	29.732	29.733	29.736	29.730	29.720
Oct. 23....	29.677	29.680	29.674	29.671	29.689	29.686	29.677	29.669	29.667	29.668	29.667	29.667	29.669	29.674
Oct. 24....	29.708	29.707	29.709	29.720	29.720	29.729	29.729	29.734	29.741	29.748	29.754	29.754	27.757	29.760
Oct. 25....	29.767	29.784	29.783	29.788	29.799	29.805	29.798	29.808	29.805	29.805	29.810	29.814	29.812	29.811
Oct. 26....	29.849	29.842	29.849	29.862	29.879	29.883	29.883	29.884	29.893	29.895	29.895	29.893	29.897	29.894
Oct. 27....	29.846	29.852	29.852	29.859	29.865	29.862	29.859	29.853	29.856	29.856	29.851	29.852	29.853	29.850
Oct. 28....	29.861	29.871	29.881	29.883	29.894	29.899	29.904	29.914	29.925	29.926	29.933	29.937	29.941	29.943
Oct. 29....	30.028	30.035	30.028	30.030	30.048	30.056	30.058	30.071	30.073	30.086	30.086	30.095	30.097	30.098
Oct. 30....	30.077	30.106	30.092	30.092	30.105	30.096	30.092	30.073	30.055	30.028	29.994	29.955	29.898	29.862
Oct. 31....	29.824	29.826	29.821	29.836	29.827	29.811	29.794	29.773	29.757	29.753	29.744	29.735	29.732	29.728
Means..	**29.862**	29.867	29.867	29.869	**29.878**	**29.878**	29.877	29.874	29.874	29.872	29.873	29.869	29.867	29.865

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Oct. 1....	29.631	29.651	29.666	29.672	29.661	29.661	29.677	29.672	29.668	29.668	**29.620**	29.677	**29.564**	.113
Oct. 2....	29.791	29.806	29.823	29.828	29.847	29.850	29.864	29.874	29.889	29.904	29.776	29.904	29.670	.234
Oct. 3....	30.045	30.046	30.047	30.037	30.037	30.028	30.029	30.020	30.020	30.020	30.004	30.047	29.904	.143
Oct. 4....	29.973	29.974	29.977	29.969	29.951	29.939	29.931	29.923	29.909	29.904	29.974	30.016	29.904	.112
Oct. 5....	29.682	29.677	29.652	29.652	29.639	29.629	29.645	29.641	29.645	29.652	29.741	29.882	29.629	.253
Oct. 6....	29.781	29.796	29.809	29.814	29.839	29.841	29.860	29.876	29.894	29.913	29.764	29.913	29.649	.264
Oct. 7....	29.974	29.975	29.977	29.979	29.980	29.969	29.970	29.969	29.973	29.972	29.963	29.980	29.907	.073
Oct. 8....	29.983	29.985	29.988	29.988	29.988	29.973	29.982	29.982	29.994	29.999	29.978	29.999	29.966	.033
Oct. 9....	29.960	29.959	29.959	29.958	29.955	29.962	29.959	29.959	29.971	29.971	29.974	29.997	29.955	.042
Oct. 10....	29.988	29.997	30.002	29.994	29.995	29.999	30.000	30.001	30.011	30.013	29.986	30.013	29.963	.050
Oct. 11....	30.043	30.050	30.060	30.069	30.074	30.080	30.080	30.107	30.115	30.126	30.049	30.126	30.001	.125
Oct. 12....	30.215	30.216	30.212	**30.217**	30.211	30.195	30.188	30.177	30.178	30.173	**30.188**	**30.217**	30.131	.086
Oct. 13....	29.996	29.974	29.958	29.948	29.928	29.906	29.903	29.877	29.856	29.857	30.019	30.152	29.856	.296
Oct. 14....	29.764	29.763	29.747	29.747	29.747	29.751	29.745	29.756	29.766	29.765	29.783	29.846	29.745	.101
Oct. 15....	29.886	29.892	29.895	29.907	29.920	29.923	29.928	29.940	29.953	29.968	29.866	29.968	29.783	.185
Oct. 16....	30.005	30.021	30.016	29.999	29.991	29.981	29.982	29.974	29.973	29.968	29.994	30.021	29.964	.057
Oct. 17....	29.834	29.821	29.813	29.809	29.804	29.785	29.773	29.772	29.768	29.760	29.850	29.953	29.760	.193
Oct. 18....	29.737	29.735	29.730	29.742	29.750	29.757	29.751	29.756	29.764	29.770	29.745	29.770	29.730	.040
Oct. 19....	29.771	29.769	29.769	29.762	29.751	29.745	29.741	29.741	29.743	29.738	29.767	29.790	29.738	.052
Oct. 20....	29.710	29.726	29.732	29.732	29.732	29.732	29.732	29.738	29.746	29.754	29.726	29.754	29.711	.043
Oct. 21....	29.762	29.760	29.758	29.758	29.758	29.758	29.751	29.749	29.747	29.746	29.762	29.778	29.745	.033
Oct. 22....	29.715	29.716	29.716	29.716	29.717	29.715	29.711	29.712	29.702	29.701	29.726	29.755	29.702	.053
Oct. 23....	29.687	29.692	29.694	29.701	29.706	29.706	29.709	29.709	29.709	29.711	29.686	29.711	29.667	.044
Oct. 24....	29.760	29.774	29.778	29.780	29.778	29.774	29.779	29.779	29.774	29.778	29.752	29.780	29.707	.073
Oct. 25....	29.819	29.820	29.822	29.827	29.832	29.836	29.836	29.855	29.856	29.854	29.814	29.856	29.767	.089
Oct. 26....	29.891	29.882	29.892	29.892	29.882	29.882	29.883	29.878	29.875	29.871	29.880	29.897	29.842	.055
Oct. 27....	29.854	29.853	29.851	29.851	29.853	29.853	29.866	29.868	29.868	29.869	29.856	29.869	29.846	.023
Oct. 28....	29.950	29.970	29.985	29.990	29.996	29.999	30.014	30.015	30.027	30.038	29.946	30.038	29.861	.177
Oct. 29....	30.079	30.078	30.078	30.064	30.063	30.076	30.083	30.088	30.095	30.114	30.071	30.114	30.028	.086
Oct. 30....	29.830	29.795	29.772	29.763	29.763	29.772	29.790	29.797	29.805	29.816	29.934	30.106	29.763	.343
Oct. 31....	29.732	29.751	29.787	29.799	29.804	29.795	29.790	29.769	29.764	29.739	29.779	29.836	29.728	.108
Means..	29.867	29.869	29.870	29.870	29.869	29.867	29.870	29.870	29.873	29.875	29.870	29.928	29.812	.116

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Nov. 1...	29.724	29.701	29.676	29.651	29.631	29.597	29.565	29.525	29.511	29.487	29.479	29.457	29.440	29.431
Nov. 2...	29.476	29.490	29.492	29.510	29.497	29.505	29.500	29.492	29.497	29.469	29.491	29.531	29.571	29.611
Nov. 3...	29.981	30.010	30.041	30.064	30.088	30.096	30.088	30.098	30.106	30.112	30.108	30.103	30.096	30.093
Nov. 4...	30.119	30.113	30.119	30.118	30.127	30.132	30.122	30.104	30.090	30.090	30.083	30.074	30.071	30.003
Nov. 5...	29.956	29.944	29.951	29.954	29.949	29.941	29.041	29.928	29.922	29.927	29.925	29.929	29.926	29.921
Nov. 6...	29.904	29.899	29.912	29.920	29.924	29.931	29.943	29.948	29.957	29.963	29.976	29.991	30.000	30.008
Nov. 7...	30.114	30.116	30.121	30.117	30.118	30.123	30.123	30.103	30.007	30.089	30.071	30.059	30.044	30.025
Nov. 8...	29.767	29.744	29.738	29.733	29.714	29.704	29.696	29.683	29.683	29.680	29.680	29.696	29.700	29.710
Nov. 9...	29.760	29.775	29.755	29.739	29.734	29.706	29.695	29.666	29.643	29.621	29.589	29.562	29.542	29.519
Nov. 10...	29.294	29.305	29.304	29.308	29.316	29.324	29.334	29.354	29.374	29.406	29.439	29.457	29.479	29.506
Nov. 11...	29.410	29.439	29.436	29.437	29.428	29.429	29.429	29.432	29.430	29.441	29.443	29.453	29.456	29.473
Nov. 12...	29.662	29.683	29.706	29.739	29.757	29.761	29.777	29.783	29.788	29.790	29.793	29.795	29.797	29.798
Nov. 13...	29.781	29.781	29.797	29.787	29.805	29.803	29.806	29.806	29.806	29.807	29.812	29.814	29.822	29.825
Nov. 14...	29.831	29.843	29.842	29.847	29.863	29.855	29.861	29.861	29.863	29.862	29.866	29.873	29.872	29.866
Nov. 15...	29.879	29.880	29.876	29.875	29.861	29.854	29.837	29.820	29.811	29.795	29.777	29.770	29.763	29.738
Nov. 16...	29.600	29.607	29.591	29.601	29.586	29.581	29.571	29.569	29.564	29.567	29.554	29.559	29.562	29.551
Nov. 17...	29.551	29.559	29.554	29.541	29.546	29.543	29.534	29.514	29.492	20.493	29.481	29.481	29.469	29.437
Nov. 18...	29.362	29.395	29.392	29.384	29.384	29.392	29.405	29.400	29.398	29.397	29.408	29.420	29.424	29.426
Nov. 19...	29.509	29.521	29.519	29.538	29.554	29.563	29.578	29.599	29.601	29.609	29.610	29.639	29.634	29.652
Nov. 20...	29.709	29.718	29.721	29.729	29.747	29.745	29.751	29.762	29.763	29.771	29.758	29.764	29.766	29.779
Nov. 21...	29.674	29.666	29.654	29.658	29.628	29.616	29.594	29.584	29.555	29.544	29.521	29.493	29.480	29.458
Nov. 22...	29.318	29.309	29.315	29.332	29.322	29.332	29.340	29.353	29.362	29.378	29.394	29.411	29.430	29.451
Nov. 22...	29.698	29.714	29.739	29.763	29.791	29.796	29.818	29.835	29.864	29.875	29.892	29.912	29.925	29.939
Nov. 24...	30.101	30.105	30.123	30.148	30.162	30.174	30.186	30.194	30.206	30.209	30.218	30.228	30.229	30.236
Nov. 25...	30.291	30.336	30.358	30.394	30.422	30.445	30.451	30.481	30.491	30.493	30.498	30.498	30.502	30.500
Nov. 26...	30.440	30.440	30.442	30.428	30.421	30.400	30.377	30.374	30.338	30.346	30.303	30.293	30.260	30.238
Nov. 27...	30.043	30.046	30.014	30.017	30.090	29.975	29.958	29.940	29.911	29.895	29.868	29.856	29.849	29.838
Nov. 28...	29.774	29.790	29.795	29.799	29.804	29.814	29.816	29.815	29.818	29.828	29.847	29.872	29.886	29.891
Nov. 29...	30.074	30.090	30.106	30.150	30.188	30.204	30.212	30.219	30.224	30.230	30.224	30.223	30.220	30.221
Nov. 30...	30.170	30.144	30.140	30.124	30.104	30.087	30.062	30.043	30.024	30.018	29.996	29.079	29.969	29.964
Means...	29.799	29.805	29.808	29.814	29.816	29.814	29.812	29.810	29.806	29.807	29.803	29.806	29.806	29.806

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Nov. 1...	29.430	29.443	29.433	29.438	29.436	29.435	29.455	29.475	29.492	29.497	29.517	29.724	29.430	.294
Nov. 2...	29.642	29.690	29.722	29.773	29.809	29.835	29.876	29.903	29.945	29.982	29.639	29.982	29.476	.506
Nov. 3...	30.109	30.111	30.114	30.109	30.104	30.104	30.105	30.105	30.112	30.128	30.091	30.128	29.981	.147
Nov. 4...	30.043	30.022	30.014	30.007	29.992	29.979	29.981	29.977	29.072	29.962	30.057	30.132	29.962	.170
Nov. 5...	29.913	29.909	29.909	29.903	29.896	29.896	29.897	29.899	29.908	29.908	29.923	29.956	29.896	.060
Nov. 6...	30.021	30.033	30.052	30.065	30.075	30.089	30.097	30.102	30.112	30.118	30.002	30.118	29.899	.219
Nov. 7...	30.005	29.986	29.981	29.951	29.924	29.891	29.866	29.835	29.819	29.791	30.015	30.123	29.791	.332
Nov. 8...	29.729	29.746	29.750	29.765	29.776	29.776	29.780	29.792	29.798	29.792	29.735	29.798	29.680	.118
Nov. 9...	29.484	29.465	29.445	29.417	29.397	29.372	29.355	29.330	29.313	29.299	29.549	29.775	29.299	.476
Nov. 10...	29.508	29,505	29.502	29.470	29.479	29.467	29.447	29.440	29.448	29.433	29.413	29.508	29.294	.214
Nov. 11...	29.490	29.500	29.527	29.542	29.560	29.572	29.601	29.611	29.630	29.656	29.493	29.656	29.410	.246
Nov. 12...	29.793	29.786	29.793	29.783	29.788	29.788	29.774	29.776	29.782	29.783	29.770	29.798	29.662	.136
Nov. 13...	29.827	29.834	29.841	29.843	29.836	29.834	29.837	29.839	29.838	29.838	29.817	29.843	29.781	.062
Nov. 14...	29.875	29.884	29.893	29.896	29.899	29.881	29.882	29.877	29.872	29.877	29.868	29.899	29.831	.068
Nov. 15...	29.728	29.715	29.706	29.687	29.664	29.640	29.627	29.622	29.624	29.632	29.758	29.880	29.624	.256
Nov. 16...	29.564	27.552	29.542	29.542	29.550	29.555	29.562	29.558	29.562	29.568	29.568	29.607	29.542	.065
Nov. 17...	29.424	29.426	29.434	29.402	29.392	29.385	29.386	29.390	29.392	29.391	29.467	29.559	29.390	.169
Nov. 18...	29.429	29.435	29.443	29.448	29.452	29.457	29.476	29.487	29.491	29.502	29.425	29.502	29.362	.140
Nov. 19...	29.663	29.674	29.674	29.683	29.687	29.689	29.694	29.700	29.697	29.700	29.624	29.700	29.509	.191
Nov. 20...	29.776	29.736	29.746	29.746	29.751	29.745	29.737	29.729	29.720	29.708	29.746	29.779	29.708	.071
Nov. 21...	29.441	29.427	29.407	29.393	29.379	29.370	29.360	29.241	29.343	29.342	29.497	29.674	29.241	.333
Nov. 22...	29.481	29.500	29.526	29.539	29.562	29.585	29.606	29.635	29.648	29.670	29.450	29.670	29.309	.361
Nov. 23...	29.960	29.975	29.991	29.994	30.008	30.030	30.047	30.058	30.081	30.094	29.908	30.094	29.698	.396
Nov. 24...	30.244	30.237	30.252	30.252	30.225	30.237	30.241	30.243	30.251	30.287	30.207	30.287	30.101	.186
Nov. 25...	30.503	30.500	30.493	30.491	30.484	30.478	30.473	30.469	30.459	30.449	30.457	30.503	30.291	.212
Nov. 26...	30.215	30.200	30.178	30.154	30.119	30.106	30.101	30.094	30 077	30.067	30.267	30.442	30.067	.375
Nov. 27...	29.829	29.821	29.807	29.787	29.787	29.775	29.779	29.776	29.778	29.790	29.881	30.046	29.775	.271
Nov. 28...	29.914	29.933	29.944	29.959	29.981	29.985	30.011	30.024	30.038	30.052	29.891	30.052	29.774	.278
Nov. 29...	30.237	30.255	30.243	30.230	30.230	30.230	30.213	30.200	30.200	30.190	30.201	30.255	30.074	.181
Nov. 30...	29.956	29.950	29.942	29.910	29.903	29.895	29.883	29.856	29.865	29.849	29.993	30.170	29.849	.321
Means...	29.808	29.809	29.810	29.806	29.805	29.803	29.805	29.805	29.809	29.812	29.808	29.922	29.694	.228

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Dec. 1 ...	29.850	29.847	29.850	29.853	29.850	29.853	29.852	29.845	29.852	29.862	29.880	29.889	29.889	29.901
Dec. 2....	29.968	29.969	29.968	29.985	29.988	29.984	29.986	29.982	29.985	29.979	29.988	29.995	30.005	30.003
Dec. 3....	30.015	30.031	30.047	30.030	30.026	30.024	30.028	30.031	30.029	30.022	30.027	30.030	30.034	30.036
Dec. 4....	30.114	30.117	30.127	30.137	30.152	30.167	30.169	30.176	30.176	30.182	30.196	30.202	30.214	30.222
Dec. 5....	30.236	30.238	30.240	30.228	30.231	30.224	30.211	30.198	30.189	30.169	30.161	30.154	30.145	30.139
Dec. 6....	29.955	29.953	29.918	29.924	29.922	29.905	29.905	29.887	29.881	29.874	29.877	29 861	29.852	29.851
Dec. 7....	29.902	29.909	29.914	29.927	29.950	29.975	29.985	30.001	30.007	30.021	30.035	30.054	30.070	30.080
Dec. 8....	30.265	30.275	30.290	30.287	30.298	30.306	30.309	30.294	30.296	30.291	30.276	30.265	30.263	30.258
Dec. 9....	30.221	30.239	30.258	30.275	30.306	30.325	30.347	30.363	30.385	30.404	30.419	30.433	30.465	30.477
Dec. 10....	30.672	30.682	30.703	30.711	30.733	30.747	30.759	30.761	30.771	30.780	30.792	30.794	30.808	30.811
Dec. 11....	30.877	30.880	30.880	30.894	30.905	30.908	30.919	30.939	30.935	30.944	30.944	30.949	30.945	30.957
Dec. 12....	30.940	30.920	30.917	30.934	30.917	30.887	30.882	30.891	30.882	30.856	30.860	30.854	30.847	30.845
Dec. 13....	30.686	30.659	30.647	30.624	30.609	30.602	30.573	30.550	30.542	30.517	30.489	30.462	30.435	30.413
Dec. 14....	30.215	30.198	30.178	30.177	30.182	30.185	30.195	30.203	30.211	30.222	30.230	30.233	30.252	30.254
Dec. 15....	30.222*	30.212	30.192	30.175	30.167	30.151	30.133	30.129	30.110	30.117	30.105	30.092	30.080	30.084
Dec. 16....	29.993	29.998	29.978	29.973	29.961	29.929	29.918	29.901	29.874	29.860	29.835	29.829	29.821	29.809
Dec. 17....	29.714	29.714	29.719	29.716	29.739	29.740	29.741	29.743	29.750	29.749	29.750	29.756	29.756	29.753
Dec. 18....	29.757	29.754	29.756	29.751	29.754	29.754	29.751	29.746	29.746	29.747	29.741	29.732	29.731	29.722
Dec. 19....	29.656	29.641	29.649	29.627	29.624	29.614	29.606	29.595	29.583	29.570	29.560	29.558	29.552	29.543
Dec. 20....	29.462	29.454	29.434	29.448	29.445	29.443	29.435	29.430	29.431	29.428	29.426	29.427	29.428	**29.426**
Dec. 21...	29.464	29.461	29.460	29.465	29.489	29.497	29.502	29.499	29.511	29.512	29.523	29.532	29.544	29.551
Dec. 22....	29.592	29.604	29.614	29.599	29.612	29.621	29.624	29.626	29.632	29.634	29.633	29.637	29.646	29.661
Dec. 23 ...	29.762	29.793	29.795	29.818	29.827	29.848	29.851	29.865	29.880	29.887	29.904	29.913	29.925	29.927
Dec. 24....	29.911	29.905	29.908	29.913	29.923	29.933	29.931	29.924	29.922	29.921	29.920	29.923	29.936	29.946
Dec. 25....	30.001	30.008	30.017	30.014	30.030	30.021	30.012	30.000	29.990	29.982	29.952	29.938	29.932	29.921
Dec. 26....	29.718	29.714	29.704	29.686	29.679	29.659	29.642	29.628	29.611	29.594	29.589	29.592	29.589	29.585
Dec. 27....	29.656	29.673	29.694	29.713	29.741	29.769	29.792	29.810	29.839	29.858	29.881	29.901	29.911	29.927
Dec. 28....	30.159	30.181	30.212	30.244	30.275	30.292	30.302	30.305	30.280	30.283	30.271	30.246	30.220	30.197
Dec. 29....	29.955	29.946	29.942	29.945	29.949	30.021	30.149	30.247	30.341	30.420	30.467	30.523	30.569	30.618
Dec. 30....	30.824	30.833	30.843	30.830	30.830	30.826	30.808	30.810	30.808	30.791	30.774	30.757	30.755	30.748
Dec. 31....	30.659	30.653	30.666	30.654	30.658	30.639	30.639	30.629	30.606	30.601	30.573	30.561	30.558	30.545
Means ..	**30.078**	30.079	30.081	30.082	30.089	30.092	30.095	30.097	30.099	30.099	30.099	30.100	30.102	30.104

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1882.														
Dec. 1....	29.917	29.927	29.925	29.925	29.940	29.945	29.951	29.964	29.966	29.962	29.896	29.966	29.845	.121
Dec. 2....	29.998	30.003	30.005	30.013	30.018	30.018	30.015	30.015	30.024	30.038	29.997	30.038	29.968	.070
Dec. 3 ...	30.046	30.060	30.064	30.062	30.063	30.072	30.082	30.093	30.095	30.098	30.084	30.098	30.015	.083
Dec. 4....	30.241	30.247	30.245	30.234	30.234	30.246	30.241	30.250	30.251	30.247	30.199	30.251	30.114	.137
Dec. 5 ...	30.121	30.105	30.093	30.067	30.057	30.025	30.017	30.012	29.995	29.986	30.135	30.240	29.986	.254
Dec. 6....	29.868	29.874	29.876	29.878	29.873	29.869	29.862	29.871	29.890	29.898	29.889	29.955	29.851	.104
Dec. 7....	30.102	30.123	30.152	30.172	30.189	30.204	30.228	30.243	30.255	30.257	30.073	30.257	29.902	.355
Dec. 8....	30.245	30.226	30.217	30.184	30.176	30.169	30.172	30.178	30.183	30.213	30.247	30.309	30.176	.133
Dec. 9....	30.509	30.526	30.550	30.565	30.576	30.598	30.621	30.634	30.654	30.673	30.450	30.673	30.221	.452
Dec. 10....	30.821	30.827	30.826	30.833	30.840	30.842	30.855	30.865	30.882	30.895	30.792	30.895	30.672	.223
Dec. 11....	30.956	30.950	30.964	**30.965**	**30.965**	30.958	30.946	30.940	30.950	30.938	**30.934**	**30.965**	30.877	.088
Dec. 12....	30.847	30.830	30.811	30.797	30.780	30.758	30.754	30.751	30.746	30.722	30.843	30.940	30.722	.218
Dec. 13....	30.397	30.390	30.380	30.341	30.311	30.277	30.264	30.254	30.240	30.232	30.454	30.686	30.232	.454
Dec. 14....	30.253	30.265	30.266	30.266	30.266	30.260	30.256	30.234	30.224	30.222	30.227	30.266	30.177	.089
Dec. 15....	30.077	30.079	30.081	30.080	30.059	30.050	30.038	30.029	30.016	30.011	30.104	30.222	30.011	.211
Dec. 16....	29.803	29.785	29.779	29.769	29.739	29.731	29.728	29.731	29.733	29.727	29.842	29.998	29.727	.271
Dec. 17....	29.755	29.763	29.765	29.768	29.761	29.752	29.753	29.760	29.762	29.756	29.747	29.768	29.714	.054
Dec. 18....	29.722	29.717	29.715	29.705	29.690	29.686	29.672	29.664	29.668	29.664	29.723	29.757	29.664	.093
Dec. 19....	29.534	29.535	29.528	29.523	29.508	29.498	29.490	29.487	29.484	29.473	29.560	29.656	29.473	.183
Dec. 20....	29.427	29.433	29.448	29.448	29.452	29.460	29.456	29.456	29.461	29.472	**29.443**	29.472	**29.426**	.046
Dec. 21....	29.568	29.572	29.579	29.586	29.588	29.594	29.593	29.597	29.605	29.601	29.537	29.605	29.460	.145
Dec. 22....	29.672	29.684	29.689	29.694	29.703	29.709	29.724	29.736	29.747	29.760	29.661	29.760	29.592	.168
Dec. 23 ...	29.926	29.924	29.924	29.924	29.924	29.916	29.924	29.927	29.925	29.916	29.884	29.927	29.762	.165
Dec. 24....	29.949	29.949	29.968	29.982	29.985	29.994	29.993	29.990	29.998	30.011	29.948	30.011	29.905	.106
Dec. 25....	29.921	29.902	29.885	29.850	29.838	29.823	29.802	29.795	29.770	29.754	29.923	30.030	29.754	.276
Dec. 26....	29.573	29.576	29.582	29.584	29.576	29.584	29.607	29.622	29.626	29.645	29.624	29.718	29.573	145
Dec. 27....	29.935	29.948	29.963	29.964	29.977	29.989	30.013	30.039	30.082	30.121	29.884	30.122	29.656	.466
Dec. 28....	30.185	30.158	30.136	30.109	30.073	30.054	30.031	30.015	29.998	29.978	30.175	30.305	29.978	.327
Dec. 29 ...	30.656	30.696	30.736	30.759	30.780	30.792	30.829	30.822	30.826	30.837	30.451	30.837	29.942	.895
Dec. 30....	30.749	30.756	30.740	30.733	30.733	30.714	30.707	30.706	30.698	30.694	30.769	30.843	30.694	.149
Dec. 31....	30.534	30.536	30.531	30.511	30.486	30.461	30.463	30.454	30.439	30.425	30.562	30.606	30.425	.241
Means ..	30.106	30.109	**30.110**	30.106	30.102	30.098	30.100	30.101	30.103	30.104	30.097	30.201	29.984	.217

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Barmometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Jan. 1....	30.391	30.372	30.344	30.325	30.321	30.311	30.272	30.237	30.223	30.199	30.170	30.147	30.116	30.088
Jan. 2....	29.726	29.709	29.663	29.643	29.635	29.604	29.567	29.537	29.517	29.537	29.527	29.488	29.474	29.463
Jan. 3....	29.420	29.427	29.429	29.419	29.429	29.439	29.420	29.407	29.403	29.401	29.385	29.386	29.388	29.387
Jan. 4....	29.311	29.311	29.297	29.300	29.287	29.272	29.250	29.233	29.218	29.208	29.198	29.186	29.173	29.165
Jan. 5....	29.066	29.069	29.061	29.050	29.054	29.048	29.040	29.036	29.028	29.030	29.030	29.017	29.013	29.013
Jan. 6....	29.030	29.032	29.038	29.055	29.058	29.073	29.085	29.098	29.100	29.091	29.098	29.112	29.113	29.125
Jan. 7....	29.208	29.216	29.213	29.224	29.245	29.253	29.268	29.255	29.264	29.270	29.278	29.283	29.297	29.306
Jan. 8....	29.347	29.352	29.352	29.357	29.371	29.372	29.362	29.357	29.360	29.356	29.349	29.348	29.354	29.362
Jan. 9....	29.480	29.507	29.542	29.565	29.576	29.588	29.604	29.623	29.637	29.662	29.681	29.706	29.731	29.751
Jan. 10....	29.932	29.915	29.951	29.943	29.957	29.972	29.977	29.972	29.977	29.982	29.975	29.976	29.975	29.975
Jan. 11....	29.969	29.978	29.970	29.965	29.975	29.980	29.978	29.981	29.972	29.979	29.978	29.986	30.004	30.006
Jan. 12....	29.967	29.950	29.947	29.943	29.945	29.945	29.928	29.918	29.914	29.916	29.915	29.920	29.930	29.929
Jan. 13....	29.941	29.956	29.958	29.951	29.963	29.960	29.968	29.963	29.958	29.958	29.957	29.958	29.956	29.973
Jan. 14....	30.115	30.137	30.168	30.102	30.237	30.246	30.277	30.292	30.317	30.332	30.340	30.362	30.378	30.406
Jan. 15....	30.706	30.734	30.761	30.774	30.797	30.835	30.851	30.863	30.866	30.898	30.891	30.897	30.906	30.923
Jan. 16....	30.841	30.810	30.790	30.780	30.718	30.695	30.652	30.603	30.549	30.495	30.435	30.372	30.326	30.260
Jan. 17....	29.741	29.751	29.776	29.788	29.797	29.807	29.840	29.861	29.879	29.884	29.890	29.901	29.909	29.925
Jan. 18....	30.047	30.050	30.064	30.083	30.115	30.131	30.141	30.158	30.179	30.183	30.205	30.224	30.250	30.279
Jan. 19....	30.469	30.493	30.509	30.523	30.549	30.555	30.577	30.605	30.615	30.629	30.629	30.631	30.646	30.666
Jan. 20....	30.628	30.604	30.587	30.565	30.570	30.560	30.531	30.505	30.501	30.505	30.468	30.448	30.436	30.419
Jan. 21....	30.333	30.346	30.360	30.357	30.367	30.365	30.356	30.351	30.340	30.338	30.329	30.326	30.310	30.303
Jan. 22....	30.133	30.121	30.112	30.078	30.086	30.081	30.050	30.039	30.017	30.004	29.970	29.945	29.916	29.897
Jan. 23....	29.546	29.543	29.518	29.503	29.460	29.440	29.403	29.380	29.374	29.353	29.346	29.349	29.346	29.315
Jan. 24....	29.330	29.337	29.357	29.372	29.392	29.394	29.410	29.420	29.420	29.438	29.438	29.455	29.461	29.486
Jan. 25....	29.681	29.711	29.721	29.731	29.754	29.776	29.781	29.794	29.792	29.798	29.810	29.820	29.838	29.848
Jan. 26....	29.949	29.956	29.959	29.966	29.993	29.998	30.001	30.003	29.996	29.996	29.999	30.007	30.015	30.018
Jan. 27....	30.027	30.031	30.040	30.045	30.069	30.078	30.083	30.085	30.090	30.085	30.097	30.104	30.110	30.114
Jan. 28....	30.142	30.154	30.164	30.162	30.171	30.174	30.179	30.179	30.176	30.177	30.190	30.182	30.191	30.207
Jan. 29....	30.262	30.276	30.302	30.316	30.343	30.351	30.368	30.391	30.409	30.420	30.446	30.463	30.479	30.495
Jan. 30....	30.641	30.651	30.655	30.670	30.688	30.703	30.703	30.708	30.711	30.710	30.707	30.713	30.728	30.732
Jan. 31....	30.653	30.678	30.644	30.609	30.632	30.619	30.017	30.579	30.539	30.528	30.499	30.458	30.435	30.383
Means ..	29.937	29.942	29.944	29.944	29.953	29.956	29.953	29.949	29.946	29.947	29.943	29.941	29.942	29.914

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
Jan. 1....	30.059	30.037	30.016	29.976	29.939	29.896	29.866	29.832	29.787	29.755	30.112	30.391	29.758	.633
Jan. 2....	29.453	29.450	29.443	29.438	29.427	29.429	29.424	29.410	29.421	29.429	29.517	29.726	29.410	.316
Jan. 3....	29.387	29.386	29.387	29.381	29.379	29.367	29.349	29.344	29.339	29.329	29.391	29.429	29.329	.100
Jan. 4....	29.160	29.150	29.133	29.133	29.131	29.113	29.101	29.086	29.074	29.069	29.190	29.311	29.069	.242
Jan. 5....	**29.006**	29.008	29.026	29.026	29.021	29.013	29.011	29.014	29.021	29.034	**29.031**	29.069	**29.006**	.063
Jan. 6....	29.134	29.153	29.158	29.164	29.164	29.170	29.184	29.207	29.209	29.222	29.120	29.204	29.030	.174
Jan. 7....	29.311	29.317	29.327	29.339	29.340	29.337	29.340	29.343	29.347	29.352	29.289	29.352	29.208	.144
Jan. 8....	29.372	29.371	29.382	29.385	29.394	29.409	29.436	29.448	29.458	29.475	29.380	29.475	29.347	.128
Jan. 9....	29.771	29.801	29.823	29.843	29.848	29.857	29.880	29.902	29.911	29.918	29.717	29.918	29.480	.438
Jan. 10....	29.978	29.981	29.993	29.986	29.991	29.991	29.987	29.985	29.982	29.983	29.974	29.993	29.932	.061
Jan. 11....	30.016	30.011	30.003	30.006	30.003	30.001	29.997	29.993	29.993	29.990	29.989	30.016	29.965	.051
Jan. 12....	29.929	29.933	29.940	29.945	29.946	29.948	29.953	29.954	29.957	29.955	29.939	29.967	29.914	.053
Jan. 13....	29.984	29.993	29.995	29.997	30.015	30.034	30.036	30.061	30.081	30.103	29.988	30.103	29.941	.162
Jan. 14....	30.445	30.485	30.522	30.533	30.558	30.587	30.608	30.621	30.669	30.674	30.395	30.674	30.115	.559
Jan. 15....	**30.939**	30.937	30.934	30.938	**30.939**	30.929	30.914	30.902	30.873	30.868	**30.870**	**30.939**	30.706	.233
Jan. 16....	30.176	30.125	30.050	29.973	29.934	29.873	29.858	29.816	29.785	29.758	30.320	30.841	29.758	1.083
Jan. 17....	29.933	29.947	29.964	29.976	20.900	30.003	30.012	30.023	30.034	30.044	29.903	30.044	29.741	.303
Jan. 18....	30.311	30.330	30.363	30.396	30.400	30.411	30.439	30.452	30.463	30.470	30.257	30.470	30.047	.423
Jan. 19....	30.687	30.695	30.696	30.688	30.682	30.688	30.688	30.676	30.661	30.649	30.621	30.696	30.469	.227
Jan. 20....	30.425	30.414	30.381	30.375	30.367	30.361	30.349	30.346	30.348	30.354	30.460	30.628	30.346	.282
Jan. 21....	30.298	30.298	30.292	30.271	30.254	30.240	30.207	30.171	30.169	30.161	30.298	30.367	30.161	.206
Jan. 22....	29.877	29.832	29.792	29.780	29.749	29.702	29.671	29.642	29.612	29.582	29.904	30.133	29.582	.551
Jan. 23....	29.347	29.355	29.355	29.355	29.357	29.357	29.344	29.335	29.332	29.330	29.391	29.546	29.330	.216
Jan. 24....	29.500	29.530	29.548	29.557	29.582	29.602	29.609	29.636	29.654	29.674	29.484	29.674	29.330	.344
Jan. 25....	29.850	29.877	29.880	29.895	29.901	29.903	29.912	29.924	29.933	29.943	29.828	29.943	29.681	.263
Jan. 26....	30.016	30.026	30.025	30.015	30.023	30.021	30.029	30.032	30.036	30.038	30.005	30.038	29.949	.089
Jan. 27....	30.117	30.126	30.127	30.129	30.131	30.131	30.137	30.142	30.140	30.151	30.100	30.151	30.027	.124
Jan. 28....	30.202	30.202	30.207	30.226	30.225	30.222	30.230	30.251	30.259	30.276	30.198	30.276	30.142	.134
Jan. 29....	30.527	30.544	30.560	30.567	30.586	30.597	30.013	30.628	30.637	30.637	30.467	30.637	30.262	.375
Jan. 30....	30.731	30.727	30.722	30.722	30.716	30.722	30.695	30.687	30.693	30.684	30.701	30.732	30.641	.091
Jan. 31....	30.368	30.358	30.328	30.293	30.268	30.249	30.225	30.209	30.207	30.191	30.440	30.678	30.191	.487
Means ..	29.946	29.949	29.947	29.945	29.944	29.940	29.939	29.938	29.938	29.939	29.944	30.078	29.802	.276

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours, 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Feb. 1 ..	30.191	30.200	30.200	30.199	30.202	30.234	30.242	30.268	30.285	30.300	30.339	30.367	30.382	30.402
Feb. 2 ..	30.577	30.576	30.562	30.546	30.566	30.547	30.543	30.524	30.529	30.531	30.495	30.469	30.456	30.435
Feb. 3 ..	30.271	30.258	30.250	30.209	30.189	30.168	30.132	30.089	30.046	30.007	29.964	29.917	29.873	29.820
Feb. 4....	29.774	29.837	29.918	29.995	30.091	30.179	30.244	30.298	30.335	30.379	30.401	30.397	30.390	30.398
Feb. 5....	30.283	30.282	30.288	30.290	30.306	30.291	30.284	30.258	30.258	30.229	30.183	30.141	30.113	30.074
Feb. 6....	29.788	29.797	29.796	29.812	29.841	29.865	29.885	29.925	29.976	30.028	30.073	30.124	30.178	30.231
Feb. 7 ...	30.286	30.232	30.194	30.136	30.098	30.048	29.995	29.926	29.863	29.790	29.750	29.724	29.695	29.689
Feb. 8....	29.988	30.044	30.103	30.164	30.214	30.264	30.299	30.335	30.360	30.381	30.410	30.416	30.409	30.407
Feb. 9 ...	29.931	29.850	29.767	29.704	29.651	29.600	29.551	29.492	29.431	29.373	29.308	29.233	29.180	29.115
Feb. 10....	29.137	29.258	29.460	29.550	29.677	29.777	29.875	29.952	30.038	30.110	30.184	30.241	30.309	30.380
Feb. 11....	30.726	30.752	30.776	30.804	30.837	30.850	30.861	30.873	30.879	30.875	30.885	30.890	**30.904**	30.899
Feb. 12....	30.618	30.569	30.538	30.500	30.458	30.399	30.350	30.297	30.233	30.177	30.128	30.077	30.022	29.981
Feb. 13....	29.746	29.761	29.799	29.815	29.840	29.868	29.872	29.879	29.873	29.860	29.890	29.896	29.898	29.894
Feb. 14....	29.895	29.897	29.906	29.920	29.936	29.954	29.965	29.970	29.970	29.979	29.998	29.995	30.014	30.022
Feb. 15....	30.145	30.160	30.175	30.194	30.213	30.230	30.255	30.270	30.295	30.307	30.328	30.331	30.345	30.353
Feb. 16....	30.425	30.427	30.430	30.428	30.439	30.436	30.435	30.435	30.433	30.413	30.408	30.385	30.386	30.363
Feb. 17....	30.209	30.204	30.207	30.212	30.218	30.231	30.251	30.250	30.262	30.276	30.290	30.299	30.322	30.345
Feb. 18 ...	30.400	30.407	30.384	30.374	30.378	30.364	30.326	30.306	30.292	30.275	30.265	30.237	30.226	30.214
Feb. 19....	30.090	30.089	30.090	30.092	30.083	30.078	30.057	30.045	30.022	30.022	30.025	30.013	30.007	30.010
Feb. 20....	30.134	30.144	30.147	30.155	30.174	30.180	30.165	30.165	30.165	30.170	30.162	30.152	30.138	30.137
Feb. 21....	30.150	30.156	30.169	30.169	30.180	30.191	30.195	30.194	30.199	30.205	30.213	30.214	30.228	30.238
Feb. 22....	30.333	30.348	30.363	30.375	30.398	30.403	30.409	30.412	30.422	30.424	30.435	30.433	30.439	30.439
Feb. 23....	30.331	30.332	30.325	30.310	30.298	30.304	30.296	30.294	30.292	30.282	30.283	30.289	30.293	30.286
Feb. 24....	30.419	30.435	30.460	30.468	30.497	30.505	30.505	30.513	30.517	30.519	30.527	30.527	30.530	30.524
Feb. 25....	30.488	30.491	30.485	30.487	30.501	30.494	30.477	30.468	30.444	30.450	30.437	30.434	30.442	30.437
Feb. 26....	30.419	30.402	30.422	30.427	30.428	30.425	30.419	30.425	30.414	30.417	30.413	30.408	30.421	30.422
Feb. 27....	30.232	30.241	30.239	30.216	30.219	30.205	30.204	30.197	30.195	30.182	30.175	30.172	30.164	30.141
Feb. 28....	30.074	30.076	30.074	30.070	30.086	30.087	30.087	30.078	30.078	30.076	30.073	30.072	30.079	30.080
Means ..	**30.181**	30.187	30.195	30.201	30.215	**30.221**	**30.221**	30.219	30.218	30.216	30.216	30.209	30.209	30.205

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
Feb. 1....	30.423	30.468	30.483	30.530	30.547	30.550	30.564	30.579	30.585	30.590	30.380	30.590	30.191	.399
Feb. 2....	30.433	30.422	30.419	30.400	30.402	30.384	30.363	30.345	30.322	30.302	30.465	30.577	30.302	.275
Feb. 3....	29.796	29.768	29.749	29.709	29.697	29.671	29.643	29.623	29.650	29.710	29.925	30.271	29.623	.648
Feb. 4....	30.386	30.376	30.368	30.367	30.365	30.346	30.334	30.313	30.297	30.289	30.253	30.401	29.774	.627
Feb. 5....	30.027	29.990	29.953	29.918	29.886	29.865	29.842	29.820	29.818	29.808	30.092	30.306	29.808	.498
Feb. 6....	30.273	30.304	30.334	30.357	30.371	30.375	30.376	30.362	30.348	30.312	30.114	30.376	29.788	.588
Feb. 7....	29.638	29.700	29.707	29.705	29.696	29.698	29.745	29.803	29.872	29.946	29.875	30.286	29.688	.598
Feb. 8....	30.410	30.399	30.381	30.363	30.325	30.282	30.224	30.152	30.094	30.005	30.268	30.416	29.998	.418
Feb. 9....	29.061	29.005	28.997	**28.975**	29.019	29.044	29.044	29.021	29.010	29.044	**29.309**	29.931	**28.975**	.956
Feb. 10....	30.435	30.477	30.498	30.541	30.569	30.608	30.642	30.660	30.686	30.718	30.155	30.718	29.135	.583
Feb. 11....	30.896	30.884	30.861	30.[illegible]29	30.805	30.792	30.766	30.749	30.718	30.664	**30.824**	**30.904**	30.664	.240
Feb. 12....	29.940	29.891	29.841	29.798	29.782	29.758	29.733	29.729	29.734	29.747	30.090	30.618	29.748	.870
Feb. 13....	29.897	29.897	29.893	29.887	29.881	29.870	29.873	29.880	29.890	29.899	29.866	29.899	29.746	.153
Feb. 14 ...	30.031	30.041	30.050	30.057	30.078	30.101	30.109	30.119	30.140	30.130	30.012	30.140	29.895	.245
Feb. 15....	30.362	30.370	30.374	30.380	30.386	30.389	30.417	30.429	30.428	30.432	30.135	30.432	30.145	.287
Feb. 16....	30.332	30.311	30.298	30.292	30.265	30.256	30.243	30.228	30.219	30.212	30.354	30.439	30.212	.227
Feb. 17....	30.359	30.366	30.391	30.411	30.426	30.434	30.442	30.435	30.432	30.423	30.320	30.442	30.200	.242
Feb. 18 ...	30.198	30.198	30.183	30.173	30.162	30.143	30.126	30.120	30.101	30.089	30.248	30.407	30.089	.318
Feb. 19 ...	30.020	30.041	30.049	30.063	30.089	30.101	30.113	30.121	30.128	30.125	30.066	30.128	30.007	.121
Feb. 20....	30.143	30.146	30.152	30.153	30.144	30.141	30.142	30.143	30.143	30.156	30.152	30.180	30.134	.046
Feb. 21....	30.254	30.257	30.270	30.272	30.276	30.282	30.288	30.307	30.325	30.335	30.232	30.335	30.150	.185
Feb. 22....	30.440	30.438	30.427	30.421	30.410	30.388	30.389	30.383	30.375	30.364	30.403	30.440	30.333	.107
Feb. 23....	30.292	30.306	30.300	30.312	30.316	30.332	30.360	30.382	30.404	30.422	30.317	30.422	30.288	.134
Feb. 24 ...	30.517	30.514	30.514	30.514	30.512	30.497	30.505	30.501	30.499	30.510	30.501	30.530	30.419	.111
Feb. 25....	30.423	30.415	30.407	30.404	30.404	30.416	30.410	30.406	30.418	30.414	30.444	30.501	30.404	.097
Feb. 26 ...	30.408	30.386	30.357	30.348	30.331	30.311	30.293	30.285	30.269	30.264	30.380	30.428	30.264	.164
Feb. 27....	30.141	30.133	30.123	30.123	30.111	30.098	30.093	30.096	30.094	30.096	30.163	30.252	30.093	.159
Feb. 28....	30.102	30.104	30.109	30.118	30.133	30.138	30.162	30.181	30.210	30.226	30.108	30.226	30.072	.154
Means ..	30.203	30.201	30.196	30.194	30.192	30.188	30.187	30.185	30.186	30.187	30.201	30.378	30.005	.873

***Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883*—Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1883.														
Mar. 1 ...	30.262	20.286	30.305	30.340	30.375	30.398	30.430	30.470	30.485	30.521	30.539	30.573	30.605	30.616
Mar. 2 ...	30.803	30.797	30.807	30.808	30.825	30.819	**30.826**	30.807	30.807	30.807	30.790	30.773	30.763	30.755
Mar. 3 ...	30.569	30.554	30.541	30.512	30.512	30.496	30.479	30.470	30.440	30.422	30.398	30.379	30.361	30.334
Mar. 4 ...	30.017	29.998	29.963	29.938	29.908	29.875	29.821	29.796	29.765	29.746	29.728	29.684	29.674	29.652
Mar. 5 ...	29.694	29.696	29.706	29.718	29.765	29.786	29.802	29.832	29.861	29.895	29.911	29.927	29.942	29.967
Mar. 6 ...	30.128	30.128	30.133	30.133	30.151	30.139	30.142	30.134	30.123	30.111	30.103	30.082	30.075	30.060
Mar. 7 ...	29.888	29.860	29.850	29.839	29.830	29.822	29.815	29.807	29.788	29.777	29.759	29.734	29.709	29.683
Mar. 8 ...	29.519	29.512	29.497	29.487	29.489	29.487	29.490	**29.480**	29.483	29.485	29.488	29.495	29.516	29.537
Mar. 9 ...	29.755	29.795	29.812	29.818	29.853	29.865	29.881	29.887	29.912	29.920	29.926	29.931	29.939	29.942
Mar. 10 ...	30.082	30.087	30.108	30.122	30.145	30.150	30.142	30.149	30.149	30.156	30.168	30.172	30.183	30.189
Mar. 11 ...	30.286	30.286	30.277	30.279	30.294	30.276	30.278	30.249	30.249	30.255	30.234	30.216	30.214	30.189
Mar. 12 ...	29.991	29.986	29.986	29.981	29.976	29.970	29.966	29.968	29.972	29.977	29.990	29.989	29.990	30.002
Mar. 13 ...	30.142	30.149	30.159	30.173	30.201	30.215	30.226	30.237	30.251	30.258	30.266	30.269	30.289	30.295
Mar. 14 ...	30.378	30.378	30.375	30.378	30.394	30.399	30.407	30.407	30.400	30.401	30.403	30.403	30.404	30.408
Mar. 15 ...	30.415	30.406	30.412	30.418	30.410	30.410	30.414	30.399	30.387	30.390	30.385	30.375	30 366	30.359
Mar. 16 ...	30.249	30.242	30.247	30.230	30.230	30.222	30.216	30.220	30.214	30.196	30.188	30.174	30.168	30.149
Mar. 17 ...	30.137	30.152	30.164	30.159	30.184	30.194	30.204	30.195	30.190	30.194	30.187	30.184	30.182	30.178
Mar. 18 ...	30.032	30.022	30.022	30.020	30.008	29.992	29.987	29.985	29.966	29.952	29.938	29.922	29.924	29.916
Mar. 19 ...	29.860	29.860	29.872	29.870	29.893	29.890	29.895	29.896	29.897	29.889	29.889	29.887	29.887	29.894
Mar. 20 ...	29.875	29.876	29.885	29.890	29.903	29.915	29.933	29.941	29.955	29.968	29.976	29.987	30.002	30.013
Mar. 21 ...	30.064	30.056	30.050	30.054	30.067	30.052	30.037	30.025	30.019	30.001	29.979	29.957	29.948	29.939
Mar. 22 ...	29.757	29.739	29.739	29.721	29.713	29.699	29.697	29.681	29.666	29.656	29.654	29.646	29.649	29.648
Mar. 23 ...	29.776	29.794	29.825	29.844	29.908	29.930	29.957	29.988	30.003	30.018	30.035	30.066	30.077	30.091
Mar. 24 ...	29.986	29.960	29.936	29.905	29.890	29.875	29.860	29.845	29.836	29.822	29.809	29.793	29.779	29.773
Mar. 25 ...	29.632	29.629	29.629	29.621	29.609	29.600	29.588	29.576	29.572	29.573	29.573	29.568	29.563	29.569
Mar. 26 ...	29.810	29.820	29.820	29.826	29.828	29.836	29.830	29.803	29.772	29.751	29.735	29.709	29.696	29.668
Mar. 27 ...	29.541	29.554	29.569	29.578	29.605	29.626	29.651	29.651	29.646	29.641	29.642	29.646	29.660	29.661
Mar. 28 ...	29.873	29.899	29.929	29.927	29.942	29.945	29.945	29.935	29.928	29.910	29.898	29.881	29.855	29.836
Mar. 29 ...	29.727	29.727	29.738	29.737	29.741	29.746	29.739	29.744	29.749	29.751	29.761	29.763	29.767	29.777
Mar. 30 ...	29.920	29.930	29.933	29.936	29.952	29.953	29.948	29.951	29.946	29.943	29.948	29.951	29.953	29.963
Mar. 31 ...	29.987	29.993	29.991	29.991	29.978	29.978	29.981	29.983	29.981	29.978	29.983	29.988	29.986	30.001
Means ..	30.005	30.006	30.009	30.008	**30.019**	30.018	**30.019**	30.016	30.013	30.012	30.009	30.004	30.004	30.002

Date.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.	Max.	Min.	Range.
1883.														
Mar. 1 ...	30.647	30.668	30.703	30.717	30.725	30.738	30.761	30.782	30.785	30.801	30.564	30.801	30.262	.539
Mar. 2 ...	30.745	30.735	30.728	30.696	30.679	30.652	30.636	30 616	30.596	30.587	**30.744**	**30.826**	30.587	.239
Mar. 3 ...	30.293	30.270	30.244	30.222	30.195	30.156	30.135	30.100	30.083	30.055	30.342	30.569	30.055	.514
Mar. 4 ...	29.642	29.621	29.618	29.628	29.632	29.645	29.652	29.647	29.666	29.691	29.750	30.017	29.618	.399
Mar. 5 ...	30.000	30.014	30.036	30.053	30.069	30.082	30.102	30.105	30.122	30.135	29.926	30.135	29.694	.441
Mar. 6 ...	30.053	30.031	30.016	29.998	29.986	29.966	29.961	29.946	29.928	29.911	30.060	30.142	29.911	.231
Mar. 7 ...	29.641	29.626	29.607	29.585	29.560	29.548	29.546	29.531	29.533	29.530	29.703	29.888	29.530	.358
Mar. 8 ...	29.558	29.587	29.615	29.639	29.654	29.673	29.699	29.710	29.737	29.764	**29.567**	29.764	**29.480**	.284
Mar. 9 ...	29.956	29.967	29.973	29.983	29.995	29.995	30.028	30.044	30.068	30.087	29.930	30.087	29.755	.332
Mar. 10 ...	30.202	30.214	30.232	30.244	30.252	30.254	30.260	30.266	30.272	30.286	30.187	30.286	30.082	.204
Mar. 11 ...	30.181	30.152	30.150	30.125	30.100	30.087	30.067	30.038	30.024	30.016	30.188	30.294	30.016	.278
Mar. 12 ...	30.013	30.023	30.045	30.055	30.069	30.082	30.105	30.111	30.129	30.139	30.021	30.139	29.966	.173
Mar. 13 ...	30.312	30.334	30.336	30.351	30.354	30.361	30.364	30.370	30.377	30.382	30.278	30.382	30.142	.240
Mar. 14 ...	30.421	30.427	30.423	30.423	30.413	30.405	30.402	30.405	30.400	30.395	30.402	30.427	30.375	.052
Mar. 15 ...	30.360	30.349	30.331	30.310	30.297	30.285	30.269	30.266	30.272	30.262	30.356	30.418	30.262	.156
Mar. 16 ...	30.142	30.132	30.137	30.133	30.118	30.118	30.134	30.141	30.154	30.153	30.179	30.249	30 132	.117
Mar. 17 ...	30.167	30.162	30.146	30.138	30.125	30.105	30.096	30.081	30.068	30.052	30.152	30.204	30.052	.152
Mar. 18 ...	29.915	29.914	29.906	29.888	29.883	29.870	29.877	29.866	29.860	29.860	29.939	30.032	29.860	.172
Mar. 19 ...	29.889	29.885	29.885	29.881	29.881	29.875	29.876	29.872	29.877	29.884	29.883	29.897	29.860	.037
Mar. 20 ...	30.039	30.044	30.048	30.056	30.060	30.063	30.073	30.079	30.074	30.075	29.989	30.079	29.875	.204
Mar. 21 ...	29.925	29.909	29.887	29.861	29.815	29.836	29.817	29.796	29.788	29.772	29.945	30.067	29.772	.295
Mar. 22 ...	29.659	29.658	29.654	29.653	29.667	29.675	29.690	29.715	29.732	29.760	29.689	29.760	29.646	.114
Mar. 23 ...	30.116	30.115	30.106	30.104	30.101	30.101	30.087	30.057	30.041	30.019	30.007	30.116	29.776	.340
Mar. 24 ...	29.758	29.748	29.701	29.700	29.697	29.666	29.658	29.653	29.640	29.625	29.788	29.986	29.625	.361
Mar. 25 ...	29.593	29.605	29.624	29.659	29.687	29.717	29.746	29.772	29.785	29.807	29.639	29.807	29.563	.244
Mar. 26 ...	29.639	29.624	29.602	29.580	29.562	29.548	29.554	29.545	29.546	29.552	29.694	29.836	29.545	.291
Mar. 27 ...	29.681	29.714	29.740	29.766	29.786	29.795	29.819	29.830	29.843	29.862	29.688	29.862	29.541	.321
Mar. 28 ...	29.823	29.806	29.801	29.794	29.780	29.766	29.761	29.754	29.746	29.741	29.853	29.945	29.741	.204
Mar. 29 ...	29.795	29.811	29.818	29.847	29.869	29.879	29.888	29.900	29.905	29.920	29.796	29.920	29.727	.193
Mar. 30 ...	29.966	29.973	29.977	29.976	29.975	29.961	29.968	29.974	29.976	29.985	29.957	29.985	29.920	.065
Mar. 31 ...	30.004	30.027	30.047	30.057	30.070	30.088	30.108	30.130	30.154	30.170	30.028	30.170	29.978	.192
Means ..	30.004	30.005	30.004	30.004	30.003	**30.000**	30.004	30.004	30.006	30.009	30.008	30.132	29.882	.250

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Apr. 1 ...	30.197	30.214	30.240	30.261	30.280	30.285	30.295	30.306	30.326	30.331	30.346	30.352	30.365	30.368
Apr. 2 ...	30.374	30.384	30.388	30.379	30.379	30.372	30.370	30.361	30.356	30.348	30.332	30.325	30.323	30.315
Apr. 3 ...	30.249	30.249	30.249	30.249	30.252	30.254	30.255	30.252	30.256	30.258	30.255	30.257	30.262	30.276
Apr. 4 ...	30.252	30.250	30.245	30.240	30.235	30.227	30.222	30.210	30.195	30.183	30.180	30.160	30.156	30.139
Apr. 5 ...	30.013	30.009	30.013	30.003	29.999	29.984	29.979	29.977	29.966	29.963	29.964	29.957	29.953	29.956
Apr. 6 ...	29.849	29.863	29.848	29.846	29.839	29.636	29.823	29.807	29.796	29.787	29.769	29.763	29.761	29.752
Apr. 7 ...	29.680	29.682	29.676	29.676	29.673	29.675	29.677	29.684	29.680	29.670	29.688	29.681	29.683	29.686
Apr. 8 ...	29.699	29.699	29.706	29.697	29.699	29.694	29.692	29.685	29.678	29.665	29.649	29.653	29.654	29.634
Apr. 9 ...	29.577	29.582	29.582	29.579	29.594	29.576	29.573	29.564	29.549	29.543	29.531	29.522	29.508	29.495
Apr. 10 ...	29.347	**29.332**	29.335	**29.332**	29.343	29.342	29.346	29.357	29.362	29.369	29.376	29.380	29.386	29.404
Apr. 11 ...	29.529	29.529	29.546	29.557	29.576	29.594	29.613	29.620	29.629	29.642	29.657	29.663	29.671	29.788
Apr. 12 ...	29.785	29.792	29.800	29.807	29.823	29.828	29.838	29.840	29.847	29.847	29.857	29.856	29.853	29.854
Apr. 13 ...	29.893	29.895	29.897	29.902	29.917	29.933	29.937	29.946	29.946	29.951	29.964	29.976	29.983	29.995
Apr. 14 ...	30.098	30.102	30.116	30.115	30.128	30.131	30.132	30.137	30.136	30.143	30.143	30.141	30.142	30.141
Apr. 15 ...	30.106	30.120	30.109	30.115	30.113	30.107	30.101	30.094	30.097	30.095	30.092	30.095	30.091	30.094
Apr. 16 ...	30.092	30.102	30.102	30.106	30.126	30.127	30.134	30.142	30.147	30.153	30.152	30.162	30.163	30.162
Apr. 17 ...	30.164	30.174	30.161	30.163	30.170	30.171	30.170	30.163	30.159	30.157	30.158	30.151	30.145	30.139
Apr. 18 ...	30.077	30.072	30.069	30.059	30.063	30.064	30.049	30.041	30.038	30.020	30.008	29.990	29.970	29.969
Apr. 19 ...	29.792	29.775	29.764	29.768	29.763	29.743	29.739	29.734	29.716	29.706	29.695	29.687	29.691	29.674
Apr. 20 ...	29.619	29.612	29.609	29.607	29.601	29.602	29.598	29.594	29.580	29.586	29.589	29.596	29.600	29.599
Apr. 21 ...	29.732	29.734	29.753	29.774	29.797	29.813	29.827	29.838	29.854	29.876	29.905	29.917	29.943	29.965
Apr. 22 ...	30.182	30.202	30.219	30.224	30.250	30.262	30.268	30.276	30.282	30.304	30.310	30.316	30.309	30.309
Apr. 23 ...	30.300	30.300	30.298	30.280	30.285	30.288	30.278	30.272	30.272	30.265	30.242	30.229	30.217	30.211
Apr. 24 ...	30.087	30.062	30.044	30.039	30.030	30.020	30.000	29.967	29.949	29.932	29.929	29.909	29.898	29.889
Apr. 25 ...	29.793	29.800	29.788	29.787	29.783	29.785	29.785	29.786	29.783	29.789	29.793	29.799	29.810	29.828
Apr. 26 ...	29.972	29.981	29.983	29.985	30.008	30.011	30.027	30.034	30.038	30.041	30.051	30.055	30.063	30.068
Apr. 27 ...	30.144	30.156	30.160	30.167	30.168	30.172	30.174	30.180	30.188	30.191	30.197	30.201	30.214	30.213
Apr. 28 ...	30.279	30.288	30.303	30.310	30.333	30.336	30.343	30.346	30.356	30.360	30.376	30.385	30.390	30.400
Apr. 29 ...	30.478	30.484	30.488	30.499	30.511	30.514	30.512	30.517	30.526	30.528	30.531	30.537	30.536	30.538
Apr. 30 ...	30.530	30.529	30.529	30.527	30.537	30.532	30.531	30.529	30.522	30.526	30.529	30.532	30.528	30.536
Means	**29.996**	29.999	30.001	30.002	30.009	30.009	30.010	30.009	30.008	30.008	30.009	30.008	30.009	**30.013**

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
Apr. 1 ...	30.379	30.376	30.390	30.384	30.385	30.392	30.392	30.388	30.386	30.382	30.334	30.392	30.197	.195
Apr. 2 ...	30.314	30.310	30.305	30.305	30.296	30.275	30.267	30.259	30.253	30.253	30.327	30.388	30.253	.135
Apr. 3 ...	30.277	30.286	30.287	30.281	30.273	30.276	30.264	30.260	30.256	30.262	30.262	30.287	30.249	.038
Apr. 4 ...	30.138	30.123	30.108	30.098	30.084	30.063	30.045	30.038	30.032	30.024	30.152	30.252	30.024	.228
Apr. 5 ...	29.945	29.942	29.941	29.936	29.925	29.911	29.904	29.901	29.896	29.883	29.955	30.013	29.883	.130
Apr. 6 ...	29.748	29.737	29.727	29.720	29.711	29.703	29.694	29.691	29.689	29.679	29.768	29.863	29.679	.184
Apr. 7 ...	29.689	29.693	29.695	29.704	29.702	29.702	29.696	29.702	29.701	29.716	29.688	29.716	29.670	.046
Apr. 8 ...	29.632	29.629	29.617	29.593	29.591	29.592	29.591	29.586	29.587	29.585	29.646	29.706	29.585	.121
Apr. 9 ...	29.476	29.467	29.445	29.427	29.419	29.392	29.385	29.374	29.363	29.346	29.495	29.582	29.346	.236
Apr. 10 ...	29.419	29.419	29.436	29.442	29.450	29.463	29.475	29.470	29.505	29.520	**29.401**	29.520	**29.332**	.188
Apr. 11 ...	29.702	29.711	29.711	29.731	29.745	29.755	29.765	29.775	29.783	29.791	29.670	29.791	29.529	.262
Apr. 12 ...	29.864	29.863	29.860	29.862	29.862	29.865	29.881	29.883	29.889	29.894	29.848	29.894	29.785	.109
Apr. 13 ...	30.013	30.018	30.016	30.025	30.031	30.045	30.060	30.070	30.083	30.094	29.983	30.094	29.893	.201
Apr. 14 ...	30.140	30.138	30.126	30.135	30.135	30.122	30.112	30.113	30.112	30.106	30.127	30.143	30.098	.045
Apr. 15 ...	30.096	30.099	30.100	30.094	30.089	30.087	30.089	30.092	30.095	30.102	30.099	30.120	30.087	.033
Apr. 16 ...	30.162	30.163	30.167	30.162	30.162	30.160	30.161	30.161	30.163	30.165	30.146	30.165	30.092	.073
Apr. 17 ...	30.143	30.138	30.126	30.126	30.115	30.115	30.110	30.104	30.093	30.090	30.142	30.174	30.090	.084
Apr. 18 ...	29.955	29.943	29.921	29.901	29.892	29.864	29.855	29.840	29.823	29.813	29.970	30.077	29.813	.264
Apr. 19 ...	29.673	29.672	29.654	29.647	29.637	29.630	29.635	29.628	29.628	29.625	29.695	29.792	29.625	.167
Apr. 20 ...	29.605	29.614	29.622	29.626	29.627	29.649	29.661	29.676	29.694	29.709	29.620	29.709	29.586	.123
Apr. 21 ...	29.992	30.007	30.031	30.049	30.064	30.079	30.116	30.131	30.153	30.172	29.939	30.172	29.732	.440
Apr. 22 ...	30.321	30.325	30.320	30.314	30.321	30.324	30.321	30.322	30.318	30.313	30.288	30.325	30.182	.143
Apr. 23 ...	30.203	30.200	30.175	30.156	30.155	30.143	30.140	30.124	30.111	30.104	30.219	30.300	30.104	.196
Apr. 24 ...	29.874	29.870	29.855	29.827	29.825	29.833	29.828	29.816	29.807	29.799	29.920	30.067	29.799	.268
Apr. 25 ...	29.846	29.861	29.868	29.872	29.891	29.893	29.923	29.923	29.938	29.946	29.836	29.946	29.783	.163
Apr. 26 ...	30.074	30.093	30.096	30.102	30.111	30.120	30.133	30.119	30.135	30.133	30.060	30.135	29.972	.163
Apr. 27 ...	30.214	30.221	30.225	30.226	30.234	30.244	30.258	30.262	30.269	30.278	30.206	30.278	30.144	.134
Apr. 28 ...	30.410	30.416	30.424	30.426	30.430	30.430	30.444	30.454	30.460	30.454	30.381	30.460	30.279	.181
Apr. 29 ...	30.541	**30.552**	30.541	30.536	30.535	30.530	30.538	30.535	30.541	30.541	**30.525**	**30.552**	30.478	.074
Apr. 30 ...	30.531	30.516	30.508	30.502	30.502	30.513	30.510	30.509	30.507	30.501	30.522	30.537	30.501	.036
Means	**30.013**	**30.013**	30.010	30.007	30.007	30.006	30.008	30.007	30.009	30.009	30.007	30.082	29.920	.156

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
May 1....	30.525	30.522	30.535	30.540	30.543	30.541	30.514	30.541	30.552	30.563	30.566	30.578	30.576	30.582
May 2....	30.548	30.513	30.535	30.546	30.538	30.530	30.532	30.520	30.506	30.505	30.498	30.480	30.465	30.460
May 3....	30.271	30.262	30.255	30.253	30.235	30.240	30.232	30.222	30.205	30.205	30.203	30.205	30.209	30.185
May 4....	30.033	30.011	29.987	29.975	29.965	29.953	29.941	29.925	29.910	29.905	29.876	29.858	29.852	29.836
May 5....	29.656	29.629	29.613	29.596	29.570	29.564	29.557	29.548	29.534	29.509	29.508	29.515	29.517	29.532
May 6....	29.673	29.690	29.691	29.698	29.707	29.718	29.733	29.738	29.744	29.758	29.784	29.780	29.815	29.819
May 7....	29.793	29.791	29.768	29.758	29.751	29.728	29.719	29.706	29.690	29.684	29.670	29.656	29.635	29.623
May 8....	29.661	29.649	29.664	29.678	29.707	29.722	29.740	29.753	29.767	29.788	29.802	29.812	29.815	29.828
May 9....	29.820	29.806	29.806	29.785	29.772	29.754	29.741	29.717	29.695	29.704	29.685	29.670	29.619	29.618
May 10....	29.648	29.662	29.666	29.663	29.676	29.671	29.669	29.676	29.673	29.692	29.695	29.694	29.698	29.709
May 11....	29.865	29.882	29.891	29.900	29.915	29.925	29.933	29.933	29.925	29.931	29.946	29.935	29.936	29.936
May 12....	29.872	29.885	29.893	29.897	29.903	29.900	29.923	29.929	29.932	29.934	29.916	29.952	29.975	29.987
May 13....	29.985	29.997	29.989	29.999	29.999	30.001	29.997	29.993	29.977	29.970	29.959	29.955	29.918	29.941
May 14....	29.832	29.815	29.785	29.777	29.765	29.729	29.709	29.681	29.655	29.624	29.621	29.597	29.584	29.585
May 15....	29.522	29.506	29.506	29.491	29.486	29.469	29.451	29.437	29.421	29.404	29.378	29.365	29.357	29.335
May 16....	29.181	29.176	29.166	29.171	29.160	29.157	29.158	29.153	29.140	29.133	29.135	**29.130**	29.136	29.132
May 17....	29.234	29.253	29.272	29.274	29.299	29.317	29.332	29.347	29.361	29.378	29.392	29.407	29.432	29.456
May 18....	29.610	29.624	29.638	29.652	29.677	29.688	29.700	29.712	29.720	29.731	29.749	29.762	29.774	29.782
May 19....	29.833	29.843	29.849	29.849	29.863	29.871	29.875	29.880	29.879	29.897	29.892	29.897	29.902	29.905
May 20....	29.953	29.952	29.953	29.963	29.978	29.983	29.993	30.003	30.005	30.013	30.013	30.018	30.026	30.038
May 21....	30.039	30.039	30.041	30.041	30.049	30.049	30.053	30.054	30.046	30.046	30.047	30.041	30.037	30.034
May 22....	29.960	29.953	29.945	29.945	29.941	29.928	29.928	29.920	29.900	29.896	29.893	29.891	29.890	29.889
May 23....	29.814	29.809	29.803	29.803	29.801	29.795	29.795	29.789	29.780	29.782	29.772	29.772	29.771	29.774
May 24....	29.759	29.746	29.746	29.748	29.737	29.743	29.741	29.741	29.743	29.752	29.760	29.772	29.779	29.781
May 25....	29.855	29.867	29.872	29.880	29.895	29.901	29.907	29.910	29.916	29.925	29.934	29.930	29.941	29.947
May 26....	29.998	29.999	29.996	29.997	30.017	30.022	30.022	30.028	30.030	30.036	30.043	30.039	30.042	30.056
May 27....	30.067	30.058	30.059	30.066	30.076	30.084	30.090	30.097	30.094	30.100	30.107	30.107	30.119	30.138
May 28....	30.160	30.161	30.172	30.159	30.168	30.163	30.170	30.164	30.159	30.152	30.161	30.149	30.151	30.150
May 29....	30.035	30.017	30.015	30.036	30.000	29.987	29.969	29.958	29.916	29.933	29.921	29.901	29.895	29.890
May 30....	29.872	29.890	29.895	29.903	29.920	29.926	29.933	29.929	29.940	29.942	29.945	29.945	29.944	29.947
May 31....	29.864	29.858	29.850	29.849	29.855	29.832	29.817	29.811	29.793	29.794	29.790	29.780	29.756	29.785
Means....	29.869	29.864	29.866	29.867	**29.870**	29.868	29.868	29.865	29.859	29.861	29.861	29.858	29.860	29.861

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
May 1....	30.579	30.585	30.584	**30.587**	30.570	30.566	30.575	30.575	30.576	30.569	**30.561**	**30.587**	30.522	.065
May 2....	30.447	30.434	30.413	30.386	30.366	30.344	30.334	30.322	30.303	30.285	30.452	30.548	30.285	.263
May 3....	30.173	30.160	30.148	30.140	30.118	30.100	30.096	30.078	30.061	30.044	30.179	30.271	30.014	.277
May 4....	29.821	29.809	29.788	29.775	29.759	29.732	29.729	29.706	29.700	29.677	29.855	30.033	29.677	.356
May 5....	29.553	29.567	29.572	29.589	29.601	29.624	29.636	29.653	29.666	29.679	29.583	29.679	29.515	.164
May 6....	29.825	29.835	29.820	29.817	29.815	29.813	29.817	29.816	29.798	29.787	29.770	29.835	29.673	.162
May 7....	29.631	29.637	29.626	29.621	29.621	29.632	29.636	29.638	29.649	29.654	29.680	29.793	29.621	.172
May 8....	29.835	29.855	29.853	29.853	29.848	29.844	29.850	29.844	29.838	29.827	29.785	29.855	29.661	.194
May 9....	29.621	29.626	29.602	29.605	29.604	29.602	29.615	29.612	29.630	29.642	29.683	29.820	29.602	.218
May 10....	29.736	29.753	29.763	29.791	29.812	29.823	29.833	29.845	29.850	29.853	29.731	29.853	29.648	.205
May 11....	29.932	29.916	29.907	29.907	29.909	29.897	29.900	29.893	29.885	29.887	29.912	29.946	29.865	.081
May 12....	29.995	29.999	29.996	29.982	29.989	29.987	29.991	29.989	30.001	29.990	29.953	30.001	29.872	.129
May 13....	29.937	29.940	29.927	29.911	29.897	29.890	29.879	29.867	29.858	29.847	29.944	30.001	29.847	.154
May 14....	29.589	29.582	29.573	29.574	29.564	29.546	29.546	29.540	29.538	29.523	29.639	29.785	29.523	.262
May 15....	29.314	29.291	29.273	29.255	29.233	29.229	29.225	29.213	29.197	29.193	29.356	29.522	29.193	.329
May 16....	29.133	29.142	29.146	29.151	29.160	29.170	29.188	29.200	29.209	29.221	**29.160**	29.221	**29.130**	.091
May 17....	29.472	29.492	29.505	29.521	29.528	29.549	29.568	29.585	29.593	29.606	29.424	29.606	29.234	.372
May 18....	29.791	29.798	29.803	29.803	29.818	29.823	29.828	29.832	29.840	29.843	29.750	29.843	29.610	.233
May 19....	29.912	29.913	29.914	29.923	29.928	29.934	29.937	29.937	29.941	29.948	29.896	29.948	29.833	.115
May 20....	30.045	30.014	30.036	30.036	30.036	30.034	30.042	30.041	30.047	30.041	30.012	30.047	29.952	.095
May 21....	30.032	30.029	30.018	30.015	30.007	30.002	29.990	29.980	29.971	29.959	30.026	30.054	29.959	.095
May 22....	29.883	29.875	29.861	29.852	29.847	29.838	29.831	29.824	29.810	29.807	29.888	29.960	29.807	.153
May 23....	29.772	29.770	29.767	29.765	29.759	29.759	23.762	29.762	29.759	29.759	29.779	29.814	29.759	.055
May 24....	29.797	29.821	29.826	29.837	29.843	29.850	29.852	29.855	29.856	29.866	29.790	29.866	29.737	.129
May 25....	29.958	29.963	29.973	29.978	29.979	29.977	29.996	29.997	29.995	30.000	29.937	30.000	29.855	.145
May 26....	30.063	30.068	30.063	30.060	30.060	30.065	30.067	30.066	30.070	30.074	30.041	30.074	29.996	.078
May 27....	30.147	30.151	30.153	30.156	30.153	30.161	30.165	30.171	30.176	30.170	30.119	30.176	30.058	.118
May 28....	30.149	30.148	30.137	30.133	30.121	30.099	30.095	30.085	30.081	30.058	30.139	30.172	30.058	.114
May 29....	29.897	29.891	29.888	29.885	29.885	29.883	29.882	29.886	29.885	29.883	29.931	30.035	29.882	.153
May 30....	29.953	29.947	29.945	29.931	29.925	29.924	29.910	29.898	29.888	29.877	29.922	29.952	29.872	.080
May 31....	29.783	29.778	29.773	29.750	29.759	29.756	29.757	29.760	29.760	29.761	29.796	29.864	29.756	.108
Means...	29.864	29.865	29.860	29.858	29.855	29.853	29.856	29.854	29.853	**29.850**	29.861	29.941	29.776	.165

Tables showing pressure of air at Uglaamie from October, 1881, *to August*, 1883—**Continued.**

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time, 5 hours, 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
June 1...	29.768	29.775	29.779	29.778	29.785	29.789	29.792	29.789	29.793	29.798	29.800	29.799	29.798	29.802
June 2....	29.743	29.751	29.754	29.764	29.765	29.770	29.775	29.779	29.776	29.786	29.794	29.794	29.801	29.796
June 3....	29.759	29.756	29.758	29.774	29.786	29.791	29.806	29.818	29.818	29.826	29.830	20.855	29.865	29.879
June 4...	29.941	29.958	29.966	29.969	29.975	29.991	29.993	29.998	30.004	30.006	30.021	30.027	30.030	30.034
June 5....	30.085	30.087	30.089	30.093	30.099	30.106	30.110	30.103	30.112	30.104	30.105	30.105	30.108	30.111
June 6....	30.129	30.137	30.140	30.146	30.147	30.147	30.146	30.135	30.134	30.124	30.114	30.108	30.101	30.097
June 7....	30.108	30.123	30.121	30.123	30.133	30.137	30.135	30.134	30.132	30.122	30.121	30.124	30.121	30.110
June 8....	30.013	30.022	30.020	30.010	30.026	30.019	30.019	30.024	30.019	30.000	30.011	30.017	30.013	30.012
June 9...	29.988	29.982	29.990	29.990	29.995	29.991	30.002	30.006	30.000	30.006	30.003	30.018	30.022	30.030
June 10...	30.145	30.150	30.173	30.173	30.191	30.197	30.205	30.205	30.200	30.200	30.200	30.194	30.188	30.188
June 11...	30.048	30.042	30.030	30.026	30.025	30.021	30.013	29.995	29.981	29.970	29.960	29.939	29.935	29.933
June 12...	29.798	29.793	29.780	29.782	29.777	29.754	29.751	29.740	29.725	29.719	29.718	29.708	29.697	29.691
June 13...	29.578	29.575	29.567	29.570	29.564	29.556	29.557	29.558	**29.544**	29.547	29.551	29.565	29.571	29.584
June 14...	29.596	29.583	29.591	29.586	29.603	29.606	29.609	29.604	29.612	29.614	29.613	29.615	29.621	29.635
June 15...	29.766	29.785	29.800	29.818	29.830	29.846	29.852	29.868	29.879	29.886	29.890	29.901	29.920	29.927
June 16...	30.001	30.003	30.008	30.018	30.035	30.043	30.043	30.044	30.047	30.048	30.050	30.058	30.067	30.071
June 17...	30.124	30.129	30.137	30.143	30.152	30.155	30.160	30.160	30.157	30.157	30.165	30.166	30.163	30.164
June 18...	30.135	30.134	30.146	30.136	30.148	30.161	30.161	30.158	30.161	30.162	30.166	30.160	30.165	30.167
June 19...	30.192	30.194	30.200	30.202	30.206	30.209	**30.214**	30.210	30.210	30.210	30.209	30.197	30.195	30.201
June 20...	30.159	30.155	30.151	30.141	30.148	30.151	30.154	30.151	30.143	30.133	30.127	30.127	30.123	30.116
June 21...	30.026	30.019	30.021	30.021	30.023	30.026	30.023	30.022	30.014	30.008	30.009	30.000	29.994	29.999
June 22...	29.909	29.901	29.903	29.895	29.895	29.892	29.883	29.883	29.876	29.876	29.869	29.867	29.850	29.858
June 23...	29.793	29.805	29.812	29.803	29.809	29.804	29.800	29.788	29.790	29.793	29.786	29.780	29.773	29.767
June 24...	29.740	29.749	29.746	29.756	29.765	29.766	29.760	29.763	29.764	29.767	29.769	29.766	29.760	29.761
June 25...	29.825	29.841	29.847	29.855	29.871	29.882	29.885	29.898	29.903	29.905	29.902	29.902	29.912	29.916
June 26...	29.940	29.945	29.958	29.955	29.965	29.968	29.970	29.975	29.970	29.968	29.970	29.972	29.977	29.984
June 27...	29.955	29.957	29.960	29.955	29.963	29.968	29.959	29.956	29.948	29.941	29.932	29.899	29.884	29.864
June 28...	29.637	29.622	29.607	29.602	29.599	29.586	29.582	29.584	29.573	29.559	29.566	29.550	29.563	29.571
June 29...	29.653	29.659	29.667	29.683	29.693	29.690	29.691	29.689	29.697	29.707	29.722	29.731	29.735	29.747
June 30...	29.726	29.740	29.730	29.739	29.754	29.755	29.753	29.747	29.740	29.744	29.745	29.755	29.762	29.767
Means...	29.909	29.912	29.915	29.917	29.924	29.926	29.927	29.926	29.924	29.923	29.924	29.924	29.924	29.913

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
June 1....	29.801	29.795	29.792	29.784	29.775	29.762	29.757	29.758	29.751	29.747	29.782	29.802	29.747	.055
June 2....	29.795	29.796	29.794	29.790	29.780	29.777	29.773	29.769	29.767	29.763	29.777	29.801	29.743	.058
June 3....	29.880	29.883	29.893	29.893	29.900	29.908	29.916	29.923	29.932	29.940	29.850	29.940	29.756	.184
June 4....	30.044	30.048	30.061	30.061	30.063	30.065	30.069	30.074	30.077	30.078	30.023	30.078	29.941	.137
June 5....	30.114	30.123	30.124	30.132	30.131	30.129	30.126	30.131	30.134	30.135	30.112	30.135	30.085	.040
June 6....	30.103	30.108	30.115	30.122	30.122	30.117	30.118	30.115	30.116	30.118	30.127	30.147	30.097	.050
June 7....	30.123	30.110	30.097	30.087	30.076	30.063	30.054	30.045	30.030	30.024	30.103	30.137	30.024	.113
June 8....	30.013	30.029	30.026	30.020	30.020	30.018	30.010	30.005	29.999	29.991	30.015	30.029	29.991	.038
June 9....	30.045	30.053	30.058	30.071	30.079	30.095	30.106	30.123	30.131	30.143	30.039	30.143	29.982	.161
June 10...	30.185	30.178	30.164	30.148	30.150	30.131	30.117	30.100	30.084	30.073	33.164	30.205	30.073	.132
June 11...	29.930	29.919	29.906	29.895	29.881	29.856	29.852	29.840	29.810	29.801	29.942	30.048	29.801	.247
June 12...	29.688	29.684	29.671	29.663	29.653	29.634	29.625	29.610	29.600	29.591	29.702	29.798	29.591	.207
June 13...	29.590	29.602	29.597	29.599	29.599	29.500	29.604	29.599	29.599	29.598	29.578	29.604	**29.544**	.060
June 14...	29.644	29.659	29.672	29.679	29.691	29.704	29.715	29.711	29.728	29.741	29.643	29.741	29.583	.158
June 15...	29.937	29.948	29.953	29.968	29.973	29.977	29.981	29.987	29.997	30.007	29.904	30.007	29.766	.241
June 16...	30.083	30.087	30.095	30.099	30.103	30.108	30.118	30.120	30.120	30.127	30.066	30.127	30.001	.126
June 17...	30.172	30.173	30.176	30.166	30.166	30.165	30.153	30.154	30.152	30.147	30.156	30.176	30.124	.052
June 18...	30.177	30.179	30.180	30.180	30.180	30.189	30.189	30.188	30.192	30.194	30.167	30.194	30.134	.060
June 19...	30.207	30.198	30.186	30.184	30.179	30.172	30.173	30.167	30.166	30.150	**30.193**	**30.214**	30.159	.055
June 20...	30.118	30.120	30.100	30.094	30.082	30.070	30.058	30.054	30.052	30.047	30.116	30.155	30.047	.108
June 21...	30.003	29.995	29.983	29.975	29.967	29.952	29.947	29.945	29.934	29.922	29.993	30.026	29.922	.104
June 22...	29.851	29.853	29.851	29.835	29.828	29.825	20.818	29.816	29.817	29.811	29.861	29.909	29.811	.098
June 23...	29.763	29.754	29.744	29.744	29.739	29.739	29.748	29.752	29.753	29.752	29.775	29.812	29.739	.073
June 24...	29.770	29.788	29.796	29.806	29.806	29.807	29.812	29.819	29.824	29.829	29.779	29.829	29.740	.089
June 25...	29.919	29.923	29.923	29.925	29.928	29.928	29.941	29.943	29.948	29.945	29.903	29.948	29.825	.123
June 26...	29.983	29.986	29.987	29.988	29.988	29.988	29.980	29.983	29.975	29.972	29.973	29.989	29.940	.049
June 27...	29.842	29.834	29.803	29.795	29.771	29.752	29.717	29.697	29.670	29.658	29.862	29.968	29.658	.310
June 28...	29.578	29.603	29.611	29.625	29.627	29.640	29.635	29.646	29.652	29.661	29.604	29.661	29.559	.102
June 29...	29.756	29.762	29.763	29.763	29.775	29.787	29.790	29.793	29.771	29.757	29.728	29.793	29.653	.140
June 30...	29.779	29.793	29.801	29.805	29.810	29.808	29.815	29.808	29.807	29.800	29.770	29.815	20.726	.089
Means...	29.930	29.933	29.931	29.930	29.928	29.926	29.924	29.922	29.920	29.918	29.924	29.974	29.859	.115

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for mean local time—5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
July 1	29.803	29.803	29.808	29.798	29.788	29.777	29.774	29.768	29.768	29.765	29.761	29.757	29.754	29.741
July 2	29.673	29.666	29.672	29.672	29.694	29.698	29.715	29.724	29.718	29.719	29.724	29.726	29.719	29.733
July 3	29.777	29.780	29.777	29.785	29.796	29.799	29.796	29.791	29.773	29.778	29.787	29.789	29.794	29.805
July 4	29.772	29.764	29.754	29.754	29.763	29.768	29.759	29.754	29.747	29.740	29.731	29.730	29.722	29.719
July 5	29.741	29.741	29.744	29.753	29.758	29.760	29.763	29.762	29.758	29.755	29.753	29.760	29.753	29.751
July 6	29.661	29.651	29.654	29.642	29.644	29.631	29.619	29.609	29.591	29.583	29.583	29.582	29.578	29.576
July 7	29.641	29.635	29.629	29.634	29.653	29.651	29.636	29.632	29.619	29.614	29.609	29.611	29.614	29.616
July 8	29.582	29.576	29.576	29.584	29.594	29.598	29.615	29.642	29.669	29.696	29.722	29.742	29.758	29.779
July 9	29.893	29.904	29.908	29.915	29.928	29.923	29.923	29.923	29.911	29.914	29.912	29.909	29.911	29.917
July 10	29.862	29.855	29.854	29.854	29.858	29.845	29.836	29.823	29.810	29.805	29.798	29.795	29.790	29.791
July 11	29.791	29.788	29.788	29.788	29.801	29.807	29.803	29.805	29.805	29.805	29.805	29.810	29.817	29.823
July 12	29.796	29.793	29.800	29.804	29.821	29.823	29.823	29.826	29.829	29.831	29.839	29.834	29.839	29.841
July 13	29.842	29.844	29.846	29.845	29.863	29.867	29.865	29.870	29.870	29.866	29.865	29.874	29.863	29.864
July 14	29.878	29.891	29.890	29.895	29.905	29.908	29.913	29.918	29.924	29.927	29.929	29.933	29.940	29.947
July 15	29.972	29.985	29.991	30.005	30.007	30.012	30.019	30.028	30.029	30.034	30.039	30.054	30.054	30.063
July 16	30.098	30.101	30.112	30.113	30.119	30.124	30.121	30.117	30.114	30.109	30.115	30.101	30.098	30.102
July 17	30.027	30.015	30.015	30.016	30.011	29.995	29.960	29.968	29.954	29.942	29.930	29.915	29.905	29.896
July 18	29.718	29.717	29.714	29.686	29.681	29.670	29.671	29.648	29.638	29.624	29.621	29.611	29.608	29.602
July 19	29.590	29.605	29.604	29.599	29.613	29.610	29.606	29.607	29.605	29.600	29.604	29.598	29.601	29.598
July 20	**29.521**	29.534	29.541	29.542	29.544	29.546	29.542	29.544	29.543	29.541	29.542	29.553	29.556	29.566
July 21	29.647	29.664	29.670	29.681	29.701	29.704	29.709	29.722	29.725	29.731	29.741	29.744	29.751	29.775
July 22	29.855	29.857	29.879	29.888	29.891	29.893	29.895	29.903	29.905	29.915	29.923	29.925	[illegible]	29.942
July 23	29.998	30.006	30.017	30.021	30.039	30.043	30.047	30.051	30.053	30.064	30.064	30.076	30.083	30.095
July 24	30.157	30.160	30.160	30.185	30.205	30.210	30.211	30.220	30.228	30.230	30.238	30.243	30.244	30.241
July 25	30.244	30.258	30.254	30.256	**30.269**	30.263	30.264	30.264	30.265	30.263	30.261	30.260	30.268	30.264
July 26	30.195	30.203	30.192	30.194	30.192	30.181	30.177	30.170	30.167	30.161	30.156	30.146	30.141	30.134
July 27	30.023	30.017	30.017	30.017	30.019	30.013	30.001	29.999	29.994	29.986	29.980	29.969	29.956	29.952
July 28	29.848	29.830	29.838	29.831	29.838	29.833	29.811	29.803	29.791	29.789	29.785	29.773	29.759	29.757
July 29	29.760	29.770	29.786	29.801	29.818	29.831	29.846	29.856	29.861	29.871	29.880	29.896	29.922	29.938
July 30	30.006	30.020	30.035	30.031	30.050	30.061	30.066	30.073	30.073	30.074	30.080	30.081	30.086	30.095
July 31	30.035	30.023	30.010	30.011	30.016	30.015	30.009	30.003	29.993	29.985	29.978	29.975	29.973	29.971
Means	**29.852**	29.854	29.857	29.858	29.867	29.866	29.865	29.865	29.862	29.862	29.863	29.864	29.864	29.868

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
July 1	29.738	29.734	29.730	29.716	29.709	29.703	29.701	29.695	29.690	29.688	29.749	29.808	29.688	.120
July 2	29.747	29.756	29.771	29.789	29.803	29.797	29.810	29.804	29.797	29.792	29.738	29.810	29.666	.144
July 3	29.813	29.820	29.826	29.831	29.825	29.816	29.807	29.801	29.793	29.785	29.798	29.831	29.773	.058
July 4	29.725	29.734	29.734	29.739	29.734	29.737	29.746	29.736	29.742	29.743	29.744	29.772	29.719	.053
July 5	29.752	29.748	29.744	29.739	29.731	29.721	29.714	29.699	29.687	29.682	29.740	29.763	29.682	.081
July 6	29.582	29.596	29.604	29.607	29.611	29.618	29.636	29.642	29.637	29.647	29.616	29.661	29.576	.085
July 7	29.619	29.620	29.624	29.619	29.619	29.609	29.609	29.603	29.596	29.593	29.621	29.653	29.593	.060
July 8	29.810	29.828	29.841	29.851	29.863	29.871	29.890	29.894	29.897	29.896	29.741	29.897	29.576	.321
July 9	29.923	29.921	29.899	29.896	29.895	29.890	29.889	29.885	29.882	29.876	29.906	29.928	29.876	.052
July 10	29.793	29.794	29.790	29.785	29.792	29.791	29.799	29.799	29.803	29.803	29.814	29.862	29.785	.077
July 11	29.821	29.820	29.808	29.808	29.808	29.805	29.813	29.810	29.810	29.805	29.806	29.823	29.788	.035
July 12	29.851	29.851	29.851	29.848	29.848	29.848	29.850	29.852	29.858	29.853	29.834	29.858	29.793	.065
July 13	29.868	29.870	29.883	29.888	29.891	29.885	29.899	29.897	29.902	29.901	29.872	29.902	29.842	.060
July 14	29.953	29.956	29.960	29.965	29.972	29.959	29.979	29.969	29.976	29.952	29.935	29.979	29.878	.101
July 15	30.081	30.087	30.093	30.091	30.088	30.086	30.095	30.104	30.107	30.111	30.051	30.111	29.972	.139
July 16	30.105	30.107	30.098	30.086	30.088	30.075	30.071	30.063	30.047	30.040	30.097	30.124	30.040	.084
July 17	29.889	29.876	29.855	29.845	29.828	29.811	29.800	29.779	29.764	29.745	29.907	30.027	29.745	.282
July 18	29.599	29.600	29.605	29.594	29.594	29.592	29.595	29.596	29.594	29.593	29.632	29.718	29.594	.126
July 19	29.609	29.603	29.594	29.586	29.581	29.566	29.566	29.559	29.559	29.546	29.592	29.613	29.546	.067
July 20	29.574	29.583	29.592	29.592	29.603	29.604	29.618	29.628	29.638	29.647	**29.571**	29.647	**29.521**	.126
July 21	29.781	29.794	29.801	29.803	29.815	29.818	29.817	29.823	29.827	29.840	29.754	29.840	29.647	.193
July 22	29.949	29.959	29.967	29.970	29.975	29.977	29.988	30.002	30.010	30.006	29.934	30.010	29.855	.155
July 23	30.104	30.113	30.120	30.115	30.115	30.118	30.130	30.133	30.142	30.153	30.079	30.153	29.998	.155
July 24	30.250	30.259	30.259	30.262	30.263	30.260	30.257	30.256	30.257	30.257	30.230	30.263	30.157	.106
July 25	30.258	30.259	30.252	30.247	30.240	30.232	30.231	30.224	30.222	30.214	**30.251**	**30.269**	30.214	.055
July 26	30.126	30.114	30.107	30.098	30.082	30.070	30.067	30.061	30.056	30.049	30.135	30.203	30.049	.154
July 27	29.953	29.939	29.925	29.923	29.918	29.900	29.894	29.894	29.877	29.868	29.960	30.023	29.868	.155
July 28	29.759	29.756	29.739	29.739	29.738	29.738	29.750	29.755	29.759	29.766	29.783	29.848	29.738	.110
July 29	29.914	29.950	29.961	29.967	29.972	29.982	29.991	29.999	30.005	30.014	29.901	30.014	29.760	.254
July 30	30.100	30.100	30.092	30.089	30.080	30.067	30.070	30.071	30.056	30.054	30.067	30.100	30.006	.094
July 31	29.961	29.951	29.944	29.939	29.938	29.923	29.923	29.916	29.927	29.913	29.973	30.035	29.913	.122
Means	29.872	**29.874**	29.873	29.872	29.872	29.867	29.871	29.869	29.868	29.866	29.866	29.921	29.802	.119

Tables showing pressure of air at Uglaamie from October, 1881, to August, 1883—Continued.

[Barometer above sea, 17 feet. Washington mean time. Correction for local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Aug. 1...	29.920	29.918	29.915	29.910	29.907	29.902	29.897	29.894	29.896	29.889	29.886	29.880	29.878	29.868
Aug. 2...	29.826	29.826	29.823	29.821	29.826	29.825	29.820	29.821	29.819	29.818	29.816	29.809	29.804	29.806
Aug. 3...	29.832	29.836	29.827	29.831	29.843	29.841	29.839	29.847	29.849	29.852	29.848	29.847	29.851	29.852
Aug. 4...	29.855	29.855	29.858	29.860	29.863	29.866	29.866	29.866	29.863	29.860	29.860	29.860	29.860	29.858
Aug. 5...	29.825	29.820	29.820	29.823	29.824	29.830	29.823	29.820	29.818	29.817	29.818	29.820	29.826	29.830
Aug. 6...	29.857	29.855	29.867	29.875	29.878	29.876	29.879	29.885	29.887	29.891	29.904	29.911	29.918	29.920
Aug. 7...	29.956	29.958	29.963	29.963	29.965	29.970	29.978	29.978	29.972	29.973	29.980	29.972	29.966	29.967
Aug. 8...	29.976	29.981	29.984	29.988	29.993	29.999	30.001	30.000	30.004	30.005	30.006	30.009	30.005	30.015
Aug. 9...	29.998	29.996	29.993	29.979	29.977	29.970	29.965	29.947	29.938	29.931	29.922	29.908	29.899	29.889
Aug. 10...	29.790	29.790	29.787	29.779	29.773	29.749	29.746	29.734	29.723	29.716	29.705	29.700	29.694	29.695
Aug. 11...	29.698	29.697	29.694	29.694	29.688	29.696	29.691	29.679	29.679	29.671	29.666	29.668	29.652	29.650
Aug. 12...	29.565	29.560	29.550	29.551	29.546	29.549	29.532	29.524	29.516	29.514	29.506	29.505	29.503	29.501
Aug. 13...	29.512	29.512	29.515	29.526	29.532	29.534	29.534	29.514	29.551	29.552	29.561	29.560	29.571	29.577
Aug. 14...	29.622	29.629	29.634	29.636	29.656	29.656	29.661	29.661	29.650	29.659	29.669	29.664	29.672	29.684
Aug. 15...	29.765	29.775	29.787	29.787	29.784	29.802	29.797	29.793	29.786	29.786	29.768	29.762	29.750	29.742
Aug. 16...	29.631	29.622	29.615	29.611	29.616	29.612	29.606	29.596	29.586	29.578	29.570	29.560	29.548	29.543
Aug. 17...	29.372	29.357	29.339	29.325	29.319	29.307	29.302	29.297	29.305	29.313	29.328	29.329	29.348	29.345
Aug. 18...	29.314	29.320	29.313	29.319	29.325	29.335	29.350	29.358	29.375	29.393	29.405	29.422	29.437	29.461
Aug. 19...	29.642	29.660	29.675	29.691	29.700	29.713	29.728	29.741	29.751	29.766	29.772	29.808	29.821	29.850
Aug. 20...	29.915	29.885	29.872	29.840	29.810	29.795	29.755	29.713	29.681	29.655	29.623	29.592	29.568	29.542
Aug. 21...	29.511	29.527	29.545	29.571	29.590	29.611	29.629	29.658	29.680	29.701	29.726	29.753	29.780	29.809
Aug. 22...	30.058	30.068	30.084	30.096	30.109	30.111	30.118	30.120	30.118	30.115	**30.122**	30.121	30.120	30.121
Aug. 23...	30.022	30.006	29.983	29.970	29.956	29.934	29.922	29.906	29.896	29.882	29.878	29.872	29.863	29.857
Aug. 24...	29.722	29.704	29.685	29.667	29.627	29.608	29.572	29.542	29.505	29.490	29.483	29.482	29.494	29.524
Aug. 25...	29.995	30.014	30.022	30.050	30.065	30.065	30.065	30.062	30.052	30.050	30.025	30.013	30.003	29.984
Aug. 26...	29.645	29.625	29.590	29.565	29.540	29.523	29.518	29.496	29.487	29.512	29.530	29.561	29.570	29.602
Aug. 27*..	29.877	29.912	29.933	29.946	29.945	29.939	29.940	29.896	29.913	29.905	29.913	29.902	29.883	29.870
Means..	29.766	**29.767**	29.766	29.766	29.765	29.764	29.761	29.755	29.752	29.752	**29.751**	**29.751**	**29.751**	29.754

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Range.
1883.														
Aug. 1...	29.869	29.866	29.865	29.860	29.858	29.850	29.845	29.840	29.839	29.846	29.879	29.920	29.839	.081
Aug. 2...	29.815	29.823	29.825	29.826	29.826	29.833	29.830	29.831	29.829	29.826	29.822	29.833	29.804	.029
Aug. 3...	29.857	29.859	29.850	29.853	29.857	29.855	29.858	29.850	29.850	29.850	29.846	29.858	29.822	.036
Aug. 4...	29.857	29.846	29.844	29.850	29.848	29.841	29.845	29.844	29.839	29.829	29.854	29.866	29.829	.037
Aug. 5...	29.834	29.837	29.841	29.841	29.845	29.849	29.851	29.857	29.853	29.850	29.832	29.857	29.817	.040
Aug. 6...	29.928	29.937	29.938	29.943	29.946	29.949	29.952	29.954	29.955	29.952	29.911	29.955	29.855	.100
Aug. 7...	29.970	29.968	29.977	29.975	29.981	29.980	29.978	29.977	29.978	29.973	29.972	29.981	29.956	.025
Aug. 8...	30.021	30.028	30.031	30.031	30.027	30.027	30.020	30.013	30.008	30.000	30.007	30.031	29.976	.055
Aug. 9...	29.879	29.867	29.867	29.852	29.835	29.829	29.823	29.813	29.804	29.798	29.903	29.998	29.798	.200
Aug. 10...	29.693	29.683	29.681	29.689	29.686	29.686	29.691	29.692	29.698	29.698	29.720	29.790	29.681	.109
Aug. 11...	29.642	29.642	29.632	29.625	29.609	29.608	29.592	29.591	29.574	29.569	29.650	29.698	29.569	.129
Aug. 12...	29.500	29.491	29.491	29.496	29.498	29.497	29.503	29.499	29.502	29.508	29.517	29.565	29.491	.074
Aug. 13...	29.577	29.591	29.589	29.594	29.594	29.594	29.603	29.609	29.616	29.617	29.565	29.617	29.512	.105
Aug. 14...	29.692	29.709	29.719	29.721	29.729	29.735	29.737	29.734	29.749	29.753	29.685	29.753	29.622	.131
Aug. 15...	29.721	29.714	29.703	29.699	29.692	29.678	29.675	29.662	29.640	29.637	29.738	29.802	29.637	.165
Aug. 16...	29.532	29.522	29.502	29.485	29.470	29.450	29.432	29.414	29.404	29.391	29.537	29.631	29.391	.240
Aug. 17...	29.352	29.355	29.355	29.360	29.352	29.349	29.337	29.323	29.314	**29.306**	**29.333**	29.372	**29.306**	.066
Aug. 18...	29.495	29.513	29.530	29.550	29.572	29.586	29.596	29.606	29.620	29.636	29.452	29.636	29.313	.323
Aug. 19...	29.868	29.898	29.900	29.917	29.933	29.918	29.933	29.935	29.923	29.923	29.811	29.935	29.642	.293
Aug. 20...	29.527	29.508	29.494	29.479	29.470	29.469	29.476	29.482	29.480	29.492	29.630	29.915	29.469	.446
Aug. 21...	29.843	29.870	29.899	29.913	29.935	29.960	29.985	30.004	30.017	30.045	29.773	30.045	29.511	.534
Aug. 22...	30.118	30.113	30.107	30.099	30.094	30.078	30.067	30.053	30.044	30.030	**30.095**	**30.122**	30.030	.092
Aug. 23...	29.850	29.838	29.840	29.840	29.817	29.804	29.785	29.769	29.750	29.735	29.874	30.022	29.735	.287
Aug. 24...	29.569	29.614	29.683	29.736	29.782	29.823	29.875	29.918	29.943	29.973	29.668	29.973	29.482	.491
Aug. 25...	29.956	29.933	29.898	29.850	29.840	29.808	29.770	29.732	29.704	29.665	29.943	30.065	29.665	.400
Aug. 26...	29.637	29.664	29.692	29.733	29.761	29.787	29.811	29.831	29.855	29.866	29.642	29.866	29.487	.379
Aug. 27...	29.852	29.829	29.803	29.792	29.791	29.769	29.751	29.727	29.711	†29.695	29.854	29.946	29.695	.251
Means..	29.758	29.760	29.762	29.764	29.765	29.763	29.764	29.761	29.760	29.758	29.760	29.854	29.664	.190

* Station abandoned August 27, 1883.

†Approximated.

Atmospheric pressure, corrected.

Month.	Mean.	Max.	Min.	Range.	Month.	Mean.	Max.	Min.	Range.	Month.	Mean.	Max.	Min.	Range.
1881.					1882.					1883.				
November	29.894	30.708	29.108	1.600	May	30.080	30.422	29.773	0.649	January	29.965	30.962	29.024	1.938
December	29.858	30.393	29.231	1.162	June	29.880	30.222	29.558	0.664	February	30.218	30.926	28.992	1.934
					July	29.804	30.116	29.443	0.673	March	30.028	30.849	29.503	1.346
Whole period	29.876	30.708	29.108	1.600	August	29.811	30.375	29.200	1.175	April	30.027	30.572	29.350	1.222
					September	29.812	30.471	29.046	1.425	May	29.881	30.606	29.146	1.460
1882.					October	29.898	30.237	29.581	0.656	June	29.941	30.233	29.561	0.672
January	29.836	30.565	28.283	2.282	November	29.828	30.524	29.316	1.208	July	29.883	30.288	29.538	0.750
February	29.725	30.291	29.015	1.276	December	30.118	30.987	29.445	1.542	August	29.770	30.141	29.313	0.828
March	30.070	30.745	29.090	1.655										
April	29.980	30.573	29.424	1.149	Whole period	29.903	30.987	28.283	2.704	Whole period	29.964	30.962	28.992	1.970

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1881.														
Oct. 18	31.1	30.3	29.9	30.4	33.5	33.3	33.3	33.8	34.6	35.7	35.9	35.6	37.5	38.5
Oct. 19	38.1	38.2	37.3	36.4	35.8	36.0	36.2	36.2	36.0	34.7	33.8	34.0	34.4	33.7
Oct. 20	31.3	31.9	30.7	30.8	31.0	30.3	30.2	29.4	29.4	29.2	28.2	28.2	27.4	26.6
Oct. 21	25.0	25.5	24.3	25.1	25.0	25.0	26.4	27.5	29.9	28.0	28.3	28.0	27.9	27.4
Oct. 22	21.6	21.0	20.3	19.9	19.5	18.8	17.6	17.1	17.4	16.1	16.1	14.5	15.5	16.2
Oct. 23	19.8	19.6	19.1	17.1	18.4	19.2	19.6	19.7	19.6	19.4	19.1	18.9	18.6	18.7
Oct. 24	15.8	14.5	15.6	15.2	14.1	12.9	12.3	13.7	14.9	17.8	17.4	19.1	17.0	16.8
Oct. 25	13.2	12.0	10.2	9.1	8.8	8.8	9.4	9.4	8.6	8.5	8.3	8.1	7.9	7.6
Oct. 26	9.7	10.0	10.7	10.8	10.7	10.8	11.5	11.7	12.7	12.9	12.6	11.1	11.2	12.0
Oct. 27	12.9	13.7	12.0	11.0	11.3	11.4	10.6	10.1	10.7	10.8	10.7	9.9	9.6	9.1
Oct. 28	14.8	14.2	14.6	15.1	15.2	15.7	17.2	17.3	17.9	17.6	16.8	17.8	18.6	19.8
Oct. 29	15.8	15.7	15.5	15.7	16.4	16.2	17.0	17.2	16.8	17.4	17.5	17.5	17.7	17.8
Oct. 30	23.5	23.5	23.5	23.2	21.7	20.8	15.8	13.7	9.9	7.0	6.2	8.8	8.2	9.5
Oct. 31	15.6	17.0	15.6	15.2	15.5	15.8	16.4	14.3	13.2	15.3	15.8	15.3	15.6	17.4
Means ..	20.59	20.51	19.95	19.64	19.78	19.64	19.54	19.36	19.40	19.31	19.05	19.06	19.08	19.37

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1881.														
Oct. 18	38.9	39.1	39.1	37.7	38.3	38.5	38.4	38.1	38.3	38.2	35.75	38.1	28.3	9.8
Oct. 19 ..	33.2	32.8	32.3	32.8	31.8	32.1	30.5	30.7	30.8	31.3	34.13	41.6	29.9	11.7
Oct. 20	26.8	27.2	26.4	27.2	26.6	26.4	25.8	25.5	25.3	25.5	28.22	38.1	24.4	13.7
Oct. 21 ...	26.2	25.9	26.2	25.9	25.1	24.1	24.1	23.1	22.9	22.5	25.80	31.9	21.9	10.0
Oct. 22	18.2	18.1	18.6	19.1	19.1	18.9	18.0	17.7	17.6	18.6	18.17	29.9	14.4	15.5
Oct. 23	13.3	18.4	18.1	17.4	17.4	17.3	17.1	15.6	15.7	16.1	18.26	21.0	14.5	6.5
Oct. 24	16.6	16.6	14.8	14.7	14.7	14.6	14.6	14.1	13.2	13.7	15.20	25.0	10.4	14.6
Oct. 25	8.5	7.7	7.8	7.7	7.5	7.3	8.0	7.5	8.8	9.0	8.74	12.3	6.0	6.3
Oct. 26	12.9	12.8	12.0	12.8	12.7	13.1	12.9	13.0	13.2	13.6	11.97	16.5	7.4	9.1
Oct. 27	5.2	9.9	10.3	9.9	12.0	10.8	6.8	6.8	6.6	13.2	10.22	13.0	2.5	10.5
Oct. 28	19.9	20.6	20.6	19.3	19.1	19.5	19.3	18.5	15.6	17.1	17.59	20.0	10.4	9.6
Oct. 29	18.8	19.3	20.5	20.9	20.7	20.6	20.6	24.3	24.1	24.4	18.68	24.0	14.0	10.0
Oct. 30	12.9	17.9	18.6	18.7	15.8	9.1	8.9	13.0	18.8	14.9	15.16	24.2	4.3	19.9
Oct. 31	17.6	17.4	17.6	16.6	16.2	16.0	16.1	16.0	16.3	16.0	15.99	17.0	11.5	5.5
Means ..	19.57	20.26	20.21	20.05	19.79	19.16	18.69	18.85	19.09	19.58	19.56	25.19	14.28	10.91

Table showing the temperature of the air at Uglaamie from October, 1881, *to August*, 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1881.														
Nov. 1 ...	16.0	15.8	16.0	15.9	15.2	14.9	14.7	13.7	12.5	11.8	9.0	11.0	10.8	10.9
Nov. 2 ...	12.0	11.0	11.0	10.8	11.0	10.6	11.1	10.6	10.8	10.9	10.7	10.6	10.8	12.7
Nov. 3 ...	12.0	11.6	10.7	10.2	9.8	9.9	9.9	10.4	9.8	9.4	8.0	7.8	7.2	6.1
Nov. 4 ...	6.8	6.0	5.3	5.0	4.8	4.2	3.9	4.2	4.2	4.5	5.1	5.4	0.0	7.1
Nov. 5 ...	3.3	4.4	4.8	4.6	4.4	3.3	3.4	2.8	1.0	0.2	0.1	−3.0	−3.0	−3.5
Nov. 6 ...	−3.4	−4.2	−4.7	−5.8	−5.8	−7.5	−7.9	−9.5	−9.3	−9.3	−9.3	−7.7	−8.2	−6.7
Nov. 7 ...	−4.9	−3.2	−3.0	−1.9	−2.3	−5.0	−5.7	−7.5	−7.0	−9.1	−9.7	−7.9	−11.0	−11.1
Nov. 8 ...	−3.7	−4.9	−5.3	−5.0	−4.9	−4.9	−4.6	−4.2	−3.8	−4.0	−4.9	−4.4	−3.9	−4.4
Nov. 9 ...	−2.7	−2.1	−3.1	−3.0	−2.3	−1.7	−0.1	−0.4	−0.7	−0.1	−1.2	−1.9	−1.0	−1.2
Nov. 10 ...	−0.1	−1.3	−2.1	−3.0	−3.0	−3.4	−3.8	−4.8	−5.3	−5.4	−4.4	−3.2	−2.5	−3.0
Nov. 11 ...	−4.1	−3.9	−3.7	−5.1	−5.3	−5.4	−4.5	−5.6	−8.3	−7.5	−11.0	−11.0	−11.9	−11.0
Nov. 12 ...	−14.5	−14.5	−15.4	−15.4	−15.6	−15.2	−16.0	−16.4	−16.3	−15.9	−15.6	−17.5	−17.6	−16.6
Nov. 13 ...	−19.2	−19.2	−19.4	−19.4	−20.3	−20.4	−21.0	−21.6	−21.0	−21.8	−21.0	−21.1	−20.7	−20.1
Nov. 14 ...	−14.1	−11.9	−10.1	−11.8	−7.5	−3.6	−0.6	−1.0	−1.0	−9.7	−9.5	−9.6	−9.1	−7.7
Nov. 15 ...	20.8	20.7	20.6	22.4	22.7	23.5	24.0	24.5	24.4	24.5	24.5	24.5	24.8	25.6
Nov. 16 ...	26.3	24.0	23.7	20.9	19.8	18.6	15.7	8.5	6.0	4.6	3.7	3.0	−0.8	1.4
Nov. 17 ...	−13.2	−12.6	−13.0	−13.0	−14.7	−14.6	−15.5	−14.3	−12.5	−16.6	−16.6	−17.5	−16.4	−15.4
Nov. 18 ...	−4.0	−4.8	−5.3	−4.9	−6.2	−6.5	−6.7	−6.2	−5.6	−5.8	−5.2	−4.4	−4.2	−4.2
Nov. 19 ...	−1.6	−0.9	−0.5	−0.4	−0.2	1.3	2.1	2.3	2.6	3.0	−2.1	3.0	4.4	5.2
Nov. 20 ...	6.2	6.4	3.8	2.7	1.4	4.4	3.4	1.5	1.4	3.2	2.8	2.7	4.2	5.2
Nov. 21 ...	8.8	6.0	4.7	4.4	4.2	3.8	3.2	2.1	1.5	−0.5	−0.8	3.6	2.3	2.4
Nov. 22 ...	−4.9	−5.8	−5.8	−6.0	−6.7	−7.5	−8.0	−8.2	−9.3	−12.3	−13.0	−15.7	−15.3	−15.5
Nov. 23 ...	−19.8	−19.0	−19.7	−20.2	−21.3	−23.1	−23.9	−22.6	−21.5	−21.5	−19.7	−17.3	−15.4	−15.4
Nov. 24 ...	−12.1	−11.7	−13.0	−11.9	−11.2	−11.4	−11.1	−11.0	−11.1	−10.6	−10.5	−9.7	−9.9	−12.2
Nov. 25 ...	−10.5	−9.7	−9.0	−7.7	−6.1	−3.7	−3.6	−5.0	−3.2	−2.0	−1.8	−1.9	−0.7	−0.6
Nov. 26 ...	5.4	5.3	5.1	2.5	3.0	3.4	3.5	2.1	1.2	0.9	0.4	0.6	0.3	0.0
Nov. 27 ...	4.6	5.0	5.5	5.7	5.1	5.6	5.0	4.9	5.3	6.4	7.2	8.8	9.8	10.0
Nov. 28 ...	22.9	21.9	19.8	15.6	14.1	12.3	11.6	11.6	9.8	9.6	8.5	8.2	9.7	12.0
Nov. 29 ...	19.0	19.4	19.6	19.4	20.0	20.7	23.5	23.5	23.5	22.9	21.5	15.4	11.8	8.0
Nov. 30 ...	3.3	2.2	0.4	−1.2	−3.2	−4.2	−5.6	−5.4	−5.6	−6.3	−6.1	−6.0	−5.0	−3.1
Means ...	1.15	1.67	0.60	0.15	−0.04	0.05	−0.12	−0.70	−0.92	−1.55	−2.03	−1.84	−1.80	−1.50

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1881.														
Nov. 1 ...	12.0	12.1	11.8	11.0	10.8	11.4	11.5	11.3	11.8	12.6	12.69	16.1	8.9	7.2
Nov. 2 ...	13.9	13.9	14.5	14.5	14.5	13.4	13.5	13.3	12.7	13.1	12.16	13.2	9.5	3.7
Nov. 3 ...	7.4	7.9	8.2	8.6	8.5	8.4	8.2	8.0	7.0	6.2	8.80	12.8	4.4	8.4
Nov. 4 ...	8.2	9.2	8.6	7.0	6.8	6.3	4.4	2.8	0.4	−1.9	5.18	8.0	−1.4	9.4
Nov. 5 ...	1.6	1.3	−1.9	−2.9	−3.0	−3.2	−3.7	−4.1	−3.2	−2.2	0.07	4.0	−6.6	10.6
Nov. 6 ...	−6.0	−7.5	−7.0	−6.2	−5.8	−4.2	−4.4	−4.4	−4.6	−6.9	−6.51	−3.0	−12.3	9.3
Nov. 7 ...	−9.8	−8.9	−8.2	−7.6	−7.4	−6.7	−5.3	−5.4	−5.1	−4.9	−6.61	−2.8	−14.1	11.3
Nov. 8 ...	−5.1	−5.6	−7.5	−4.9	−5.4	−4.4	−4.9	−3.8	−3.5	−3.5	−4.65	−5.5	−7.6	2.1
Nov. 9 ...	−0.3	−0.1	0.3	0.0	0.4	0.9	1.3	0.3	−1.4	0.4	−0.82	−0.3	−7.3	7.0
Nov. 10 ...	−1.4	−1.8	−2.1	−2.8	−3.6	−4.0	−4.0	−3.4	−3.0	−4.0	−3.14	−1.0	−7.5	6.5
Nov. 11 ...	−10.1	−11.4	−11.5	−15.2	−13.8	−13.8	−13.9	−14.6	−14.0	−14.7	−9.64	−4.5	−18.6	14.1
Nov. 12 ...	−14.5	−15.8	−15.8	−15.0	−16.2	−17.8	−18.2	−18.1	−18.1	−19.1	−16.30	−17.0	−23.5	6.5
Nov. 13 ...	−17.9	−17.7	−15.2	−16.2	−15.8	−16.4	−17.5	−17.4	−17.2	−16.0	−18.90	−18.5	−26.2	7.7
Nov. 14 ...	−2.8	−0.6	2.5	6.7	8.7	11.0	12.4	13.5	16.2	16.8	−0.95	15.4	−21.0	36.4
Nov. 15 ...	28.9	27.7	25.6	23.0	26.5	26.4	26.3	25.4	27.3	*30.9	24.82	29.0	14.4	14.6
Nov. 16 ...	0.5	0.9	0.7	−0.2	−0.6	−1.2	−2.5	−5.8	−11.2	−11.9	6.00	30.4	−14.4	44.8
Nov. 17 ...	−14.2	−14.3	−15.0	−14.0	−11.1	−8.6	−7.1	−6.5	−6.0	−5.1	−12.82	−6.0	−21.6	15.6
Nov. 18 ...	−4.2	−4.0	−3.5	−2.3	−2.1	−2.1	−2.1	−2.3	−1.3	−1.2	−4.13	−3.0	−9.1	6.1
Nov. 19 ...	8.3	9.8	7.4	0.5	7.5	8.7	6.2	3.9	3.9	7.0	3.64	9.0	−3.6	12.6
Nov. 20 ...	21.2	20.7	23.5	28.5	20.7	12.0	15.4	12.7	12.5	10.8	9.47	28.0	−2.1	30.1
Nov. 21 ...	2.1	0.4	0.3	0.2	0.9	0.4	0.2	−0.4	−2.2	−1.7	1.93	9.8	−4.1	13.9
Nov. 22 ...	−15.1	−16.5	−17.0	−17.0	−17.3	−18.4	−16.4	−18.2	−18.7	−19.7	−12.85	−6.2	−22.6	16.4
Nov. 23 ...	−15.2	−15.6	−16.1	−16.0	−13.8	−14.9	−14.8	−14.7	−13.6	−12.1	−17.80	−17.0	−28.0	11.0
Nov. 24 ...	−11.1	−11.2	−11.1	−10.5	−9.7	−9.3	−8.4	−8.4	−9.3	−8.8	−10.65	−11.0	−19.2	8.2
Nov. 25 ...	1.4	0.7	5.2	4.9	5.1	5.2	4.4	4.7	6.5	5.4	−0.82	6.0	−13.6	19.6
Nov. 26 ...	0.0	1.4	2.0	2.9	2.3	3.2	3.0	3.2	4.9	4.7	2.55	5.0	−1.7	6.7
Nov. 27 ...	10.8	13.3	14.5	14.7	14.0	16.3	17.8	18.6	20.7	24.1	10.57	21.0	2.3	18.7
Nov. 28 ...	13.6	15.8	16.6	15.6	15.6	15.4	21.5	21.7	22.9	18.6	15.20	24.0	6.8	17.2
Nov. 29 ...	6.5	5.2	6.0	6.8	6.9	6.1	5.8	5.7	6.0	3.6	13.62	23.5	4.3	19.2
Nov. 30 ...	−0.6	−0.7	1.6	2.0	1.8	2.5	2.3	1.4	−1.4	−2.4	−1.64	4.8	−8.6	13.4
Means ...	0.27	0.29	0.58	0.74	0.85	0.75	1.03	0.63	0.63	0.60	−0.05	5.47	−8.14	13.61

* Standard read higher than maximum.

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1881.														
Dec. 1....	— 6.2	— 8.3	— 8.5	— 8.7	— 8.6	— 5.4	— 2.1	— 3.7	— 2.3	— 3.0	0.4	3.5	1.9	— 0.7
Dec. 2....	9.1	10.0	9.1	7.8	7.0	5.1	4.0	0.4	— 0.1	— 0.9	— 1.5	— 1.5	— 1.4	— 1.3
Dec. 3....	0.6	1.1	1.2	0.4	— 0.6	— 0.7	— 1.2	— 2.5	— 2.5	— 3.4	— 4.4	— 5.1	— 7.1	— 6.7
Dec. 4....	—14.5	—15.5	—15.2	—14.3	—14.5	—14.9	—15.6	—16.8	—17.5	—16.4	—16.1	—15.5	—14.5	—13.8
Dec. 5....	— 8.0	— 7.3	— 6.9	— 6.9	— 7.0	— 7.1	— 7.5	— 7.2	— 7.7	— 7.6	— 8.0	— 8.4	—11.2	— 9.3
Dec. 6....	—15.8	—15.5	—16.4	—16.8	—16.6	—16.4	—14.9	—14.7	—14.1	—12.6	—11.3	—11.0	—10.4	— 9.6
Dec. 7....	— 7.9	— 8.1	— 5.3	— 5.4	— 6.4	— 8.6	— 9.7	—10.3	— 9.9	— 8.1	— 8.6	— 8.0	— 7.5	— 7.7
Dec. 8....	— 8.1	— 7.9	— 7.1	— 8.8	—10.5	— 9.5	— 9.4	— 9.6	—10.7	—11.8	—12.1	—13.2	—13.2	—13.9
Dec. 9....	—16.2	—17.9	—18.3	—20.3	—21.4	—22.2	—22.6	—23.6	—24.8	—25.7	—26.9	—27.1	—24.9	—22.1
Dec. 10....	1.0	2.3	2.5	3.2	3.2	4.4	6.0	4.9	3.0	0.9	0.4	0.2	0.0	0.2
Dec. 11....	— 9.6	— 6.4	— 7.0	— 7.9	— 8.5	— 9.6	—10.6	—11.8	—11.7	—11.6	—12.3	—11.9	—11.3	—11.1
Dec. 12....	— 2.4	— 1.3	— 2.4	— 6.5	— 7.6	—10.1	—11.0	—12.3	—14.2	—14.2	—14.9	—15.6	[illegible]	—14.6
Dec. 13....	—15.1	—15.2	—15.1	—15.8	—14.7	—13.8	—13.3	—15.3	—17.4	—16.3	—16.8	—16.9	[illegible]	—16.4
Dec. 14....	—19.0	—18.4	—18.2	—16.6	—16.2	—15.8	—15.6	—14.9	—14.9	—14.7	—15.1	—15.3	[illegible]	—14.9
Dec. 15....	—21.4	—21.6	—22.6	—22.5	—22.7	—22.6	—21.4	—21.2	—21.2	—22.0	—23.1	—23.4	[illegible]	—25.5
Dec. 16....	—22.5	—21.9	—21.7	—21.5	—19.2	—19.4	—19.9	—19.4	—19.6	—18.9	—17.6	—17.0	[illegible]	—16.8
Dec. 17....	—18.4	—18.9	—19.3	—19.2	—19.5	—19.9	—19.4	—20.7	—23.1	—24.1	—23.2	—24.2	[illegible]	—27.1
Dec. 18....	—36.3	—37.1	—37.3	—38.9	—39.6	—40.9	—40.9	—42.3	—42.5	—41.8	—41.4	—42.4	—42.3	—41.8
Dec. 19....	—42.5	—43.5	—43.8	—43.9	—44.2	—46.3	—47.1	—48.8	—48.8	—48.9	—49.9	—50.1	—50.1	—50.0
Dec. 20....	—46.1	—45.0	—45.0	—44.1	—43.5	—37.7	—35.5	—38.0	—36.5	—33.2	—32.6	—35.5	—36.5	—38.3
Dec. 21....	—37.7	—35.0	—32.6	—32.1	—32.6	—32.4	—32.5	—32.4	—33.0	—32.8	—33.8	—33.4	—31.9	—34.1
Dec. 22....	—31.7	—31.1	—31.9	—31.5	—30.9	—31.7	—31.2	—39.9	—31.5	—32.6	—32.7	—32.6	—31.8	—31.7
Dec. 23....	—29.2	—29.1	—29.0	—29.9	—31.7	—31.8	—29.9	—28.3	—27.3	—25.7	—26.4	—24.7	—24.7	—24.4
Dec. 24....	—20.6	—20.6	—20.6	—20.6	—21.0	—21.0	—21.2	—22.5	—24.4	—25.4	—26.9	—28.0	—28.8	29.8
Dec. 25....	—28.3	—27.6	—27.8	—27.6	—27.1	—27.0	—25.9	—26.6	—27.1	—27.1	—28.0	—27.6	—25.7	—24.2
Dec. 26....	—22.0	—21.4	—21.4	—21.0	—20.5	—21.0	—21.6	—21.6	—21.2	—20.9	—20.2	—18.9	—18.3	17.4
Dec. 27....	—18.6	—19.4	—19.5	—19.5	—18.9	—19.2	—17.3	—16.8	—15.3	—13.3	—12.3	—13.2	—14.7	—14.9
Dec. 28....	—19.3	—20.4	—21.4	—21.9	—20.3	—22.9	—23.3	—23.5	—22.9	—23.4	—23.2	—23.1	—24.6	—25.9
Dec. 29....	—31.7	—27.4	—28.3	—27.0	—27.0	—27.3	—26.7	—25.6	—24.2	—23.7	—24.0	—22.5	—19.9	—18.2
Dec. 30....	—21.9	—20.0	—18.4	—18.0	—16.6	—16.2	—15.1	—15.2	—13.2	—12.2	—10.4	— 9.9	— 8.8	— 7.2
Dec. 31....	1.2	2.3	2.3	0.9	— 0.3	— 1.6	— 3.4	— 2.5	— 0.6	0.5	2.3	4.2	— 5.3	— 5.6
Means ..	—18.04	—17.62	—17.61	—17.90	—17.91	—18.18	—17.93	—18.80	—18.62	18.42	—18.41	—18.33	—18.28	—18.19

Date.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.	Max.	Min.	Diff.
1881.														
Dec. 1....	6.0	4.7	3.6	3.7	4.2	4.1	5.6	6.9	8.0	8.0	0.13	7.0	—11.4	18.4
Dec. 2....	— 0.7	— 2.2	— 1.1	— 0.5	— 2.1	— 0.7	— 0.8	— 1.4	— 0.2	— 1.2	1.45	11.5	— 4.3	15.8
Dec. 3....	— 6.0	— 9.5	—10.8	—11.8	—12.1	—13.1	—13.8	—14.0	—13.8	—14.2	— 6.21	1.2	—17.3	18.5
Dec. 4....	—11.4	—11.2	—12.1	—11.9	—11.4	—10.4	— 9.3	— 8.9	— 8.1	— 7.9	—13.55	—10.2	—21.4	11.2
Dec. 5....	—12.1	—11.9	—13.1	—14.2	—14.6	—14.2	—14.2	—14.6	—13.6	—15.6	—10.34	— 9.0	20.4	11.4
Dec. 6....	— 8.3	— 8.3	— 8.2	— 7.9	— 8.8	— 8.8	— 7.1	— 6.9	— 5.3	— 6.9	—11.36	— 7.2	—21.6	14.4
Dec. 7....	— 7.1	— 6.9	— 6.4	— 6.5	— 5.2	— 6.9	— 7.1	— 7.2	— 8.5	— 8.0	— 7.55	— 7.0	—13.6	6.6
Dec. 8....	—14.7	—14.8	—14.2	—14.3	—15.4	—14.3	—13.2	—14.0	—13.3	—14.7	—12.03	— 9.5	—19.2	9.7
Dec. 9....	—18.7	—16.1	—14.2	—12.3	—10.7	— 8.7	— 5.2	— 3.4	— 1.8	— 1.4	—16.94	— 3.5	—32.1	28.6
Dec. 10....	— 0.3	— 0.9	— 0.3	0.7	— 2.3	— 3.2	— 4.4	— 7.2	— 8.8	— 9.5	— 0.17	5.0	—13.1	18.1
Dec. 11....	—10.6	—10.6	—11.5	—12.3	—10.4	— 8.8	— 6.7	— 6.8	— 5.4	— 5.6	— 9.58	— 7.5	—16.1	8.6
Dec. 12....	—14.3	—14.3	—13.4	—12.6	—13.6	—13.2	—14.9	—15.2	—15.4	—15.6	—11.93	— 3.2	—20.5	17.3
Dec. 13....	—16.6	—17.5	—17.7	—17.9	—18.5	—18.9	—18.6	—18.9	—19.9	—19.4	—16.76	—16.3	—24.5	8.2
Dec. 14....	—14.2	—15.9	—16.9	—18.0	—19.0	—19.6	—19.4	—20.8	—20.7	—20.5	—16.67	—18.0	—25.2	7.2
Dec. 15....	—25.7	—25.3	—25.5	—25.8	—26.0	—26.8	—26.7	—25.8	—24.7	—23.4	—24.05	—24.0	—31.6	7.6
Dec. 16....	—16.8	—16.7	—17.0	—17.0	—17.5	—17.5	—18.4	—18.0	—19.1	—18.9	—18.70	—20.6	—29.5	8.9
Dec. 17....	—27.6	—29.7	—32.1	—32.6	—33.1	—32.4	—33.6	—33.7	—34.4	—37.5	—25.78	—22.0	—39.3	17.3
Dec. 18....	—37.3	—37.2	—39.3	—38.4	—39.6	—40.0	—39.8	—38.1	—41.4	—42.5	—39.96	—40.3	—47.1	6.8
Dec. 19....	—49.7	—47.8	—48.5	—48.9	—48.8	—48.3	—48.3	—47.9	—45.4	—45.3	—47.37	—41.4	—52.6	11.2
Dec. 20....	—39.0	—39.5	—38.5	—39.2	—39.6	—40.4	—39.9	—39.8	—39.9	—38.9	39.26	—32.6	—50.1	17.5
Dec. 21....	—33.4	—31.1	—33.1	—33.3	—33.4	—32.1	—31.8	—31.5	—33.0	—30.8	—32.92	—31.5	—39.9	8.4
Dec. 22....	—31.4	—32.0	—28.2	—29.8	—31.7	—30.9	—30.9	—31.5	—30.5	—29.5	—31.03	—28.2	—37.1	8.9
Dec. 23....	—20.6	—21.2	—21.4	—20.7	—19.5	—18.9	—20.3	—21.5	27.6	—20.6	—25.18	—18.7	—36.6	17.9
Dec. 24....	—31.0	—31.5	—30.7	—31.1	—31.5	—30.5	—30.7	—31.1	—31.0	—30.3	—26.70	—20.6	—36.9	16.3
Dec. 25....	—22.4	—22.1	—21.7	—19.6	—17.4	—23.1	—23.2	—23.1	—23.6	—23.0	—24.87	—19.4	—31.9	12.5
Dec. 26....	—14.3	—13.1	—12.1	—11.2	—11.4	—11.7	—13.2	—15.6	—16.8	—18.0	—17.70	—11.2	27.3	16.1
Dec. 27....	—15.9	—16.6	—17.0	—16.6	—16.7	—16.8	—18.1	—19.3	—19.4	—18.9	—17.01	—13.2	—23.3	10.1
Dec. 28....	—20.6	—26.9	—27.8	—29.5	—30.8	—31.7	—31.1	—31.7	—31.9	—32.0	—25.67	—19.3	—36.6	17.3
Dec. 29....	—16.8	—16.6	—16.6	—16.8	—17.9	—20.7	—21.9	—23.1	—24.1	—23.5	—22.98	—16.4	—36.5	20.1
Dec. 30....	— 4.9	— 4.1	— 3.1	— 2.0	— 1.4	— 0.9	0.2	2.3	1.7	1.0	— 8.93	2.5	—26.3	28.8
Dec. 31....	6.6	6.9	5.4	5.0	5.5	5.1	6.7	8.7	6.2	7.4	3.29	9.0	— 6.1	15.1
Means ..	—17.30	—17.42	—17.53	—17.53	—17.44	—17.88	—17.75	—17.84	—18.12	—17.97	—17.96	—13.37	—27.40	14.03

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 M.	1 p. m.	2 p. m.
1882.														
Jan. 1....	5.2	5.6	4.7	4.2	— 2.3	— 1.2	— 0.5	— 2.3	— 6.9	— 7.7	— 6.2	— 7.7	— 9.7	—10.6
Jan. 2....	—15.6	—16.6	—18.3	—19.1	—19.4	—18.2	—17.8	—18.2	—19.0	—19.6	—20.1	—19.7	—20.5	—21.2
Jan. 3....	—18.6	—18.2	—17.7	—17.7	—17.5	—17.1	—16.6	—16.2	—16.2	—16.7	—17.3	—17.6	—17.4	—17.9
Jan. 4....	—19.0	—20.1	—21.2	22.2	—22.1	—23.1	—23.6	—24.5	—25.9	—26.1	—26.1	—27.6	—27.5	—26.1
Jan. 5....	—27.1	—28.0	—29.7	—29.8	—29.1	—29.1	—28.0	—29.0	—29.1	—29.9	—29.7	—29.1	—28.0	—27.8
Jan. 6....	—26.1	—26.1	—25.9	—26.7	—27.1	—28.8	—28.2	—28.7	—28.9	—29.1	—29.1	—29.5	—29.1	—29.0
Jan. 7....	—24.8	—24.2	—25.7	—25.5	—25.3	—25.7	—25.9	—26.2	—27.1	—27.2	—27.3	—27.3	—27.4	—27.6
Jan. 8....	—25.2	—25.2	—25.9	—26.9	—27.3	—27.6	—28.4	—29.4	—29.1	—30.9	—31.9	—30.9	—30.7	—29.7
Jan. 9....	—26.2	—26.6	—26.7	—25.5	—26.9	—27.4	—27.6	—27.8	—28.8	—28.2	—30.3	—29.7	—30.3	—29.1
Jan. 10....	—27.6	—27.8	—27.8	—28.0	—28.3	—29.0	—28.8	—29.0	—28.6	—29.0	—28.1	—28.3	—27.8	—27.6
Jan. 11....	—21.2	—21.4	—21.4	—21.6	—22.1	—22.6	—22.3	—22.1	—22.2	—22.6	—22.3	—22.5	—20.3	—17.5
Jan. 12....	— 3.2	— 2.4	— 1.4	— 0.7	0.4	1.2	3.9	4.0	4.7	6.4	7.5	10.3	9.3	6.3
Jan. 13....	— 4.2	— 4.2	— 5.5	— 6.3	— 7.7	— 8.4	—10.6	—11.2	—12.8	—14.6	—14.5	—13.5	—12.1	—11.4
Jan. 14....	—12.6	—13.0	—13.6	—13.8	—14.0	—15.1	—15.2	—15.6	—16.7	—17.7	—18.5	—17.8	—18.6	—19.5
Jan. 15....	—18.4	—17.7	—18.7	—18.8	—19.4	—21.1	—21.5	—22.4	—22.9	—23.1	—22.4	—22.1	—21.2	—21.9
Jan. 16....	—21.2	—21.2	—21.5	—22.1	—21.5	—21.0	—21.0	—20.5	—20.1	—19.9	—19.4	—19.4	—17.7	—18.7
Jan. 17....	—11.6	—11.4	—11.5	—12.3	—12.6	—12.6	—11.7	—10.6	—12.6	—12.1	— 9.8	— 6.2	— 5.5	— 6.3
Jan. 18....	— 6.2	— 6.4	— 7.1	— 7.5	— 8.2	— 8.8	— 9.3	— 9.3	— 9.1	— 8.8	— 8.8	— 8.8	— 9.1	— 9.1
Jan. 19....	— 5.5	— 5.7	— 4.9	— 4.6	— 4.6	— 4.6	— 4.5	— 4.8	— 4.4	— 4.4	— 4.5	— 4.4	— 4.3	— 4.0
Jan. 20....	0.2	0.2	0.0	— 0.5	— 0.9	— 1.9	— 1.7	— 1.6	— 1.9	— 1.9	— 2.0	— 1.9	— 2.0	— 2.0
Jan. 21....	0.9	1.3	1.9	2.1	2.1	2.3	2.5	2.3	2.7	3.2	3.4	1.6	6.4	5.9
Jan. 22....	20.2	**20.3**	20.1	20.1	19.8	19.4	19.1	19.2	19.1	18.8	18.5	19.0	18.2	18.5
Jan. 23....	1.9	1.2	0.6	0.1	— 0.7	— 2.1	— 2.4	— 2.9	— 4.6	— 6.7	— 7.9	— 9.1	— 9.8	— 9.7
Jan. 24....	— 8.4	— 8.9	—10.0	—10.9	—11.4	—12.1	—12.8	—14.1	—13.9	—13.8	—14.5	—14.0	—14.0	—13.6
Jan. 25....	— 9.7	— 8.7	— 7.5	— 8.6	— 9.5	— 8.9	— 8.9	— 8.6	— 8.2	— 8.4	— 8.6	— 8.3	— 7.1	— 6.7
Jan. 26....	4.1	4.4	4.0	3.4	3.4	0.1	— 0.8	— 3.4	— 7.2	— 8.8	— 9.8	—11.4	—11.4	—11.9
Jan. 27....	—14.1	—14.7	—14.7	—15.6	—16.1	—16.1	—16.1	—16.8	—17.3	—17.8	—18.2	—18.2	—19.4	—19.5
Jan. 28....	—21.2	—21.2	—21.2	—21.2	—21.2	—21.4	—21.5	—21.4	—20.5	—20.8	—21.2	—20.4	—19.6	—20.1
Jan. 29....	—29.9	—31.1	—31.7	—31.7	—31.7	—31.7	—31.9	—31.9	—32.6	—32.6	—32.9	—33.4	—32.9	—33.1
Jan. 30....	—31.9	—32.8	—33.1	—33.6	—34.4	—34.8	—34.4	—34.8	—35.7	—35.7	—36.3	—37.3	—37.0	—37.5
Jan. 31....	—37.5	—37.5	—37.9	—35.3	—34.8	—33.8	—33.1	—32.4	—32.0	—31.5	—31.3	—30.9	—31.1	—32.8
Means..	—14.01	—14.13	—14.17	—14.74	—15.17	—15.52	—15.47	—15.81	—16.38	—16.68	—16.76	—16.65	—16.37	—16.49

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily Means.	Max.	Min.	Diff.
1882.														
Jan. 1....	—11.0	— 9.9	—10.8	— 9.7	—11.2	—13.0	—12.6	—13.6	—16.1	—16.1	— 6.64	*5.0	—17.1	22.7
Jan. 2....	—20.7	—20.5	—19.4	—20.5	—19.2	—21.0	—21.2	—21.2	—19.4	—19.1	—19.40	—15.6	—25.1	9.5
Jan. 3....	—17.1	—17.9	—19.6	—21.0	—21.4	—21.0	—20.9	—21.5	—22.1	—19.7	—18.54	—16.2	—25.3	9.1
Jan. 4....	—26.4	—25.7	—26.2	—24.9	—24.9	—25.4	—24.9	—24.7	—26.7	—26.2	—24.63	—19.0	—30.1	11.1
Jan. 5....	—25.6	—24.6	—24.2	—23.8	—23.6	—24.0	—24.0	—25.1	—24.3	—26.1	—27.03	—23.6	—36.4	12.8
Jan. 6....	—28.0	—28.0	—27.6	—27.8	—27.9	—27.6	—27.5	—27.3	—25.2	—24.4	—27.65	—24.4	—33.9	9.5
Jan. 7....	—27.4	—27.5	—27.6	—27.6	—27.2	—27.1	—27.2	—26.1	—25.4	—25.2	—26.48	—24.2	—32.3	8.1
Jan. 8....	—29.7	—29.0	—29.5	—28.8	—29.0	—30.2	—29.9	—29.7	—27.1	—25.5	—28.65	—25.2	—33.1	7.9
Jan. 9....	—27.6	—27.8	—28.1	—27.8	—28.6	—28.4	—28.1	—27.8	—27.8	—27.8	—27.95	—25.5	—32.4	6.9
Jan. 10....	—25.1	—24.2	—24.5	—23.3	—22.9	—23.0	—22.2	—22.4	—22.1	—21.6	—26.12	—21.6	—33.2	11.6
Jan. 11....	—14.7	—13.3	—12.8	—11.0	— 8.9	— 8.2	— 6.5	— 4.6	— 4.6	— 4.2	—16.29	— 4.2	—26.7	22.5
Jan. 12....	7.0	8.7	11.3	15.1	15.2	10.9	6.0	7.2	0.0	— 3.2	5.19	15.2	— 5.6	20.8
Jan. 13....	—11.0	—10.8	—10.5	—10.2	— 9.4	— 9.3	— 9.8	—10.8	—11.6	—12.1	—10.10	— 4.2	—16.3	12.1
Jan. 14....	—18.4	—18.9	—18.9	—19.1	—19.8	—19.8	—20.3	—20.1	—19.8	—20.1	—17.37	—12.6	—24.2	11.6
Jan. 15....	—21.7	—21.3	—21.5	—21.3	—21.3	—21.5	—21.3	—21.1	—21.4	—21.2	—21.05	—17.7	—28.6	10.9
Jan. 16....	—17.7	—17.7	—17.7	—17.4	—16.4	—14.5	—13.8	—13.6	—13.6	—13.6	—18.38	—13.6	—26.9	13.3
Jan. 17....	— 3.1	— 3.8	— 1.6	— 4.0	— 4.5	— 2.8	— 2.9	— 4.3	— 4.6	— 6.5	— 7.70	— 1.6	—15.9	14.3
Jan. 18....	— 9.1	— 8.2	— 7.1	— 7.3	— 6.6	— 6.3	— 6.0	— 5.6	— 5.8	— 5.8	— 7.68	— 5.6	—12.6	7.0
Jan. 19....	— 3.3	— 3.1	— 2.3	— 2.4	— 2.3	— 1.7	— 1.1	— 0.6	— 0.8	— 0.5	— 3.47	— 0.5	— 8.0	7.5
Jan. 20....	— 0.8	— 0.3	0.1	0.2	0.3	— 0.2	0.8	1.1	1.1	0.1	— 0.65	1.1	— 4.1	5.2
Jan. 21....	10.8	12.7	14.1	15.4	16.2	16.4	16.8	17.6	17.6	18.4	8.11	18.4	— 0.9	19.3
Jan. 22....	17.1	12.8	10.1	8.2	7.5	5.6	5.1	4.4	3.7	2.9	14.49	**20.3**	1.2	10.1
Jan. 23....	— 8.0	— 7.6	— 6.8	— 6.0	— 5.8	— 5.7	— 5.6	— 6.3	— 6.9	— 7.4	— 4.93	1.9	— 7.1	9.0
Jan. 24....	—12.9	—12.8	—12.8	—12.1	—12.0	—12.0	—11.0	—10.2	— 9.5	— 9.5	—11.97	— 8.4	—16.4	8.0
Jan. 25....	— 4.7	— 3.8	— 2.4	— 1.4	— 0.3	1.4	2.3	3.0	3.2	— 3.7	— 4.86	3.7	—13.3	17.0
Jan. 26....	—12.3	—13.1	—13.0	—12.0	—12.7	—13.2	—13.2	—12.0	—14.0	—14.2	— 7.28	4.4	—17.7	22.1
Jan. 27....	—20.3	—21.0	—21.1	—20.8	—17.3	—18.8	—19.0	—20.2	—20.7	—21.4	—18.13	—14.1	—24.3	10.2
Jan. 28....	—19.7	—23.1	—24.9	—26.1	—26.7	—24.7	—27.6	—25.9	—28.3	—29.9	—22.90	—19.6	—37.3	17.7
Jan. 29....	—33.2	—33.2	—32.7	—33.2	—31.9	—32.4	—33.0	—33.2	—33.1	—32.4	—32.39	—29.9	—39.0	9.7
Jan. 30....	—38.5	—39.1	**—39.2**	—38.1	—38.3	—38.2	—37.7	—38.2	**—39.2**	**—39.2**	—36.38	—31.9	**—45.6**	13.7
Jan. 31....	—32.4	—31.8	—32.0	—31.7	—31.7	—32.1	—33.2	—33.6	—34.6	—34.7	—33.32	—30.9	—44.3	13.4
Means..	—15.66	—15.61	—15.47	—15.03	—14.86	—15.09	—15.16	—15.05	—15.45	—15.56	—15.49	—10.31	—23.00	12.69

* Highest reading of standard for maximum of day from January 1, 1882, to July 1, 1882.

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth 4 feet. Washington mean time. Correction [illegible] 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Feb. 1...	−34.8	−33.4	−34.8	−33.9	[illegible]	−34.3	−34.2	−32.5	−31.9	−32.8	−32.6	[illegible]	−32.8	−32.5
Feb. 2...	−31.7	−32.5	−33.6	−34.7	−37.5	−36.1	−36.1	−36.1	−36.5	−36.5	−36.3	[illegible]	−33.7	−32.9
Feb. 3...	−28.0	−27.6	−26.5	−25.1	[illegible]	−22.6	−22.1	−22.1	−22.1	−22.3	−22.1	−21.9	−21.7	−21.4
Feb. 4...	−16.6	−17.1	−17.4	−18.9	[illegible]	−19.4	−20.3	−21.0	−21.2	−21.9	−22.1	−22.9	−22.5	[illegible]
Feb. 5...	−29.9	−33.7	−33.8	−34.4	−33.6	−33.1	−32.4	−30.7	−29.9	−29.5	−29.0	[illegible]	[illegible]	−26.1
Feb. 6...	−7.6	−3.1	−3.1	−2.3	−2.5	−2.3	−2.3	−3.1	−3.2	−3.5	−3.4	−4.2	−3.2	−2.6
Feb. 7...	−7.9	−8.6	−9.0	−9.1	−9.7	−9.9	−11.4	−10.6	−11.0	−11.7	−11.6	−12.1	−12.3	−11.9
Feb. 8...	−12.0	−12.3	−12.3	−12.0	−11.5	−11.0	−10.4	−10.4	−10.4	−10.2	−11.0	[illegible]	[illegible]	−10.2
Feb. 9...	−6.4	−6.4	−6.6	−7.6	−9.0	−9.5	−10.4	−10.6	−11.0	−11.5	−12.3	−15.2	[illegible]	[illegible]
Feb. 10...	−9.5	−10.6	−9.9	−10.6	−10.1	−10.0	−10.0	−10.0	−10.9	−10.4	−10.6	[illegible]	[illegible]	−9.5
Feb. 11...	−21.2	−21.3	−22.1	−23.1	−24.3	−24.7	−25.3	−26.1	−26.7	−27.3	−27.6	−27.2	−26.5	−26.7
Feb. 12...	−29.5	−27.8	−29.2	−29.2	−30.2	−30.7	−30.7	−31.1	−31.7	−32.1	−32.1	[illegible]	−32.6	−31.6
Feb. 13...	−31.5	−30.7	−29.0	−28.2	−29.2	−28.8	−28.8	−29.3	−29.3	−28.8	−29.9	[illegible]	−29.9	−29.5
Feb. 14...	−24.2	−23.9	−23.5	−23.2	−23.5	−24.0	−24.0	−24.0	−24.0	−24.0	−23.8	[illegible]	[illegible]	−21.5
Feb. 15...	−21.0	−21.1	−21.0	−20.6	−19.6	−18.9	−18.6	−18.4	−17.5	−16.5	−14.9	−14.2	−14.1	−14.1
Feb. 16...	−12.6	−12.3	−12.4	−11.9	−13.0	−13.0	−12.3	−12.3	−12.5	−12.1	−11.0	−10.7	−9.8	−9.7
Feb. 17...	−6.7	−6.2	−5.3	−5.9	−6.3	−6.3	−6.3	−6.9	−7.3	−7.7	−8.0	−8.1	[illegible]	−9.5
Feb. 18...	−14.1	−14.0	−13.3	−13.0	−13.2	−12.1	−12.3	−12.3	−12.1	−12.1	−13.1	−13.2	[illegible]	−12.3
Feb. 19...	−9.5	−8.8	−8.8	−8.9	−8.9	−10.6	−10.4	−10.0	−10.0	−10.0	−10.4	−12.1	−12.1	−11.1
Feb. 20...	−13.2	−12.9	−13.2	−12.9	−12.5	−13.0	−13.0	−13.1	−13.3	−13.3	−14.0	−14.7	[illegible]	−15.0
Feb. 21...	−26.7	−26.6	−27.1	−27.4	−28.1	−29.2	−30.7	−30.7	−31.9	−33.1	−34.1	−33.4	[illegible]	−33.8
Feb. 22...	−34.6	−35.5	−35.3	−35.8	−36.7	−37.3	−37.5	−38.8	−38.8	−39.4	−40.6	−40.3	−40.9	−40.7
Feb. 23...	−37.2	−37.0	−37.5	−37.0	−37.7	−38.4	−38.4	−38.7	−39.7	−40.1	−40.6	[illegible]	−40.2	−40.2
Feb. 24...	−41.6	−41.6	−42.4	−43.0	−43.5	−43.6	−43.6	−43.7	−43.9	−44.3	−44.3	[illegible]	−42.3	−42.3
Feb. 25...	−45.2	−45.5	−45.8	−46.1	−46.8	−47.6	−48.1	−48.5	−48.6	−49.1	−49.1	[illegible]	−48.9	−47.1
Feb. 26...	−31.9	−32.5	−32.9	−33.8	−34.6	−35.1	−35.3	−36.5	−37.0	−37.5	−36.7	−37.1	−37.3	−37.5
Feb. 27...	−30.8	−29.5	−28.0	−28.0	−27.1	−24.9	−23.8	−20.7	−21.2	−24.9	−26.5	−29.6	[illegible]	−32.6
Feb. 28...	−29.0	−29.5	−29.6	−30.3	−29.7	−28.3	−25.9	−23.8	−22.1	−19.8	−18.9	−16.4	−14.0	[illegible]
Means.	−23.03	−22.94	−22.98	−23.10	−23.40	−23.38	−23.38	−23.29	−23.39	−23.68	−23.81	−23.71	[illegible]	−23.19

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
Feb. 1...	−32.8	−33.4	−33.4	−33.6	−34.8	−35.4	−35.3	−35.0	−32.8	−32.4	−33.58	−31.9	−39.1	7.2
Feb. 2...	−32.4	−32.8	−32.6	−32.4	−32.1	−32.0	−32.1	−31.9	−30.3	−30.5	−33.59	−36.3	−46.6	10.3
Feb. 3...	−21.9	−21.4	−21.2	−21.0	−20.6	−20.7	−20.7	−20.3	−18.5	−17.9	−22.24	−17.9	[illegible]	15.7
Feb. 4...	−24.9	−25.1	−25.9	−26.1	−27.2	−28.1	−20.2	−29.7	−27.8	−29.8	−23.36	−16.6	−33.7	17.1
Feb. 5...	−24.2	−21.7	−17.5	−16.1	−15.2	−14.0	−12.1	−9.6	−7.1	−7.1	−24.01	−7.1	−40.1	33.0
Feb. 6...	−2.8	−3.6	−4.2	−5.1	−6.1	−6.8	−6.9	−6.9	−6.7	−6.9	−4.28	−2.3	−9.8	7.5
Feb. 7...	−11.7	−12.1	−11.5	−11.5	−12.7	−12.7	−13.1	−13.0	−12.7	−12.3	−11.25	[illegible]	−15.9	8.0
Feb. 8...	−9.8	−9.0	−9.4	−7.9	−6.7	−6.0	−6.0	−6.1	−5.4	−10.8	−9.65	−5.4	−16.1	10.7
Feb. 9...	−16.2	−15.3	−15.8	−16.1	−15.8	−15.1	−14.8	−14.0	−12.2	−11.2	−12.08	−6.4	−18.6	12.2
Feb. 10...	−12.1	−13.2	−14.7	−16.4	−19.4	−19.4	−19.8	−19.9	−19.9	−20.5	−13.16	[illegible]	−25.1	16.1
Feb. 11...	−26.9	−27.2	−27.6	−28.0	−27.8	−27.0	−28.4	−28.5	−28.6	−29.8	−26.29	−21.2	−34.1	12.9
Feb. 12...	−32.1	−32.1	−32.0	−32.0	−31.7	−31.6	−32.6	−32.4	−31.5	−29.5	−31.22	−27.8	−39.1	11.3
Feb. 13...	−29.8	−29.2	−28.8	−28.0	−27.7	−27.1	−26.1	−25.9	−25.5	−25.5	−28.55	−25.5	−36.1	10.6
Feb. 14...	−21.4	−21.4	−21.2	−21.0	−20.6	−20.3	−20.6	−20.3	−20.5	−20.7	−22.40	[illegible]	[illegible]	8.4
Feb. 15...	−14.1	−13.6	−13.4	−13.7	−13.6	−13.4	−13.3	−13.5	−13.6	−12.8	−16.66	−12.8	−25.3	12.5
Feb. 16...	−8.6	−7.2	−6.9	−7.1	−7.2	−7.1	−7.8	−7.1	−8.0	−8.6	−10.03	−6.9	−16.4	9.5
Feb. 17...	−10.2	−12.1	−12.3	−12.4	−12.4	−12.3	−12.5	−13.2	−13.6	−14.5	−9.37	−5.3	−18.1	12.8
Feb. 18...	−11.8	−11.4	−11.2	−10.8	−10.6	−10.3	−0.9	−9.5	−8.9	−9.5	−11.75	−8.0	−18.4	10.4
Feb. 19...	−16.1	−14.1	−13.6	−13.3	−13.0	−13.0	−13.2	−12.6	−14.0	−14.3	−11.70	−8.8	−9.7	10.9
Feb. 20...	−19.4	−22.9	−23.1	−23.2	−23.1	−23.2	−24.0	−24.8	−24.2	−25.1	−17.62	−12.9	[illegible]	17.1
Feb. 21...	−31.8	−34.0	−33.8	−33.4	−33.1	−33.0	−33.0	−33.6	−34.4	−34.0	−31.81	−26.6	−40.4	13.8
Feb. 22...	−40.9	−40.7	−39.9	−39.5	−39.6	−39.3	−39.4	−39.2	−38.6	−37.9	−38.63	−34.6	−46.1	11.5
Feb. 23...	−40.0	−39.2	−37.7	−36.9	−37.3	−38.3	−38.4	−39.3	−39.7	−40.8	−38.81	−36.9	−45.6	8.7
Feb. 24...	−42.6	−42.5	−41.4	−40.9	−40.6	−40.2	−41.4	−42.4	−44.2	−44.8	−42.67	−40.2	−49.1	8.9
Feb. 25...	−43.5	−40.8	−39.6	−39.2	−37.8	−37.0	−36.0	−34.8	−33.1	33.6	[illegible]	−33.1	−52.5	19.4
Feb. 26...	−37.5	−36.3	−35.7	−35.3	−34.1	−32.8	−32.8	−32.6	−31.9	−31.9	−34.90	−31.9	−42.6	10.7
Feb. 27...	−32.6	−32.0	−32.5	−32.6	−32.6	−31.9	−31.7	−31.7	−30.6	31.1	−29.10	−20.7	−37.3	16.6
Feb. 28...	−11.5	−10.6	−10.4	−8.8	−8.1	−6.9	−6.4	−5.9	−6.9	−5.8	−17.16	−5.8	−35.1	29.3
Means.	−23.04	−23.41	−23.13	−22.94	−22.91	−22.71	−22.75	−22.63	−22.15	22.49	−23.16	[illegible]	[illegible]	−13.33

Table showing the temperature of the air at Uglaamie from October, 1881, *to August,* 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, — 5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Mar. 1...	— 5.3	— 5.9	— 5.7	— 4.8	— 4.9	— 5.1	— 5.1	— 5.1	— 5.1	— 4.4	— 4.4	— 5.4	— 6.0	— 6.4
Mar. 2...	— 0.7	— 0.8	— 0.9	— 0.8	— 1.0	— 1.0	— 0.9	— 0.9	— 1.4	— 1.4	— 1.0	— 0.7	— 0.7	— 0.5
Mar. 3...	— 3.4	— 4.2	— 4.8	— 5.5	— 6.9	— 6.9	— 6.4	— 7.2	— 7.7	— 8.0	— 7.9	— 7.1	— 6.9	— 6.7
Mar. 4...	— 3.3	— 2.9	— 2.6	— 2.5	— 3.2	— 3.0	— 2.5	— 2.3	— 1.4	— 1.4	— 1.4	— 1.2	— 0.7	— 0.3
Mar. 5...	0.4	— 0.7	— 2.2	— 2.4	— 2.8	— 3.2	— 2.7	— 2.7	— 3.4	— 4.2	— 5.3	— 5.1	— 5.1	— 5.4
Mar. 6...	— 1.4	— 1.5	— 2.5	— 3.1	— 4.4	— 4.9	— 5.1	— 5.1	— 5.1	— 5.1	— 4.4	— 4.4	— 4.5	— 4.8
Mar. 7...	— 1.1	— 2.4	— 2.9	— 3.4	— 4.5	— 5.3	— 5.8	— 6.3	— 6.9	— 7.1	— 6.9	— 7.1	— 7.1	— 7.7
Mar. 8...	2.6	3.7	4.4	4.7	3.8	4.7	6.0	8.0	8.7	9.3	10.0	11.1	14.5	17.1
Mar. 9...	19.7	19.4	18.0	14.9	13.2	14.7	10.3	9.6	10.8	13.7	12.9	13.4	16.4	16.9
Mar. 10...	12.9	13.9	13.7	13.3	12.2	11.8	11.6	10.8	11.3	11.8	12.0	12.5	12.4	12.7
Mar. 11...	6.4	5.0	4.0	1.7	— 0.1	— 1.8	— 3.2	— 4.0	— 5.5	— 6.7	— 7.9	— 9.5	—10.6	—10.6
Mar. 12...	—10.9	—11.9	—14.1	—15.2	—14.7	—13.5	—11.9	—11.2	— 8.6	— 7.1	— 5.1	— 2.7	— 0.5	2.5
Mar. 13...	— 2.3	— 3.1	— 4.2	— 4.8	— 7.5	—10.8	—11.5	—12.3	—12.3	—12.4	—12.8	—13.6	—14.1	—15.3
Mar. 14...	2.9	3.8	6.2	6.7	6.7	6.0	5.8	5.6	4.7	4.2	4.0	3.3	2.2	2.6
Mar. 15...	— 5.7	— 8.1	—11.4	—11.2	—14.5	—15.7	—15.4	—16.6	—16.8	—16.8	—17.3	—17.8	—19.7	—19.3
Mar. 16...	—16.9	—16.9	—17.9	—19.4	—19.4	—19.8	—19.8	—19.8	—19.4	—18.6	—17.7	—18.0	—17.7	—16.9
Mar. 17...	— 8.7	— 8.9	— 9.2	—10.3	—11.2	—12.1	—12.0	—12.0	—12.3	—12.6	—13.0	—13.4	—12.1	—11.5
Mar. 18...	— 3.0	— 4.0	— 4.3	— 5.0	— 6.0	— 6.0	— 6.0	— 6.0	— 6.0	— 5.5	— 5.1	— 4.0	— 3.2	— 2.4
Mar. 19...	— 2.0	— 3.2	— 1.6	— 0.2	0.4	1.4	2.0	3.7	3.7	2.3	2.3	2.2	0.2	— 1.4
Mar. 20...	12.0	11.2	8.9	4.4	2.8	0.1	— 2.3	— 4.4	— 6.3	— 8.0	— 9.5	—11.4	—10.7	— 9.9
Mar. 21...	13.2	—13.7	—15.0	—23.8	—17.9	—17.9	—19.4	—19.7	—17.8	—18.4	—19.4	—20.1	—20.6	—20.5
Mar. 22...	—17.7	—18.4	—18.2	—16.4	—17.0	—16.1	—15.6	—13.8	— 9.9	— 6.0	— 1.8	— 0.3	— 1.4	0.6
Mar. 23...	— 1.5	— 7.0	— 9.5	— 9.5	— 8.8	— 5.1	— 2.3	— 1.8	— 1.4	— 1.4	— 1.7	— 2.0	— 0.8	0.4
Mar. 24...	— 1.1	— 0.7	0.5	0.7	0.2	— 0.3	— 0.5	— 0.7	— 0.9	— 0.9	— 0.7	— 0.7	— 0.9	— 0.7
Mar. 25...	0.3	1.9	4.0	3.5	3.2	3.2	3.2	3.4	3.2	2.5	2.3	0.2	—15.0	—16.6
Mar. 26...	—14.0	—13.5	—13.3	—13.7	—14.2	—14.2	—14.0	—12.3	—11.4	—11.2	—12.1	—14.9	—14.5	—13.8
Mar. 27...	—13.6	—13.5	—13.2	—12.3	—14.5	—15.6	—16.6	—18.4	—19.7	—20.0	—21.2	—21.7	—22.1	—22.2
Mar. 28...	—22.9	—23.4	—23.9	—24.6	—27.1	**—27.3**	**—27.3**	—26.5	—25.9	—24.4	—23.3	—21.5	—19.5	—17.7
Mar. 29...	— 4.9	— 4.8	— 2.4	— 3.9	— 5.3	— 5.3	— 5.5	— 6.3	— 6.9	— 6.9	— 6.9	— 4.5	— 6.2	— 6.0
Mar. 30...	— 3.3	— 5.1	— 6.8	— 7.4	— 7.9	— 7.9	— 7.7	— 7.2	— 6.9	— 6.4	— 6.4	— 6.0	— 6.5	— 8.4
Mar. 31...	—12.8	—14.1	—14.9	—15.7	—15.9	—16.8	—16.8	—16.9	—17.5	—16.1	—14.1	—11.1	—10.5	— 7.9
Means..	— 3.63	— 4.19	— 4.57	— 5.35	— 6.04	— 6.25	— 6.37	**— 6.40**	— 6.26	— 6.04	— 5.93	— 5.85	— 6.10	— 5.85

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
Mar. 1...	— 6.7	— 8.0	— 8.4	— 8.1	— 7.4	— 6.4	— 4.6	— 3.4	— 1.8	— 1.7	— 5.42	— 1.7	—11.5	9.8
Mar. 2...	— 0.5	0.1	0.2	0.1	0.1	0.0	0.0	— 0.5	— 2.1	— 4.0	— 0.80	0.2	— 6.1	6.3
Mar. 3...	— 6.8	— 5.5	— 5.1	— 5.0	— 4.6	— 4.8	— 4.9	— 5.1	— 4.6	— 4.5	— 5.85	— 3.4	—12.1	8.7
Mar. 4...	0.2	0.6	1.9	1.7	1.7	1.6	1.6	— 1.5	2.2	0.4	— 0.76	2.2	— 6.1	8.3
Mar. 5...	— 6.6	— 5.3	— 5.1	— 5.1	— 5.5	— 5.5	— 4.2	— 3.7	— 2.0	— 2.8	— 3.78	0.4	— 9.1	9.5
Mar. 6...	— 5.1	— 4.4	— 3.2	— 3.0	— 2.3	— 2.1	— 1.4	— 1.0	— 2.0	— 2.7	— 3.48	— 1.0	— 8.5	7.5
Mar. 7...	— 5.5	— 3.4	— 2.3	— 1.4	— 1.4	— 0.9	— 0.7	— 0.8	— 0.4	0.8	— 3.77	0.8	—11.5	12.3
Mar. 8...	20.2	21.3	20.3	18.1	17.2	16.8	20.7	22.0	21.7	19.6	12.77	22.0	— 0.1	22.1
Mar. 9...	20.3	20.9	**22.8**	22.0	18.6	14.7	13.7	14.1	14.3	14.0	15.80	**22.8**	8.4	14.4
Mar. 10...	12.7	13.2	13.5	13.7	13.3	12.5	11.0	10.5	9.6	8.1	12.13	13.9	6.5	7.4
Mar. 11...	—10.8	—11.0	—11.2	—11.4	—11.4	—11.3	—11.2	—11.2	—10.9	—11.5	— 6.45	6.4	—15.1	21.5
Mar. 12...	4.6	5.4	7.2	8.1	10.3	10.8	11.2	12.9	6.2	1.1	— 1.96	12.9	—20.1	33.0
Mar. 13...	—14.0	—11.9	— 9.7	— 7.2	— 4.4	— 2.7	— 1.0	0.1	3.0	2.3	— 7.61	3.0	—20.7	23.7
Mar. 14...	2.9	3.2	5.0	5.1	4.7	4.4	3.8	2.3	— 0.2	— 1.6	3.93	6.7	— 4.4	11.1
Mar. 15...	—18.2	—18.3	—18.1	—17.9	—17.5	—15.6	—15.6	—15.8	—16.5	—16.5	—15.68	— 5.7	—23.8	18.1
Mar. 16...	—14.7	—15.6	—13.0	—12.1	—10.6	— 9.5	— 9.5	— 9.8	— 9.8	— 7.6	—15.43	— 7.6	—23.5	15.9
Mar. 17...	—10.5	—10.1	— 8.6	— 7.9	— 7.4	— 6.2	— 5.3	— 4.8	— 3.4	— 3.2	— 9.45	— 3.2	—16.9	13.7
Mar. 18...	— 0.9	— 0.5	— 1.4	— 1.4	— 1.5	— 1.2	0.0	0.2	— 0.3	— 2.0	— 3.15	0.2	—13.1	13.3
Mar. 19...	— 3.0	— 2.0	2.8	5.6	6.4	9.4	11.4	12.3	12.7	13.5	3.29	13.5	— 5.7	19.2
Mar. 20...	— 9.7	— 7.7	— 7.2	— 6.9	— 6.5	— 6.9	— 7.7	—11.2	—12.8	—13.3	— 4.71	12.0	—16.1	28.1
Mar. 21...	—18.4	—15.6	—14.9	**—14.1**	—13.2	—13.3	—14.0	—14.6	—16.3	—16.6	—17.02	—13.2	—24.8	11.6
Mar. 22...	2.7	2.2	0.9	0.4	— 0.4	0.9	1.8	4.6	5.7	3.9	— 5.27	5.7	—23.1	28.8
Mar. 23...	1.4	1.4	1.4	1.4	1.6	2.5	2.5	2.3	1.3	— 0.7	— 1.55	2.5	—13.3	15.8
Mar. 24...	— 0.3	0.0	0.4	0.6	0.9	1.4	1.4	1.4	2.1	3.0	0.18	3.0	— 4.0	7.0
Mar. 25...	—16.8	—16.4	—16.1	—14.9	—14.7	—14.3	—13.8	—13.9	—13.9	—14.4	— 6.25	4.0	—20.5	24.5
Mar. 26...	—11.8	— 9.5	— 8.8	— 7.7	— 7.0	— 5.8	— 6.4	— 7.9	— 9.4	—11.6	—11.38	— 5.8	—17.6	11.8
Mar. 27...	—22.2	—22.1	—21.4	—21.2	—21.3	—21.3	—21.5	—21.6	—22.1	—22.5	—19.24	—12.3	—26.6	14.3
Mar. 28...	—15.9	—14.9	—14.2	—13.4	—12.4	—11.9	—10.9	— 7.2	— 7.4	— 7.7	—18.80	— 7.2	**—30.4**	23.2
Mar. 29...	— 4.9	— 3.2	— 2.5	— 2.5	— 2.5	— 2.7	— 3.2	— 1.8	2.3	4.8	— 3.83	4.8	—12.0	16.8
Mar. 30...	— 9.1	— 9.0	— 9.8	—10.2	—10.4	—10.5	—10.6	—10.6	—10.5	—11.9	— 8.19	— 3.3	—14.5	11.2
Mar. 31...	— 6.5	— 4.6	— 4.2	— 2.5	— 0.9	0.2	0.4	— 0.2	— 0.3	— 1.1	— 9.20	0.4	—21.1	21.5
Means..	— 5.29	— 4.22	— 3.51	— 3.13	— 2.65	— 2.51	— 2.16	**— 2.06**	— 2.12	— 2.79	— 4.55	2.36	—13.46	15.82

***Tables showing the temperature of the air at Uglaamie from October, 1881, to August, 1883*—Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1882.														
Apr. 1 ...	-1.4	-1.5	-1.6	0.0	0.8	-0.5	-0.8	-1.4	-2.1	-2.0	-2.3	-2.2	-2.3	-2.3
Apr. 2 ...	-4.3	-4.0	-3.9	-3.7	-3.7	-4.2	-4.2	-4.2	-4.2	-4.2	-4.4	-4.5	-4.4	-4.3
Apr. 3 ...	-4.9	-5.2	-6.3	-7.4	-9.0	-10.1	-10.6	-10.6	-10.6	-10.6	-10.6	-9.8	-8.6	-6.3
Apr. 4 ...	-6.9	-8.9	-11.5	-12.1	-13.5	-13.8	-13.0	-11.4	-10.4	-9.0	-9.1	-7.7	-7.5	-7.0
Apr. 5 ...	-7.7	-8.5	-9.3	-8.9	-7.9	-8.4	-9.5	-10.7	-12.1	-13.2	-14.1	-14.3	-14.1	-13.6
Apr. 6 ...	-13.3	-13.8	-15.3	-16.9	-17.8	-18.9	-19.6	-19.6	-18.9	-17.7	-16.6	-14.7	-13.6	-12.1
Apr. 7 ...	0.4	0.6	1.8	2.1	2.1	3.0	6.0	6.0	5.8	5.8	5.9	5.7	0.8	7.9
Apr. 8 ...	7.7	6.7	5.3	2.1	-0.5	-0.8	-0.8	-2.1	-4.2	-6.0	-6.7	-6.0	-4.6	-3.2
Apr. 9 ...	6.7	6.0	6.7	5.7	5.5	5.8	6.0	6.0	6.0	6.0	8.0	9.9	10.6	12.7
Apr. 10 ...	14.0	13.7	10.5	9.0	6.0	4.2	3.4	4.0	4.9	6.6	8.7	10.4	10.8	12.4
Apr. 11 ...	0.5	-1.6	-2.0	-2.6	-6.4	-7.7	-8.0	-8.8	-8.6	-8.6	-10.4	-10.3	-8.9	-6.5
Apr. 12 ...	1.6	0.6	-0.5	-0.7	-2.5	-4.2	-5.3	-6.3	-6.9	-6.9	-8.8	-7.2	-6.3	-4.5
Apr. 13 ...	0.6	-2.0	-4.0	-5.7	-5.3	-3.2	-0.7	1.8	4.4	8.0	11.0	16.6	16.2	15.4
Apr. 14 ...	4.9	4.2	3.2	3.7	3.2	3.2	3.2	3.1	3.2	0.4	-0.7	-2.7	-4.4	-3.1
Apr. 15 ...	-0.5	-1.6	-2.3	-3.3	-6.2	-7.5	-8.8	-9.5	-10.8	-11.8	-11.4	-11.2	-10.6	-8.7
Apr. 16 ...	4.0	5.0	5.2	5.3	4.2	2.8	3.7	1.9	0.4	0.0	0.1	1.0	1.6	2.4
Apr. 17 ...	7.9	7.2	5.8	6.0	3.2	2.5	0.4	-1.6	-2.3	-4.0	-4.4	-6.5	-7.5	-7.0
Apr. 18 ...	-3.2	-5.1	-7.6	-0.8	-4.2	-2.5	-2.7	-1.7	-1.4	0.0	-0.5	0.2	0.9	1.0
Apr. 19 ...	1.9	3.0	3.4	3.9	4.2	3.0	3.0	2.3	1.4	0.9	-0.7	-0.5	-0.5	0.2
Apr. 20 ...	-4.5	-6.3	-8.2	-9.3	-10.6	-11.2	-9.1	-7.9	-6.3	-5.1	-3.5	-2.5	-2.5	-2.5
Apr. 21 ...	-4.0	-5.0	-8.1	-8.7	-10.6	-11.8	-13.2	-14.5	-14.7	-14.7	13.0	-11.5	-10.1	-9.6
Apr. 22 ...	-9.3	-10.1	-9.2	-10.1	-10.8	-11.2	-11.2	-10.0	-8.8	-13.0	-7.9	-6.2	-5.5	-5.3
Apr. 23 ...	-0.5	-2.5	-4.2	-4.9	-6.7	-7.1	-7.6	-8.4	-9.2	-10.6	-9.5	-8.1	-7.7	-6.2
Apr. 24 ...	11.6	12.9	12.9	12.7	12.0	13.5	14.1	15.6	16.2	16.8	17.8	19.4	20.4	21.7
Apr. 25 ...	24.6	24.4	23.7	23.6	23.3	23.0	22.7	22.3	21.5	21.3	20.3	20.6	20.7	21.7
Apr. 26 ...	22.6	22.4	21.4	20.3	19.1	18.6	17.4	16.1	15.6	14.9	14.9	14.7	14.6	13.6
Apr. 27 ...	23.4	23.4	22.6	23.4	23.3	23.3	23.0	23.9	23.5	23.5	23.3	23.5	24.3	25.4
Apr. 28 ...	32.2	31.3	20.8	29.8	27.4	25.8	25.2	25.9	26.2	25.9	25.9	24.1	22.9	23.3
Apr. 29 ...	25.1	22.5	21.7	19.8	18.1	17.0	16.8	18.1	16.8	16,9	18.9	20.4	20.7	23.1
Apr. 30 ...	31.1	27.7	23.9	20.3	18.2	16.8	16.4	14.5	12.7	12.5	11.0	11.6	11.8	12.0
Means ...	5.34	4.52	3.46	2.89	1.83	1.31	1.21	1.09	0.90	0.74	10.4	1.74	2.11	3.02

Date.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.	Max.	Min.	Diff.
1882.														
Apr. 1 ...	-2.3	-2.4	-3.2	-3.2	-3.0	-2.8	-2.9	-3.2	-3.7	-4.0	-2.10	0.8	-6.1	6.9
Apr. 2 ...	-3.6	-2.5	-1.7	-0.7	-0.1	-0.7	-1.7	-1.6	-3.2	-4.7	-3.28	-0.1	-6.8	6.7
Apr. 3 ...	-5.1	-4.3	-3.2	-3.2	-2.7	-2.1	-0.9	-2.1	-3.6	-5.5	-6.39	-0.9	-15.3	14.4
Apr. 4 ...	-6.3	-3.2	-1.6	-1.2	-2.3	-3.2	-3.4	-5.1	-6.1	-6.9	-7.55	-1.2	-18.6	17.4
Apr. 5 ...	-13.3	-11.1	-10.6	-9.5	-9.3	-9.0	-9.5	-9.7	-10.6	-11.1	-10.67	-7.7	-19.6	11.9
Apr. 6 ...	-10.4	-9.3	-7.8	-9.0	-4.4	-2.3	-0.7	0.2	1.6	0.8	-11.25	1.6	-23.5	25.1
Apr. 7 ...	8.9	11.0	12.7	14.2	14.7	14.7	13.7	13.3	12.2	10.3	7.73	14.7	-2.2	16.9
Apr. 8 ...	-1.9	-1.4	0.8	2.8	4.2	4.9	5.4	6.3	7.0	7.4	0.93	7.7	-10.0	17.7
Apr. 9 ...	15.8	18.1	19.6	20.7	22.1	22.3	22.5	22.3	19.8	15.4	12.51	22.5	3.9	18.6
Apr. 10 ...	14.0	13.5	14.5	14.9	15.3	14.7	12.7	9.4	7.5	-4.2	9.97	15.3	0.9	14.4
Apr. 11 ...	-3.0	-0.5	0.9	3.3	5.6	6.8	6.2	5.8	4.4	2.7	-2.40	6.8	-13.9	20.7
Apr. 12 ...	-2.1	0.4	3.0	5.1	6.9	8.0	8.8	8.6	6.0	3.2	-0.42	8.8	-12.0	20.8
Apr. 13 ...	14.5	12.9	12.6	10.8	10.0	8.8	7.9	6.1	5.8	6.2	6.20	16.6	-9.2	25.8
Apr. 14 ...	-2.3	-0.5	0.9	2.8	3.2	3.1	4.0	4.0	2.5	0.4	1.65	4.9	-6.5	11.4
Apr. 15 ...	-7.1	-4.8	-2.3	0.2	2.3	3.6	3.6	3.4	5.8	3.7	-3.99	5.8	-14.9	20.7
Apr. 16 ...	2.5	3.0	3.2	5.3	8.2	6.5	8.9	8.7	8.8	8.0	4.20	8.9	-2.5	11.4
Apr. 17 ...	-6.3	-5.4	-4.6	-4.2	-3.7	-3.7	-3.2	-2.5	-3.1	-2.8	-1.66	7.9	-10.3	18.2
Apr. 18 ...	3.4	4.1	4.7	5.5	5.3	5.1	4.8	5.3	5.6	2.5	0.53	5.6	-11.3	16.9
Apr. 19 ...	0.2	0.2	2.1	2.0	1.8	1.2	0.9	0.8	1.6	-0.3	1.50	4.2	-4.3	8.5
Apr. 20 ...	-2.5	-2.5	-2.3	-2.8	-1.7	-1.7	-2.0	-2.7	-2.7	-2.8	-4.72	-1.7	-14.5	12.8
Apr. 21 ...	-8.0	-7.7	-6.2	-6.0	-6.3	-6.3	-4.7	-4.8	-5.4	-8.1	-8.87	-4.0	-18.3	14.3
Apr. 22 ...	-4.7	-3.2	-1.1	-0.5	-0.2	0.8	1.2	1.0	1.6	0.1	-5.55	1.6	-14.3	15.9
Apr. 23 ...	-3.5	-1.5	1.8	3.2	4.7	5.0	6.5	8.7	11.3	10.8	-1.92	11.3	-14.0	25.3
Apr. 24 ...	22.4	22.9	23.3	29.5	29.5	23.7	24.6	24.9	25.8	24.7	19.54	29.5	9.9	19.6
Apr. 25 ...	22.5	23.9	24.7	25.0	25.1	24.9	24.9	24.5	24.3	23.5	23.21	25.1	18.0	7.1
Apr. 26 ...	15.2	15.8	17.6	19.4	20.3	22.5	21.4	24.5	25.5	25.1	18.90	25.5	11.3	14.2
Apr. 27 ...	26.9	27.7	28.9	30.1	30.8	31.5	31.8	31.9	32.3	31.8	26.40	32.3	21.4	10.9
Apr. 28 ...	25.6	27.9	28.4	29.0	29.4	29.9	29.9	29.5	28.4	26.9	27.52	32.2	17.7	14.5
Apr. 29 ...	25.0	26.7	28.9	30.1	30.2	32.3	31.8	31.3	31.2	30.7	23.92	32.3	15.7	16.6
Apr. 30 ...	13.0	13.5	14.7	15.6	16.0	17.6	18.2	18.2	18.5	17.8	16.82	31.1	9.5	21.6
Means ...	4.25	5.38	6.62	7.61	8.41	8.54	8.69	8.57	8.30	7.00	4.36	11.25	4.06	15.91

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
May 1	18.0	17.6	17.0	16.4	16.3	15.8	15.8	15.9	15.6	15.7	15.6	17.1	18.1	18.5
May 2	12.8	10.8	11.5	11.9	12.3	12.5	11.2	11.1	8.5	6.3	5.1	4.9	4.9	5.3
May 3	6.7	6.2	6.1	5.9	4.9	4.4	4.2	3.7	3.8	4.7	6.0	6.4	6.4	6.8
May 4	9.2	9.2	8.7	8.7	8.7	7.8	7.8	7.6	7.4	7.2	7.4	7.2	7.8	8.4
May 5	7.4	6.7	6.3	6.5	6.0	5.1	4.2	3.9	3.0	4.0	2.3	2.7	2.5	2.5
May 6	7.2	6.3	6.1	5.9	4.9	4.4	4.0	4.4	5.1	4.9	5.3	6.3	7.5	8.2
May 7	11.1	11.0	11.1	11.0	10.0	9.6	9.6	9.8	9.8	10.0	10.6	10.6	11.0	11.0
May 8	16.0	16.3	16.4	16.5	15.8	15.8	15.8	15.9	15.8	15.8	16.1	16.1	15.8	16.1
May 9	17.9	16.9	16.8	16.8	16.3	15.8	15.6	15.4	14.6	13.7	13.5	13.6	13.6	15.2
May 10	15.6	15.9	16.3	16.0	15.8	15.6	15.3	11.8	14.5	14.9	15.1	15.4	15.4	15.1
May 11	18.7	19.0	19.5	19.9	21.0	21.5	20.3	22.5	24.9	25.4	26.6	26.8	27.2	28.8
May 12	33.2	32.8	32.0	31.5	30.8	30.5	29.9	29.4	29.2	29.5	30.1	30.9	32.6	32.6
May 13	33.4	32.6	31.6	31.2	29.4	30.5	30.5	30.5	30.3	30.5	31.5	32.1	33.1	32.1
May 14	31.6	31.5	31.1	30.0	30.1	29.4	29.2	28.4	28.2	28.7	29.6	30.1	30.3	31.5
May 15	30.7	30.3	30.3	30.1	28.6	28.2	27.9	28.0	26.4	29.1	29.8	30.1	30.8	31.1
May 16	29.5	28.3	25.2	23.6	19.8	19.4	18.1	16.9	15.7	15.6	17.4	20.3	22.5	25.4
May 17	30.4	29.9	29.6	29.6	28.6	28.8	28.8	28.7	29.0	29.2	30.3	30.7	31.5	32.1
May 18	33.3	33.2	32.5	32.4	31.7	31.6	31.3	31.3	30.3	29.5	28.6	29.0	29.0	29.0
May 19	31.3	30.4	29.2	27.9	26.2	25.4	24.0	22.5	20.5	19.4	10.8	20.7	21.8	23.3
May 20	33.6	34.0	33.7	34.0	33.1	33.1	33.0	33.0	33.3	33.3	34.0	34.8	35.6	35.8
May 21	34.2	34.0	33.9	33.8	33.3	33.3	33.1	33.0	32.9	33.1	33.3	33.0	34.0	34.4
May 22	33.6	33.4	33.3	33.1	33.6	32.5	32.0	32.3	32.1	32.1	32.5	32.4	33.5	34.4
May 23	29.8	28.7	27.3	26.7	25.8	25.2	24.5	24.3	24.3	24.5	24.9	27.2	26.2	26.0
May 24	24.9	23.3	21.3	19.9	18.0	19.1	19.3	18.4	18.4	17.8	17.6	17.4	19.1	19.1
May 25	20.3	19.5	19.4	19.4	18.3	18.2	18.2	17.9	17.6	18.0	18.8	18.8	18.8	19.1
May 26	23.6	23.0	23.0	21.4	21.9	21.8	21.0	20.0	19.6	18.8	18.4	18.8	19.1	20.1
May 27	21.8	20.7	20.3	20.1	15.6	13.1	11.6	11.4	11.6	12.5	13.9	13.8	18.0	19.6
May 28	19.8	18.5	17.0	15.7	13.7	12.6	12.5	11.8	12.5	13.4	14.3	15.1	17.1	17.1
May 29	18.9	17.5	17.6	16.5	15.6	14.9	14.5	15.2	16.4	17.1	18.0	19.4	19.4	20.4
May 30	24.7	21.6	24.3	24.0	23.7	23.0	22.5	23.7	23.0	23.3	24.3	24.7	25.4	25.9
May 31	29.5	28.6	27.8	27.6	26.4	26.2	26.0	25.8	26.1	26.2	26.8	27.2	27.7	30.2
Means	22.86	22.28	21.81	21.42	20.52	20.16	19.73	19.56	19.43	19.39	19.92	20.43	21.18	21.84

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
May 1	19.6	20.0	20.3	20.5	19.6	19.6	18.1	15.8	15.4	13.5	17.32	20.5	12.2	8.3
May 2	7.8	7.4	6.2	6.2	7.5	7.6	7.0	6.7	7.2	6.9	8.32	12.8	3.4	9.4
May 3	6.8	6.6	7.0	7.8	8.4	8.9	9.4	9.9	9.5	9.1	6.65	9.9	0.9	9.0
May 4	9.5	10.6	11.3	10.6	9.8	9.4	8.9	8.4	8.2	7.4	8.65	11.3	5.0	6.3
May 5	3.4	4.6	5.6	5.9	6.8	7.4	7.8	8.2	8.6	7.0	5.22	8.6	—1.7	10.3
May 6	9.2	10.2	11.6	11.8	11.3	12.0	12.2	12.0	11.7	10.3	8.05	12.2	2.0	10.2
May 7	12.2	13.3	13.2	13.5	14.3	14.7	14.9	16.4	16.3	15.3	12.10	16.4	7.3	9.1
May 8	16.1	16.1	16.5	16.8	17.6	18.6	18.8	19.1	18.8	18.0	16.70	19.1	14.2	4.9
May 9	15.4	15.4	15.6	16.5	16.4	16.4	16.0	16.6	19.5	17.8	15.89	19.5	11.0	8.5
May 10	16.4	17.4	17.6	18.8	19.0	19.4	19.6	19.7	18.9	18.0	16.72	19.7	13.3	6.4
May 11	29.6	30.7	32.1	33.1	33.2	33.3	33.3	33.5	33.8	32.9	26.98	33.8	17.0	16.8
May 12	33.5	34.2	34.7	35.2	34.8	34.2	34.0	33.7	33.6	33.0	32.33	35.2	28.0	7.2
May 13	33.9	34.2	34.6	35.7	32.8	32.1	32.1	31.8	31.5	31.1	32.05	35.7	26.0	9.7
May 14	31.7	32.1	32.1	32.2	32.3	32.3	33.1	33.1	32.9	31.4	30.95	33.1	27.2	5.9
May 15	31.3	31.5	31.7	31.5	31.1	30.9	30.6	30.4	30.2	29.2	30.08	31.7	26.8	4.9
May 16	26.6	28.4	28.9	29.7	30.8	31.5	31.9	31.6	31.3	30.3	24.05	31.9	14.1	17.8
May 17	32.6	33.1	33.3	33.7	33.5	33.4	35.2	34.6	34.0	33.3	31.40	35.2	27.8	7.4
May 18	29.0	29.0	28.2	29.4	31.3	31.9	32.1	32.3	32.2	31.5	30.82	33.3	27.0	6.3
May 19	24.3	25.7	27.4	28.4	30.5	31.8	33.2	33.3	33.5	33.1	26.80	33.5	18.0	15.5
May 20	35.8	36.0	36.2	36.0	37.0	36.4	36.1	35.2	35.2	35.2	34.72	37.0	32.3	4.7
May 21	34.4	34.4	35.0	35.2	35.2	34.8	34.4	34.2	34.2	33.5	33.93	35.2	31.8	3.4
May 22	35.0	35.4	35.4	35.4	35.0	33.5	33.5	33.1	32.6	32.2	33.41	35.4	30.8	4.6
May 23	26.1	26.8	26.9	27.4	27.4	27.3	27.2	27.2	27.4	26.4	26.40	29.8	21.8	8.0
May 24	19.1	19.6	19.6	19.8	20.1	20.3	21.3	21.0	21.3	20.6	19.85	24.9	15.3	9.6
May 25	19.1	19.1	19.8	21.5	23.0	23.3	23.5	23.4	23.7	23.5	20.49	23.7	16.3	7.4
May 26	20.1	20.8	21.3	21.5	21.7	22.0	21.5	21.3	21.9	21.5	21.00	23.6	15.8	7.8
May 27	21.0	22.3	23.3	23.5	23.6	23.5	23.5	23.0	22.6	21.3	18.90	23.6	10.2	13.4
May 28	18.4	18.9	19.6	20.1	20.9	20.5	21.1	19.8	19.9	19.5	17.08	20.9	10.0	10.9
May 29	21.1	22.5	23.0	24.5	24.5	24.8	25.0	24.5	23.9	24.5	19.09	25.0	12.8	12.2
May 30	26.4	27.2	27.4	27.7	28.4	28.9	29.3	29.2	29.7	29.4	25.82	29.7	21.2	8.5
May 31	28.6	29.4	30.1	30.4	30.9	31.2	31.0	31.6	31.6	30.5	28.61	31.6	24.0	7.6
Means	22.39	23.01	23.40	23.88	24.17	24.25	24.37	24.21	24.25	23.46	21.99	25.61	16.83	8.77

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to local time, subtract 5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1882.														
June 1...	30.5	29.8	28.9	28.2	27.7	27.2	26.4	26.1	26.4	27.3	28.6	29.7	[illegible]	[illegible]
June 2...	30.5	30.4	29.6	29.3	27.9	27.6	27.6	28.2	27.6	26.7	26.6	[illegible]	27.4	29.2
June 3...	29.2	28.8	28.2	28.2	27.4	27.4	27.6	27.7	28.9	29.4	30.6	31.5	32.5	33.1
June 4...	33.5	32.7	32.4	32.3	31.5	31.1	30.5	30.3	30.7	31.1	31.7	32.1	33.1	[illegible]
June 5...	34.4	33.6	32.6	32.4	31.8	31.3	31.2	30.3	30.1	29.9	30.7	30.7	31.8	[illegible]
June 6...	38.3	36.0	35.6	35.3	33.6	33.3	34.2	31.1	33.8	35.2	[illegible]	38.1	39.1	[illegible]
June 7...	40.3	39.3	38.3	35.4	32.6	31.3	32.3	32.7	33.7	33.7	34.8	36.7	38.4	[illegible]
June 8...	38.2	37.1	36.2	34.2	30.3	29.5	29.4	29.7	30.5	32.8	33.5	34.1	34.1	34.5
June 9...	38.3	37.0	35.5	34.2	31.7	30.7	31.5	32.5	33.6	32.0	32.9	32.9	33.1	33.7
June 10...	34.0	33.1	32.4	32.1	31.5	31.5	31.5	31.6	32.5	33.7	34.9	34.0	34.4	34.4
June 11...	34.4	33.4	33.5	33.1	32.5	32.5	32.5	32.2	32.7	32.8	34.7	34.9	35.8	36.3
June 12...	46.2	42.0	40.1	38.6	38.6	38.7	37.9	36.3	38.3	38.3	39.3	40.7	41.2	39.8
June 13...	35.6	36.1	35.2	34.1	33.3	32.9	33.5	33.1	32.5	32.5	33.7	34.8	35.0	34.4
June 14...	33.7	34.0	33.2	33.2	32.7	32.7	32.9	33.0	33.0	33.1	33.5	34.0	34.1	34.0
June 15...	34.4	34.2	34.2	33.7	33.2	33.1	33.1	32.7	32.7	33.4	33.7	33.6	34.3	34.1
June 16...	33.2	32.4	31.6	31.3	30.5	29.9	30.1	30.1	30.5	31.2	31.4	32.3	31.9	33.1
June 17...	35.4	33.5	35.2	33.7	31.0	30.2	29.7	31.5	32.5	32.9	32.9	33.5	34.6	35.0
June 18...	31.4	33.5	32.9	32.4	31.8	32.9	34.4	35.8	38.8	38.6	38.9	39.3	41.8	42.9
June 19...	41.2	40.1	38.1	37.3	37.1	36.2	36.8	37.4	37.9	38.5	38.9	39.6	39.6	[illegible]
June 20...	38.9	37.0	36.0	36.2	35.4	34.0	34.4	34.6	34.6	34.4	35.0	35.4	37.9	36.4
June 21...	35.3	34.5	34.0	33.5	33.2	32.7	32.8	32.8	32.9	33.1	33.5	34.2	34.2	34.0
June 22...	33.1	31.3	29.8	30.1	29.3	28.2	28.6	28.1	28.8	29.0	29.9	30.4	30.7	29.7
June 23...	32.4	32.0	31.5	31.3	30.5	30.7	30.0	30.5	30.5	32.3	32.5	32.5	32.3	32.5
June 24...	34.0	36.2	37.3	36.6	33.9	33.3	31.3	30.7	31.3	32.7	33.1	35.8	34.1	[illegible]
June 25...	41.0	41.7	40.1	38.5	36.4	36.6	38.3	40.9	41.0	39.8	41.8	42.0	44.2	47.4
June 26...	38.8	38.1	34.4	33.5	33.5	33.5	33.5	33.5	33.1	32.5	32.5	32.5	32.5	32.5
June 27...	33.0	32.6	32.5	32.6	32.5	32.5	32.1	31.5	31.5	31.5	31.5	31.5	31.0	32.5
June 28...	32.1	31.6	31.4	31.2	30.7	30.5	30.6	30.3	30.3	30.5	30.8	31.5	32.5	33.0
June 29...	31.3	32.3	32.4	31.6	31.5	32.5	32.5	32.5	32.5	32.7	33.8	34.0	35.4	36.1
June 30...	34.2	34.3	34.0	33.7	33.7	33.5	33.5	33.5	33.5	33.5	34.9	34.9	35.2	35.2
Means...	35.33	34.62	33.90	33.26	32.24	31.93	32.05	32.04	32.55	32.87	33.54	34.18	34.66	35.09

Date.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.	Max.	Min.	Def
1882.														
June 1...	31.1	32.1	32.1	32.3	32.5	32.8	32.5	32.1	32.0	31.3	29.92	32.8	24.5	8.3
June 2...	28.2	28.6	28.9	29.4	28.6	29.4	30.2	29.9	29.8	29.2	28.58	30.5	23.0	7.5
June 3...	34.0	35.0	35.1	35.0	34.7	34.4	34.2	34.0	33.4	33.5	31.41	35.1	26.5	8.6
June 4...	31.0	34.0	31.2	35.0	35.2	35.2	38.9	35.2	35.8	34.9	33.29	38.9	29.3	9.6
June 5...	33.8	35.0	37.7	38.1	38.9	37.7	37.9	37.4	38.3	37.5	34.00	38.9	29.1	9.8
June 6...	39.1	39.1	37.9	37.8	37.9	37.5	39.3	40.1	40.3	41.7	37.10	41.7	31.8	9.9
June 7...	36.8	36.0	36.7	37.2	37.2	37.0	37.0	36.4	37.1	38.1	36.20	40.3	30.8	9.5
June 8...	34.7	35.7	37.2	37.6	37.4	37.2	37.2	36.7	38.1	40.0	34.83	40.0	27.4	12.6
June 9...	31.0	34.4	35.2	36.7	36.0	35.4	35.3	34.9	34.5	34.2	34.18	38.3	28.8	9.5
June 10...	35.0	35.8	36.4	36.4	36.6	36.4	36.9	36.1	35.5	36.2	34.25	36.6	30.0	6.6
June 11...	38.3	39.5	41.2	41.3	41.1	38.7	39.3	41.5	42.9	45.2	36.75	45.2	31.6	13.6
June 12...	37.9	38.5	38.7	38.5	39.3	39.3	38.3	37.9	36.4	35.7	39.02	46.2	35.4	10.8
June 13...	35.0	35.4	35.2	35.6	34.4	34.0	34.0	34.0	34.0	33.6	34.25	36.1	31.8	4.3
June 14...	35.2	35.3	36.4	37.0	36.9	36.7	36.5	36.9	35.8	34.7	34.52	37.0	32.0	5.0
June 15...	33.9	35.0	34.6	34.4	34.0	33.5	33.8	33.5	33.6	34.2	33.79	35.0	31.9	3.1
June 16...	33.1	33.1	33.0	33.3	33.8	33.8	34.0	34.6	34.4	35.2	32.41	35.2	29.1	6.1
June 17...	35.4	36.2	35.9	35.7	35.8	36.4	36.9	36.6	36.0	34.3	34.20	36.9	29.0	7.9
June 18...	45.2	40.5	40.1	40.6	40.3	39.3	39.1	42.5	44.3	45.0	38.55	45.2	30.9	14.3
June 19...	41.5	40.9	40.5	38.8	39.9	38.9	38.6	38.3	39.1	38.9	38.94	41.5	35.1	6.4
June 20...	37.9	38.3	38.6	38.6	38.7	38.5	38.3	37.8	37.1	35.7	36.57	38.9	33.0	5.9
June 21...	34.2	33.7	33.9	34.0	33.7	33.7	32.5	32.5	33.1	32.4	33.52	35.3	31.0	4.3
June 22...	31.1	31.4	31.5	32.0	34.3	32.7	32.9	32.7	33.1	32.3	30.92	34.3	26.8	7.5
June 23...	32.5	32.5	32.0	31.7	31.7	32.1	32.0	32.0	32.3	33.2	31.85	33.2	29.0	4.2
June 24...	33.9	35.0	35.2	35.4	36.0	36.0	35.0	35.9	36.4	37.0	34.58	37.3	30.1	7.2
June 25...	47.2	48.8	49.7	50.5	52.0	53.5	51.2	52.2	51.3	48.9	44.50	53.5	34.0	19.5
June 26...	33.7	34.0	34.4	34.2	34.0	34.0	34.2	33.9	34.2	33.3	33.93	38.8	32.0	6.8
June 27...	33.7	33.5	33.5	32.7	32.5	32.1	31.7	31.5	32.4	32.1	32.27	33.7	29.6	4.1
June 28...	33.5	34.4	34.4	34.2	34.9	34.4	34.2	33.0	33.4	31.6	32.29	34.9	29.3	5.6
June 29...	36.4	36.4	37.4	36.2	35.4	35.4	36.4	35.6	35.2	34.0	34.20	37.4	29.8	7.6
June 30...	35.4	35.4	35.4	35.4	35.4	35.4	35.4	38.3	39.0	40.6	35.14	40.6	32.0	8.6
Means...	35.52	35.78	36.10	36.19	36.30	36.05	36.16	36.13	36.20	35.95	34.53	38.31	30.22	8.09

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
July 1...	37.9	34.4	33.5	33.0	32.8	33.5	38.8	40.7	38.3	40.1	40.3	40.2	40.8	40.8
July 2...	38.9	39.5	41.2	40.7	37.4	38.8	35.4	37.4	37.4	37.4	38.8	40.6	44.0	44.2
July 3...	39.8	39.3	37.4	37.0	35.8	35.6	36.4	37.2	37.8	37.9	35.4	34.4	33.1	33.3
July 4...	35.0	35.4	34.5	34.0	33.7	34.3	34.4	34.1	38.3	38.3	38.3	37.4	38.3	38.3
July 5...	40.1	38.1	36.2	34.7	34.4	33.9	34.4	35.6	37.4	40.3	43.0	46.2	46.0	46.2
July 6...	43.3	43.8	42.8	40.8	41.0	42.2	43.4	42.4	44.0	45.2	44.7	45.2	45.0	45.2
July 7...	48.2	49.8	49.2	45.3	46.2	45.0	48.2	50.2	51.0	53.2	55.5	56.2	40.2	56.4
July 8...	49.0	46.2	40.9	41.4	39.1	38.3	36.8	40.3	42.4	43.2	44.5	45.4	45.4	45.2
July 9...	41.1	39.7	38.2	35.3	33.5	32.0	31.0	30.7	31.5	32.5	33.9	34.4	34.4	34.2
July 10...	40.8	39.4	40.3	41.1	38.3	39.1	43.4	47.0	50.2	52.8	55.2	49.7	52.2	45.0
July 11...	40.8	41.5	39.7	38.3	38.1	40.1	42.0	46.2	47.8	52.7	58.0	56.2	56.7	59.9
July 12...	43.2	43.2	44.7	45.2	42.7	42.7	42.5	42.2	41.9	44.2	44.2	47.2	44.2	42.2
July 13...	39.1	36.9	36.6	37.0	37.2	37.3	37.2	38.9	39.3	39.3	38.9	38.3	38.3	38.3
July 14...	48.2	49.2	45.8	41.0	39.1	38.9	40.6	41.2	42.9	42.7	41.2	40.7	40.1	39.5
July 15...	33.5	33.5	31.0	30.1	29.[illegible]	29.0	28.6	32.5	31.5	33.1	32.3	32.5	33.1	33.5
July 16...	37.4	35.9	36.3	34.0	34.2	32.5	32.5	32.5	33.5	34.2	85.4	36.9	36.7	35.9
July 17...	34.9	34.8	34.5	34.3	34.4	34.4	34.1	33.7	33.7	32.7	33.7	34.4	34.6	35.2
July 18...	37.3	36.0	35.3	35.0	34.9	34.6	34.4	34.4	34.9	35.6	36.4	37.7	37.7	38.3
July 19...	40.4	39.9	38.1	38.3	38.3	38.1	37.9	39.1	40.5	41.2	43.4	46.3	50.7	49.0
July 20...	46.3	41.6	45.2	44.8	43.9	44.0	43.6	47.4	48.9	47.2	48.0	45.2	46.2	46.7
July 21...	46.5	43.2	41.3	41.2	40.5	40.3	40.3	39.6	39.3	39.3	40.1	42.2	41.7	44.4
July 22...	45.8	44.4	44.1	43.3	42.6	42.2	41.8	41.4	42.2	43.4	45.6	44.7	47.2	47.7
July 23...	46.8	46.8	45.4	43.4	43.2	43.4	42.5	43.2	45.7	40.5	49.2	50.4	50.4	55.2
July 24...	56.7	52.0	49.0	48.9	50.5	51.2	50.9	51.2	52.1	53.9	57.2	57.2	61.3	62.5
July 25...	61.3	59.1	55.1	55.2	52.2	53.2	53.2	53.9	57.2	60.3	61.1	55.2	53.7	51.2
July 26...	54.3	54.0	52.8	51.2	51.2	50.9	50.5	51.6	52.2	53.4	54.2	54.7	55.2	53.4
July 27...	44.7	43.1	41.3	41.5	41.2	41.2	41.0	41.0	40.3	41.0	40.3	41.7	43.0	43.0
July 28...	35.9	35.9	36.3	36.6	36.1	35.4	34.6	33.9	33.5	33.9	34.9	34.9	35.9	36.5
July 29...	36.2	35.5	35.2	35.0	35.2	35.7	34.9	34.9	35.9	35.9	36.9	38.8	37.4	40.3
July 30...	40.9	39.4	38.5	38.6	37.2	36.7	36.9	36.9	38.3	39.3	40.3	41.2	43.2	44.2
July 31...	54.7	54.6	51.6	53.0	51.2	50.4	50.7	50.2	50.9	52.7	51.6	52.2	52.7	53.9
Means..	43.20	42.13	41.23	40.30	39.52	39.51	39.77	40.69	41.64	42.79	43.56	43.82	44.24	44.50

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
July 1...	40.7	40.8	39.3	40.8	41.4	41.0	41.8	42.0	42.0	43.4	39.10	43.4	32.2	11.2
July 2...	47.5	48.7	48.0	47.7	47.0	46.7	46.2	45.2	42.8	40.8	42.18	48.7	34.0	14.7
July 3...	34.2	33.2	34.0	33.9	33.8	33.0	33.1	34.2	34.4	34.6	35.37	39.8	31.6	8.2
July 4...	38.1	39.3	39.8	40.7	40.5	39.6	40.2	40.4	41.2	41.2	37.72	41.2	32.2	9.0
July 5...	47.4	46.7	46.2	45.4	44.2	44.0	43.4	44.2	43.2	44.7	41.50	47.4	33.2	14.2
July 6...	45.2	46.7	46.2	45.0	42.7	43.2	44.8	43.4	44.0	45.0	43.97	46.7	39.8	6.9
July 7...	56.8	58.3	59.3	60.4	60.6	59.1	57.7	56.4	56.0	52.2	53.35	60.6	42.2	18.4
July 8...	47.0	47.2	49.0	49.0	48.7	48.6	48.2	43.7	39.9	40.2	44.28	49.0	36.2	12.8
July 9...	34.2	34.4	35.4	35.6	36.4	37.9	43.4	43.2	40.3	40.3	35.98	43.4	29.8	13.6
July 10...	49.0	51.7	50.4	43.7	43.4	42.7	45.2	51.2	53.2	51.3	46.51	55.2	37.3	17.9
July 11...	56.7	59.1	55.7	50.4	48.2	45.2	46.0	43.2	45.2	42.0	47.82	59.9	36.5	23.4
July 12...	42.7	41.8	41.2	40.3	40.1	39.8	38.8	37.4	38.2	38.5	42.05	47.2	35.5	11.7
July 13...	38.8	39.3	39.9	40.3	40.6	40.4	41.0	42.2	43.8	49.2	39.50	49.2	35.0	14.2
July 14...	38.8	38.3	38.3	38.4	38.3	37.8	37.4	36.6	35.7	35.0	40.24	49.2	33.9	15.3
July 15...	33.7	34.0	31.4	35.4	34.6	34.4	35.2	35.4	37.1	37.4	33.12	37.4	27.1	10.3
July 16...	36.9	36.9	37.4	37.8	37.8	37.6	36.7	35.6	85.5	35.3	35.64	37.8	31.9	5.9
July 17...	35.6	36.6	37.2	37.9	38.5	37.8	37.2	36.1	37.4	36.9	35.44	38.5	32.8	5.7
July 18...	38.3	38.3	38.3	38.1	38.1	38.5	38.8	39.3	39.9	39.3	37.06	39.9	33.7	6.2
July 19...	51.7	47.8	48.0	48.0	45.8	46.7	49.0	48.3	46.8	43.7	44.00	51.7	37.0	14.7
July 20...	46.2	46.2	47.4	48.7	48.2	48.4	48.2	47.2	47.3	46.4	46.38	48.9	48.7	0.2
July 21...	45.4	47.0	47.7	45.2	42.7	43.0	43.4	43.8	45.0	46.3	43.02	47.7	38.3	9.4
July 22...	47.7	48.0	48.2	48.4	50.0	51.8	52.5	52.3	53.7	50.0	46.62	53.7	40.7	13.0
July 23...	57.2	60.8	60.9	61.1	54.4	53.7	57.4	57.8	55.4	55.2	51.21	61.1	41.8	19.3
July 24...	63.7	65.3	65.5	59.1	58.3	55.4	56.6	57.2	57.8	61.0	56.46	65.5	48.0	17.5
July 25...	49.7	49.2	50.8	53.4	55.1	56.0	57.1	56.7	54.8	55.0	54.90	61.3	48.1	13.2
July 26...	54.2	54.2	52.2	54.8	52.7	52.4	49.5	49.4	47.8	45.8	52.19	55.2	43.8	11.4
July 27...	41.0	42.2	43.2	45.0	42.2	40.5	39.0	37.5	35.9	36.2	41.12	45.0	35.0	10.0
July 28...	37.8	36.6	36.4	37.2	36.8	36.4	36.4	36.9	37.3	36.8	35.95	37.8	32.8	5.0
July 29...	41.0	41.2	41.8	43.2	43.0	43.0	42.8	43.5	42.2	41.8	38.80	43.5	33.8	9.7
July 30...	46.7	48.5	50.2	53.5	50.4	49.2	50.7	53.0	53.0	55.2	44.25	55.2	35.8	19.4
July 31...	54.5	56.6	56.7	54.2	54.2	54.2	55.2	56.8	58.3	57.2	53.80	58.3	49.0	9.3
Means..	45.11	45.64	45.77	45.57	44.80	44.42	44.93	44.84	44.69	41.47	43.21	49.01	37.02	11.99

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Aug. 1 ...	55.5	55.2	55.9	54.8	50.2	49.2	47.7	47.7	48.2	49.6	50.3	50.2	50.0	52.0
Aug. 2 ...	42.9	42.8	43.0	43.0	44.2	44.7	44.2	44.2	44.4	44.7	45.2	46.9	49.0	49.9
Aug. 3 ...	53.7	53.4	48.0	45.2	43.5	41.7	40.7	40.3	40.6	38.6	38.8	38.8	38.8	38.3
Aug. 4 ...	40.4	42.7	38.5	38.1	38.3	39.6	40.3	40.9	41.7	43.4	45.8	47.2	41.8	41.4
Aug. 5 ...	32.7	34.1	34.0	34.1	34.0	32.5	32.7	32.9	33.7	34.9	36.4	37.6	38.7	39.5
Aug. 6 ...	40.2	40.3	40.2	40.8	41.2	41.9	43.2	44.4	44.7	45.5	49.0	49.7	50.7	53.7
Aug. 7 ...	51.8	50.7	49.9	49.0	43.7	43.2	42.8	42.2	41.7	41.9	41.4	41.9	41.2	41.3
Aug. 8 ...	43.8	41.6	41.3	41.0	40.6	44.6	40.1	40.0	41.2	41.2	43.4	45.5	46.2	48.1
Aug. 9 ...	52.7	52.0	51.9	52.0	51.2	50.7	50.2	49.7	49.2	49.4	49.4	48.5	48.0	48.7
Aug. 10 ...	33.6	33.1	32.7	33.6	33.3	33.3	34.9	36.1	38.3	40.3	41.0	42.2	43.4	43.6
Aug. 11 ...	53.3	52.0	50.6	50.1	50.2	50.0	50.2	50.2	50.2	50.2	50.2	51.7	53.4	53.2
Aug. 12 ...	57.9	54.4	50.6	50.2	48.6	48.2	47.7	47.7	46.8	46.2	46.2	41.2	39.1	37.6
Aug. 13 ...	35.1	35.2	34.2	33.1	32.5	31.7	32.0	31.8	31.8	32.0	32.0	31.9	31.0	31.0
Aug. 14 ...	31.6	31.3	30.5	30.5	30.3	30.0	30.3	30.3	31.0	31.0	32.0	32.0	33.5	34.0
Aug. 15 ...	34.0	33.7	33.5	33.5	32.7	32.5	32.5	32.5	33.1	33.3	33.6	34.4	34.8	36.0
Aug. 16 ...	33.9	32.5	32.3	32.3	32.3	32.0	32.3	32.1	32.1	32.1	32.5	32.5	32.5	34.2
Aug. 17 ...	33.1	32.5	32.3	32.2	31.8	31.0	31.7	32.2	32.8	32.3	32.4	32.4	33.0	33.0
Aug. 18 ...	33.4	33.1	33.3	32.5	32.5	32.1	31.9	31.5	31.8	32.2	32.5	33.2	33.6	33.7
Aug. 19 ...	34.2	32.5	31.4	30.7	30.3	29.9	30.1	30.3	32.5	35.5	35.5	36.2	37.4	37.4
Aug. 20 ...	38.1	37.5	37.0	36.9	36.4	36.1	35.4	35.4	35.6	35.9	35.9	36.6	37.4	38.1
Aug. 21 ...	37.5	36.5	35.4	36.7	38.3	37.2	36.4	35.6	35.2	34.4	34.4	33.7	33.5	33.9
Aug. 22 ...	36.4	36.4	33.1	33.3	33.2	33.2	33.0	33.3	33.3	33.5	35.1	35.7	36.4	37.1
Aug. 23 ...	35.4	35.4	35.2	35.2	35.2	34.9	34.9	34.6	35.4	34.6	34.7	34.4	34.9	35.4
Aug. 24 ...	36.4	32.5	31.1	31.0	30.5	30.9	31.5	31.5	31.5	31.5	31.7	32.8	32.8	32.8
Aug. 25 ...	33.5	32.5	32.0	32.3	32.5	32.3	32.3	32.5	33.3	33.1	33.5	33.3	33.3	33.0
Aug. 26 ...	33.5	33.3	33.3	33.3	33.3	33.0	33.0	33.2	32.9	32.8	32.5	32.5	33.2	33.5
Aug. 27 ...	31.5	30.5	29.6	28.5	28.1	28.2	28.6	29.3	29.6	29.6	29.8	30.5	30.5	30.8
Aug. 28 ...	39.4	28.6	28.5	28.2	28.6	28.4	28.1	27.8	27.4	27.6	29.1	30.1	30.5	30.2
Aug. 29 ...	29.1	29.0	28.7	28.9	28.8	28.6	28.6	28.8	29.2	29.4	29.6	30.5	31.3	32.0
Aug. 30 ...	31.3	30.9	31.3	30.6	30.5	30.5	30.3	30.5	29.6	29.8	30.5	31.3	32.1	32.3
Aug. 31 ...	31.3	32.0	32.3	32.3	32.5	32.5	33.0	33.0	32.3	32.3	32.3	32.0	32.2	32.5
Means ..	38.62	38.01	37.15	36.90	36.43	36.30	36.15	36.21	36.47	36.74	37.31	37.66	37.88	38.33

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
Aug. 1 ...	52.2	52.7	50.3	48.8	47.4	48.2	46.4	45.4	42.6	42.2	49.70	57.6	40.8	16.8
Aug. 2 ...	48.7	48.7	48.3	48.0	47.9	48.2	49.9	50.0	53.9	55.1	46.99	55.0	40.7	14.3
Aug. 3 ...	37.8	38.3	38.4	38.5	36.7	36.6	35.0	35.2	36.1	37.2	40.42	56.1	33.6	22.5
Aug. 4 ...	41.5	39.3	37.1	35.6	35.7	35.8	36.3	36.2	35.1	34.2	39.45	47.5	33.0	14.5
Aug. 5 ...	40.1	41.2	41.2	40.4	39.8	39.5	39.6	39.8	39.9	40.6	37.08	42.0	31.7	10.3
Aug. 6 ...	54.2	55.2	56.7	57.2	57.0	56.4	55.3	53.5	53.0	52.6	49.02	57.5	39.3	18.2
Aug. 7 ...	41.2	42.2	43.0	43.9	43.3	43.0	42.7	42.8	41.3	41.1	43.62	53.6	39.6	14.0
Aug. 8 ...	50.2	51.4	53.0	54.2	56.0	50.4	52.0	52.5	52.8	52.8	46.84	56.5	38.0	18.5
Aug. 9 ...	50.0	49.4	39.8	37.4	35.6	36.2	35.0	36.2	35.8	34.4	45.56	52.9	33.2	19.7
Aug. 10 ...	50.4	51.5	52.5	52.8	54.3	55.2	55.3	54.4	54.7	53.3	43.91	56.1	31.4	24.7
Aug. 11 ...	54.2	54.2	54.0	55.4	56.0	56.8	56.7	56.0	57.7	55.8	53.01	58.9	49.0	9.9
Aug. 12 ...	37.4	36.4	36.1	36.4	36.2	35.5	35.1	34.5	34.8	35.8	42.52	58.3	33.3	25.0
Aug. 13 ...	30.5	31.0	30.8	31.4	31.5	31.4	32.2	31.9	32.1	32.1	32.09	35.9	29.0	6.9
Aug. 14 ...	34.0	34.6	34.0	34.7	35.4	36.4	36.1	35.5	36.0	35.4	32.93	37.3	29.0	8.3
Aug. 15 ...	36.1	37.4	37.2	37.2	36.9	36.6	35.4	35.2	35.1	34.2	34.64	37.9	31.5	6.4
Aug. 16 ...	34.6	34.9	36.2	35.6	35.2	34.8	34.7	34.7	34.4	34.3	33.54	36.9	30.7	6.2
Aug. 17 ...	33.9	34.4	33.8	34.6	34.4	35.2	34.9	34.8	34.6	34.3	33.24	36.1	30.7	5.4
Aug. 18 ...	35.4	36.4	36.2	36.6	36.4	35.9	31.9	35.0	35.0	35.0	33.80	37.7	30.8	6.9
Aug. 19 ...	39.3	39.8	40.1	41.1	40.3	40.6	40.4	40.3	40.4	39.1	36.05	42.0	29.0	13.0
Aug. 20 ...	39.1	40.3	40.9	41.2	41.0	40.9	40.5	39.4	40.0	38.9	38.10	42.1	34.8	7.3
Aug. 21 ...	34.4	34.9	38.8	34.6	34.7	34.0	34.4	33.8	34.4	34.0	35.28	40.1	32.3	7.8
Aug. 22 ...	36.6	37.5	37.0	36.9	37.2	37.6	37.1	36.5	35.2	35.4	35.42	38.2	31.2	7.0
Aug. 23 ...	35.8	36.2	36.4	36.5	36.7	37.1	36.9	36.6	36.2	34.5	35.55	37.7	33.5	4.2
Aug. 24 ...	33.5	33.6	34.0	34.1	34.6	34.7	34.8	34.0	34.2	33.3	32.80	35.9	29.7	6.2
Aug. 25 ...	32.9	33.3	33.5	33.8	33.9	34.0	34.0	33.9	34.0	33.7	33.18	34.0	31.0	3.0
Aug. 26 ...	33.5	32.5	33.6	34.7	35.4	35.8	35.6	35.2	34.0	33.5	33.63	36.2	30.9	5.3
Aug. 27 ...	31.5	31.7	30.6	30.3	29.2	30.1	29.8	29.7	29.6	29.6	29.88	35.5	26.6	8.9
Aug. 28 ...	31.0	30.9	32.0	32.0	31.8	31.3	31.0	31.5	30.5	29.6	29.75	34.0	31.0	3.9
Aug. 29 ...	32.6	33.0	33.3	33.5	33.3	33.3	34.0	34.1	33.0	31.9	31.02	35.0	27.3	7.7
Aug. 30 ...	32.2	32.1	32.3	33.0	33.5	33.5	33.9	33.0	32.3	31.3	31.61	35.7	28.5	7.2
Aug. 31 ...	33.6	33.7	34.0	34.2	34.2	34.2	34.2	34.2	34.2	34.9	33.08	36.1	29.9	6.2
Means ..	38.98	39.31	39.20	39.18	39.08	39.01	38.75	38.57	38.48	38.67	37.86	43.75	32.93	10.82

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Sept. 1..	33.5	34.4	33.5	33.5	32.3	32.3	31.3	30.5	30.1	39.0	29.9	29.9	30.1	30.8
Sept. 2...	30.3	30.1	29.5	30.2	30.5	30.5	30.5	29.6	29.3	29.4	29.1	28.5	28.9	30.5
Sept. 3...	36.2	35.5	35.2	34.9	34.2	33.5	33.7	33.3	33.0	33.4	33.5	33.5	35.0	36.9
Sept. 4...	35.5	34.5	33.9	33.1	33.5	33.0	32.5	32.7	33.1	33.4	35.4	35.6	37.0	39.5
Sept. 5...	40.4	37.9	37.6	36.4	35.4	34.4	33.9	33.3	33.3	33.3	33.2	35.0	36.9	39.1
Sept. 6...	35.2	32.3	31.3	31.3	31.0	30.1	29.8	30.1	30.1	30.1	30.3	32.3	32.4	33.1
Sept. 7...	29.8	30.5	31.3	31.7	32.5	32.5	32.5	32.3	33.3	33.0	33.0	33.0	32.9	33.2
Sept. 8...	31.3	30.3	29.6	29.4	30.1	30.5	30.5	30.5	30.3	30.3	29.6	29.5	29.6	29.2
Sept. 9...	29.2	29.0	28.5	28.3	28.1	29.4	26.4	25.6	25.1	25.0	24.8	25.4	25.5	25.4
Sept. 10...	27.8	28.3	28.6	28.6	28.6	28.8	28.8	28.6	28.1	28.4	28.5	29.1	29.4	30.2
Sept. 11...	30.4	30.3	30.2	30.1	29.6	29.8	29.6	29.6	29.6	29.3	29.3	29.5	30.3	31.3
Sept. 12...	30.3	30.3	31.1	30.5	30.9	31.3	31.3	31.1	31.0	30.5	30.5	30.7	31.1	31.2
Sept. 13...	[illegible]	31.7	32.3	32.4	32.5	32.5	32.4	32.3	32.0	31.5	31.0	31.0	31.5	31.7
Sept. 14...	32.1	32.3	32.4	32.5	32.5	32.5	32.3	32.3	31.7	31.8	31.3	31.8	32.3	33.1
Sept. 15...	28.1	26.1	26.3	27.6	29.1	28.6	26.6	28.3	26.6	27.0	26.8	27.9	28.1	32.4
Sept. 16...	[illegible]	30.3	30.0	29.6	29.6	29.6	29.4	29.6	29.6	30.1	30.3	31.0	31.8	32.3
Sept. 17...	30.1	29.7	29.4	29.3	29.4	29.6	29.8	30.4	30.5	31.3	31.3	32.2	32.0	32.3
Sept. 18...	31.8	32.2	32.1	32.4	32.5	32.5	32.0	31.5	31.3	31.2	30.5	32.3	32.4	32.5
Sept. 19...	32.1	32.3	32.2	32.0	31.5	31.5	31.6	31.3	31.3	31.3	31.3	31.6	31.8	31.9
Sept. 20...	30.5	31.2	30.5	29.4	27.8	27.6	27.4	26.6	26.4	26.1	25.6	25.8	25.7	26.4
Sept. 21...	29.4	29.2	30.1	30.2	30.2	30.1	30.1	29.8	29.4	29.4	29.4	29.4	29.2	29.2
Sept. 22...	28.2	28.4	28.4	28.4	28.4	28.4	28.3	28.1	28.0	27.4	27.2	27.6	27.4	27.5
Sept. 23...	25.0	25.2	25.6	25.9	25.5	25.4	25.1	25.6	25.6	26.4	26.4	27.6	27.9	28.1
Sept. 24...	27.4	27.1	26.6	25.8	25.6	25.2	25.2	25.4	25.2	25.0	24.7	21.9	24.7	24.5
Sept. 25...	25.6	27.0	26.9	27.4	27.7	27.6	26.8	26.1	25.7	25.8	24.7	25.4	25.8	26.5
Sept. 26...	25.8	26.4	25.3	22.7	23.6	24.7	22.9	24.5	25.5	25.4	25.7	26.0	27.2	28.6
Sept. 27...	32.1	31.6	31.6	31.7	31.6	31.0	30.5	31.0	31.2	31.5	31.4	31.8	32.6	33.0
Sept. 28...	35.7	35.6	35.5	35.5	34.9	35.3	34.4	34.4	34.4	34.1	35.1	34.2	34.0	34.1
Sept. 29...	35.1	34.5	34.2	33.6	33.3	33.0	33.0	33.0	34.2	35.4	35.5	35.3	35.0	35.0
Sept. 30...	35.1	33.9	32.3	31.7	31.5	32.3	33.0	33.3	33.3	33.3	33.7	34.0	34.2	34.1
Means...	31.16	30.94	30.74	30.54	30.46	30.35	30.05	30.02	29.94	30.00	29.97	30.39	30.76	31.45

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
Sept. 1..	30.7	[illegible]	30.8	31.5	31.6	31.4	31.5	31.5	31.3	31.3	31.44	38.4	28.4	10.0
Sept. 2...	31.6	33.5	34.2	35.4	36.6	38.1	39.2	39.8	40.1	38.7	32.67	40.4	27.1	13.3
Sept. 3...	38.0	39.1	39.1	42.5	42.5	43.7	43.2	43.2	41.2	38.5	37.20	44.6	31.7	12.9
Sept. 4...	42.0	43.4	45.2	46.5	47.2	48.7	49.4	50.6	47.6	49.3	39.69	51.3	30.7	20.6
Sept. 5...	41.8	42.7	43.0	42.9	43.7	41.8	41.0	39.9	39.2	36.7	38.03	48.4	31.7	16.7
Sept. 6...	34.2	33.3	33.3	33.3	33.0	32.5	32.2	32.0	30.5	30.3	31.71	41.1	28.3	12.8
Sept. 7...	33.0	34.2	34.2	34.2	33.9	33.5	33.5	32.3	32.0	32.0	32.68	36.9	28.4	8.5
Sept. 8...	27.8	27.7	28.0	27.1	26.4	26.0	27.4	28.4	28.0	28.7	29.01	38.6	24.4	14.2
Sept. 9...	25.5	25.6	26.9	27.8	28.4	28.6	28.6	29.1	28.6	28.0	27.20	33.3	24.4	8.9
Sept. 10...	30.4	[illegible]	31.2	31.5	31.5	32.3	32.5	32.4	31.7	31.4	29.90	34.4	26.4	8.0
Sept. 11...	31.3	31.6	31.3	31.7	32.0	32.0	32.0	31.9	31.0	30.3	30.58	35.7	27.5	8.2
Sept. 12...	[illegible]	31.5	31.5	31.9	32.5	32.0	33.0	32.9	31.7	32.7	31.37	36.5	29.1	7.4
Sept. 13...	32.0	32.1	32.3	32.3	32.4	32.0	31.9	31.7	31.8	31.7	31.95	34.6	29.5	5.1
Sept. 14...	34.9	34.4	34.9	34.4	34.2	34.2	33.5	32.5	31.3	29.5	32.70	30.8	28.0	2.8
Sept. 15...	33.1	34.0	34.2	35.2	25.1	35.0	34.9	33.5	32.5	30.9	30.33	35.9	24.1	11.8
Sept. 16...	32.7	32.5	32.5	32.0	33.0	31.3	31.1	31.3	30.9	30.3	30.92	35.9	27.6	8.3
Sept. 17...	32.8	32.1	33.4	33.5	33.5	33.0	33.3	33.4	32.7	32.6	31.61	35.0	27.7	7.3
Sept. 18...	33.0	33.2	33.5	33.7	33.5	33.3	33.1	32.9	32.3	32.1	32.42	35.6	29.7	5.9
Sept. 19...	32.0	32.2	32.4	31.5	30.7	31.1	31.7	31.5	30.7	30.5	31.58	36.9	29.2	7.7
Sept. 20...	26.6	26.9	28.1	29.4	30.3	30.3	30.6	30.3	29.9	29.5	28.29	34.8	24.1	10.7
Sept. 21...	29.3	29.4	29.4	29.4	29.4	29.0	28.6	28.5	28.3	28.1	29.35	35.5	26.7	8.8
Sept. 22...	27.4	27.3	27.4	27.6	27.6	27.4	27.3	27.3	26.2	25.4	27.61	33.2	24.1	9.1
Sept. 23...	28.5	29.2	30.1	31.3	30.7	29.9	29.4	28.9	28.4	28.0	27.49	33.5	23.8	9.7
Sept. 24...	24.8	25.9	27.6	27.9	27.6	27.4	26.3	25.7	25.0	25.0	25.85	33.7	22.8	10.9
Sept. 25...	26.4	26.3	27.8	28.4	28.6	28.8	28.6	28.6	28.4	26.2	26.96	31.6	23.1	8.5
Sept. 26...	30.8	32.1	33.5	33.0	32.5	32.5	32.6	31.9	31.7	31.9	28.08	36.5	19.5	17.0
Sept. 27...	33.8	34.6	36.2	36.4	36.9	37.2	36.7	36.6	36.2	35.7	33.45	37.8	29.3	8.5
Sept. 28...	34.2	36.7	38.2	37.2	37.8	39.1	39.3	37.5	36.5	35.9	35.82	42.3	32.8	9.5
Sept. 29...	35.2	35.3	35.4	35.6	35.8	35.9	36.3	35.9	35.7	35.6	34.88	41.3	31.8	9.5
Sept. 30...	33.9	33.2*	32.5	32.5	32.3	32.3	32.3	32.5	32.5	32.8	33.03	38.3	31.2	7.1
Means...	31.93	32.45	32.91	33.25	33.37	33.34	33.37	33.15	32.46	31.99	31.46	37.43	27.44	9.99

* Interpolated.

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1882.														
Oct. 1....	32.7	32.9	32.6	32.7	32.6	33.2	33.8	33.6	34.6	35.0	34.6	34.8	35.1	35.5
Oct. 2....	37.2	37.5	37.9	37.5	37.4	38.5	38.4	37.6	37.2	37.4	37.0	36.8	37.1	37.4
Oct. 3....	31.3	31.4	30.3	30.3	30.1	29.6	29.4	28.7	27.9	27.5	26.9	26.4	26.1	26.3
Oct. 4....	25.6	25.6	25.3	25.4	25.1	25.1	24.9	24.7	24.4	24.2	23.7	23.4	22.9	23.0
Oct. 5....	22.5	21.8	20.9	19.8	20.0	19.6	19.6	19.8	19.2	19.6	20.1	20.4	20.5	20.6
Oct. 6....	20.3	20.2	20.3	20.0	20.0	20.1	19.7	19.6	19.6	19.5	19.5	19.1	18.8	18.7
Oct. 7....	18.6	18.6	18.7	18.7	18.7	19.0	19.3	19.6	19.4	19.3	19.3	19.4	19.6	19.8
Oct. 8....	18.6	18.4	18.4	18.5	17.8	17.2	16.8	16.6	16.3	16.1	16.5	16.5	16.3	16.5
Oct. 9....	15.9	15.6	15.4	15.2	15.0	15.1	15.2	15.3	15.4	14.9	14.8	14.7	14.7	14.8
Oct. 10....	13.7	13.9	14.2	13.5	12.4	12.1	12.1	10.3	9.8	9.1	8.5	9.1	6.4	6.9
Oct. 11....	9.4	9.1	8.1	7.8	6.2	6.2	6.0	0.7	7.0	6.7	7.2	8.3	8.5	8.4
Oct. 12....	6.2	6.2	6.9	7.7	8.0	8.7	9.1	8.8	9.0	6.1	5.3	3.7	4.5	4.7
Oct. 13....	6.3	4.2	4.2	5.8	5.2	5.0	5.1	4.4	3.4	0.6	— 0.5	— 1.1	— 1.9	— 1.5
Oct. 14....	4.4	3.5	3.9	3.4	2.5	3.2	1.6	1.4	1.1	0.4	— 0.9	3.0	3.4	5.5
Oct. 15....	3.2	3.2	2.7	2.6	3.0	2.7	1.8	1.2	0.2	1.6	0.7	0.6	0.5	2.1
Oct. 16....	— 2.2	— 2.4	1.2	3.0	6.0	6.5	0.7	5.1	4.2	4.2	4.2	3.4	1.6	0.4
Oct. 17....	2.2	3.0	2.4	1.7	1.6	1.4	3.4	2.5	2.3	1.6	1.0	1.6	— 0.7	0.4
Oct. 18....	3.1	3.4	4.3	4.9	5.3	5.7	5.4	5.3	5.0	5.0	4.9	5.1	6.9	6.7
Oct. 19....	5.1	5.8	6.7	6.1	6.0	5.7	5.4	4.8	4.9	5.0	5.0	4.2	3.4	3.4
Oct. 20....	4.3	3.9	4.2	4.9	5.1	5.9	3.4	3.5	4.2	4.2	4.5	4.4	4.2	4.2
Oct. 21....	2.6	2.9	3.4	2.6	2.1	0.1	— 1.4	— 2.1	— 2.1	— 2.3	— 2.2	— 0.5	— 1.0	— 1.1
Oct. 22....	4.2	5.8	5.4	5.3	5.5	6.0	6.2	6.2	0.0	4.5	3.2	2.9	2.4	1.4
Oct. 23....	9.0	7.9	— 7.8	— 6.6	— 6.2	— 6.0	— 5.3	— 4.2	— 4.5	— 5.2	— 5.2	— 4.5	— 4.2	— 0.6
Oct. 24....	0.5	0.6	1.1	1.4	1.6	0.4	0.4	0.2	0.2	0.6	0.3	— 0.4	— 0.6	— 0.5
Oct. 25....	2.1	2.1	2.1	1.8	1.8	1.7	2.1	2.2	2.5	2.5	2.6	2.7	2.5	2.6
Oct. 26....	3.2	2.9	2.3	1.1	— 0.1	— 1.2	— 1.9	— 1.7	— 2.5	— 2.9	— 3.4	— 3.9	— 3.2	— 3.0
Oct. 27....	— 4.5	— 6.1	— 6.9	— 7.1	— 7.2	— 7.5	— 8.0	— 9.3	— 9.3	— 9.1	— 8.4	— 8.5	— 8.5	— 8.5
Oct. 28....	—14.0	—14.7	—10.4	— 8.2	— 7.7	— 5.8	— 4.5	— 4.4	— 4.2	— 3.9	— 2.1	— 1.2	— 1.1	— 0.7
Oct. 29....	— 5.2	— 4.6	— 7.2	— 9.6	— 9.9	—13.2	—14.9	—16.7	—17.3	—17.3	—16.2	—14.8	—14.7	—14.0
Oct. 30....	— 0.2	1.4	2.9	3.3	6.0	8.1	8.7	7.7	1.4	— 1.4	— 3.1	— 1.0	0.4	5.2
Oct. 31....	18.6	17.2	16.9	16.9	17.3	17.0	17.4	15.8	14.4	13.9	14.5	15.3	19.0	18.8
Means....	9.51	9.30	9.05	9.05	9.07	9.04	8.90	8.40	8.05	7.66	7.49	7.71	7.71	8.17

Date.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily Means.	Max.	Min.	Diff.
1882.														
Oct. 1....	35.6	37.2	36.9	37.6	37.2	37.2	38.7	37.8	36.5	30.1	35.19	30.5	31.6	7.0
Oct. 2....	37.7	37.9	37.9	38.1	38.1	37.9	37.6	36.0	36.5	32.5	37.33	40.7	31.6	9.1
Oct. 3....	26.6	26.7	26.6	26.4	26.3	26.3	26.6	26.3	26.2	26.2	27.77	37.3	24.4	12.9
Oct. 4....	23.2	23.4	23.5	23.5	23.4	23.2	23.4	23.3	23.0	22.9	24.00	31.8	21.4	10.4
Oct. 5....	20.6	20.5	20.7	20.7	20.5	20.5	20.5	20.3	20.3	20.3	20.39	29.0	17.8	11.2
Oct. 6....	18.6	18.6	19.1	19.1	18.6	18.0	18.9	18.9	18.9	18.8	19.35	26.2	17.1	9.1
Oct. 7....	20.3	20.5	20.5	20.9	21.0	20.7	19.5	19.0	18.1	18.5	19.46	23.0	16.8	6.2
Oct. 8....	16.7	16.7	16.7	16.8	16.9	16.8	16.9	16.7	16.0	15.8	16.94	25.2	14.5	10.7
Oct. 9....	14.8	14.9	15.5	15.5	15.2	14.9	14.7	15.0	14.4	14.4	15.05	21.4	12.8	8.6
Oct. 10....	7.7	7.9	9.1	9.7	10.0	9.9	9.7	9.2	8.9	8.8	10.13	20.8	5.3	15.5
Oct. 11....	6.5	5.7	5.5	5.7	5.7	5.3	5.7	5.7	5.8	6.0	6.80	10.2	3.2	7.0
Oct. 12....	4.5	5.6	7.0	7.0	5.1	4.2	3.4	3.1	5.3	6.0	6.09	11.4	0.8	10.6
Oct. 13....	— 2.0	— 0.5	4.4	4.6	4.7	4.4	4.4	3.8	3.8	4.5	2.97	14.4	— 4.2	18.6
Oct. 14....	7.8	8.9	10.0	9.5	7.0	6.8	6.2	5.3	5.3	6.0	4.55	9.8	— 0.8	10.6
Oct. 15....	3.3	4.0	3.4	3.2	2.5	1.8	— 0.7	— 3.0	— 0.7	— 0.2	1.65	12.2	— 5.3	17.5
Oct. 16....	2.1	4.3	4.4	4.4	4.4	4.8	7.2	7.0	5.8	4.3	3.78	11.4	— 4.6	16.0
Oct. 17....	2.4	2.5	2.9	2.7	2.3	1.8	2.8	2.6	2.5	4.8	2.15	12.7	— 3.5	16.2
Oct. 18....	6.4	0.3	6.4	5.7	5.1	4.6	4.8	5.0	5.0	5.2	5.23	6.9	1.4	5.5
Oct. 19....	3.5	3.9	4.7	4.9	5.1	5.1	5.4	5.9	5.6	4.5	5.00	6.7	1.6	5.1
Oct. 20....	4.3	4.5	5.1	6.2	7.0	6.7	5.7	4.7	3.6	3.0	4.65	7.0	1.5	5.5
Oct. 21....	— 0.6	0.4	1.4	1.8	2.1	2.1	0.3	2.5	2.2	3.1	0.68	4.9	— 4.9	9.8
Oct. 22....	0.4	— 0.3	— 1.0	— 3.2	— 6.6	— 7.5	— 5.3	— 6.7	— 7.5	— 7.9	0.89	8.3	—10.0	18.3
Oct. 23....	— 2.1	— 5.7	— 6.0	— 6.7	— 6.9	— 2.5	— 2.7	— 1.0	— 0.3	0.2	— 3.21	— 0.2	—12.2	12.0
Oct. 24....	0.0	0.5	0.6	0.6	0.5	0.9	1.0	1.5	1.7	2.0	0.63	2.0	— 2.4	4.4
Oct. 25....	2.9	3.3	3.6	3.9	3.7	3.6	2.9	2.4	2.4	2.5	2.60	3.5	0.0	3.5
Oct. 26....	— 2.6	— 2.3	— 2.4	— 1.9	— 1.7	— 1.7	— 1.1	— 1.3	— 1.5	— 1.9	— 1.36	3.0	— 6.1	9.1
Oct. 27....	— 8.0	— 8.2	— 7.7	— 9.3	—10.6	—10.5	—13.1	—14.7	—14.8	—15.2	— 9.21	— 0.7	—19.1	18.4
Oct. 28....	— 0.3	— 0.2	— 0.5	— 0.3	— 0.2	0.3	0.9	0.4	— 2.2	— 5.3	— 3.76	2.2	—19.3	21.5
Oct. 29....	—11.9	— 9.5	— 6.1	— 5.3	— 4.1	— 3.2	— 3.0	— 1.7	— 1.3	— 0.9	— 9.28	— 1.3	—21.8	20.5
Oct. 30....	10.8	14.4	19.2	20.1	19.8	19.1	17.6	16.8	18.2	19.2	8.90	20.4	— 5.6	26.0
Oct. 31....	18.6	18.0	17.6	16.8	16.3	15.8	15.1	14.8	14.5	14.6	16.46	21.5	12.5	9.0
Means....	8.61	9.03	9.63	9.64	9.30	9.29	9.16	8.92	8.70	8.67	8.77	14.88	3.05	11.83

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Nov. 1 ...	13.7	12.1	12.8	13.1	11.8	8.7	8.0	11.0	12.0	11.5	9.8	6.2	5.9	5.7
Nov. 2 ...	−2.9	3.6	5.4	5.1	7.4	8.0	7.7	7.3	7.3	7.2	5.9	1.6	−1.2	−4.8
Nov. 3 ...	−6.0	−4.3	−4.2	−4.0	−2.2	−1.8	−1.4	−3.0	−3.9	−4.0	−4.9	−5.0	−4.9	−4.8
Nov. 4 ...	−2.4	−3.4	−3.8	−3.6	−2.5	−2.3	−2.5	−3.0	−4.3	−6.0	−5.0	−5.9	−6.1	−4.9
Nov. 5 ...	−5.0	−5.2	−5.6	−5.2	−4.5	−5.4	−5.6	−5.3	−5.1	−4.4	−4.0	−3.8	−4.9	−5.3
Nov. 6 ...	−3.1	−3.8	−4.0	−4.9	−5.8	−7.1	−8.2	−8.6	−8.6	−8.7	−7.5	−7.8	−7.1	−7.4
Nov. 7 ...	−4.0	−3.8	−3.8	−3.0	−3.4	−3.2	−5.1	−3.8	−4.0	−4.9	−6.6	−6.8	−7.5	−7.9
Nov. 8 ...	−7.6	−7.4	−6.6	−5.4	−4.9	−4.2	−1.9	−0.2	1.1	1.2	0.6	0.6	0.1	−0.5
Nov. 9 ...	1.2	1.6	1.2	0.4	2.1	3.4	4.0	5.7	8.9	9.9	11.0	12.0	13.0	13.8
Nov. 10 ...	28.6	27.9	26.4	26.6	26.4	26.6	26.7	26.3	25.8	27.4	24.5	22.4	19.0	14.2
Nov. 11 ...	6.6	5.9	5.1	5.5	6.3	6.8	6.2	5.1	4.4	2.9	1.4	−0.5	−1.2	−2.0
Nov. 12 ...	−12.6	−13.9	−14.7	−16.7	−17.7	−18.7	−20.1	−21.0	−21.0	−21.2	−21.0	−21.2	−21.4	−21.1
Nov. 13 ...	−25.3	−24.9	−25.8	−25.9	−26.1	−25.9	−25.2	−25.7	−25.8	−24.8	−24.6	−24.2	−24.3	−24.6
Nov. 14 ...	−24.6	−24.8	−25.2	−24.7	−25.9	−25.8	−26.9	−27.2	−28.6	−28.3	−29.8	−29.2	−29.5	−29.1
Nov. 15 ...	−30.5	−30.0	−30.3	−29.5	−30.0	−29.1	−28.9	−27.1	−25.9	−26.5	−26.0	−24.6	−23.6	−22.1
Nov. 16 ...	−18.9	−18.6	−18.8	−19.9	−18.7	−18.4	−18.6	−19.4	−18.5	−19.1	−18.5	−18.4	−18.3	−18.5
Nov. 17 ...	−12.5	−13.0	−12.1	−12.0	−11.2	−10.2	−9.6	−8.9	−8.5	−9.3	−7.9	−9.3	−9.5	−8.2
Nov. 18 ...	−5.4	−6.0	−7.3	−6.3	−6.3	−7.0	−7.9	−8.8	−9.1	−8.5	−7.8	−8.4	−9.2	−9.5
Nov. 19 ...	−10.4	−9.7	−10.0	−9.7	−10.0	−10.0	−9.8	−9.9	−10.2	−9.7	−8.6	−7.5	−7.0	−7.7
Nov. 20 ...	−5.1	−6.5	−7.9	−8.6	−8.2	−8.4	−8.8	−8.7	−8.7	−9.0	−6.7	−4.2	−3.1	−2.5
Nov. 21 ...	−6.6	−5.2	−4.2	−4.9	−4.9	−4.7	−4.0	−2.3	−2.2	−2.4	−2.4	−2.5	−1.7	−1.2
Nov. 22 ...	2.9	6.2	11.0	11.7	12.7	12.4	12.2	9.8	8.7	8.3	7.5	6.7	5.1	3.6
Nov. 23 ...	−0.7	−0.3	0.3	0.4	−1.9	−1.7	−0.7	−1.7	−2.5	−3.1	−3.1	−3.1	−3.2	−3.3
Nov. 24 ...	−8.6	−8.8	−6.7	−4.0	−3.8	−3.2	−3.2	−4.0	−6.2	−6.6	−6.8	−8.8	−10.8	−10.9
Nov. 25 ...	−1.6	−4.3	−7.0	−9.2	−10.6	−11.7	−12.1	−12.3	−12.6	−13.0	−12.8	−12.1	−12.0	−12.0
Nov. 26 ...	−11.4	−14.7	−16.7	−18.8	−19.3	−18.5	−19.2	−18.6	−17.5	−18.1	−18.4	−18.4	−18.5	−18.2
Nov. 27 ...	−9.5	−7.9	−6.6	−6.9	−7.3	−7.5	−7.8	−9.3	−10.0	−11.8	−12.1	−11.7	−11.3	−11.0
Nov. 28 ...	−12.8	−14.5	−13.3	−11.7	−11.5	−11.3	−10.6	−10.2	−10.0	−8.9	−7.7	−7.6	−8.9	−9.5
Nov. 29 ...	−10.5	−10.6	−10.2	−9.7	−10.2	−10.4	−10.5	−11.5	−11.5	−11.0	−11.5	−9.5	−9.1	−9.4
Nov. 30 ...	−7.5	−7.1	−6.6	−6.3	−6.9	−7.5	−7.1	−5.8	−6.0	−7.0	−6.7	−4.6	−3.6	−3.3
Means ..	−6.42	−6.38	−6.31	−6.27	−6.24	−6.27	−6.36	−6.37	−6.42	−6.60	−6.66	−6.85	−7.16	−7.41

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
Nov. 1 ...	3.4	−0.6	−2.1	−3.2	−2.6	−1.7	8.0	5.1	2.5	−1.2	6.25	15.4	−6.5	21.9
Nov. 2 ...	−5.8	−5.2	−5.2	−3.8	−4.9	−5.2	−6.2	−6.8	−7.0	−7.1	0.02	7.7	−9.8	17.5
Nov. 3 ...	−4.8	−4.5	−3.0	−3.2	−2.1	−1.9	−1.0	−1.4	−2.1	−3.0	−3.39	−0.6	−9.2	8.6
Nov. 4 ...	−3.9	−3.2	−3.2	−4.9	−5.3	−5.3	−5.0	−4.8	−4.2	−4.9	−4.18	−1.6	−9.7	8.1
Nov. 5 ...	−5.3	−5.2	−5.1	−5.1	−4.9	−4.7	−4.2	−4.7	−4.6	−4.1	−4.88	−4.0	−8.7	4.7
Nov. 6 ...	−7.4	−6.9	−6.9	−6.7	−7.3	−7.2	−6.3	−5.3	−4.4	−4.2	−6.47	−3.2	−11.7	8.5
Nov. 7 ...	−9.5	−9.7	−8.9	−8.7	−11.2	−8.9	−8.6	−8.6	−8.2	−7.6	−6.58	−4.2	−13.3	9.1
Nov. 8 ...	−1.7	−1.9	−1.6	−0.5	0.1	0.8	1.1	2.0	2.5	2.7	−1.32	2.8	−10.6	13.4
Nov. 9 ...	14.9	14.7	14.7	15.3	16.6	18.0	19.7	21.1	23.5	25.6	11.35	25.5	−1.2	26.7
Nov. 10 ...	12.7	11.1	11.0	9.9	9.5	8.9	8.8	8.7	7.3	6.8	18.48	28.8	5.8	23.0
Nov. 11 ...	−2.8	−4.2	−5.8	−6.9	−7.9	−7.9	−8.6	−9.7	−10.2	−10.9	−0.93	10.5	−14.2	24.7
Nov. 12 ...	−21.0	−21.0	−20.8	−22.5	−23.1	−23.8	−22.9	−23.0	−23.0	−22.8	−20.26	−10.4	−27.5	17.1
Nov. 13 ...	−25.4	−25.6	−23.8	−24.7	−24.7	−23.8	−24.3	−24.6	−24.7	−24.7	−24.98	−21.2	−31.1	9.9
Nov. 14 ...	−29.0	−29.1	−29.1	−28.6	−28.7	−29.6	−30.7	−30.6	−30.5	−29.4	−28.12	−23.5	−35.5	12.0
Nov. 15 ...	−21.0	−21.1	−19.6	−19.9	−20.3	−20.8	−21.2	−19.7	−19.4	−18.4	−24.40	−19.4	−35.2	15.8
Nov. 16 ...	−18.4	−17.3	−17.8	−17.3	−14.6	−12.8	−11.7	−11.7	−12.5	−12.1	−17.03	−12.2	−24.0	11.8
Nov. 17 ...	−7.9	−7.9	−7.9	−8.2	−8.2	−8.4	−8.3	−8.4	−8.4	−7.3	−9.30	−7.5	−16.5	9.0
Nov. 18 ...	−10.2	−10.0	−9.8	−10.2	−10.4	−10.6	−10.0	−10.2	−11.1	−10.8	−8.78	−5.5	−14.5	9.0
Nov. 19 ...	−8.4	−9.0	−9.5	−9.5	−9.1	−8.9	−8.6	−6.6	−5.1	−4.3	−8.72	−4.3	−14.2	9.9
Nov. 20 ...	−2.2	−2.4	−3.2	−3.0	−3.2	−5.1	−5.7	−6.1	−6.9	−6.5	−5.86	−2.2	−12.0	9.8
Nov. 21 ...	−1.4	−1.8	−3.2	−3.0	−3.0	−2.8	−1.7	−1.2	0.6	2.3	−2.68	1.3	−9.5	10.8
Nov. 22 ...	3.9	4.3	2.4	0.8	1.3	1.1	0.7	0.2	−0.4	−1.2	5.50	12.8	−4.8	17.6
Nov. 23 ...	−3.2	−3.2	−2.8	−3.0	−3.2	−9.1	−11.8	−13.0	−13.3	−11.2	−4.10	0.4	−18.4	18.8
Nov. 24 ...	−11.9	−14.3	−15.4	−16.2	−16.2	−16.5	−17.4	−15.7	−4.0	−1.0	−9.21	−1.5	−21.5	20.0
Nov. 25 ...	−11.9	−11.8	−11.7	−11.4	−11.9	−11.9	−11.9	−11.5	−11.4	−11.0	−10.82	−1.2	−16.6	15.4
Nov. 26 ...	−17.6	−16.5	−15.8	−15.6	−15.5	−14.3	−13.8	−12.3	−11.5	−10.4	−16.23	−10.2	−24.1	13.9
Nov. 27 ...	−10.5	−10.8	−11.5	−10.4	−10.4	−11.3	−11.5	−12.1	−13.1	−12.7	−10.21	−7.3	−16.6	9.3
Nov. 28 ...	−9.3	−9.0	−9.5	−9.1	−9.1	−8.8	−8.5	−9.1	−10.0	−10.5	−10.06	−8.0	−18.2	10.2
Nov. 29 ...	−9.5	−9.6	−9.5	−9.1	−9.1	−8.9	−7.7	−6.9	−6.7	−6.6	−9.55	−0.4	−14.8	8.4
Nov. 30 ...	−5.1	−7.6	−9.3	−9.1	−9.1	−9.3	−10.4	−8.6	−8.1	−6.3	−7.04	−3.2	−12.8	9.6
Means .	−7.67	−7.89	−8.13	−8.26	−8.28	−8.36	−7.99	−7.85	−7.48	−7.09	−7.12	−1.75	−15.23	13.48

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours, 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1882.														
Dec. 1....	— 6.0	— 6.7	— 6.4	— 5.8	— 5.2	— 5.1	— 4.3	— 3.0	— 2.3	— 2.9	— 2.1	— 2.3	— 2.5	— 3.0
Dec. 2....	— 8.9	— 9.2	—10.2	— 9.7	—10.6	—10.9	—11.5	—12.0	—11.9	—11.8	—11.7	—11.2	—11.5	—11.8
Dec. 3....	— 3.4	— 3.0	— 2.4	— 2.1	— 2.2	— 4.5	— 6.5	— 7.7	— 8.4	— 7.9	— 9.3	— 9.7	—10.2	—10.2
Dec. 4....	—12.1	—12.6	—11.5	—12.8	—13.2	—13.0	—12.3	—11.0	—10.6	—10.5	—10.4	—10.5	—11.8	—11.2
Dec. 5....	—12.3	—12.3	—12.4	—12.8	—13.0	—13.6	—12.6	—13.2	—14.2	—14.5	—14.7	—14.8	14.2	—14.0
Dec. 6....	—12.7	—12.1	—11.1	—10.2	—10.6	— 9.7	— 9.5	—10.0	— 8.4	— 6.8	— 5.6	— 4.7	— 3.7	— 3.3
Dec. 7....	— 4.9	— 5.1	— 6.2	— 6.7	— 7.1	— 8.2	— 9.7	—10.5	—11.0	—11.2	—12.2	—13.4	—13.8	—15.4
Dec. 8....	—21.5	—21.5	—21.9	—21.2	—21.0	—20.1	—19.6	—18.4	—17.3	—14.1	—13.1	—11.8	—11.5	—11.3
Dec. 9....	—18.6	—19.6	—20.3	—20.5	—21.2	—21.4	—21.5	—21.0	—21.0	—20.1	—20.0	—18.4	—18.4	—18.8
Dec. 10....	—20.5	—20.9	—20.8	—20.9	—20.8	—20.1	—19.8	—19.7	—19.4	—19.4	—19.1	—18.9	—17.9	—17.8
Dec. 11....	—11.2	—10.8	— 9.5	— 8.0	— 7.5	— 7.0	— 7.1	— 7.6	— 7.9	— 8.3	— 8.5	— 8.9	— 9.1	— 9.3
Dec. 12....	—16.4	—17.6	—17.7	—17.6	—17.9	—18.8	—20.8	—20.1	—21.5	—21.4	—22.7	—21.9	—23.1	—23.3
Dec. 13....	—20.6	—19.6	—18.2	—17.3	—16.4	—15.4	—15.2	—15.6	—15.4	—14.5	—14.4	—14.1	—13.8	—13.6
Dec. 14....	—14.1	—14.8	—16.0	—17.2	—17.8	—18.8	—19.5	—20.1	—21.9	—21.7	—20.4	—20.3	—20.5	—19.5
Dec. 15....	—13.8	—16.2	—16.6	—16.4	—14.5	—13.8	—13.8	—12.8	—12.1	—12.6	—14.0	—15.3	—16.0	—16.9
Dec. 16....	—24.3	—24.9	—25.2	—25.1	—25.7	—25.2	—24.7	—23.7	—24.5	—23.0	—21.8	—19.0	—19.1	—19.2
Dec. 17....	—18.6	—18.4	—18.4	—18.7	—19.2	—19.8	—19.6	—19.2	—18.7	—17.5	—16.9	—18.7	—20.2	—19.2
Dec. 18....	—19.1	—19.4	—20.3	—22.0	—23.4	—23.1	—22.2	—22.0	—23.2	—22.6	—22.7	—23.0	—23.6	—23.4
Dec. 19....	—23.3	—24.5	—24.8	—24.0	—23.8	—24.3	—23.3	—22.4	—22.1	—20.8	—21.7	—22.4	—23.1	—23.2
Dec. 20....	—19.5	—18.0	—18.1	—18.4	—19.7	—16.6	—17.3	—19.0	—20.4	—21.1	—21.6	—21.3	—21.2	—21.0
Dec. 21....	—15.7	—16.9	—16.6	—13.8	—13.1	—13.6	—13.6	—13.2	—13.9	—15.5	16.6	—16.8	—17.2	—18.6
Dec. 22....	—22.8	—23.3	—23.2	—23.1	—22.9	—22.4	—22.1	—23.2	—24.0	—23.3	—23.1	—22.6	—23.1	—23.6
Dec. 23....	—27.2	—27.7	—27.7	—27.7	—27.8	—27.7	—27.6	—27.1	—27.1	—26.6	—25.8	—26.1	—26.2	—26.0
Dec. 24....	—25.8	—26.7	—27.0	—27.2	—27.2	—28.0	—28.8	—28.6	—28.2	—28.7	—28.8	—28.2	—27.6	—28.7
Dec. 25....	—32.0	—30.9	—29.9	—27.8	—26.5	—25.1	—24.6	—23.1	—22.4	—21.3	—20.5	—19.7	—19.1	—18.8
Dec. 26....	—17.5	—16.9	—16.9	—16.9	—16.9	—15.7	—15.4	—15.2	—14.6	—14.1	—13.8	—12.5	—12.8	—12.9
Dec. 27....	—14.1	—14.6	—14.7	—14.9	—15.8	—16.9	—16.9	—17.6	—17.7	—18.7	—17.6	—16.9	—16.4	—17.6
Dec. 28....	—12.8	—14.5	—16.3	—15.6	—15.9	—16.4	—17.6	—17.7	—18.5	—18.9	—17.1	—18.0	—18.2	—18.3
Dec. 29....	1.2	2.3	2.5	3.2	2.8	2.5	— 7.1	—12.3	—14.9	—18.3	—20.4	—21.7	—22.9	—23.2
Dec. 30....	—31.6	—31.7	—31.5	—32.5	—33.6	—34.9	—35.1	—32.9	—31.9	—31.0	—30.6	—29.5	—29.1	—27.6
Dec. 31....	—21.2	—21.0	—21.0	—21.0	—20.8	—20.0	—19.4	—19.2	—19.1	—19.3	—18.9	—18.0	—17.5	—17.4
Means..	—16.82	—17.07	—17.11	—16.93	—17.05	—17.00	—17.39	—17.39	—17.56	—17.37	—17.58	—17.09	—17.27	—17.39

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1882.														
Dec. 1....	— 3.4	— 4.1	— 4.3	— 5.3	— 6.9	— 7.7	— 7.1	— 8.3	—10.5	— 9.3	— 5.19	— 2.3	—12.7	10.4
Dec. 2....	—11.2	—10.6	—10.4	—10.2	— 9.3	— 7.5	— 5.2	— 5.1	— 5.3	— 5.3	— 9.71	— 4.8	—15.4	10.6
Dec. 3....	—10.4	—10.5	—10.5	—10.8	—10.9	—12.2	—12.5	—12.4	—12.6	—12.7	— 8.42	— 2.7	—16.3	13.6
Dec. 4....	—11.0	—10.7	—10.4	—10.4	— 9.1	— 8.9	— 9.7	—10.2	—10.4	—11.2	—10.98	—10.0	—16.4	6.4
Dec. 5....	—14.0	—13.5	—15.6	—15.5	—14.7	—14.3	—13.3	—13.1	—13.2	—13.2	—13.71	—10.5	—19.0	8.5
Dec. 6....	— 2.5	— 2.5	— 3.0	— 3.2	— 2.5	— 1.9	— 2.6	— 3.5	— 4.1	— 4.6	— 6.20	— 2.6	—16.2	13.6
Dec. 7....	—16.5	—17.5	—19.2	—20.1	—20.1	—20.8	—21.6	—21.7	—21.9	—21.4	—14.01	— 3.8	—26.8	23.0
Dec. 8....	—10.7	—10.7	—10.4	—10.0	— 9.7	—10.5	—12.3	—14.0	—16.0	—17.8	—15.25	—10.3	—26.6	16.3
Dec. 9....	—18.9	—19.7	—19.9	—20.1	—20.3	—20.5	—20.4	—20.4	—20.0	—20.4	—20.42	—16.9	—25.5	8.6
Dec. 10....	—17.7	—17.3	—14.8	—14.0	—14.5	—14.7	—14.8	—14.7	—14.8	—13.1	—17.73	—14.2	—25.0	10.8
Dec. 11....	— 9.6	—11.7	—12.1	—14.0	—14.8	—15.2	—15.6	—16.1	—16.2	—16.1	—10.92	— 7.2	—20.3	13.1
Dec. 12....	—22.9	—22.9	—23.1	—23.1	—21.9	—21.3	—20.5	—22.5	—22.5	—22.6	—21.00	—14.6	—28.0	13.4
Dec. 13....	—13.6	—13.5	—13.4	—13.6	—13.6	—13.6	—13.2	—14.1	—14.3	—15.1	—15.09	—13.3	—26.2	12.9
Dec. 14....	—18.3	—17.3	—14.3	—13.9	—15.6	—15.4	—13.8	—13.2	—12.1	—11.7	—16.99	—11.4	—26.4	15.0
Dec. 15....	—17.5	—18.7	—18.7	—18.8	—21.0	—22.1	—24.2	—24.5	—24.8	—23.3	—17.43	—11.4	—29.2	17.8
Dec. 16....	—19.4	—19.8	—19.7	—19.5	—18.4	—18.4	—18.6	—17.9	—17.8	—18.5	—21.39	—17.1	—30.5	13.4
Dec. 17....	—21.0	—20.9	—19.5	—18.2	—17.7	—17.5	—18.6	—19.6	—19.6	—19.2	—18.95	—17.2	—25.1	7.9
Dec. 18....	—23.7	—24.7	—24.7	—24.9	—24.9	—24.7	—24.9	—25.2	—25.4	—25.2	—23.26	—13.4	—29.5	16.1
Dec. 19....	—23.6	—23.8	—23.8	—24.2	—21.2	—22.4	—23.1	—13.4	—23.8	—21.7	—22.70	—14.2	—29.2	15.0
Dec. 20....	—20.8	—20.1	—18.7	—16.1	—14.8	—17.4	—16.6	—16.4	—16.6	—19.6	—18.76	—14.6	—25.2	10.6
Dec. 21....	—19.4	—19.1	—18.2	—18.0	—19.2	—19.0	—19.3	—21.6	—23.1	—23.2	—17.20	—10.6	—26.3	15.7
Dec. 22....	—23.8	—24.3	—24.9	—25.0	—26.2	—26.7	—27.0	—27.1	—27.4	—27.2	—24.30	—21.4	—31.8	10.4
Dec. 23....	—25.3	—23.8	—23.1	—23.1	—23.6	—22.7	—23.6	—24.4	—25.7	—26.1	—25.82	—24.2	—32.2	8.0
Dec. 24....	—28.8	—29.5	—30.5	—32.7	—33.2	—33.6	—34.5	—34.7	—34.7	—32.7	—29.81	—16.4	—39.0	22.6
Dec. 25....	—19.0	—19.2	—18.8	—19.2	—19.2	—19.2	—19.0	—18.6	—18.2	—17.9	—22.08	—19.4	—36.7	17.3
Dec. 26....	—14.5	—14.8	—14.3	—13.8	—12.4	—12.2	—12.9	—12.8	—13.7	—13.8	—14.51	—13.0	—22.0	9.0
Dec. 27....	—13.7	—13.1	—10.8	— 9.7	—10.4	—11.0	—11.1	—12.1	—12.1	—13.1	—14.48	—10.2	—23.3	13.1
Dec. 28....	—16.4	—13.6	—11.7	— 9.4	— 6.7	— 5.3	— 3.6	— 1.8	— 0.7	— 0.4	—12.69	— 0.5	—23.1	22.6
Dec. 29....	—22.4	—22.6	—22.9	—23.2	—24.0	—24.1	—24.1	—25.3	—27.1	—27.9	—15.41	8.0	—32.7	40.7
Dec. 30....	—20.9	—26.0	—25.5	—25.0	—24.5	—24.1	—23.5	—23.3	—22.5	—20.5	—28.55	—23.4	—12.0	18.6
Dec. 31....	—17.1	—13.5	—12.6	—12.8	—13.0	—13.0	—13.7	—13.3	—13.4	—12.8	—17.04	— 7.2	—26.2	19.0
Means..	—17.21	—17.10	—16.77	—16.73	—16.59	—16.71	—16.80	—16.82	—17.44	—17.32	—17.10	—11.32	—25.96	14.64

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Jan. 1....	—14.0	—13.3	—13.0	—13.0	—12.8	—12.9	—13.0	—12.2	—12.1	—11.9	—11.8	—11.5	—11.2	—11.3
Jan. 2....	— 6.0	— 5.8	— 3.0	— 2.8	— 3.2	— 2.7	— 2.3	— 1.7	— 2.6	— 3.5	— 3.8	— 5.0	— 5.2	— 4.0
Jan. 3....	— 1.5	— 1.6	— 1.7	— 1.7	— 4.2	— 4.2	— 4.8	— 4.9	— 2.3	— 1.4	— 2.8	— 3.3	— 4.4	— 5.1
Jan. 4....	— 4.0	— 4.0	— 4.3	— 4.4	— 4.0	— 2.5	— 3.5	— 3.4	— 4.0	— 4.2	— 3.2	— 2.0	— 2.2	— 2.1
Jan. 5....	— 7.1	— 8.4	— 9.3	— 9.6	—10.4	—10.6	—10.5	—10.6	—10.7	—11.4	—11.7	—11.5	—11.0	—10.7
Jan. 6....	— 7.9	— 8.4	— 7.9	— 7.8	— 8.4	— 9.0	—10.3	—11.0	—11.9	—12.8	—13.5	—14.8	—14.9	—15.6
Jan. 7....	—14.7	—15.5	—16.4	—16.9	—17.5	—17.7	—16.6	—15.9	—15.9	—16.2	—17.3	—18.2	—16.9	—15.9
Jan. 8....	—16.5	—16.5	—16.7	—16.6	—16.4	—15.6	—14.5	—13.8	—13.6	—13.2	—13.0	—12.7	—11.6	—11.2
Jan. 9....	—15.9	—16.8	—16.9	—16.4	—15.7	—14.9	—14.5	—13.2	—14.6	—14.5	—15.9	—16.9	—17.5	—19.0
Jan. 10....	—19.3	—20.1	—18.6	—15.6	—15.6	—16.7	—17.7	—16.3	—14.8	—13.4	—12.5	—13.4	—14.4	—14.6
Jan. 11....	—17.5	—17.5	—17.5	—18.3	—18.6	—20.3	—21.0	—21.4	—21.3	—21.1	—21.0	—22.0	—22.9	—23.7
Jan. 12....	—25.0	—25.8	—25.9	—25.7	—24.3	—23.8	—24.0	—24.9	—26.0	—26.0	—27.1	—27.4	—27.7	—28.6
Jan. 13....	—33.6	—33.6	—34.1	—34.6	—34.6	—34.4	—34.0	—33.4	—33.3	—32.8	—32.5	—32.2	—31.9	—32.2
Jan. 14....	—31.5	—30.9	—30.9	—30.7	—30.5	—30.0	—29.5	—28.8	—28.6	—27.6	—26.7	—25.4	—24.7	—25.5
Jan. 15....	—29.5	—29.5	—29.7	—29.6	—29.6	—29.3	—28.6	—28.8	—29.5	—29.2	—29.4	—31.5	—32.5	—31.7
Jan. 16....	—35.3	—35.3	—34.6	—33.4	—31.7	—28.8	—27.0	—24.7	—22.2	—10.5	—16.9	—15.3	—13.4	—11.3
Jan. 17....	— 2.3	— 2.1	— 1.9	— 1.7	— 0.3	7.0	9.1	6.4	3.4	1.6	0.7	0.4	0.3	— 0.3
Jan. 18....	— 6.2	— 7.0	— 7.4	— 8.4	— 8.9	— 9.5	—10.1	—11.0	—11.7	—12.1	—12.3	—12.6	—12.8	—12.5
Jan. 19....	—14.7	—15.4	—16.5	—17.2	—17.7	—18.2	—18.5	—18.6	—19.4	—19.3	—19.3	—19.6	—19.8	—20.0
Jan. 20....	—22.9	—23.7	—23.6	—25.1	—25.2	—25.5	—25.5	—25.3	—24.8	—24.2	—24.6	—22.3	—21.2	—20.1
Jan. 21....	—18.2	—18.1	—18.1	—18.1	—17.5	—16.8	—16.2	—14.9	—14.4	—12.9	—11.4	—10.5	—10.4	—10.2
Jan. 22....	— 9.2	— 8.7	— 7.2	— 6.3	— 6.2	— 6.0	— 5.6	— 5.8	— 6.1	— 5.9	— 6.5	— 6.0	— 5.7	— 5.8
Jan. 23....	— 0.7	0.1	0.1	0.1	0.1	1.4	1.6	1.6	— 1.2	— 0.5	0.2	0.2	0.0	0.3
Jan. 24....	12.3	11.3	9.8	7.3	5.0	3.2	0.4	— 1.4	— 3.1	— 3.2	— 3.8	— 4.5	— 6.6	— 8.6
Jan. 25....	—13.7	—14.1	—14.1	—14.1	—16.6	—16.6	—16.4	—17.7	—18.1	—18.8	—19.8	—21.0	—21.2	—22.7
Jan. 26....	—24.3	—24.1	—24.2	—23.9	—23.3	—23.8	—24.5	—24.7	—24.2	—24.0	—24.4	—24.5	—24.0	—23.7
Jan. 27....	—27.8	—28.1	—29.4	—29.1	—29.7	—30.5	—30.5	—30.3	—31.2	—31.9	—31.9	—31.6	—31.5	—31.5
Jan. 28....	—30.9	—30.6	—31.0	—30.6	—30.5	—30.1	—29.5	—29.5	—30.3	—29.7	—29.5	—29.9	—29.7	—29.6
Jan. 29....	—26.8	—28.0	—28.0	—28.1	—28.1	—28.2	—27.8	—27.1	—27.1	—27.3	—27.5	—27.6	—26.9	—26.8
Jan. 30....	—27.8	—28.3	—29.1	—29.6	—30.3	—30.3	—30.7	—31.1	—31.8	—33.2	—33.4	—33.8	—32.7	—32.0
Jan. 31....	—28.9	—29.0	—29.4	—30.5	—20.9	—29.5	—29.5	—30.0	—29.5	—28.4	—27.6	—25.9	—24.3	—22.8
Means..	—16.82	—17.06	—17.11	—17.17	—17.31	—16.99	—16.95	—16.92	—17.19	—17.05	—17.10	—17.17	—17.06	—17.08

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1883.														
Jan. 1....	—11.0	—10.4	—10.2	—10.4	— 9.7	— 9.5	— 9.5	— 8.9	— 7.8	— 6.3	—11.15	—*6.3	—18.2	11.9
Jan. 2....	— 3.7	— 3.3	— 3.4	— 3.0	— 3.3	— 3.3	— 3.7	— 4.6	— 3.5	— 0.7	— 3.50	— 0.7	— 9.3	8.6
Jan. 3....	— 5.0	— 4.7	— 4.7	— 4.6	— 4.3	— 4.3	— 5.2	— 5.4	— 5.3	— 4.5	— 3.83	— 1.4	— 8.2	6.8
Jan. 4....	— 2.9	— 3.8	— 4.4	— 4.8	— 5.6	— 6.7	— 6.7	— 6.2	— 6.4	— 6.8	— 4.25	— 2.0	—10.2	8.2
Jan. 5....	—10.0	— 8.8	— 7.8	— 7.3	— 7.1	— 6.9	— 7.5	— 8.6	— 8.8	— 7.3	— 9.32	— 6.9	—15.3	8.4
Jan. 6....	—16.4	—16.2	—15.6	—15.6	—16.7	—16.8	—15.9	—15.7	—14.8	—14.5	—13.02	— 7.8	—20.7	12.9
Jan. 7....	—14.8	—13.8	—17.7	—14.9	—14.9	—14.8	—14.1	—14.0	—15.4	—15.5	—15.90	—13.8	—22.0	8.2
Jan. 8....	—11.5	—11.8	—12.0	—11.7	—12.4	—12.8	—12.1	—14.0	—14.6	—15.1	—13.75	—11.2	—21.2	10.0
Jan. 9....	—19.2	—19.6	—20.5	—20.1	—19.9	—19.5	—20.2	—20.6	—20.7	—20.5	—17.65	—13.2	—25.2	12.0
Jan. 10....	—14.7	—14.7	—15.7	—17.3	—17.6	—17.6	—17.9	—17.5	—17.5	—17.5	—16.29	—12.5	—24.2	11.7
Jan. 11....	—24.5	—22.9	—24.5	—24.9	—25.0	—25.2	—25.5	—25.5	—25.2	—25.1	—22.18	—17.5	—30.3	12.8
Jan. 12....	—29.2	—29.3	—20.5	—30.3	—31.4	—32.0	—32.4	—32.4	—33.6	—33.8	—28.17	—23.8	—38.8	15.0
Jan. 13....	—32.1	—31.9	—30.4	—31.5	—31.7	—29.5	—31.5	—31.7	—31.7	—30.9	—32.50	—29.5	—39.2	9.7
Jan. 14....	—26.4	—27.4	—28.1	—29.3	—29.3	—29.0	—29.5	—29.5	—29.5	—29.3	—28.69	—24.7	—36.2	11.5
Jan. 15....	—31.6	—32.5	—34.7	—35.0	—35.0	—35.5	—35.9	—36.0	—36.8	—35.6	—31.96	—28.6	—41.8	13.2
Jan. 16....	— 9.3	— 6.9	— 5.3	— 4.3	— 3.5	— 3.3	— 2.9	— 2.6	— 2.5	— 2.5	—16.35	— 2.5	—40.6	38.1
Jan. 17....	— 0.5	— 0.5	— 0.8	— 1.6	— 2.1	— 2.3	— 3.4	— 4.1	— 4.4	— 4.9	— 0.18	9.1	— 8.7	17.8
Jan. 18....	—12.7	—12.7	—12.8	—13.1	—13.4	—13.4	—13.9	—14.0	—14.1	—14.5	—11.55	— 6.2	—18.7	12.5
Jan. 19....	—19.9	—19.5	—19.6	—19.4	—10.4	—19.4	—21.1	—21.6	—21.6	—22.0	—19.07	—14.7	—26.5	11.8
Jan. 20....	—20.7	—20.5	—19.4	—17.8	—17.5	—18.0	—18.0	—17.9	—17.5	—17.7	—21.62	—17.5	—30.0	12.5
Jan. 21....	—10.6	—10.9	—11.2	—11.6	—12.0	—12.1	—11.4	—10.2	— 9.7	— 9.9	—13.22	— 9.7	—22.0	12.3
Jan. 22....	— 5.8	— 5.5	— 4.3	— 3.6	— 3.3	— 3.3	— 3.0	— 2.5	— 2.1	— 1.6	— 5.25	— 1.6	—13.2	11.6
Jan. 23....	0.5	2.7	3.2	3.7	4.4	4.9	5.3	6.0	6.6	10.0	2.11	10.0	— 4.3	14.3
Jan. 24....	— 9.4	—11.2	—13.1	—14.1	—14.8	—15.6	—15.5	—14.5	—14.1	—13.4	— 4.90	12.3	—19.3	31.6
Jan. 25....	—22.8	—22.8	—23.2	—23.2	—23.6	—24.3	—24.8	—24.8	—25.1	—24.8	—20.18	—13.7	—28.4	14.7
Jan. 26....	—23.6	—23.8	—23.2	—23.8	—24.9	—25.7	—24.2	—24.3	—26.5	—25.7	—24.30	—23.2	—31.2	8.0
Jan. 27....	—30.7	—30.5	—30.3	—30.7	—31.0	—31.3	—31.0	—30.6	—31.1	—31.4	—30.57	—27.8	—36.0	8.2
Jan. 28....	—30.3	—30.4	—29.8	—29.0	—29.3	—28.4	—27.1	—27.0	—27.0	—27.8	—29.48	—27.0	—36.2	9.2
Jan. 29....	—26.7	—25.9	—24.5	—25.7	—26.4	—26.7	—26.9	—27.6	—28.0	—28.1	—27.16	—24.5	—32.9	8.4
Jan. 30....	—33.6	—32.4	—32.0	—31.9	—32.4	—32.2	—33.2	—32.5	—31.8	—30.2	—31.55	—27.8	—38.7	10.9
Jan. 31....	—20.2	—17.6	—15.2	—11.7	—10.2	— 8.8	— 8.8	— 7.9	— 7.5	— 7.0	—21.25	— 7.0	—35.2	28.2
Means..	—17.07	—16.76	—16.80	—16.93	—16.88	—16.88	—17.02	—16.99	—17.03	—16.61	—16.99	—11.99	—25.25	13.26

* Highest reading of standard thermometer taken for maximum of day from January 1, 1883, to June 1, 1883.

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time −5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Feb. 1....	−6.9	−6.9	−6.7	−6.3	−7.4	−8.2	−9.3	−10.2	−11.0	−11.5	−11.3	−11.5	−11.2	−10.8
Feb. 2....	−9.2	−8.5	−7.7	−7.6	−7.7	−6.7	−6.7	−6.0	−6.9	−6.9	−6.6	−5.3	−5.1	−4.8
Feb. 3....	2.3	2.3	3.0	4.7	4.8	4.2	3.4	2.1	1.4	1.3	0.4	−0.1	0.6	2.3
Feb. 4....	12.6	12.8	13.6	13.5	12.5	10.5	9.1	8.7	8.0	7.7	7.1	6.5	6.6	6.9
Feb. 5....	11.8	11.9	12.0	12.1	11.5	11.8	13.3	13.9	13.9	14.0	13.9	13.9	13.8	14.4
Feb. 6....	23.5	23.7	23.7	23.3	22.7	21.7	20.9	18.8	14.9	10.9	7.2	3.6	−0.2	−1.6
Feb. 7....	−6.0	−5.3	−4.2	−2.5	−1.7	−0.8	0.5	2.5	3.3	5.2	8.2	12.1	15.2	14.9
Feb. 8....	0.1	−0.7	−2.4	−0.7	0.1	−0.5	−0.7	−0.7	−1.0	−0.7	−0.9	−1.0	−0.8	−0.5
Feb. 9....	7.4	9.4	12.5	15.2	16.8	17.4	18.3	19.2	19.9	18.0	23.1	24.1	19.4	18.0
Feb. 10....	−5.1	−6.8	−8.2	−9.5	−11.2	−12.8	−14.1	−14.9	−15.5	−15.5	−16.0	−16.5	−16.7	−17.3
Feb. 11....	−15.6	−15.6	−15.6	−15.5	−15.6	−15.4	−15.4	−15.2	−15.0	−14.7	−14.7	−14.4	−14.0	−13.8
Feb. 12....	−15.3	−14.4	−12.9	−11.9	−11.0	−10.0	−9.3	−8.4	−7.5	−6.6	−5.6	−4.5	−4.0	−3.9
Feb. 13....	7.0	6.0	3.2	0.4	−1.6	−3.0	−4.5	−5.1	−5.2	−5.3	−5.6	−5.8	−6.0	−6.0
Feb. 14....	−9.7	−9.7	−10.3	−10.5	−10.7	−11.9	−13.2	−14.1	−14.0	−13.6	−13.1	−12.4	−11.2	−10.5
Feb. 15....	−6.5	−6.5	−6.3	−6.7	−6.8	−6.8	−7.1	−8.0	−6.2	−12.1	−13.6	−14.9	−13.8	−13.1
Feb. 16....	−14.5	−14.9	−15.8	−15.6	−15.4	−14.7	−14.5	−14.5	−14.6	−14.6	−14.5	−15.4	−17.5	−18.6
Feb. 17....	−9.7	−8.6	−7.9	−8.4	−8.8	−8.7	−7.1	−5.3	−4.4	−4.3	−4.2	−4.7	−6.7	−7.6
Feb. 18....	−11.2	−10.4	−9.5	−9.5	−9.3	−8.2	−6.9	−5.1	−3.8	−2.1	−1.1	−0.7	1.1	2.2
Feb. 19....	9.5	7.4	7.0	6.4	6.0	5.3	4.2	3.2	2.5	2.5	4.2	5.1	4.3	3.7
Feb. 20....	5.8	5.1	3.3	1.7	0.1	−1.7	−4.5	−6.2	−7.7	−8.4	−8.8	−9.7	−11.1	−12.6
Feb. 21....	−10.8	−10.9	−11.5	−12.2	−12.9	−13.2	−13.0	−12.6	−12.3	−11.9	−11.8	−11.1	−10.7	−10.2
Feb. 22....	−9.5	−10.8	−12.3	−13.1	−14.3	−15.4	−16.6	−16.4	−16.9	−18.2	−18.4	−20.5	−20.3	−20.4
Feb. 23....	−20.0	−20.9	−21.2	−21.5	−21.2	−21.2	−16.7	−17.5	−18.3	−18.2	−18.1	−18.2	−17.5	−17.7
Feb. 24....	−19.0	−18.4	−20.0	−20.5	−21.2	−21.0	−21.4	−22.1	−22.8	−23.3	−23.6	−23.3	−22.9	−22.1
Feb. 25....	−22.8	−23.4	−23.7	−23.8	−23.8	−22.5	−22.4	−21.5	−20.6	−20.5	−18.6	−18.8	−19.2	−19.4
Feb. 26....	−22.1	−22.4	−24.0	−23.8	−24.5	−25.3	−25.7	−26.2	−26.9	−27.1	−27.5	−27.6	−29.8	−30.7
Feb. 27....	−17.5	−17.8	−17.1	−17.7	−18.2	−19.4	−19.1	−19.4	−20.1	−21.0	−20.5	−20.7	−19.4	−19.2
Feb. 28....	−13.8	−13.1	−11.9	−9.3	−10.4	−10.4	−8.0	−7.0	−4.9	−3.5	−2.5	−2.5	−4.2	−4.4
Means..	−5.90	−5.98	−6.10	−6.05	−6.40	−6.68	−6.66	−6.71	−6.85	−7.16	−6.89	−6.93	−7.19	−7.21

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1883.														
Feb. 1....	−10.7	−10.8	−10.4	−10.3	−10.5	−10.4	−10.4	−10.2	−10.2	−9.5	−9.69	−6.3	−15.1	8.8
Feb. 2....	−4.9	−4.2	−4.2	−3.0	−2.4	−1.7	−0.8	0.2	0.7	1.6	−4.77	1.6	−12.3	13.9
Feb. 3....	4.3	5.3	6.2	7.0	7.2	7.6	8.9	12.3	13.9	14.3	4.99	14.3	−1.9	16.2
Feb. 4....	7.0	6.9	6.4	7.0	7.1	7.5	8.2	8.9	9.0	9.9	8.92	13.6	5.0	8.6
Feb. 5....	14.9	15.6	16.6	15.8	16.1	15.6	16.2	22.3	23.2	22.7	15.05	23.2	9.2	14.0
Feb. 6....	−2.4	−2.4	−4.2	−4.2	−4.0	−4.7	−5.8	−7.3	−7.4	−6.6	6.84	23.7	−9.9	33.6
Feb. 7....	20.0	20.1	19.0	16.8	14.1	15.2	13.6	11.0	6.6	3.5	7.55	20.1	−8.2	28.3
Feb. 8....	0.2	2.5	3.2	3.4	3.6	4.2	4.2	4.3	4.8	5.8	1.08	5.8	−4.8	10.6
Feb. 9....	16.5	15.2	17.2	15.8	14.5	10.8	7.0	4.4	1.7	1.4	14.31	24.4	−5.2	29.6
Feb. 10....	−17.5	−17.3	−16.9	−16.7	−16.2	−15.7	−15.4	−15.7	−16.0	−15.6	−14.30	−5.1	−21.8	16.7
Feb. 11....	−13.7	−13.6	−13.4	−13.4	−13.8	−14.3	−16.5	−16.8	−16.2	−16.0	−14.92	−13.4	−20.6	7.2
Feb. 12....	−1.5	0.4	1.2	2.5	3.4	5.1	5.3	6.9	7.3	6.9	−3.66	7.3	−19.2	26.5
Feb. 13....	−6.5	−7.4	−8.2	−9.5	−9.3	−10.8	−11.0	−10.6	−10.2	−10.1	−5.21	7.0	−13.8	20.8
Feb. 14....	−9.7	−9.9	−10.4	−10.6	−9.3	−9.1	−8.8	−8.3	−7.7	−7.0	−10.65	−7.0	−17.7	10.7
Feb. 15....	−12.1	−10.6	−11.0	−10.5	−10.6	−11.2	−11.9	−13.2	−14.0	−14.0	−10.31	−6.2	−17.9	11.7
Feb. 16....	−17.6	−16.6	−15.0	−13.9	−14.3	−14.3	−13.6	−13.1	−12.2	−11.0	−14.86	−11.0	−22.6	11.6
Feb. 17....	−11.2	−11.0	−10.4	−10.4	−10.8	−10.4	−10.6	−11.5	−11.5	−12.0	−8.59	−4.2	−15.6	11.4
Feb. 18....	2.7	3.2	3.7	4.1	4.9	5.7	5.9	5.8	6.8	7.4	−1.01	7.4	−14.9	22.3
Feb. 19....	4.7	5.3	6.9	9.1	10.0	10.0	9.7	8.3	7.0	6.4	6.20	10.0	0.8	9.2
Feb. 20....	−13.6	−13.4	−12.3	−12.1	−13.3	−11.0	−10.8	−10.8	−11.1	−11.0	−7.25	5.8	−17.1	22.9
Feb. 21....	−9.4	−8.6	−7.8	−7.5	−6.9	−7.0	−7.5	−7.9	−8.6	−8.9	−10.22	6.9	−17.4	24.3
Feb. 22....	−20.3	−20.1	−19.7	−18.4	−17.8	−18.2	−18.2	−18.4	−19.5	−20.0	−17.24	−9.5	−25.2	15.7
Feb. 23....	−17.3	−16.6	−15.2	−14.9	−14.7	−14.5	−15.8	−16.9	−18.2	−19.0	−17.57	−14.5	−25.1	10.6
Feb. 24....	−22.1	−22.0	−21.6	−21.0	−21.0	−21.2	−20.8	−21.1	−21.9	−22.9	−21.55	−18.4	−27.5	9.1
Feb. 25....	−19.1	−19.0	−18.7	−18.5	−17.7	−17.7	−18.8	−19.2	−20.4	−21.5	−20.48	−18.5	−27.4	8.9
Feb. 26....	−29.8	−28.5	−25.7	−24.3	−22.2	−20.3	−28.5	−17.9	−17.7	−18.2	−24.86	−17.7	−34.3	16.6
Feb. 27....	−18.8	−17.7	−15.2	−14.3	−16.2	−18.0	−19.7	−17.9	−17.4	−16.1	−18.27	−14.3	−25.0	10.7
Feb. 28....	−3.2	−2.4	−2.4	−1.7	−1.2	−2.5	−4.5	−5.1	−6.7	−8.4	−6.00	−1.2	−18.6	17.4
Means..	−6.82	−6.34	−5.80	−5.49	−5.40	−5.40	−6.09	−5.62	−5.92	−6.00	−6.32	0.85	−15.15	16.00

Table showing the temperature of the air at Uglaamie from October, 1881, *to August,* 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time,—5 hours 17 minutes.]

Date	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1883.														
Mar. 1 ...	—11.4	—11.2	— 9.4	—14.3	—16.5	—19.4	—20.5	—22.1	—23.7	—25.0	—24.7	—24.4	—25.8	—25.9
Mar. 2 ...	—32.7	—33.1	—34.4	—33.6	—36.8	—38.4	37.8	—39.2	—40.4	—40.3	—39.2	—37.4	—35.3	—23.6
Mar. 3 ...	—24.9	—24.0	—25.8	—25.9	—26.1	—26.9	—27.1	—26.9	—27.5	—27.6	—27.8	—26.8	—26.0	—25.7
Mar. 4 ...	—16.5	—17.5	—19.4	—18.4	—19.0	—19.4	—18.2	—17.7	—17.7	—19.6	—18.7	—24.2	—22.1	—23.3
Mar. 5 ...	—15.7	—16.6	—17.7	—11.9	—14.7	—18.0	—17.5	—14.9	—13.1	— 9.7	— 7.1	— 5.1	— 3.3	— 3.5
Mar. 6 ...	—15.6	—16.7	—18.2	—19.1	—18.6	—19.4	—22.9	—24.9	—25.2	—27.0	—28.8	—30.6	—32.2	—30.8
Mar. 7 ...	—24.3	—24.6	—24.2	—25.9	—26.1	—26.3	—25.7	—27.8	—29.6	—31.5	—32.2	—32.7	—33.4	—29.7
Mar. 8 ...	—23.1	—21.2	—20.5	—23.1	—24.9	—25.2	—28.1	—25.9	—27.7	—28.3	—27.0	—28.2	—31.7	—33.8
Mar. 9 ...	—37.3	—37.3	—37.2	—37.7	—38.4	—39.6	—40.3	—41.6	—43.3	—46.3	—46.4	—43.3	—42.5	—40.4
Mar. 10 ...	—27.5	—38.5	—40.6	—40.2	—40.2	—40.4	—39.6	—39.4	—39.4	—40.3	—40.6	—40.9	—40.1	—39.0
Mar. 11 ...	—37.6	—36.3	—36.7	—34.9	—37.3	—36.7	—36.9	—36.8	—36.0	—37.4	—38.3	—37.1	—39.2	—38.4
Mar. 12 ...	—24.2	—25.8	—25.1	—23.2	—21.9	—23.1	—22.1	—21.3	—19.2	—21.1	—20.6	—21.0	—19.4	—18.2
Mar. 13 ...	—20.0	—21.1	—19.5	—20.3	—23.8	—25.7	—26.9	—25.9	—25.9	—25.9	—25.4	—24.3	—26.6	—25.7
Mar. 14 ...	—27.5	—26.7	—28.8	—30.5	—27.9	—29.3	—29.3	—28.0	—29.6	—29.5	—28.9	—28.6	—28.5	—25.9
Mar. 15 ...	—26.7	—29.8	—31.8	—31.5	—33.6	—33.9	—34.8	—35.5	—35.6	—34.6	—45.7	—33.9	—32.4	—30.3
Mar. 16 ...	—21.0	—21.1	—21.8	—22.2	—21.5	—20.6	—18.4	—17.9	—18.2	—18.2	—18.2	—17.4	—16.6	—14.0
Mar. 17 ...	—16.7	—15.8	—15.8	—15.8	—15.9	—15.7	—15.6	—15.6	—16.2	—16.6	—16.6	—17.0	—16.7	—16.3
Mar. 18 ...	—13.2	—14.0	—16.6	—20.1	—20.5	—20.1	—20.3	—23.8	—22.0	—24.3	—21.2	—20.3	—20.1	—19.6
Mar. 19 ...	—17.7	—18.4	—18.7	—18.4	—18.0	—20.5	—20.5	—20.3	—20.9	—21.5	—22.0	—23.6	—23.3	—22.6
Mar. 20 ...	—22.3	—23.0	—24.8	—24.2	—24.7	—26.9	—22.7	—23.8	—25.7	—23.2	—22.2	—24.0	—22.9	—23.0
Mar. 21 ...	—18.3	—17.6	—19.7	—20.5	—20.3	—18.2	—16.4	—16.4	—16.4	—15.9	—15.6	—14.8	—13.5	—12.1
Mar. 22 ...	— 5.1	— 5.2	— 5.6	— 6.1	— 6.2	— 6.0	— 5.9	— 5.8	— 6.0	— 6.3	— 6.7	— 6.3	— 6.6	— 6.7
Mar. 23 ...	— 5.3	— 8.8	— 7.1	— 3.8	— 0.5	— 0.3	— 1.7	— 4.7	— 7.5	—11.2	—11.2	—12.4	—11.8	—10.7
Mar. 24 ...	— 2.9	— 4.1	— 4.5	— 1.2	0.6	1.4	— 0.7	— 1.2	— 1.3	— 2.1	0.6	3.0	1.4	3.4
Mar. 25 ...	13.3	15.8	18.7	19.8	20.7	21.1	23.0	23.9	19.8	18.5	16.8	18.0	19.9	22.3
Mar. 26 ...	9.1	5.3	4.0	4.0	5.3	4.0	5.7	7.4	7.0	6.8	9.1	10.8	12.6	16.1
Mar. 27 ...	25.6	25.7	25.1	24.2	23.7	22.9	20.8	21.3	20.5	19.7	20.2	21.1	21.1	23.2
Mar. 28 ...	5.3	3.2	0.6	— 3.0	— 3.8	— 5.8	— 6.7	— 6.7	— 7.7	— 7.7	— 8.7	— 6.3	— 2.6	1.4
Mar. 29 ...	19.0	20.5	21.3	18.8	18.8	19.1	16.8	16.3	12.9	14.7	15.7	16.9	17.8	10.7
Mar. 30 ...	14.1	7.8	5.3	8.9	9.5	10.0	8.9	2.9	— 0.7	— 1.5	— 0.7	— 1.2	2.5	3.4
Mar. 31 ...	9.1	10.4	10.9	10.5	10.8	11.0	9.8	8.0	3.4	3.4	4.9	6.1	4.2	4.2
Means....	—12.97	—13.54	—14.13	—14.18	—14.45	—15.04	—15.21	—15.62	—16.55	—17.08	—17.01	—16.32	—15.91	—14.37

Date.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.	Max.	Min.	Diff.
1883.														
Mar. 1 ...	—26.7	—26.8	—27.5	—25.8	—26.2	—27.6	—28.3	—30.9	—33.6	—33.4	—23.38	— 9.4	—37.2	27.8
Mar. 2 ...	—32.3	—30.3	—28.2	—24.7	—23.3	—22.9	—22.7	—23.4	—24.7	—24.3	—31.62	—22.7	—45.2	22.5
Mar. 3 ...	—24.3	—22.1	—20.5	—18.2	—16.8	—15.9	—16.0	—15.2	—15.4	—15.4	—22.87	—15.2	—32.2	17.0
Mar. 4 ...	—24.5	—23.4	—22.3	—20.5	—18.0	—17.3	—18.0	—16.9	—15.0	—16.8	—19.35	—15.0	—28.3	13.3
Mar. 5 ...	— 5.3	— 8.6	—10.2	—11.7	—12.8	—13.0	—13.4	—13.4	—13.2	—13.6	—11.83	— 3.3	—23.2	19.9
Mar. 6 ...	—29.9	—29.4	—20.3	—20.1	—19.7	—19.5	—20.5	—23.3	—23.3	—19.6	—23.15	—15.6	—36.7	21.1
Mar. 7 ...	—29.5	—22.4	—18.2	—17.1	—17.5	—17.5	—19.5	—21.5	—23.1	—24.2	—25.19	—17.1	—38.3	21.2
Mar. 8 ...	—34.9	—36.3	—36.7	—36.8	—37.3	—35.3	—36.7	—37.3	—37.7	—38.3	—30.67	—20.5	—43.8	23.3
Mar. 9 ...	—39.6	—36.6	—31.9	—33.4	—32.9	—32.1	—32.4	—32.8	—33.8	—35.3	—38.12	—32.1	—51.4	19.3
Mar. 10 ...	—37.7	—37.1	—33.7	—32.4	—31.0	—30.3	—30.7	—31.9	—35.9	—35.6	—37.21	—30.3	—46.7	16.4
Mar. 11 ...	—36.6	—34.6	—32.1	—29.9	—28.9	—27.8	—27.1	—25.6	—27.0	—26.7	—34.00	—25.6	—43.4	17.8
Mar. 12 ...	—16.7	—15.4	—14.9	—13.4	—12.3	—13.9	—14.3	—18.0	—19.6	—20.5	—19.38	—12.3	—30.1	17.8
Mar. 13 ...	—25.3	—24.7	—22.9	—21.2	—20.4	—21.0	—22.5	—22.9	—26.0	—26.7	—23.78	—19.5	—32.7	13.2
Mar. 14 ...	—25.1	—23.1	—23.5	—21.5	—20.4	—21.2	—21.1	—19.6	—21.5	—22.8	—25.78	—19.6	—34.7	15.1
Mar. 15 ...	—27.1	—23.4	—22.6	—20.8	—20.3	—19.4	—19.3	—19.5	—20.0	—21.3	—28.49	—19.3	—39.7	20.4
Mar. 16 ...	—12.1	—11.8	—10.4	— 9.7	— 9.6	—10.8	—12.6	—14.6	—16.6	—16.7	—16.33	— 9.6	—26.0	16.4
Mar. 17 ...	—14.7	—13.9	—12.3	—11.3	—10.8	—11.0	—11.3	—11.8	—12.4	—13.0	—14.53	—10.8	—21.1	10.3
Mar. 18 ...	—16.4	—13.8	—10.5	— 9.5	— 9.1	— 9.1	—10.4	—12.5	—13.3	—12.3	—16.38	— 9.1	—27.7	18.6
Mar. 19 ...	—21.3	—19.3	—16.6	—14.7	—14.3	—13.1	—14.5	—14.9	—18.9	—21.0	—19.00	—13.1	—27.8	14.7
Mar. 20 ...	—20.4	—23.6	—14.6	—13.9	—13.9	—14.7	—15.6	—15.1	—15.3	—16.3	—20.70	—13.9	—32.2	18.3
Mar. 21 ...	—11.0	— 9.6	— 8.4	— 7.5	— 6.9	— 6.2	— 6.0	— 5.6	— 5.3	— 5.1	—12.80	— 5.1	—24.1	19.0
Mar. 22 ...	— 6.1	— 5.7	— 4.6	— 3.2	— 1.7	— 0.6	— 0.8	— 0.5	— 0.4	— 2.9	— 4.62	— 0.4	— 9.3	8.9
Mar. 23 ...	—10.6	— 9.5	— 7.8	— 7.0	— 4.6	— 4.7	— 2.8	— 1.1	0.0	0.1	— 6.04	0.1	—15.9	16.0
Mar. 24 ...	5.0	6.4	9.8	13.9	14.2	17.3	17.5	18.6	15.9	14.0	5.21	18.6	— 8.0	26.6
Mar. 25 ...	21.1	21.6	21.6	20.5	22.5	23.7	22.0	18.3	15.0	10.1	19.50	23.9	9.6	14.3
Mar. 26 ...	18.9	20.3	22.5	22.7	22.5	22.2	22.3	24.7	26.2	24.3	13.91	26.2	0.7	25.5
Mar. 27 ...	23.8	21.1	18.1	15.1	12.9	11.1	9.7	8.4	8.0	7.0	18.76	25.7	4.0	21.7
Mar. 28 ...	4.4	7.4	10.3	13.0	12.9	13.4	14.6	14.8	16.2	17.4	3.10	17.4	—10.8	28.2
Mar. 29 ...	21.9	24.5	25.5	24.9	23.1	24.2	23.0	19.2	17.5	17.9	19.58	25.5	12.2	13.3
Mar. 30 ...	6.5*	9.0	10.6	10.7	11.1	12.7	12.3	9.7	8.3	8.7	7.03	14.1	— 3.2	17.3
Mar. 31 ...	4.0*	3.9*	3.9*	3.6*	3.4*	3.4*	3.3	1.8	0.1	— 0.7	5.56	11.0	— 3.2	14.2
Means ...	—13.61	—12.49	—10.69	— 9.67	— 9.33	— 8.93	— 9.41	—10.00	—11.12	—11.71	—13.31	— 5.71	—24.08	18.37

* Interpolated.

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. [illegible] 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Apr. 1	-2.2	-4.1	-6.3	-9.3	-10.3	-11.0	11.9	-11.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Apr. 2	-11.4	-13.0	-13.1	-14.0	-15.4	-15.3	-16.6	[illegible]	-17.3	-18.6	-19.1	[illegible]	[illegible]	-14.2
Apr. 3	-12.3	-13.9	-14.1	-14.9	-15.6	-16.4	-17.1	-17.7	-17.9	-18.2	-18.1	[illegible]	[illegible]	[illegible]
Apr. 4	-11.2	-13.3	-13.8	-14.7	-15.6	-15.6	-17.3	-18.4	-19.2	-19.7	[illegible]	[illegible]	[illegible]	[illegible]
Apr. 5	-9.5	-8.9	-8.2	-7.9	-7.5	-7.7	-6.9	-6.9	-6.9	[illegible]	-6.0	[illegible]	-4.1	[illegible]
Apr. 6	-3.4	-5.3	-6.0	-6.0	-6.0	-6.2	-6.7	-6.5	-6.0	-6.5	-6.0	-5.2	[illegible]	[illegible]
Apr. 7	-13.8	-15.6	19.2	18.6	-18.4	-17.3	-16.6	-15.4	-14.7	13.1	-11.2	9.5	9.0	-7.5
Apr. 8	-18.6	-20.3	-21.2	-22.4	-23.1	-24.2	-24.7	-24.5	-23.8	24.0	-24.1	[illegible]	-15.7	-12.1
Apr. 9	-11.9	-14.3	-15.4	-15.6	-11.1	-13.2	-15.2	-16.6	-16.9	-15.5	-13.9	-10.5	-9.5	-7.8
Apr. 10	-1.1	-0.7	-1.1	2.0	-2.5	-3.4	-4.2	-4.9	-6.0	-7.0	-7.0	-6.1	-5.0	[illegible]
Apr. 11	-3.5	-4.8	-9.1	-5.7	-5.3	-6.3	-6.1	-6.0	-6.2	-6.1	-5.8	5.0	-4.2	[illegible]
Apr. 12	-2.5	-5.1	5.0	-4.5	-6.0	-7.5	-9.5	-9.8	-7.3	4.9	2.6	-0.7	1.8	[illegible]
Apr. 13	1.7	0.7	0.0	-1.4	-2.8	-4.0	-4.0	-5.1	-7.0	-6.4	-4.1	[illegible]	-3.5	-1.9
Apr. 14	1.7	-2.2	-1.2	-1.1	-1.5	-4.5	-7.3	-6.9	-5.9	-4.9	-3.2	-0.5	[illegible]	[illegible]
Apr. 15	3.5	1.6	0.8	-1.2	-1.3	-1.2	-1.0	-2.1	-2.5	-2.4	-2.6	-1.9	-3.2	-1.8
Apr. 16	-3.0	-11.2	-9.4	-8.8	-10.6	-13.6	-18.4	-21.0	-24.0	-23.2	-22.0	-20.2	[illegible]	-14.7
Apr. 17	-13.6	-16.4	-18.1	-18.4	-19.2	-19.2	-19.0	-21.7	-21.3	-24.2	-23.0	-21.6	-19.7	16.6
Apr. 18	-17.5	-19.6	-21.2	-24.0	-25.2	-26.7	-26.7	-27.8	-28.8	-30.8	29.0	-27.0	-21.2	[illegible]
Apr. 19	-7.0	-7.2	-7.3	-7.7	-9.4	-8.6	-8.9	-8.7	-8.9	-8.6	-7.6	-6.8	[illegible]	[illegible]
Apr. 20	5.7	6.1	5.3	4.9	4.9	6.2	5.7	5.1	6.7	6.9	7.2	7.2	[illegible]	[illegible]
Apr. 21	15.1	14.2	13.6	12.8	12.0	11.2	10.8	9.5	5.6	6.2	4.1	2.6	1.6	[illegible]
Apr. 22	-0.7	-1.3	-1.7	-2.2	-2.1	-2.5	-2.8	-3.0	-2.4	1.4	-0.3	0.7	2.8	3.2
Apr. 23	-3.4	-3.9	-4.7	-5.3	-5.1	-1.7	-3.2	-6.7	-7.0	-7.0	-6.7	-2.3	1.8	5.9
Apr. 24	6.4	5.7	4.0	2.2	1.6	1.2	-0.5	-0.3	1.5	3.2	5.1	6.9	7.2	7.4
Apr. 25	10.3	10.1	9.1	9.6	8.9	8.2	9.1	9.1	9.3	10.1	10.5	11.2	12.0	11.6
Apr. 26	11.1	11.4	10.8	10.6	9.8	8.2	7.4	8.9	8.7	8.1	7.7	6.9	7.4	7.5
Apr. 27	4.8	3.7	1.7	-1.1	0.8	3.2	3.2	3.4	4.2	4.1	5.0	6.5	8.2	9.9
Apr. 28	10.4	7.6	7.7	7.2	7.4	7.2	7.7	5.6	5.4	6.8	7.9	9.5	11.0	13.3
Apr. 29	10.1	9.2	8.5	7.8	7.2	7.2	6.9	6.4	7.5	6.9	8.1	8.7	8.9	10.2
Apr. 30	8.5	7.5	5.5	4.2	3.2	3.4	4.2	3.6	1.8	1.4	1.0	1.7	2.9	3.4
Means	-1.91	-3.44	-4.40	-5.02	-5.47	-5.66	-6.32	-6.86	-7.10	-7.07	-6.52	-5.27	-3.99	-2.59

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1883.														
Apr. 1	-15.6	-13.8	-12.7	-10.9	-10.2	-9.3	-8.9	-7.8	-8.6	-8.6	-11.37	-2.2	-21.9	19.7
Apr. 2	-13.1	-10.6	-10.0	-9.7	-8.7	-8.2	-8.8	-9.5	-9.2	-10.1	-13.09	-8.2	-24.8	16.6
Apr. 3	-13.0	-11.9	-11.2	-10.5	-10.2	-9.3	-8.8	-8.5	-19.5	-10.4	-13.75	-8.5	-23.0	14.5
Apr. 4	-14.9	-13.0	-11.4	-10.1	-9.0	-8.2	-7.9	-7.8	-7.6	-9.5	-14.01	-7.6	-26.7	19.1
Apr. 5	-2.4	-2.0	-0.9	-0.7	-0.5	-0.4	-0.8	-0.9	-2.2	-3.2	-4.55	-0.4	-14.3	13.9
Apr. 6	-2.6	-2.5	-3.1	-2.0	-2.1	-2.3	-3.0	-3.7	-4.9	-7.7	-4.70	-2.0	[illegible]	9.3
Apr. 7	-6.9	-5.3	-7.6	-8.6	-9.2	-8.5	-9.7	-10.2	-12.6	-15.2	-12.24	-5.3	-23.0	17.7
Apr. 8	-10.2	-7.8	-6.0	-4.9	-4.5	-4.3	-4.7	-5.5	-7.2	-8.8	-15.15	-4.3	-29.0	24.7
Apr. 9	-6.7	-5.9	-4.7	-2.3	-0.6	-0.6	-1.0	-1.1	-1.3	-1.1	-8.99	-0.6	-29.4	19.8
Apr. 10	-2.9	-2.2	-1.6	-1.2	-0.7	-0.7	-1.2	-1.7	-2.4	-2.9	-2.99	-0.7	-9.9	9.2
Apr. 11	-3.2	-2.6	-1.2	0.4	0.8	1.3	-0.1	0.0	-1.9	-1.1	-3.53	1.3	-9.0	10.3
Apr. 12	4.9	5.4	5.5	5.7	5.6	5.1	4.2	3.6	3.1	2.2	-0.61	5.7	-13.6	19.3
Apr. 13	0.4	1.6	3.8	5.3	6.2	6.8	6.8	6.4	4.4	3.1	0.10	6.8	10.6	17.4
Apr. 14	5.5	5.8	6.3	7.0	7.3	7.3	7.5	6.2	5.7	4.4	0.93	7.5	-10.9	18.4
Apr. 15	0.1	1.2	-0.2	-1.7	-2.2	-2.5	-3.5	-4.6	-4.1	-6.7	-1.63	3.5	-9.7	13.2
Apr. 16	-14.4	-13.8	-13.8	-13.6	-13.7	-13.9	-14.0	-13.9	-14.1	-13.8	-14.90	-3.0	-27.7	24.7
Apr. 17	-14.4	-13.1	-11.3	-11.0	-10.5	-9.6	-9.7	-10.8	-11.9	-14.3	-16.32	-9.6	-28.9	19.3
Apr. 18	-11.9	-9.1	-6.7	-5.8	-5.2	-5.2	-5.8	-6.1	-7.6	-7.0	-17.15	-5.2	35.0	29.8
Apr. 19	-1.6	-0.7	1.3	2.5	3.2	5.1	5.0	5.1	5.9	5.7	-3.09	5.9	-11.8	17.7
Apr. 20	10.5	11.3	12.5	13.7	14.7	15.4	16.0	15.5	15.8	14.7	9.60	16.0	2.8	13.2
Apr. 21	0.4	0.7	-0.5	-0.1	1.1	0.6	0.5	-0.3	-0.4	-0.7	5.05	15.1	-3.4	18.5
Apr. 22	4.7	4.8	4.4	3.6	3.2	1.6	1.0	0.8	-1.3	0.3	0.39	4.8	-7.5	12.3
Apr. 23	5.9	6.2	7.4	7.7	7.5	7.3	7.3	8.2	8.3	7.2	0.95	8.3	-10.1	18.4
Apr. 24	7.3	8.2	8.9	9.8	10.0	11.0	10.7	11.1	11.3	11.2	6.42	11.3	-2.5	13.8
Apr. 25	12.2	13.6	15.6	15.9	15.6	14.9	14.0	13.7	12.4	11.5	11.60	15.9	6.6	9.3
Apr. 26	8.7	8.5	8.5	8.5	8.5	8.3	8.0	7.4	7.0	5.1	8.46	11.4	3.0	8.4
Apr. 27	11.1	11.5	14.4	15.4	15.8	15.6	14.6	11.4	10.5	11.1	7.88	15.8	-2.3	18.1
Apr. 28	13.9	14.1	13.7	12.8	11.1	11.0	10.7	11.0	11.0	11.5	9.81	14.1	3.9	10.2
Apr. 29	11.3	12.5	13.6	13.6	13.6	13.2	12.5	11.8	10.1	9.6	9.81	13.6	5.0	8.6
Apr. 30	4.8	4.5	5.3	4.4	3.9	4.9	5.8	5.1	5.3	5.4	4.14	8.5	-0.8	9.3
Means	-1.07	-0.15	0.61	1.11	1.36	1.55	1.22	0.83	0.13	-0.67	-2.76	3.69	-12.16	15.76

Table showing the temperature of the air at Uglaamie from October, 1881, *to August,* 1883—**Continued.**

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
May 1....	1.6	− 0.3	− 3.8	− 3.2	− 7.0	− 7.6	−11.0	−10.4	−10.2	− 9.3	− 8.4	− 7.2	− 5.1	− 3.0
May 2....	2.3	− 0.5	− 3.4	− 5.3	− 6.9	− 7.2	− 7.7	− 7.5	− 6.4	− 5.1	− 4.5	− 2.2	− 0.5	1.6
May 3....	7.0	6.3	4.0	1.7	− 1.2	− 3.5	− 4.0	− 3.8	− 3.4	− 2.8	− 3.4	− 1.0	0.8	2.7
May 4....	7.1	5.5	4.0	2.5	1.6	0.2	− 0.3	1.1	1.9	2.8	3.5	5.3	6.3	7.8
May 5....	15.5	15.9	15.9	15.5	14.8	15.4	16.0	16.6	16.8	17.0	17.7	20.0	21.1	23.2
May 6....	33.4	31.9	27.2	28.3	26.6	27.1	29.4	29.8	29.6	27.1	25.7	23.2	21.0	19.2
May 7....	15.0	14.4	14.1	14.3	13.9	14.7	14.7	15.3	15.8	15.7	17.1	18.3	19.0	20.5
May 8....	26.3	24.7	23.7	23.5	21.7	20.5	19.0	18.3	18.7	17.7	15.8	15.4	17.8	18.8
May 9....	22.8	22.7	22.8	23.2	22.3	21.9	21.5	20.7	20.4	20.4	20.5	21.0	20.9	21.0
May 10....	25.7	23.5	22.7	21.7	20.0	18.7	18.8	19.6	19.7	21.2	21.0	21.2	23.0	25.6
May 11....	25.7	27.6	27.3	26.8	26.4	25.6	24.9	24.7	24.8	24.6	25.5	25.7	26.3	25.8
May 12....	24.9	24.7	24.4	24.3	23.5	22.3	20.5	17.8	14.7	15.7	15.6	15.8	17.7	18.0
May 13....	25.6	25.3	24.8	22.8	21.7	21.5	20.3	20.5	20.3	20.7	21.7	22.6	23.4	23.7
May 14....	24.7	24.3	23.9	24.1	23.3	23.5	23.2	22.8	23.0	23.4	23.8	25.4	25.5	29.6
May 15....	28.7	25.4	24.0	23.3	22.5	21.9	21.6	21.2	20.9	20.7	20.6	20.3	20.4	21.7
May 16....	26.8	26.2	26.3	26.9	26.6	26.4	26.8	26.8	26.9	27.5	28.5	20.8	30.4	31.2
May 17....	29.0	28.2	27.3	27.2	26.8	26.6	26.1	25.6	25.3	25.3	25.1	25.4	25.5	24.3
May 18....	23.8	23.5	23.4	22.7	21.9	22.0	21.7	21.5	21.3	21.2	21.9	23.2	23.9	25.1
May 19....	24.7	23.5	19.9	15.9	12.9	10.9	9.5	11.8	14.6	16.7	19.8	22.6	25.1	25.8
May 20....	27.8	26.5	24.7	22.1	17.0	14.0	12.6	13.7	13.8	12.6	14.7	17.1	19.2	22.8
May 21....	29.1	25.4	22.8	20.4	19.0	17.6	14.7	14.4	16.2	16.7	17.9	17.8	18.8	19.7
May 22....	23.1	22.3	21.8	21.5	20.5	20.7	20.9	20.9	20.8	21.4	21.4	22.4	24.3	24.8
May 23....	25.4	24.9	24.5	24.5	24.2	24.1	24.1	24.5	25.0	25.4	26.3	27.8	27.5	29.4
May 24....	30.1	26.7	23.2	23.7	23.9	23.1	22.2	20.7	23.4	24.7	26.0	28.1	31.3	33.5
May 25....	33.7	33.7	33.5	32.1	31.0	30.8	30.3	29.9	30.7	31.2	32.3	33.3	34.7	35.8
May 26....	34.4	33.5	32.6	32.2	31.5	31.7	31.3	30.9	30.5	30.1	29.7	30.1	30.2	30.7
May 27....	30.3	29.3	28.7	28.6	27.6	26.7	24.9	25.0	26.1	26.8	27.6	26.9	28.1	29.6
May 28....	32.7	31.1	30.3	29.4	28.2	27.6	25.4	28.0	28.8	28.8	30.5	31.5	30.4	31.2
May 29....	32.1	30.7	−29.6	28.2	27.8	27.6	30.1	29.8	30.2	29.4	29.9	30.5	29.9	29.4
May 30....	34.0	33.9	33.1	33.2	32.2	32.0	31.7	30.3	31.2	31.0	31.8	31.5	32.7	33.2
May 31....	31.5	31.2	30.3	29.7	29.4	28.8	28.2	29.3	28.8	29.3	30.1	31.1	32.6	34.9
Means....	24.35	23.29	22.05	21.35	20.12	19.54	18.95	19.03	19.30	19.61	20.18	21.06	22.01	23.15

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1883.														
May 1....	− 1.5	0.9	2.7	3.7	4.6	4.9	5.1	5.0	4.4	4.0	− 2.13	5.1	−14.0	19.1
May 2....	4.9	6.2	8.2	9.1	10.1	10.3	9.5	9.5	8.8	7.7	1.29	10.3	−10.8	21.1
May 3....	3.4	4.3	5.1	6.2	6.9	8.0	8.0	8.2	8.1	7.5	2.71	8.2	− 6.5	14.7
May 4....	9.3	10.0	12.0	13.3	14.8	14.9	15.1	15.2	15.6	14.7	7.68	15.6	− 2.2	17.8
May 5....	27.8	30.1	33.6	33.9	33.5	33.3	32.9	33.1	33.8	33.5	23.62	33.9	13.5	20.4
May 6....	19.1	19.8	20.1	19.8	19.4	18.8	18.6	17.8	17.9	16.3	23.63	33.4	15.0	18.4
May 7....	21.2	23.5	25.2	25.7	27.0	27.6	28.4	28.4	28.2	28.2	20.26	28.4	12.4	16.0
May 8....	20.9	22.0	23.0	23.7	23.7	24.0	24.0	24.2	23.1	21.1	21.32	26.3	12.9	13.4
May 9....	22.8	23.7	25.3	27.9	29.4	27.9	27.1	25.7	27.0	27.1	23.58	29.4	19.2	10.2
May 10....	26.8	25.9	27.4	27.9	28.4	28.6	30.1	30.2	27.6	27.0	24.26	30.2	17.5	12.7
May 11....	25.4	26.7	26.2	26.0	27.9	27.2	26.6	26.0	25.6	25.5	26.03	27.9	22.2	5.7
May 12....	18.8	19.5	21.7	22.5	23.7	24.8	25.5	25.6	25.3	25.3	21.36	25.6	13.3	12.3
May 13....	23.8	23.6	24.9	25.6	25.6	25.3	24.9	24.5	24.5	24.8	23.43	25.6	18.6	7.0
May 14....	30.2	30.5	31.5	31.3	29.9	29.8	30.7	32.1	30.3	29.2	26.92	32.1	21.8	10.3
May 15....	22.5	24.5	26.8	26.7	26.6	26.7	26.9	27.3	28.2	28.6	24.08	28.6	18.5	10.1
May 16....	32.3	33.0	33.9	33.7	33.4	34.4	32.5	31.8	31.0	30.1	29.72	34.4	24.7	9.7
May 17....	26.3	27.4	28.4	27.0	27.6	28.2	27.4	26.0	25.3	25.2	26.56	29.0	22.4	6.6
May 18....	26.9	26.7	28.4	28.1	28.8	28.5	27.6	26.5	25.3	25.1	24.54	28.8	19.5	9.3
May 19....	28.1	29.4	30.8	30.4	30.1	29.9	29.3	29.7	29.6	28.7	22.90	30.8	7.6	23.2
May 20....	24.1	25.3	27.1	29.2	30.0	30.9	30.0	31.6	31.8	32.3	22.95	32.3	11.5	20.8
May 21....	22.5	24.6	26.4	27.6	28.7	29.6	29.2	28.0	26.3	24.6	22.42	29.6	11.5	18.1
May 22....	25.3	25.6	25.9	26.8	27.1	27.6	28.0	27.1	25.8	25.2	23.80	28.0	19.2	8.8
May 23....	30.4	32.1	33.2	34.4	34.4	33.5	33.3	32.3	32.0	30.5	28.49	34.4	22.8	11.6
May 24....	34.6	34.4	35.4	35.4	35.0	36.6	35.8	35.1	34.1	33.9	29.62	36.6	18.9	17.7
May 25....	36.0	37.8	37.8	37.6	37.4	36.4	35.4	35.5	35.7	35.0	34.02	37.8	28.7	9.1
May 26....	31.1	31.9	32.5	32.5	33.0	33.7	32.4	32.0	32.0	31.0	31.73	34.4	28.6	5.8
May 27....	30.6	31.4	33.2	32.7	31.9	33.5	32.9	32.6	32.1	32.0	29.55	33.5	23.7	9.8
May 28....	30.8	31.8	32.5	32.7	33.5	34.2	33.2	32.4	31.6	31.9	30.77	34.2	24.5	9.7
May 29....	30.7	31.6	32.5	32.9	33.7	33.5	33.5	33.6	33.6	34.0	31.03	34.0	26.2	7.8
May 30....	33.9	34.1	34.4	33.7	33.5	32.9	32.3	32.2	31.6	31.9	32.60	34.4	28.3	6.1
May 31....	34.4	34.6	34.9	35.9	34.4	33.6	34.4	33.6	32.1	31.5	31.86	35.9	27.0	8.9
Means....	24.30	25.25	26.48	26.93	27.23	27.39	27.12	26.86	26.40	25.92	23.25	28.67	16.02	12.65

Table showing the temperature of the air at Uglaamie from October, 1881, *to August,* 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, - 5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
June 1...	30.5	30.5	29.9	29.8	29.9	29.6	29.5	29.4	29.4	30.1	29.5	30.1	30.4	30.9
June 2...	32.2	31.2	30.5	30.1	28.9	27.6	26.6	26.7	26.1	26.4	26.5	26.6	26.7	28.1
June 3...	27.6	27.6	27.2	26.7	26.4	26.2	25.6	24.7	26.0	25.1	24.5	24.5	25.5	25.8
June 4...	22.3	21.5	20.8	20.3	20.0	20.1	20.3	20.2	20.4	21.2	20.6	21.0	24.1	23.8
June 5..	29.1	29.3	26.7	25.7	25.2	24.9	24.2	23.7	23.2	24.2	25.2	25.8	27.6	28.4
June 6...	34.0	32.4	31.3	31.5	30.5	31.7	32.5	33.5	33.3	34.2	35.2	35.2	36.6	37.2
June 7...	39.0	38.3	38.3	35.5	34.0	35.2	31.5	27.8	27.4	29.1	29.5	30.4	31.7	32.6
June 8...	31.3	30.0	29.6	29.2	28.4	28.2	28.4	28.8	29.4	29.9	29.1	30.2	31.1	32.0
June 9...	30.1	29.5	28.5	28.4	27.6	26.4	26.1	25.8	25.8	25.5	25.5	25.6	26.3	27.4
June 10...	32.4	31.7	31.3	29.4	27.6	27.4	27.9	29.1	29.7	30.6	31.1	32.4	33.9	35.1
June 11...	33.2	30.6	29.7	27.8	27.0	26.8	26.6	26.7	26.8	26.5	27.3	25.1	26.8	27.6
June 12...	30.6	29.7	29.8	29.6	29.3	29.2	28.6	29.1	29.1	30.1	30.4	29.5	30.2	31.3
June 13...	33.3	33.3	33.2	33.0	32.4	32.0	32.1	32.3	32.6	32.8	34.0	35.4	36.8	37.4
June 14...	33.7	33.3	32.3	32.3	31.7	31.7	32.3	32.5	32.5	33.2	33.1	33.8	34.2	34.3
June 15...	33.3	32.5	31.4	31.0	30.8	31.3	31.4	31.3	31.4	32.6	33.0	33.3	32.9	33.5
June 16...	31.5	31.1	30.6	30.5	30.1	29.8	29.6	29.6	29.9	30.1	30.7	32.5	31.7	32.3
June 17...	30.1	29.3	28.4	27.4	26.8	25.2	25.6	26.6	26.9	27.8	28.9	29.6	30.7	31.6
June 18...	35.2	35.0	32.1	29.7	29.4	29.1	28.8	29.4	29.6	30.1	30.8	31.5	30.7	31.2
June 19...	32.2	31.1	30.7	30.2	29.6	29.2	28.4	29.0	28.0	28.5	28.7	29.6	30.0	31.2
June 20...	31.3	30.1	29.6	28.7	27.6	27.2	27.4	28.0	29.9	29.8	29.5	30.1	31.7	32.4
June 21...	35.9	32.3	30.7	30.2	29.2	28.8	28.1	27.9	27.2	27.8	27.6	28.8	29.4	30.1
June 22..	28.7	28.2	28.2	27.3	27.3	27.1	27.4	27.8	27.7	27.3	28.2	29.5	30.3	32.2
June 23...	31.5	28.7	28.0	28.6	30.1	30.5	31.3	31.5	31.4	31.5	32.0	32.1	32.5	33.9
June 24...	36.8	37.2	35.4	33.0	32.5	32.1	32.3	31.5	31.3	31.5	32.5	33.5	34.3	34.4
June 25...	37.0	36.3	35.4	33.9	33.1	31.5	31.3	31.2	31.1	31.6	31.2	32.4	32.5	32.7
June 26...	36.2	35.5	34.5	34.1	33.5	33.1	33.3	33.5	33.5	33.3	33.5	33.9	34.2	34.8
June 27...	34.5	34.0	34.4	34.2	34.2	34.4	33.9	34.0	33.6	34.1	34.3	33.9	34.3	36.1
June 28...	35.7	35.5	35.0	34.6	34.2	34.4	35.0	35.5	36.6	39.6	41.3	44.5	46.6	49.7
June 29...	47.8	40.1	40.3	41.6	40.7	40.3	39.5	39.1	40.1	39.1	37.2	37.4	39.0	39.7
June 30...	40.4	39.9	40.5	38.3	40.1	36.8	36.4	37.5	39.0	38.4	37.7	37.5	37.2	37.4
Means..	33.25	32.19	31.48	30.75	30.27	29.93	29.73	29.79	29.96	30.40	30.65	31.19	32.00	32.84

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1883.														
June 1...	31.6	32.1	33.2	34.0	34.2	34.4	33.3	33.1	32.5	32.0	31.25	34.8	27.9	6.9
June 2...	28.5	28.8	30.3	32.0	31.8	31.5	30.2	30.4	29.8	28.9	29.02	33.0	24.5	8.5
June 3...	25.9	26.7	27.4	26.9	26.4	25.0	24.9	23.4	23.1	22.7	25.66	30.7	20.9	9.8
June 4...	20.5	25.9	26.1	28.1	27.6	30.1	28.3	28.7	28.1	28.1	23.92	30.2	18.2	12.0
June 5...	30.7	33.9	35.6	36.2	36.0	37.1	37.1	36.0	35.8	35.2	29.87	38.1	22.7	15.4
June 6...	38.0	38.6	38.6	37.8	37.9	37.4	37.4	37.8	38.3	39.9	35.45	39.4	28.2	11.2
June 7...	38.5	33.6	34.2	33.9	34.4	34.2	33.6	32.7	32.8	31.9	33.13	39.4	26.2	13.2
June 8...	32.2	32.7	33.3	32.8	32.8	32.8	32.2	31.5	31.2	30.7	30.78	33.4	27.0	6.4
June 9...	28.5	29.3	30.5	31.5	31.9	32.0	31.8	32.0	32.1	32.5	28.78	32.5	24.2	8.3
June 10...	34.6	35.2	35.4	35.4	34.6	34.6	33.9	33.9	33.7	33.9	32.28	36.3	25.7	10.6
June 11...	30.4	30.7	31.7	32.0	31.3	31.4	32.1	32.1	30.9	30.5	29.23	34.9	24.7	10.2
June 12...	31.8	32.9	33.5	34.2	34.2	34.7	33.9	33.7	34.0	33.5	31.37	35.4	27.5	7.9
June 13...	37.9	38.4	38.5	37.8	36.0	36.0	35.4	34.4	34.1	33.6	34.70	38.9	30.8	8.1
June 14...	34.6	35.4	35.6	35.4	35.4	35.4	35.4	35.2	34.4	33.7	33.81	35.6	30.5	5.1
June 15...	33.8	34.5	34.6	34.6	33.7	33.9	33.5	32.8	32.5	31.9	32.73	34.9	29.8	5.1
June 16...	33.9	34.6	33.9	33.9	33.7	33.5	33.1	33.1	31.7	30.8	31.76	35.5	28.3	7.2
June 17...	32.5	33.7	34.6	34.6	34.2	35.2	34.5	34.6	34.0	35.6	30.77	35.7	23.6	12.1
June 18...	32.8	32.6	32.8	33.0	33.7	34.2	34.1	34.0	33.4	32.7	31.89	36.2	27.3	8.9
June 19...	32.3	33.2	34.7	35.4	35.4	35.5	35.0	34.4	32.6	31.8	31.53	35.5	26.5	9.0
June 20...	33.5	35.0	35.9	36.4	36.9	37.2	34.1	33.9	33.9	35.8	31.91	37.4	25.6	11.8
June 21...	30.4	30.8	30.1	30.5	31.3	31.0	30.7	30.0	29.8	29.0	29.90	35.8	25.7	10.1
June 22...	32.9	32.7	33.5	33.9	33.9	33.5	32.5	32.1	31.8	31.8	30.24	34.0	25.4	8.6
June 23...	34.3	34.4	35.4	36.2	35.7	35.5	35.6	35.5	36.2	35.2	32.82	36.1	26.0	10.1
June 24...	35.2	35.6	35.6	36.0	36.0	37.2	37.0	37.4	36.8	36.8	34.70	37.3	30.1	7.2
June 25...	32.6	33.5	34.3	34.7	35.6	36.8	36.4	36.2	36.1	35.7	33.88	36.7	30.0	6.7
June 26...	35.3	35.6	35.8	36.2	36.2	35.9	35.3	35.0	34.3	34.3	34.62	36.3	32.0	4.3
June 27...	36.3	36.5	36.0	37.0	36.0	36.5	35.9	35.7	35.2	35.5	35.08	37.2	32.5	4.7
June 28...	50.4	40.1	39.3	37.9	37.1	36.4	37.3	38.5	40.7	46.6	39.27	50.9	33.2	17.7
June 29...	39.4	40.3	48.1	49.5	39.2	39.8	41.2	41.8	43.7	42.2	41.13	50.4	35.5	14.9
June 30...	37.3	38.0	38.6	38.0	37.2	37.9	37.2	37.2	38.0	37.2	38.07	42.8	34.6	8.2
Means..	33.57	33.84	34.59	34.86	34.40	34.55	34.10	33.90	33.72	33.67	32.32	36.84	27.50	9.34

Table showing the temperature of the air at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.
1883.														
July 1 ...	36.4	35.2	34.4	34.1	33.7	33.9	33.2	32.5	32.6	33.6	35.1	34.9	35.0	35.4
July 2 ...	34.9	34.5	34.0	33.9	34.8	33.7	33.3	33.1	33.2	33.6	33.9	34.9	34.6	35.4
July 3 ...	36.3	35.6	35.3	35.0	35.0	35.2	35.3	35.3	34.6	35.4	36.5	38.7	41.1	40.4
July 4 ...	39.1	39.2	38.1	37.5	36.2	36.0	35.8	35.6	35.7	35.9	37.4	37.5	37.4	37.8
July 5 ...	35.2	34.8	35.1	34.0	33.9	33.5	33.4	33.7	33.5	34.0	34.9	35.3	35.2	35.7
July 6 ...	34.3	34.1	33.9	33.7	33.3	33.2	33.7	34.0	34.6	34.5	34.6	34.8	35.2	35.5
July 7 ...	42.9	38.4	37.6	37.5	37.1	37.0	37.8	38.0	41.5	43.3	44.8	45.8	46.9	48.3
July 8 ...	51.2	50.3	47.8	47.3	45.8	45.3	40.3	36.2	35.2	35.1	35.4	35.9	34.7	34.1
July 9 ...	36.2	37.2	33.6	38.1	35.0	35.6	32.9	36.2	39.3	38.8	36.4	37.4	37.6	37.3
July 10 ...	31.5	30.7	30.2	30.1	29.6	29.8	30.0	30.2	30.5	31.2	32.4	33.8	34.4	35.5
July 11 ...	38.5	38.7	38.9	35.8	35.2	36.3	36.9	37.4	38.3	38.0	37.9	38.2	37.6	37.8
July 12 ...	35.9	34.6	34.5	34.2	33.9	33.9	33.7	33.5	33.9	34.1	33.9	34.1	34.2	34.3
July 13 ...	36.5	36.1	34.5	35.0	33.9	34.3	34.5	34.7	34.7	35.2	34.5	34.4	36.6	35.9
July 14 ...	35.5	36.5	34.1	33.3	32.1	32.3	34.9	36.4	33.4	33.8	34.9	36.0	35.7	35.4
July 15 ...	35.9	37.4	35.3	34.6	34.4	34.4	34.2	34.0	33.5	34.5	33.7	34.1	34.6	34.7
July 16 ...	34.1	33.9	33.9	33.6	33.3	33.5	33.5	33.6	33.0	33.9	32.6	34.4	35.2	36.1
July 17 ...	33.1	32.1	31.8	30.5	29.4	29.4	29.6	30.7	32.5	32.8	32.2	36.3	36.9	38.8
July 18 ...	38.9	39.9	37.9	37.8	36.0	37.2	37.4	39.5	41.5	42.5	44.3	45.2	47.3	39.9
July 19 ...	48.2	41.0	43.3	44.0	37.4	37.9	38.3	38.8	40.4	41.8	37.5	43.0	42.7	43.2
July 20 ...	37.9	36.5	36.2	36.3	35.8	35.5	35.2	35.2	35.1	35.4	35.7	36.6	36.3	36.2
July 21 ...	34.5	33.9	33.2	40.4	32.3	32.3	32.5	32.6	32.3	40.4	33.1	34.0	34.4	34.8
July 22 ...	33.7	32.8	32.5	32.2	31.3	30.9	31.1	31.6	31.7	32.0	32.3	33.5	34.7	36.1
July 23 ...	32.6	34.5	34.0	31.5	30.1	29.2	29.2	29.1	30.8	32.5	32.1	32.0	32.4	32.5
July 24 ...	31.5	31.1	30.6	30.1	30.2	30.3	30.0	29.4	28.8	29.1	29.9	31.1	32.3	35.4
July 25 ...	40.8	40.8	39.3	35.9	35.4	33.5	33.1	35.8	36.5	38.3	36.4	34.9	35.2	39.5
July 26 ...	39.8	35.6	33.2	32.2	31.7	31.3	31.1	31.3	32.9	33.5	34.9	37.1	37.9	39.4
July 27 ...	39.3	38.9	37.9	36.5	34.6	34.0	34.4	35.4	36.9	37.3	37.6	38.3	38.6	39.3
July 28 ...	36.3	35.4	34.5	34.4	33.9	33.1	32.7	33.1	33.9	36.4	36.9	37.2	37.4	37.6
July 29 ...	32.2	32.2	31.6	31.1	30.5	29.8	29.4	29.4	29.7	31.1	30.8	30.5	31.2	32.5
July 30 ...	32.0	31.9	31.1	30.6	30.1	30.1	29.6	29.4	28.9	29.4	29.3	29.4	30.2	31.1
July 31 ...	35.6	34.7	33.6	32.3	29.7	29.2	29.3	29.0	29.1	29.2	30.1	30.4	31.6	33.4
Means..	36.80	36.08	35.22	34.95	33.73	33.60	33.43	33.70	34.15	35.05	34.90	35.80	36.29	36.75

Date.	3 p.m.	4 p.m.	5 p.m.	6 a.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.	Max.	Min.	Diff.
1883.														
July 1 ...	34.6	34.2	33.9	33.9	34.4	35.9	35.1	35.1	34.9	35.0	34.46	38.7	31.4	7.3
July 2 ...	36.4	36.7	36.0	37.7	35.4	39.0	38.7	37.9	36.3	37.1	35.38	39.6	31.9	7.7
July 3 ...	39.9	38.7	38.3	37.9	39.3	40.2	38.8	39.5	40.3	39.3	37.58	42.2	33.4	8.8
July 4 ...	38.5	38.6	39 9	37.6	38.1	37.8	37.9	37.5	36.2	35.5	37.37	40.2	33.8	6.4
July 5 ...	36.1	35.2	35.4	35.4	36.0	36.4	37.2	37.4	36.3	34.8	35.10	37.5	32.0	5.5
July 6 ...	37.6	37.9	40.2	40.4	42.5	42.2	43.5	42.6	41.7	40.7	37.03	43.9	32.0	11.9
July 7 ...	50.4	52.3	51.7	50.2	50.5	51.2	52.8	52.5	52.0	53.2	45.57	53.1	35.8	17.3
July 8 ...	34.7	35.5	36.9	36.7	36.4	36.9	35.9	36.1	35.3	35.1	38.92	53.2	32.9	20.3
July 9 ...	36.2	35.1	34.4	35.1	35.4	35.4	34.1	33.8	32.5	31.9	35.65	39.4	30.7	8.7
July 10 ...	36.7	37.1	39.3	40.1	40.1	40.6	40.8	39.7	38.3	38.3	34.62	41.2	28.3	12.9
July 11 ...	38.0	38.4	38.3	38.6	38.6	38.3	37.7	37.4	37.6	36.5	37.70	39.7	33.7	6.0
July 12 ...	35.1	37.4	36.0	36.7	36.2	36.1	35.9	36.1	35.6	35.4	34.97	37.5	32 5	5.0
July 13 ...	35.1	35.2	36.1	36.6	37.2	36.3	38.2	36.5	37.2	37.4	35.69	37.6	32.5	5.1
July 14 ..	36.7	36.9	37.6	37.7	38.3	37.5	37.7	38.1	37.4	37.2	35.81	38.9	30.4	8.5
July 15 ...	35.2	36.0	36.2	36.4	37.2	37.6	36.8	35.9	35.0	34.5	35.25	37.0	32.3	5.6
July 16 ...	36.7	37.6	37.8	38.3	39.5	38.3	36.8	36.2	35.3	34.1	35.22	39.1	31.9	7.2
July 17 ...	39.5	42.3	41.8	41.2	39.6	39.1	38.3	38.4	38.4	39.0	35.57	41.2	28.0	13.2
July 18 ...	40.5	40.7	41.5	40.3	40.6	41.2	42.8	43.0	44.5	42.8	40.97	48.2	34.2	14.0
July 19 ..	43.4	43.2	43.0	39.6	41.6	41.5	39.2	40.4	40.0	40.1	41.23	48.7	34.8	13.9
July 20 ...	36.2	37.1	36.6	36.4	36.7	37.8	38.5	37.0	36.0	34.9	36.30	40.9	34.0	6.9
July 21 ...	35.6	35.4	35.7	35.8	36.6	36.6	36.0	35.5	35.2	34.2	34.89	37.2	31.0	6.2
July 22 ...	36.6	36.4	36.2	35.7	35.9	36.8	35.3	34.6	33.9	33.7	33.81	37.8	29.4	8.4
July 23 ...	33.1	33.4	33.9	34.2	34.4	35.4	35.4	34.3	33.6	32.5	32.61	35.6	27.4	8.2
July 24 ...	35.1	34.4	34.7	35.1	35.6	36.4	38.6	39.5	40.3	40.6	33.34	40.2	27.7	12.5
July 25 ...	41.1	36.6	37.4	37.4	37.2	36.4	36.4	38.5	38.8	39.0	37.26	41.3	30.8	10.5
July 26 .	40.0	39.9	41.4	42.2	40.7	40.7	40.4	40.1	39.9	39.8	36.96	42.2	29.8	12.4
July 27 ..	40.0	40.4	40.7	40.6	40.3	40.1	39.4	39.3	38.8	38.4	38.21	41.3	32.3	9.0
July 28 ...	38.0	39.1	39.6	39.8	40.5	40.0	38.3	35.8	35.0	33.0	36.33	40.9	31.8	9.1
July 29 ...	32.6	32.9	33.3	33.0	33.9	34.1	33.7	33.5	33.1	32.4	31.85	34.5	27.9	6.6
July 30 ...	32.2	33.5	33.9	34.4	35.6	36.4	36.4	35.5	35.4	35.7	32.17	36.3	27.3	9.0
July 31 .	35.5	36.6	36.9	37.6	36.6	36.4	36.6	36.5	35.6	35.2	33.36	37.6	27.7	9.9
Means..	37.33	37.57	37.89	37.83	38.09	38.34	38.17	37.88	37.43	37.01	36.17	40.76	31.28	9.48

Table showing the temperature of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the thermometer above the surface of the earth, 4 feet. Washington mean time. Correction to reduce to mean local time 7 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.
1883.														
Aug. 1	34.2	34.4	34.0	33.9	33.5	33.3	33.0	33.2	33.1	33.3	33.6	33.7	34.4	35.4
Aug. 2	34.9	34.5	34.2	34.0	33.9	33.5	33.7	34.0	34.2	34.9	35.4	36.1	37.0	38.3
Aug. 3	36.3	35.7	34.9	34.8	35.0	34.2	33.9	34.0	33.6	33.9	35.0	37.1	38.4	38.5
Aug. 4	36.4	35.0	34.9	34.4	35.2	35.5	35.4	35.4	35.2	35.4	36.0	36.4	37.9	38.0
Aug. 5	35.7	35.1	34.6	33.9	33.3	32.7	32.9	33.5	33.9	34.4	35.0	35.2	35.6	35.8
Aug. 6	35.0	34.5	34.2	33.9	33.9	34.0	34.1	34.4	34.2	34.1	34.4	34.6	34.1	34.0
Aug. 7	33.5	33.0	33.3	33.5	33.5	33.6	33.7	33.7	33.5	33.6	34.4	35.2	37.0	38.2
Aug. 8	39.9	41.0	43.2	43.0	43.9	43.6	44.0	44.0	45.0	45.6	46.4	47.9	50.3	46.2
Aug. 9	52.8	50.0	46.4	44.4	43.4	42.8	42.2	42.2	44.0	46.9	48.9	50.3	54.1	58.1
Aug. 10	44.1	42.3	39.4	38.1	38.0	38.1	38.3	39.5	42.2	41.8	45.2	48.0	51.7	49.9
Aug. 11	42.2	40.4	39.1	40.5	40.2	41.0	38.5	38.5	37.7	37.9	37.5	38.9	39.8	45.1
Aug. 12	46.5	46.7	49.0	48.9	46.2	45.0	43.2	42.6	41.7	41.8	42.2	41.8	43.9	46.2
Aug. 13	37.9	39.8	40.3	40.1	40.5	40.6	40.5	39.1	38.3	39.3	39.3	39.1	37.0	36.8
Aug. 14	34.4	34.5	34.2	34.0	34.2	34.2	34.0	34.0	32.4	33.0	34.1	35.2	37.3	39.0
Aug. 15	40.5	39.3	36.1	35.8	34.2	33.9	33.3	32.5	33.2	35.0	37.3	38.8	41.8	44.5
Aug. 16	47.3	45.5	41.8	43.0	43.4	42.6	42.6	40.6	38.1	37.9	37.2	38.1	37.2	37.2
Aug. 17	38.0	37.1	36.6	36.2	36.1	36.2	36.2	36.2	34.0	33.1	32.0	34.0	34.4	35.4
Aug. 18	39.9	37.4	36.4	36.0	37.0	37.4	37.6	37.1	35.2	33.8	33.6	34.6	34.2	34.4
Aug. 19	31.0	30.8	30.3	29.6	20.4	29.2	28.6	28.2	27.5	28.1	28.6	27.6	28.2	28.2
Aug. 20	29.4	28.7	29.6	29.4	30.1	30.2	30.1	30.1	30.3	30.3	30.1	29.9	30.3	30.5
Aug. 21	29.8	29.2	29.2	28.7	28.6	27.9	27.6	27.2	27.1	26.4	26.4	26.4	26.1	25.9
Aug. 22	25.6	25.1	25.2	25.2	24.9	**24.3**	24.7	24.5	24.6	25.4	26.4	26.7	27.3	27.6
Aug. 23	34.6	34.1	34.2	34.0	34.3	34.7	34.9	35.7	36.2	36.4	37.0	36.6	36.4	37.1
Aug. 24	38.4	38.1	37.9	37.6	38.1	38.3	39.1	39.3	38.6	38.4	37.9	36.0	34.2	33.9
Aug. 25	27.1	26.6	26.9	27.2	27.4	26.4	27.2	37.4	27.3	27.7	27.5	29.7	29.4	30.3
Aug. 26	40.1	40.3	43.3	44.0	44.4	42.7	39.5	39.8	39.1	37.9	36.0	34.6	33.5	33.7
Aug. 27*	29.7	29.1	29.0	28.4	29.0	28.5	28.8	28.6	29.1	20.4	30.0	30.6	32.0	33.0
Means	36.86	36.23	35.97	35.65	35.61	35.35	35.10	35.01	**34.79**	35.03	35.49	36.04	36.80	37.45

Date.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.	Max.	Min.	Diff.
1883.														
Aug. 1	35.6	36.4	36.2	36.4	36.9	37.9	37.4	37.4	36.4	35.8	34.98	38.1	32.0	6.1
Aug. 2	38.9	39.5	39.9	40.3	40.6	40.0	38.6	39.0	38.3	37.4	36.71	40.6	32.0	8.6
Aug. 3	38.1	39.3	39.7	40.6	40.7	40.1	40.0	39.3	38.1	37.7	37.04	40.9	32.5	8.4
Aug. 4	37.9	38.8	38.7	38.3	38.8	38.1	37.7	37.4	37.0	36.4	36.08	39.1	33.4	5.7
Aug. 5	36.0	36.7	37.4	38.3	37.9	38.3	37.4	36.4	35.8	35.8	35.48	38.5	31.3	7.2
Aug. 6	34.8	36.0	36.1	36.5	36.0	36.0	35.0	34.4	33.8	33.3	34.64	36.7	32.1	4.6
Aug. 7	40.2	41.5	42.6	44.3	45.3	46.9	45.2	44.4	42.5	42.5	38.13	48.7	32.0	16.7
Aug. 8	44.5	43.8	44.9	44.3	42.8	42.3	47.4	48.9	54.7	54.9	45.52	54.6	38.8	15.8
Aug. 9	60.3	57.6	57.2	**60.5**	57.5	54.7	52.9	50.6	50.1	46.7	**50.61**	**60.5**	40.5	20.0
Aug. 10	53.2	54.0	50.7	46.3	43.8	47.8	45.1	43.6	43.4	42.6	44.46	57.1	36.5	20.6
Aug. 11	47.0	47.7	48.1	49.2	48.3	44.4	47.3	45.5	48.1	46.4	42.89	49.7	36.2	13.5
Aug. 12	49.9	52.3	52.4	45.0*	41.2	41.2	39.4	40.0	39.5	38.9	44.40	53.5	37.7	15.8
Aug. 13	37.4	37.0	36.7	37.0	37.4	36.9	35.4	34.7	35.0	34.5	37.94	40.9	33.4	7.5
Aug. 14	40.0	38.8	39.3	40.4	40.4	41.0	41.0	43.0	40.8	40.3	37.06	43.8	31.2	12.6
Aug. 15	47.2	43.2	49.4	45.7	47.7	46.4	43.5	43.6	46.5	46.5	40.66	50.9	31.0	19.9
Aug. 16	37.0	37.7	36.7	37.4	37.9	40.4	41.3	40.6	39.1	39.0	40.11	48.2	35.5	12.7
Aug. 17	37.7	37.8	38.0	39.5	40.2	41.9	42.0	43.3	43.1	41.2	37.55	44.8	31.8	13.0
Aug. 18	34.8	34.0	33.5	32.7	32.5	32.0	32.5	32.3	32.2	31.7	34.70	42.8	30.3	12.5
Aug. 19	28.4	28.7	28.7	28.3	29.2	29.0	29.2	29.6	29.1	29.4	28.95	32.0	26.2	5.8
Aug. 20	30.8	31.2	31.0	30.3	30.2	30.1	30.1	29.9	30.0	29.9	30.10	31.0	27.2	3.8
Aug. 21	26.4	25.9	27.2	27.6	27.8	27.7	27.8	27.5	27.1	26.6	**27.42**	31.2	24.0	7.2
Aug. 22	30.0	31.1	32.0	32.7	33.5	34.5	34.0	34.4	34.4	34.6	28.36	35.4	**22.4**	13.0
Aug. 23	37.9	37.9	38.3	39.5	38.8	39.4	39.2	39.3	38.8	38.1	34.06	40.4	32.6	7.8
Aug. 24	33.8	34.0	33.7	32.6	32.4	31.9	30.5	29.1	28.3	28.2	26.81	39.4	26.8	12.6
Aug. 25	31.6	32.4	33.7	35.0	36.4	38.1	39.6	39.9	39.9	39.9	35.01	40.3	25.2	15.1
Aug. 26	33.7	33.5	33.1	32.3	31.9	32.0	31.5	31.0	30.5	30.3	31.44	44.4	28.5	15.9
Aug. 27*	34.4	36.2	38.8	40.3	41.3	42.4	43.2	43.7	41.6	40.3†	36.20	44.8	27.2	17.6
Means	38.43	38.63	**39.04**	38.94	38.79	38.94	38.67	38.47	38.30	37.74	36.97	43.27	31.42	11.85

*Station abandoned August 27, 1883. †Approximated.

Temperature observations at Uglaamie, Alaska.

Month.	Mean.	Max.	Min.	Range.	Month.	Mean.	Max.	Min.	Range.	Month.	Mean.	Max.	Min.	Range.
1881.					1882.					1883.				
November	− 0.05	30.4	−28.0	58.4	May	21.99	37.0	− 1.7	38.7	January	−16.9	12.3	−41.8	54.1
December	−17.96	11.5	−52.6	64.1	June	34.52	53.5	24.5	29.0	February	− 6.32	24.4	−31.3	58.7
					July	43.21	65.5	27.1	38.4	March	−13.31	26.2	−51.4	77.6
Whole period.	− 9.00	30.4	−52.6	83.0	August	37.86	58.9	26.6	32.3	April	− 2.76	16.0	−29.0	45.0
					September	31.46	51.3	19.5	31.8	May	23.25	37.8	−14.0	51.8
1882.					October	8.77	40.7	−21.8	62.5	June	32.32	50.9	18.2	32.7
January	−15.49	20.3	−45.6	65.9	November	− 7.12	28.8	−35.5	64.3	July	30.17	53.2	27.3	25.9
February	−23.16	− 2.3	−52.5	50.2	December	−17.10	8.0	−42.0	50.0	August *	36.97	60.5	22.4	38.1
March	− 4.55	22.8	−30.4	53.2										
April	− 4.36	32.3	−23.5	55.8	Whole period.	8.83	65.5	−52.5	118.0	Whole period.	11.17	60.5	−51.4	111.9

*August for 27 days only.

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.
1881.																									
Oct. 18	88	87	90	84	88	85	97	97	96	95	93	96	94	90	87	85	85	88	87	88	86	88	92	92	89.0
Oct. 19	88	88	84	86	85	84	88	90	90	92	92	88	93	93	93	97	96	97	96	95	96	96	97	96	91.6
Oct. 20	96	96	96	92	90	95	95	94	96	98	92	93	94	95	92	87	89	88	89	90	89	87	87	93	92.2
Oct. 21	92	87	91	72	92	92	93	92	91	92	91	93	90	87	88	88	88	89	91	92	92	92	90	89	89.7
Oct. 22	90	91	90	91	89	89	90	90	90	90	90	87	88	90	86	84	84	86	88	88	86	100*	77	84	88.2
Oct. 23	91	88	79	74	91	91	83	83	85	83	84	84	81	82	86	88	82	89	89	89	88	86	85	85	85.2
Oct. 24	81	84	83	82	91	77	80	84	84	86	85	86	88	88	78	80	77	79	80	82	84	84	81	87	82.9
Oct. 25	87	86	88	87	85	87	85	85	85	82	80	78	76	78	80	85	78	87	87	87	87	80	82	85	83.6
Oct. 26	87	86	84	84	82	84	86	86	85	87	83	86	86	86	79	81	80	79	79	79	79	83	81	74	82.7
Oct. 27	83	76	82	86	82	82	82	81	80	84	82	79	79	75	85	85	81	73	78	86	89	84	81	76	81.2
Oct. 28	74	73	75	76	74	79	82	83	87	100*	90	86	89	88	88	86	87	88	88	90	84	88	84	80	84.1
Oct. 29	76	83	82	83	88	85	87	87	88	87	89	89	87	89	88	85	72	87	87	86	86	91	88	87	85.7
Oct. 30	88	94	94	89	89	93	88	87	85	89	88	85	87	83	85	86	88	86	81	78	80	83	82	88	86.5
Oct. 31	84	88	84	86	88	86	85	84	81	84	83	82	81	85	89	82	84	88	88	85	86	85	85	88	85.0
Means	85.0	86.2	85.8	83.7	86.7	86.3	87.2	87.3	87.3	89.2	87.2	86.5	86.6	86.3	86.0	85.6	83.6	86.0	86.2	86.7	86.5	87.6	85.1	86.0	86.3
1881.																									
Nov. 1	88	88	88	88	89	83	95	87	77	86	[illegible]	86	86	84	82	84	84	86	86	86	84	84	74	79	85.0
Nov. 2	86	86	86	86	86	84	82	86	84	84	84	86	86	85	87	87	80	84	84	81	85	85	83	87	84.7
Nov. 3	84	84	84	84	81	81	85	84	81	81	87	82	82	81	82	80	80	80	80	82	82	85	82	86	82.5
Nov. 4	79	83	83	80	85	85	85	85	82	82	83	83	81	75	87	80	82	82	86	85	85	84	91†	75	82.5
Nov. 5	76	77	80	80	82	82	76	84	86	91	94	90	90	93	86	83	87	87	83	87	90	90	80	87	85.0
Nov. 6	90	97	100	96	96	88	84	82	83	83	78	88	87	100	96	96	89	85	96	93	97	97	96	92	91.2
Nov. 7	96	87	90	90	90	89	93	96	96	78	68	83	86	86	82	87	88	92	88	92	96	96	96	96	89.2
Nov. 8	85	96	96	96	96	96	100	97	93	79	100	97	93	97	96	96	96	96	96	97	96	97	90	97	94.9
Nov. 9	90	90	87	90	90	94	91	88	88	85	94	90	94	91	91	91	89	91	88	91	83	89	91	86	89.6
Nov. 10	85	91	84	93	90	93	97	96	93	96	97	87	87	83	80	90	90	90	90	97	97	90	90	93	90.7
Nov. 11	93	93	93	93	93	96	89	89	83	80	76	81	76	86	86	76	76	71	57	57	56	49	46†	43	76.5
Nov. 12	50	43	59	59	53	60	58	57	58	58	53	55	55	57	35	46	52	42	52	68	68	61	61	66	55.2
Nov. 13	80	80	58	65	64	64	53	69	70	68	53	53	70	64	61	61	48	45	46	45	49	42	62	43	58.8
Nov. 14	50	76	77	81	88	97	85	88	84	68	69	69	83	75	66	78	81	72	85	90	86	87	85	85	79.3
Nov. 15	86	84	84	86	90	88	90	91	88	91	88	91	91	94	93	93	89	86	90	89	89	87	84	88	88.7
Nov. 16	82	84	88	87	90	86	83	82	83	80	79	76	81	89	94	94	94	91	91	91	90	96	76	76	85.9
Nov. 17	75†	74	64	64	55	61	59	50	80	63	63	68	64	47	84	84	54	32	76	87	92	100*	100*	96	70.3
Nov. 18	97	93	93	93	96	96	96	96	96	96	96	93	93	93	90	90	86	77	74	74	67	80	87	88	89.1
Nov. 19	84	84	88	88	91	94	86	89	87	79	83	73	85	83	82	83	82	84	84	87	82	79	79	89	84.3
Nov. 20	88	88	90	87	94	85	87	94	94	87	87	87	90	90	90	90	91	96	90	86	88	87	85	84	88.9
Nov. 21	85	88	82	82	85	85	87	92	[illegible]	91	91	82	78	100	100	76	79	79	83	86	91	82	87	90	83.6
Nov. 22	96	96	96	89	96	88	79	79	78	71	58	47	48	47	55	57	63	63	69	67	75	67	73	79	72.3
Nov. 23	72	73	72	51	69	75	74	42	38	45	43	36	32	41	54	47	46	46	51	49	49	49	52	63	53.2
Nov. 24	75	76	74	76	76	76	76	76	76	67	72	82	82	75	72	76	72	67	68	69	87	87	78	79	75.5
Nov. 25	63	73	74	75	92	86	83	93	83	81	81	81	88	88	89	100	78	78	80	80	77	77	84	85	82.1
Nov. 26	85	85	88	86	87	87	84	72	83	83	85	86	88	82	88	77	75	76	86	87	87	87	80	77	83.3
Nov. 27	80	78	83	83	80	81	75	78	83	81	82	85	83	83	78	81	80	81	100	85	84	86	89	88	83.6
Nov. 28	85	85	84	84	84	82	70	79	81	83	80	80	85	82	84	85	83	86	86	88	89	87	86	81	83.6
Nov. 29	80	81	84	84	87	90	90	90	89	87	87	86	84	85	84	80	86	84	82	86	88	86	88	82	85.4
Nov. 30	84	81	86	84	87	93	89	90	89	85	96	89	93	87	97	100*	86	75	80	86	77	89	87	84	87.2
Means	81.6	83.1	83.1	82.6	84.6	85.0	83.0	82.7	82.6	79.6	79.6	79.0	80.7	80.7	81.7	81.6	78.8	76.8	76.9	81.6	82.2	82.0	81.4	81.4	81.4

* Wet bulb read higher than dry bulb.

† Interpolated.

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time, – 5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.
1881.																									
Dec. 1	92	79	78	83	79	93	74	93	90	90	83	74	89	75	90	77	81	84	82	82	83	84	85	87	83.6
Dec. 2	92	88	87	86	84	93	82	88	86	84	87	87	84	84	78	40	88	84	77	88	85	84	97	100	84.7
Dec. 3	85	86	86	85	85	88	92	83	87	90	97	93	100*	96	88	73	76	60	60	53	51	56	51	55	78.2
Dec. 4	61	53	60	56	61	54	54	63	68	57	58	53	50	51	76	66	70	75	76	81	82	78	79	83	65.2
Dec. 5	79	80	92	92	92	92	88	80	84	84	79	83	71	87	65	65	64	100*	65	50	50	51	52	59	75.2
Dec. 6	59	59	57	69	57	57	48	43	50	65	71	67	72	77	83	83	79	67	83	83	88	92	80	84	70.1
Dec. 7	75	75	85	89	88	79	83	77	78	83	79	79	84	83	92	92	89	92	96	96	96	96	92	79	85.7
Dec. 8	83	79	80	83	71	78	83	78	62	66	60	58	42	56	49	49	44	50	47	50	63	51	58	43	61.8
Dec. 9	45†	48	47	46†	45†	50†	59	57	54	71	80	91	63	60	73	52	50	70	81	86‡	92	84	84	81	65.4
Dec. 10	83	89	86	81	81	80	84	83	82	88	91	91	88	91	91	81	85	71	83	83	89	80	74	73	83.7
Dec. 11	73	84	92	92	78	73	52	60	66	61	65	60	66	62	67	67	66	70	77	83	88	88	81	89	73.3
Dec. 12	77	87	97	84	79	82	67	65	44	44	48	47	47	43	50	50	52	64	52	63	43	48	47	47	59.5
Dec. 13	61	48	42	53	50	51	47	54	100*	58	63	56	58	51	51	55	48	48	53	52	53	52	57	58†	55.0
Dec. 14	60	46	40	51	51	40	41	54	54	49	42	42	41	48	44	46	44	54	59	64	58	54	54	53†	49.5
Dec. 15	52	52	58	59	67	59	52	54	54	60	66	66	72	71	71	72	71	81	71	80	80	71	64	49	64.7
Dec. 16	50	60	61	61	59	58	100*	100*	100*	59	55	53†	51	57	50	50	50	43	48	48	46	41	52	48	58.3
Dec. 17	53	53	44	44	58	53	51	58	66	63†	58	55	53	69	68	88	100	100*	100*	100	100	100*	100*	100*	72.2
Dec. 18	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	**100.0**
Dec. 19	100*	100*	100*	100*	100*	100*	100*	100‡	100‡	100‡	100‡	100‡	100‡	100‡	100‡	100‡	100*	100‡	100‡	100‡	100‡	100‡	100*	100*	**100.0**
Dec. 20	100*	100	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100	100*	100*	100*	100*	100*	100*	100	**100.0**
Dec. 21	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100	100*	100*	100	100*	100*	100*	100	100	100*	100*	**100.0**
Dec. 22	100	100	100*	100*	100*	100*	100*	100	100*	100*	100*	100*	100*	100*	100*	86	67	88	100	100	100	100*	100*	100*	97.5
Dec. 23	100	100	100	100	100	100*	76	78	79	70†	60	47	47	47	55	53	69	55	58	59	56	70	81	33	70.5
Dec. 24	33	33	33	33	40	46	53	59	55	62	69	67	89	88	94†	100*	100	100†	100*	100	100*	100	100*	100	73.1
Dec. 25	78	80	66	80	90	90	61	49	47	65†	78	56	51	47	68	61	61	58	51	66	66	66	65	50	61.7
Dec. 26	44	38	38	40	34	40	52	52	53	47	49	52	46	50	50	47	55	56	61	50	52	41	57	54	48.2
Dec. 27	60	51	51	51	52	51	62	43	46	58	54	58	49	66	53	51	50	51	44	37	55	64	58	38	52.2
Dec. 28	37	40†	44	38	45†	51	57	57	58	57	66	66	54	61	80	58	45	52	100	100	100	100	100*	100*	65.2
Dec. 29	100	79	78	58	58	69	89	81	55	65	56	50	27	46	57	51	51	50	48	58	70†	83	82	74	64.0
Dec. 30	60	63	53	54	66	52	48	48	63	65	72	77	78	86	89	85	86	87	87	97	89	74	83	91	73.1
Dec. 31	86	81	81	86	88	81	83	100*	78	85	86	80	85	83	84	82	100*	100*	100*	100*	100*	87	100*	82	88.2
Means.	73.5	72.0	72.2	72.7	72.8	72.9	72.2	72.8	72.9	72.1	73.3	71.2	69.6	72.2	74.7	70.3	72.6	74.5	76.1	77.7	78.5	77.3	78.8	74.5	73.6
1882.																									
Jan. 1	85	88	85	85	90	88	91	90	96	88	96	87	82	82	76	78	77	87	76	74	75	63	64	64	81.9
Jan. 2	53	63	67	65	65	67	54	67	65	50	49	50	55	46	47	55	58	55	58	46	53	53	36	60	56.2
Jan. 3	46	54	61	61	55	56	50	52	52	57	69	68	68	61	56	61	50	62	68	62	62	61	59	58	58.7
Jan. 4	59	56	53	60	60	75	65	64	71	70	70	68	68	70	70	71	80	63	63	72	63	63	90	70	67.2
Jan. 5	47	67	76	88	77	77	78	89	77	88	88	68	91	78	61	64	64	65	65	65	56	82	73	80	74.3
Jan. 6	80	80	81	80	79	77	67	77	65	88	65	64	65	89	44	78	68	67	78	79	57	68	45	47	70.3
Jan. 7	47	47	51	52	52	51	61	70	79	79	68	68	68	68	79	79	79	79	58	90	58	50	62	62	64.8
Jan. 8	62	62	61	79	68	79	89	100	65	100*	100*	100*	100	88	76	77	76	89	89	88	100	88	69	71	82.3
Jan. 9	60	90	69	62	79	79	79	78	89	78	100	76	100	88	79	67	56	67	89	89	78	67	67	67	77.2
Jan. 10§	89	89	89	89	89	89	87	88	89	89	89	89	89	89	89	97	97	97	98	97	98	97	96	96	91.8
Jan. 11	96	96	96	97	97	97	97	97	97	97	97	99	99	97	100	100	100	100	96	94	94	94	96	96	**97.0**
Jan. 12	96	96	97	97	97	97	97	97	97	97	97	97	97	97	96	96	89	94	98	93	91	91	91	91	95.2
Jan. 13	91	90	90	89	89	89	89	89	89	89	89	89	89	89	82	84	84	84	84	84	81	88	88	88	87.5
Jan. 14	90	90	90	91	91	91	91	91	91	91	90	90	91	90	90	90	90	90	91	91	91	91	91	91	90.5
Jan. 15	92	90	92	90	92	89	90	90	90	90	92	91	91	91	91	91	91	91	91	91	90	90	90	90	90.6
Jan. 16	91	91	91	91	91	91	91	91	91	91	91	90	90	90	90	90	90	91	91	91	90	90	90	90	90.5
Jan. 17	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91.0
Jan. 18	91	91	91	91	91	90	90	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90.9
Jan. 19	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91.0
Jan. 20	91	91	91	91	91	91	91	91	91	91	91	92	92	93	91	92	92	92	91	91	90	90	91	91	91.2
Jan. 21	91	91	91	91	91	91	91	91	91	91	91	91	91	91	95	95	95	96	96	96	96	97	97	97	93.0
Jan. 22	96	96	96	96	96	96	96	96	96	95	94	96	94	94	94	91	90	89	89	89	89	89	90	90	93.2
Jan. 23	88	87	87	87	86	86	86	85	85	85	84	81	80	81	82	82	84	83	84	84	84	83	85	85	91.8
Jan. 24	85	85	85	84	83	83	82	79	80	80	79	81	81	81	80	80	80	81	81	80	81	83	84	84	81.7
Jan. 25	85	85	85	85	85	84	82	84	83	82	81	81	81	83	82	82	83	83	84	85	86	85	88	88	82.8
Jan. 26	88	88	88	88	88	87	87	87	87	87	87	85	83	82	82	81	81	82	82	82	80	82	82	82	81.5
Jan. 27	82	82	82	82	82	82	82	82	79	79	79	80	80	80	78	78	79	79	80	80	80	80	80	80	80.2
Jan. 28	80	80	80	80	80	80	80	80	80	80	78	79	78	79	79	77	77	78	77	75	78	78	78	78	78.3
Jan. 29	78	77	77	77	77	77	76	76	75	75	74	74	74	74	75	74	74	75	76	75	76	76	77	74	75.5
Jan. 30	77	76	76	76	76	76	76	76	74	74	74	74	74	74	74	75	75	74	75	75	74	75	76	76	75.0
Jan. 31	76	75	75	75	75	76	76	76	75	75	74	74	75	74	74	76	74	75	76	76	76	76	76	76	75.2
Means	80.0	81.7	81.7	82.6	82.3	83.0	82.3	84.1	82.9	84.1	84.1	83.4	83.8	82.9	80.1	81.7	80.8	81.9	82.4	82.8	80.7	80.7	80.1	80.6	82.2

* Wet bulb reading higher than dry bulb. † Interpolated. ‡ Below the scale.
§ On and after January 10, 1882, until August 27, 1883, relative humidity taken from hair hygrometer.

Table showing the moisture of the air at Uglaamie from October, 1881, *to August,* 1883—**Continued.**

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time, −5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.
1882.																									
Feb. 1	76	76	76	75	75	74	74	76	76	77	76	76	76	76	76	75	75	76	76	77	77	77	75	75	75.7
Feb. 2	75	75	75	75	76	76	76	76	76	76	76	76	76	76	76	77	77	77	77	76	76	76	76	76	76.0
Feb. 3	78	78	78	78	78	80	79	79	79	79	76	78	78	78	80	80	79	79	79	79	79	80	79	80	78.7
Feb. 4	80	79	79	79	80	80	80	80	80	79	76	77	77	77	78	78	78	77	77	77	77	78	78	76	78.2
Feb. 5	76	75	75	74	74	75	77	77	77	77	77	77	77	77	77	77	78	79	79	80	80	81	83	82	77.5
Feb. 6	82	84	81	85	86	86	86	86	85	85	85	85	85	85	85	85	85	85	85	85	84	85	84	83	84.7
Feb. 7	82	80	82	81	83	83	83	83	83	83	83	83	83	83	82	82	83	83	83	82	82	82	82	81	82.3
Feb. 8	80	81	80	80	82	82	82	82	82	82	82	82	84	84	83	84	84	84	85	85	84	84	84	86	82.8
Feb. 9	82	83	83	83	84	84	84	83	83	83	83	83	82	81	80	80	80	80	80	81	81	81	81	82	81.9
Feb. 10	83	80	82	80	83	83	83	83	83	83	83	83	83	83	83	83	82	82	82	81	81	81	79	82	82.1
Feb. 11	79	80	79	80	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	78	78	78	77	78.8
Feb. 12	77	77	77	76	77	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	77	76	77	76.2
Feb. 13	76	76	76	75	76	76	76	76	77	77	77	77	77	78	77	77	77	78	78	78	78	78	76	80	76.9
Feb. 14	79	79	78	77	79	78	78	78	78	78	78	78	78	78	78	78	79	79	79	80	79	77	79	79	78.3
Feb. 15	79	79	79	80	79	79	80	80	80	80	80	80	80	80	80	79	79	79	80	80	80	80	82	81	79.7
Feb. 16	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82	82	83	83	85	81.2
Feb. 17	84	82	82	82	84	84	84	85	85	84	84	84	84	83	83	83	83	82	82	82	82	82	82	80	83.0
Feb. 18	80	81	81	80	81	81	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	81.6
Feb. 19	83	83	82	81	83	83	83	83	83	82	82	82	82	81	80	81	81	81	81	82	82	82	80	82	81.7
Feb. 20	82	82	81	80	81	82	82	82	82	82	82	82	82	82	82	79	79	79	80	80	80	80	79	79	80.8
Feb. 21	78	77	77	76	78	78	78	78	77	77	77	77	77	77	76	76	76	76	76	76	76	76	76	77	76.7
Feb. 22	76	76	76	75	76	76	76	76	76	76	76	76	76	76	75	75	76	76	76	76	76	76	74	76	75.7
Feb. 23	74	75	75	75	76	76	76	75	75	76	75	75	75	75	75	75	76	76	76	76	76	76	75	75	75.3
Feb. 24	75	75	75	74	74	74	74	74	74	74	74	74	74	75	75	75	75	75	75	75	75	76	74	74	74.5
Feb. 25	74	75	73	75	74	74	74	74	74	74	74	74	74	74	74	74	75	75	75	76	76	76	75	78	74.9
Feb. 26	78	76	76	76	76	76	76	76	76	75	75	75	75	76	76	76	76	76	76	76	77	77	75	77	76.0
Feb. 27	76	76	76	77	77	77	78	79	79	77	77	77	76	76	76	76	77	77	77	77	77	77	76	77	76.8
Feb. 28	77	76	77	76	77	77	78	78	79	80	80	60	80	80	81	81	81	82	82	83	82	85	84	85	80.0
Means	78.6	78.4	78.3	78.0	78.8	78.9	79.1	79.1	79.1	79.0	78.7	78.8	78.8	78.8	78.7	78.7	78.8	78.9	79.0	79.2	79.1	79.3	78.7	79.4	78.8
1882.																									
Mar. 1	84	84	85	85	84	85	84	84	84	85	85	85	83	82	82	81	81	83	83	83	83	84	84	86	83.7
Mar. 2	86	86	86	86	86	86	85	85	85	85	85	85	85	84	85	86	86	86	86	86	86	86	84	84	85.4
Mar. 3	85	85	85	84	84	84	85	85	84	84	82	81	81	81	81	81	84	84	84	84	85	85	85	85	83.6
Mar. 4	86	86	86	84	85	85	85	85	85	85	85	85	85	85	86	86	86	86	87	87	86	87	86	86	85.6
Mar. 5	85	85	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	86	85.0
Mar. 6	85	85	85	85	85	85	85	85	85	85	84	84	84	84	83	83	84	84	84	84	84	84	85	85	84.4
Mar. 7	86	86	84	83	85	85	85	85	85	85	84	84	84	84	84	84	85	85	86	86	86	85	84	87	84.8
Mar. 8	88	88	88	87	87	88	88	88	89	90	90	90	91	91	91	92	96	96	94	94	96	96	96	96	91.2
Mar. 9	95	94	93	92	92	92	91	91	91	91	91	91	93	93	93	93	95	96	96	94	92	92	91	91	92.6
Mar. 10	91	91	92	92	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91.0
Mar. 11	89	89	87	85	86	85	85	85	85	85	84	82	80	80	80	80	81	81	81	81	82	82	80	82	83.2
Mar. 12	82	82	80	81	81	81	81	82	82	82	83	83	83	85	87	87	89	89	90	90	90	90	88	86	84.7
Mar. 13	85	86	83	83	83	85	85	85	85	85	84	83	82	80	80	80	83	84	84	84	86	86	86	86	83.8
Mar. 14	87	87	87	89	89	88	89	89	89	89	89	87	87	87	87	88	83	88	87	88	89	89	86	86	87.8
Mar. 15	83	84	80	81	81	80	81	80	80	80	78	80	74	78	78	79	79	79	80	81	81	81	79	80	79.8
Mar. 16	80	79	78	78	79	79	79	79	79	79	79	79	79	79	81	80	81	82	82	82	82	82	82	82	80.0
Mar. 17	81	82	82	80	82	82	81	81	81	80	80	89	80	80	80	80	80	80	81	81	81	81	82	82	80.8
Mar. 18	83	82	82	82	82	82	82	82	82	82	82	82	82	83	82	82	82	82	82	82	82	82	83	82	82.1
Mar. 19	83	82	81	81	82	83	83	83	83	83	83	83	82	82	82	83	83	83	84	83	82	83	83	84	82.6
Mar. 20	84	83	84	83	83	83	82	92	82	82	82	81	81	81	81	81	80	80	80	80	80	79	79	79	81.3
Mar. 21	79	78	78	78	78	78	78	78	78	78	78	78	77	77	76	77	78	78	78	78	78	78	78	78	77.8
Mar. 22	78	79	77	77	77	77	77	77	77	77	77	79	80	81	81	80	81	81	81	81	82	82	82	82	79.2
Mar. 23	81	81	80	80	79	80	80	80	80	80	80	80	80	81	81	81	81	81	82	82	82	82	83	82	80.7
Mar. 24	81	82	82	83	83	83	83	83	83	83	83	83	83	82	82	82	82	82	83	83	83	83	83	82	82.5
Mar. 25	83	83	84	83	83	83	83	83	83	83	82	82	82	79	79	78	78	78	78	79	79	79	78	78	80.8
Mar. 26	77	78	79	79	79	79	79	79	79	79	79	79	78	78	78	78	79	80	80	81	80	80	81	80	79.0
Mar. 27	79	79	79	79	79	79	79	79	79	79	79	79	77	76	76	76	78	78	78	78	77	77	77	76	78.0
Mar. 28	77	77	77	77	76	76	76	76	76	76	75	75	75	75	76	76	76	77	76	76	78	78	80	79	76.5
Mar. 29	79	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82	81	80.8
Mar. 30	82	83	81	81	81	81	81	81	81	81	81	81	80	80	80	80	80	80	80	80	80	79	79	79	80.5
Mar. 31	79	79	79	79	78	78	78	78	78	79	79	79	79	80	80	80	81	81	81	82	82	83	83	82	79.3
Means.	83.3	82.7	82.8	82.6	82.7	82.8	82.8	82.8	82.8	82.3	82.5	82.4	82.0	82.0	82.2	82.2	83.0	83.2	83.3	83.4	83.5	83.6	83.4	83.3	82.8

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time − 7 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.
1882.																									
Apr. 1	82	82	83	82	82	82	82	82	82	82	82	82	82	82	82	81	81	81	81	81	81	81	81	81	81.6
Apr. 2	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82	82	82	81	82	81	82	81.2
Apr. 3	82	82	82	81	81	81	81	81	81	81	81	81	81	81	81	81	80	80	81	81	81	81	82	82	81.1
Apr. 4	82	81	81	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	82	81	80.6
Apr. 5	82	81	81	81	81	81	81	81	81	81	80	80	80	80	80	81	81	81	81	81	80	80	81	80	80.7
Apr. 6	80	79	79	79	79	79	79	79	79	79	79	79	79	79	79	80	81	81	82	82	82	82	83	83	80.0
Apr. 7	83	83	82	83	83	83	83	85	85	85	93	93	93	93	93	93	93	92	92	91	90	88	89	87	88.1
Apr. 8	87	85	84	84	84	84	84	81	81	81	81	82	83	86	86	86	86	87	87	86	85	85	87	86	84.5
Apr. 9	84	87	87	86	88	89	89	89	88	88	90	93	92	92	93	92	89	89	88	87	86	85	81	79	87.9
Apr. 10	82	85	81	81	81	81	81	81	82	88	88	88	90	90	90	90	88	88	88	86	84	82	81	77	84.7
Apr. 11	76	78	82	78	77	76	76	77	77	77	74	75	77	81	84	83	82	82	82	83	83	82	83	81	79.4
Apr. 12	83	80	81	82	80	80	80	80	79	78	78	78	79	80	81	83	82	82	82	82	83	82	78	78	80.5
Apr. 13	76	77	76	74	79	83	83	83	85	85	91	90	90	90	89	88	86	85	85	84	83	82	82	[illegible]	83.7
Apr. 14	84	85	83	84	84	84	84	83	83	80	80	80	79	79	81	83	83	83	83	83	83	83	82	82	83.6
Apr. 15	82	80	80	80	80	79	79	78	78	77	78	77	80	76	80	79	79	80	80	80	82	82	82	81	79.5
Apr. 16	82	85	85	85	84	82	83	81	80	87	87	81	81	82	82	83	81	81	83	82	83	82	85	82	82.8
Apr. 17	81	82	84	84	83	83	81	81	80	80	80	80	80	80	80	79	79	79	79	78	80	78	82	81	80.5
Apr. 18	77	79	79	82	81	81	81	81	82	82	82	82	82	82	82	82	80	80	80	81	81	80	81	80	80.8
Apr. 19	80	82	79	81	80	82	81	81	81	80	79	79	80	80	79	79	79	77	77	76	76	76	76	78	78.6
Apr. 20	74	75	80	79	78	78	79	80	80	80	82	81	81	82	80	79	79	79	79	79	78	78	79	79	79.0
Apr. 21	76	75	77	77	78	78	75	75	77	78	78	79	80	81	81	80	80	79	79	79	79	77	79	77	78.0
Apr. 22	81	81	80	78	78	77	77	77	79	79	79	80	79	79	79	79	78	78	78	79	79	80	81	80	78.5
Apr. 23	82	79	78	78	80	80	79	79	79	77	79	80	81	82	80	83	83	83	83	83	84	85	87	87	81.2
Apr. 24	87	88	88	89	87	90	90	91	90	90	94	95	94	94	94	93	93	93	93	91	89	89	87	90	90.7
Apr. 25	89	89	88	89	88	89	88	87	87	86	87	87	87	87	87	86	86	86	87	86	87	87	88	87	87.2
Apr. 26	86	85	84	85	84	84	83	82	82	82	83	83	83	82	80	83	82	82	83	86	85	86	89	85	83.7
Apr. 27	83	87	85	86	87	87	87	87	85	85	87	88	87	89	87	89	89	80	80	88	89	89	88	87	86.9
Apr. 28	86	87	86	82	81	82	82	82	83	83	85	82	80	82	84	85	83	83	81	85	85	84	83	81	83.3
Apr. 29	81	81	81	81	79	79	79	81	81	81	84	84	85	82	82	83	81	81	80	80	80	82	84	83	81.6
Apr. 30	84	85	83	79	83	82	82	81	80	80	81	81	81	81	81	82	82	82	82	81	81	81	79	79	81.7
Means	81.8	82.2	81.9	81.7	81.7	81.9	81.6	81.5	81.6	81.7	82.8	82.7	83.0	83.2	83.3	83.4	82.9	82.8	82.3	82.8	82.7	82.4	82.7	82.2	82.3
1882.																									
May 1	70	80	82	81	79	79	80	80	80	80	82	79	82	82	87	83	79	79	79	79	78	78	79	81	80.2
May 2	80	79	82	78	81	81	81	80	78	78	79	78	78	76	78	78	74	75	75	75	75	74	72	74	77.4
May 3	75	74	76	77	78	77	77	77	78	78	78	78	78	78	79	79	78	78	77	77	78	77	76	[illegible]	77.4
May 4	78	76	74	72	73	74	74	74	75	75	76	74	75	76	73	72	74	74	75	74	73	74	75	77	74.4
May 5	76	77	74	75	76	77	77	77	76	76	78	78	78	78	78	79	77	77	78	78	78	79	79	78	77.2
May 6	79	77	79	77	77	77	78	79	80	79	80	80	81	82	82	82	83	83	81	82	83	80	78	80	79.9
May 7	79	82	82	82	81	81	81	81	81	81	82	83	83	84	84	86	83	83	82	83	83	85	82	82	82.3
May 8	83	83	80	83	84	85	85	85	85	85	85	85	83	83	82	82	80	80	80	80	81	80	80	80	82.4
May 9	82	82	82	79	83	82	82	82	82	82	82	82	82	80	82	82	82	82	80	79	78	79	79	77	81.4
May 10	76	79	79	77	80	81	81	80	80	80	80	81	81	81	83	82	81	81	82	82	81	80	82	82	80.5
May 11	86	85	86	81	87	88	86	90	90	90	90	90	89	88	87	87	84	84	84	85	85	85	87	86	86.6
May 12	88	87	86	85	88	89	88	87	87	87	90	90	89	90	89	88	86	85	85	86	86	88	86	87	87.3
May 13	90	86	87	84	87	87	87	87	87	87	90	90	87	87	86	87	85	85	85	84	84	85	84	83	86.2
May 14	84	80	84	82	81	81	81	85	87	87	87	92	90	87	82	85	83	81	79	78	79	79	80	81	82.7
May 15	87	85	85	83	84	83	85	84	85	84	80	81	82	82	78	79	80	81	81	82	82	82	81	83	82.5
May 16	86	86	88	86	86	82	83	83	83	83	85	87	87	86	86	85	83	83	82	80	79	80	80	80	83.7
May 17	84	84	86	83	85	86	86	88	89	88	89	86	88	87	86	84	82	79	79	80	78	79	86	85	84.5
May 18	86	86	86	85	86	89	89	88	87	87	88	89	89	89	89	87	86	85	84	85	86	87	86	88	86.9
May 19	89	90	89	89	87	87	86	85	85	84	85	88	87	88	88	88	85	87	87	86	87	87	88	87	87.0
May 20	89	86	88	89	88	87	88	88	87	88	89	88	86	85	83	82	82	82	81	84	84	86	89	88	86.1
May 21	88	89	89	90	89	89	88	88	88	88	91	90	88	90	90	89	89	89	88	87	86	86	88	88	88.5
May 22	86	86	86	88	89	89	88	80	88	87	88	83	87	87	85	87	87	87	85	85	85	84	86	87	86.5
May 23	82	83	84	80	86	86	84	83	83	83	82	81	81	83	85	86	84	82	80	80	80	79	77	77	82.3
May 24	79	81	80	81	81	81	81	81	82	81	80	80	80	84	83	83	82	82	83	84	84	84	84	84	81.8
May 25	84	83	84	83	83	83	83	83	83	84	85	85	86	84	84	83	84	84	84	85	85	84	85	86	84.0
May 26	84	84	84	84	85	85	85	83	83	82	82	83	83	84	84	82	83	83	83	82	82	81	82	82	83.1
May 27	81	80	81	81	81	79	79	78	79	80	80	80	80	80	79	80	80	79	79	79	79	79	80	79	79.6
May 28	80	79	80	79	80	79	79	79	80	81	80	82	82	82	82	82	81	81	80	80	80	80	80	81	80.3
May 29	79	81	82	82	82	82	82	82	82	83	83	84	83	85	83	85	84	84	84	84	84	83	84	81	82.9
May 30	82	83	85	85	85	84	85	85	85	86	87	87	85	85	84	84	83	83	83	83	82	83	83	85	84.2
May 31	84	83	84	85	85	85	86	86	86	85	86	88	88	85	88	88	85	84	84	84	85	84	85	86	85.3
Means.	82.7	82.4	83.0	82.3	83.1	83.0	83.0	83.0	83.2	83.1	83.8	84.0	83.8	83.8	83.5	83.4	82.2	82.0	81.5	81.6	81.6	81.6	82.0	82.6	82.7

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.
1882.																									
June 1	85	86	87	88	88	87	88	88	87	86	82	87	87	85	85	87	87	87	87	86	88	88	89	89	86.8
June 2	88	89	89	89	89	89	89	91	90	89	89	89	87	86	86	86	85	85	84	84	84	84	87	86	87.2
June 3	85	87	89	87	86	87	88	88	88	89	91	91	91	91	90	87	86	85	86	86	85	86	87	83	87.5
June 4	83	85	88	87	88	87	87	88	88	89	90	89	90	90	87	87	85	85	86	87	85	86	84	86	87.0
June 5	87	89	89	88	86	87	87	87	89	88	89	89	89	89	85	86	80	79	79	81	82	81	83	84	85.5
June 6	87	85	83	85	87	87	83	84	84	82	83	82	80	80	82	83	83	84	85	85	79	79	76	72	82.5
June 7	69	71	71	77	80	82	82	83	85	83	83	82	81	80	83	83	82	82	82	82	82	81	80	76	80.1
June 8	72	73	77	88	88	88	87	86	84	79	79	81	81	83	83	83	83	84	85	85	85	84	83	77	82.4
June 9	77	78	78	79	84	85	84	82	78	84	87	89	88	87	87	87	85	85	84	84	84	84	87	85	83.8
June 10	85	87	86	87	90	90	90	90	88	85	85	85	86	86	87	84	85	84	84	84	82	82	86	84	85.0
June 11	86	88	84	84	84	85	85	86	86	84	82	80	84	84	83	83	82	79	79	79	78	75	70	81	82.1
June 12	71	79	79	81	81	84	86	85	86	88	88	85	82	84	84	82	82	82	80	80	83	81	86	86	82.7
June 13	87	87	87	88	89	90	89	90	90	90	89	85	83	85	86	86	82	87	83	85	84	85	88	87	86.8
June 14	88	88	89	89	89	89	89	89	91	90	90	90	91	90	90	89	87	84	86	86	85	86	87	88	88.3
June 15	88	88	89	90	89	89	89	89	91	89	89	88	87	87	87	85	84	85	85	87	86	85	85	84	87.3
June 16	85	87	87	87	87	88	88	88	87	86	86	83	85	83	82	86	84	84	84	85	83	82	81	80	84.9
June 17	78	82	79	81	84	86	87	85	82	81	82	81	81	81	80	80	83	84	84	84	85	85	86	86	82.8
June 18	87	88	88	89	88	85	81	79	76	78	80	83	82	82	82	82	80	80	80	81	83	80	75	78	82.0
June 19	81	81	82	84	87	88	87	88	87	87	87	89	85	82	83	75	76	78	78	80	81	81	80	81	82.8
June 20	81	83	84	86	87	89	90	90	90	90	88	87	86	87	87	85	83	84	86	86	86	87	87	87	86.5
June 21	88	89	90	89	89	89	89	89	89	89	89	89	88	88	82	78	78	77	75	76	78	73	73	74	83.7
June 22	72	77	83	85	87	87	86	83	85	79	82	79	82	75	75	72	74	76	75	74	78	76	81	82	79.4
June 23	61	76	77	81	81	81	83	79	79	76	76	77	79	76	78	76	80	80	79	80	82	85	82	79	79.3
June 24	76	77	74	74	75	81	83	83	84	82	80	75	76	80	80	80	79	78	74	76	77	76	76	73	77.9
June 25	70	71	72	73	78	77	75	70	70	72	72	65	75	76	76	82	80	78	75	73	70	72	74	77	74.1
June 26	81	83	89	88	89	89	90	89	90	90	90	90	89	89	89	85	85	85	86	88	83	82	83	83	86.9
June 27	84	88	89	88	87	87	88	89	87	86	86	86	83	80	80	80	79	77	82	85	83	83	82	80	84.1
June 28	76	75	76	82	83	85	84	83	82	80	80	80	80	82	82	80	82	80	78	75	77	77	81	80	80.0
June 29	80	80	82	87	89	88	90	90	89	88	87	82	82	83	79	79	78	82	85	82	79	77	80	83	83.4
June 30	85	86	86	87	88	88	89	89	88	88	85	85	85	85	85	85	85	82	83	82	81	82	80	79	85.8
Means.	84.1	85.4	86.1	87.6	88.6	89.1	89.1	88.7	88.3	87.6	87.5	86.8	86.8	86.5	86.2	85.4	84.8	84.7	84.6	84.9	84.8	84.2	84.6	84.3	86.3
1882.																									
July 1	83	90	90	87	87	88	78	73	75	75	75	76	73	73	71	79	77	81	80	80	76	72	71	69	78.3
July 2	76	78	75	75	83	79	83	80	81	82	80	80	80	70	70	67	65	66	62	60	60	60	71	75	73.2
July 3	80	86	86	85	85	87	87	88	88	88	88	88	88	88	88	85	88	84	82	82	84	85	84	82	85.7
July 4	82	80	84	84	84	78	77	80	72	70	70	79	73	75	78	72	71	69	70	72	70	74	82	73	75.8
July 5	74	80	84	85	84	85	86	88	86	82	82	70	70	70	65	68	67	67	72	73	75	75	80	77	76.9
July 6	78	77	80	84	82	87	83	84	81	77	75	75	72	72	70	70	70	73	76	76	73	75	71	75	76.3
July 7	66	66	68	71	73	73	72	69	68	67	66	70	70	70	69	66	65	65	62	64	64	59	60	58	66.3
July 8	62	66	73	80	80	83	85	82	80	78	78	75	78	80	80	78	79	79	79	80	80	78	79	78	77.9
July 9	78	80	84	90	90	91	91	90	90	90	90	90	88	85	85	82	83	83	80	76	75	74	88	88	85.0
July 10	86	86	85	82	86	86	81	81	80	80	83	78	78	78	76	80	82	76	76	80	79	75	81	80	80.6
July 11	86	82	87	90	87	87	84	77	82	78	77	75	75	75	75	75	78	78	76	78	80	89	90	88	81.2
July 12	87	86	84	81	85	85	89	88	88	88	82	82	82	88	88	82	82	90	89	88	87	85	85	82	85.5
July 13	81	87	88	87	87	85	86	83	83	81	82	82	82	82	82	82	80	81	82	81	80	80	77	69	82.1
July 14	70	68	72	81	84	86	82	80	78	80	85	85	90	90	90	90	89	90	90	90	88	87	86	88	84.1
July 15	87	88	87	90	90	90	89	83	85	85	86	87	85	87	86	89	87	87	87	85	83	82	80	79	86.0
July 16	78	80	82	85	84	86	88	88	87	88	85	80	82	82	82	82	81	82	82	85	87	87	89	87	84.1
July 17	89	90	90	89	89	90	94	96	96	96	96	98	98	98	98	98	97	97	95	93	95	92	91	97	94.2
July 18	92	95	95	96	94	94	94	94	94	94	95	92	93	90	90	87	82	83	82	80	81	80	84	85	89.4
July 19	95	94	96	98	95	95	95	94	93	93	95	95	82	88	80	85	86	85	88	90	92	90	93	94	91.3
July 20	89	97	97	98	95	96	95	87	82	85	85	90	90	90	90	85	84	81	81	80	84	84	87	87	88.3
July 21	87	92	94	94	94	94	94	95	96	96	98	98	98	98	98	98	95	98	96	95	97	93	94	89	95.0
July 22	90	92	93	92	94	95	95	95	96	96	98	98	98	95	92	90	90	89	83	80	81	83	87	89	91.3
July 23	91	95	91	97	96	94	93	93	89	87	90	89	90	90	80	75	68	71	78	84	90	88	89	89	87.4
July 24	84	89	93	94	94	92	92	92	92	87	85	85	70	70	70	65	62	68	75	80	75	75	78	78	81.0
July 25	78	83	88	87	92	88	88	90	87	83	80	90	90	90	90	90	88	86	84	82	77	78	85	84	85.8
July 26	85	83	86	89	92	92	92	88	91	88	87	85	83	82	82	82	80	80	80	88	91	95	96	96	87.2
July 27	96	86	98	98	96	94	93	94	94	95	95	95	95	95	93	87	88	84	84	86	88	92	92	94	92.6
July 28	94	93	90	89	89	89	89	89	89	88	80	80	82	82	81	80	82	81	83	82	82	78	77	77	84.4
July 29	75	77	79	81	79	79	80	81	79	80	80	80	80	75	75	75	73	73	75	74	74	78	76	80	77.4
July 30	81	86	90	90	90	90	90	90	90	87	88	90	80	80	75	74	76	70	82	83	78	65	74	72	82.1
July 31	78	80	80	84	87	86	88	90	90	86	87	83	80	80	75	75	75	80	80	80	77	76	78	83	81.6
Means.	82.5	85.7	86.1	87.5	88.0	87.9	87.5	86.5	85.9	84.8	84.6	84.5	83.1	82.8	81.4	80.4	79.7	79.9	80.4	80.9	80.7	80.1	82.4	81.9	83.5

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time [illegible] 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily mean.
1882.																									
Aug. 1	82	90	90	90	93	93	94	94	94	94	93	92	89	88	86	86	86	92	94	90	92	91	97	[illegible]	[illegible]
Aug. 2	95	94	93	91	94	94	94	94	94	95	95	95	95	95	95	95	94	92	92	91	92	92	[illegible]	[illegible]	[illegible]
Aug. 3	92	95	93	93	93	93	93	91	92	92	90	90	88	90	88	88	87	86	87	88	91	90	89	84	90.1
Aug. 4	76	76	86	90	92	92	92	92	92	92	92	92	90	90	88	91	80	88	86	87	81	87	86	91	87.9
Aug. 5	91	93	90	89	90	90	90	90	90	89	90	90	89	75	75	75	76	79	85	92	92	92	91	94	87.4
Aug. 6	91	91	91	92	92	93	93	93	93	93	92	93	87	85	80	80	76	70	70	73	72	77	[illegible]	[illegible]	[illegible]
Aug. 7	90	91	91	92	91	89	86	88	89	83	87	85	85	87	87	82	89	87	84	82	85	84	87	[illegible]	[illegible]
Aug. 8	82	84	87	90	89	89	89	90	90	90	87	80	80	76	80	80	76	76	74	82	83	87	86	86	[illegible]
Aug. 9	84	83	84	83	85	85	88	91	90	87	88	92	92	92	88	90	92	95	94	92	91	89	92	92	[illegible]
Aug. 10	96	92	92	90	91	90	92	95	96	95	93	95	95	91	90	92	86	86	85	80	81	82	[illegible]	84	89.6
Aug. 11	85	87	90	90	89	88	88	89	90	91	91	91	90	80	80	80	83	75	73	71	74	83	77	82	84.0
Aug. 12	78	79	88	88	90	92	91	91	94	94	95	95	95	95	93	93	95	92	95	95	94	94	95	[illegible]	91.5
Aug. 13	89	83	83	84	84	83	87	87	84	84	84	85	83	82	82	82	83	79	80	77	77	76	78	78	[illegible]
Aug. 14	81	81	79	81	82	81	83	83	85	84	84	84	84	82	83	82	92	83	83	80	80	79	78	82	82.3
Aug. 15	82	82	85	88	92	92	92	88	86	91	90	86	84	82	81	82	80	82	82	81	83	85	89	91	85.6
Aug. 16	88	90	89	89	89	89	89	89	89	89	87	85	83	82	82	85	81	80	80	82	81	82	86	87	85.5
Aug. 17	88	89	89	89	89	89	89	88	88	88	89	90	90	89	86	84	85	81	80	79	77	77	77	79	85.4
Aug. 18	88	93	87	84	84	85	83	86	85	86	84	80	86	85	75	67	65	66	68	68	69	70	71	75	78.7
Aug. 19	75	82	89	91	92	92	92	92	90	85	86	86	80	80	76	68	71	66	70	68	72	72	78	77	80.4
Aug. 20	81	82	82	89	89	89	89	89	85	85	90	90	83	80	80	72	69	74	78	72	70	76	79	78	81.[illegible]
Aug. 21	83	88	91	92	85	85	88	84	91	91	93	95	85	80	83	87	88	89	88	89	90	93	92	91	88.1
Aug. 22	93	94	91	94	92	92	92	92	92	92	88	88	81	81	78	83	79	80	85	84	82	86	87	91	87.1
Aug. 23	89	89	91	91	91	91	92	92	92	91	93	84	84	82	81	83	82	84	84	83	85	83	87	92	87.3
Aug. 24	92	91	93	92	93	94	93	92	92	92	92	84	86	88	88	82	80	80	81	82	80	85	86	91	87.9
Aug. 25	90	91	95	95	95	95	95	95	95	95	95	95	95	95	94	96	95	92	92	93	91	92	94	95	94.0
Aug. 26	94	95	92	91	91	90	90	90	90	90	92	92	92	90	90	90	87	84	81	78	80	83	83	86	88.4
Aug. 27	90	90	90	89	89	88	88	88	87	89	88	82	84	84	85	85	84	86	87	86	85	86	86	87	85.8
Aug. 28	82	89	88	89	87	88	88	89	89	88	88	88	83	84	80	83	80	80	80	84	84	89	86	[illegible]	85.6
Aug. 29	90	90	91	92	90	89	89	90	89	89	89	89	87	84	82	83	80	80	82	82	83	82	85	86	86.4
Aug. 30	89	89	89	91	87	86	86	86	86	87	86	86	86	92	91	89	88	92	81	80	85	86	89	93	87.5
Aug. 31	93	90	91	91	88	87	87	87	88	88	90	84	78	74	68	68	65	57	62	78	80	79	79	79	80.5
Means	87.1	88.2	89.0	89.7	89.6	89.5	89.7	89.8	89.9	89.6	89.7	88.5	86.7	85.2	83.7	83.3	82.7	81.6	82.0	82.2	82.6	84.0	85.5	86.6	86.5
1882.																									
Sept. 1	78	80	82	84	86	87	89	89	89	92	91	91	90	86	86	85	86	85	87	87	91	92	93	94	87.5
Sept. 2	97	97	96	95	95	95	94	93	91	91	91	91	92	90	90	89	90	88	87	85	85	85	83	84	90.6
Sept. 3	89	92	92	92	91	91	91	91	91	89	88	87	84	80	77	75	75	72	72	72	75	76	88	94	84.4
Sept. 4	95	95	95	96	95	92	92	92	92	92	92	90	89	85	82	77	70	70	75	65	60	63	81	86	84.2
Sept. 5	90	91	92	92	93	93	94	94	94	94	94	93	92	90	87	86	86	86	85	84	85	86	88	91	90.0
Sept. 6	96	97	94	97	94	94	93	92	92	92	93	93	94	93	94	94	95	90	90	93	93	90	87	90	92.9
Sept. 7	90	90	88	91	86	86	78	85	85	88	89	85	86	80	85	78	80	82	85	75	75	70	75	78	82.9
Sept. 8	77	79	80	80	79	77	84	78	76	78	86	88	86	82	87	90	90	90	93	93	92	88	87	89	84.5
Sept. 9	89	94	92	93	91	87	91	94	94	94	93	93	94	90	90	90	90	90	90	90	92	84	88	93	91.0
Sept. 10	89	90	91	92	91	90	90	89	88	89	89	89	90	90	90	87	90	90	90	90	88	90	91	90	89.7
Sept. 11	94	92	92	94	93	94	93	92	92	92	91	91	90	89	90	88	87	87	90	90	86	83	85	89	90.2
Sept. 12	87	88	89	91	88	89	90	91	91	88	86	86	84	83	86	84	85	82	80	90	81	81	85	87	86.3
Sept. 13	92	95	95	93	90	90	91	88	82	80	78	86	82	89	88	86	87	87	87	87	89	91	94	95	88.3
Sept. 14	94	95	94	95	94	93	93	92	93	93	92	92	90	91	88	89	89	90	87	89	87	85	82	90	90.7
Sept. 15	86	90	91	92	92	92	91	92	92	94	94	94	93	93	92	92	91	90	90	89	88	88	89	91	91.1
Sept. 16	93	94	94	94	93	93	93	93	93	93	93	92	91	90	90	90	90	90	90	90	92	92	92	92	92.0
Sept. 17	95	94	92	91	89	89	89	89	89	87	89	90	91	91	88	89	89	89	89	88	88	90	90	91	89.8
Sept. 18	92	94	90	90	89	89	91	92	91	91	91	91	90	90	90	90	90	90	90	90	91	92	91	92	90.7
Sept. 19	92	89	89	89	80	82	85	87	83	86	87	88	89	86	83	82	83	90	90	90	84	81	83	86	86.0
Sept. 20	87	88	90	89	87	88	87	87	87	87	88	89	88	87	86	85	85	85	83	92	86	87	90	92	87.7
Sept. 21	90	91	89	89	86	89	89	89	89	89	89	89	88	86	84	82	83	83	83	83	84	83	85	85	86.5
Sept. 22	84	84	86	86	82	83	84	83	84	85	84	85	85	86	87	88	89	87	86	86	85	85	85	86	85.2
Sept. 23	87	88	89	90	89	90	91	91	90	90	90	86	83	80	80	78	76	75	78	75	82	83	83	84	88.7
Sept. 24	85	85	89	88	88	89	89	88	89	89	89	88	86	85	84	81	78	73	80	83	86	86	85	87	85.4
Sept. 25	85	84	80	79	78	79	80	77	73	71	78	65	61	66	74	76	78	76	76	73	69	70	77	86	75.5
Sept. 26	88	90	89	88	90	87	90	90	92	90	90	91	91	92	91	93	93	93	93	89	86	78	80	78	88.8
Sept. 27	76	74	73	81	81	87	90	90	90	91	92	94	94	95	95	94	94	94	94	94	93	90	90	88	88.9
Sept. 28	87	86	91	90	89	88	88	90	91	91	93	93	92	92	93	88	92	92	90	90	85	87	88	89	89.8
Sept. 29	93	92	91	92	91	91	92	92	92	93	92	91	90	90	91	91	92	92	92	92	93	94	94	93	91.9
Sept. 30	93	93	93	94	92	92	91	91	91	91	88	87	88	89	90	89	90	91	90	92	92	92	92	91	90.9
Means	89.0	89.7	89.6	90.2	88.7	88.9	89.8	89.4	88.9	89.0	89.3	88.9	88.1	87.2	87.3	86.2	86.4	86.0	86.4	86.9	85.4	84.7	86.7	88.6	88.1

Table showing the moisture of the air at Uglaamie from October, 1881, *to August,* 1883—**Continued.**

[Height of the hygrometer above the surface of the ground 4 feet. Washington mean time. Correction reduced to mean local time, −5 hours 17 minutes.]

Date	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.
1882.																									
Oct. 1	92	92	92	92	[illegible]	92	92	92	92	92	91	92	92	92	92	92	92	92	92	92	92	94	92	92	92.0
Oct. 2	[illegible]	[illegible]	92	92	[illegible]	91	91	91	91	91	91	91	90	90	89	91	92	92	92	91	91	94	[illegible]	92	91.4
Oct. 3	[illegible]	[illegible]	91	95	92	91	92	91	91	91	90	89	90	90	89	89	89	89	88	88	88	89	[illegible]	90	90.4
Oct. 4	90	90	[illegible]	89	90	89	89	89	89	89	89	88	89	88	88	88	88	88	88	88	88	89	88	88	88.7
Oct. 5	89	89	89	89	88	88	88	88	89	89	89	89	88	87	88	89	89	89	89	89	89	89	89	87	88.6
Oct. 6	85	84	84	84	84	84	83	83	84	84	83	83	84	84	85	84	83	83	83	83	84	84	84	83	83.7
Oct. 7	84	84	84	84	83	83	84	84	84	84	84	84	85	85	84	85	83	83	83	82	83	83	83	83	83.2
Oct. 8	82	82	82	82	82	82	82	82	82	82	82	82	82	82	81	81	82	82	82	82	82	82	82	82	81.9
Oct. 9	82	81	81	82	81	81	82	82	82	82	82	82	83	83	84	84	83	83	82	82	82	82	82	82	82.2
Oct. 10	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	87	87	87	87	89	88	87	87	83.8
Oct. 11	87	85	87	87	87	87	87	87	87	88	88	88	89	89	88	88	88	88	88	88	87	87	87	87	87.5
Oct. 12	87	87	87	86	86	86	86	86	86	84	84	84	83	84	84	84	87	87	87	87	87	83	[illegible]	85	85.5
Oct. 13	87	86	86	86	86	86	86	86	85	84	82	82	81	83	80	83	85	84	84	84	85	85	[illegible]	[illegible]	84.4
Oct. 14	82	87	87	88	85	86	86	85	85	84	85	86	83	86	87	87	86	87	87	89	88	88	[illegible]	[illegible]	86.4
Oct. 15	87	86	86	86	85	86	86	86	85	86	86	86	86	85	85	86	86	85	85	85	84	83	84	84	85.4
Oct. 16	87	87	88	89	88	88	88	87	87	87	87	87	86	86	86	86	86	86	86	86	87	87	87	86	86.9
Oct. 17	88	88	87	87	86	86	87	87	87	87	87	86	86	86	86	86	86	86	87	88	87	87	87	87	86.8
Oct. 18	88	88	89	88	87	87	87	87	87	87	85	84	84	84	85	86	86	86	86	86	89	88	86	86	86.5
Oct. 19	87	89	89	89	87	88	86	86	85	85	84	84	85	84	84	85	85	85	88	88	87	87	87	87	86.3
Oct. 20	89	88	88	88	87	87	86	85	84	81	84	84	83	83	83	83	85	85	85	82	85	84	83	83	84.9
Oct. 21	83	83	84	83	84	83	82	81	82	83	82	84	82	82	82	83	85	83	83	83	80	84	84	84	82.9
Oct. 22	88	88	88	87	86	87	87	86	88	86	85	85	83	83	83	83	83	83	82	82	85	83	82	82	84.8
Oct. 23	84	85	84	85	83	84	84	83	82	82	82	82	82	82	82	82	82	82	82	82	83	84	83	84	82.9
Oct. 24	87	86	87	86	84	84	84	83	83	84	84	84	83	83	83	83	83	84	82	82	85	83	83	83	83.9
Oct. 25	85	86	85	84	81	82	82	82	82	82	81	81	81	80	78	75	75	75	75	75	75	79	80	81	80.1
Oct. 26	84	79	83	84	84	85	85	85	84	84	84	84	83	83	83	84	84	84	84	84	84	83	83	83	84.0
Oct. 27	85	84	85	84	82	82	83	82	82	83	83	82	82	81	82	82	82	82	82	82	80	81	81	81	82.3
Oct. 28	82	82	83	82	81	81	81	82	82	82	82	83	83	83	84	84	85	85	85	85	85	85	84	82	83.0
Oct. 29	82	84	82	81	81	80	80	79	79	79	79	79	80	81	81	81	80	80	80	80	80	81	81	81	80.5
Oct. 30	85	86	86	85	85	85	85	85	83	80	80	81	83	85	85	92	95	94	90	92	91	88	88	87	86.5
Oct. 31	89	**90**	89	**90**	88	88	88	87	86	89	89	90	89	88	86	82	80	80	79	77	75	76	76	82	83.9
Means	86.3	86.3	86.3	86.3	85.4	85.5	85.5	85.2	85.1	85.0	84.7	84.8	84.7	84.0	84.5	84.8	85.2	85.1	84.9	84.9	85.1	85.2	84.9	85.1	85.2
1882.																									
Nov. 1	80	81	83	82	82	83	85	79	79	73	75	78	81	82	82	86	87	87	87	87	85	84	83	80	82.1
Nov. 2	81	84	81	81	81	80	73	73	73	73	74	74	74	72	70	74	75	75	74	74	75	73	75	74	75.5
Nov. 3	75	77	78	79	79	78	78	79	80	79	80	79	80	80	79	80	80	80	80	82	82	84	83	83	79.8
Nov. 4	85	85	85	86	83	83	83	83	83	83	83	82	81	81	80	81	82	83	83	83	81	81	81	81	82.6
Nov. 5	81	83	82	82	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	85	87	82.0
Nov. 6	88	88	88	87	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	84	84	84	84	85.8
Nov. 7	85	85	84	84	85	84	84	84	84	84	84	80	81	81	80	80	83	83	82	82	82	83	83	84	83.0
Nov. 8	84	83	83	85	84	84	84	85	85	85	85	85	85	84	84	84	83	83	85	85	85	85	85	85	84.4
Nov. 9	84	85	84	84	85	85	86	86	86	87	87	88	88	89	89	88	88	88	90	89	90	89	90	90	87.3
Nov. 10	91	90	92	90	89	89	89	89	89	89	89	89	89	88	88	86	86	86	85	85	83	83	82	82	87.4
Nov. 11	82	82	82	82	81	81	81	81	81	80	80	80	80	79	79	79	80	80	80	80	78	78	76	73	79.8
Nov. 12	72	71	71	71	72	72	72	72	71	71	72	72	72	72	73	71	72	73	72	72	72	70	68	67	71.4
Nov. 13	65	65	64	65	64	65	65	64	65	65	65	66	65	65	64	64	68	65	66	66	66	65	65	65	65.1
Nov. 14	65	65	65	65	64	64	64	64	64	64	63	63	63	64	64	64	62	63	63	64	63	64	61	64	63.8
Nov. 15	64	63	63	63	63	63	63	63	64	64	64	64	64	65	65	65*	65*	66*	66*	67	75	79	85	88	67.1
Nov. 16	90	91	91	91	92	92	92	92	93	93	92	92	92	92	92	92	93	93	93	93	91	91	91	90	91.8
Nov. 17	89	89	89	91	91	91	92	92	91	92	92	93	93	94	94	93	93	93	93	93	93	94	94	93	92.1
Nov. 18	94	93	92	93	93	93	93	92	93	93	93	93	92	92	92	92	92	92	92	92	92	92	92	92	92.5
Nov. 19	93	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92.0
Nov. 20	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92.0
Nov. 21	91	91	91	91	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91.8
Nov. 22	92	92	93	93	94	93	94	93	93	94	93	93	92	92	92	92	92	92	92	92	92	92	92	92	92.5
Nov. 23	91	91	90	90	91	91	91	91	91	91	91	91	90	90	90	90	91	91	92	92	90	90	90	90	90.7
Nov. 24	90	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	90	90	90	90	89	89	89	89	89.2
Nov. 25	89	89	89	88	88	88	88	88	88	88	88	88	88	88	88	88	90	90	90	90	88	88	88	88	88.5
Nov. 26	88	88	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87.1
Nov. 27	86	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86.8
Nov. 28	86	86	86	86	86	86	86	86	86	87	87	87	87	87	86	86	86	86	86	86	86	87	87	87	86.3
Nov. 29	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	87	87	86.1
Nov. 30	86	86	86	86	87	87	87	87	86	87	87	87	86	86	86	86	86	86	86	86	86	86	86	86	86.3
Means	84.2	84.3	84.1	84.2	84.2	84.1	84.1	83.8	83.9	83.8	83.9	83.9	83.9	83.9	83.7	83.8	84.3	84.3	84.4	84.4	84.2	84.3	84.5	84.4	84.1

* Interpolated.

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Corrections reduced to mean local time, —5 hour. 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.
1882.																									
Dec. 1	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87.0
Dec. 2	87	87	87	86	87	87	87	87	87	87	87	87	86	86	86	86	86	86	86	86	86	87	87	87	82.4
Dec. 3	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87.0
Dec. 4	86	86	86	86	86	86	86	86	86	86	86	87	86	86	86	86	86	86	86	86	86	86	86	86	86.0
Dec. 5	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86.0
Dec. 6	86	86	86	86	86	86	86	86	87	87	87	87	86	86	86	86	86	86	86	86	87	87	87	87	86.3
Dec. 7	86	86	86	86	86	87	87	87	87	87	87	87	87	87	86	87	87	87	86	86	86	86	86	86	86.5
Dec. 8	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86.0
Dec. 9	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86.0
Dec. 10	86	86	86	86	86	86	86	86	86	85	84	84	84	84	84	84	85	85	85	85	84	85	85	85	85.1
Dec. 11	86	87	87	[illegible]	89	89	89	89	88	88	88	88	87	86	86	85	85	86	85	85	84	84	84	85	86.6
Dec. 12	84	82	83	83	83	82	82	83	81	81	80	82	81	81	81	80	80	80	80	80	82	81	81	81	81.4
Dec. 13	82	83	83	84	84	84	84	84	84	84	84	84	85	85	85	84	85	85	83	84	84	83	84	83	83.9
Dec. 14	83	83	81	81	82	82	81	81	80	81	83	82	82	83	82	82	82*	82*	82*	83*	83	86	87	88	82.6
Dec. 15	87	86	86	87	87	87	87	88	88	87	87	87	86	86	86	86	86	87	87	87	87	87	87	89	86.9
Dec. 16	89	88	87	87	87	88	88	88	88	89	89	90	90	89	89	89	89	89	89	89	90	90	90	89	88.8
Dec. 17	89	89	89	89	89	88	89	89	90	90	90	88	88	88	88	89	89	89	89	89	88	88	89	90	88.9
Dec. 18	89	88	86	86	87	87	88	88	87	87	87	87	87	87	86	86	86	86	86	86	86	86	86	86	86.7
Dec. 19	89	88	88	88	87	87	88	88	88	88	88	88	87	87	86	85	86	86	86	86	87	87	87	90	87.3
Dec. 20	89	89	90	90	90	90	91	91	89	90	89	89	89	89	89	89	89	89	89	89	90	90	89	89	89.5
Dec. 21	91	89	90	91	92	92	92	93	92	91	90	90	89	89	89	89	90	90	90	90	89	87	87	87	90.0
Dec. 22	88	87	87	88	88	88	88	87	87	88	88	88	87	86	86	86	87	87	87	87	87	87	87	87	87.2
Dec. 23	88	87	87	87	87	87	87	87	87	87	87	87	87	87	88	88	88	88	88	88	87	87	86	87	87.2
Dec. 24	90	88	88	87	87	87	87	87	87	86	86	86	86	86	86	86	86	86	86	86	84	84	84	87	86.4
Dec. 25	87	87	87	87	88	88	88	88	88	89	89	89	89	89	88	88	89	89	89	89	89	89	89	89	88.4
Dec. 26	89	89	89	89	89	89	89	89	89	89	89	89	89	89	88	89	89	89	89	89	91	92	91	92	89.4
Dec. 27	91	92	92	93	92	92	92	92	91	91	91	92	92	93	93	92	93	93	93	93	93	93	93	93	92.3
Dec. 28	92	91	91	91	92	92	91	92	91	91	91	91	91	91	91	92	92	93	93	93	95	95	96	96	92.2
Dec. 29	96	96	96	96	97	96	93	92	89	89	88	87	86	86	86	86	88	88	88	88	86	86	86	86	89.8
Dec. 30	84	84	84	84	84	83	83	83	84	84	84	84	85	85	85	85	86	86	86	86	86	87	87	87	84.8
Dec. 31	87	87	87	87	87	87	87	87	87	87	87	88	88	87	87	87	89	89	89	89	89	89	89	89	87.8
Means..	87.5	87.2	87.1	87.3	87.5	87.4	87.4	87.4	87.1	87.1	87.0	87.1	86.8	86.8	86.6	86.6	87.0	87.1	86.9	87.0	87.0	87.1	87.2	87.5	87.1
1883.																									
Jan. 1	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	90	92	89.5
Jan. 2	90	91	92	92	92	92	92	93	92	93	92	91	91	92	91	91	91	91	91	91	91	90	91	93	91.5
Jan. 3	92	91	91	91	90	90	89	89	91	91	90	90	90	89	90	89	89	89	89	89	88	88	89	92	89.8
Jan. 4	91	91	91	90	90	91	91	90	90	89	91	91	91	91	91	90	90	90	90	90	89	89	88	90	88.5
Jan. 5	87	87	86	86	87	87	87	87	86	86	86	86	86	86	87	88	88	88	88	88	87	87	87	89	87.0
Jan. 6	91	88	88	88	87	87	86	85	84	84	83	82	83	83	83	84	84	84	84	84	84	84	84	85	85.0
Jan. 7	84	84	84	83	83	83	84	84	84	84	83	83	84	85	85	85	86	86	86	85	85	85	84	86	84.4
Jan. 8	84	84	84	84	84	85	85	85	85	85	85	85	85	85	85	86	86	86	86	86	88	85	85	87	85.2
Jan. 9	84	83	83	84	85	85	86	86	85	85	84	84	83	83	83	83	83	83	83	83	83	83	82	82	83.7
Jan. 10	83	83	84	88	85	85	84	85	84	87	87	85	84	84	84	85	85	84	84	84	83	83	83	83	84.4
Jan. 11	82	82	82	82	83	82	81	81	83	83	83	82	82	82	82	82	82	82	82	82	81	82	82	82	82.0
Jan. 12	83	82	82	81	82	82	81	80	80	80	80	80	80	80	80	80	79	79	79	79	79	80	79	83	80.4
Jan. 13	84	81	81	80	80	80	80	80	81	80	80	80	80	80	80	80	80	80	80	80	80	80	80	83	80.4
Jan. 14	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	81	81	81	81	81	82	80	80	83	81.4
Jan. 15	80	80	80	80	80	80	80	80	80	80	79	79	79	79	79	79*	76*	74*	71*	69*	67	68	70	74	76.8
Jan. 16	76	77	78	79	80	81	83	85	87	88	89	91	91	92	94	95	94	94	95	95	94	94	94	94	88.3
Jan. 17	95	95	94	94	95	96	97	97	96	94	94	93	93	93	93	93	93	93	93	93	92	91	91	92	93.8
Jan. 18	91	90	90	90	90	89	89	88	88	88	88	88	88	87	87	87	89	88	88	88	87	87	87	87	88.3
Jan. 19	87	87	86	86	84	85	85	86	86	86	86	86	85	85	85	85	85	86	86	86	85	85	85	87	85.6
Jan. 20	86	86	86	86	84	84	84	84	84	84	84	84	84	84	85	85	86	86	86	86	86	86	86	86	85.1
Jan. 21	87	86	86	85	86	86	86	87	87	87	87	88	87	87	87	87	87	88	86	86	87	88	88	89	86.9
Jan. 22	89	88	89	89	89	90	90	90	89	89	89	89	89	89	89	89	89	89	89	89	90	90	90	90	89.2
Jan. 23	92	93	92	93	92	92	92	92	92	92	92	92	92	92	92	93	95	95	95	95	94	95	95	98	92.2
Jan. 24	98	97	97	96	94	93	91	90	90	90	89	89	88	87	87	86	86	86	86	86	85	85	85	86	89.5
Jan. 25	85	85	85	85	84	84	84	84	84	83	83	83	82	82	82	82	83	85	85	85	82	82	82	82	83.5
Jan. 26	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	81	85	82.1
Jan 27	82	81	80	80	80	80	80	80	80	79	80	79	79	79	79	80	80	80	80	80	80	80	80	80	79.9
Jan. 28	81	80	80	80	80	80	80	80	80	80	80	80	79	79	79	79	79	79	70	79	80	80	80	80	79.7
Jan. 29	81	81	81	80	80	80	80	81	80	80	80	80	80	80	81	81	82	82	81	81	81	80	80	80	80.5
Jan. 30	81	81	80	80	80	80	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	80	79.4
Jan. 31	81	81	81	80	80	80	80	79	79	80	80	80	82	82	83	84	85	85	87	87	87	87	87	87	82.7
Means..	85.8	85.4	85.3	85.3	85.1	85.2	85.1	85.2	85.1	84.8	85.0	84.9	84.8	84.8	85.0	85.2	85.3	85.3	85.2	85.1	84.8	84.7	84.6	86.0	85.1

* Interpolated.

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time, —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.
1883.																									
Feb. 1	88	87	86	88	88	87	87	86	86	85	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86.4
Feb. 2	87	87	87	87	87	87	88	88	88	88	89	89	89	90	90	90	90	91	91	91	91	91	91	91	89.1
Feb. 3	91	91	91	92	92	92	92	92	91	91	91	91	91	91	92	93	95	95	95	95	95	97	97	97	92.9
Feb. 4	97	96	96	96	96	95	94	93	93	93	93	92	92	92	92	91	92	92	92	92	93	93	93	94	93.4
Feb. 5	94	95	94	94	95	95	95	95	95	96	96	95	94	95	95	96	97	97	97	97	97	97	97	96	95.6
Feb. 6	96	96	95	95	95	95	94	92	91	89	87	84	83	82	81	80	80	80	80	80	77	77	78	79	86.1
Feb. 7	79	79	81	82	83	83	83	84	85	85	85	87	90	90	91	92	92	92	92	92	90	89	87	86	86.6
Feb. 8	82	82	81	81	82	82	82	82	82	82	81	81	81	80	81	84	85	85	85	84	84	84	85	86	82.7
Feb. 9	86	86	87	89	90	90	91	91	92	92	94	94	95	93	91	90	90	91	91	90	88	85	85	83	89.8
Feb. 10	81	81	80	79	79	78	77	77	77	77	76	76	76	76	76	75	75	76	77	77	76	76	76	76	77.1
Feb. 11	75	75	75	76	76	76	76	77	77	77	77	77	77	77	77	77	77	77	77	77	76	76	76	76	76.4
Feb. 12	76	76	77	77	77	78	78	79	79	80	80	80	81	81	81	82	85	85	85	85	86	86	86	87	81.1
Feb. 13	86	86	85	84	82	82	81	80	80	80	80	80	80	79	79	79	79	79	79	79	79	78	78	77	80.5
Feb. 14	81	79	77	77	77	76	75	75	76	76	76	77	77	77	77	78	78	78	78	77	78	78	78	79	77.3
Feb. 15	81	79	80	79	79	79	79	77	77	76	75	75	76	76	76	77	77	77	77	77	74	74	74	74	76.9
Feb. 16	77	74	74	74	74	74	74	74	74	74	75	74	73	73	74	74	75	75	75	75	75	75	75	76	74.5
Feb. 17	77	77	77	76	76	76	78	79	79	79	78	77	76	76	74	74	75	75	75	75	75	74	73	74	76.0
Feb. 18	76	76	76	76	76	77	77	78	79	79	81	81	81	80	81	81	81	82	83	83	84	83	83	84	79.9
Feb. 19	85	84	84	83	82	82	81	80	80	80	82	83	81	81	81	81	82	84	85	85	85	82	82	81	82.3
Feb. 20	81	81	80	79	78	77	76	76	75	76	75	75	74	74	73	73	74	74	75	75	75	75	75	75	75.9
Feb. 21	75	75	75	74	74	74	75	75	75	75	75	75	76	75	76	76	76	76	77	76	76	76	76	75	75.3
Feb. 22	75	74	74	74	73	72	72	72	72	72	71	71	70	71	71	71	72	72	72	72	71	71	71	72	72.0
Feb. 23	76	74	72	71	71	71	77	75	75	74	73	73	74	73	73	74	75	75	74	74	72	72	72	71	73.4
Feb. 24	75	79	76	74	72	72	72	71	71	70	70	70	71	71	71	71	72	72	72	72	70	72	75	73	72.2
Feb. 25	74	72	71	72	71	73	72	72	74	72	75	74	73	72	73	72	72	72	72	72	71	71	71	70	72.2
Feb. 26	73	74	71	71	70	69	69	69	69	69	69	69	69	68	69	70	70	70	71	72	72	72	72	70	70.3
Feb. 27	71	71	72	71	70	68	69	69	69	69	70	70	71	71	72	72	72	73	73	73	73	71	72	72	71.0
Feb. 28	76	73	74	74	73	73	74	75	77	77	79	78	76	76	78	77	77	77	77	78	77	76	77	75	76.0
Means	81.1	80.7	80.4	80.2	79.9	79.8	79.9	79.8	79.9	80.1	79.9	79.8	79.8	79.5	79.7	79.0	80.4	80.6	80.8	80.8	80.2	79.9	80.0	79.8	80.1
1883.																									
Mar. 1	75	74	75	75	74	72	71	71	70	70	70	69	69	69	69	70	71	72	72	72	72	73	73	73	71.7
Mar. 2	73	72	72	72	72	71	71	71	71	71	70	71	71	72	72	72	72	72	73	73	74	73	73	75	72.0
Mar. 3	74	72	73	74	73	72	72	72	71	71	71	71	71	71	72	73	73	73	73	73	73	73	75	76	72.6
Mar. 4	74	74	74	74	74	74	75	75	74	72	73	73	74	74	74	74	74	74	75	75	75	75	77	76	74.3
Mar. 5	76	76	75	75	74	75	75	76	77	77	78	79	80	81	80	79	79	79	79	79	74	74	75	77	77.0
Mar. 6	77	76	76	77	74	74	72	72	74	74	73	72	72	72	72	74	75	75	75	75	74	74	73	74	74.0
Mar. 7	75	75	74	74	72	71	72	73	72	71	71	71	72	74	75	75	75	75	75	75	75	74	73	74	73.5
Mar. 8	75	76	76	74	72	73	71	72	72	72	72	73	70	68	69	70	70	70	70	71	72	70	70	72	71.7
Mar. 9	70	71	71	72	71	71	70	69	68	68	67	68	69	69	70	70	70	71	71	71	71	71	70	71	70.0
Mar. 10	73	72	71	71	69	68	68	69	68	67	67	67	67	68	68	71	71	71	71	71	70	69	69	70	69.4
Mar. 11	71	71	71	69	68	68	68	68	68	68	68	69	68	70	71	71	71	70	71	71	71	72	72	74	70.0
Mar. 12	75	75	75	75	74	74	74	74	75	74	74	74	75	74	75	76	76	76	76	76	76	75	74	74	74.8
Mar. 13	76	74	74	76	72	72	72	73	74	74	73	73	71	72	72	73	73	73	73	73	70	70	69	71	72.6
Mar. 14	74	74	74	72	71	71	71	71	69	68	70	71	71	74	74	73	74	74	74	75	74	76	76	73	72.7
Mar. 15	73	71	71	72	71	71	70	70	70	70	70	70	71	71	67	68	70	72	72	72	73	73	74	75	71.1
Mar. 16	76	76	75	75	74	75	75	76	76	76	76	76	76	77	77	77	78	77	77	77	77	77	77	77	76.2
Mar. 17	78	78	78	80	77	76	77	76	76	76	76	76	75	75	75	76	75	75	75	75	75	75	75	76	76.1
Mar. 18	76	75	75	75	73	73	73	72	73	73	75	74	74	74	74	75	76	76	76	77	77	76	77	77	74.8
Mar. 19	78	78	78	78	76	76	76	76	76	75	75	75	75	76	76	76	76	77	77	77	77	76	76	75	76.3
Mar. 20	74	73	73	73	71	71	73	76	75	75	75	75	75	76	76	76	77	77	77	77	77	77	77	78	75.0
Mar. 21	78	78	77	77	76	76	76	77	77	77	77	77	77	77	77	77	77	79	79	79	79	79	79	79	77.5
Mar. 22	79	79	79	79	79	80	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	80	82	80.0
Mar. 23	81	79	79	81	80	80	80	78	78	77	77	77	78	78	78	78	80	78	78	78	78	78	78	78	78.5
Mar. 24	79	80	81	80	79	80	79	79	79	79	79	79	78	78	78	78	77	77	78	78	81	84	81	81	79.2
Mar. 25	81	84	86	88	90	90	91	91	91	90	89	90	90	90	90	89	89	89	89	93	87	85	88	84	88.3
Mar. 26	84	81	81	82	81	82	83	83	83	83	85	85	86	86	87	87	91	91	91	91	90	89	89	89	85.8
Mar. 27	87	86	86	86	86	86	85	85	85	84	84	84	85	85	89	88	67	86	86	85	84	83	83	82	85.3
Mar. 28	82	82	81	79	78	77	77	76	77	78	77	79	80	80	81	81	81	81	80	82	83	84	85	87	80.3
Mar. 29	88	88	88	88	88	88	87	87	87	88	88	87	87	87	89	89	89	88	88	90	88	85	88	90	87.9
Mar. 30	88	82	85	85	84	83	82	79	79	79	79	78	82	81	82	82	83	81	80	81	81	81	81	81	81.6
Mar. 31	81	83	82	82	82	82	82	81	79	79	81	81	83	84	84	84	83	81	79	78	77	80	79	79	81.1
Means	77.4	76.9	77.0	77.1	76.0	75.9	75.7	76.0	75.6	75.4	75.5	75.6	75.9	76.2	76.5	76.9	77.2	77.1	77.1	77.5	77.0	76.8	76.8	77.4	76.5

***Table showing the moisture of the air at Uglaamie from October,* 1881, *to August,* 1883—Continued.**

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction reduced to mean local time, —5 hours 17 minutes.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily means.
1883.																									
Apr. 1	77	76	76	76	75	75	75	74	74	76	75	75	73	74	73	76	74	77	74	74	74	73	74	74	74.8
Apr. 2	74	74	76	74	73	74	73	73	73	71	72	74	72	73	73	74	74	74	74	74	74	74	73	76	73.6
Apr. 3	77	75	75	74	73	72	72	71	72	72	71	71	73	73	74	74	75	75	75	75	74	74	74	75	73.6
Apr. 4	75	75	75	75	73	73	73	72	72	73	73	73	72	73	74	75	75	75	75	75	74	74	74	74	73.8
Apr. 5	75	77	76	76	75	75	75	75	74	74	75	73	71	71	72	71	71	71	71	70	71	71	70	72	73.0
Apr. 6	72	72	75	75	73	73	72	73	73	73	73	73	72	73	71	71	72	72	72	72	72	73	73	72	72.6
Apr. 7	73	69	72	71	72	72	72	72	72	73	73	71	72	71	70	71	69	68	69	70	69	69	69	71	70.8
Apr. 8	74	74	74	74	72	72	72	72	73	73	73	73	74	74	75	75	76	76	76	76	75	75	75	75	74.1
Apr. 9	75	75	77	77	76	76	76	76	75	75	76	76	76	76	77	77	78	78	79	79	80	80	80	81	77.1
Apr. 10	81	81	81	81	80	80	80	80	79	79	79	79	79	79	80	80	81	81	81	81	80	80	80	80	80.1
Apr. 11	80	80	80	80	79	79	79	79	79	79	79	79	78	78	78	78	78	79	79	79	79	79	79	80	79.0
Apr. 12	80	80	80	81	78	78	78	78	79	79	80	80	80	80	80	79	79	79	79	79	79	78	79	80	79.2
Apr. 13	80	80	81	80	79	79	79	79	78	78	79	78	78	78	78	78	79	79	79	79	77	77	77	78	78.6
Apr. 14	79	78	78	79	78	78	77	77	77	78	78	78	78	78	78	78	78	78	78	77	78	78	78	79	78.0
Apr. 15	78	78	78	78	78	78	78	77	78	78	78	77	76	77	77	70	72	75	75	75	74	74	72	75	76.1
Apr. 16	74	77	77	78	76	76	75	74	73	74	72	74	74	74	75	75	76	76	76	76	72	72	72	72	74.2
Apr. 17	72	74	73	74	72	72	72	73	74	73	73	73	74	74	74	73	72	72	72	72	69	67	66	69	72.0
Apr. 18	68	74	71	76	72	72	72	72	72	71	71	72	72	72	74	74	72	70	70	70	71	72	74	74	72.0
Apr. 19	76	77	78	77	76	75	76	76	76	75	75	75	77	79	79	79	76	74	74	73	76	77	78	80	76.4
Apr. 20	83	83	82	84	82	82	83	82	83	82	82	79	79	77	78	80	80	80	80	80	79	81	80	81	80.9
Apr. 21	83	84	82	83	82	82	83	83	82	81	81	79	78	78	77	76	76	77	77	77	76	76	76	78	79.5
Apr. 22	79	79	79	79	76	72	76	76	76	75	74	72	70	70	69	71	75	76	77	77	76	75	75	74	74.9
Apr. 23	76	77	78	78	79	82	80	78	79	79	79	80	81	80	81	81	82	82	83	83	81	83	83	84	80.5
Apr. 24	85	85	85	84	82	82	82	82	84	83	84	84	83	82	82	82	82	82	82	82	81	80	80	81	82.5
Apr. 25	84	85	84	84	84	84	83	84	84	84	84	85	85	84	84	83	83	83	82	82	81	81	82	84	83.5
Apr. 26	84	84	84	84	83	82	82	83	83	83	83	83	82	81	82	82	82	82	81	81	84	82	81	82	82.5
Apr. 27	82	80	80	79	80	80	80	80	80	80	80	79	79	78	77	76	76	76	75	75	74	72	76	79	78.0
Apr. 28	79	80	80	80	79	79	79	79	79	79	78	78	76	76	75	74	74	74	76	76	75	76	75	76	77.2
Apr. 29	79	80	80	81	79	80	81	82	82	82	80	79	79	77	76	75	75	74	73	73	73	74	75	79	77.8
Apr. 30	81	83	84	86	85	84	84	84	84	84	84	84	84	84	83	82	80	80	80	77	77	78	78	80	82.1
Means.	77.8	78.2	78.4	78.6	77.4	77.3	77.3	77.2	77.3	77.2	77.1	76.9	76.6	76.5	76.5	76.2	76.4	76.5	76.5	76.3	75.9	75.8	75.9	77.2	76.9
1883.																									
May 1	78	80	80	80	79	79	79	79	77	77	77	77	78	78	79	79	79	80	80	80	79	79	79	79	78.8
May 2	78	79	80	81	79	79	79	79	80	78	78	78	79	80	80	80	80	80	82	82	82	82	82	82	80.0
May 3	83	82	81	83	81	80	80	80	79	79	79	79	79	79	80	80	81	81	81	81	80	80	81	83	80.5
May 4	82	84	84	84	83	83	83	83	83	83	82	82	82	83	83	83	83	83	83	83	83	84	83	85	83.1
May 5	86	86	87	87	86	86	86	86	86	86	86	85	83	83	84	84	88	89	91	91	91	91	90	91	87.0
May 6	92	93	90	92	89	90	93	95	95	94	91	92	88	85	83	83	82	82	82	82	82	83	86	87	87.9
May 7	86	87	89	89	87	86	86	87	86	86	87	87	87	86	85	83	82	82	84	84	82	80	81	81	85.0
May 8	84	85	88	90	87	88	88	89	87	86	83	83	83	82	80	78	78	78	79	79	80	81	80	81	83.2
May 9	82	87	88	86	86	[illegible]	86	86	86	88	88	87	87	88	88	86	84	80	78	79	81	82	82	83	84.8
May 10	86	88	89	91	91	93	94	95	93	93	90	89	88	86	85	86	86	84	83	83	83	81	82	83	87.6
May 11	82	86	86	86	85	87	87	88	89	89	89	88	87	89	88	87	87	87	87	87	85	87	88	89	87.1
May 12	91	91	92	94	91	92	92	86	86	81	80	85	84	84	83	83	84	84	84	84	84	87	88	91	86.7
May 13	92	91	92	89	88	87	87	87	87	87	88	89	89	89	89	89	89	90	90	91	91	91	91	92	89.4
May 14	93	93	92	93	92	93	94	92	91	90	90	89	87	87	85	84	82	81	80	79	80	76	77	78	86.6
May 15	82	84	87	88	90	91	93	93	94	93	92	91	91	89	89	91	91	89	88	88	88	90	90	90	89.7
May 16	91	92	93	93	91	91	91	91	91	91	92	91	90	88	87	86	86	86	84	81	83	85	86	89	88.7
May 17	91	92	94	94	94	93	92	91	90	89	88	87	86	85	85	85	84	82	80	80	80	80	81	84	87.0
May 18	81	86	86	85	87	86	86	86	86	85	84	82	83	80	80	78	75	73	73	73	73	74	77	80	80.9
May 19	82	82	80	80	83	84	81	77	80	80	80	80	79	78	77	75	73	75	75	74	79	79	80	77	78.8
May 20	77	89	93	92	91	86	83	78	78	79	79	80	84	84	86	85	85	81	81	78	79	78	76	74	82.8
May 21	76	78	75	81	89	86	91	91	90	90	88	85	84	84	85	84	83	83	84	82	83	85	87	90	84.8
May 22	94	94	94	94	93	93	91	91	91	91	90	90	88	86	85	84	82	82	81	81	80	82	82	84	87.6
May 23	86	87	87	88	88	88	89	89	89	88	87	86	84	88	82	80	79	78	78	79	80	83	87	90	84.8
May 24	86	89	89	91	91	90	90	90	90	88	88	88	87	85	84	84	85	84	84	82	82	84	87	89	87.0
May 25	90	91	90	89	90	91	94	93	92	88	87	84	83	80	80	76	76	76	77	81	83	82	83	86	85.1
May 26	89	91	91	92	92	92	92	94	94	93	92	91	91	89	88	86	85	85	85	83	86	90	90	92	89.7
May 27	96	98	96	96	94	94	92	90	90	89	87	85	84	84	83	82	81	80	81	83	80	82	83	84	87.2
May 28	84	88	91	94	92	90	90	94	92	87	85	82	83	82	82	81	83	84	83	83	85	89	90	88	86.8
May 29	88	89	92	92	94	93	88	87	85	88	88	89	89	88	89	89	89	92	90	89	89	89	89	90	89.4
May 30	91	91	91	86	86	85	84	84	79	78	77	79	80	80	79	78	80	79	80	80	81	81	82	81	[illegible]
May 31	83	86	87	[illegible]	88	87	88	88	89	90	90	89	89	81	80	81	81	79	83	86	82	83	86	88	85.5
Means.	86.0	87.7	88.2	88.6	88.3	88.0	88.0	87.7	87.3	86.6	86.2	85.5	86.4	84.0	83.5	82.9	82.7	82.2	82.3	82.2	82.5	83.2	84.1	85.2	85.3

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.
1883.																									
June 1	88	90	90	91	91	91	92	92	93	90	91	89	88	87	86	86	85	84	82	80	83	84	84	85	87.5
June 2	89	89	89	86	86	86	86	86	86	87	87	87	86	86	86	84	81	78	80	78	80	77	78	89	84.0
June 3	86	88	90	90	88	87	85	87	86	85	87	82	79	60	81	81	81	83	84	86	84	86	86	84	84.8
June 4	89	90	89	90	90	90	92	92	92	91	92	90	89	86	86	82	83	80	80	78	78	79	81	80	86.2
June 5	85	83	87	88	87	89	90	94	92	91	91	89	88	86	85	80	78	81	80	80	80	83	86	89	85.9
June 6	91	91	92	89	87	80	79	79	81	80	79	82	81	82	83	84	83	83	85	84	85	83	81	76	83.3
June 7	79	78	78	82	83	81	84	92	93	94	93	92	90	89	87	88	88	88	88	89	90	91	93	95	87.7
June 8	96	96	97	97	95	95	93	93	93	90	90	88	86	85	84	85	84	84	85	85	85	86	80	88	89.4
June 9	90	92	93	92	91	91	92	93	92	90	90	89	87	85	84	84	83	82	78	78	80	80	81	80	86.5
June 10	81	80	81	82	82	83	86	87	86	86	86	84	84	80	82	79	78	80	83	78	80	78	79	79	81.8
June 11	79	84	86	88	89	90	91	91	87	82	82	88	87	86	85	85	85	86	86	90	87	89	92	94	87.0
June 12	93	95	97	96	95	95	95	94	95	94	93	93	94	91	88	86	86	83	83	80	85	86	85	90	90.5
June 13	94	94	94	96	94	95	95	95	95	94	90	88	84	83	83	80	82	82	86	86	90	92	94	93	89.9
June 14	94	95	96	94	94	95	95	94	94	94	93	91	91	90	89	85	85	86	86	66	87	87	88	89	90.7
June 15	90	90	94	95	93	92	92	90	89	88	87	90	91	88	89	86	85	86	87	86	89	91	91	92	89.6
June 16	94	94	92	93	90	90	91	89	87	89	91	84	85	84	80	76	82	86	85	86	86	87	91	94	87.7
June 17	95	92	93	94	90	91	92	90	91	91	90	89	86	84	82	80	76	77	80	78	82	82	83	79	86.0
June 18	80	80	90	96	96	97	96	95	95	93	90	89	88	86	85	82	84	78	79	79	82	83	85	87	87.2
June 19	91	91	91	91	90	90	91	92	92	92	92	92	90	88	86	85	85	83	83	85	86	87	89	93	88.9
June 20	95	94	95	95	94	94	92	92	87	86	88	88	88	86	83	83	79	78	81	74	83	85	84	78	86.7
June 21	82	91	94	96	96	95	93	92	93	92	91	89	87	88	87	86	87	87	86	89	89	90	91	94	90.2
June 22	93	92	94	95	94	92	92	90	89	88	88	87	88	83	82	82	83	82	80	78	80	84	86	87	86.8
June 23	89	92	95	95	95	96	95	93	91	90	89	90	92	93	94	94	96	90	88	90	88	88	66	88	91.5
June 24	87	84	87	91	89	90	90	89	90	89	89	87	86	87	85	85	85	85	86	84	84	83	83	83	86.5
June 25	83	84	86	86	87	88	89	90	89	87	88	86	85	87	88	89	89	87	86	84	85	85	84	85	86.5
June 26	86	86	87	88	87	88	89	88	87	91	92	93	92	89	87	86	86	85	86	88	89	89	95	95	88.7
June 27	97	96	97	97	96	96	95	96	96	95	95	93	94	94	93	92	94	92	90	95	90	91	91	91	94.0
June 28	91	92	91	92	92	92	91	91	92	88	88	88	89	88	81	82	84	89	90	91	89	87	82	80	88.1
June 29	82	80	84	87	90	90	91	92	93	92	91	90	89	88	87	86	86	78	86	82	82	82	82	85	86.4
June 30	93	94	93	91	90	91	91	90	90	89	89	90	89	87	86	85	82	85	83	85	83	86	81	83	87.7
Means	88.7	89.2	90.7	91.4	90.7	90.6	90.8	90.9	90.5	89.6	89.4	88.5	87.7	85.8	85.4	84.2	84.1	83.6	84.0	83.7	84.7	85.3	85.9	86.5	87.5
1883.																									
July 1	83	86	84	85	86	89	89	89	89	88	86	84	84	86	88	88	91	91	91	94	93	92	92	91	88.2
July 2	93	92	94	96	94	94	94	95	94	95	95	96	95	96	95	94	94	94	94	94	94	93	93	93	94.2
July 3	94	95	96	96	95	95	95	95	95	95	96	96	96	92	90	91	94	93	88	85	89	89	90	93	93.0
July 4	93	95	95	94	91	91	92	92	92	92	92	93	92	93	90	88	90	93	90	85	87	85	89	90	90.0
July 5	91	91	91	94	92	93	93	94	93	93	93	90	88	89	87	88	89	87	87	88	88	87	87	90	90.1
July 6	92	93	93	94	95	96	96	95	95	94	94	95	95	95	94	93	94	94	91	91	88	88	88	88	92.9
July 7	85	89	91	93	92	93	93	94	94	93	93	92	89	86	87	80	79	79	77	77	77	81	85	89	87.0
July 8	91	93	92	87	88	90	93	94	94	92	92	90	92	87	85	82	82	83	83	81	80	81	82	82	87.3
July 9	80	78	85	80	82	81	89	78	76	76	83	83	85	88	89	91	91	90	90	90	87	87	92	95	85.2
July 10	98	95	96	97	96	97	96	95	95	95	94	90	90	90	90	89	88	85	84	84	81	79	82	82	90.3
July 11	82	81	82	87	87	85	84	82	81	79	79	80	84	84	85	83	84	83	83	83	84	84	84	86	83.1
July 12	90	95	93	94	93	95	95	96	95	95	95	95	95	95	94	91	92	91	90	91	87	87	89	89	92.5
July 13	91	92	95	94	94	94	96	94	94	94	94	94	94	92	94	94	94	92	93	94	88	87	88	84	92.5
July 14	90	89	89	89	89	90	84	81	86	87	87	86	88	89	84	84	83	82	81	84	83	84	84	86	85.7
July 15	88	85	85	88	89	89	90	91	90	90	90	87	85	87	87	85	86	85	84	82	85	87	89	89	87.2
July 16	93	94	94	92	94	94	95	95	94	95	94	94	94	92	90	91	89	86	88	84	84	83	84	88	90.8
July 17	93	94	94	93	93	92	92	91	88	87	89	86	85	85	84	81	83	86	88	85	84	84	84	82	87.6
July 18	84	81	85	84	85	83	83	82	78	78	78	80	80	82	81	83	80	80	82	81	79	79	76	76	80.8
July 19	74	79	74	76	82	82	85	86	87	87	85	82	86	84	82	80	80	94	92	92	92	90	87	87	84.3
July 20	90	93	95	94	94	94	94	94	94	93	93	94	92	92	92	91	92	92	90	85	86	89	90	92	91.8
July 21	94	95	96	96	95	95	96	96	95	94	93	92	89	88	85	84	87	88	80	82	89	88	87	91	90.6
July 22	88	91	91	92	92	93	94	94	94	94	94	94	92	90	90	90	89	66	88	84	86	88	89	89	90.5
July 23	94	91	88	94	95	94	94	94	92	85	84	86	66	87	85	84	85	84	86	84	85	89	89	93	88.6
July 24	94	92	91	91	90	90	93	94	94	94	94	94	94	85	83	84	84	82	82	79	78	77	73	76	87.0
July 25	80	80	82	82	81	83	82	82	80	79	78	82	83	80	70	82	82	82	82	84	84	82	83	86	81.2
July 26	82	91	96	96	95	94	94	93	91	90	90	85	84	82	83	82	82	80	81	81	79	72	74	78	85.6
July 27	80	80	83	86	88	89	89	86	80	77	75	74	72	73	74	72	72	75	74	73	72	72	74	77	77.7
July 28	82	85	85	85	84	88	89	90	89	82	76	77	77	76	73	70	70	80	76	80	86	91	92	95	82.4
July 29	96	96	93	96	94	94	95	94	92	88	87	90	89	86	85	85	86	86	84	84	86	86	88	88	89.5
July 30	89	88	88	91	91	92	93	93	92	92	93	92	91	90	90	88	88	84	82	76	76	76	76	77	87.0
July 31	79	82	84	86	90	91	91	91	91	91	88	87	86	83	81	77	78	77	80	82	80	83	85	87	84.5
Means	88.2	89.0	89.6	90.3	90.8	90.9	91.5	90.9	90.1	89.1	88.8	88.3	88.1	87.2	86.0	85.3	85.7	85.9	85.2	84.4	84.4	84.5	85.3	86.0	87.7

Table showing the moisture of the air at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of the hygrometer above the surface of the ground, 4 feet. Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily means.
1883.																									
Aug. 1	88	88	88	89	90	92	93	95	95	95	94	95	95	90	88	88	88	87	88	83	85	85	88	91	89.9
Aug. 2	91	92	92	94	94	95	95	96	95	95	94	94	90	86	84	83	82	84	82	81	86	86	88	90	89.5
Aug. 3	93	96	94	94	95	94	94	94	93	94	95	95	91	90	88	86	85	82	84	86	86	86	90	90	90.6
Aug. 4	92	95	95	96	95	96	95	95	95	94	94	94	94	91	90	90	87	87	87	85	88	88	88	89	91.6
Aug. 5	90	91	91	93	94	94	94	95	95	95	94	94	94	93	95	93	93	93	90	91	85	87	88	89	92.1
Aug. 6	89	91	90	91	92	94	94	94	94	93	93	93	93	93	93	93	93	92	92	94	92	90	91	92	92.3
Aug. 7	92	92	92	93	94	93	93	95	94	94	92	91	89	88	90	80	85	84	80	80	81	83	86	87	88.6
Aug. 8	90	91	89	93	93	92	92	93	94	94	94	94	94	93	93	93	93	93	93	92	92	88	82	82	91.5
Aug. 9	85	89	90	95	95	94	93	92	92	89	87	84	77	68	67	72	75	72	74	80	79	80	81	84	83.0
Aug. 10	86	89	91	91	91	92	92	91	88	90	85	83	83	86	86	87	92	93	93	92	91	96	95	95	89.9
Aug. 11	95	95	94	95	95	95	96	94	94	94	94	93	95	95	94	93	87	82	88	88	85	91	84	88	91.8
Aug. 12	94	92	92	93	93	92	92	93	93	93	93	93	93	90	90	82	83	89	93	94	89	91	94	93	91.4
Aug. 13	92	93	95	95	95	94	95	94	94	94	94	93	92	91	91	91	90	90	90	91	91	91	91	90	92.3
Aug. 14	89	92	91	92	92	91	93	94	94	94	94	93	91	90	87	90	92	87	88	86	87	87	88	89	90.4
Aug. 15	88	87	91	94	93	92	92	92	92	92	96	95	97	95	94	94	89	89	89	89	88	88	88	89	91.3
Aug. 16	90	91	90	91	91	91	92	91	91	91	91	92	92	92	92	92	93	94	94	94	95	95	95	94	92.2
Aug. 17	95	95	94	94	94	94	94	94	94	93	90	90	90	88	89	88	85	80	80	78	75	70	72	81	87.7
Aug. 18	82	89	91	91	91	92	92	92	92	92	92	92	91	91	91	92	92	92	91	91	91	91	88	87	90.6
Aug. 19	90	90	89	89	89	89	89	89	89	89	89	89	86	88	88	88	88	87	88	88	86	85	88	87	88.2
Aug. 20	89	90	90	90	90	91	91	92	92	91	91	92	92	90	90	91	91	93	94	94	94	94	94	94	91.6
Aug. 21	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	93	93	92	93.7
Aug. 22	93	93	94	93	93	94	94	93	94	94	94	94	94	89	90	89	89	89	88	88	88	88	88	90	91.3
Aug. 23	91	91	91	92	92	92	93	92	90	90	90	91	90	91	91	91	91	91	91	91	92	92	92	93	91.2
Aug. 24	94	96	95	96	95	95	95	95	95	94	94	94	94	94	94	94	94	94	89	84	86	85	83	83	92.1
Aug. 25	80	82	79	79	78	77	79	81	81	82	81	83	83	82	81	79	79	79	78	80	80	83	88	90	81.0
Aug. 26	92	92	93	94	93	94	94	94	94	94	94	94	93	92	92	92	91	87	86	85	85	83	83	86	90.7
Aug. 27*	87	86	88	84	88	89	89	89	89	90	86	90	90	93	94	94	94	94	92	91	91	93	93	93	90.2
Means.	90.0	91.1	91.2	92.0	92.1	92.2	92.5	92.7	92.4	92.3	91.8	91.8	91.0	89.9	89.4	88.8	88.7	88.0	88.0	87.7	87.4	87.7	88.1	88.8	90.2

* Station abandoned August 27, 1883.

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, — 5h 17m. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.		2 a. m. Direction and velocity.		3 a. m. Direction and velocity.		4 a. m. Direction and velocity.		5 a. m. Direction and velocity.		6 a. m. Direction and velocity.		7 a. m. Direction and velocity.		8 a. m. Direction and velocity.		9 a. m. Direction and velocity.		10 a. m. Direction and velocity.		11 a. m. Direction and velocity.		12 m. Direction and velocity.	
1881.																								
Oct. 18	WSW.		S.		S.		S.		SW.		S.		SSW.		SSW.		SSW.		SSW.		SSW.		SSW.	
Oct. 19	W.	36	W.	30	W.	30	W.	30	W.	26	W.	28	WNW.	24	W.	21	W.	17	NW.	8	NW.	6	NW.	5
Oct. 20	ESE.	18	E.	19	E.	20	E.	22	E.	20	E.	21	SE.	22	SE.	24	SE.	20	SE.	26	SE.	24	SE.	20
Oct. 21	SE.	8	E.	6	NE.	4	SE.	2	S.	4	S.	4	S.	6	SW.	7	NW.	12	NW.	18	N.	20	N.	20
Oct. 22	N.	14	N.	15	N.	15	N.	13	NNE.	13	NNE.	13	NE.	18	N.	18	NNE.	18	NNE.	16	NNE.	16	NNE.	16
Oct. 23	NNE.	20	NNE.	24	NNE.	20	NNE.	24	NNE.	20	NNE.	20	NE	24	NE.	24	NE.	22	NE.	22	NE.	20	NE.	24
Oct. 24	N.	25	N.	24	N.	24	NNE.	24	NNE.	10	NNE.	12	N.	13	NNE.	17	NNE.	16	N.	18	N.	30	N.	20
Oct. 25	N.	44	N	44	N.	44	N.	36	N.	32	NNE	32	N.	32	N.	32	N.	32	N.	29	N.	24	N.	24
Oct. 26	N.	8	N.	10	N.	12	NNE.	13	NNE.	15	NNE.	14	N.	20	N.	16	N.	19	N.	16	N.	12	N.	16
Oct. 27	NNE.	11	N.	8	NNE.	8	NE.	8	ENE.	8	E.	9	SE.	10	SE.	10	SE.	12	SE.	14	SE.	10	SE.	10
Oct. 28	NE.	14	NE.	19	NE.	20	NE.	20	NE.	24	NNE	20	NNE.	21	NE.	22	NNE.	24	NNE.	24	N.	24	N.	24
Oct. 29	ESE.	4	ENE.	5	NNE.	3	NNE.	1	NNE.	1	E.	2	E.	2	E.	3	E.	3	Calm.		E.	2	E.	2
Oct. 30	E	4	E.	8	E.	8	SE.	8	SE.	9	SE.	9	SE.	12	SE.	6	SE.	8	SE.	3	SE.	4	SE.	4
Oct. 31	ESE.	5	E.	5	E.	8	E.	8	E.	6	SE.	6	E.	7	E.	14	E.	11	E.	8	E.	10	E.	10
Means.	16.23		16.69		16.61		16.07		14.61		14.61		16.23		16.46		16.46		15.53		15.53		15.46	

Date.	1 p. m. Direction and velocity.		2 p. m. Direction and velocity.		3 p. m. Direction and velocity.		4 p. m. Direction and velocity.		5 p. m. Direction and velocity.		6 p. m. Direction and velocity.		7 p. m. Direction and velocity.		8 p. m. Direction and velocity.		9 p. m. Direction and velocity.		10 p. m. Direction and velocity.		11 p. m. Direction and velocity.		12 p. m. Direction and velocity.		Daily mean velocity.
1881.																									
Oct. 18	SW.	28	SW.	28	SW.	28	SW.	30	SW.	32	SW.	20	SW.	28	SW.	36	SW.	34	SW.	40	SW.	40	SW.	40	(*)
Oct. 19	NE.	8	E.	8	E.	14	E	12	E.	15	E.	18	E.	12	E.	12	E.	15	E.	16	ESE.	20	ESE.	20	18.04
Oct 20	SE.	26	SE.	28	SE.	25	SE.	20	SE.	20	SE	20	SE.	20	SE.	20	SE.	18	SE.	16	SE.	12	ESE.	8	20.62
Oct. 21	N.	20	N.	16	NNW.	18	NNW.	16	NW.	14	NW.	16	NW.	16	N.	16	N.	16	NNW.	16	NNW.	17	N.	13	12.70
Oct. 22	NNE.	20	NNE.	18	NE	20	NE.	20	NE.	22	NE.	20	NE.	20	NE.	21	NE.	22	NE	22	NNE.	21	NE.	24	18.12
Oct. 23	NE.	26	NE.	20	NNE.	20	NNE.	28	NNE.	24	NNE.	26	NNE.	27	NNE.	27	NNE.	24	N.	24	NNE	24	NNE.	24	23.25
Oct. 24	NNE.	20	NNE.	19	NE.	36	NE.	34	NE.	36	NE	40	NE.	36	NE.	32	NNE.	36	NNE.	41	NNE.	40	NNE.	44	26.95
Oct. 25	N.	24	N.	24	N.	22	N.	16	N.	17	N.	16	N.	12	N.	10	N.	10	N.	0	N.	11	NNE.	12	24.50
Oct. 26	N.	16	N.	16	N.	20	N.	16	NNW.	18	NNW.	18	NNW.	20	NW.	16	NW.	16	NW.	14	NW.	12	NW.	13	15.25
Oct. 27	SE.	10	SE.	8	SSE.	5	Calm.		SE.	4	SE	3	SE.	3	E.	8	NNE.	10	NNE.	10	NE	14	NE.	13	8.61
Oct. 28	N.	24	N.	24	N.	26	N.	25	N.	25	NE.	12	NE.	15	E.	16	E.	6	E.	3	SE.	11	SE.	4	18.62
Oct. 29	E.	3	E.	3	ENE.	3	ENE.	4	ENE.	6	ENE.	4	NNE.	4	NNE.	6	NNE.	6	E.	8	ESE.	7	E.	7	3.70
Oct. 30	SE.	2	SE.	2	Calm.		SSE.	4	SE.	10	E.	5	E.	14	E.	8	E.	6	E.	3	ESE.	3	E.	8	6.16
Oct. 31	E.	12	E.	16	E.	18	E.	22	E.	22	E	22	E.	26	E	28	E.	28	E.	28	E.	28	E.	26	15.58
Means.	16.23		15.53		17.46		16.69		17.92		16.92		17.30		16.92		16.38		16.15		16.92		16.67		16.31

* Record incomplete for October, 18.

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1882—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, — 5h 17m. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1881.												
Nov. 1	E. 25	E. 20	E. 24	E. 24	E. 22	E. 20	E. 18	E. 20	E. 20	E. 20	E. 20	E. 16
Nov. 2	ENE. 19	ENE. 20	ENE. 20	ENE. 20	ENE. 20	ENE. 16	NE. 24	ENE. 17	ENE. 18	ENE 19	ENE. 20	ENE 16
Nov. 3	NE. 32	ENE. 38	ENE. 36	ENE. 32	ENE. 34	ENE. 32	NE 36	NE 34	NE 37	NE. 36	NE 36	NE 36
Nov. 4	ENE. 24	ENE. 24	ENE. 24	ENE. 24	ENE. 24	ENE. 24	ESE. 21	ENE. 18	ENE. 20	ENE. 21	ENE. 20	ENE 18
Nov. 5	NE. 14	ENE. 20	ENE. 20	ENE. 24	ENE. 28	ENE. 22	ENE 24	ENE. 21	ENE. 27	ENE. 27	ENE. 30	ENE. 24
Nov. 6	NE. 28	ENE. 26	ENE. 26	ENE. 20	ENE. 20	ENE. 24	ENE. 30	ENE. 25	ENE. 25	ENE. 25	ENE. 20	ENE. 24
Nov. 7	ENE. 14	ENE. 16	ENE. 22	NE. 22	NE. 22	NE. 20	NE. 20	ENE. 24	ENE. 20	ENE 19	NE 20	NE. 16
Nov. 8	ENE. 15	ENE. 16	ENE. 16	ENE. 14	ENE. 14	ENE. 10	ENE 14	ENE 14	ENE. 12	ENE 11	ENE. 10	ENE 15
Nov. 9	NNE. 27	NNE. 26	NNE. 24	NNE. 28	NNE. 28	NNE. 28	NNE. 28	NNE. 30	NNE. 29	NNE. 31	NNE. 28	N. 18
Nov. 10	NE. 23	NE 21	NE. 22	NE 20	NE. 20	NE. 20	NE. 21	NE. 29	NE 20	NE. 22	NE. 26	NE 24
Nov. 11	NE. 19	NE 20	NE. 20	NE. 19	NE. 16	NE. 17	ENE. 20	ENE. 19	ENE 16	ENE. 15	ENE. 12	ENE 12
Nov. 12	ENE 12	ENE. 12	ENE. 11	ENE. 12	ENE. 9	ENE. 12	ENE. 10	ENE. 9	ENE. 9	ENE. 10	ENE. 10	ENE 6
Nov. 13	ENE. 6	ENE. 5	ENE. 6	ENE. 5	ENE. 4	ENE. 4	E. 5	E. 4	E. 4	E. 4	E 5	E 6
Nov. 14	ESE. 19	ESE. 20	ESE 18	ESE. 18	ESE. 21	SE. 20	SE. 18	SE. 18	SE 19	SE 18	ESE. 20	ESE. 20
Nov. 15	S. 21	S. 24	SSW. 24	SSW. 26	SSW. 28	SW. 25	SW. 27	SW. 24	SW. 26	SW. 28	SW. 26	SW. 24
Nov. 16	WNW. 20	WNW. 21	WNW. 18	W. 22	WNW. 18	WNW. 20	WNW. 22	NW. 18	NW. 18	NW. 20	NW. 16	NW. 15
Nov. 17	NNE. 13	NNE. 12	NNE. 10	NNE. 11	NNE. 8	NNE 10	NNE. 10	NE. 9	NE. 12	NE 10	NE. 9	NE. 9
Nov. 18	NE. 21	NE. 24	NE. 24	NE. 24	NE. 28	NNE. 28	NE. 28	NE. 29	NE 32	NE 30	NE 32	NE. 32
Nov. 19	NE. 38	ENE 34	ENE. 36	ENE. 36	ENE. 36	ENE. 32	ENE. 34	ENE. 34	ENE. 31	ENE. 28	E. 28	E. 28
Nov. 20	E. 24	ESE. 24	ESE. 16	ESE. 14	ESE. 10	S. 16	SSE. 16	SSE. 11	SSE. 16	S. 10	SSE. 9	SSE. 6
Nov. 21	WNW. 24	WNW. 21	WNW. 24	WNW. 24	WNW. 26	NW. 28	NW. 31	NW. 31	NW. 28	NW. 26	NW. 23	WNW. 20
Nov. 22	NW. 10	NW. 9	NW. 10	NW. 6	NW. 6	NW. 6	NW. 6	NW. 6	NW. 6	NW. 3	NW. 2	NW. 4
Nov. 23	SSW. 4	SSW. 3	SSW. 4	SSW. 5	SSW. 3	SSW. 3	SSW. 4	SSW. 6	SSW. 7	S. 5	SSE. 6	SSE. 8
Nov. 24	ENE. 16	ENE. 15	ENE 14	ENE. 18	ENE. 16	ENE. 14	ENE. 16	ENE. 12	ENE. 15	ENE. 17	ENE. 18	ENE. 20
Nov. 25	ENE. 22	ENE. 22	ENE. 18	ENE. 20	ENE. 24	ENE. 24	ENE. 27	ENE 24	ENE. 28	ENE. 28	ENE. 28	E 34
Nov. 26	E. 33	E. 31	E. 28	E. 24	E. 22	E. 22	E. 25	E. 22	E. 22	E. 22	E 20	E. 18
Nov. 27	ENE. 14	ENE 9	ENE 9	ENE. 7	ENE. 7	E. 8	ENE. 8	E. 8	ENE. 8	ENE 9	ENE. 6	ENE. 6
Nov. 28	SW. 8	SW. 8	S. 5	SSW. 9	S. 9	S. 9	SSE. 16	SSE. 14	SSE. 10	SSE. 10	SSE 7	SSE. 9
Nov. 20	S. 15	S. 14	S. 13	S. 14	S. 10	S. 12	S. 14	S. 10	S. 8	S. 4	NW. 7	NW. 20
Nov. 30	NW. 12	N. 12	N. 9	N. 8	N. 8	N. 8	N. 9	N. 10	N. 12	N. 10	N. 10	N. 10
Means.	19.06	19.10	18.36	18.33	18.03	17.80	19.10	18.03	18.50	17.93	17.46	17.46

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1881.													
Nov. 1	E. 20	E. 16	E. 16	E. 16	ENE. 20	ENE. 20	ENE. 20	ENE. 18	ENE. 16	ENE. 16	ENE. 20	ENE. 20	19.70
Nov. 2	ENE. 16	E. 20	E. 20	ENE. 20	ENE. 16	ENE. 24	ENE. 28	ENE. 28	ENE. 24	ENE. 26	ENE. 30	ENE. 28	21.20
Nov. 3	ENE. 32	ENE. 30	ENE. 27	ENE. 30	ENE. 36	NE. 30	NE. 28	NE. 28	NE. 28	NE. 26	ENE. 27	NE. 24	31.87
Nov. 4	E. 19	E. 14	E. 15	ENE. 19	ENE. 18	ENE. 20	ENE. 20	ENE. 20	ENE. 18	ENE. 18	ENE. 15	ENE. 13	19.62
Nov. 5	ENE. 20	ENE. 20	ENE. 24	ENE. 31	ENE. 30	ENE. 24	ENE. 22	ENE. 24	NE. 24	NE. 24	ENE. 18	ENE. 24	23.58
Nov. 6	ENE. 20	ENE. 20	ENE. 27	ENE. 24	ENE. 21	NE. 16	NE. 20	NE. 24	NE. 20	NE. 24	NE. 24	ENE. 18	22.95
Nov. 7	NE. 18	NE. 16	NE. 20	NE. 16	NE. 24	NE. 18	NE. 20	NE. 24	ENE. 20	ENE. 20	ENE. 20	ENE. 20	19.62
Nov. 8	ENE. 14	ENE 13	ENE. 20	ENE. 16	ENE. 14	ENE. 15	NE. 16	NNE. 14	NNE. 16	NNE. 24	NNE. 25	NNE. 24	15.55
Nov. 9	NNE. 28	NNE. 24	N. 26	NNE. 26	NNE. 24	NNE. 21	NNE. 20	NNE. 21	NNE. 21	NNE. 24	NE. 22	NNE. 20	25.55
Nov. 10	NE. 23	NE. 21	NE. 20	NE. 21	NE. 22	NE. 18	NE. 20	NE. 16	NE. 18	NE. 16	NN. 20	NE. 17	20.45
Nov. 11	ENE. 12	ENE. 13	ENE. 18	ENE. 14	ENE. 14	ENE. 12	ENE. 13	ENE. 12	ENE. 13	ENE. 12	ENE. 13	ENE. 11	15.08
Nov. 12	ENE. 8	ENE. 10	ENE. 7	ENE. 8	ENE. 8	ENE. 8	ENE. 6	ENE. 5	ENE. 5	ENE. 5	ENE 5	ENE. 5	8.41
Nov. 13	E. 6	E. 6	E. 6	E. 7	E. 8	E. 8	E. 9	E. 16	E. 18	E. 18	E. 18	ESE. 16	8.08
Nov. 14	ESE. 18	ESE. 16	ESE. 15	SE. 14	SE. 16	SE. 12	S. 20	S. 13	S. 16	S. 17	S. 20	S. 20	17.75
Nov. 15	SW. 26	SW. 24	SW. 26	SW. 28	WNW. 28	NW. 20	NW. 18	W. 12	W. 17	W. 20	W. 17	WNW. 24	23.45
Nov. 16	NW. 16	NW. 15	NW. 15	NNW. 15	NNW. 9	NNW. 14	NNW. 14	N. 14	N. 14	N. 10	NNE. 12	NNE. 12	16.16
Nov. 17	NE. 9	NE. 9	NE. 10	NE. 10	NE. 9	NE. 8	NE. 10	NE. 14	NE. 14	NE. 14	NE. 19	NE. 20	11.20
Nov. 18	NE. 35	NE. 34	NE. 35	NE. 32	NE. 34	NE. 36	NE. 40	NE. 40	NE. 40	NE. 40	NE. 43	NE. 40	32.54
Nov. 19	E. 28	E. 25	E. 27	E. 25	E. 25	E. 24	E. 24	E. 22	E. 23	E. 20	E 15	E 24	28.20
Nov. 20	S. 12	S. 10	WSW. 20	WSW. 12	WSW. 24	W. 20	W. 24	WNW. 20	W. 20	WNW. 20	WNW. 24	WNW. 22	16.66
Nov. 21	W. 20	W. 20	WNW. 19	W. 18	W. 14	WNW. 14	WNW. 12	WNW. 16	WNW. 15	WNW. 14	NW. 12	NW. 11	20.45
Nov. 22	SSW. 6	SSW. 5	SSW. 3	SSW. 4	SSW. 7	SSW. 5	SSW. 4	SSW. 4	SSW. 4	SSW. 4	SSW. 3	SSW. 4	5.29
Nov. 23	SSE. 4	SSE. 6	E. 11	E. 14	E. 13	E. 14	E. 12	E. 12	ENE. 12	ENE. 12	ENE. 16	ENE. 18	8.41
Nov. 24	ENE. 18	ENE. 12	ENE. 15	ENE. 16	ENE. 15	ENE. 16	ENE. 20	ENE. 18	ENE. 16	ENE. 20	ENE. 20	ENE. 20	16.54
Nov. 25	E. 32	ENE. 30	ENE. 34	E. 33	E. 30	E. 30	E. 28	E. 28	E. 28	E. 28	E 28	E. 31	27.45
Nov 26	ENE. 19	ENE. 15	ENE. 15	E. 11	E. 13	E. 12	E. 12	E. 11	E. 11	ENE. 10	E. 9	E. 9	18.16
Nov. 27	ENE. 7	ENE. 5	ENE. 6	ENE. 12	E. 12	E. 11	E. 7	E. 5	SE. 5	S. 7	SSW. 7	SW. 10	8.04
Nov. 28	SSE. 7	SSE. 6	SSE. 4	SSE. 4	SSW. 14	S. 9	S. 9	S. 18	S. 14	S. 9	S. 12	S. 12	9 66
Nov. 29	NW. 24	NW. 24	NW. 20	NW. 18	NW. 13	NW. 14	NW. 15	NW. 13	NW. 14	NW. 10	NW. 12	NW. 9	13.62
Nov. 30	N. 10	N. 10	N. 10	N. 9	N. 9	N. 16	N. 12	N. 6	N. 7	N. 8	NNW. 12	NW. 14	10.04
Means	17.56	16.30	17.70	17.43	18.00	16.96	17.43	17.20	17.03	17.20	17.93	18.00	17.84

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, $-5^h 17^m$. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1881.												
Dec. 1	NW. 13	NW. 14	NW. 12	NW. 9	NW. 9	WSW. 10	WSW. 8	SSW. 14	W. 16	WSW. 8	WSW. 8	SW. 9
Dec. 2	SSW. 7	WNW. 9	WNW. 8	WNW. 5	WNW. 6	WNW. 6	WNW. 12	N. 12	N. 16	NNE. 20	NE. 19	NE. 24
Dec. 3	ENE. 42	ENE. 41	ENE. 41	ENE. 40	ENE. 38	ENE. 36	NE. 40	NE. 41	NE. 41	NNE. 38	NNE. 38	N. 36
Dec. 4	N. 4	N. 4	N. 4	N. 4	ENE. 3	E. 3	ENE. 5	ENE. 8	ENE. 7	ENE. 6	ENE. 7	ENE. 7
Dec. 5	NE. 12	NE. 12	NE. 13	NE. 13	NE. 15	NE. 16	NE. 12	NE. 14	NE. 16	NE. 13	NNE. 16	NE. 16
Dec. 6	NE. 8	NE. 8	NE. 8	NE. 4	NE. 4	NE. 4	Calm.	Calm.	Calm.	Calm.	NNE. 3	NNE. 4
Dec. 7	SSE. 12	SW. 12	SSW. 11	W. 12	W. 11	W. 12	W. 6	W. 8	W. 8	W. 7	W. 8	W. 7
Dec. 8	W. 10	W. 6	W. 6	W. 4	W. 3	W. 4	W. 7	W. 5	W. 5	W. 5	W. 5	W. 7
Dec. 9	SSW. 4	SSW. 5	SSW. 4	SSW. 2	SSW. 4	SE. 3	SE. 5	SE. 5	SE. 4	SE. 4	SE. 4	SE. 6
Dec. 10	S. 9	S. 11	S. 11	S. 8	S. 8	SSW. 7	SW. 7	W. 19	W. 11	W. 11	W. 12	W. 10
Dec. 11	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	N. 5	N. 7	SSE. 6	SSE. 6	SSE. 5	SSE. 5
Dec. 12	SW. 7	NW. 10	NW. 12	NW. 12	NW. 12	NNW. 14	NNW. 14	NNW. 11	NNW. 10	NNW. 7	NNW. 6	NNW. 6
Dec. 13	NNW. 7	W. 8	W. 10	W. 8	W. 8	WNW. 10	WNW. 11	WNW. 12	WNW. 8	WNW. 7	WNW. 7	WNW. 7
Dec. 14	WNW. 2	WNW. 3	WNW. 3	WNW. 3	WNW. 3	WNW. 4	S. 5	S. 5	S. 5	S. 5	SSW. 5	SSW. 4
Dec. 15	SSW. 3	SSW. 5	SSW. 4	SSW. 4	SSW. 5	SSW. 3	SSW. 4	SSW. 4	SSW. 4	SSW. 3	SSW. 3	SSW. 3
Dec. 16	SSW. 8	SSW. 8	SSW. 8	SSW. 8	SSW. 8	SSW. 8	SSW. 8	SSW. 10	SSW. 10	SSW. 7	SSW. 7	SSW. 6
Dec. 17	SSW. 3	SSW. 4	SSW. 4	SSW. 4	SSW. 3	NNE. 3	NNE. 3	NNE. 2	NNE. 4	NNE. 3	NNE. 2	NNE. 2
Dec. 18	ENE. 3	ENE. 7	ENE. 3	ENE. 4	ENE. 6	ENE. 4	ENE. 6	ENE. 6	ENE. 6	ENE. 5	ENE. 6	ENE. 5
Dec. 19	ENE. 6	ENE. 8	ENE. 8	ENE. 7	ENE. 5	ENE. 5	ENE. 8	ENE. 9	ENE. 8	ENE. 8	ENE. 8	ENE. 8
Dec. 20	ENE. 8	ENE. 9	ENE. 9	ENE. 7	ENE. 8	ENE. 8	ENE. 12	ENE. 15	ENE. 12	ENE. 14	NE. 15	NE. 14
Dec. 21	NE. 10	NE. 11	NE. 12	NE. 13	NE. 12	NE. 13	NE. 12	NE. 12	NE. 12	NE. 11	NE. 9	NE. 12
Dec. 22	NE. 5	NE. 5	NE. 6	NE. 5	NE. 3	NE. 3	ESE. 4	ESE. 4	ESE. 2	ESE. 4	ESE. 5	ESE. 4
Dec. 23	NE. 14	NE. 13	NE. 18	ENE. 12	ENE. 12	ENE. 12	ENE. 11	ENE. 13	ENE. 10	ENE. 8	E. 2	Calm.
Dec. 24	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	ESE. 7	S. 8	S. 10
Dec. 25	S. 5	S. 3	S. 3	S. 4	Calm.	Calm.	Calm.	S. 3	S. 8	S. 4	S. 5	Calm.
Dec. 26	W. 3	W. 4	W. 2	W. 5	Calm.	W. 3	W. 5	W. 5	W. 4	Calm.	WNW. 6	Calm.
Dec. 27	WNW. 14	WNW. 11	WNW. 6	WNW. 8	WNW. 6	WNW. 10	WNW. 5	WNW. 11	WNW. 11	WNW. 7	WNW. 12	WNW. 8
Dec. 28	WNW. 6	WNW. 7	WNW. 4	WNW. 4	Calm.	WNW. 3	WNW. 6	WNW. 6	WNW. 6	WNW. 4	WNW. 6	Calm.
Dec. 29	SSE. 14	SSE. 12	SSE. 14	SSE. 14	SE. 13	SE. 13	SE. 16	SE. 14	SE. 17	SE. 18	SE. 20	SE. 18
Dec. 30	SE. 16	SE. 12	SE. 12	SE. 7	SE. 8	Calm.	SE. 4	Calm.	Calm.	S. 6	S. 15	S. 8
Dec. 31	SSW. 14	SSW. 20	SSW. 12	SSW. 11	SSW. 9	SSW. 12	SSW. 12	SSW. 12	SSW. 9	SSW. 3	WSW. 7	WSW. 8
Means.	8.67	9.09	8.61	7.83	7.16	7.38	8.16	9.25	8.90	8.03	9.00	8.16

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1881.													
Dec. 1	SSW. 16	W. 18	WSW. 15	W. 23	WNW. 12	W. 10	WNW. 7	SSW. 9	SSW. 16	WSW. 13	SW. 12	SSW. 17	12.41
Dec. 2	NE. 28	ENE. 29	ENE. 31	ENE. 31	ENE. 34	ENE. 34	ENE. 39	ENE. 36	ENE. 38	ENE. 40	ENE. 40	ENE. 40	23.50
Dec. 3	N. 32	N. 26	N. 24	N. 22	N. 18	N. 16	N. 16	N. 16	N. 12	N. 10	N. 6	N. 6	28.16
Dec. 4	ENE. 7	NE. 8	NE. 9	NE. 8	NE. 10	NE. 10	NE. 8	NE. 7	NE. 10	NE. 13	NE. 12	NE. 12	7.33
Dec. 5	NE. 9	NE. 12	NE. 10	NE. 10	NE. 11	NE. 10	NE. 10	NE. 9	NE. 4	NE. 5	NE. 4	NE. 4	11.08
Dec. 6	NNE. 4	NNE. 1	Calm.	NNE. 3	Calm.	SE. 5	SE. 8	SE. 8	SE. 8	SE. 5	SE. 5	SE. 8	3.95
Dec. 7	W 8	W. 8	W. 12	W. 10	W. 8	W. 6	W. 7	W. 8	W. 7	W. 9	W. 7	W. 11	8.95
Dec. 8	SW. 8	SW. 8	SW. 8	SW. 8	SW. 8	SW. 6	SW. 4	SW. 4	SW. 4	SW. 4	SW. 3	SW. 4	5.66
Dec. 9	SE. 4	SSW. 7	S. 4	SSE. 6	SSE. 4	SSE. 6	SSE. 4	SSE. 3	SSE. 2	SSE. 4	SSE. 7	SSE. 8	4.54
Dec. 10	WNW. 7	NW. 4	NW. 9	NW. 8	NW. 7	NW. 5	N. 3	N. 4	N. 7	N. 5	N. 6	N. 3	8.00
Dec. 11	SSE. 7	SSE. 7	SSE. 5	SSE. 14	SSE. 22	S. 12	S. 12	S. 16	S. 16	S. 17	S. 15	S. 12	7.87
Dec. 12	NNW. 4	NNW. 4	NNW. 5	NNW. 6	NNW. 6	NNW. 6	NNW. 6	NNW. 5	NNW. 5	NNW. 6	NNW. 7	NNW. 7	7.83
Dec. 13	WNW. 7	WNW. 6	WNW. 6	WNW. 6	WNW. 5	WNW. 8	WNW. 8	WNW. 7	WNW. 4	WNW. 4	WNW. 5	WNW. 5	7.25
Dec. 14	SSW. 5	SSW. 4	SSW. 5	SSW. 2	SSW. 3	SSW. 2	SSW. 4	SSW. 4	SSW. 3	SSW. 2	SSW. 3	SSW. 3	3.62
Dec. 15	SSW. 3	SSW. 3	SSW. 4	SSW. 4	SSW. 5	SSW. 5	SSW. 6	SSW. 7	SSW. 7	SSW. 6	SSW. 8	SSW. 8	4.62
Dec. 16	SSW. 6	SSW. 5	SSW. 7	SSW. 3	SSW. 4	SSW. 1	SSW. 5	SSW. 5	SSW. 2	Calm.	SSW. 4	SSW. 3	5.85
Dec. 17	NNE. 3	NE. 3	NE. 5	NE. 4	NE. 4	ENE. 4	ENE. 6	ENE. 5	ENE. 6	ENE. 3	ENE. 3	ENE. 4	3.62
Dec. 18	ENE. 7	ENE. 6	ENE. 6	ENE. 3	ENE. 5	ENE 4	ENE. 3	ENE. 3	ENE. 4	ENE. 6	ENE. 4	ENE. 4	4.79
Dec. 19	ENE. 6	ENE. 7	ENE. 8	ENE. 8	ENE. 8	ENE. 8	ENE. 8	ENE. 7	ENE. 7	ENE. 7	ENE. 9	ENE. 10	7.54
Dec. 20	NE. 13	NE. 14	NE. 11	NE. 12	NE. 12	NE. 11	NE. 9	NE. 9	NE. 9	NE. 12	NE. 13	NE. 11	11.12
Dec. 21	NE. 12	NE. 12	NE. 7	NE. 8	NE. 8	NE. 8	NE. 6	NE. 4	NE. 3	NE. 3	NE. 4	NE. 3	9.04
Dec. 22	ESE. 4	ESE. 3	ESE. 4	ESE. 5	ENE. 9	ENE. 8	ENE. 7	ENE. 8	ENE. 9	ENE. 12	ENE. 13	NE. 14	6.08
Dec. 23	ENE. 10	Calm.	ENE. 4	Calm.	Calm.	ENE. 6	ENE. 6	ENE. 4	ENE. 2	Calm.	Calm.	Calm.	6.62
Dec. 24	S. 11	S. 12	S. 4	S. 6	S. 10	S. 10	S. 10	S. 8	S. 6	S. 4	S. 6	S. 4	4.83
Dec. 25	Calm.	Calm.	Calm.	Calm.	W. 4	W. 6	W. 6	W. 4	W. 4	W. 6	W. 4	W. 5	3.08
Dec. 26	Calm.	Calm.	WSW. 8	WSW. 4	W. 3	W. 8	W. 9	W. 9	WNW. 10	WNW. 9	WNW. 10	WNW. 11	4.91
Dec. 27	WNW. 14	WNW. 12	WNW. 10	WNW. 12	WNW. 12	WNW. 14	WNW. 10	WNW. 10	WNW. 12	WNW. 12	WNW. 6	WNW. 6	9.95
Dec. 28	WNW. 7	WNW. 4	WNW. 4	WSW. 6	SW. 3	SSW. 2	SSW. 3	S. 8	S. 8	Calm.	SSE. 3	SSE. 10	4.58
Dec. 29	SE. 20	SE. 24	SE. 22	SE. 20	SE. 22	SE. 20	SE. 24	ESE. 24	SE. 20	SE. 24	ESE. 23	ESE. 15	18.37
Dec. 30	S. 9	S. 9	S. 10	S. 11	S. 13	S. 12	S. 12	S. 12	S. 11	SW. 16	SW. 12	SSW. 12	9.45
Dec. 31	WSW. 6	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	E. 4	E. 5	6.00
Means	8.93	8.25	8.29	8.48	8.70	8.48	8.58	8.48	8.25	8.29	8.32	8.54	8.41

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, – 5h 17m. Velocity given in miles per hour.]

Date.	1 a.m. Direction and velocity.	2 a.m. Direction and velocity.	3 a.m. Direction and velocity.	4 a.m. Direction and velocity.	5 a.m. Direction and velocity.	6 a.m. Direction and velocity.	7 a.m. Direction and velocity.	8 a.m. Direction and velocity.	9 a.m. Direction and velocity.	10 a.m. Direction and velocity.	11 a.m. Direction and velocity.	12 m. Direction and velocity.
1882.												
Jan. 1	ESE. 7	ESE. 9	ESE. 10	ESE. 17	ESE. 10	ESE. 16	ESE. 18	ESE. 12	ESE. 15	ESE. 15	ESE. 16	ESE. 17
Jan. 2	E. 14	E. 12	E. 10	E. 10	E. 12	E. 10	E 14	E. 12	E. 9	E. 12	E. 14	E. 12
Jan. 3	E. 13	E. 11	E. 12	E. 12	E. 12	E. 12	ENE. 12	ENE. 14	ENE. 15	ENE. 14	ENE. 12	ENE. 15
Jan. 4	ENE. 10	ENE. 10	ENE. 8	ENE. 8	ENE. 12	ENE. 11	ENE. 11	ENE. 11	ENE. 11	ENE. 9	ENE. 4	ENE. 6
Jan. 5	E. 11	E. 8	E. 8	E. 8	ENE. 10	ENE. 5	ENE. 5	ENE. 8	ENE. 10	ENE. 10	ENE. 5	ENE. 4
Jan. 6	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.
Jan. 7	Calm.	NE. 4	Calm.	NE. 4	Calm.	NE. 4	NE. 6	NE. 4	NE. 4	NE. 4	NE. 4	Calm.
Jan. 8	NE. 4	NE. 4	NE. 4	NE. 4	NE. 4	Calm	NE. 5	NE. 6	NE. 7	NE. 10	NE. 7	NE. 4
Jan. 9	NE. 11	NE. 8	NE. 7	NE. 6	NE. 8	NE. 3	Calm.	NE. 5	NE. 6	NE. 8	NE. 8	NE. 7
Jan. 10	NE. 6	NE. 6	NE. 6	NE. 8	NE. 8	NE. 4	NE. 5	NE. 6	NE. 7	NE. 12	NE. 8	NE. 8
Jan. 11	ENE. 18	ENE. 18	ENE. 18	ENE. 18	ENE. 20	ENE. 20	ENE. 18	ENE. 19	ENE. 20	ENE. 20	ENE. 24	ENE. 24
Jan. 12	ENE. 28	ENE. 28	ENE. 27	ENE. 26	ENE. 28	ENE. 24	E. 24	E. 24	ENE. 22	SE. 24	S. 30	SSW. 28
Jan. 13	W. 46	W. 48	W. 48	W. 46	W. 48	W. 52	W. 52	W. 52	WSW. 52	W. 52	W. 52	WSW. 52
Jan. 14	W. 48	W. 40	W. 38	W. 42	W. 38	W. 38	W. 32	W. 32	W. 32	W. 32	W. 24	W. 24
Jan. 15	Calm.	Calm.	Calm.	Calm.	Calm.	WNW. 7	WNW. 7	NW. 10	N. 8	NNE. 10	NNE. 20	NNE. 9
Jan. 16	NNE. 10	NNE. 12	NE. 10	NE. 10	NE. 16	NE. 14	NE. 14	NE. 16	NE. 16	NE: 16	NE. 14	NE. 14
Jan. 17	ENE. 32	ENE. 25	ENE. 26	ENE. 28	ENE. 28	ENE. 25	ENE. 28	ENE. 28	ENE. 32	E. 32	E. 36	E. 32
Jan. 18	ESE. 20	E. 20	E. 16	E. 12	E. 13	E. 11	E. 12	E. 12	E. 12	E. 16	E. 20	E. 6
Jan. 19	E. 10	E. 13	E. 12	E. 14	E. 14	E. 14	E. 16	E. 16	E. 12	E. 12	E. 8	E. 8
Jan. 20	Calm.	Calm.	WNW. 9	WNW. 8	WNW. 8	WNW. 10	WNW. 12	WNW. 14	WNW. 14	WNW. 12	WNW. 10	WNW. 8
Jan. 21	SSW. 14	S. 12	S. 14	S. 14	SSE. 17	SSE. 24	SSE. 24	SSE. 24	SSE. 24	SSE. 28	SSE. 28	SSE. 28
Jan. 22	S. 40	S. 46	S. 54	S. 54	S. 56	S. 52	S. 52	S. 52	S. 56	SW. 52	SW. 64	SW. 100
Jan. 23	W. 34	W. 28	W. 28	W. 28	W. 28	W. 27	WSW. 28	W. 28	W. 28	W. 30	W. 28	WSW. 28
Jan. 24	W. 34	W. 34	W. 36	W. 34	W. 32	W. 32	W. 32	W. 28	W. 28	W. 32	W. 24	W. 20
Jan. 25	SW. 4	SW. 7	SW. 6	SE. 5	SE. 4	SE. 6	SE. 14	SE. 20	SE. 14	SE. 16	SSE. 18	SSE. 16
Jan. 26	W. 17	W. 14	W. 12	W. 16	W. 18	WNW. 24	WNW. 26	WNW. 24	WNW. 24	WNW. 26	WNW. 24	WNW. 20
Jan. 27	W. 24	W. 24	W. 22	W. 24	W. 24	W. 22	W. 22	W. 24	W. 24	W. 20	W. 10	W. 20
Jan. 28	WNW. 7	WNW. 6	WNW. 4	WNW. 6	WNW. 5	WNW. 5	WNW. 4	WNW. 4	WNW. 5	WNW. 5	WNW. 2	WNW. 3
Jan. 29	NNE. 9	NNE. 10	NNE. 8	NNE. 10	NNE. 9	NNE. 8	NNE. 8	NNE. 8	NNE. 8	NNE. 8	NNE. 8	NNE. 8
Jan. 30	N. 4	Calm.	Calm.	N. 4	N. 2	Calm.	Calm.	N. 2	Calm.	Calm.	Calm.	Calm.
Jan. 31	ESE. 6	ESE. 2	ENE. 8	ENE. 8	ENE. 9	NE. 10	NE. 12	NE. 14	NE. 12	NE. 14	NE. 14	NE. 16
Means.	15.52	14.81	14.87	15.61	15.90	15.81	16.55	17.06	16.93	17.13	17.61	17.64

Date.	1 p.m. Direction and velocity.	2 p.m. Direction and velocity.	3 p.m. Direction and velocity.	4 p.m. Direction and velocity.	5 p.m. Direction and velocity.	6 p.m. Direction and velocity.	7 p.m. Direction and velocity.	8 p.m. Direction and velocity.	9 p.m. Direction and velocity.	10 p.m. Direction and velocity.	11 p.m. Direction and velocity.	12 p.m. Direction and velocity.	Daily mean velocity.
1882.													
Jan. 1	ESE. 17	ESE. 14	E. 15	E. 20	E. 16	E. 16	E. 12	E. 12	E. 10	E. 14	E. 12	E. 12	13.83
Jan. 2	E. 9	E. 8	E. 12	E. 12	E. 12	E. 12	E. 10	E. 5	E. 9	E. 10	E. 11	E. 12	10 95
Jan. 3	ENE. 13	ENE. 10	ENE. 14	ENE. 11	ENE. 10	ENE. 11	ENE. 12	ENE. 12	ENE. 12	ENE. 9	ENE. 10	ENE. 10	12.00
Jan. 4	ENE. 6	ENE. 4	ENE. 10	ENE. 5	ENE. 8	E. 4	E. 4	E. 7	E. 7	E. 6	E. 11	E. 10	8.04
Jan. 5	ENE. 4	ENE. 8	Calm.	Calm.	Calm.	Calm	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	4.12
Jan. 6	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	
Jan. 7	NE. 4	NE. 4	NE. 3	NE. 3	NE. 4	NE. 3	NE. 3	NE. 3	NE. 4	NE. 5	NE. 3	NE. 3	3 16
Jan. 8	NE. 5	NE. 4	NE. 4	NE. 4	NE. 5	NE. 4	NE. 7	NE. 11	NE. 8	NE. 6	NE. 6	NE. 9	5.50
Jan. 9	NE. 5	NE. 4	NE. 8	NE. 6	NE. 6	NE. 7	NE. 8	NE. 7	NE. 7	NE. 7	NE. 6	NE. 8	6.41
Jan. 10	NE. 10	NE. 12	NE. 13	ENE. 16	ENE. 16	ENE. 16	ENE. 14	ENE. 14	ENE. 13	ENE. 16	ENE. 16	ENE. 17	10.70
Jan. 11	ENE. 28	ENE. 28	ENE. 28	ENE. 30	ENE. 24	ENE. 26	ENE. 32	ENE. 40	ENE. 36	ENE. 37	ENE. 32	ENE. 30	25.33
Jan. 12	SSW. 36	SSW. 38	SSW. 36	WSW. 40	WSW. 37	WSW. 44	WSW. 48	W. 40	WSW. 44	WSW. 47	W. 42	W. 52	34.04
Jan. 13	W. 52	WSW. 48	W. 48	W. 52	W. 52	W. 50	W. 48	W. 48	W. 45	WNW. [1]46	WNW. [1]46	W. [1]48	49.29
Jan. 14	W. 24	W. 13	W. 14	W. 15	WNW. 13	WNW. 12	WNW. 23	WNW. 4	WNW. 2	WNW. 6	WNW. 10	Calm.	23.58
Jan. 15	NNE. 8	NNE. 10	NNE. 8	NNE. 9	NNE. 8	NNE. 11	NNE. 11	NNE. 12	NNE. 11	NNE. 11	NNE. 8	NNE. 10	7.83
Jan. 16	ENE. 16	ENE. 16	ENE. 16	ENE. 17	ENE. [1]20	ENE. [1]23	ENE. 26	ENE. 24	ENE. 24	ENE. 20	ENE. 22	ENE 24	17.08
Jan. 17	E. 36	E. 36	E. 32	E. 35	E. 32	E. 28	E. 30	E. 24	E. 20	E. 16	ESE. 20	ESE. 20	28.37
Jan. 18	E. 9	E. 9	E. 12	E. 20	E. 20	E. 22	E. 22	E. 17	E. 12	E. 15	E. 13	E. 11	15.08
Jan. 19	E. 7	E. 6	E. 5	E. 4	E. 3	E. 4	E. 4	SE. 8	SE. 7	SE. 7	SE. 4	SE 3	8.70
Jan. 20	WNW. 7	WNW. 6	WNW. 4	WNW. 3	WNW. 4	WNW. 5	WNW. 4	WNW. 4	WNW. 4	SSW. 8	SSW. 4	SSW. 16	7.25
Jan. 21	SSE. 36	SSE. 36	S. 42	S. 45	S. 41	S. 37	SSE. 41	SSE. 40	SSE. 36	SSE. 33	SSE. 30	S. 40	29.50
Jan. 22	SW. 80	SW. 96	WSW. [1]88	WSW. 80	W. 72	W. 64	W. 60	W. 44	W. 40	W. 44	W. 40	WSW. 30	59.00
Jan. 23	W. 32	WSW. 32	WSW. 38	WSW. 40	WSW. 40.	WSW. 38	WSW. 37	WSW. 39	WSW. 40	W. 36	W. 36	W. 34	32.70
Jan. 24	W. 20	W. 20	W. 16	W. 15	W. 16	W. 11	W. 13	W. 12	W. 8	WSW. 9	WSW. 6	WSW. 5	21.54
Jan. 25	SSE. 20	SSE. 18	S. 16	S. 12	S. 19	S. 20	SSW. 19	SSW. 20	SW. 16	SW. 16	SW. 12	WSW. 14	13.83
Jan. 26	WNW. 24	WNW. 24	W. [1]24	W. [1]23	W. 23	W. 21	W. 19	W. 20	W. 19	W. 23	W. 24	W. 22	21.19
Jan. 27	W. 16	WNW. 14	WNW. 15	WNW. 16	WNW. 16	WNW. 13	WNW. 10	WNW. 11	WNW. 8	WNW. 12	WNW. 10	WNW. 9	17.50
Jan. 28	WNW. 2	WNW. 3	WNW. 2	WNW. 4	WNW. 4	WNW. 7	N. 7	N. 6	NNE. 8	N. 7	NNE. 8	NNE. 9	5.04
Jan. 29	NNE. 8	NNE. 8	N. 9	N. 8	N. 8	N. 8	N. 8	N. 6	N. 8	N. 8	N. 5	N. 4	7.91
Jan. 30	Calm.	Calm.	NE. 3	ESE. 3	ESE. 6	ESE. 3	ESE. 5	ESE. 7	ESE. 7	ESE. 7	ESE. 6	ESE. 6	2.70
Jan. 31	NNE. 12	N. 12	NNE. 16	NNE. 15	N. 11	N. 17	N. 16	N. 15	N. 14	N. 14	N. 14	N. 8	12.04
Means..	17.61	17.29	17.17	18.16	17.61	17.32	17.83	16.51	15.77	15.97	15.66	15.20	16.59

[1] Interpolated.

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, $-5^{h}\ 17^{m}$. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity
1882.												
Feb. 1	N. 12	N. 11	N. 11	N. 9	N. 6	N. 7	N. 6	N. 2	Calm.	Calm.	SW. 6	SW. 5
Feb. 2	SW. 9	SW. 9	SW. 8	SW. 11	SW. 9	SW. 10	SW. 9	SW. 9	SW. 10	SW. 12	SW. 10	SW. 10
Feb. 3	SSW. 14	SSW. 14	SSW. 13	SSW. 10	SSW. 8	SSW. 9	SSW. 7	SSW. 6	SSW. 7	SSW. 6	SSW. 2	SSW. 2
Feb. 4	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	SSW. 2	Calm.
Feb 5	SW. 8	SW. 10	SSW. 10	SSW. 14	SSW. 16	SSW. 16	SSW. 18	SSW. 20	SSW. 20	SSW. 20	SSW. 20	S. 18
Feb. 6	WSW. 25	WSW. 24	WSW. 22	WSW. 21	SW. 22	SSW. 24	WSW. 22	WSW. 22	WSW. 20	W. 21	W. 24	SW. 24
Feb. 7	WSW. 10	W. 9	WSW. 15	WSW. 15	WSW. 14	WSW. 12	WSW. 8	WSW. 9	WSW. 10	WSW. 12	WSW. 11	WSW. 10
Feb. 8	SW. 9	SW. 8	SW. 9	SW. 10	SW. 10	SW. 12	WSW. 14	WSW. 13	WSW. 12	WSW. 12	WSW. 12	WSW. 8
Feb. 9	WSW. 18	WSW. 18	WSW. 16	WSW. 13	W. 22	WSW. 16	WSW. 17	WSW. 19	WSW. 18	W. 18	W. 22	W. 22
Feb. 10	Calm.	SSW. 9	SSW. 10	SSW. 13	SSW. 11	SSW. 7	SSW. 8	SSW. 8	SSW. 6	WSW. [illegible]	WSW. 10	WSW. 10
Feb. 11	WNW. 6	WNW. 6	WNW. 4	WNW. 4	WNW. 5	WNW. 6	WNW. 7	WNW. 5	WNW. 6	WNW. 5	WNW. 4	WNW. 5
Feb. 12	N. W. 4	NW. 4	NW. 3	NW. 3	NW. 4	WSW. 4	WSW. 2	WSW. 4	WSW. 3	WSW. 5	WSW. 7	SSE. 4
Feb. 13	S. 8	S. 7	S. 7	S 6	S. 8	S. 7	S. 8	S. 8	S. 7	S. 7	S. 6	S. 8
Feb. 14	WSW. 14	WSW. 16	WSW. 19	WSW. 19	WSW. 18	WSW. 18	WSW. 18	WSW. 18	WSW. 13	WSW. 16	WSW. 16	WSW. 16
Feb. 15	WSW. 15	WSW. 13	WSW. 13	WSW. 13	WSW. 14	WSW. 10	SSW. 20	SSW. 18	SSW. 20	SSW. 18	SW. 26	SW. 18
Feb. 16	SW. 13	SW. 9	SSW. 6	SSW. 7	SSW. 11	SSW. 4	SSW. 3	SSW. 4	SSW. 5	SSE. 6	SSE. 8	SSE. 8
Feb. 17	NE. 23	NE. 24	NE. 24	NE. 25	NNE. 24	NNE. 25	NNE. 22	NNE. 18	NNE. 16	NNE. 16	N. 14	N. 10
Feb. 18	NE. 9	NE. 10	Calm.	NE. 10	NE. 14	NE. 15	NE. 18	NNE. 20	NNE. 22	NNE. 20	NNE. 22	NNE. 22
Feb. 19	NNE. 23	N. 20	N. 22	N. 20	NNE. 22	NNE. 22	NNE. 23	NNE. 24	NNE. 26	NNE. 25	NNE. 28	NNE. 22
Feb. 20	NNE. 26	NNE. 24	NNE. 26	NNE. 25	NNE. 26	NNE. 25	NNE. 22	NNE. 24	NNE. 24	NNE. 24	NNE. 22	NNE. 22
Feb. 21	NNE. 6	NNE 5	NNE. 6	NNE. 6	NNE. 4	NNE. 3	NNE. 6	NNE. 5	NNE. 4	NNE. 8	NNE. 6	NNE. 3
Feb. 22	NNE. 2	NNE. 5	NNE. 5	NNE. 7	NNE. 5	NNE. 4	NNE. 5	NNE. 3	NNE. 4	NNE. 4	NNE. 4	NNE. 5
Feb. 23	NNW. 2	Calm.	NNW. 4	NNW. 3	Calm.	SW. 5	SW. 5	SW. 6	SW. 8	SW. 8	SW. 6	SW. 6
Feb. 24	WNW. 10	WNW. 9	WNW. 8	WNW. 5	WNW. 5	WNW. 8	WNW. 6	WNW. 7	WNW. 8	WNW. 7	WNW. 5	WNW. 5
Feb. 25	SW. 9	SW. 8	SW. 8	SSW. 11	SSW. 10	SSW. 8	SSW. 6	SSW. 5	SSW. 9	SSW. 8	SSW. 6	SSW. 8
Feb. 26	S. 13	S. 12	S. 10	S. 4	S. 12	S. 6	S. 9	S. 6	S. 8	S. 7	S. 8	S. 6
Feb. 27	S. 8	S. 8	S. 8	SSW. 9	SSW. 8	SW. 10	SW. 11	WNW. 16	NW. 18	NW. 19	NW. 24	NW. 24
Feb. 28	SW. 11	SW. 16	SSW. 17	SSW. 24	SSW. 24	SSW. 25	SSW. 26	SSW. 27	SSW. 28	SSW. 32	SSW. 32	SSW. 30
Means..	10.96	11.00	10.85	11.32	11.85	11.35	11.64	11.64	11.85	12.21	**13.00**	11.82

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1882.													
Feb. 1	SW. 8	SW. 7	SW. 8	SW. 9	SW. 8	SW. 8	SW. 9	SW. 8	SW. 8	SW. 10	SW. 10	SW. 10	7.41
Feb. 2	SW. 12	SW. 12	SW. 12	SSW. 12	SSW. 12	SSW. 12	SSW. 14	SSW. 12	SSW. 12	SSW. 16	SSW. 16	SSW. 20	11.58
Feb. 3	SSW. 2	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	4.16
Feb. 4	SSW. 2	SSW. 2	WSW. 2	Calm.	Calm.	Calm.	WSW. 4	WSW. 4	WSW. 7	WSW. 6	WSW. 2	SW. 6	1.54
Feb. 5	S. 22	S. 22	SSW. 20	SSW. 20	SW. 27	SW. 24	SW. 24	SW. 23	SW. 20	WSW. 24	WSW. 21	WSW. 18	18.95
Feb. 6	WSW. 24	W. 22	W. 22	W. 24	W. 26	W. 20	W. 24	W. 16	WSW. 22	WSW. 24	WSW. 17	WSW. 12	21.83
Feb. 7	WSW. 10	SW. 12	SW. 8	SW. 9	WSW. 8	WSW. 7	WSW. 12	WSW. 11	WSW. 12	WSW. 12	WSW. 10	WSW. 8	10.58
Feb. 8	WSW. 12	WSW. 8	WSW. 7	W. 12	W. 8	WSW. 8	WSW. 7	WSW. 20	WSW. 22	WSW. 20	SW. 19	SW. 20	12.16
Feb. 9	W. 22	W. 22	W. 22	W. 22	W. 20	W. 16	W. 16	W. 12	W. 12	W. 6	Calm.	Calm.	16.28
Feb. 10	W. 10	W. 9	WNW. 10	WNW. 10	WNW. 10	WNW. 11	WNW. 12	WNW. 10	WNW. 10	WNW. 10	WNW. 8	WNW. 8	9.08
Feb. 11	WNW. 6	NW. 6	NW. 4	NW. 4	Calm.	NW. 5	NW. 5	NW. 5	NW. 5	NW. 4	NW. 4	NW. 5	4.79
Feb. 12	SSE. 4	SSE. 4	S. 4	S. 6	S. 5	S. 5	S. 4	S. 6	S. 6	S. 5	S. 7	S. 10	4.70
Feb. 13	S. 10	SSW. 9	SSW. 12	SSW. 12	SW. 11	SW. 10	SW. 11	SW. 12	SW. 14	SW. 16	SW. 13	SW. 12	9.54
Feb. 14	WSW. 16	WSW. 16	WSW. 14	WSW. 16	WSW. 14	WSW. 14	WSW. 15	WSW. 16	WSW. 14	WSW. 13	WSW. 14	WSW. 14	15.70
Feb. 15	SW. 18	SW. 15	SW. 20	SW. 21	SW. 20	SW. 18	SW. 18	SW. 16	SW. 20	SW. 18	SW. 12	SW. 14	17.00
Feb. 16	ENE. 10	ENE. 9	ENE. 14	ENE. 16	NE. 18	NE. 18	NE. 18	NE. 20	NE. 20	NE. 20	NE. 20	NE. 24	12.12
Feb. 17	N. 9	NE. 8	NE. 9	NE. 10	NE. 7	NE. 5	NE. 5	NE. 4	NE. 5	NE. 10	NE. 12	NE. 9	13.91
Feb. 18	NNE. 22	N. 24	N. 22	N. 24	N. 28	N. 22	N. 22	N. 24	N. 18	N. 24	N. 24	NNE. 20	19.00
Feb. 19	NNE. 23	NNE. 22	N. 23	N. 25	N. 24	N. 22	N. 26	N. 26	N. 25	N. 24	N. 22	NNE. 26	23.54
Feb. 20	NNE. 22	NNE. 22	NNE. 20	NNE. 22	NNE. 22	NNE. 18	NNE. 19	NNE. 18	NNE. 14	NNE. 16	NNE. 16	NNE. 7	21.18
Feb. 21	NNE. 3	NNE. 3	NNE. 3	NNE. 2	NNE. 4	NNE. 4	NNE. 4	NNE. 5	NNE. 4	NNE. 4	NNE. 5	NNE. 4	4.37
Feb. 22	NNE. 4	N. 4	N. 4	N. 5	N. 4	N. 5	N. 4	N. 4	N. 4	N. 4	NNW. 8	Calm.	4.08
Feb. 23	SW. 4	SW. 5	WSW. 5	WSW. 4	WSW. 3	WSW. 3	WSW. 4	WSW. 4	WSW. 2	W. 7	W. 6	WNW. 6	4.41
Feb. 24	Calm.	Calm.	WNW. 3	WNW. 4	WSW. 3	WSW. 3	WSW. 3	WSW. 3	WSW. 4	SW. 9	SW. 8	SW. 7	5.41
Feb. 25	SSW. 10	SSW. 12	SSW. 12	SSW. 12	SSW. 12	SSW. 14	SSW. 14	S. 12	S. 14	S. 14	S. 14	S. 12	10.33
Feb. 26	S. 9	SSE. 6	SSE. 6	SSE. 6	SSE. 9	SSE. 9	SSE. 9	SSE. 11	SSE. 10	S. 12	S. 14	S. 8	8.75
Feb. 27	NW. 22	NW. 20	NW. 16	NW. 16	NW. 16	NW. 12	NW. 12	NW. 14	NW. 12	NW. 8	W. 8	SW. 12	13.79
Feb. 28	SSW. 32	SW. 28	SW. 24	SW. 24	SW. 22	SW. 26	SW. 25	SW. 25	SW. 22	SW. 24	SW. 24	SW. 22	**24.58**
Means..	12.39	11.75	11.64	12.39	12.17	11.39	12.14	12.17	12.07	12.85	11.75	11.21	11.81

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, $-5^{h}\ 17^{m}$. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1882.												
Mar. 1	SW. 24	SW. 17	SW. 20	WSW. 20	SW. 16	WSW. 14	W. 23	W. 18	WSW. 19	WSW. 20	WSW. 16	WSW. 17
Mar. 2	WSW. 28	WSW. 20	WSW. 20	WSW. 24	WSW. 20	W. 22	W. 22	W. 22	W. 16	WSW. 14	WSW. 12	SW. 12
Mar. 3	SE. 12	SE. 16	SE. 14	SE. 17	SE. 16	SE. 16	SE. 16	SE 12	SE. 6	SE. 8	SE. 8	SE 4
Mar. 4	SSW. 4	NE. 6	NE. 18	NE. 14	NE. 15	NE. 16	NE. 14	NE. 16	NE. 20	NE. [illegible]	NE. 20	NE. 20
Mar. 5	ENE. 28	E. 26	E. 26	ENE. 28	E. 20	ENE. 25	E. 27	E. 28	E. 32	ESE. 32	E. 32	ESE. 24
Mar. 6	SSE. 14	ESE. 12	ESE. 15	ESE. 14	ESE. 12	ESE. 12	ESE. 11	ESE. 10	ESE. 10	ESE. 13	ESE. 12	ESE. 10
Mar. 7	ESE. 16	ESE. 15	ESE. 13	ESE. 15	ESE. 15	ESE. 18	ESE. 16	ESE. 13	ESE 16	ESE. 16	ESE. 8	ESE 18
Mar. 8	ESE. 14	ESE. 15	ESE. 15	ESE. 19	ESE. 18	ESE. 16	ESE 19	ESE. 20	ESE. 19	ESE. 16	ESE. 15	SE 16
Mar. 9	S. 11	SSW. 12	SSW. 11	SSW. 14	S. 18	S. 16	SSE. 16	SSE. 17	SSE. 16	SSE 19	SSE 15	SSE. 16
Mar. 10	S. 12	S. 11	SSW. 12	SW 4	SSW. 6	S. 6	S. 4	S 8	S. 8	SSW. 8	SSW. 6	SSW. 3
Mar. 11	WNW. 16	WNW. 17	WNW. 21	WNW. 22	W. 24	W. 23	W. 24	W. 20	W. 24	W. 20	W. 26	W. 26
Mar. 12	WSW. 9	WSW. 7	SW. 9	SSW. 10	SSW. 10	SSW. 12	S 14	S. 18	SSE. 20	SSE. 22	SSE 20	S. 16
Mar. 13	W. 26	WNW. 24	WNW. 27	WNW. 22	WNW. 20	W. 24	W. 20	W. 17	WSW. 13	WSW. 13	SW. 10	SSW. 12
Mar. 14	SW. 14	WSW. 13	WSW. 19	WSW. 18	WSW. 12	SW. 12	SW. 8	SW. 10	SW. 8	SSW. 5	SSW 6	SSW. 6
Mar. 15	N. 11	N. 8	N. 8	N. 8	N. 6	N. 6	N. 6	N. 6	N. 5	N. 4	N. 6	N 6
Mar. 16	ENE. 14	ENE. 13	ENE. 16	ENE. 17	ENE. 16	ENE. 16	ENE. 16	E. 18	E. 18	E. 20	E. 20	E. 18
Mar. 17	E. 30	E. 30	E. 29	E. 23	ESE. 30	ESE. 26	ESE. 34	ESE. 34	ESE. 36	ESE. 36	ESE. 36	ESE. 32
Mar. 18	ESE. 31	ESE. 32	ESE 33	ESE. 24	ESE. 28	ESE. 27	ESE. 26	ESE. 28	ESE 24	ESE. 25	ESE 22	ESE. 22
Mar. 19	ESE. 6	ESE. 6	SE. 6	SE. 4	Calm.	SW. 3	SW. 4	W. 6	W. 6	W. 6	W. 4	W. 3
Mar. 20	WNW. 17	WNW. 19	WNW. 21	WNW. 16	WNW. 19	NW. 16	NW. 16	NW. 13	NW. 11	NW. 7	NW 7	WNW. 7
Mar. 21	SSW. 5	SSW. 4	SSW. 3	SSW. 4	SSW. 4	Calm.	SSW. 3	SSW. 3	SSW. 4	SSW. 2	SSW. 3	SSW. 3
Mar. 22	SSE. 7	SSE. 16	SSE. 15	SSE. 24	SSE. 18	SSE. 12	S. 18	SSW. 12	SSW. 12	SSW. 14	S 9	S. 14
Mar. 23	SSW. 16	SSW. 16	SSW. 16	SSW. 15	SSW. 14	SSW. 12	SW. 10	WSW. 21	W. 18	W. 22	W. 22	W. [illegible]
Mar. 24	W. 21	W. 24	W. 21	W. 24	W. 25	W. 22	W. 24	W. 26	W. 18	W. 20	W. 22	W. 25
Mar. 25	W. 24	W. 24	W. 23	W. 19	W. 18	W. 16	W. 20	WNW. 22	WNW. 18	WNW. 20	WNW. 20	WNW. 18
Mar. 26	W. 13	W. 21	W. 18	W. 20	W. 16	W. 16	W. 14	W. 14	W. 12	W. 12	W. 18	W. 14
Mar. 27	SSE. 8	SSE. 5	SSE. 4	SSE. 3	SSE. 4	SSE. 3	SSE. 4	W. 4	W. 5	W. 6	W. 5	NW. 6
Mar. 28	NW. 12	NW. 12	NW. 11	NW. 10	NW. 8	NW. 10	NW. 10	NW. 10	NW. 12	NW. 13	NW. 16	NW. 16
Mar. 29	W. 32	W. 32	W. 30	WSW. 28	W. 32	WSW. 32	W. 30	W. 32	W. 30	W. 30	WSW. 28	WSW. 32
Mar. 30	WNW. 24	WNW. 23	WNW. 23	WNW. 23	WNW. 18	WNW. 14	WNW. 18	WNW. 13	WNW. 14	WNW. 16	WNW. 12	WNW. 12
Mar. 31	WNW. 6	WNW. 7	WNW. 7	WNW. 9	WNW. 9	WNW. 8	WNW. 8	WNW. 9	WNW. 10	WNW. 12	WSW. 12	WSW. 12
Means..	16.29	16.22	16.85	16.83	15.70	15.19	15.96	16.12	15.48	15.90	15.09	14.90

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1882.													
Mar. 1	WSW. 16	SW. 12	SW. 14	SW. 13	SW. 12	SSW. 14	SSW. 20	SW. 20	SW. 24	SW. 26	SW. 28	SW. 32	18.95
Mar. 2	WSW. 14	WSW. 16	SW. 12	SSW. 10	SSW. 11	SSW. 16	SSW. 8	SSW. 5	SSW. 5	S. 9	S. 5	SSE. 10	14.70
Mar. 3	SE. 5	SE. 8	SE. 8	SE. 8	SE. 8	SE. 5	S. 6	SSW. 8	SSW. 4	SSW. 3	Calm.	SSW. 2	8.75
Mar. 4	NE. 24	ENE. 24	ENE. 22	NE. 22	NE. [illegible]	ENE. 24	ENE. 28	ENE. 24	ENE. 28	ENE. 25	ENE. 28	ENE. 30	19.91
Mar. 5	ESE. 28	ESE. 22	ESE. 28	ESE. 27	ESE. 28	ESE. 32	ESE. 24	ESE. 24	ESE. 24	ESE. 20	ESE. 20	ESE. 23	26.15
Mar. 6	ESE. 7	ESE. 12	E. 18	E. 19	E. 19	E. 22	ESE. 16	ESE. 20	ESE. 20	ESE. 18	ESE. 19	ESE. 14	14.54
Mar. 7	ESE. 18	ESE. 16	ESE. 12	SE. 16	SE. 14	SE. 14	SE. 14	SE. 9	SE. 10	ESE. 11	ESE. 9	ESE. 11	13.87
Mar. 8	SSE. 19	SSE. 20	S. 19	S. 16	S. 10	SSW. 12	SSW. 12	SSW. 14	SSW. 16	SSW. 22	SSW. 19	SSW. 16	16.79
Mar. 9	S. 15	SSW. 16	SW. 28	WSW. 27	WSW. 24	SW. 18	SW. 12	SW. 16	WSW. 19	SSW. 16	SSW. 12	SSW. 11	16.45
Mar. 10	SSW. 3	SW. 4	WSW. 4	WSW. 8	WSW. 3	WSW. 2	W. 4	WNW. 6	WNW. 7	WNW. 4	WNW. 10	WNW. 10	8.25
Mar. 11	W. 20	W. 22	W. 24	W. 22	WSW. 22	W. 18	W. 23	W. 18	W. 16	WSW. 13	WSW. 11	WSW. 9	20.45
Mar. 12	S. 18	S. 17	SSW. 18	SSW. 14	S. 12	S. 16	S. 16	S. 12	W. 6	WNW. 22	W. 22	W. 28	15.33
Mar. 13	SW. 16	SSW. 12	SSW. 20	S. 16	S. 19	S. 22	S. 24	S. 24	SW. 24	SW. 24	SW. 19	SW. 18	19.41
Mar. 14	SSW. 6	SSE. 2	Calm.	NNW. 3	N. 4	NNE. 14	NNE. 15	N. 16	N 21	N. 16	N. 14	N. 14	10.66
Mar. 15	N. 8	N. 8	N. 6	N. 8	N. 8	N. 8	ENE. 8	ENE. 8	NE. 12	ENE. 12	ENE. 13	ENE. 12	7.95
Mar. 16	E. 24	E. 25	E. 26	E. 25	E. 28	E. 28	E. 32	E. 30	E. 28	E. 28	E. 28	E. 31	22.29
Mar. 17	ESE. 32	ESE. 36	ESE. 36	SE. 38	ESE. 30	ESE. 34	ESE. 32	ESE. 30	ESE. 30	ESE. 28	ESE. 29	ESE. 23	32.0[illegible]
Mar. 18	ESE. 22	ESE. 16	ESE. 18	ESE. 18	ESE. 15	ESE. 20	ESE. 16	ESE. 16	ESE. 6	ESE. 9	ESE. 9	ESE. 8	20.62
Mar. 19	W. 6	S. 3	S. 6	SW. 7	SW. 6	SW. 7	SW. 9	SW. 12	SW. 11	SW. 11	SW. 10	W. 15	6.54
Mar. 20	NW. 9	NW. 9	NW. 7	NW. 6	NW. 10	NW. 8	NW. 3	NW. 3	NW. 4	SSW. 8	SSW. 7	SSW. 8	10.04
Mar. 21	SSE. 3	SE. 3	SSE. 3	SSE. 3	SSE. 4	SSE. 12	SW. 4	S. 6	S. 14	SSE. 7	SSE. 23	SSE. 16	5.66
Mar. 22	SSW. 16	S. 16	S. 16	S. 15	S. 14	S. 14	SSW. 14	SSW. 9	SSW. 8	WSW. 16	WSW. 16	SW. 12	14.04
Mar. 23	W. 22	W. 22	W. 16	W. 20	W. 17	W. 19	W. 23	W. 23	W. 24	W. 24	W. 20	W. 23	19.04
Mar. 24	W. 22	W. 22	W. 24	W. 24	W. 24	W. 24	W. 24	W. 28	WNW. 24	WNW. 28	WNW. 26	WNW. 24	23.58
Mar. 25	WNW. 20	WNW. 18	WNW. 20	WNW. 18	W. 20	W. 17	W. 16	W. 18	W. 14	W. 16	W. 16	W. 13	18.66
Mar. 26	W. 9	W. 7	W. 10	W. 12	W. 15	W. 11	W. 7	W. 3	Calm.	Calm.	SSE. 7	SSE. 5	11.41
Mar. 27	NW. 8	NW. 8	NW. 9	NW. 14	NW. 10	NW. 11	NW. 12	NW. 13	NW. 14	NW. 13	NW. 11	NW. 13	8.04
Mar. 28	W. 18	W. 18	W. 20	WSW. 22	W. 24	W. 31	W. 28	WSW. 28	WSW. 27	W. 32	W. 32	WSW. 31	18.79
Mar. 29	WSW. 32	WSW. 28	W. 28	W. 32	W. 32	W. 32	W. 32	W. 26	W. 30	W. 30	W. 25	WNW. 25	30.00
Mar. 30	WNW. 8	WNW. 9	WNW. 9	WNW. 9	WNW. 11	WNW. 11	WNW. 12	WNW. 10	WNW. 10	WNW. 11	WNW. 7	WNW. 8	13.54
Mar. 31	WSW. 16	W. 15	W. 14	W. 15	W. 15	W. 13	WNW. 20	WNW. 17	WNW. 20	WNW. 19	WNW. 16	WNW. 18	12.79
Means..	15.61	15.63	15.96	16.19	16.10	17.06	16.58	16.00	15.48	16.84	16.48	16.70	16.08

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, *to August,* 1883—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1882.												
Apr. 1	WNW. 14	WNW. 14	WNW. 20	WNW. 18	WNW. 18	WNW. 20	WNW. 16	WNW. 20	WNW. 17	WNW. 16	WNW. 12	WNW. 13
Apr. 2	W. 8	W. 7	WSW. 9	WSW. 7	WSW. 7	WSW. 8	WSW. 7	WSW. 7	WSW. 6	WSW. 6	WSW. 4	WSW. 4
Apr. 3	SSW. 6	SSW. 5	SSW. 3	SSW. 3	SSW. 5	SSW. 2	SSW. 2	SSW. 2	SSW. 2	Calm.	Calm.	S. 2
Apr. 4	S. 4	S. 2	S. 5	S. 3	S. 4	S. 3	S. 2	Calm.	Calm.	S. 3	ESE. 3	ESE. 2
Apr. 5	ESE. 5	ESE. 5	ESE. 8	ESE. 10	ESE. 4	ESE. 7	ESE. 6	ESE. 6	ESE. 7	ESE. 10	ESE. 8	ESE. 7
Apr. 6	ESE. 14	ESE. 11	ESE. 9	ESE. 9	ESE. 7	ESE. 7	ESE. 11	ESE. 9	ESE. 13	ESE. 13	ESE. 8	ESE. 8
Apr. 7	ESE. 17	ESE. 20	SE. 20	SE. 20	SE. 19	SE. 20	SE 22	SE. 21	SE. 23	SE 24	SE. 24	SE. 24
Apr. 8	SSE. 18	SSE. 17	SE. 14	SE. 13	SE. 14	SE. 14	SE. 7	E. 4	ESE. 8	ESE. 10	ESE. 12	ESE. 12
Apr. 9	WNW. 3	WNW. 4	WNW. 2	WNW. 7	WNW. 3	WNW. 3	WNW. 2	WNW. 4	WNW. 3	WNW. 3	WNW. 3	WNW. 5
Apr. 10	WSW. 3	WSW. 3	WSW. 5	WSW. 4	WSW. 4	WSW. 2	SSW. 3	SSW. 3	Calm.	SE. 3	ENE. 5	ENE. 4
Apr. 11	S. 3	S. 5	S. 4	S. 1	SE. 6	SE. 3	SE. 6	SE. 4	SE. 4	SE. 5	SE. 5	SE. 5
Apr. 12	SE. 24	SE. 22	SE. 24	SE. 20	SE. 18	SE. 22	SE. 19	SE. 17	SE. 17	SE. 12	SE. 12	SE. 14
Apr. 13	SE. 4	SE. 8	SE. 6	SE. 7	Calm.	SE. 4	Calm.	SE. 3	SE. 2	SE. 4	E. 4	WNW. 12
Apr. 14	WNW. 19	WNW. 19	WNW. 19	WNW. 16	WNW. 18	WNW. 14	WNW. 10	WNW. 10	WNW. 10	WNW. 6	WNW. 7	WSW. 7
Apr. 15	SSE. 12	SSE. 7	SE. 8	ESE. 12	ESE. 8	ESE. 8	ESE. 8	ESE. 10	ESE. 11	ESE. 11	ESE. 9	ESE. 8
Apr. 16	ESE. 13	ESE. 12	ESE. 11	SE. 10	SE. 10	SE. 8	SE. 8	SE. 10	SSW. 4	SSW. 2	SE. 6	SE. 6
Apr. 17	WNW. 4	WNW. 7	WNW. 7	WNW. 12	WNW. 15	WNW. 16	WNW. 14	WNW. 12	WNW. 13	WNW. 16	WNW. 12	WNW. 14
Apr. 18	WNW. 15	WNW. 12	WNW. 11	WNW. 8	WNW. 6	WNW. 7	SSW. 11	SSW. 12	SSW. 12	WSW. 10	WSW. 7	WSW. 9
Apr. 19	WSW. 6	WSW. 5	WSW. 5	W. 5	W. 6	W. 4	W. 4	W. 5	W. 6	W. 5	W. 8	W. 7
Apr. 20	NNE. 6	NNE. 5	NNE. 5	NNE. 5	NNE. 3	NNE. 2	NNE. 4	NNE. 3	NNE. 3	NNE. 4	NNE. 5	NNE. 4
Apr. 21	N. 4	N. 4	N. 6	N. 2	N. 3	N. 2	N. 1	Calm.	Calm.	Calm.	Calm.	Calm.
Apr. 22	W. 10	W. 8	W. 11	W. 11	W. 10	W. 10	W. 12	W. 10	W. 12	W. 15	W. 16	W. 16
Apr. 23	WNW. 22	WNW. 17	WNW. 16	WNW. 17	WNW. 13	WNW. 12	WNW. 10	WNW. 10	WNW. 9	WNW. 7	SW. 6	SW. 7
Apr. 24	ESE. 18	S. 23	S. 23	S. 22	S. 20	SSW. 20	SSW. 21	SSW. 28	SSW. 28	SSW. 28	SSW. 30	SSW. 28
Apr. 25	SW. 15	SW. 9	SW. 7	SW. 7	SW. 6	Calm.	SSE. 5	SSE. 5	SSE. 7	ESE. 10	ESE. 11	ESE. 12
Apr. 26	E. 28	ESE. 29	ESE. 24	ESE. 24	ESE. 26	ESE 27	ESE. 26	ESE. 22	ESE. 18	ESE. 20	ESE. 16	ESE. 12
Apr. 27	S. 9	S. 10	S. 13	SSW. 9	SSW. 10	SSW. 12	S. 9	S. 12	S. 14	S. 12	S. 12	S. 10
Apr. 28	SSW. 15	SSW. 16	SSW. 16	SW. 17	SW. 16	SW. 14	SW. 14	SW. 18	SW. 15	WSW. 15	WSW. 12	SSW. 9
Apr. 29	S. 15	S. 7	S. 15	SSW. 12	SSW. 11	SSW. 14	SSW. 12	SSW. 14	SSW. 15	SSW. 10	SSW. 12	SSW. 12
Apr. 30	W. 19	WNW. 29	WNW. 29	WNW. 38	WNW. 34	WNW. 34	WNW. 26	WNW. 26	WNW. 28	WNW. 22	WNW. 20	WNW. 18
Means.	11.76	11.40	11.83	11.63	10.80	10.63	9.93	10.23	10.23	10.26	9.63	9.90

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1882.													
Apr. 1	WNW. 14	WNW. 13	W. 12	W. 14	W. 12	W. 11	W. 12	W. 10	W. 12	W. 7	W. 5	W. 8	13.67
Apr. 2	WSW. 6	WSW. 4	WSW. 4	WSW. 6	SW. 4	SW. 4	SW. 7	SW. 5	SW. 6	SW. 4	SSW. 7	SSW. 5	5.92
Apr. 3	S. 2	Calm.	S. 2	Calm.	Calm.	S. 3	S. 3	Calm.	Calm.	S. 4	S. 3	S. 4	2.20
Apr. 4	ESE. 4	ESE. 1	ESE. 4	ESE. 3	ESE. 2	ESE. 6	ESE. 7	ESE. 7	ESE. 8	ESE. 5	ESE. 5	ESE. 5	3.66
Apr. 5	ESE. 7	ESE. 6	ESE. 6	ESE. 10	ESE. 8	ESE. 10	ESE. 11	ESE. 9	ESE. 11	ESE. 12	ESE. 11	ESE. 12	8.16
Apr. 6	ESE. 8	ESE. 8	ESE. 12	ESE. 16	ESE. 11	ESE. 14	ESE. 14	ESE. 15	ESE. 12	ESE. 13	ESE. 18	ESE. 12	11.12
Apr. 7	SE. 24	SE. 20	SE. 18	SE. 18	SE. 22	SSE. 22	SSE. 18	SSE. 14	SSE. 16	SSE. 16	SSE. 20	SSE. 16	19.92
Apr. 8	ESE. 4	Calm.	ESE. 4	ESE. 4	ESE. 2	E. 6	E. 7	Calm.	WNW. 4	WNW. 2	WNW. 3	WNW. 3	7.56
Apr. 9	WNW. 5	WNW. 4	WNW. 6	WNW. 6	WNW. 4	WNW. 3	WNW. 2	WNW. 3	Calm.	SSW. 2	SSW. 2	SW. 3	3.42
Apr. 10	ENE. 4	E. 4	ESE. 8	ESE. 6	ESE. 8	ESE. 5	ESE. 5	ESE. 4	ESE. 5	ESE. 7	WSW. 5	S. 6	4.42
Apr. 11	SE. 7	SE. 8	SE. 9	SE. 9	SE. 13	SE. 11	SE. 16	SE. 16	SE. 18	SE. 16	SE. 19	SE. 21	9.04
Apr. 12	SE. 9	SE. 10	SE. 12	SE. 12	SE. 11	SE. 12	SE. 15	SE. 8	SE. 6	SE. 10	SE. 10	SE. 10	14.42
Apr. 13	WNW. 22	WNW. 22	WNW. 20	WNW. 22	WNW. 22	WNW. 20	WNW. 21	WNW. 23	WNW. 22	WNW. 20	WNW. 18	WNW. 18	12.67
Apr. 14	WSW. 6	WSW. 5	WSW. 6	WSW. 5	SW. 7	SW. 5	SW. 8	SSW. 4	SSW. 8	S. 10	SSE. 12	SSE. 12	10.12
Apr. 15	ESE. 12	ESE. 14	ESE. 12	ESE. 17	ESE. 8	ESE. 8	ESE. 10	ESE. 11	ESE. 14	ESE. 14	ESE. 15	ESE. 12	10.79
Apr. 16	SE. 5	SE. 4	SE. 4	SE. 2	SE. 7	SE. 5	SE. 5	SE. 4	SE. 5	SE. 2	SE. 3	WNW. 3	6.21
Apr. 17	WNW. 16	WNW. 14	WNW. 16	WNW. 14	WNW. 16	WNW. 14	WNW. 14	WNW. 14	WNW. 15	WNW. 12	WNW. 12	WNW. 15	13.08
Apr. 18	SW. 8	SW. 9	SW. 9	SW. 10	SW. 8	SW. 8	SW. 8	SW. 8	SW. 8	SW. 8	WSW. 8	WSW. 6	9.00
Apr. 19	W. 6	W. 8	W. 5	W. 5	W. 1	W. 2	W. 3	W. 3	W. 2	W. 4	W. 4	W. 4	4.83
Apr. 20	NNE. 8	NNE. 8	NNE. 8	NNE. 9	NNE. 7	NNE. 7	NNE. 8	NNE. 6	NNE. 8	NNE. 7	N. 4	N. 4	5.54
Apr. 21	Calm.	SW. 7	WSW. 7	WSW. 7	W. 8	W. 8	W. 9	W. 8	W. 9	W. 11	W. 12	W. 10	4.91
Apr. 22	W. 16	W. 22	W. 24	W. 24	W. 24	WNW. 28	WNW. 24	WNW. 21	WNW. 22	WNW. 24	WNW. 19	WNW. 20	17.04
Apr. 23	SW. 8	SW. 10	SSW. 8	SSW. 8	SSW. 9	SSE. 14	SSE. 14	SSE. 18	SSE. 18	SSE. 21	SSE. 23	SSE. 20	13.21
Apr. 24	SSW. 32	SSW. 30	SSW. 32	SSW. 26	SSW. 24	SSW. 28	SSW. 24	SSW. 20	SSW. 20	SSW. 20	SSW. 20	SW. 15	24.17
Apr. 25	E. 12	E. 16	E. 12	E. 16	E. 16	E. 19	E. 20	ESE. 21	ESE. 20	E. 14	E. 19	E. 24	12.62
Apr. 26	ESE. 12	ESE. 9	ESE. 5	ESE. 7	ESE. 8	ESE. 6	ESE. 8	ESE. 4	ESE. 7	SSE. 8	SSE. 12	SSE. 12	15.41
Apr. 27	S. 16	S. 18	S. 18	SSE. 19	S. 14	S. 18	S. 17	S. 17	S. 16	S. 18	S. 17	SSW. 14	14.67
Apr. 28	SSW. 12	SSW. 14	SSW. 12	SSW. 12	SSW. 12	SSW. 6	SSW. 7	SSW. 7	SSW. 10	SSW. 8	SSW. 11	SSW. 7	12.29
Apr. 29	SSW. 12	SSW. 12	SSW. 12	SSW. 12	SSW. 14	SW. 14	SW. 20	SW. 16	SW. 18	SW. 17	WSW. 19	WSW. 20	13.96
Apr. 30	WNW. 20	WNW. 18	WNW. 18	WNW. 16	WNW. 16	WNW. 14	WNW. 14	WNW. 12	W. 14	W. 12	W. 12	W. 10	20.79
Means	10.56	10.60	10.83	11.16	10.60	11.03	11.70	9.96	11.13	10.90	11.43	11.37	10.81

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 21 feet. Washington mean time. Correction to reduce to mean local time, —5ʰ 17ᵐ. Velocity given in miles per hour.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.
1882.												
May 1..	SSW. 11	SW. 11	SW. 13	SW. 12	SW. 12	SW. 12	SW. 8	SW. 9	SW. 10	SW. 11	SW. 8	SW. 7
May 2..	NNW. 12	NNW. 11	NNW. 11	NNW. 13	NNW. 12	NNW. 14	NNW. 16	NNW. 22	NNW. 20	NNW. 20	NNW. 20	NNW. 16
May 3..	N. 13	N. 18	N. 16	NNE. 15	NE. 17	NE. 18	NE. 18	NE. 16	NE. 11	NE. 5	NE. 5	NNE. 14
May 4..	NE. 9	NE. 9	NE. 7	NE. 13	NE. 13	NE. 8	NE. 8	NNE. 8	NNE. 11	NE. 7	NE. 8	NE. 10
May 5..	ENE. 14	ENE. 15	ENE. 13	ENE. 17	ENE. 16	ENE. 14	ENE. 18	ENE. 16	ENE. 18	ENE. 18	ENE. 16	ENE. 16
May 6..	NE. 17	NE. 17	NE. 20	NE. 20	NE. 22	NE. 12	NE 13	NE. 14	NE. 20	NE. 19	NE. 16	NE 16
May 7..	NE. 23	NE. 22	NE. 23	NE. 18	NE. 18	NE. 16	NE. 19	NE 18	NE. 19	NE. 22	NE. 18	NE 18
May 8..	NE. 20	NE. 19	NE. 20	NE. 19	NE. 18	NE 18	NE. 16	NE. 17	NE. 15	NE. 18	NE. 18	NE. 20
May 9..	NE. 11	NE. 9	NE. 7	NE. 8	NNE. 7	NNE. 8	NNE. 10	NNE. 16	NNE. 13	NNE. 16	NNE. 16	NNE 14
May 10..	NNE. 1	SW. 2	SW. 2	SW. 2	SW. 3	SW. 2	SW. 2	SSW. 4	SSW. 5	SSW. 6	S. 8	S. 10
May 11..	SE. 18	SE. 17	SE. 13	SE. 10	SE. 8	SE. 7	SE. 10	SE. 12	SSE. 13	S. 12	S. 8	SSE. 12
May 12..	S. 11	S. 10	S. 9	S. 9	S. 8	S. 7	S. 8	S 5	SSE. 9	SE. 8	SE. 8	SE. 8
May 13..	SW. 7	SW. 8	SW. 9	SW. 6	SW. 9	WSW. 10	WSW. 17	W. 11	W. 12	W. 7	W. 2	W. 4
May 14..	W. 7	W. 8	W. 10	W. 10	W. 9	W. 10	W. 10	W. 10	W. 9	W. 10	W. 9	W 12
May 15..	ESE. 5	SSE. 4	SSE. 5	SSE. 8	SSE. 8	SE. 8	SSE. 9	SSE. 10	S. 8	S 9	SSW. 6	SSW. 7
May 16..	SW. 8	SSW. 8	SSW. 10	SSW. 8	SSW. 8	SSW. 3	SE. 4	SE. 3	SE 3	SE. 3	SE. 2	SE. 4
May 17..	WSW. 15	WSW. 14	WSW. 12	WSW. 11	W. 14	W. 9	W. 10	W. 8	W. [illegible]	W. 9	W. 6	W. 6
May 18..	SSE. 5	SSE. 4	SSE. 4	SSE. 6	SSE. 3	SSE. 4	SSE. 4	SSE. 4	E. 12	E. 15	E. 18	E [illegible]
May 19..	ESE. 21	ESE. 20	ESE. 21	ESE. 24	ESE. 22	ESE. 24	ESE. 22	ESE. 24	ESE. 23	ESE. 24	ESE. 23	ESE 24
May 20..	SE. 10	SE. 12	SE. 7	SE. 3	SE. 4	Calm.	SE. 4	SE. 6	SE. 9	SSE. 12	SSE. 16	SSE. 14
May 21..	SW. 19	S V. 16	SW. 16	SW. 16	WSW. 14	WSW. 16	WSW. 14	WSW. 12	WSW. 12	WSW. 12	WSW. 12	WSW. 11
May 22..	W. 6	W. 7	W. 6	W. 7	W. 7	WNW. 7	WNW. 7	WNW. 6	NNW. 5	NNW. 6	NNE. 7	NNE. 4
May 23..	ENE. 22	ENE. 22	ENE. 23	ENE. 19	ENE. 21	ENE. 22	E. 23	E. 17	ENE. 20	ENE 21	ENE 18	ENE. 16
May 24..	ENE. 21	ENE. 20	ENE. 20	ENE. 20	ENE. 15	ENE. 16	ENE. 21	E. 23	ENE. 23	ENE. 22	ENE. 22	ENE. 21
May 25..	ENE. 21	ENE. 24	ENE. 25	ENE. 22	ENE. 19	ENE. 20	ENE. 22	ENE. 22	ENE. 23	ENE. 22	ENE. 21	ENE. 22
May 26..	ENE. 22	ENE. 20	ENE. 20	ENE. 21	ENE. 19	ENE. 19	ENE. 20	ENE. 20	ENE. 19	ENE. 20	ENE 22	NE. 22
May 27..	ENE. 16	ENE. 19	ENE. 20	E. 13	ENE. 11	ENE. 11	ENE. 12	ENE. 12	ENE. 13	ENE. 13	ENE. 12	ENE. 12
May 28..	ENE. 18	ENE. 16	NE. 17	NE. 16	NE. 14	NE. 12	NE 14	NE. 12	NE. 14	ENE. 16	ENE. 16	ENE. 16
May 29..	E. 18	E. 17	E. 18	ENE. 15	ENE. 18	ENE. 22	ENE. 18	ENE. 16	ENE 16	ENE. 18	ENE. 14	ENE. 16
May 30..	E. 16	E. 16	E. 18	E. 17	E. 17	E. 18	E. 16	E. 16	E 15	E. 14	E. 14	E. 16
May 31..	E. 10	E. 13	E. 10	E. 10	E. 11	E. 10	E. 12	E. 11	E. 9	E. 11	E. 10	ESE 16
Means.	13.77	13.81	13.71	13.16	12.81	12.16	13.06	12.90	13.45	13.74	13.06	13 55

Date.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1882.													
May 1..	SSW. 5	W. 10	W. 8	WNW. 13	WNW. 14	NW. 18	NNW. 20	NNW. 18	NNW. 18	NNW. 18	NNW. 16	NNW. 14	12 33
May 2..	NNW. 16	NNW. 12	NNW. 11	NNW. 12	NNW. 15	NNW. 12	NNW. 14	NNW. 16	NNW. 15	N. 16	N. 15	N 16	11.88
May 3..	NNE. 14	NNE. 12	NNE. 12	NNE. 12	N. 14	N. 13	NNE. 12	NNE. 12	NNE. 11	NE. 10	NE. 11	NE. 10	12 88
May 4..	ENE. 4	S. 3	S. 3	Calm.	SSE. 4	E. 10	ENE. 13	ENE. 11	ENE. 13	ENE. 14	ENE. 16	ENE. 14	9 00
May 5..	ENE. 16	ENE. 16	NE. 22	NE. 22	NE. 20	NE. 20	NE. 24	NE. 20	NE. 24	NE. 20	NE. 16	NE. 14	17.71
May 6..	NE. 20	NE. 22	NE. 22	NE. 20	NE. 22	NE. 18	NE. 20	NE. 20	NE. 24	NE. 21	NE. 22	NE. 20	19.04
May 7..	NE. 18	NE. 20	NE. 20	NE. 22	NE. 20	NE. 18	NE. 20	NE. 20	NE. 18	NE. 16	NE. 21	NE. 15	19 25
May 8..	NE. 16	NE. 16	NE. 16	NE. 16	NE. 15	NE. 10	NE. 12	NE. 11	NE. 9	NE. 9	NE. 9	NE. 8	15.21
May 9..	NNE. 12	NNE. 10	NNE. 11	NNE. 12	NNE. 12	N. 8	N. 11	N. 11	N. 6	N. 5	NNE. 6	NNE. 4	10 13
May 10..	SSE. 12	SE. 14	SSE. 16	SSE. 16	SE. 16	SE. 14	SE. 16	SE. 18	SE. 20	SE. 18	SE. 16	SE. 14	9 88
May 11..	SSE. 8	SSE. 10	SSE. 12	SSE 12	SSE. 12	SSE. 11	SSE. 16	SSE. 14	SSE. 13	SSE. 13	S 12	S. 10	11.79
May 12..	SE. 8	SE. 8	SE. 8	SSE. 9	SE. 8	SE. 7	SSW 8	SW. 7	SW. 8	SW. 5	SW. 7	SW. 5	7 83
May 13..	W. 4	W. 4	W. 4	W. 4	W. 2	W. 5	W. 9	W. 10	W. 14	W. 15	W. 12	W 8	8 04
May 14..	WNW. 11	WNW. 8	WNW. 7	WNW. 7	WNW. 8	WNW. 4	NE. 4	NNE. 2	Calm.	E. 2	ESE. 4	ESE. 5	7 33
May 15..	SSW. 9	SW. 10	SW. 10	SW. 14	SW. 14	SW. 13	SW. 16	SW. 14	SW. 12	SW. 12	SW. 10	WSW. 9	9 58
May 16..	SSW. 6	SW. 10	WSW. 12	WSW. 12	WSW. 14	WSW. 12	WSW. 20	SW. 15	SW. 19	WSW. 16	WSW. 14	WSW. 14	9.50
May 17..	W. 7	W. 6	W. 6	W. 4	W. 4	Calm.	Calm.	Calm.	W. 4	W. 3	SSE. 4	SSE. 4	6.83
May 18..	ESE. 20	ESE. 20	ESE. 20	ESE. 22	ESE. 24	ESE. 18	ESE. 24	ESE. 18	ESE 20	ESE. 22	ESE. 21	ESE. 16	14.17
May 19..	ESE. 24	ESE. 26	ESE. 24	ESE. 24	ESE. 24	ESE. 19	ESE. 20	ESE. 18	ESE. 14	SE. 16	SE. 15	SE. 12	21.29
May 20..	SSW. 16	S. 10	S. 16	S. 16	SW. 9	SW. 5	SSW. 9	SSW. 9	SSW. 11	SW. 22	SW. 22	SW. 16	10 75
May 21..	WSW. 10	WSW. 10	WSW. 9	WSW. 8	WSW. 7	WSW. 5	WSW. 5	WSW. 6	WSW. 6	WSW. 7	WSW. 7	W. 6	10.67
May 22..	NNE. 8	NNE. 9	NNE. 10	NNE. 12	NE. 12	NE. 11	NE 16	NE. 18	ENE. 18	ENE. 20	ENE. 20	ENE. 18	10 29
May 23..	ENE. 20	ENE. 22	ENE. 24	ENE. 24	ENE. 24	ENE. 20	ENE. 27	ENE. 24	ENE. 24	ENE. 24	ENE. 23	ENE. 20	21.67
May 24..	ENE. 22	ENE. 22	ENE. 25	ENE. 24	E 24	ENE. 20	ENE. 24	ENE. 24	ENE. 24	E. 24	ENE. 24	ENE. 19	21.67
May 25..	ENE. 26	ENE. 26	NE. 26	NE. 26	ENE 23	ENE. 20	ENE 20	ENE. 20	ENE 25	ENE. 21	ENE. 20	ENE. 20	22.46
May 26..	NE. 22	NE. 21	NE. 22	NE. 20	NE. 21	NE. 16	NE. 20	NE. 20	NE. 22	ENE. 22	ENE. 20	ENE. 16	20.25
May 27..	ENE. 15	ENE. 15	ENE. 21	ENE. 20	ENE. 20	ENE. 18	ENE. 21	ENE. 20	ENE. 20	ENE. 20	ENE. 20	ENE. 18	16.33
May 28..	ENE. 16	ENE. 16	ENE. 18	ENE. 17	ENE. 17	ENE. 16	ENE. 20	ENE. 18	E. 20	ENE. 20	E 19	ENE. 18	16.50
May 29..	ENE. 16	ENE. 17	ENE. 16	E. 16	ENE. 17	ENE. 17	ENE. 16	ENE. 16	E. 16	E. 16	E 16	E. 16	16.71
May 30..	E. 14	E. 13	E. 13	E. 12	E. 12	E 12	E. 12	E. 12	E. 11	E. 10	E. 9	E. 9	13.83
May 31..	ESE. 15	ESE. 13	E. 12	E. 16	E. 12	E. 16	E. 16	E. 15	E. 19	E. 16	E. 16	E. 16	13.12
Means	13.87	13.00	14.77	14.97	14.84	13.10	15.64	14.74	15.42	15.26	14.93	13.03	13.90

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 21 feet.* Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.
1882.												
June 1	E. 18	E. 15	E. 16	E. 16	E. 13	E. 14	E. 13	E. 10	E. 9	E. 10	E. 12	E. 13
June 2	NE. 20	NE. 19	NE. 17	NE. 16	NE. 18	NE. 18	NNE. 22	NNE. 21	NNE. 22	NNE. 21	NNE. 22	NNE. 22
June 3	N. 25	N. 20	N. 20	N. 20	N. 20	N. 19	N. 18	N. 16	N. 18	N. 16	N. 14	N. 16
June 4	E. 9	E. 9	E. 11	E. 11	E. 11	E. 10	E. 13	E. 15	E. 12	E. 13	E. 14	E. 15
June 5	SW. 8	SW. 13	SW. 16	WSW. 16	WSW. 12	WSW. 11	WSW. 14	WSW. 12	WSW. 10	WSW. 11	WSW. 11	WSW. 12
June 6	SE. 6	SE. 9	SE. 7	SE. 8	SE. 12	SE. 12	SE. 11	SE. 10	SE. 6	SE. 8	SE. 9	SE. 8
June 7	SE. 12	SE. 11	SE. 11	SE. 10	SE. 6	Calm.	NNE. 6	NNE. 5	NE. 6	NE. 6	NE. 4	NE. 7
June 8	NE. 4	NE. 4	NE. 5	NE. 6	NE. 7	ENE. 6	ENE. 6	ENE. 6	ENE. 7	ENE. [illegible]	ENE. 8	E. 9
June 9	E. 15	E. 13	E. 14	E. 15	E. 16	E. 16	E. 16	E. 16	E. 15	E. 16	E. 21	E. 22
June 10	ENE. 19	ENE. 21	E. 21	E. 20	ENE. 22	ENE. 20	E. 20	E. 20	E. 19	E. 16	E. 18	ENE. 19
June 11	NE. 15	NE. 10	ENE. 7	ENE. 5	ENE. 4	ENE. 4	ESE. 2	ESE. 4	ESE. 3	ESE. 3	ESE. 6	ESE. 6
June 12	ESE. 8	ESE. 7	ESE. 7	ESE. 6	ESE. 4	ESE. 8	ESE. 3	ESE. 6	ESE. 7	E. 10	E. 8	E. 8
June 13	NE. 9	NE. 9	NE. 12	NE. 11	NE. 9	NE. 10	NE 9	ENE. 9	ENE. 8	ENE. 8	ENE. 6	ENE. 8
June 14	NNE. 9	NNE. 11	NNE. 11	NNE. 8	NNE. 11	NNE. 9	NNE. 8	NNE. 8	NNE. 10	NNE. 8	NNE. 8	NNE. 6
June 15	NE. 9	NE. 9	NE. 6	NNE. 6	NE. 7	NE. 8	NE. 8	NE. 7	NE. 8	NE. 9	NE. 9	NE. 10
June 16	NNE. 10	NNE. 9	NNE. 9	NNE. 7	NNE. 7	NNE. 6	NNE. 6	NNE. 5	NNE. 7	NNE. 7	NNE. 8	NNE. 6
June 17	NNE. 8	NNE. 9	NNE. 10	NNE. 9	NNE. 7	NNE. 8	NNE. 10	NNE. 8	NNE. 8	ENE. 8	ENE. 9	ENE. 1[illegible]
June 18	ESE. 14	ESE. 15	ESE. 15	ESE. 11	ESE. 8	ESE. 9	ESE. 9	SE. 7	SE. 8	SE. 12	SE. 10	SE. 12
June 19	SW. 12	SW. 14	SW. 14	SW. 17	SW. 13	SW. 10	SW. 13	SW. 13	SW. 13	SW. 13	SW. 14	SW. 8
June 20	SW. 9	SW. 9	SW. 9	SW. 12	SW. 15	W. 13	W. 12	W. 11	SW. 6	SW. 10	SW. 9	WSW. 6
June 21	WSW. 6	WSW. 5	W. 5	WNW. 5	WNW. 6	NW. 6	NNW. 6	NNW. 6	N. 8	NNE. 10	NNE. 11	NNE. 12
June 22	NNW. 11	NW. 10	NW. 8	NW. 8	NW. 9	NW. 7	NW. 5	NW. 7	NNE. 8	NW. 11	NNW. 8	NW. 10
June 23	NNW. 8	N. 9	N. 9	N. 6	N. 9	NNE. 5	N. 4	N. 7	N. 6	N. 6	NW. 3	NW. 2
June 24	N. 7	ENE. 7	E. 5	E. 5	E. 4	E. 4	ENE. 5	ENE. 6	NNE. 5	E. 5	E. 4	ENE. 5
June 25	ENE. 9	E. 8	E. 7	ESE. 7	E. 7	ESE. 6	ESE. 6	ESE. 5	ESE. 6	ESE. 8	SE. 6	SE. 7
June 26	WNW. 9	WNW. 12	NW. 15	NW. 13	WNW. 14	WNW. 16	WNW. 16	WNW. 15	WNW. 18	WNW. 18	WNW. 19	WNW. 18
June 27	WNW. 15	WNW. 15	W. 14	WNW. 12	NW. 14	NNW. 12	NNW. 18	NNW. 13	NNW. 11	NNW. 13	NNW. 15	NNW. 12
June 28	NNW. 8	NW. 9	NNW. 6	N. 9	NNW. 6	NNW. 7	NNW. 8	NNW. 12	NNW. 10	NNW. 9	N. 8	N. [illegible]
June 29	NNW. 13	NW. 7	NW. 7	NNW. 10	NE. 7	NW. 7	NNW. 9	NNW. 9	NNW. 6	WNW. 5	NW. 6	NNW. 6
June 30	N. 6	NNE. 5	NE. 8	NE. 9	NE. 6	ENE. 7	ENE. 6	ENE. 6	NE. 6	NNE. 7	NNE. 7	NNE. 8
Means.	[illegible]1.03	10.77	10.73	10.47	10.13	9.60	10.07	9.83	9.53	10.17	10.23	10.37

Date.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1882.													
June 1	E. 16	E. 19	E. 16	E. 14	ENE. 12	ENE. 13	ENE. 14	ENE. 13	ENE. 17	NE. 18	NE. 19	NE. 18	14.50
June 2	NNE. 20	NNE. 20	NNE. 20	NNE. 18	N. 24	N. 23	N. 27	N. 24	N. 24	N. 25	N. 23	N. 23	21.21
June 3	N. 13	N. 12	NE. 12	NE. 11	NE. 10	NE. 11	NE. 13	NE. 11	NE. 13	NE. 11	ENE. 14	ENE. 10	15.12
June 4	E 14	E. 14	E. 12	E. 16	E. 13	E. 12	E. 9	E. 7	E. 5	E. 3	Calm.	SW. 2	10.42
June 5	WSW. 8	WSW. 7	WSW. 7	WSW. 5	SSW. 5	SSW. 5	SSW. 5	SSW. 5	SSW. 5	S. 6	S. 8	SE. 7	9.12
June 6	SE. 10	SE. 11	SE. 10	SE. 10	SE. 13	SE. 12	SE. 12	SE. 9	SE. 5	SE. 9	SE. 10	SE. 8	9.38
June 7	ENE. 6	ENE. 3	ENE. 3	ENE. 4	ENE. 4	ENE. 4	NE. 7	NE. 8	NE. 4	NE. 5	NE. 4	NE. 5	5.88
June 8	E 8	E. 11	E. 13	ESE. 16	ESE. 14	ESE. 13	ESE. 15	ESE. 15	ESE. 14	E. 18	E. 17	E. 17	10.20
June 9	E. 20	E. 19	E. 20	ENE. 20	ENE. 20	ENE. 18	E. 20	E. 20	ESE. 20	ENE. 20	ENE. 19	ENE. 20	17.96
June 10	ENE. 22	E. 20	ENE. 19	E. 18	ENE. 18	ENE. 18	ENE. 18	ENE. 17	ENE. 15	ENE. 16	NE. 11	NE. 13	18.33
June 11	ESE. 10	ESE. 12	ESE. 10	ESE. 8	S. 7	SSW. 8	SSW. 7	SSW. 6	SSW. 4	SSW. 3	SSW. 2	ESE. 1	6.12
June 12	E. 7	NE. 6	NE. 6	NE. 8	NE. 11	NE. 10	NE. 11	NE. 13	NE. 8	NE. 8	NE. 7	NE. 8	7.71
June 13	ENE. 9	NE. 12	NE. 13	NE. 13	NE. 12	NE. 12	NE. 14	NE. 12	NNE. 10	NNE. 11	NNE. 10	NNE. 6	10.08
June 14	NNE. 9	NNE. 9	NNE. 13	NNE. 12	ENE. 12	ENE. 9	ENE. 10	NE. 10	ENE. 10	NE. 10	NE. 12	NE. 11	9.75
June 15	NE. 10	NE. 10	NE. 9	NE. 10	NE. 9	NE. 7	NE. 10	NE. 9	NE. 8	NNE. 9	NNE. 9	NNE. 10	8.58
June 16	NNE. 8	NNE. 6	NNE. 6	NNE. 6	NNE. 7	NNE. 6	NNE. 7	NNE. 6	NNE. 7	NNE. 8	NNE. 8	NNE. 9	7.12
June 17	ENE. 11	E. 12	NE. 11	E. 10	E. 14	E. 13	E. 15	E. 15	ESE 14	ESE. 15	E 13	E. 15	10.92
June 18	SE. 10	S. 8	SSE. 6	W. 4	W. 4	SW. 3	SW. 3	SW. 6	SW. 8	SW. 6	SW. 8	SW. 10	8.58
June 19	SW. 9	SW. 10	SW. 8	SW. 11	SW. 14	SW. 10	SW. 13	SW. 13	SW. 12	SW. 13	SW. 12	SW. 11	12.08
June 20	WSW. 6	WSW. 8	WSW. 6	WSW. 5	WSW. 4	WSW. 6	WSW. 6	WSW. 6	WSW. 5	WSW. 6	WSW. 6	WSW. 6	7.96
June 21	NNE. 14	NNE. 11	NNE. 13	NNE. 10	NNE. 11	NNE. 8	N. 9	N. 8	N. 7	N. 11	NNW. 7	NNW. 8	8.46
June 22	NW. 14	NW 10	NNW. 10	NNW. 12	NNW. 13	NNW. 8	NNW. 12	NW. 12	NNW. 12	NNW. 11	NNW. 11	NNW. 7	9.75
June 23	NW. 4	NNW 4	NW. 6	NW. 6	NW. 6	WNW. 5	WNW. 5	WNW. 6	WNW. 8	N. 8	N. 7	N. 7	6.08
June 24	NNE. 6	N. 8	N. 7	N. 10	N. 8	N. 9	N. 8	NNE. 9	NNE. 8	NNE. 9	NNE. 8	NNE. 7	6.02
June 25	E. 7	ESE. 7	ESE. 8	ESE. 8	ENE. 10	E. 9	ESE. 7	ESE. 9	E. 8	ESE. 7	ESE. 4	W. 3	7.64
June 26	NW. 20	NW. 18	NW. 16	NW. 16	NW. 10	NW. 17	NW. 16	NW. 14	NW. 17	NW. 13	WNW. 13	WNW. 13	15.50
June 27	NNW. 12	NNW. 12	NW. 9	NNW. 14	N. 14	N. 12	NNW. 12	NNW. 13	NNW. 11	NNW. 10	NNW. 11	N. 11	12.71
June 28	N. 9	N. 10	N. 8	N. 8	N. 8	N. 8	N. 7	N. 11	NNW. 9	NNW. 13	NNW. 15	NNW. 16	9.25
June 29	NNW. 8	W. 5	NW. 5	W. 5	WSW. 4	NW. 6	NNW. 7	N. 8	N. 5	N. 5	N. 6	NNE. 8	6.83
June 30	NNE. 7	NNE. 9	NNE. 11	NNE. 10	NNE. 12	NNE. 10	NNE. 12	N. 12	NNE. 11	NE. 12	NE. 11	ENE. 11	8.71
Means.	10.90	10.77	10.43	10.60	10.97	10.17	11.03	10.90	10.13	10.63	10.17	10.03	10.40

* On and after June 15, 1882, anemometer cups 28 feet above the ground.

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1882.												
July 1	NE. 12	NE. 10	E. 11	E. 11	ESE. 10	ESE. 6	ESE. 5	ESE. 6	SE. 4	ESE. 6	ESE. 11	ESE. 12
July 2	NNE. 8	E. 8	E. 7	ENE. 6	ENE. 9	E. 6	ESE. 9	ESE. 9	ESE. 5	ESE. 4	ESE. 6	SE. 5
July 3	ESE. 12	E. 7	E. 8	E. 7	E. 7	ESE. 8	ESE. 5	ESE. 6	SSE. 6	SSE. 10	SW. 10	W. 8
July 4	W. 6	W. 3	W. 2	W. 3	W. 2	Calm.	SSE. 4	W. 4	SW. 5	SW. 7	SW. 8	WSW. 8
July 5	W. 4	WSW. 5	WSW. 5	W. 4	S. 3	S. 4	S. 3	SSE. 7	S. 13	S. 18	SSW. 20	SW. 25
July 6	WSW. 22	SW. 19	SW. 14	SW. 15	SW. 18	SSW. 16	SW. 18	SW. 15	SW. 21	SW. 22	SW. 20	SW. 20
July 7	SW. 14	SW. 15	SW. 11	SW. 11	SW. 8	SW. 9	S 5	S. 5	S. 3	S. 3	SE. 4	E. 5
July 8	ESE. 14	E. 13	ENE. 10	ENE. 13	E. 12	ESE. 10	ENE. 12	E. 13	ESE. 11	E. 12	ESE. 10	E. 10
July 9	NW. 4	WNW. 7	W. 5	W. 7	W. 10	W. 9	W. 13	W. 9	W. 7	W. 9	WSW. 7	WSW. 8
July 10	E. 10	E. 12	E. 12	E. 11	ESE. 12	E. 8	ESE. 10	SE. 8	SE. 8	SE. 7	SE. 5	Calm.
July 11	NNE. 8	NNW. 5	NW. 11	NNW. 6	NNW. 5	WNW. 5	WSW. 4	WSW. 2	S. 2	SSE. 6	SSE. 6	SE. 7
July 12	SW. 12	SW. 16	SW. 14	SW. 14	SW. 15	SW. 12	SW. 16	SW. 13	SW. 13	SW. 17	SW. 20	SW. 20
July 13	WSW. 18	WSW. 20	SW. 16	SW. 17	SW. 19	SW. 18	SW. 22	WSW. 20	WSW. 21	WSW. 19	WSW. 16	WSW. 14
July 14	WSW. 7	WSW. 5	WSW. 9	WSW. 10	WSW. 9	WSW. 10	SW. 11	SW. 12	SW. 14	SW. 18	SW. 14	SW. 14
July 15	NNW. 8	N. 10	N. 10	N. 5	N. 8	NNW. 8	NNW. 12	N. 10	N. 8	N. 9	N. 9	N. 7
July 16	ENE. 10	E. 10	E. 10	E. 10	ENE. 8	E. 8	ENE. 9	E. 13	E. 11	E. 11	ENE. 11	E. 13
July 17	ENE. 16	ENE. 16	ENE. 18	E. 19	E. 20	ENE. 16	ENE. 16	ENE. 18	ENE. 14	ENE. 16	ENE. 16	ENE. 16
July 18	NNW. 6	NW. 5	NW. 6	WNW. 5	WNW. 5	W. 4	WSW. 8	WSW. 8	WSW. 7	WSW. 9	WSW. 7	WSW. 5
July 19	NE. 6	ENE. 6	NNE. 7	NNE. 6	NNE. 6	NNE. 4	E. 6	ESE. 8	SE. 7	SE. 8	SE. 8	SSE. 12
July 20	NNE. 7	NNE. 9	E. 8	E. 7	E. 7	E. 6	E. 6	E. 8	E. 8	E. 10	ENE. 12	ENE. 12
July 21	E. 21	ESE. 22	E. 24	ESE. 18	ESE. 19	ESE. 16	ESE. 18	ESE. 20	ESE. 19	ESE. 18	ESE. 19	SE. 12
July 22	ENE. 12	E. 11	E. 11	ENE. 9	E. 6	E. 6	ESE. 9	ESE. 7	ESE. 9	SE. 9	SW. 4	SW. 7
July 23	N. 3	NW. 3	NW. 3	NW. 5	NNW. 5	NNE. 6	NNE. 6	NNE. 7	NNE. 7	ENE. 8	ENE. 5	E. 8
July 24	ESE 11	ESE. 14	ESE. 11	ESE. 10	SE. 8	SE. 8	SE. 10	SE. 9	SSE. 12	SSE. 12	SSE. 12	S. 13
July 25	NE. 6	ENE. 7	E. 8	E. 6	E. 9	E. 9	E. 11	ESE. 11	SE. 7	S. 10	SW. 16	SW. 20
July 26	SSW. 1	SW. 1	Calm.	WSW. 2	NW. 2	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.
July 27	W. 8	WNW 8	NW. 7	NW. 4	NW. 5	NW. 4	NW. 6	NNW. 6	NNW. 11	N. 8	NNE. 10	NNE. 10
July 28	NNE. 18	NNE. 16	NE. 16	NNE. 20	NE. 18	NE. 16	NE. 22	NE. 10	NE. 18	ENE. 19	ENE. 18	ENE. 16
July 29	E. 16	E. 13	E. 12	SE. 18	ESE. 16	SE. 14	ESE. 17	SE. 15	ESE. 16	SE. 14	SE. 16	SE. 22
July 30	ESE. 22	SE. 20	ESE. 18	SE. 18	SE. 17	SE. 14	SE. 16	SE. 18	SE. 17	SSE. 18	SE. 18	SE. 18
July 31	SW. 13	SW. 14	SW. 11	SSW. 8	SSW. 14	SSW. 10	SSW. 12	S. 10	S. 10	SSW. 11	SSW. 10	SW. 16
Means.	10.81	10.65	10.16	9.84	10.06	8.71	10.35	10.19	10.13	11.23	11.23	11.71

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1882.													
July 1	ESE. 10	ESE. 10	ESE. 11	E. 10	ESE. 10	E. 8	E. 9	E. 8	E. 8	ESE. 9	ESE. 9	ESE. 8	8.92
July 2	SE. 7	SE. 8	E. 5	ESE. 9	E. 8	ESE. 12	E. 13	E. 11	E. 15	ESE. 15	ESE. 15	ESE. 12	8.83
July 3	WNW. 10	WNW. 12	WNW. 13	NW. 12	WNW. 10	WNW. 10	NW. 11	NW. 9	NW. 10	NW. 6	WNW. 5	W. 6	8.67
July 4	WSW. 7	WSW. 7	WSW. 7	SW. 7	SW. 8	WSW. 8	WSW. 8	W. 6	W. 5	W. 5	W. 5	W. 5	5.42
July 5	SW. 24	SW. 24	SW. 25	SW. 23	SW. 16	SW. 12	WSW. 13	WSW. 12	WSW. 12	WSW. 14	WSW. 15	SW. 20	13.38
July 6	SW. 18	SW. 20	SW. 18	SW. 21	SW. 18	WSW. 17	WSW. 14	SW. 13	SW. 13	SW. 12	SW. 11	SW. 11	16.92
July 7	NNE. 6	E. 9	E. 9	E. 11	E. 11	E. 13	E. 14	E. 13	ESE. 14	ESE. 16	ESE. 19	ESE. 16	10.17
July 8	E. 10	ESE. 12	E. 10	E. 12	ENE. 10	ENE. 8	E. 9	ENE. 8	ENE. 8	NNE. 7	N. 6	NNW. 6	10.25
July 9	WNW. 6	W. 7	WNW. 5	NNW. 4	N. 5	N. 6	NNE. 8	NE. 11	ENE. 12	E. 13	ENE. 15	ESE. 16	8.46
July 10	Calm.	NNW. 6	NNE. 5	NNE. 6	NW. 5	NNW. 7	N. 5	NNW. 6	N. 6	NNE. 11	NE. 10	ENE. 11	7.54
July 11	SSE. 6	SE. 10	S. 13	SW. 17	SW. 13	W. 9	W. 6	W. 8	W. 9	WSW. 8	SW. 12	WSW. 13	7.96
July 12	SW. 20	SW. 20	SW. 21	SW. 20	SW. 24	SW. 20	SW. 18	WSW. 16	WSW. 19	W. 23	WSW. 19	WSW. 16	17.42
July 13	WSW. 14	WSW. 14	WSW. 13	WSW. 15	WSW. 13	WSW. 12	WSW. 10	WSW. 12	WSW. 9	WSW. 10	WSW. 11	SW. 8	15.04
July 14	SW. 16	SW. 14	SW. 16	SW. 16	WSW. 15	WSW. 12	WSW. 15	W. 12	W. 7	W. 5	WNW. 4	NNW. 8	11.38
July 15	N. 6	N. 6	N. 5	N. 7	NNE. 8	NNE. 7	NNE. 10	NNE. 9	N. 9	NNE. 11	NE. 11	ENE. 11	8.50
July 16	E. 16	ENE. 15	E. 15	ENE. 16	ENE. 17	ENE. 17	ENE. 20	ENE. 18	E. 22	E. 20	ENE. 18	ENE. 16	13.92
July 17	ENE. 17	ENE. 17	ENE. 16	E. 16	ENE. 12	E. 9	E. 9	NNE. 7	NNE. 8	NNE. 7	NNE. 6	N. 5	13.75
July 18	W. 5	W. 5	W. 5	W. 5	W. 5	NW. 6	NW. 4	NW. 3	NW. 3	WNW. 4	N. 4	N. 6	5.42
July 19	SSW. 9	WSW. 4	SW. 14	WSW. 15	WSW. 8	WSW. 6	WNW. 11	WNW. 5	W. 2	WNW. 3	WNW. 2	N. 4	6.96
July 20	ENE. 18	E. 18	E. 17	E. 18	E. 17	E. 14	E. 19	E. 19	E. 16	E 22	E. 22	ESE 20	13.54
July 21	SE. 12	SE. 11	SE. 5	SE. 4	Calm.	WNW. 3	NW. 5	NW. 6	NNW. 4	NNE. 7	NNE. 7	NNE. 9	12.46
July 22	SW. 9	SW. 10	SW. 8	WSW. 7	WSW. 5	W. 3	NW. 5	NNE. 8	E. 11	E. 12	E. 9	N. 5	8.00
July 23	E. 8	SE. 10	SSE. 15	SSE. 16	SSE. 16	SSE. 14	N. 7	NW. 7	SE. 3	E. 12	E. 12	E. 12	8.25
July 24	SSE. 13	SSE. 12	SSE. 15	SSE. 16	S. 15	NW. 8	NNW. 6	WNW. 4	NNW. 5	N. 6	NNE. 8	NE. 4	10.08
July 25	SW. 18	W. 14	W. 16	W. 8	WSW. 8	WSW. 4	SW. 7	SW. 6	WSW. 2	W. 3	WNW. 2	Calm.	8.67
July 26	Calm.	WSW. 7	WSW. 6	WSW. 7	WSW. 6	SW. 20	SW. 12	WSW. 8	W. 8	W. 9	WSW. 12	W. 10	4.62
July 27	NNE. 8	N. 8	N. 12	NNE. 14	NNE. 15	N. 12	NNE. 13	N. 19	N. 17	N. 18	NNE. 20	NE. 17	10.83
July 28	NE. 16	NE. 10	ENE. 12	ENE. 13	ENE. 12	ENE. 11	NE. 12	E. 11	E. 11	E. 12	E. 12	ESE. 14	15.04
July 29	SE. 18	SE. 20	SE. 20	SE. 18	ESE. 20	SE. 17	ESE. 18	SE. 17	ESE. 20	SE. 17	SE. 20	ESE. 20	17.25
July 30	SSE. 18	SSE. 22	SSE. 22	SSE. 24	SSE. 22	SSW. 20	WSW. 8	WSW. 8	WSW. 7	SW. 7	SW. 9	SW. 12	16.38
July 31	SW. 16	SW. 18	SW. 20	SW. 19	SW. 16	SW. 12	WSW. 7	W. 7	W. 3	NW. 2	ESE. 5	ESE. 13	11.54
Means	11.65	12.26	12.71	13.10	11.87	10.87	10.52	9.90	9.61	10.52	10.81	10.77	10.82

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1882.												
Aug. 1	ESE. 16	SSE. 17	SE. 14	SSE. 17	WNW. 28	W. 20	WSW. 21	WSW. 18	WSW. 17	SW. 13	SW. 15	SW. 16
Aug. 2	NW. 1	NW. 2	N. 4	NNE. 5	NNE. 6	E. 6	E. 8	E. 8	E. 10	ENE. 12	NE. 12	E. 12
Aug. 3	WSW. 10	WSW. 18	SW. 20	SW. 28	WSW. 28	WSW. 26	WSW. 24	WSW. 20	WSW. 17	W. 20	W. 20	WSW. 18
Aug. 4	NW. 7	NW. 2	WNW. 2	E. 2	ESE. 6	ESE. 6	ESE. 11	SE. 16	SE. 17	SSE. 19	S. 17	SW. 8
Aug. 5	N. 10	N. 6	N. 6	NE. 7	ENE. 6	ENE. 8	ENE. 7	ENE. 8	ENE. 11	ENE. 12	E. 16	E. 16
Aug. 6	ESE. 41	SE. 28	SE. 28	SE. 32	SE. 28	SE. 20	SE 20	SSE. 16	S. 15	S. 14	SSW. 13	S. 16
Aug. 7	SSW. 32	SSW. 30	SSW. 27	SSW. 28	W. 26	W. 24	W. 28	W. 28	W. 29	W. 32	W. 32	W. 25
Aug. 8	WSW. 17	WSW. 11	SW. 9	WSW. 16	WSW. 15	WSW. 10	SW. 5	S. 7	S. 8	SSE. 12	SSE. 13	SSE. 22
Aug. 9	S. 26	S. 28	SSW. 24	S. 26	SSW. 24	SSW. 24	SSW. 27	SSW. 28	SSW. 26	SSW. 27	SSW. 28	SW. 36
Aug. 10	W. 18	W. 14	WSW. 14	W. 9	NW. 4	ESE. 4	ESE. 8	E. 7	ESE. 10	ESE. 10	SE. 19	SE. 22
Aug. 11	SSE. 24	SSE. 17	SSE. 15	SSE. 19	SSE. 14	SSE. 14	SSE. 14	SE. 16	SSE. 16	SSE. 12	SSE. 9	SSE. 9
Aug. 12	S. 9	SSW. 9	S. 10	S. 16	S. 16	SSW. 16	SW. 20	SW. 20	SW. 22	SW. 22	SW. 24	SW. 24
Aug. 13	NW. 22	NW. 24	NW. 24	NNW. 24	NW. 18	NW. 18	NW. 18	NW. 18	NW. 17	NW. 16	NW. 15	NW. 15
Aug. 14	NNE. 5	N. 3	NE. 4	E. 5	E. 8	ENE. 6	ENE. 5	ENE. 6	ESE. 8	E. 8	SE. 8	ESE. 9
Aug. 15	E. 16	ESE. 16	ESE. 15	SE. 16	ESE. 14	ESE. 14	ESE. 16	ESE. 17	ESE. 18	SE. 18	SE. 20	ESE. 18
Aug. 16	ESE. 24	ESE 25	ESE. 20	ESE. 20	E. 19	E. 20	E. 18	E. 20	E. 20	E. 20	E. 18	E. 20
Aug. 17	ESE. 22	ESE. 20	ESE. 20	E. 18	ESE. 17	ESE. 16	ESE. 17	ESE. 17	ESE. 17	ESE. 20	E. 20	E. 20
Aug. 18	ENE. 19	E. 15	E. 13	ENE. 16	ENE. 15	E. 13	E. 16	E. 14	ENE. 12	E. 15	ESE. 16	E. 14
Aug. 19	ENE. 11	ENE. 9	NE. 7	NE. 8	ENE. 9	ENE. 7	ENE. 8	ENE. 8	E. 8	E. 6	E. 7	ESE. 4
Aug. 20	SE. 9	SE. 11	SE. 12	SSE. 13	SSE. 12	SSE. 12	SSE. 10	SSE. 10	SSE. 11	SSE. 11	SSE. 10	SSE. 9
Aug. 21	ENE. 7	NE. 9	NE. 6	NE. 6	NNE. 13	NNE. 15	NNE. 16	NNE. 18	NNE. 18	NNE. 18	NNE. 16	NNE. 16
Aug. 22	ENE. 20	NE. 16	NE. 15	NE. 18	NE. 16	NE. 15	NE. 14	NE. 16	NE. 14	NE. 14	NE. 11	NE. 12
Aug. 23	WNW. 2	S. 6	S. 5	S. 5	S. 4	Calm.	ESE. 4	SE. 4	SE. 4	ESE. 5	ESE. 5	E. 9
Aug. 24	NE. 14	NE. 12	NE. 13	NE. 12	NNE. 10	NNE. 11	NNE. 12	NNE. 13	NE. 13	NE. 15	NE. 14	NE. 14
Aug. 25	E. 8	ENE. 9	ENE. 10	ENE. 10	ENE. 10	NE. 12	NE. 14	NE. 18	NE. 15	NE. 14	NE. 16	NE. 10
Aug. 26	NE. 18	NE. 18	NE. 17	NE. 17	NE. 18	NE. 16	NE. 16	NE. 16	NE. 20	NE. 20	NNE. 20	NNE. 20
Aug. 27	N. 18	N. 18	NNE. 17	NNE. 17	NNE. 19	NE. 18	NNE. 14	NE. 14	NNE. 10	NE. 11	NE. 11	NE. 9
Aug. 28	E. 8	NNE. 8	NE. 7	E. 5	ENE. 5	ENE. 5	ENE. 5	E. 6	E. 4	E. 4	E. 3	E. 5
Aug. 29	E. 7	E. 6	ENE. 6	E. 5	ENE. 6	ENE. 6	ENE. 6	ENE. 5	ENE. 6	ENE. 8	ENE. 6	ENE. 6
Aug. 30	NE. 10	NNE. 12	NNE. 12	NE. 10	NE. 10	NE. 10	NE. 8	NNE. 9	NE. 13	NE. 12	NE. 10	NE. 9
Aug. 31	E. 9	E. 5	E. 6	E. 4	ENE. 4	NE. 6	NNE. 8	NNE. 8	NE. 8	NE. 9	NE. 10	NE. 13
Means.	14.84	13.68	12.97	14.00	13.81	12.84	13.48	13.84	14.00	14.48	14.65	15.00

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1882.													
Aug. 1	SW. 16	SW. 16	SW. 16	SW. 17	WSW. 13	WSW. 16	WSW. 12	WSW. 12	W. 15	WNW. 12	WNW. 8	NW. 2	15.29
Aug. 2	E. 14	E. 13	E. 17	E. 16	E. 14	E. 16	E. 17	ESE. 10	ESE. 11	E. 7	SE. 12	SE. 11	10.17
Aug. 3	W. 18	W. 17	WNW. 19	W. 17	W. 16	WNW. 12	WNW. 12	WNW. 11	WNW. 12	WNW. 12	WNW. 8	WNW. 8	17.12
Aug. 4	NW. 12	NW. 24	NW. 13	NNW. 20	NNW. 20	NNW. 18	NNW. 16	NNW. 12	NNW. 12	NNW. 13	N. 15	NW. 11	12.46
Aug. 5	E. 20	E. 24	E. 28	E. 34	E. 32	E. 32	E. 34	ESE. 34	ESE. 38	E. 40	ESE. 41	ESE. 40	21.25
Aug. 6	S. 16	S. 19	SSW. 28	SSW. 26	SSW. 27	SSW. 34	SSW. 26	SSW. 26	SSW. 32	S. 32	SSW. 29	SSW. 26	24.67
Aug. 7	W. 28	W. 24	WSW. 28	WSW. 24	WSW. 24	WSW. 26	W. 26	W. 24	W. 22	W. 20	W. 20	W. 20	26.12
Aug. 8	SSE. 25	SSE. 28	SSE. 30	S. 28	S. 26	S. 23	WSW. 22	SW. 27	S. 12	S. 23	SSW. 23	SSW. 24	18.17
Aug. 9	SSW. 34	SSW. 32	SW. 36	WSW. 39	WNW. 27	WNW. 28	WNW. 28	WNW. 28	WNW. 25	WNW. 28	WNW. 22	WNW. 20	27.96
Aug. 10	SE. 22	SE. 17	SSE. 16	SSE. 16	SSE. 14	SSE. 15	SSE. 10	S. 17	S. 16	S. 22	S. 20	S. 21	14.38
Aug. 11	S. 9	S. 8	SSE. 9	SSE. 13	S. 13	S. 22	S. 20	S. 18	S. 12	SSE. 9	SSE. 13	SSE. 8	13.88
Aug. 12	WNW. 23	NW. 22	NW 21	NW. 26	NW. 29	NW. 26	NW. 32	NW. 28	NNW. 32	NNW. 29	NNW. 29	NW. 31	22.33
Aug. 13	NW. 13	NNW. 12	NNW. 13	NW. 12	NW. 12	NW. 12	NW. 9	NNW. 9	NNW. 9	NNW. 8	NNW. 7	NNW. 5	14.58
Aug. 14	ESE. 8	SE. 10	E. 12	ESE. 11	ESE. 13	ESE. 12	E. 15	ESE. 15	E. 14	E. 14	E. 14	ESE. 15	9.50
Aug. 15	ESE. 23	SE. 20	ESE. 22	ESE. 23	E. 24	ESE. 23	ESE. 24	E. 23	E. 24	ESE. 24	E. 24	E. 24	19.88
Aug. 16	E. 22	ENE. 21	E. 21	ESE. 22	E. 21	E. 20	E. 20	E. 20	E. 20	E. 20	E. 21	E. 22	20.58
Aug. 17	E. 24	ESE. 20	ESE. 24	E. 25	E. 22	E. 22	ESE. 24	E. 20	E. 22	E. 23	E. 22	E. 20	20.50
Aug. 18	E. 16	E. 11	ESE. 23	E. 24	E. 20	E. 20	E. 20	E. 16	ENE. 16	E. 17	E. 16	ENE. 14	16.29
Aug. 19	ESE. 8	ESE. 8	ESE. 8	SE. 10	E. 9	ESE. 9	E. 10	E. 15	ESE. 11	E. 15	E. 13	SE. 13	9.21
Aug. 20	SE. 9	SE. 9	SE. 8	SE. 8	SE. 8	ESE. 8	ESE. 10	E. 10	ENE. 9	ENE. 12	ENE. 11	ENE. 10	10.08
Aug. 21	NE. 15	NE. 16	NE. 16	NE. 15	NE. 17	NE. 17	NE. 17	NE. 17	NE. 17	ENE. 18	NE. 19	NE. 20	15.08
Aug. 22	NNE. 13	NNE. 13	NNE. 13	N. 10	N. 10	NNW. 10	NNW. 8	NNW. 6	N. 8	NNW. 8	WNW. 5	WNW. 4	12.04
Aug. 23	E. 8	ENE. 10	ENE. 13	E. 13	ENE. 11	ENE. 11	ENE. 11	E. 10	E. 9	ENE. 8	ENE. 8	ENE. 11	7.33
Aug. 24	NE. 14	NE. 13	NE. 12	NNE. 14	NNE. 15	NNE. 12	NNE. 11	NNE. 11	NNE. 12	NE. 11	ENE. 10	E. 9	12.38
Aug. 25	NE. 20	NE. 22	NE. 22	NE. 22	NE. 24	NE. 22	NE. 23	NE. 23	NE. 22	NE. 23	NE. 21	NE. 20	17.46
Aug. 26	NNE. 20	NNE. 21	NNE. 20	NNE. 20	NE. 20	NE. 20	NE. 22	NE. 22	NE. 21	NE. 20	NNE. 22	NNE. 18	19.25
Aug. 27	ENE. 9	ENE. 9	NE. 7	NNE. 11	NNE. 12	NE. 10	ENE. 8	NE. 8	ENE 9	NE. 9	NE. 11	ENE. 8	11.96
Aug. 28	E. 5	ESE. 5	Calm.	NNE. 4	NNE. 5	NE. 7	NE. 7	ENE. 8	ENE. 7	NE. 7	ENE. 7	ENE. 7	5.58
Aug. 29	ENE. 6	ENE. 7	ENE. 8	ENE. 10	ENE. 10	NE. 9	ENE. 13	ENE. 9	NE. 10	NE. 9	NE. 10	NNE. 10	7.67
Aug. 30	NE. 9	NE. 11	NE. 13	NE. 11	NNE. 11	NE. 10	ENE. 10	NE. 10	ENE. 9	NE. 11	ENE. 8	E. 10	10.33
Aug. 31	NE. 11	NNE. 12	NNE. 11	N. 11	N. 12	N. 12	NNW. 12	NNW. 19	NW. 20	NW. 22	NNW. 25	NNW. 28	11.86
Means.	15.81	15.94	17.00	17.81	17.13	17.23	17.06	16.71	16.39	16.97	16.58	15.81	15.33

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, $-5^{h}\ 17^{m}$. Velocity given in miles per hour.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity	Direction and velocity.
1882.												
Sept. 1	NNW. 28	NNW. 27	NNW. 32	NNW. 29	NNW. 26	NNW. 27	NNW. 23	NNW. 22	N. 23	N. 22	N. 17	N. 15
Sept. 2	NNW. 10	NNW. 6	NW. 5	WSW. 2	SW. 4	SW. 3	SW. 5	WSW. 7	W. 8	SSW. 8	SW. 7	SSW. 6
Sept. 3	SE. 9	SE. 12	SSE. 15	SSE. 16	SSE. 14	SSE. 14	SSE. 16	SSE. 14	SSE. 16	SSE. 18	SE. 13	SE. 14
Sept. 4	ESE. 8	ESE. 8	ESE. 10	ESE. 6	ESE. 6	ESE. 6	SE. 7	SE. 9	SE. 10	S. 12	SSE. 10	S. 9
Sept. 5	ESE. 10	ESE. 10	SE. 11	SE. 11	SE. 10	SE. 10	SE. 10	ESE. 11	ESE. 12	ESE. 12	ESE. 12	ESE. 12
Sept. 6	E. 8	E. 10	E. 8	ESE. 9	ESE. 6	E. 5	E. 6	E. 6	E. 5	ESE. 5	E. 6	ENE. 7
Sept. 7	ENE. 13	NE. 12	ENE. 14	ENE. 11	NE. 12	NE. 12	ENE. 13	NE. 10	NNE. 13	NNE. 20	NE. 14	NE. 13
Sept. 8	NE. 14	E. 18	ENE. 14	NE. 12	NE. 9	NE. 9	NE. 9	NE. 8	NE. 11	NE. 12	ENE. 9	ENE. 11
Sept. 9	ESE. 16	ESE. 12	E. 13	ENE. 13	E. 13	E. 10	ENE. 14	ENE. 12	ENE. 12	NE. 15	ENE. 14	ENE. 13
Sept. 10	ESE. 20	ESE. 14	E. 18	ENE. 21	E. 19	ENE. 20	E. 20	E. 20	E. 20	E. 20	E. 20	E. 21
Sept. 11	E. 23	E. 22	ESE. 18	ESE. 16	ESE. 11	ESE. 12	ESE. 11	ESE. 8	ESE. 8	ESE. 6	E. 8	E. 7
Sept. 12	NNW. 8	NW. 8	NNW. 8	NW. 10	WNW. 11	NW. 13	NW. 14	NW. 12	WNW. 12	WNW. 13	WNW. 12	WNW. 14
Sept. 13	WNW. 12	NNW. 12	N. 9	N. 10	N. 12	N. 12	NNE. 12	N. 11	N. 14	N. 15	NNW. 13	N. 14
Sept. 14	NNE. 14	NNE. 14	NNE. 13	NNE. 13	NNE. 12	NE. 10	ENE. 5	ENE. 4	ENE. 3	ENE. 3	ENE. 2	ENE. 2
Sept. 15	SSW. 3	SSW. 4	ENE. 5	ESE. 4	ESE. 5	E. 6	E. 8	E. 8	ESE. 6	ESE. 8	ESE. 7	ESE. 8
Sept. 16	E. 12	ENE. 15	E. 16	E. 19	E. 16	E. 17	E. 17	E. 16	E. 18	E. 19	E. 20	E. 22
Sept. 17	NE. 26	NE. 27	NE. 27	NE. 28	NE. 24	NE. 18	NE. 15	NNE. 14	NNE. 16	NNE. 16	NNE. 17	NE. 12
Sept. 18	SW. 7	WSW. 7	WSW. 10	WSW. 9	W. 10	WSW. 12	WSW. 14	WSW. 13	WSW. 14	WSW. 15	WSW. 16	WSW. 16
Sept. 19	NW. 7	WNW. 11	WNW. 11	NW. 13	NW. 15	NW. 9	WNW. 5	WNW. 12	W. 13	W. 13	W. 17	W. 19
Sept. 20	W. 13	W. 15	NNW. 14	NNW. 16	NNW. 14	NNW. 12	NNW. 13	NW. 7	NW. 5	E. 2	NE. 4	ESE. 4
Sept. 21	SE. 8	ESE. 8	ESE. 8	SE. 11	E. 9	E. 8	E. 7	E. 8	E. 12	E. 12	E. 11	ENE. 8
Sept. 22	NE. 17	NE. 16	NE. 16	NE. 18	ENE. 16	ENE. 18	ENE. 16	ENE. 16	NE. 16	ENE. 15	ENE. 16	ENE. 16
Sept. 23	E. 12	E. 11	E. 15	E. 14	ENE. 15	ENE. 14	E. 16	ENE. 14	ENE. 15	ENE. 17	ENE. 16	ENE. 14
Sept. 24	ENE. 20	ENE. 17	NE. 17	NE. 18	NE. 16	NE. 18	NE. 16	NE. 17	NE. 16	NE. 19	NNE. 22	NNE. 22
Sept. 25	N. 28	N. 29	NNW. 28	NNW. 26	NNW. 23	N. 22	N. 23	NNW. 23	NNW. 17	NW. 13	NNW. 17	NNW. 20
Sept. 26	S. 6	S. 10	SSW. 8	SSW. 11	SSW. 8	SSW. 10	SSW. 11	S. 10	S. 13	S. 17	S. 18	S. 20
Sept. 27	W. 16	W. 18	W. 16	WSW. 15	WSW. 10	SSW. 10	SSW. 10	SSW. 13	SSW. 13	S. 17	SSW. 17	SSW. 16
Sept. 28	SSW. 17	SSW. 18	SSW. 22	SSW. 20	SSW. 16	SSW. 20	SW. 18	SW. 15	SW. 20	SSW. 20	SSW. 23	SW. 24
Sept. 29	WSW. 29	WSW. 22	W. 18	WSW. 17	WSW. 11	SW. 8	SSW. 7	S. 6	SSW. 15	SSW. 23	SSW. 24	SSW. 22
Sept. 30	SSW. 5	S. 6	SE. 6	SE. 8	ESE. 7	ENE. 10	ENE. 13	ENE. 15	E. 19	ENE. 23	ENE. 26	ENE. 28
Means.	13.97	13.97	14.17	14.20	12.67	12.50	12.47	12.03	13.17	14.33	14.27	14.30

Date.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1882.													
Sept. 1	N. 10	NNE. 10	NW. 11	NNW. 10	N. 6	NNW. 6	NNW. 7	NW. 8	NW. 9	NNW. 11	NW. 11	NNW. 9	16.62
Sept. 2	SE. 7	S. 10	S. 11	SSE. 13	S. 13	SSE. 13	SSE. 14	SSE. 15	SE. 19	ESE. 15	ESE. 17	SE. 14	9.67
Sept. 3	SE. 17	SE. 19	SE. 16	SE. 12	SE. 7	SE. 9	SE. 9	S. 5	SE. 5	SE. 5	ESE. 6	ESE. 6	11.96
Sept. 4	S. 9	SSE. 6	SSE. 8	S. 7	SSE. 12	SSE. 12	SSE. 13	SSE. 13	SSE. 12	SE. 9	ESE. 7	ESE. 9	9.68
Sept. 5	ESE. 12	ESE. 10	ESE. 10	ESE. 8	E. 9	E. 11	E. 11	E. 13	E. 13	E. 12	E. 8	E. 9	10.71
Sept. 6	ENE. 7	NE. 8	NE. 11	ENE. 9	NNE. 11	NNE. 10	ENE. 11	NE. 13	NE. 13	NE. 13	ENE. 12	NE. 12	8.79
Sept. 7	ENE. 12	NE. 11	NE. 12	ENE. 13	NE. 13	E. 12	E. 16	E. 16	E. 15	ENE. 16	NE. 13	NE. 13	13.29
Sept. 8	ENE. 12	ENE. 11	NE. 16	NNE. 14	ENE. 13	NE. 14	NE. 13	NE. 14	E. 12	E. 12	E. 13	ESE. 13	12.21
Sept. 9	E. 15	E. 16	E. 16	E. 20	ESE. 20	E. 21	E. 21	ESE. 23	E. 22	E. 22	E. 20	E. 20	16.38
Sept. 10	E. 22	E. 20	E. 22	E. 23	E. 24	E. 22	E. 22	E. 23	E. 23	E. 26	E. 25	E. 24	21.21
Sept. 11	E. 5	Calm.	NE. 7	NE. 7	NE. 5	NNE. 6	NNE. 6	NNE 5	NNE. 5	NNW. 5	NNW. 8	NNW. 6	8.96
Sept. 12	NW. 14	WNW. 13	WNW. 13	WNW. 14	WNW. 12	WNW. 11	WNW. 11	WNW. 11	WNW. 8	NW. 10	NW. 14	NW. 10	11.50
Sept. 13	NNW. 14	N. 10	N. 14	N. 13	N. 13	N. 13	N. 14	N. 14	N. 16	N. 16	N. 15	NNE. 16	13.08
Sept. 14	E. 2	ESE. 2	SE. 2	SSW. 8	SSW. 6	WSW. 5	SW. 5	WSW. 2	SSW. 2	SSW. 2	Calm.	SSW. 3	5.58
Sept. 15	ESE. 10	ESE. 11	ESE. 10	ESE. 11	ESE. 7	ESE. 11	ESE. 11	ESE. 11	E. 11	E. 12	E. 12	ENE. 10	8.29
Sept. 16	ENE. 22	E. 24	ENE. 24	ENE. 27	ENE. 24	ENE. 27	ENE. 26	ENE. 26	NE. 28	NE. 26	NE. 26	NE. 24	21.29
Sept. 17	NE. 7	NE. 6	NNE. 3	NNE. 2	NNW. 6	NNW. 4	NNW. 4	NW. 5	NW. 5	NW. 4	WNW. 4	WSW. 4	13.25
Sept. 18	W. 13	SW. 12	W. 13	W. 12	WSW. 11	WSW. 10	W. 12	W. 12	WNW. 12	NW. 10	WNW. 7	WNW. 9	11.50
Sept. 19	W. 19	W. 16	W. 16	W. 15	W. 17	NW. 16	WNW. 17	WNW. 18	WNW. 15	WNW. 16	WNW. 15	W. 10	13.96
Sept. 20	SE. 4	ESE. 4	SE. 7	E. 5	SE. 6	SE. 7	SE. 10	SE. 8	ESE. 11	ESE. 11	ESE. 10	ESE. 8	8.75
Sept. 21	NE. 10	NE. 10	NE. 11	ENE. 12	NE. 14	NE. 16	NE. 15	NE. 14	NE. 10	NE. 17	NE. 17	ENE. 16	11.33
Sept. 22	ENE. 16	E. 16	E. 15	E. 16	ENE. 14	ENE. 13	ENE. 15	NE. 15	ENE. 15	ENE. 15	ENE. 13	ENE. 12	15.46
Sept. 23	ENE. 16	ENE. 20	E. 20	ENE. 20	ENE. 20	ENE. 22	E. 21	E. 22	ENE. 20	ENE. 20	ENE. 20	ENE. 21	17.29
Sept. 24	NNE. 26	NNE. 28	NNE. 28	NNE. 28	N. 36	N. 38	N. 36	N. 34	NNW. 33	NNW. 32	E. 30	NNW. 27	24.75
Sept. 25	NNW. 9	WNW. 10	WNW. 8	WNW. 10	W. 8	W. 12	WNW 12	WSW. 12	WNW. 7	WSW. 8	WSW. 10	S. 3	15.75
Sept. 26	S. 20	S. 20	SSW. 20	SW. 16	SW. 20	WNW. 22	WNW. 24	NW. 17	WNW. 24	NW. 21	WNW. 18	WNW. 16	15.83
Sept. 27	S. 14	S. 14	S. 15	S. 16	SSW. 16	SSW. 22	SSW. 21	S. 17	SSW. 16	S. 14	SSW. 15	S. 15	15.25
Sept. 28	SW. 24	SW. 23	SW. 18	WSW. 24	SSW. 22	SSW. 24	SSW. 25	SSW. 29	SW. 33	SW. 28	SW. 28	SW. 26	22.38
Sept. 29	SW. 21	SW. 21	SW. 22	SW. 22	SSW. 21	SSW. 22	SW. 20	SW. 17	SW. 18	SW. 16	SW. 13	SW. 7	17.58
Sept. 30	ENE. 32	ENE. 28	E. 34	E. 32	E. 28	E. 28	E. 26	ESE. 20	E. 18	ESE. 22	E. 22	E. 24	20.00
Means.	14.03	13.63	14.43	14.63	14.47	15.30	15.60	15.07	15.00	14.87	14 30	13.20	14.02

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, *to August*, 1883—**Continued.**

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, $-5^h 17^m$. Velocity given in miles per hour.

Date.	1 a. m. Direction and velocity.	2 a. m. Direction and velocity.	3 a. m. Direction and velocity.	4 a. m. Direction and velocity.	5 a. m. Direction and velocity.	6 a. m. Direction and velocity.	7 a. m. Direction and velocity.	8 a. m. Direction and velocity.	9 a. m. Direction and velocity.	10 a. m. Direction and velocity.	11 a. m. Direction and velocity.	12 m. Direction and velocity.
1882.												
Oct. 1	ESE. 11	E. 13	E. 19	E. 17	ENE. 20	ESE. 14	SE. 8	SE. 8	S. 11	S. 6	S. 6	S. 6
Oct. 2	SSW. 12	SSW. 12	SSW. 15	SSW. 13	SSW. 14	SW. 14	SSW. 14	SSW. 11	S. 11	S. 12	SSW. 12	SW. 15
Oct. 3	NE. 17	NE. 16	NE. 18	NE. 16	ENE. 18	NE. 18	NE. 17	NE. 17	NE. 21	NE. 22	NE. 20	ENE. 23
Oct. 4	ENE. 25	ENE. 24	ENE. 25	ENE. 25	ENE. 24	ENE. 25	ENE. 26	ENE. 26	ENE. 27	ENE. 28	ENE. 28	ENE. 28
Oct. 5	ENE. 32	ENE. 32	ENE. 32	ENE. 32	ENE. 32	ENE. 32	ENE. 35	ENE. 34	NE. 36	ENE. 38	NE. 36	NE. 36
Oct. 6	ENE. 29	ENE. 30	ENE. 24	ENE. 26	ENE. 26	NE. 27	NE. 24	NE. 25	NE. 26	NE. 25	NE. 24	NE. 24
Oct. 7	NE. 24	NE. 22	NE. 26	NE. 27	NE. 24	NE. 23	NE. 23	NE. 23	NE. 25	NE. 26	NE. 26	NE. 23
Oct. 8	NE. 27	NE. 26	NE. 27	NE. 28	NE. 28	NE. 29	ENE. 28	NE. 28	NE. 28	NE. 28	ENE. 28	NE. 28
Oct. 9	ENE. 22	NE. 21	NE. 22	ENE. 24	ENE. 22	ENE. 22	ENE. 22	ENE. 19	NE. 21	ENE. 20	ENE. 20	NE. 20
Oct. 10	ENE. 19	NE. 17	NE. 17	NE. 15	NE. 15	ENE. 14	ENE. 12	NE. 11	ENE. 11	NE. 10	NE. 9	ENE. 8
Oct. 11	E. 5	E. 4	ENE. 7	E. 6	E. 6	N. 8	ENE. 5	NE. 3	NNW. 4	N. 6	NW. 5	NW. 4
Oct. 12	N. 4	N. 5	NNW. 3	NNW. 3	N. 3	N. 3	N. 3	N. 4	NNE. 3	NE. 3	NE. 2	Calm.
Oct. 13	ESE. 8	ESE. 7	ESE. 6	ESE. 8	ESE. 7	ESE. 8	ESE. 9	ESE. 8	ESE. 10	ESE. 8	ESE. 7	ESE. 7
Oct. 14	E. 20	E. 18	E. 19	ENE. 16	ENE. 13	ENE. 15	ENE. 11	ENE. 12	ENE. 15	ENE. 15	ENE. 15	ENE. 14
Oct. 15	NE. 15	ENE. 16	ENE. 15	ENE. 14	ENE. 16	ENE. 16	ENE. 16	ENE. 14	ENE. 14	ENE. 16	ENE. 16	ENE. 17
Oct. 16	ENE. 13	ENE. 12	E. 16	E. 15	ESE. 15	ESE. 15	E. 13	E. 11	ENE. 8	E. 12	E. 12	E. 10
Oct. 17	E. 14	E. 16	E. 16	E. 16	E. 13	E. 14	E. 17	ENE. 15	ENE. 18	ENE. 18	ENE. 18	ENE. 17
Oct. 18	E. 14	E. 15	E. 15	E. 14	E. 15	ESE. 11	ESE. 10	ESE. 10	ESE. 10	ESE. 8	ESE. 6	E. 5
Oct. 19	ENE. 13	ENE. 12	ENE. 12	ENE. 11	ENE. 10	NE. 11	ENE. 10	ENE. 11	ENE. 12	NE. 9	E. 6	ENE. 6
Oct. 20	E. 5	E. 5	ESE. 5	ESE. 4	ESE. 2	E. 2	E. 3	ESE. 3	SE. 3	SE. 3	SE. 3	ESE. 3
Oct. 21	E. 4	E. 3	NW. 3	NNW. 4	NNW. 5	NW. 5	NW. 4	NW. 4	NW. 5	NW. 5	NW. 4	WNW. 3
Oct. 22	S. 6	SSW. 8	SSW. 8	SSW. 6	S. 7	S. 8	S. 8	S. 8	S. 9	SSE. 10	SSE. 9	SSE. 8
Oct. 23	ESE. 5	ESE. 6	E. 6	E. 7	E. 6	E. 8	ENE. 8	ENE. 6	ENE. 6	ENE. 6	ENE. 7	ENE. 7
Oct. 24	ENE. 6	E. 6	ENE. 6	ENE. 6	ENE. 6	ENE. 6	ENE. 5	ENE. 6	ENE. 5	ENE. 6	E. 6	ENE. 6
Oct. 25	ENE. 12	ENE. 10	ENE. 9	NE. 9	NE. 7	ENE. 6	ENE. 6	ENE. 6	ENE. 8	ENE. 6	ENE. 6	E. 6
Oct. 26	N. 14	NNW. 15	N. 20	NNW. 18	NNW. 17	NNW. 14	NNW. 11	NNW. 14	NNW. 13	NNW. 15	NNW. 16	NNW. 15
Oct. 27	NW. 7	NNW. 5	NNW. 7	NNW. 6	NNW. 6	NNW. 8	NNW. 7	NNW. 6	NNW. 5	NNW. 6	NNW. 6	NNW. 6
Oct. 28	NNW. 2	NNW. 3	S. 3	S. 3	S. 4	S. 3	S. 2	SSE. 5	SSE. 6	SSE. 6	SSE. 7	S. 7
Oct. 29	SSW. 5	SSW. 6	SE. 8	SSE. 6	SSE. 5	SE. 7	SE. 3	SE. 3	SE. 6	SE. 9	SE. 9	SE. 10
Oct. 30	SSE. 20	SSE. 18	SSE. 22	SSE. 20	SSE. 19	SSE. 18	SSE. 18	SSE. 18	SE. 17	SE. 21	SE. 22	SE. 22
Oct. 31	SSW. 28	SSW. 30	SSW. 28	SSW. 27	SSW. 28	SSW. 25	SSW. 30	SSW. 22	SSW. 18	SSW. 20	SSW. 17	SSW. 16
Means.	14.13	13.98	14.81	14.26	13.97	13.84	13.06	12.61	13.29	13.65	13.16	12.90

Date.	1 p. m. Direction and velocity.	2 p. m. Direction and velocity.	3 p. m. Direction and velocity.	4 p. m. Direction and velocity.	5 p. m. Direction and velocity.	6 p. m. Direction and velocity.	7 p. m. Direction and velocity.	8 p. m. Direction and velocity.	9 p. m. Direction and velocity.	10 p. m. Direction and velocity.	11 p. m. Direction and velocity.	12 p. m. Direction and velocity.	Daily mean velocity.
1882.													
Oct. 1	S. 5	S. 7	S. 3	S. 5	SSE. 6	S. 6	SSE. 6	SSE. 12	SSE. 11	SSE. 9	SSE. 10	SSE. 8	9.46
Oct. 2	SW. 13	SW. 17	SW. 18	SW. 14	SW. 16	SW. 12	SW. 16	SW. 12	SW. 10	W. 5	NNE. 9	NNE. 15	13.00
Oct. 3	ENE. 22	ENE. 22	ENE. 22	ENE. 23	E. 24	ENE. 24	ENE. 21	ENE. 22	ENE. 23	ENE. 24	ENE. 24	ENE. 22	20.67
Oct. 4	ENE. 28	ENE. 28	ENE. 29	ENE. 29	ENE. 32	ENE. 31	ENE. 32	NE. 30	ENE. 32	ENE. 32	ENE. 33	ENE. 31	28.25
Oct. 5	NE. 38	NE. 38	NE. 39	NE. 38	ENE. 36	ENE. 36	ENE. 38	NE. 35	ENE. 36	ENE. 35	ENE. 33	ENE. 31	35.00
Oct. 6	ENE. 24	ENE. 24	ENE. 24	ENE. 24	NE. 24	NE. 24	NE. 24	NE. 24	NE. 24	NE. 24	NE. 23	NE. 23	24.83
Oct. 7	NE. 22	NE. 23	NE. 24	NE. 28	NE. 28	NE. 28	ENE. 27	NE. 22	NE. 23	NE. 23	NE. 24	NE. 26	24.58
Oct. 8	NE. 28	NE. 26	NE. 27	NE. 28	NE. 26	NE. 26	NE. 26	NE. 26	NE. 24	NE. 25	NE. 24	NE. 23	26.75
Oct. 9	NE. 18	NE. 18	NE. 17	NE. 21	NE. 22	NE. 22	NE. 21	NE. 20	NE. 20	NE. 18	NE. 19	NE. 19	20.42
Oct. 10	NE. 8	NE. 7	NE. 8	NE. 6	NE. 6	NE. 7	NE. 7	E. 7	E. 7	NE. 9	NE. 7	NE. 7	10.17
Oct. 11	NW. 5	NNW. 7	N. 6	N. 4	N. 5	N. 5	N. 4	N. 5	N. 5	N. 5	NNW. 3	N. 3	5.00
Oct. 12	NE. 8	NE. 7	NE. 7	NE. 4	NE. 2	E. 4	E. 6	E. 8	E. 10	ESE. 8	ESE. 7	ESE. 6	4.71
Oct. 13	ESE. 6	ESE. 6	ESE. 5	E. 6	E. 9	E. 8	ENE. 9	ENE. 9	ENE. 14	ENE. 13	E. 17	E. 16	8.79
Oct. 14	E. 14	E. 19	E. 20	E. 21	E. 23	E. 20	E. 20	ENE. 19	ENE. 19	ENE. 17	ENE. 17	ENE. 17	17.04
Oct. 15	ENE. 16	ENE. 15	ENE. 16	ENE. 16	ENE. 14	ENE. 14	ENE. 13	ENE. 12	ENE. 11	ENE. 10	ENE. 13	ENE. 14	14.54
Oct. 16	E. 10	ENE. 9	E. 11	E. 12	E. 12	E. 12	E. 14	E. 14	E. 20	E. 20	E. 17	E. 16	13.29
Oct. 17	ENE. 12	E. 14	E. 23	E. 22	E. 22	E. 22	E. 22	E. 20	E. 17	E. 17	E. 17	E. 14	17.25
Oct. 18	E. 16	E. 16	ENE. 16	ENE. 18	ENE. 18	ENE. 18	ENE. 18	ENE. 14	ENE. 14	ENE. 13	ENE. 12	ENE. 12	13.25
Oct. 19	E. 6	ENE. 7	ENE. 7	ENE. 5	NE. 4	E. 4	E. 4	E. 3	E. 3	ESE. 4	SE. 4	E. 5	7.46
Oct. 20	ESE. 3	ESE. 3	ESE. 3	SE. 3	SE. 3	SE. 3	SE. 2	SE. 2	ENE. 4	ENE. 3	ENE. 4	ENE. 4	3.25
Oct. 21	NW. 3	NW. 3	NW. 2	NNW. 3	SSE. 3	SE. 4	SSE. 4	SSE. 4	S. 5	S. 5	S. 6	S. 6	4.04
Oct. 22	SSE. 7	SSE. 6	SSE. 8	SSE. 7	SE. 8	SE. 8	SE. 7	SE. 7	ESE. 5	ESE. 6	ESE. 7	ESE. 7	7.42
Oct. 23	ENE. 7	ENE. 6	ENE. 7	ENE. 7	ENE. 7	ENE. 7	ENE. 6	ENE. 6	ENE. 8	ENE. 8	ENE. 7	ENE. 6	6.67
Oct. 24	ENE. 6	ENE. 7	ENE. 6	ENE. 14	ENE. 12	ENE. 11	ENE. 12	E. 13	ENE. 13	ENE. 13	ENE. 13	ENE. 13	8.46
Oct. 25	E. 5	NNE. 3	N. 9	N. 11	N. 11	N. 13	N. 14	N. 17	N. 17	N. 16	N. 16	NNW. 16	9.96
Oct. 26	NNW. 13	NNW. 12	NNW. 11	NNW. 9	NW. 8	NNW. 9	NW. 9	NW. 8	NW. 10	NNW. 10	NNW. 9	NNW. 9	12.46
Oct. 27	NNW. 3	NNW. 3	NNW. 2	NNW. 1	NNW. 1	NNW. 1	NNW. 1	NNW. 1	NNW. 2	NNW. 2	NNW. 3	NNW. 2	4.04
Oct. 28	S. 7	SSW. 7	SSW. 8	SSW. 8	SSW. 8	SSW. 8	SSW. 7	SSW. 7	SSW. 6	SSW. 6	SSW. 7	SSW. 4	5.58
Oct. 29	SE. 9	SE. 10	SE. 14	SE. 17	SE. 20	SE. 20	SE. 22	SE. 26	SSE. 26	SSE. 25	SSE. 25	SSE. 22	13.04
Oct. 30	SE. 26	SE. 27	SE. 29	SSE. 32	SSE. 36	SSW. 36	SSW. 32	SSW. 24	SSW. 26	SSW. 29	SSW. 32	SW. 28	24.67
Oct. 31	WSW. 17	WNW. 21	W. 23	W. 24	W. 24	W. 20	W. 21	W. 21	W. 21	WSW. 16	W. 20	W. 16	22.21
Means	13.06	13.48	14.32	14.84	15.16	14.94	15.00	14.52	15.03	14.52	14.90	14.23	14.07

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, $-5^h\ 17^m$. Velocity given in miles per hour.]

Date.	1 a.m. Direction and velocity.	2 a.m. Direction and velocity.	3 a.m. Direction and velocity.	4 a.m. Direction and velocity.	5 a.m. Direction and velocity.	6 a.m. Direction and velocity.	7 a.m. Direction and velocity.	8 a.m. Direction and velocity.	9 a.m. Direction and velocity.	10 a.m. Direction and velocity.	11 a.m. Direction and velocity.	12 m. Direction and velocity.
1882.												
Nov. 1	W. 12	W. 7	WSW. 8	W. 6	WSW. 5	SSW. 7	SSW. 7	WSW. 5	W. 13	WNW. 13	WNW. 10	NW. 9
Nov. 2	W. 4	WSW. 10	WSW. 14	WSW. 13	W. 17	W. 20	W. 21	WNW. 19	W. 21	WNW. 18	WNW. 21	NNW. 23
Nov. 3	NW. 29	NW. 33	NW. 32	NW. 28	NW. 23	NW. 20	NW. 22	NW. 21	NW. 21	WNW. 18	NW. 17	NW. 16
Nov. 4	NNW. 4	ENE. 4	ENE. 6	ENE. 6	ESE. 10	ESE. 10	ESE. 14	ESE. 12	ESE. 13	ESE. 13	ESE. 15	ESE. 15
Nov. 5	E. 20	E. 20	E. 21	E. 23	E. 28	E. 27	ENE. 24	ENE. 28	ENE. 28	ENE. 24	ENE. 26	E. 22
Nov. 6	E. 30	ENE. 28	ENE. 26	ENE. 28	ENE. 27	ENE. 25	ENE. 24	ENE. 24	ENE. 24	ENE. 24	ENE. 24	ENE. 19
Nov. 7	E. 24	E. 24	E. 24	E. 28	E. 23	E. 23	E. 26	E. 24	E. 25	E. 27	ENE. 27	ENE. 27
Nov. 8	ENE. 30	ENE. 31	ENE. 32	ENE. 32	ENE. 30	ENE. 23	ENE. 25	ENE. 24	ENE. 25	ENE. 24	ENE. 22	ENE. 23
Nov. 9	ENE. 21	ENE. 17	ENE. 17	ENE. 18	E. 15	E. 20	E. 20	E. 21	ESE. 27	E. 28	E. 30	E. 30
Nov. 10	SW. 20	SW. 22	SW. 17	SW. 22	WSW. 28	WSW. 29	WSW. 31	WSW. 30	WSW. 37	W. 31	WNW. 12	NW. 10
Nov. 11	E. 28	E. 32	E. 32	E. 32	E. 27	E. 24	E. 26	ENE. 28	ENE. 29	NE. 30	ENE. 31	ENE. 34
Nov. 12	NE. 40	NE. 38	NE. 42	NE. 34	NE. 35	NE. 32	NNE. 31	NE. 26	NE. 30	NE. 28	NE. 24	NE. 21
Nov. 13	ENE. 12	ENE. 14	ENE. 10	ENE. 12	ENE. 11	ENE. 12	E. 10	E. 10	E. 9	ENE. 11	NE. 12	NE. 13
Nov. 14	ENE. 10	ENE. 10	ENE. 10	ENE. 10	ENE. 6	E. 10	E. 8	E. 9	E. 10	ESE. 8	ESE. 7	ESE. 7
Nov. 15	ENE. 8	ENE. 8	ENE. 9	ENE. 9	ENE. 9	ENE. 10	ENE. 9	ENE. 10	ENE. 10	ENE. 9	NE. 10	ENE. 10
Nov. 16	NE. 11	NE. 10	NE. 12	NE. 10	NE. 11	NE. 10	NE. 10	NE. 9	NE. 11	NE. 11	NE. 11	NE. 10
Nov. 17	NE. 19	NE. 20	NE. 20	NE. 19	NE. 20	NE. 23	NE. 27	NE. 27	NE. 30	NE. 27	NE. 32	NE. 26
Nov. 18	NE. 32	NE. 32	NE. 32	NE. 32	NE. 33	NE. 27	ENE. 25	NE. 23	NE. 25	NE. 22	ENE. 20	NE. 20
Nov. 19	NE. 21	ENE. 19	ENE. 22	ENE. 20	ENE. 19	ENE. 21	ENE. 19	ENE. 19	ENE. 18	ENE. 18	ENE. 22	E. 22
Nov. 20	ESE. 26	ESE. 20	ESE. 23	ESE. 25	ESE. 25	ESE. 25	ESE. 23	ESE. 23	ESE. 24	ESE. 20	E. 24	ESE. 24
Nov. 21	ENE. 26	ENE. 24	ENE. 28	ENE. 24	ENE. 24	ENE. 24	ENE. 22	ENE. 23	ENE. 22	ENE. 25	ENE. 24	ENE. 23
Nov. 22	E. 2	N. 4	NE. 14	N. 13	NNW. 19	NNW. 18	NW. 18	NNW. 19	NW. 22	NW. 20	NW. 18	NW. 26
Nov. 23	WNW. 17	WNW. 16	WNW. 18	WNW. 20	WNW. 16	W. 19	W. 19	WNW. 15	WNW. 14	WNW. 13	W. 10	WSW. 10
Nov. 24	SE. 2	E. 5	SE. 4	S. 10	SSW. 12	S. 11	SSE. 11	S. 10	S. 9	S. 12	S. 9	S. 6
Nov. 25	WNW. 22	NW. 29	NW. 27	NW. 22	WNW. 20	NW. 19	NW. 17	WNW. 17	WNW. 16	NNW. 16	N. 13	N. 16
Nov. 26	NW. 6	SSW. 4	SSW. 4	S. 7	S. 7	SSE. 7	SE. 7	SE. 5	SE. 10	SE. 10	ESE. 12	ESE. 15
Nov. 27	SSE. 11	S. 7	SSE. 8	SSE. 6	SSE. 4	S. 7	SSE. 5	SE. 7	SE. 11	SE. 11	ESE. 16	ESE. 16
Nov. 28	ESE. 21	ESE. 17	ESE. 20	ESE. 23	ESE. 24	ESE. 20	ESE. 25	ESE. 24	ESE. 26	ESE. 26	ESE. 25	ESE. 21
Nov. 29	ESE. 33	ESE. 27	ESE. 32	ESE. 22	ESE. 16	ESE. 15	ESE. 22	ESE. 18	ESE. 20	ESE. 23	E. 21	ESE. 28
Nov. 30	E. 21	E. 26	ESE. 29	E. 31	ESE. 28	ESE. 23	ESE. 27	ESE. 29	ESE. 28	ESE. 22	ESE. 25	ESE. 28
Means	18.73	18.60	19.77	19.50	19.07	18.70	19.17	18.63	20.27	19.40	19.00	18.80

Date.	1 p.m. Direction and velocity.	2 p.m. Direction and velocity.	3 p.m. Direction and velocity.	4 p.m. Direction and velocity.	5 p.m. Direction and velocity.	6 p.m. Direction and velocity.	7 p.m. Direction and velocity.	8 p.m. Direction and velocity.	9 p.m. Direction and velocity.	10 p.m. Direction and velocity.	11 p.m. Direction and velocity.	12 a.m. Direction and velocity.	Daily mean velocity.
1882.													
Nov. 1	NW. 6	NW. 4	S. 5	SW. 10	SW. 15	SSW. 12	SSW. 12	SSW. 11	W. 16	NW. 15	NW. 6	NW. 1	8.96
Nov. 2	NW. 28	NW. 31	NW. 28	NW. 22	NW. 22	NW. 32	WNW. 34	NW. 32	NW. 31	NW. 39	NW. 40	NNW. 37	24.04
Nov. 3	NW. 18	NW. 14	NW. 13	NW. 6	WNW. 11	WNW. 8	NNW. 8	NNW. 8	NNW. 12	NW. 12	N. 10	NNW. 9	17.04
Nov. 4	ESE. 16	ESE. 17	ESE. 17	ESE. 19	ESE. 17	E. 16	E. 17	E. 20	E. 19	E. 20	E. 20	E. 20	14.17
Nov. 5	ENE. 26	ENE. 24	ENE. 27	ENE. 28	ENE. 27	ENE. 30	ENE. 28	ENE. 29	ENE. 29	E. 29	E. 27	ENE. 30	26.04
Nov. 6	ENE. 24	ENE. 22	ENE. 24	ENE. 24	ENE. 24	ENE. 24	ENE. 23	E. 22	ENE. 23	E. 24	E. 23	E. 22	24.25
Nov. 7	ENE. 26	ENE. 24	ENE. 25	ENE. 24	ENE. 25	ENE. 23	ENE. 24	ENE. 24	ENE. 29	ENE. 32	ENE. 30	ENE. 30	25.75
Nov. 8	ENE. 24	ENE. 24	ENE. 25	ENE. 26	ENE. 26	ENE. 23	ENE. 24	ENE. 25	ENE. 24	ENE. 24	ENE. 22	ENE. 17	25.21
Nov. 9	E. 31	ESE. 29	ESE. 31	ESE. 28	ESE. 28	ESE. 26	ESE. 20	E. 15	E. 13	E. 10	E. 6	SW. 7	21.17
Nov. 10	NNE. 13	ENE. 11	ENE. 12	ENE. 16	E. 17	E. 23	E. 20	E. 20	E. 24	E. 26	ENE. 27	E. 29	21.96
Nov. 11	ENE. 32	NE. 31	NE. 38	NE. 39	NE. 37	NE. 38	NE. 44	NE. 40	NE. 41	NE. 43	NE. 42	NE. 38	**34.00**
Nov. 12	NE. 24	NE. 23	NNE. 24	NNE. 27	NE. 20	NE. 19	ENE. 19	NE. 18	NE. 19	NE. 19	NE. 17	ENE. 12	25.92
Nov. 13	NE. 14	ENE. 13	ENE. 12	ENE. 13	ENE. 11	ENE. 11	ENE. 11	ENE. 12	ENE. 10	ENE. 11	ENE. 10	ENE. 10	11.42
Nov. 14	ESE. 8	ESE. 7	ESE. 7	ESE. 8	ESE. 10	E. 9	E. 9	ENE. 9	ENE. 9	E. 6	ENE. 8	E. 8	8.46
Nov. 15	ENE. 11	ENE. 11	ENE. 12	ENE. 11	ENE. 11	NE. 11	NE. 11	NE. 10	ENE. 9	NE. 11	NE. 11	NE. 11	10.04
Nov. 16	NE. 11	ENE. 10	NE. 10	NE. 11	NE. 10	NE. 11	NE. 12	NE. 15	NE. 15	NE. 16	NE. 15	NE. 16	11.58
Nov. 17	NE. 27	NE. 30	NE. 28	NE. 27	NE. 30	NE. 36	NE. 36	NE. 32	NE. 32	NE. 34	NE. 34	NE. 32	27.83
Nov. 18	NE. 20	NE. 21	NE. 21	ENE. 21	ENE. 24	ENE. 23	ENE. 24	ENE. 24	ENE. 17	ENE. 20	ENE. 20	ENE. 20	24.08
Nov. 19	E. 23	E. 19	E. 16	E. 16	E. 18	E. 22	E. 23	E. 24	E. 25	E. 28	ESE. 26	ESE. 28	21.17
Nov. 20	E. 26	E. 20	E. 24	E. 24	E. 24	E. 24	E. 24	E. 24	E. 22	E. 21	E. 20	ENE. 20	23.12
Nov. 21	NE. 19	NE. 20	NE. 19	NE. 11	NE. 10	NE. 10	NE. 9	NE. 9	NE. 9	NE. 7	NE. 6	ENE. 4	17.58
Nov. 22	NW. 19	WNW. 19	WNW. 20	WNW. 21	WNW. 21	WNW. 20	WNW. 20	WNW. 18	W. 23	WNW. 20	WNW. 20	WNW. 22	17.92
Nov. 23	W. 11	WSW. 9	WNW. 5	W. 6	W. 7	NW. 5	NW. 8	NW. 4	ESE. 5	ESE. 6	ESE. 4	SE. 4	10.88
Nov. 24	SSE. 6	SSE. 6	SSE. 7	SSE. 8	SSE. 8	SSE. 9	SSE. 7	SSE. 6	SSE. 5	S. 5	NW. 10	WNW. 24	8.42
Nov. 25	WNW. 16	W. 17	WNW. 18	WNW. 17	WNW. 12	WNW. 14	WNW. 10	W. 12	W. 10	WNW. 9	W. 8	WNW. 7	16.00
Nov. 26	SE. 16	SE. 19	SE. 19	SE. 19	SE. 19	SE. 18	SE. 17	SSE. 16	SE. 5	SSE. 6	SSE. 13	SSE. 6	11.12
Nov. 27	ESE. 16	ESE. 17	ESE. 16	ESE. 16	ESE. 15	ESE. 19	SE. 20	SE. 21	SE. 11	SE. 9	ESE. 12	ESE. 18	12.46
Nov. 28	E. 20	E. 20	E. 24	ESE. 23	ESE. 24	ESE. 20	ESE. 21	ESE. 24	ESE. 27	ESE. 28	ESE. 32	ESE. 34	23.71
Nov. 29	ESE. 28	ESE. 23	ESE. 29	ESE. 25	ESE. 28	ESE. 28	ESE. 28	ESE. 28	ESE. 33	ESE. 32	E. 30	E. 32	25.88
Nov. 30	ESE. 24	ESE. 20	E. 16	ENE. 15	ENE. 12	ENE. 15	ENE. 15	ENE. 13	ENE. 13	ENE. 15	ENE. 17	ENE. 22	21.42
Means	19.43	18.50	19.07	18.70	18.77	19.30	19.27	18.83	18.67	19.23	18.87	19.00	19.05

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, $-5^h 17^m$. Velocity given in miles per hour.]

Date.	1 a. m.		2 a. m.		3 a. m.		4 a. m.		5 a. m.		6 a. m.		7 a. m.		8 a. m.		9 a. m.		10 a. m.		11 a. m.		12 m.	
	Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.	
1882.																								
Dec. 1	ENE.	19	ENE.	17	ENE.	20	ENE.	19	ENE.	20	ENE.	17	ENE.	18	ENE.	18	ENE.	20	ENE.	20	ENE.	17	ENE.	17
Dec. 2	E.	11	E.	10	E.	10	ESE.	10	ESE.	10	ESE.	13	ESE.	11	ESE.	9	ESE.	10	E.	10	ENE.	10	E.	7
Dec. 3	ENE.	4	ENE.	4	ENE.	4	ENE.	5	E.	4	E.	3	ENE.	4	ENE.	4	ENE.	5	ENE.	4	ENE.	3	E.	3
Dec. 4	SE.	3	SE.	4	SE.	5	SE.	5	SE.	5	SE.	3	SE.	1	Calm.		SE.	5	SE.	4	SE.	4	SE.	5
Dec. 5	E.	8	E.	7	E.	9	ENE.	9	E.	10	E.	9	E.	9	E.	7	ENE.	6	ENE.	9	ENE.	9	ENE.	7
Dec. 6	SE.	3	SE.	2	SE.	1	SE.	3	SE.	1	SE.	1	Calm.		E.	5	ENE.	3	ENE.	2	ENE.	3	ENE.	3
Dec. 7	NNE.	9	NNE.	11	NNE.	10	NNE.	10	NNE.	9	NNE.	9	NNE.	8	NNE.	8	NNE.	8	NNE.	8	NNE.	8	NNE.	8
Dec. 8	NNE.	5	NNE.	4	NNE.	4	NNE.	3	NNE.	3	NNE.	2	NNE.	2	NNE.	2	NNE.	3	NNE.	4	N.	4	NNW.	4
Dec. 9	N.	9	NNW.	10	NNW.	9	NNW.	10	NNW.	10	NNW.	9	NNW.	8	NNW.	7	NNW.	6	NNW.	7	NNW.	7	NNW.	6
Dec. 10	N.	8	N.	8	N.	7	N.	8	N.	7	N.	6	N.	6	N.	6	N.	5	NNW.	7	NNW.	5	NNW.	5
Dec. 11	WNW.	7	NW.	8	W.	7	WSW.	8	W.	8	W.	5	NW.	7	NW.	6	NW.	5	NW.	4	WNW.	4	WNW.	4
Dec. 12	WSW.	3	WSW.	2	SSW.	1	SSW.	1	SSW.	1	SE.	2	ESE.	8	ESE.	4	ESE.	5	ESE.	6	ESE.	6	ESE.	5
Dec. 13	SE.	7	SE.	7	SE.	6	ESE.	7	ESE.	8	SE.	8	SE.	8	SE.	8	SE.	8	SE.	7	SE.	7	SE.	6
Dec. 14	SE.	7	SE.	7	SE.	7	SE.	6	SE.	8	ESE.	8	ESE.	7	E.	8	E.	8	E.	7	E.	8	E.	6
Dec. 15	NNE.	15	NE.	14	NNE.	14	NNE.	14	NNE.	14	NE.	13	NNE.	14	NE.	14	NE.	13	NNE.	15	NNE.	14	NNE.	14
Dec. 16	ENE.	9	ENE.	8	ENE.	9	ENE.	8	ENE.	9	ENE.	9	ENE.	9	ENE.	11	ENE.	12	NE.	12	NE.	12	NE.	13
Dec. 17	NE.	12	NE.	13	NE.	13	NE.	11	NE.	12	NE.	9	NE.	12	NE.	13	NE.	11	NE.	12	NE.	10	ENE.	7
Dec. 18	ENE.	5	ENE.	5	ENE.	7	ENE.	9	ENE.	8	ENE.	6	ENE.	8	ENE.	7	ENE.	6	ENE.	6	ENE.	3	ENE.	4
Dec. 19	E.	3	E.	3	E.	3	E.	6	E.	3	E.	3	E.	3	E.	2	E.	2	E.	2	E.	3	E.	5
Dec. 20	SSW.	8	SSW.	10	SSW.	8	S.	7	S.	5	S.	10	S.	6	S.	6	S.	4	S.	2	S.	4	S.	4
Dec. 21	SSW.	2	SSW.	5	SSW.	5	SSW.	8	SSW.	8	SSW.	8	S.	8	S.	9	SSW.	7	SSW.	3	NW.	8	NW.	6
Dec. 22	SE.	1	SE.	2	SE.	2	SE.	1	SE.	2	SE.	1	SE.	1	SE.	3	Calm.		Calm.		N.	7	N.	8
Dec. 23	NNW.	8	NNW.	7	NNW.	6	NNW.	7	NNW.	7	NNW.	7	NNW.	7	NNW.	6	NNW.	6	NNW.	4	NNW.	1	Calm.	
Dec. 24	Calm.		Calm.		Calm.		Calm.		Calm.		Calm.		Calm.		WNW.	1	Calm.		Calm.		Calm.		Calm.	
Dec. 25	Calm.		Calm.		Calm.		Calm.		Calm.		Calm.		SE.	1	ESE.	2	NE.	6	NE.	7	NNE.	10	NNE.	12
Dec. 26	NNE.	13	NNE.	15	NE.	13	NE.	12	NE.	12	NE.	2	NE.	2	NE.	2	NE.	1	Calm.		NE.	1	S.	5
Dec. 27	WSW.	13	WSW.	14	WSW.	13	WSW.	13	WSW.	12	WSW.	11	WSW.	10	WSW.	11	WSW.	9	SW.	13	SW.	11	SW.	12
Dec. 28	WSW.	19	WSW.	15	WSW.	15	WSW.	15	WSW.	9	SW.	9	SSW.	16	SSW.	18	S.	18	S.	20	S.	19	S.	20
Dec. 29	SW.	30	SW.	32	SW.	31	SSW.	31	WSW.	28	NNW.	36	NNW.	42	NNW.	36	NW.	24	NW.	22	NW.	21	WNW.	14
Dec. 30	SSE.	8	SE.	7	SSE.	10	SSE.	5	SE.	6	SE.	8	ESE.	12	ESE.	10	ESE.	10	SE.	11	SE.	12	SE.	13
Dec. 31	SE.	21	SE.	16	SE.	17	SE.	19	ESE.	16	ESE.	18	SE.	21	SE.	15	SE.	19	ESE.	14	ESE.	16	SE.	16
Means.	8.71		8.61		8.58		8.71		8.23		7.90		8.68		8.32		7.90		7.81		7.97		7.71	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.		7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily mean velocity.
	Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		
1882.																									
Dec. 1	ENE.	17	ENE.	16	ENE.	16	ENE.	16	E.	17	E.	12	E.	10	ENE.	12	E.	10	E.	5	E.	9	E.	12	15.58
Dec. 2	ENE.	8	ENE.	9	ENE.	11	ENE.	8	E.	8	E.	8	E.	8	E.	8	E.	6	E.	6	ENE.	5	ENE.	4	8.75
Dec. 3	E.	3	ESE.	3	ESE.	2	ESE.	3	ESE.	3	SE.	3	SE.	4	SE.	7	SE.	3	SE.	4	SE.	2	SE.	4	3.67
Dec. 4	ESE.	6	ESE.	5	ESE.	4	ESE.	5	ESE.	6	ESE.	7	E.	10	E.	6	E.	8	E.	8	E.	6	E.	8	5.12
Dec. 5	ENE.	7	ENE.	4	ENE.	6	ENE.	3	E.	5	E.	5	E.	6	ESE.	6	SE.	3	SE.	4	SE.	3	SE.	3	6.42
Dec. 6	ENE.	2	NE.	5	NE.	6	NE.	7	NE.	5	NE.	6	NE.	7	NE.	6	NNE.	8	NNE.	4	NNE.	8	NNE.	9	4.17
Dec. 7	NNE.	8	NNE.	9	NNE.	8	NNE.	10	NNE.	10	NNE.	8	NNE.	6	NNE.	5	NNE.	6	NNE.	6	NNE.	7	NNE.	6	8.12
Dec. 8	NNW.	5	NNW.	5	NNW.	5	NNW.	5	NW.	5	NW.	6	WNW.	7	NW.	10	NW.	12	NW.	11	NNW.	10	N.	10	5.46
Dec. 9	NNW.	7	N.	6	N.	6	N.	9	N.	8	N.	6	N.	7	N.	7	N.	9	N.	5	N.	7	N.	8	7.62
Dec. 10	NNW.	8	NNW.	7	NNW.	5	NNW.	4	SW.	5	WNW.	8	WNW.	7	WNW.	8	WNW.	8	WNW.	6	WNW.	5	WNW.	7	6.50
Dec. 11	WNW.	2	WNW.	2	WNW.	2	WNW.	3	WSW.	4	WSW.	4	WSW.	4	WSW.	3	SW.	2	WSW.	1	WSW.	2	WSW.	3	4.38
Dec. 12	ESE.	7	ESE.	7	ESE.	6	ESE.	7	ESE.	7	ESE.	11	SE.	8	SE.	7	SE.	6	ESE.	5	ESE.	4	SE.	9	5.33
Dec. 13	SE.	7	SE.	8	SE,	6	SE.	5	SE.	7	SE.	8	SE.	6	SE.	6	SE.	6	SE.	5	SE.	5	SE.	5	6.71
Dec. 14	ENE.	7	ENE.	7	ENE.	5	ENE.	7	NE.	9	NE.	10	NE.	8	NE.	8	NE.	10	NNE.	11	NNE.	11	NNE.	16	8.17
Dec. 15	NE.	13	NE.	12	NE.	9	NE.	9	NE.	8	NE.	8	NE.	7	NE.	7	NE.	8	NE.	8	NE.	7	ENE.	9	11.38
Dec. 16	NE.	13	NE.	12	NE.	13	NE.	13	NE.	12	NE.	12	NE.	15	NE.	15	NE.	13	NE.	14	NE.	12	NE.	10	11.46
Dec. 17	ENE.	8	ENE.	7	ENE.	9	ENE.	9	ENE.	8	ENE.	7	ENE.	9	ENE.	9	ENE.	8	ENE.	7	ENE.	8	ENE.	6	9.58
Dec. 18	ENE.	4	E.	3	E.	5	E.	7	E.	8	E.	4	E.	5	E.	5	E.	5	E.	5	E.	5	E.	6	5.67
Dec. 19	E.	3	E.	3	E.	2	E.	4	E.	2	E.	4	E.	2	E.	5	E.	4	SE.	6	SE.	6	S.	9	3.67
Dec. 20	S.	2	S.	1	SSW.	3	SSW.	3	SW.	4	W.	6	SW.	3	SW.	3	SSW.	3	SW.	4	SSW.	5	SSW.	3	4.75
Dec. 21	NW.	6	NW.	6	NW.	5	NW.	3	Calm.		Calm.		NW.	6	NW.	6	Calm.		NW.	4	NW.	4	SSE.	2	4.96
Dec. 22	N.	7	N.	8	N.	8	N.	9	N.	10	N.	9	N.	8	N.	8	NNW.	8	NNW.	7	NNW.	9	NNW.	8	5.29
Dec. 23	Calm.		NNW.	2	NNW.	4	NNW.	3	NW.	3	NW.	3	NW.	3	NW.	8	NW.	1	Calm.		Calm.		Calm.		3.67
Dec. 24	Calm.		Calm.		Calm.		Calm.		Calm.		S.	1	S.	3	Calm.		Calm.		Calm.		Calm.		Calm.		.21
Dec. 25	NNE.	12	NNE.	14	NNE.	15	NNE.	16	NNE.	16	NNE.	15	NNE.	16	NNE.	15	NNE.	13	NE.	10	NNE.	10	NNE.	10	8.33
Dec. 26	NNW.	6	NNW.	8	NNW.	5	NNW.	3	NNW.	3	Calm.		WNW.	12	W.	13	W.	14	W.	14	W.	12	WSW.	10	7.42
Dec. 27	SSW.	15	SSW.	12	SW.	18	SW.	13	SSW.	20	SSW.	22	SSW.	23	SSW.	19	SW.	25	WSW.	30	WSW.	26	WSW.	17	15.92
Dec. 28	S.	23	S.	23	S.	26	S.	26	S.	28	S.	27	S.	34	S.	32	SSW.	32	SSW.	36	SSW.	29	SSW.	32	22.54
Dec. 29	WNW.	16	WNW.	14	W.	13	W.	15	W.	12	WNW.	6	WNW.	5	WNW.	2	Calm.		SSW.	4	Calm.		Calm.		18.08
Dec. 30	SE.	14	SE.	15	SE.	16	SE.	15	SE.	18	SE.	18	SE.	18	SE.	19	SE.	20	SE.	20	SE.	22	SE.	21	13.67
Dec. 31	ESE.	16	ESE.	13	ESE.	17	ESE.	20	E.	19	E.	18	ESE.	20	E.	21	E.	18	ESE.	19	E.	20	E.	20	17.88
Means.	8.13		7.94		8.26		8.39		8.71		8.45		9.26		9.06		8.68		8.68		8.35		8.61		8.40

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a.m.		2 a.m.		3 a.m.		4 a.m.		5 a.m.		6 a.m.		7 a.m.		8 a.m.		9 a.m.		10 a.m.		11 a.m.		12 m.	
	Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.	
1883.																								
Jan. 1	E.	17	E.	23	E.	28	E.	25	E.	24	ESE.	18	E.	20	E.	25	E.	25	E.	24	ESE.	23	ESE.	23
Jan. 2	E.	26	ESE.	24	ESE.	40	ESE.	40	ESE.	32	ESE.	28	ESE.	32	ESE.	32	ESE.	31	ESE.	23	SE.	23	SE.	19
Jan. 3	SSW.	4	SSW.	6	SSW.	4	SSW.	2	SE.	9	SE.	4	SE.	5	SE.	10	E.	11	E.	15	ESE.	15	E.	12
Jan. 4	E.	12	E.	7	E.	9	E.	7	E.	10	E.	10	E.	10	E.	9	E.	7	E.	6	ENE.	9	ENE.	6
Jan. 5	NE.	12	NE.	11	NE.	10	NE.	12	NE.	11	NE.	12	NE.	11	NNE.	12	NNE.	11	NNE.	12	NNE.	12	NNE.	12
Jan. 6	NNE.	8	NNE.	9	NNE.	7	NNE.	7	NNE.	7	NNE.	8	NNE.	7	NNE.	6	NNE.	7	NNE.	5	NNE.	6	NNE.	6
Jan. 7	N.	3	N.	7	NNW.	6	NNW.	6	NNW.	2	NNW.	2	NNW.	1	WNW.	5	WNW.	4	WNW.	5	WNW.	4	WNW.	4
Jan. 8	WNW.	10	WNW.	10	WNW.	9	WNW.	7	WNW.	8	WNW.	8	WNW.	11	WNW.	11	WNW.	12	WNW.	12	WNW.	14	WNW.	11
Jan. 9	W.	14	W.	8	W.	13	W.	15	WNW.	15	W.	14	W.	11	W.	16	WSW.	12	WSW.	16	W.	15	W.	12
Jan. 10	WSW.	10	W.	10	WSW.	9	W.	15	W.	15	WNW.	10	WNW.	7	W.	12	WSW.	12	WSW.	12	WSW.	15	W.	10
Jan. 11	WSW.	8	WSW.	10	WSW.	9	WSW.	8	W.	11	W.	9	W.	9	W.	11	W.	15	W.	13	WNW.	10	WNW.	9
Jan. 12	WNW.	1	WNW.	2	WNW.	3	WNW.	6	WNW.	3	WNW.	3	WNW.	2	WNW.	8	WNW.	8	WNW.	4	WNW.	6	WNW.	4
Jan. 13	WNW.	9	WNW.	7	WNW.	9	WNW.	9	WNW.	10	WNW.	9	WNW.	10	WNW.	10	WNW.	11	WNW.	12	WNW.	10	WNW.	9
Jan. 14	WNW.	8	WNW.	8	WNW.	6	WNW.	8	WNW.	10	WNW.	11	WNW.	11	WNW.	13	WNW.	12	WNW.	12	WNW.	11	WNW.	13
Jan. 15	WNW.	6	WNW.	4	WNW.	5	WNW.	4	WNW.	3	WNW.	3	WNW.	3	WNW.	1	WNW.	4	WNW.	1	WNW.	1	WNW.	3
Jan. 16	ENE.	9	ENE.	11	ENE.	10	ENE.	10	ENE.	14	ENE.	16	E.	17	E.	18	E.	19	E.	23	E.	24	E.	27
Jan. 17	SE.	33	SE.	23	SE.	19	SSE.	14	S.	12	WSW.	29	WSW.	34	WSW.	41	WSW.	36	WSW.	37	SW.	41	SW.	40
Jan. 18	WSW.	34	WSW.	28	WSW.	27	WSW.	35	WSW.	29	WSW.	28	WSW.	33	WSW.	32	WSW.	36	W.	40	W.	34	W.	37
Jan. 19	W.	14	WNW.	16	WNW.	16	WNW.	15	WNW.	12	WNW.	10	WNW.	8	WNW.	7	NW.	9	WNW.	7	WNW.	7	WNW.	8
Jan. 20	N.	10	N.	11	N.	10	NNE.	15	NNE.	12	NNE.	13	NNE.	13	NNE.	15	NNE.	13	NNE.	10	ENE.	16	ENE.	17
Jan. 21	ENE.	30	E.	28	E.	28	E.	28	ENE.	28	ENE.	28	ENE.	28	ENE.	28	ENE.	28	E.	29	E.	29	ENE.	31
Jan. 22	E.	33	E.	26	E.	33	E.	40	E.	35	E.	30	E.	36	E.	30	E.	32	E.	31	E.	27	E.	26
Jan. 23	ESE.	39	ESE.	37	ESE.	39	ESE.	36	ESE.	33	ESE.	32	ESE.	32	ESE.	25	ESE.	12	ESE.	6	SE.	8	SSW.	5
Jan. 24	W.	19	WNW.	21	WNW.	22	WNW.	19	WNW.	22	WNW.	21	NW.	24	NW.	15	WNW.	15	W.	13	WNW.	12	WNW.	14
Jan. 25	N.	15	N.	14	N.	10	N.	9	NNE.	14	NNE.	14	NNE.	18	NNE.	16	NNE.	17	NNE.	18	NNE.	18	NNE.	18
Jan. 26	NNE.	13	NNE.	10	NNE.	9	NNE.	8	NNE.	6	NNE.	9	NNE.	10	NNE.	12	NNE.	14	NNE.	12	NNE.	9	NNE.	9
Jan. 27	ENE.	8	ENE.	8	ENE.	9	ENE.	8	ENE.	8	ENE.	8	ENE.	9	ENE.	8	ENE.	8	ENE.	9	ENE.	10	ENE.	10
Jan. 28	ENE.	8	ENE.	8	ENE.	9	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	7	ENE.	8
Jan. 29	ENE.	8	ENE.	8	ENE.	7	ENE.	8	ENE.	7	ENE.	8	ENE.	8	ENE.	6	ENE.	6	ENE.	6	ENE.	5	ENE.	6
Jan. 30	ESE.	1	ESE.	2	ESE.	3	ESE.	2	ESE.	3	ESE.	1	ESE.	2	ESE.	3	ESE.	3	ESE.	3	ESE.	2	ESE.	4
Jan. 31	SE.	3	SE.	5	SE.	5	SE.	8	SE.	3	SE.	4	SE.	1	SE.	7	SE.	7	SE.	8	SE.	6	ESE.	8
Means	13.70		12.97		13.64		14.00		13.41		13.16		13.90		14.58		14.35		13.93		13.84		13.58	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.		7 p.m.		8 p.m.		9 p.m.		10 p.m.		11 p.m.		12 p.m.		Daily mean velocity.
	Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		
1883.																									
Jan. 1	E.	21	E.	17	E.	30	E.	31	E.	30	E.	24	E.	25	E.	25	E.	30	E.	27	E.	26	E.	30	24.62
Jan. 2	SE.	18	SE.	20	SE.	17	SE.	12	SE.	16	SE.	12	SE.	10	SE.	9	SE.	6	SE.	8	SSE.	8	SSE.	6	20.50
Jan. 3	ESE.	12	ESE.	11	ESE.	9	ESE.	8	ESE.	9	SE.	7	SE.	7	SE.	12	ESE.	13	ESE.	7	ESE.	7	E.	12	8.79
Jan. 4	ENE.	6	ENE.	6	ENE.	7	ENE.	8	ENE.	7	ENE.	6	ENE.	7	ENE.	8	ENE.	8	NE.	10	NE.	11	NE.	11	8.20
Jan. 5	NNE.	12	NNE.	11	NNE.	11	NNE.	11	NNE.	11	NNE.	10	NNE.	12	NNE.	12	NNE.	11	NNE.	9	NNE.	10	NNE.	9	11.12
Jan. 6	NNE.	5	NNE.	3	NNE.	3	NNE.	1	Calm.		N.	2	N.	3	N.	4	N.	4	N.	3	N.	3	N.	4	4.91
Jan. 7	WNW.	3	WNW.	5	WNW.	4	WNW.	5	WNW.	8	WNW.	8	WNW.	5	WNW.	5	WNW.	14	WNW.	12	WNW.	9	WNW.	9	5.66
Jan. 8	WNW.	14	WNW.	9	WNW.	13	W.	14	W.	15	W.	16	W.	14	W.	12	W.	13	W.	13	W.	12	W.	12	11.66
Jan. 9	W.	14	W.	13	W.	15	W.	15	W.	11	W.	12	WSW.	11	WSW.	11	W.	12	W.	11	W.	10	WSW.	11	12.79
Jan. 10	W.	11	W.	13	W.	15	W.	11	W.	12	W.	12	W.	10	W.	9	W.	7	W.	8	W.	6	W.	8	10.79
Jan. 11	WNW.	7	WNW.	6	WNW.	7	WNW.	8	WNW.	6	WNW.	5	WNW.	5	WNW.	4	WNW.	3	WNW.	4	WNW.	5	WNW.	2	7.66
Jan. 12	WNW.	6	WNW.	5	WNW.	5	WNW.	5	WNW.	6	WNW.	7	WNW.	8	WNW.	9	WNW.	4	WNW.	5	WNW.	7	WNW.	8	5.25
Jan. 13	WNW.	9	WNW.	8	WNW.	10	WNW.	11	WNW.	10	WNW.	9	WNW.	11	WNW.	11	WNW.	10	WNW.	10	WNW.	10	WNW.	10	9.75
Jan. 14	WNW.	13	WNW.	12	WNW.	10	WNW.	10	WNW.	9	WNW.	7	WNW.	8	WNW.	8	WNW.	9	WNW.	6	WNW.	7	WNW.	5	9.45
Jan. 15	WNW.	4	WNW.	2	Calm.		WNW.	4	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	9	ENE.	10	ENE.	12	ENE.	7	4.91
Jan. 16	E.	30	E.	36	E.	44	E.	55	E.	52	E.	60	E.	56	E.	52	ESE.	48	ESE.	48	ESE.	46	ESE.	39	31.83
Jan. 17	SW.	36	SW.	40	SW.	38	SW.	32	WSW.	40	WSW.	34	SW.	30	SW.	32	WSW.	35	WSW.	33	WSW.	33	WSW.	33	32.29
Jan. 18	W.	32	W.	27	W.	38	W.	26	W.	26	W.	25	WSW.	26	W.	25	WNW.	20	WNW.	20	W.	16	W.	16	28.33
Jan. 19	WNW.	7	WNW.	8	WNW.	6	WNW.	5	WNW.	5	WNW.	8	NW.	4	Calm.		W.	2	W.	2	W.	3	NW.	7	7.75
Jan. 20	ENE.	19	ENE.	20	ENE.	20	ENE.	21	ENE.	24	ENE.	24	ENE.	25	ENE.	25	ENE.	31	ENE.	29	ENE.	30	ENE.	30	18.87
Jan. 21	ENE.	31	ENE.	34	ENE.	32	ENE.	31	ENE.	30	ENE.	26	ENE.	28	ENE.	29	ENE.	30	ENE.	34	ENE.	32	ENE.	30	29.58
Jan. 22	ENE.	29	ENE.	27	ENE.	29	ENE.	31	ENE.	34	E.	30	E.	36	E.	40	E.	38	E.	40	E.	38	E.	35	32.75
Jan. 23	SSW.	5	SW.	6	SW.	4	SW.	1	SW.	2	SSE.	4	SSE.	5	S.	7	S.	7	SSW.	8	SW.	13	WSW.	18	16.00
Jan. 24	NW.	17	NW.	20	NW.	11	NNW.	16	NNW.	18	NNW.	15	NNW.	14	NNW.	10	N.	16	NNW.	13	N.	14	N.	12	16.37
Jan. 25	NNE.	16	NNE.	17	NNE.	17	NNE.	20	NNE.	19	NNE.	15	NNE.	16	NNE.	17	NNE.	20	NNE.	16	NNE.	15	NNE.	16	16.04
Jan. 26	NNE.	5	NE.	5	NE.	5	NE.	7	NE.	5	NE.	6	NE.	8	NE.	9	NE.	6	NE.	5	ENE.	8	ENE.	8	8.25
Jan. 27	ENE.	10	ENE.	9	ENE.	8	ENE.	7	ENE.	7	ENE.	8	ENE.	10	ENE.	9	ENE.	10	ENE.	8	ENE.	8	ENE.	8	8.54
Jan. 28	ENE.	7	ENE.	7	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	8	ENE.	4	ENE.	4	ENE.	5	ENE.	8	7.45
Jan. 29	ENE.	4	ENE.	4	ENE.	2	ENE.	3	ENE.	3	ENE.	3	ENE.	2	ENE.	2	ENE.	2	E.	2	E.	2	ESE.	2	4.75
Jan. 30	ESE.	2	ESE.	3	ESE.	6	ESE.	4	ESE.	4	ESE.	4	ESE.	6	ESE.	5	ESE.	6	ESE.	6	ESE.	6	SE.	6	3.62
Jan. 31	ESE.	8	ESE.	8	ESE.	9	ESE.	8	SE.	10	SE.	10	SE.	11	ESE.	11	ESE.	15	ESE.	13	ESE.	12	ESE.	12	8.00
Means	13.32		13.29		13.64		13.84		14.35		13.70		13.84		13.80		14.29		13.68		13.68		13.68		13.76

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—**Continued.**

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a.m. Direction and velocity.	2 a.m. Direction and velocity.	3 a.m. Direction and velocity.	4 a.m. Direction and velocity.	5 a.m. Direction and velocity.	6 a.m. Direction and velocity.	7 a.m. Direction and velocity.	8 a.m. Direction and velocity.	9 a.m. Direction and velocity.	10 a.m. Direction and velocity.	11 a.m. Direction and velocity.	12 m. Direction and velocity.
1883.												
Feb. 1	ESE. 12	ESE. 15	ESE. 12	ESE. 15	ESE. 10	ESE. 9	E. 12	E. 9	E. 6	E. 7	E. 4	E. 6
Feb. 2	SW. 4	SW. 6	SW. 6	SW. 3	SW. 6	SW. 9	SW. 9	SSW. 8	SSW. 6	SSW. 6	SSW. 8	SSW. 11
Feb. 3	SSW. 8	SW. 8	SW. 8	SSW. 8	SSW. 9	SSW. 8	S. 1	S. 8	S. 11	S. 11	S. 11	S. 10
Feb. 4	W. 44	W. 48	W. 54	W. 51	W. 50	W. 46	W. 36	W. 31	W. 28	W. 25	WSW. 18	WSW. 12
Feb. 5	NNE. 7	NE. 7	ENE. 6	NE. 11	ENE. 13	E. 16	E. 15	ESE. 9	SSW. 16	S. 13	SSE. 17	S. 20
Feb. 6	WSW. 48	WSW. 50	WSW. 48	WSW. 56	WSW. 56	WSW. 48	W. 50	W. 40	W. 46	W. 45	W. 44	WNW. 35
Feb. 7	SE. 23	ESE. 29	ESE. 36	ESE. 35	ESE. 40	ESE. 35	SE. 40	SE. 40	SE. 42	SE. 40	SE. 32	SSE. 25
Feb. 8	W. 60	W. 54	W. 56	W. 55	W. 55	W. 48	WSW. 48	WSW. 47	WSW. 40	WSW. 36	WSW. 38	WSW. 30
Feb. 9	ESE. 25	ESE. 24	ESE. 27	SE. 21	S. 24	S. 21	S. 24	S. 27	S. 33	S. 35	SSE. 32	S. 34
Feb. 10	W.	WNW.	WNW.	WNW.	WNW.	WNW.	WNW.	WNW.	WNW.	WNW.	WNW.	WNW.
Feb. 11	WNW. 40	WNW. 36	WNW. 40	W. 32	WNW. 32	W. 29	WNW. 30	W. 27	W. 24	W. 23	W. 22	W. 22
Feb. 12	SSW. 12	SSW. 15	SSW. 16	SSW. 11	S. 8	S. 12	S. 15	S. 14	S. 15	S. 14	SSE. 16	SSE. 15
Feb. 13	NW. 8	NNW. 8	NNW. 10	NNW. 9	NW. 8	NW. 5	WNW. 3	WNW. 4	WNW. 5	WNW. 5	WNW. 5	WNW. 8
Feb. 14	NW. 11	NW. 11	NW. 15	NW. 13	NW. 11	NW. 6	NW. 5	NW. 4	NW. [illegible]	WNW. 6	WNW. 8	WNW. 8
Feb. 15	W. 7	W. 8	W. 8	WNW. 9	WNW. 8	WNW. 7	WNW. 9	WNW. 8	WNW. 8	W. 7	W. 8	W. 8
Feb. 16	W. 14	W. 12	W. 11	W. 12	W. 8	W. 7	W. 10	WSW. 8	WSW. 6	WSW. 4	WSW. 3	SW. 4
Feb. 17	ESE. 5	ESE. 6	E. 7	E. 8	E. 6	E. 4	E. 4	E. 3	ENE. 7	NE. 8	NE. 8	NE. 8
Feb. 18	ESE. 9	ESE. 9	ESE. 6	ESE. 9	ESE. 9	ESE. 10	ESE. 10	ESE. 7	ESE. 9	ESE. 15	ESE. 16	SE. 11
Feb. 19	SW. 14	SW. 15	SW. 13	SW. 8	SW. 8	SW. 10	SW. 9	SW. 7	SW. 7	SW. 6	WSW. 5	SW. 4
Feb. 20	NW. 10	NW. 11	NNW. 13	NNW. 11	NNW. 11	NNW. 12	NNW. 12	NNW. 8	NNW. 10	NNW. 7	NNW. 11	NNW. 11
Feb. 21	NNW. 8	NNW. 7	NNW. 8	NNW. 8	NNW. 7	NNW. 8	NNW. 7	NNW. 6	NNW. 8	NNW. 10	NNW. 6	NNW. 6
Feb. 22	NNW. 10	NNW. 12	NNW. 11	NNW. 11	NNW. 9	N. 10	N. 10	N. 5	N. 5	N. 6	NNE. 4	NNE. 9
Feb. 23	NE. 4	NE. 1	NE. 1	NE. 1	NE. 1	Calm.	Calm.	NE. 1	NE. 1	NE. 2	NE. 2	NE. 4
Feb. 24	WNW. 7	WNW. 5	WNW. 6	WNW. 7	WNW. 6	WNW. 4	WNW. 4	WNW. 4	WNW. 4	W. 7	W. 6	W. 5
Feb. 25	WSW. 8	WSW. 8	WSW. 8	WSW. 9	WSW. 11	WSW. 11	WSW. 8	WSW. 10	WSW. 12	WSW. 11	WSW. 14	WSW. 11
Feb. 26	WSW. 4	WSW. 3	WSW. 3	Calm.	Calm.	Calm.	WSW. 1	Calm.	Calm.	SW. 1	SW. 3	SSE. 2
Feb. 27	SE. 8	SE. 12	SE. 13	SE. 18	SE. 12	SE. 11	SE. 4	SE. 6	SE. 6	SE. 5	SE. 6	SE. 3
Feb. 28	SSE. 8	S. 6	S. 5	S. 7	S. 6	S. 7	S. 9	SSW. 8	SSW. 9	SSW. 8	SSW. 10	SSW. 8
Means	15.11	15.46	16.15	16.03	15.38	14.31	13.84	12.38	12.84	12.61	12.50	11.19

Date.	1 p.m. Direction and velocity.	2 p.m. Direction and velocity.	3 p.m. Direction and velocity.	4 p.m. Direction and velocity.	5 p.m. Direction and velocity.	6 p.m. Direction and velocity.	7 p.m. Direction and velocity.	8 p.m. Direction and velocity.	9 p.m. Direction and velocity.	10 p.m. Direction and velocity.	11 p.m. Direction and velocity.	12 p.m. Direction and velocity.	Daily mean velocity.
1883.													
Feb. 1	E. 2	E. 2	E. 2	E. 3	E. 2	E. 2	WSW. 4	WSW. 1	WSW. 4	WSW. 3	WSW. 5	WSW. 7	6.41
Feb. 2	SSW. 10	SW. 10	SW. 9	SW. 8	SW. 8	SSW. 8	SW. 7	SSW. 6	SSW. 8	SSW. 9	SSW. 8	SSW. 7	7.50
Feb. 3	SSE. 11	S. 16	SSW. 28	SSW. 20	SSW. 28	SSW. 22	SSW. 26	SW. 26	SW. 31	WSW. 48	WSW. 49	W. 44	18.75
Feb. 4	WSW. 15	WSW. 21	SSW. 12	SW. 16	SW. 14	SW. 14	SW. 14	SSW. 9	SSW. 9	SSW. 11	SW. 8	SW. 6	24.66
Feb. 5	S. 26	S. 24	S. 26	S. 28	SSW. 28	SW. 28	SW. 30	SSW. 44	SW. 32	WSW. 45	WSW. 47	WSW. 43	22.95
Feb. 6	WNW. 31	WNW. 28	NW. 20	NW. 16	NW. 16	NNW. 8	NNW. 7	NNW. 5	ENE. 8	E. 12	E. 13	ESE. 18	31.16
Feb. 7	SSE. 26	SSW. 19	SW. 29	WSW. 44	WSW. 44	WSW. 48	SSW. 36	SW. 46	SW. 52	WSW. 45	W. 52	W. 58	38.16
Feb. 8	W. 25	W. 20	WSW. 14	SW. 10	SW. 12	SSW. 14	SSW. 8	S. 7	SE. 6	ESE. 12	ESE. 17	ESE. 22	30.58
Feb. 9	S. 37	S. 40	S. 46	S. 42	SW. 52	SW. 60	WSW. 71	SW. 75	WSW. 70	WSW.	WSW.	WSW.	(*)
Feb. 10	WNW.	WNW.	W.	W. 47	WNW. 44	W. 48	W. 48	W. 52	WNW. 44	WNW. 44	WNW. 41	WNW. 38	(*)
Feb. 11	W. 18	W. 18	W. 16	W. 14	WSW. 11	WSW. 11	WSW. 8	SW. 18	SSW. 12	SSW. 13	SSW. 13	SSW. 9	21.58
Feb. 12	S. 18	S. 15	S. 15	SSW. 17	SSW. 18	SSW. 17	SSW. 14	SSW. 8	SW. 8	W. 9	WNW. 7	WNW. 6	13.12
Feb. 13	WNW. 3	WNW. 2	WNW. 3	W. 4	W. 6	W. 4	W. 4	W. 4	W. 4	WNW. 4	NW. 6	NW. 5	5.08
Feb. 14	WNW. 7	W. 5	W. 4	WNW. 7	WNW. 5	NW. 8	NW. 4	NW. 4	W. 6	W. 8	W. 8	W. 6	7.20
Feb. 15	W. 17	W. 15	W. 15	W. 16	W. 24	W. 16	W. 22	W. 16	W. 17	W. 14	W. 13	W. 11	12.12
Feb. 16	ESE. 2	ESE. 8	ESE. 5	ESE. 8	ESE. 8	ESE. 8	ESE. 10	ESE. 7	ESE. 5	ESE. 7	ESE. 7	ESE. 6	7.50
Feb. 17	NE. 9	NE. 8	NE. 12	ENE. 8	ENE. 5	ENE. 6	ENE. 6	E. 7	E. 12	E. 14	E. 9	E. 10	7.50
Feb. 18	SE. 10	SE. 11	SSE. 16	S. 9	S. 7	S. 11	SSW. 13	SSW. 10	SSW. 8	SSW. 11	SW. 12	SW. 12	10.41
Feb. 19	SW. 5	SW. 5	W. 6	W. 5	W. 10	W. 6	WNW. 7	NW. 9	NW. 11	NW. 11	NW. 9	NW. 11	8.37
Feb. 20	NNW. 12	N. 10	N. 9	N. 9	N. 13	NNE. 10	NNE. 12	N. 12	N. 10	N. 13	NNW. 12	NNW. 10	10.79
Feb. 21	NNW. 8	NNW. 9	NNW. 11	NNW. 12	NNW. 10	NNW. 10	N. 11	N. 10	N. 12	N. 11	N. 13	N. 13	9.12
Feb. 22	NNE. 5	NE. 6	NE. 2	NE. 4	NE. 6	NE. 4	Calm.	NE. 5	NE. 2	Calm.	NE. 1	NE. 1	5.75
Feb. 23	Calm.	SSW. 2	SSW. 3	SSW. 3	SSW. 5	W. 5	W. 5	W. 6	W. 8	W. 8	W. 8	W. 8	3.29
Feb. 24	W. 9	W. 7	W. 9	W. 9	WSW. 8	W. 7	W. 8	W. 8	W. 6	W. 7	W. 9	W. 8	6.66
Feb. 25	WSW. 10	WSW. 8	WSW. 11	WSW. 7	WSW. 8	WSW. 7	WSW. 7	WSW. 6	WSW. 7	WSW. 3	WSW. 3	WSW. 4	8.41
Feb. 26	Calm.	SSE. 1	SSE. 2	SSE. 6	SSE. 6	SSE. 7	SSE. 11	SE. 10	SE. 9	SE. 10	SE. 8	SE. 12	4.12
Feb. 27	SE. 9	SE. 9	SE. 14	SE. 13	SE. 7	SE. 4	SE. 5	SE. 6	SE. 9	SE. 8	SE. 7	SSE. 7	8.41
Feb. 28	SSW. 8	SSW. 7	SSW. 5	SSW. 5	SSW. 5	SSW. 4	SSW. 3	N. 7	N. 6	N. 8	N. 12	N. 6	6.95
Means	11.38	11.00	11.46	11.57	12.07	11.11	10.84	11.42	11.61	13.23	13.69	13.46	12.94

* Record incomplete for February 9 and 10.

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, $-5^{h} 17^{m}$. Velocity given in miles per hour.]

Date.	1 a.m. Direction and velocity.	2 a.m. Direction and velocity.	3 a.m. Direction and velocity.	4 a.m. Direction and velocity.	5 a.m. Direction and velocity.	6 a.m. Direction and velocity.	7 a.m. Direction and velocity.	8 a.m. Direction and velocity.	9 a.m. Direction and velocity.	10 a.m. Direction and velocity.	11 a.m. Direction and velocity.	12 m. Direction and velocity.
1883.												
Mar. 1	N. 6	N. 6	N. 7	N. 8	N. 10	N. 6	N. 6	N. 6	N. 6	N. 8	N. 6	N. 5
Mar. 2	NE. 10	NE. 12	ENE. 16	E. 13	E. 13	E. 12	E. 11	E. 14	E. 12	E. 14	E. 16	E. 17
Mar. 3	ESE. 7	ESE. 5	ESE. 6	ESE. 12	ESE. 8	ESE. 7	ESE. 6	ESE. 4	ESE. 5	ESE. 4	ESE. 5	ESE. 6
Mar. 4	E. 13	E. 11	E. 13	ENE. 11	ENE. 13	ENE. 10	ENE. 16	ENE. 8	ENE. 8	ENE. 6	ENE. 4	ENE. 14
Mar. 5	SW. 14	SW. 11	SW. 12	W. 13	WSW. 9	WSW. 12	WSW. 10	W. 13	WNW. 14	WNW. 9	WNW. 8	WNW. 7
Mar. 6	WNW. 7	WNW. 6	W. 9	W. 8	W. 8	W. 6	W. 6	W. 8	W. 11	W. 10	W. 9	WSW. 9
Mar. 7	WSW. 4	WSW. 4	WSW. 3	WSW. 3	WSW. 4	WSW. 4	WSW. 4	WSW. 7	WSW. 8	WSW. 8	WSW. 8	WSW. 10
Mar. 8	W. 14	W. 14	WSW. 13	WSW. 12	WSW. 11	WSW. 12	WSW. 11	SW. 10	WSW. 10	WSW. 11	W. 16	W. 16
Mar. 9	W. 13	W. 10	W. 10	W. 13	W. 11	W. 12	W. 10	W. 10	WSW. 9	WSW. 8	SW. 8	SW. 10
Mar. 10	W. 6	W. 6	WSW. 8	WSW. 6	WSW. 6	WSW. 6	WSW. 6	WSW. 4	WSW. 3	WSW. 3	WSW. 4	WSW. 4
Mar. 11	SW. 7	SW. 4	SW. 4	SW. 3	SW. 4	SW. 3	SW. 3	SW. 2	SW. 1	Calm.	SSE. 2	NE. 2
Mar. 12	NE. 12	NE. 12	NE. 11	NE. 10	NE. 11	NE. 10	NE. 10	NE. 10	NE. 9	NE. 11	NE. 9	ENE. 4
Mar. 13	SW. 6	SW. 1	WSW. 1	WSW. 3	WSW. 4	WSW. 4	WSW. 4	WSW. 4	WSW. 4	WSW. 5	WSW. 8	NNE. 6
Mar. 14	SE. 4	SE. 3	SE. 3	SE. 2	SE. 1	SE. 1	SE. 2	SE. 2	SE. 2	Calm.	E. 1	NE. 4
Mar. 15	ENE. 14	ENE. 10	ENE. 14	ENE. 14	ENE. 14	ENE. 13	ENE. 13	ENE. 13	ENE. 12	ENE. 14	ENE. 12	ENE. 10
Mar. 16	ENE. 20	ENE. 20	ENE. 18	ENE. 18	ENE. 16	ENE. 18	ENE. 22	ENE. 22	ENE. 22	ENE. 24	ENE. 22	ENE. 22
Mar. 17	ENE. 21	ENE. 22	ENE. 21	ENE. 28	ENE. 24	ENE. 24	ENE. 25	ENE. 24	ENE. 24	ENE. 23	ENE. 24	ENE. 22
Mar. 18	NE. 20	ENE. 20	ENE. 19	ENE. 12	ENE. 13	ENE. 14	ENE. 14	E. 12	E. 15	E. 13	ENE. 18	ENE. 16
Mar. 19	NE. 11	NE. 9	NE. 9	NE. 10	NE. 8	NE. 5	NE. 6	NE. 4	NE. 3	ESE. 4	SSE. 3	SSE. 4
Mar. 20	SSW. 4	SSW. 3	SSW. 5	SSW. 2	SSW. 2	SSW. 1	SSW. 4	SSW. 1	SSW. 4	SSW. 3	Calm.	SW. 3
Mar. 21	ESE. 12	ESE. 11	E. 12	E. 11	E. 10	E. 10	E. 14	E. 14	E. 14	E. 16	E. 16	E. 17
Mar. 22	E. 28	ESE. 30	E. 30	E. 32	E. 26	E. 23	E. 24	E. 28	ESE. 28	ESE. 32	ESE. 26	ESE. 26
Mar. 23	SE. 4	SE. 7	SE. 6	SSE. 7	SW. 14	SW. 14	SW. 16	SW. 15	SW. 14	SW. 11	SW. 12	SW. 16
Mar. 24	SE. 12	SE. 17	SE. 17	SE. 18	SE. 19	SE. 18	SE. 19	SE. 18	SE. 18	SE. 16	SE 16	SE. 16
Mar. 25	SE. 14	SE. 17	SSE. 20	SSE. 18	SSE. 16	SSE. 16	SSE. 21	SSE. 20	SSE. 17	SSE. 14	SSE. 16	SSE. 14
Mar. 26	WSW. 6	SW. 3	SW. 4	SW. 2	NNW. 2	NE. 4	NE. 4	NE. 8	NE. 10	ENE. 11	ENE. 12	ENE. 13
Mar. 27	SSW. 34	S. 29	S. 27	S. 28	SSW. 25	SSW. 28	SSW. 25	S. 22	S. 25	S. 29	S. 32	S. 32
Mar. 28	WSW. 23	SW. 13	SW. 15	SSW. 8	SW. 12	SSW. 8	S. 8	S. 3	SSE. 9	SSE. 8	SE. 12	SE. 4
Mar. 29	SE. 17	SE. 19	SE. 16	SE. 13	SE. 16	SSE. 12	SSE. 8	SSE. 8	SE. 6	SE. 7	SSE. 8	S. 5
Mar. 30	WSW. 7	S. 4	SE. 4	SSE. 5	SSE. 6	SSE. 4	S. 3	SSE. 3	SSE. 6	SSE. 6	S. 5	SSW. 5
Mar. 31	SSE. 8	SSE. 2	S. 3	SSE. 5	SSE. 5	SSE. 4	SSE. 9	S. 8	SW. 6	SW. 2	SW. 7	WSW. 4
Means.	12.19	11.00	11.48	11.22	11.00	10.35	10.96	10.48	10.80	10.64	11.12	11.06

Date.	1 p.m. Direction and velocity.	2 p.m. Direction and velocity.	3 p.m. Direction and velocity.	4 p.m. Direction and velocity.	5 p.m. Direction and velocity.	6 p.m. Direction and velocity.	7 p.m. Direction and velocity.	8 p.m. Direction and velocity.	9 p.m. Direction and velocity.	10 p.m. Direction and velocity.	11 p.m. Direction and velocity.	12 p.m. Direction and velocity.	Daily mean velocity.
1883.													
Mar. 1	N. 7	N. 7	N. 7	N. 8	N. 9	N. 6	N. 8	NNE. 10	NNE. 7	NNE. 12	NNE. 12	NE. 10	7.62
Mar. 2	ESE. 18	ESE. 19	ESE. 17	ESE. 16	ESE. 17	ESE. 16	ESE. 18	ESE. 18	ESE. 21	ESE. 16	ESE. 12	ESE. 10	14.91
Mar. 3	ESE. 7	ESE. 11	ESE. 4	ESE. 7	ESE. 11	ESE. 8	ESE. 8	ESE. 8	ESE. 5	ESE. 9	ESE. 12	E. 12	7.37
Mar. 4	ENE. 8	ENE. 6	ENE. 6	ESE. 5	SE. 5	SSE. 6	SSW. 8	SSW. 10	SSW. 14	SW. 14	SW. 15	SW. 14	9.91
Mar. 5	WNW. 10	WNW. 10	WNW. 14	NW. 12	NW. 12	WNW. 11	WNW. 12	WNW. 11	NW. 10	NW. 8	WNW. 8	WNW. 7	10.70
Mar. 6	WSW. 10	WSW. 10	WSW. 11	WSW. 8	SW. 8	WSW. 8	WSW. 8	WSW. 10	SW. 8	WSW. 7	WSW. 10	WSW. 8	8.45
Mar. 7	WSW. 11	WSW. 11	WSW. 17	WSW. 14	WSW. 15	W. 17	W. 20	WSW. 14	W. 15	WNW. 12	W. 14	W. 14	10.04
Mar. 8	WNW. 16	WNW. 15	WNW. 18	WNW. 19	WNW. 18	WNW. 17	WNW. 18	W. 16	W. 18	W. 15	W. 10	W. 10	14.16
Mar. 9	SW. 10	SW. 12	WSW. 11	WSW. 9	WSW. 11	W. 11	W. 12	W 12	W. 8	W. 8	W. 7	W. 7	10.08
Mar. 10	WSW. 3	WSW, 4	WSW. 4	WSW. 6	SW. 5	SW. 5	SW. 5	SW. 6	WSW. 5	WSW. 4	SW. 6	SW. 8	5.12
Mar. 11	SSE. 3	SE. 5	ESE. 5	ESE. 4	ESE. 4	ESE. 4	ESE. 6	ENE. 6	ENE. 9	ENE. 16	ENE. 14	ENE. 9	5.00
Mar. 12	ENE. 6	ENE. 3	ENE. 8	ENE. 10	NE. 5	NE. 2	NE. 2	NE. 3	SW. 3	WSW. 5	SW. 4	SW. 4	7.25
Mar. 13	NE. 5	SE. 2	NE. 1	SSE. 2	SE 2	SE. 1	SE. 1	SE. 4	SE. 2	SE. 2	SE. 3	SE. 4	3.29
Mar. 14	NNE. 4	NNE. 4	SE. 3	SE. 3	E. 7	E. 6	SE 4	ENE. 7	E. 10	ENE. 8	ENE. 7	ENE. 6	3.91
Mar. 15	ENE. 11	ENE. 12	ENE. 12	ENE. 15	ENE. 16	ENE. 19	ENE. 19	ENE. 16	ENE. 16	ENE. 16	ENE. 18	ENE. 16	14.12
Mar. 16	ENE. 22	ENE. 24	ENE. 26	ENE. 24	ENE. 24	ENE. 24	ENE. 29	ENE. 24	ENE. 23	ENE. 26	ENE. 22	ENE. 19	22.12
Mar. 17	ENE. 24	ENE. 24	ENE. 24	ENE. 23	ENE. 25	ENE. 20	ENE. 22	ENE. 23	ENE. 25	ENE. 25	ENE 23	ENE. 21	23.37
Mar. 18	ENE. 15	ENE. 14	ENE. 13	ENE. 14	ENE. 16	NE. 17	NE. 20	NE. 18	NE. 12	NE. 10	NE. 15	NE. 12	15.08
Mar. 19	SSW. 6	SSW. 3	SSW. 6	SSW. 7	SSW. 5	SSW. 6	SSW. 6	SSW. 8	SSW. 10	SSW. 6	SSW. 8	SSW. 6	6.37
Mar. 20	Calm.	Calm.	ESE. 4	ESE. 3	ESE. 4	ESE. 5	ESE. 5	ESE. 6	ESE. 6	ESE. 4	ESE. 7	ESE. 9	3.54
Mar. 21	E. 18	E. 20	E. 23	E. 26	E. 28	E. 28	E. 30	ESE. 26	E. 31	ESE. 29	ESE. 25	ESE. 28	19.54
Mar. 22	ESE. 27	ESE. 24	ESE. 20	ESE. 23	SE. 23	SE. 18	SE. 11	SE. 16	SE. 8	SE. 6	SE. 2	SE. 5	21.50
Mar. 23	SW. 15	S. 17	S. 14	S. 12	S. 12	S. 11	S. 11	S. 10	S. 11	S. 6	S. 13	SSE 14	11.75
Mar. 24	SE. 16	SE. 14	SE. 16	SE. 16	SE. 20	SE. 20	SE. 19	SE. 19	SE. 21	SE. 20	SE. 19	SE. 16	17.50
Mar. 25	SSE. 16	SSE. 15	S. 14	SSW. 10	SSW. 11	SW. 10	SW. 12	SW. 14	W. 17	SW. 8	SW. 8	SW. 8	14.41
Mar. 26	ENE. 14	ENE. 17	E. 22	E. 24	ESE. 24	ESE. 23	ESE. 27	ESE. 24	SE. 19	SE. 20	SSE. 20	SSE. 21	13.91
Mar. 27	S. 32	S. 26	SSW. 28	WSW. 24	WSW. 27	SW. 25	SW. 27	WSW. 28	WSW. 27	WSW. 24	WSW. 27	WSW. 20	27.12
Mar. 28	ESE. 14	ESE. 16	ESE. 16	ESE. 14	ESE. 11	ESE. 6	ESE. 12	ESE. 15	ESE. 16	ESE. 18	SE. 17	SE. 17	12.29
Mar. 29	WSW. 8	SW. 6	WSW. 12	W. 15	W. 11	W. 10	W. 13	W. 17	W. 12	WSW. 9	WSW. 10	SW. 8	11.08
Mar. 30	SSE. 4	SW. 8	SSW. 7	SSW. 3	SSW. 7	S. 8	S. 8	S. 9	S. 5	SSE. 8	S. 12	SSE. 11	6.16
Mar. 31	W. 6	NW. 8	NNW. 11	NNW. 12	NNW. 14	NNW. 13	NNW. 19	NNW. 20	NW. 18	NNW. 18	NNW. 19	NNW. 16	9.83
Means	11.80	11.83	12.70	12.51	13.12	12.29	13.54	13.80	13.29	12.54	12.87	11.93	11.85

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, *to August*, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time. —5h 17m. Velocity given in miles per hour.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.
1883.												
Apr. 1	NNW. 19	NNW. 18	NNW. 17	NNW. 19	NNW. 16	NNW. 15	NNW. 16	NNW. 17	NNW. 16	NNW. 14	NNW. 15	NNW. 15
Apr. 2	NW. 2	NW. 3	NW. 3	NW. 3	NW. 2	NW. 4	NW. 4	NW. 3	NW. 3	WSW. 1	W. 2	N. 2
Apr. 3	N. 5	N. 4	N. 3	N. 4	N. 4	N. 4	N. 4	N. 4	N. 1	N. 1	N. 4	N. 4
Apr. 4	N. 4	N. 3	N. 3	N. 3	N. 4	Calm.	Calm.	N. 2	N. 4	W. 3	W. 3	W. 4
Apr. 5	W. 6	WNW. 7	WNW. 7	WNW. 7	NW. 6	NW. 6	NW. 6	NW. 5	NW. 3	NW. 3	Calm.	NE. 2
Apr. 6	SSE. 1	SSE. 3	SSE. 6	S. 6	S. 4	SW. 3	SSW. 5	SSW. 4	S. 6	S. 7	S. 6	S. 7
Apr. 7	SSW. 7	SSW. 5	SSW. 3	SSW. 4	SSW. 11	SSW. 10	SSW. 9	SSW. 7	SSW. 8	SSW. 8	SSW. 8	SSW. 6
Apr. 8	SSE. 10	SE. 10	SE. 11	SE. 13	SE. 13	SE. 12	SE. 13	ESE. 13	ESE. 13	ESE. 11	ESE. 8	ENE. 9
Apr. 9	ENE. 13	ENE. 13	ENE. 13	ENE. 13	ENE. 12	ENE. 12	ENE. 14	ENE. 14	ENE. 15	ENE. 15	ENE. 15	ENE. 15
Apr. 10	ENE. 29	E. 28	ENE. 27	ENE. 25	ENE. 22	ENE. 22	ENE. 22	ENE. 19	ENE. 18	ENE. 17	ENE. 15	ENE. 14
Apr. 11	ENE. 14	ENE. 15	ENE. 16	ENE. 15	ENE. 16	ENE. 12	ENE. 12	ENE. 13	ENE. 14	ENE. 14	ENE. 9	E. 9
Apr. 12	Calm.	E. 2	E. 3	E. 1	E. 3	E. 4	SSW. 7	SW. 6	SW. 5	WSW. 4	SW. 2	SW. 2
Apr. 13	NW. 3	NW. 2	NW. 2	NW. 2	NW. 3	NW. 3	NW. 3	NW. 1	W. 4	WSW. 1	Calm.	SW. 4
Apr. 14	W. 1	W. 1	W. 6	W. 5	W. 4	W. 5	W. 6	W. 6	W. 5	W. 5	W. 6	WSW. 4
Apr. 15	W. 3	W. 1	W. 2	W. 3	W. 3	W. 1	W. 2	W. 1	W. 1	W. 1	W. 2	Calm.
Apr. 16	NNE. 9	NNE. 7	NNE. 8	NNE. 12	NNE. 9	NNE. 12	NNE. 11	NNE. 12	NNE. 8	NE. 11	NNE. 8	NNE. 7
Apr. 17	N. 7	N. 4	N. 6	N. 6	N. 4	N. 3	N. 1	Calm.	WSW. 3	WSW. 3	WSW. 4	SW. 4
Apr. 18	SSW. 8	SSW. 5	SSW. 4	SSW. 5	SSW. 6	SSE. 5	SSE. 2	SSE. 3	SSE. 3	ESE. 3	ESE. 5	E. 2
Apr. 19	NE. 13	NE. 14	NE. 16	NE. 15	NE. 14	NE. 13	NE. 14	NE. 12	NE. 14	NE. 14	NE. 12	NE. 12
Apr. 20	ENE. 8	E. 12	E. 8	NE. 6	NE. 8	E. 12	E. 6	E. 3	E. 15	E. 12	ENE. 14	ESE. 5
Apr. 21	ESE. 2	NE. 1	N. 3	N. 3	W. 6	W. 6	W. 9	WNW. 14	W. 17	WNW. 17	W. 17	W. 17
Apr. 22	W. 14	W. 12	W. 12	W. 12	W. 13	W. 10	W. 8	W. 7	W. 6	W. 3	W. 1	SW. 1
Apr. 23	ESE. 13	ESE. 12	ESE. 12	ESE. 15	ESE. 11	ESE. 10	ESE. 15	ESE. 11	ESE. 14	ESE. 13	E. 13	E. 13
Apr. 24	E. 17	E. 20	E. 16	E. 12	ENE. 16	ENE. 14	ENE. 14	ENE. 14	ENE. 16	ENE. 13	ENE. 9	ENE. 10
Apr. 25	NE. 2	WNW. 3	WNW. 6	WNW. 4	W. 8	WSW. 6	WSW. 4	WSW. 3	WSW. 4	WSW. 2	W. 6	W. 7
Apr. 26	NW. 9	W. 4	WNW. 4	WNW. 5	WNW. 6	W. 6	W. 5	W. 4	W. 7	W. 11	W. 13	W. 11
Apr. 27	W. 12	W. 10	W. 8	W. 6	W. 6	W. 6	W. 4	W. 5	W. 6	WSW. 7	WSW. 6	WSW. 5
Apr. 28	WSW. 4	WSW. 5	WSW. 5	WSW. 4	WSW. 3	WSW. 5	Calm.	SSW. 5	SSW. 4	WSW. 4	WSW. 3	WSW. 1
Apr. 29	N. 6	NNW. 6	NNW. 6	NNW. 9	NW. 4	NNE. 5	NE. 6	NE. 5	NE. 4	ENE. 6	ENE. 3	NNE. 4
Apr. 30	NNE. 6	NNW. 7	NNW. 9	N. 8	N. 6	N. 1	NNW. 5	N. 6	NNE. 11	ENE. 10	ENE. 8	NE. 7
Means	8.23	7.90	8.16	8.16	8.10	7.56	7.56	7.30	8.26	7.80	7.23	6.76

Date.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1883.													
Apr. 1	NNW. 14	NNW. 12	NNW. 9	NNW. 9	NNW. 9	NNW. 7	NNW. 8	NW. 8	NW. 9	NW. 7	NW. 7	NW. 3	12.45
Apr. 2	Calm.	WNW. 1	NNW. 2	WNW. 3	WNW. 5	N. 5	N. 5	N. 5	N. 8	N. 8	N. 5	N. 5	3.50
Apr. 3	N. 2	N. 3	N. 3	N. 4	N. 4	N. 4	N. 6	N. 5	N. 5	N. 4	N. 5	N. 6	3.87
Apr. 4	W. 4	W. 4	W. 6	W. 6	W. 7	W. 7	W. 9	W. 8	W. 8	W. 8	W. 9	W. 6	4.79
Apr. 5	NE. 2	NW. 1	Calm.	ENE. 1	ESE. 1	ESE. 2	Calm.	ESE. 2	ESE. 1	ESE. 2	SSE. 2	SSE. 1	3.04
Apr. 6	S. 10	S. 10	S. 10	S. 12	S. 12	S. 11	S. 11	S. 11	S. 11	SSW. 12	SSW. 12	SSW. 11	7.95
Apr. 7	SSW. 10	S. 9	S. 10	S. 11	S. 11	S. 10	SSE. 12	SSE. 11	SSE. 13	SSE. 12	SSE. 10	SSE. 9	8.91
Apr. 8	E. 12	E. 12	E. 12	E. 14	E. 15	E. 16	E. 13	E. 14	E. 14	E. 13	ENE. 12	ENE. 13	12.33
Apr. 9	ENE 15	ENE. 20	ENE. 24	ENE. 25	ENE. 27	ENE. 27	ENE. 29	ENE. 30	ENE. 33	ENE. 30	ENE. 31	ENE. 28	20.12
Apr. 10	ENE. 16	ENE. 18	ENE. 21	ENE. 21	ENE. 20	ENE. 20	ENE. 20	ENE. 19	ENE. 20	ENE. 18	ENE. 16	ENE. 15	20.08
Apr. 11	ENE. 9	ENE. 8	ENE. 8	ENE. 9	E. 7	E. 6	E. 5	E. 4	E. 5	E. 5	E. 3	E. 1	9.54
Apr. 12	WSW. 2	WSW. 2	W. 3	WNW. 4	WNW. 7	WNW. 6	NW. 7	NW. 6	NW. 6	NW. 6	NW. 4	NW. 6	4.08
Apr. 13	Calm.	Calm.	Calm.	Calm.	Calm.	Calm.	WSW. 2	WNW. 2	WNW. 1	WNW. 2	WNW. 4	WNW. 3	1.75
Apr. 14	SW. 5	SW. 5	SW. 6	SW. 6	SW. 7	SW. 7	SW. 7	WSW. 6	WSW. 5	WSW. 6	WSW. 6	W. 4	5.16
Apr. 15	W. 2	W. 3	W. 1	WNW. 3	NNE. 8	N. 9	N. 10	N. 8	N. 10	N. 12	N. 7	NNE. 8	4.20
Apr. 16	NNE. 6	N. 9	N. 11	N. 11	N. 9	N. 10	N. 11	N. 10	N. 11	N. 10	N. 8	N. 7	9.45
Apr. 17	SW. 5	SW. 3	SW. 3	SW. 2	SW. 2	SSW. 7	SSW. 6	SSW. 6	SSW. 6	SSW. 8	SSW. 5	SSW. 5	4.29
Apr. 18	E. 2	E. 4	E. 6	ENE. 8	ENE. 10	ENE. 11	ENE. 13	ENE. 13	NE. 16	NE. 15	NE. 15	NE. 14	7.41
Apr. 19	NE. 12	NE. 10	NE. 10	NE. 11	NE. 9	NE. 10	NE. 11	NE. 8	NE. 10	NE. 11	NE. 9	NE. 8	11.75
Apr. 20	Calm.	Calm.	ENE. 16	E. 14	ENE. 15	E. 13	E. 13	E. 13	ESE. 9	E. 9	E. 3	ENE. 7	8.79
Apr. 21	W. 19	WNW. 19	WNW. 17	W. 20	WNW. 18	WNW. 17	WNW. 20	W. 17	WNW. 16	W. 16	WNW. 16	W. 14	13.37
Apr. 22	SW. 1	SSW. 2	S. 3	ESE. 4	ESE. 8	ESE. 10	ESE. 11	ESE. 10	ESE. 10	ESE. 12	ESE. 11	ESE. 12	8.04
Apr. 23	E. 16	E. 16	ESE. 20	ESE. 26	ESE. 28	ESE. 31	ESE. 28	ESE. 25	E. 23	ESE. 24	ESE. 21	ESE. 18	17.83
Apr. 24	ENE. 17	ENE. 17	ENE. 18	ENE. 17	ENE. 16	ENE. 13	ENE. 11	ENE. 8	ENE. 8	NE. 4	NE. 2	NE. 1	12.62
Apr. 25	W. 7	WNW. 10	WNW. 8	WNW. 7	W. 5	W. 8	W. 6	WNW. 7	WNW. 7	NW. 6	WNW. 8	NW. 9	5.95
Apr. 26	W. 11	W. 11	W. 11	W. 13	W. 15	W. 16	W. 13	W. 13	W. 13	W. 14	W. 11	W. 13	9.95
Apr. 27	WSW. 5	WSW. 4	WSW. 3	W. 3	W. 3	W. 1	W. 2	W. 1	W. 3	W. 3	WSW. 6	WSW. 4	4.95
Apr. 28	Calm.	NW. 1	N. 7	NNE. 7	NNE. 7	NNE. 7	NNE. 8	NNE. 7	NNE. 6	NNE. 4	NE. 2	NE. 1	4.16
Apr. 29	NE. 4	NE. 5	E. 5	ENE. 5	NE. 4	NE. 6	E. 5	NE. 6	NNE. 4	NE. 6	N. 6	NNE. 8	5.33
Apr. 30	NE. 6	NNE. 11	ENE. 10	NE. 12	NE. 10	E. 12	ENE. 12	ENE. 9	ENE. 11	E. 10	ENE. 13	NE. 16	9.00
Means	7.13	7.66	8.76	9.60	9.96	8.96	10.46	9.73	10.06	9.90	8.96	8.53	8.48

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time $-5^{h} 17^{m}$. Velocity given in miles per hour.]

Date.	a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.
1883.												
May 1	NE. 17	ENE. 11	NE. 11	NE. 13	NE. 11	NE. 9	NE. 9	NE. 9	NE. 12	NE. 13	NE. 11	NE. 11
May 2	ENE. 16	ENE. 15	ENE. 16	ENE. 16	ENE. 16	ENE. 15	ENE. 16	ENE. 16	ENE. 16	ENE. 16	ENE. 17	ENE. 17
May 3	ENE. 23	ENE. 19	ENE. 20	ENE. 19	ENE. 14	NE. 11	NE. 14	NE. 13	NE. 13	NE. 12	NE. 10	ENE. 10
May 4	ESE. 13	ESE. 14	E. 14	ESE. 13	E. 14	E. 14	E. 12	E. 15	E. 16	E. 15	E. 18	E. 20
May 5	E. 17	ESE. 20	ESE. 21	ESE. 22	E. 22	ESE. 16	ESE. 17	ESE. 15	ESE. 16	ESE. 20	ESE. 15	SE. 17
May 6	SSW. 6	SSW. 10	SSW. 9	SSW. 12	SSW. 5	SW. 7	WSW. 8	WNW. 11	WNW. 9	NW. 13	N. 13	NNW. 17
May 7	NNE. 27	NNE. 25	NNE. 25	NNE. 25	NNE. 24	NNE. 23	NNE. 25	NNE. 22	NNE. 20	NNE. 22	NNE. 22	NNE. 20
May 8	SSE. 4	SSE. 8	S. 10	SW. 11	SW. 14	SW. 14	SW. 14	SW. 14	SW. 12	SSW. 16	SW. 11	SSW. 10
May 9	NE. 11	NE. 13	NE. 14	NE. 16	NE. 16	NNE. 16	NNE. 19	NNE. 20	NNE. 19	NE. 20	NE. 21	NNE. 16
May 10	SW. 5	SW. 7	SW. 4	SSE. 2	SE. 1	ENE. 5	NE. 5	NE. 7	NE. 7	E. 6	ENE. 4	NNE. 5
May 11	SSW. 8	W. 11	WSW. 11	WSW. 8	W. 8	WNW. 4	W. 6	NNW. 3	NNW. 2	NNW. 7	ENE. 6	NNE. 7
May 12	NE. 17	NE. 14	NE. 16	NE. 12	NNE. 10	N. 10	NNE. 12	N. 14	NNE. 10	NE. 7	NE. 5	NE. 9
May 13	NE. 16	NE. 16	NE. 16	NE. 15	NE. 18	NE. 18	NE. 18	NE. 18	NE. 21	NE. 21	NE. 24	NE. 19
May 14	ENE. 21	ENE. 19	NE. 20	NE. 21	NE. 21	NE. 19	NNE. 16	NNE. 16	NNE. 13	NNE. 14	NNE. 11	NE. 8
May 15	ENE. 3	NNW. 6	NNW. 7	N. 8	NNE. 7	N. 7	N. 10	N. 10	N. 12	N. 10	N. 15	NNW. 16
May 16	N. 20	NNW. 15	NNW. 15	NNW. 13	NW. 9	NW. 9	NW. 7	NW. 8	NW. 9	NW. 7	NW. 8	NW. 4
May 17	SSW. 11	SSW. 12	SSW. 13	SSW. 13	SSW. 12	SW. 15	SW. 15	SW. 13	SW. 13	SW. 16	SW. 16	SW. 19
May 18	SW. 17	SW. 16	SW. 16	SW. 13	SW. 17	SW. 16	SW. 15	SW. 16	SW. 14	SW. 13	SW. 12	SW. 14
May 19	SSW. 12	SSW. 8	SSW. 9	SSW. 10	SSW. 12	SSW. 11	SW. 8	SW. 8	SW. 9	SW. 4	SSW. 6	SSW. 7
May 20	SSW. 16	SSW. 15	S. 12	SSW. 11	SSW. 10	SSW. 6	S. 4	SSW. 5	SSW. 4	SSW. 3	SSW. 2	SSW. 2
May 21	SW. 1	SW. 2	SW. 5	SW. 3	NW. 1	Calm.	ESE. 4	E. 3	NE. 4	E. 5	E. 5	E. 4
May 22	E. 11	E. 10	ESE. 10	ESE. 11	ESE. 11	ESE. 10	ESE. 10	ESE. 11	ESE. 12	ESE. 12	ESE. 11	ESE. 12
May 23	SE. 14	SE. 16	SE. 19	SE. 16	SE. 16	SE. 16	SE. 14	SE. 19	SSE. 14	SSE. 16	SSE. 17	SSE. 16
May 24	SSE. 10	SSE. 9	SSE. 8	SSE. 12	SSE. 10	SSE. 6	SSE. 9	SSE. 8	SSW. 8	SSW. 7	SW. 7	SW. 7
May 25	SW. 10	SW. 8	SW. 6	SW. 7	SW. 7	WSW. 4	WSW. 5	WSW. 2	Calm.	Calm.	Calm.	SSE. 4
May 26	NE. 6	ENE. 5	ENE. 6	ENE. 4	NNE. 4	NE. 2	ENE. 3	NE. 3	NNE. 3	NNE. 4	NE. 6	NE. 5
May 27	ENE. 6	ENE. 11	ENE. 12	ENE. 10	ENE. 10	ENE. 8	ENE. 6	ENE. 6	ENE. 6	E. 7	SE. 10	ESE. 10
May 28	ESE. 8	ESE. 9	ESE. 6	ESE. 8	ESE. 6	ESE. 6	ESE. 8	ESE. 4	ESE. 4	Calm.	Calm.	Calm.
May 29	NNE. 13	NNE. 12	NNE. 12	NNE. 13	NNE. 13	NNE. 14	NNE. 16	NNE. 16	NE. 19	NE. 22	NE. 20	NE. 22
May 30	E. 18	E. 16	ENE. 16	ENE. 20	ENE. 19	ENE. 21	E. 21	E. 22	E. 20	E. 19	E. 19	E. 21
May 31	E. 18	ENE. 19	ENE. 20	ENE. 16	ENE. 16	E. 19	E. 18	E. 14	E. 16	E. 14	ENE. 13	ENE. 13
Means	12.74	12.61	12.87	12.67	12.06	11.32	11.74	11.64	11.38	11.64	11.48	11.67

Date.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1883.													
May 1	NE. 12	NE. 12	NE. 16	ENE. 16	ENE. 17	ENE. 16	ENE. 17	ENE. 19	ENE. 17	ENE. 18	ENE. 16	ENE. 16	13.76
May 2	ENE. 18	ENE. 20	ENE. 21	ENE. 24	ENE. 24	ENE. 27	ENE. 26	ENE. 25	ENE. 28	ENE. 24	ENE. 24	ENE. 24	19.87
May 3	ENE. 11	ENE. 14	E. 16	ENE. 16	E. 14	E. 15	E. 16	E. 16	ESE. 17	ESE. 16	ESE. 16	ESE. 17	15.08
May 4	ESE. 19	ESE. 19	E. 17	ESE. 20	E. 20	ESE. 20	ESE. 18	ESE. 20	ESE. 17	E. 17	E. 15	E. 16	16.50
May 5	SE. 11	SE. 9	S. 6	SW. 11	SW. 15	WSW. 13	SW. 11	SSW. 10	SSW. 12	SSW. 13	SW. 13	SW. 12	14.75
May 6	N. 16	N. 17	N. 18	NNE. 18	N. 20	N. 22	NNE. 24	NNE. 24	NNE. 23	NNE. 24	NNE. 24	NNE. 24	15.58
May 7	NNE. 24	NNE. 20	NNE. 17	NE. 14	E. 14	E. 12	ESE. 10	ESE. 7	SE. 7	SSE. 6	SSE. 5	SSE. 4	17.08
May 8	SW. 7	SW. 7	SW. 5	SW. 3	SE. 1	SE. 6	ESE. 7	ESE. 7	ESE. 9	ENE. 7	ENE. 6	NE. 9	8.83
May 9	NE. 19	NNE. 24	NNE. 19	NNE. 12	NNE. 12	SE. 3	Calm.	W. 5	W. 6	WNW. 7	SW. 7	SW. 5	13.33
May 10	NE. 4	NNE. 4	W. 7	WNW. 10	WNW. 8	W. 9	WSW. 8	W. 8	WSW. 7	SW. 8	SSW. 8	SSW. 7	6.08
May 11	NE. 8	N. 12	NNE. 16	NNE. [illegible]	NNE. 16	NE. 15	NNE. 10	NNE. 14	NNE. 16	NNE. 17	NNE. 15	NNE. 16	10.50
May 12	NE. 8	NE. 8	NNE. 7	NNE. 10	NE. 11	NE. 15	ENE. 16	ENE. 16	NE. 14	ENE. 16	NE. 16	NE. 15	12.00
May 13	NE. 25	NE. 23	NE. 24	ENE. 25	ENE. 25	ENE. 24	ENE. 23	E. 24	ENE. 24	ENE. 24	ENE. 22	ENE. 20	20.96
May 14	NE. 3	SE. 3	SW. 3	SW. 4	S. 3	SSW. 5	WNW. 4	WNW. 3	SE. 1	ESE. 1	NW. 1	ESE. 1	9.62
May 15	NNW. 16	N. 18	NNW. 18	NNW. 21	N. 23	N. 23	N. 24	N. 19	NNW. 19	N. 17	NNW. 15	N. 18	14.25
May 16	WNW. 5	WNW. 5	WNW. 5	W. 5	WSW. 6	WSW. 8	WSW. 9	SW. 9	SW. 10	SW. 10	SSW. 9	SSW. 11	9.41
May 17	SW. 20	SSW. 20	SW. 21	SW. 17	SW. 20	SW. 24	SSW. 20	SSW. 19	SW. 17	SW. 19	SW. 17	SW. 15	16.54
May 18	SW. 14	SW. 12	SW. 12	SW. 12	SW. 11	WSW. 8	SW. 11	SW. 9	SW. 8	SW. 9	SW. 12	SSW. 11	12.83
May 19	SSW. 8	SSW. 7	SSW. 8	SW. 9	S. 8	S. 11	S. 12	S. 11	S. 11	S. 12	S. 12	S. 12	9.41
May 20	SSW. 3	S. 7	SW. 10	SW. 6	SW. 6	SW. 4	SW. 7	SW. 4	SW. 5	SW. 2	SW. 2	Calm.	6.08
May 21	E. 3	E. 4	E. 4	E. 4	E. 5	E. 6	E. 6	E. 6	E. 7	E. 8	ESE. 10	E. 10	4.58
May 22	SE. 12	ESE. 12	SE. 12	E. 15	ESE. 15	ESE. 15	ESE. 15	ESE. 15	SE. 15	SE. 16	ESE. 18	SE. 16	12.79
May 23	SSE. 19	SSE. 19	SSE. 20	SSE. 20	SSE. 18	SSE. 17	SSE. 15	SSE. 14	S. 15	SSE. 16	SSE. 14	SSE. 12	16.33
May 24	SW. 13	SW. 14	SW. 14	WSW. 12	WSW. 11	WSW. 12	WSW. 12	WSW. 8	WSW. 10	SW. 10	SW. 13	SW. 10	10.00
May 25	SSE. 4	SSE. 3	SSE. 4	SSE. 2	SSE. 2	Calm.	Calm.	NNE. 6	NNE. 6	NNE. 5	NE. 5	NE. 4	3.91
May 26	NNE. 6	NNE. 5	NNE. 7	NE. 7	NNE. 6	NNE. 2	NE. 5	NE. 8	NE. 5	NE. 10	ENE. 5	ENE. 6	5.12
May 27	SE. 7	ESE. 7	ESE. 8	ESE. 10	ESE. 10	ESE. 10	E. 10	SE. 10	SE. 7	ESE. 7	ESE. 7	SE. 8	8.46
May 28	Calm.	Calm.	NNW. 3	NNE. 4	N. 4	NNE. 6	ENE. 7	ENE. 6	NNE. 9	NNE. 9	NNE. 11	NNE. 12	5.41
May 29	NE. 24	NE. 22	NE. 25	NE. 25	NE. 27	NE. 26	NE. 28	ENE. 25	ENE. 26	ENE. 21	E. 23	E. 20	20.17
May 30	E. 26	E. 30	E. 24	E. 28	E. 25	E. 24	ENE. 24	E. 22	E. 22	E. 20	E. 22	E. 20	21.16
May 31	E. 11	E. 9	ENE. 9	NE. 11	NE. 11	ENE. 9	NNE. 11	NE. 12	NE. 10	ENE. 8	N. 8	NNE. 9	13.08
Means	12.12	12.45	12.77	13.12	13.16	12.80	13.09	12.93	12.90	12.80	12.61	12.45	12.37

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, *to August*, 1883—**Continued.**

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.
1883.												
June 1	NNE. 12	NNE. 11	NNE. 8	NNE. 8	N. 6	N. 9	N. 7	N. 7	N. 9	N. 8	NNW. 8	NNW. 8
June 2	WNW. 13	NW. 14	NW. 9	NW. 12	NW. 14	NNW. 16	NW. 9	NNW. 10	NW. 10	NW. 8	NW. 7	NNW. 8
June 3	NNW. 7	NNE. 5	NNE. 4	NNE. 4	NNW. 7	NNW. 6	N. 8	NNW. 9	NNW. 7	N. 6	N. 9	NNW. 8
June 4	NW. 7	WNW. 6	WNW. 7	WNW. 7	NW. 7	NNW. 8	WNW. 6	NW. 7	W. 7	WSW. 6	NW. 5	WNW. 5
June 5	SSW. 4	S. 3	SSW. 6	S. 5	S. 6	SSE. 5	SSE. 8	SE. 8	SE. 11	SSE. 8	SE. 8	SE. 8
June 6	WSW. 9	WSW. 8	WSW. 6	SW. 3	SSW. 6	S. 4	S. 10	SSW. 9	S. 14	S. 13	S. 12	S. 12
June 7	SW. 8	WSW. 5	WSW. 4	WSW. 4	WSW. 2	WSW. 1	Calm.	NNE. 6	NE. 6	NE. 8	ENE. 7	E. 6
June 8	ENE. 12	ENE. 13	ENE. 12	ENE. 14	NE. 14	ENE. 13	ENE. 12	ENE. 12	E. 12	ENE. 15	ENE. 15	ENE. 15
June 9	E. 17	ENE. 17	E. 19	E. 17	ENE. 17	E. 15	E. 18	E. 16	E. 15	E. 17	E. 15	E. 16
June 10	ESE. 13	ESE. 11	ESE. 10	ESE. 11	ESE. 11	ESE. 11	SE. 13	SE. 12	SE. 10	SE. 10	SE. 8	SE. 8
June 11	ESE. 6	E. 8	ENE. 8	E. 8	ESE. 6	ESE. 6	ENE. 3	E. 4	ENE. 6	NNE. 6	NE. 6	NNE. 8
June 12	NE. 15	NNE. 14	NNE. 13	NNE. 12	NNE. 12	NNE. 14	NNE. 16	NNE. 14	N. 12	N. 12	NNE. 10	NNE. 12
June 13	ENE. 14	ENE. 14	ENE. 13	ENE. 11	ENE. 12	E. 11	ESE. 9	ESE. 6	ESE. 7	ESE. 7	SE. 9	SSE. 10
June 14	NE. 21	ENE. 20	ENE. 22	ENE. 20	ENE. 20	ENE. 16	ENE. 13	ENE. 13	E. 12	E. 13	E. 14	ENE. 12
June 15	ESE. 13	ENE. 13	ENE. 14	E. 14	ENE. 11	ENE. 10	ENE. 8	NE. 7	NE. 7	NE. 8	ENE. 11	ENE. 11
June 16	NNE. 9	NE. 9	NNE. 10	NE 8	NE. 8	NE. 6	NNE. 6	NNE. 6	NNE. 8	NNE. 6	NE. 6	NE. 7
June 17	NNE. 8	NNE. 6	NNE. 5	NNE. 4	NNE. 4	NNE. 5	NNE. 6	NNE. 3	NNE. 5	NNE. 4	NNE. 5	N. 5
June 18	N. 5	N. 4	NNE. 9	NNE. 9	NNE. 8	NNE. 8	NNE. 8	NE. 10	NE. 10	NNE. 10	NNE. 10	NNE. 11
June 19	E. 15	NNE. 16	E. 14	E. 14	ENE. 15	ENE. 14	ENE. 16	ENE. 13	E. 13	ENE. 12	ENE. 13	NE. 12
June 20	ENE. 12	ENE. 12	ENE. 12	ENE. 13	ENE. 14	ENE. 11	NE. 12	ENE. 11	ENE. 13	ENE. 13	ENE. 11	NE. 10
June 21	NE. 17	NE. 17	NE. 17	NE. 16	NE. 17	NE. 16	ENE. 16	ENE. 14	NE. 14	ENE. 12	NE. 14	NE. 13
June 22	NNE. 12	NNE. 14	NNE. 12	NE. 14	NNE. 13	NE. 12	NE. 11	NE. 13	NE. 13	NE. 14	NE. 11	ENE. 11
June 23	ENE. 15	NE. 12	NE. 15	NE. 11	NE. 14	NE. 14	NE. 16	ENE. 17	ENE. 18	ENE. 16	NE. 14	NE. 14
June 24	ENE. 24	ENE. 28	ENE. 28	ENE. 31	ENE. 29	ENE. 29	ENE. 32	ENE. 30	ENE. 33	ENE. 31	ENE. 28	ENE. 30
June 25	ENE. 32	ENE. 30	ENE. 28	ENE. 28	ENE. 29	ENE. 30	ENE. 27	ENE. 26	ENE. 23	ENE. 23	ENE. 27	ENE. 25
June 26	ENE. 23	ENE. 23	ENE. 23	ENE. 22	ENE. 20	ENE. 17	ENE. 19	ENE. 18	ENE. 19	E. 20	E. 19	E. 21
June 27	ESE. 10	ESE. 10	ESE. 10	ESE. 9	ESE. 8	ESE. 6	SE. 3	SE. 3	SSE. 5	ESE. 4	ESE. 8	E. 11
June 28	ESE. 17	E. 19	E. 16	ESE. 14	ESE. 15	ESE. 11	ESE. 12	ESE. 7	ESE. 8	ESE. 11	ESE. 9	SE. 8
June 29	ENE. 7	NNE. 7	NE. 7	NE. 9	ENE. 10	E. 10	ESE. 10	ESE. 8	SE. 8	SW. 12	SW. 5	WSW. 4
June 30	ESE. 16	SE. 1	SSE. 12	WSW. 14	W. 1	WSW. 6	SW. 1	SSW. 6	SSW. 6	SW. 15	SW. 16	SW. 11
Means	12.73	12.33	12.43	12.20	11.86	11.33	11.16	10.83	11.36	11.60	11.33	11.33

Date.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1883.													
June 1	NNW. 6	WNW. 6	W. 7	W. 9	W. 11	WSW. 12	WSW. 12	WSW. 15	WSW. 14	W. 13	W. 15	WNW. 14	9.79
June 2	NNW. 8	NNW. 2	NW. 3	WNW. 5	NW. 3	NW. 2	Calm.	NNE. 5	N. 4	N. 3	N. 4	N. 3	7.16
June 3	NW. 4	NW. 5	NNW. 9	NNW. 6	WNW. 7	NW. 8	NW. 11	NNW. 10	WNW. 9	NNW. 8	NW. 8	WNW. 6	7.12
June 4	WSW. 1	W. 5	WSW. 5	W. 5	WNW. 4	WSW. 6	WNW. 4	WSW. 4	WNW. 2	WSW. 2	W. 3	W. 3	5.08
June 5	SE. 10	SE. 9	SE. 10	SE. 11	SSE. 10	SSW. 8	SSW. 8	SSW. 7	SSW. 6	SSW. 6	SSW. 7	S. 7	7.45
June 6	S. 13	S. 16	S. 16	SSW. 14	SW. 8	SW. 9	SW. 7	SW. 10	WSW. 8	WSW. 7	SW. 11	SW. 7	9.66
June 7	ENE. 6	E. 7	ENE. 7	NE. 8	ENE. 9	E. 11	ENE. 12	ENE. 12	ENE. 12	ENE. 13	ENE. 14	ENE. 12	7.50
June 8	E. 14	E. 15	E. 16	E. 16	ENE. 14	E. 15	ENE. 15	ENE. 15	E. 16	E. 17	E. 17	E. 16	14.79
June 9	ENE. 16	E. 14	ENE. 16	ENE. 17	ENE. 18	E. 16	E. 18	E. 16	ESE. 17	ESE. 15	ESE. 16	ESE. 14	16.33
June 10	SE. 6	ESE. 6	ESE. 7	E. 6	ENE. 6	ENE. 8	E. 8	ESE. 6	E. 5	ENE. 4	ENE. 6	E. 5	8.37
June 11	NNE. 6	NNE. 7	ENE. 7	NE. 6	NNE. 10	NNE. 11	NNE. 12	NNE. 13	NNE. 12	NNE. 14	NE. 15	NE. 15	11.91
June 12	N. 11	NNE. 11	NNE. 9	NNE. 8	NNE. 7	NNE. 8	NNE. 11	ENE. 13	NNE. 12	NE. 12	ENE. 14	NE. 14	8.45
June 13	SSE. 13	SSE. 9	SE. 12	SE. 10	ESE. 15	E. 16	E. 17	E. 20	E. 20	E. 19	E. 18	ENE. 19	12.95
June 14	E. 14	E. 15	E. 16	E. 14	E. 12	E. 12	E. 13	ENE. 12	ENE. 12	E. 13	E. 14	E. 14	14.87
June 15	E. 11	NE. 10	ENE. 11	NE. 11	ENE. 10	NNE. 9	NNE. 10	NE. 10	ENE. 11	ENE. 11	ENE. 10	NE. 10	10.46
June 16	NNE. 8	NNE. 7	NE. 8	E. 7	NNE. 7	NNE. 8	NNE. 11	NNE. 12	NNE. 11	NNE. 5	NNE. 8	N. 8	7.87
June 17	N. 5	N. 6	N. 7	N. 7	N. 5	NNW. 6	NNW. 6	NNW. 7	NNW. 6	NNW. 6	NNW. 6	NNW. 4	5.58
June 18	NNE. 11	NNE. 11	ENE. 12	NE. 16	ENE. 14	ENE. 16	E. 17	E. 16	ENE. 16	ENE. 16	ENE. 16	ENE. 16	11.62
June 19	ENE. 11	NE. 11	ENE. 11	NE. 12	ENE. 15	ENE. 14	ENE. 14	ENE. 14	E. 15	E. 16	E. 16	ENE. 16	13.83
June 20	ENE. 11	NE. 10	NE. 13	NE. 13	NE. 13	NE. 14	NE. 16	NE. 16	NNE. 14	NNE. 16	NNE. 14	NE. 15	12.87
June 21	NNE. 13	NE. 12	NE. 12	NE. 13	NNE. 15	NNE. 15	NNE. 12	NNE. 13	NNE. 14	NNE. 13	NNE. 12	NNE. 12	14.12
June 22	ENE. 11	ENE. 12	ENE. 13	NE. 13	NE. 13	NE. 14	NE. 13	NE. 13	NE. 14	NE. 16	ENE. 15	ENE. 15	13.00
June 23	NE. 13	NE. 16	ENE. 16	ENE. 19	E. 22	E. 23	E. 25	E. 27	E. 26	E. 25	E. 24	ENE. 24	18.16
June 24	ENE. 36	ENE. 35	ENE. 34	ENE. 32	ENE. 31	ENE. 30	ENE. 32	ENE. 30	ENE. 29	ENE. 31	ENE. 31	ENE. 29	30.54
June 25	E. 26	ENE. 23	ENE. 21	ENE. 27	ENE. 24	E. 28	ENE. 24	E. 23	ENE. 24	ENE. 23	ENE. 24	ENE. 21	25.66
June 26	ESE. 22	E. 20	E. 19	E. 19	E. 17	E. 16	E. 17	E. 12	ENE. 12	ENE. 13	E. 14	ESE. 13	18.25
June 27	E. 15	ESE. 14	E. 15	E. 15	E. 19	ESE. 17	E. 18	ESE. 20	E. 19	E. 20	E. 20	E. 18	12.37
June 28	S. 12	S. 12	SW. 12	SW. 6	WSW. 6	WSW. 6	NW. 4	N. 6	NNW. 6	NNE. 8	NNE. 8	NE. 8	10.04
June 29	SW. 7	WSW. 7	WSW. 5	WSW. 2	S. 1	SSE. 9	NW. 9	NW. 4	NW. 2	NW. 1	ESE. 2	ESE. 11	6.54
June 30	WSW. 11	WSW. 13	SW. 14	WSW. 13	SW. 12	SW. 13	WSW. 14	WSW. 12	WSW. 12	WSW. 9	WSW. 4	W. 7	9.95
Means	11.70	11.53	12.10	12.00	11.93	12.33	13.00	13.10	12.66	12.50	12.88	12.80	12.04

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, —5h 17m. Velocity given in miles per hour.]

Date.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.
1883.												
July 1	SW. 7	WSW. 6	WSW. 8	Calm.	Calm.	Calm.	WNW. 4	WNW. 3	NNW. 2	Calm.	NNW. 2	NNW. 1
July 2	ENE. 9	ENE. 9	ENE. 8	ENE. 7	ENE. 7	ENE. 7	NE. 6	NE. 7	ENE. 7	E. 9	ESE. 12	E. 7
July 3	ESE. 12	ESE. 12	ESE. 10	ESE. 11	ESE. 9	ESE. 9	ESE. 11	E. 10	ESE. 12	ESE. 7	ESE. 8	ESE. 5
July 4	E. 9	E. 8	E. 7	E. 1	SW. 5	SW. 6	SW. 5	SW. 5	SW. 5	SW. 4	SW. 6	SW. 5
July 5	WSW. 9	WSW. 7	WSW. 8	WSW. 9	WSW. 8	WSW. 7	WSW. 7	WSW. 7	WSW. 6	WSW. 5	WSW. 5	WSW. 5
July 6	ENE. 13	ENE. 13	ENE. 13	ENE. 13	E. 15	ENE. 15	ENE. 14	ENE. 16	ENE. 18	ENE. 18	E. 19	E. 13
July 7	ENE. 8	E. 10	ESE. 10	ENE. 9	E. 7	E. 8	ENE. 6	ESE. 10	ESE. 10	ESE. 11	ESE. 14	SE. 14
July 8	SE. 9	ESE. 12	S. 12	S. 17	S. 14	S. 20	SW. 23	WSW. 19	SW. 21	WSW. 22	WSW. 21	WSW. 21
July 9	W. 4	W. 3	Calm.	SSE. 1	SE. 1	SE. 3	SE. 5	NE. 2	ENE. 6	ENE. 8	E. 9	E. 11
July 10	NNE. 20	NNE. 20	NNE. 20	NNE. 20	NNE. 19	NNE. 20	NNE. 22	NNE. 23	NNE. 23	NNE. 24	NNE. 22	NNE. 22
July 11	NNE. 18	NNE. 20	NNE. 19	NNE. 20	NNE. 18	NNE. 16	NNE. 19	NNE. 19	NE. 23	NE. 21	NE. 20	NE. 20
July 12	NNE. 22	NNE. 15	NNE. 14	NNE. 14	NE. 12	NE. 12	NNE. 11	NNE. 11	NE. 11	NE. 10	NE. 9	NNE. 8
July 13	ENE. 8	ENE. 7	NE. 5	ENE. 5	NE. 4	ENE. 5	ENE. 5	E 4	E. 3	E. 5	NE. 5	NE. 5
July 14	WSW. 8	WSW. 2	WSW. 5	WSW. 3	WNW. 3	WSW. 3	WSW. 3	SW. 4	W. 4	WNW. 5	W. 4	WSW. 5
July 15	NW. 2	ESE. 2	NNE. 2	NNE. 5	NNE. 3	NNE. 4	NNE. 3	NNE. 4	NNE. 6	N. 6	NNE. 3	N. 7
July 16	N. 8	N. 8	NNE. 9	NNE. 9	NNE. 9	NNE. 8	NNE. 8	NE. 12	NE. 12	NE. 9	NNE. 8	ENE. 8
July 17	NNE. 4	NNE. 5	NNE. 6	NE. 6	ENE. 3	ENE. 2	ENE. 3	ENE. 3	ENE. 4	ENE. 5	ESE. 5	SE. 5
July 18	ESE. 14	ESE. 12	E. 11	ESE. 13	ESE. 11	ESE. 8	ESE. 8	SE. 8	SE. 7	SE. 9	SE. 6	SE. 6
July 19	NE. 4	NNE. 6	NE. 5	ENE. 4	NNE. 8	NE. 6	ENE. 6	ESE. 9	ESE. 5	NE. 4	NE. 10	ENE. 9
July 20	NE. 20	ENE. 19	ENE. 11	E. 16	ENE. 17	ENE. 16	E. 16	E. 16	E. 16	E. 14	E. 12	E. 14
July 21	ENE. 13	NE. 12	NE. 11	NE. 13	NE. 11	ENE. 11	NE. 10	ENE. 10	NE. 8	NNE. 10	NNE. 11	NE. 10
July 22	ENE. 12	NE. 13	NE. 12	NE. 13	NNE. 8	NE. 13	NNE. 13	NE. 13	NNE. 10	NNE. 13	NNE. 12	NNE. 13
July 23	NNE. 15	NNE. 16	NE. 12	ENE. 14	NE. 15	NE. 14	NE. 11	NNE. 9	NE. 9	NE. 10	NNE. 9	NNE. 8
July 24	NE. 13	ENE. 13	ENE. 12	ENE. 12	ENE. 11	ENE. 12	ENE. 12	ENE. 11	ENE. 10	NE. 10	ENE. 9	ENE. 10
July 25	ENE. 10	E. 10	ENE. 9	NE. 8	NE. 6	NE. 8	NE. 7	NE. 8	NE. 8	ENE. 7	NE. 7	NNE. 8
July 26	ENE. 12	E. 14	E. 12	E. 12	E. 9	E. 10	E. 10	E. 11	E. 11	ESE. 11	ESE. 10	SE. 9
July 27	E. 16	E. 15	E. 12	E. 10	E. 10	ENE. 10	ENE. 12	E. 12	ENE. 12	ENE. 15	ENE. 16	E. 17
July 28	E. 21	E. 20	E. 20	E. 22	E. 18	E. 15	E. 17	E. 16	E. 16	E. 17	E. 19	ENE. 22
July 29	ENE. 26	ENE. 23	ENE. 22	NE. 21	ENE. 20	ENE. 22	ENE. 22	ENE. 22	ENE. 22	ENE. 22	ENE. 24	NE. 22
July 30	NE. 20	ENE. 20	ENE. 22	ENE. 19	NE. 19	ENE. 17	NE. 19	NE. 16	NE. 19	NE. 18	ENE. 18	NE. 17
July 31	ENE. 20	ENE. 20	ENE. 21	ENE. 19	ENE. 18	ENE. 19	ENE. 21	ENE. 20	ENE. 20	ENE. 19	ENE. 20	ENE. 20
Means.	12.29	12.00	11.06	11.16	10.25	10.51	10.93	10.96	10.51	11.22	11.45	11.19

Date.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	12 p. m.	Daily mean velocity.
	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	Direction and velocity.	
1883.													
July 1	NNW. 1	NNW. 1	NNW. 3	N. 6	NNE. 8	NNE. 8	NNE. 11	ENE. 11	ENE. 9	ENE. 9	E. 11	ENE. 10	4.82
July 2	ESE. 13	ESE. 11	ESE. 12	ESE. 16	ESE. 9	ESE. 5	NW. 6	ESE. 2	ESE. 7	ESE. 9	ESE. 10	ESE. 8	8.45
July 3	ESE. 5	SSW. 1	SW. 5	WSW. 4	WSW. 6	WSW. 6	N. 3	N. 3	N. 7	NNE. 8	ENE. 9	ENE. 10	7.62
July 4	SW. 4	WSW. 6	WSW. 5	WSW. 5	WSW. 7	WSW. 8	WSW. 9	WSW. 9	WSW. 9	WSW. 9	WSW. 9	WSW. 10	6.50
July 5	WSW. 3	WSW. 4	WSW. 3	W. 5	N. 5	N. 5	NNE. 6	NNE. 9	NE. 11	ENE. 14	E. 14	E. 14	7.33
July 6	E. 20	E. 18	ESE. 18	E. 15	E. 11	E. 11	E. 8	E. 8	NE. 8	NE. 7	ENE. 8	E. 9	13.37
July 7	ESE. 16	SSE. 13	SSE. 11	S. 12	SSW. 16	S. 16	S. 17	S. 13	SSE. 15	SSE. 13	SSE. 11	ESE. 10	11.66
July 8	WSW. 24	W. 26	W. 24	W. 22	W. 18	WSW. 17	WSW. 15	W. 15	W. 15	WSW. 13	W. 10	W. 8	17.41
July 9	E. 13	E. 12	ENE. 11	ENE. 13	ENE. 14	NNE. 15	ENE. 17	NE. 16	NNE. 18	NNE. 18	NE. 16	NNE. 18	9.75
July 10	NNE. 24	NE. 24	NE. 27	NE. 27	NE. 24	NE. 28	NE. 27	NE. 24	NE. 23	NNE. 21	NNE. 17	NNE. 20	22.54
July 11	NE. 16	NNE. 17	NNE. 16	NNE. 16	NNE. 17	NNE. 16	NNE. 18	NNE. 16	NNE. 16	NNE. 16	NNE. 16	NNE. 16	17.87
July 12	NNE. 8	NNE. 8	NNE. 8	NNE. 7	N. 8	NNE. 7	N. 8	NNE. 8	N. 7	N. 8	NNE. 8	NNE. 8	10.08
July 13	NE. 3	NE. 5	NNE. 5	WNW. 4	W. 3	WNW. 6	W. 6	W. 6	WSW. 6	W. 7	WSW. 6	WSW. 4	5.08
July 14	WSW. 6	WSW. 5	WSW. 4	W. 4	WNW. 6	WNW. 5	WNW. 3	NW. 2	W. 3	N. 5	N. 4	NNE. 8	4.12
July 15	N. 5	N. 8	N. 7	N. 8	N. 8	N. 8	N. 9	NNE. 7	NNE. 8	NNE. 8	NNE. 9	N. 7	5.79
July 16	ENE. 8	ENE. 9	E. 9	ENE. 10	ENE. 9	E. 8	ENE. 9	NNE. 7	NNE. 8	NNE. 6	N. 7	NE. 6	8.50
July 17	SE. 4	ESE. 8	ESE. 7	ESE. [illegible]	ESE. 11	E. 12	E. 12	E. 12	E. 13	E. 14	E. 15	E. 15	7.62
July 18	SE. 4	NNE. 5	NNE. 6	N. 9	NE. 8	NNE. 6	NNE. 7	NNE. 6	NNE. 8	NNE. 6	NNE. 5	NNE. 5	7.83
July 19	NE. 12	ENE. 12	ENE. 14	ENE. 16	ENE. 16	NE. 13	ENE. 15	ENE. 16	ENE. 14	ENE. 18	ENE. 19	NE. 17	10.75
July 20	E. 14	ENE. 14	E. 16	ENE. 18	E. 18	E. 17	E. 16	ESE. 16	E. 16	ENE. 15	ENE. 16	E. 13	15.66
July 21	NE. 11	NE. 10	NNE. 12	NNE. 10	NNE. 12	NNE. 13	NE. 14	NE. 13	NE 12	ENE. 13	NE. 12	NE. 11	11.37
July 22	NNE. 15	NE. 19	NE. 17	ENE. 18	ENE. 18	NNE. 19	NNE. 18	NE. 18	NNE. 18	NE. 18	NE. 17	NNE. 16	14.83
July 23	N. 8	N. 8	N. 9	N. 7	N. 8	N. 6	N. 7	NNE. 10	NNE. 12	NE. 13	NNE. 14	NE. 14	10.75
July 24	ENE. 10	ENE. 6	NNE. 7	NNE. 9	NNE. 10	NNE. 10	NNE. 11	NNE. 12	NNE. 12	NE. 14	ENE. 14	ENE. 13	10.95
July 25	NNE. 9	E. 9	ENE. 9	NNE. 12	NNE. 11	NNE. 10	NNE. 9	NNE. 12	NNE. 10	ENE. 14	ENE. 13	ENE. 12	9.41
July 26	ESE. 12	ESE. 11	E. 12	E. 15	E. 14	ESE. 15	E. 16	ESE. 16	E. 17	E. 19	E. 16	ESE. 16	12.91
July 27	E. 17	E. 17	E. 18	E. 20	E. 20	ESE. 21	E. 21	E. 23	ESE. 24	E. 24	E. 23	ENE. 21	16.91
July 28	ENE. 22	ENE. 21	E. 23	ENE. 23	E. 21	E. 22	ENE. 23	ENE. 22	ENE. 24	ENE. 25	ENE. 25	ENE. 24	21.58
July 29	NE. 20	NE. 20	NE. 21	NE. 22	ENE. 22	ENE. 20	NE. 22	ENE. 20	NE. 22	ENE. 22	NE. 22	NE. 20	21.70
July 30	ENE. 19	ENE. 18	NE. 19	ENE. 20	ENE. 21	E. 22	ENE. 20	E. 23	ENE. 24	E. 24	E. 23	ENE. 23	20.00
July 31	E. 22	E. 22	ENE. 23	ENE. 26	ENE. 25	ENE. 25	ENE. 22	ENE. 22	ENE. 22	ENE. 22	ENE. 22	ENE. 20	21.25
Means.	11.87	11.87	12.25	13.16	13.03	12.90	13.06	12.80	13.48	13.93	13.58	13.09	12.07

Statement showing the direction and velocity of the wind at Uglaamie from October, 1881, to August, 1883—Continued.

[Height of anemometer above surface of ground, 28 feet. Washington mean time. Correction to reduce to mean local time, $-5^{h} 17^{m}$. Velocity given in miles per hour.]

Date.	1 a.m.		2 a.m.		3 a.m.		4 a.m.		5 a.m.		6 a.m.		7 a.m.		8 a.m.		9 a.m.		10 a.m.		11 a.m.		12 m.	
	Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.	
1883.																								
Aug. 1	ENE.	19	ENE.	18	ENE.	20	ENE.	19	ENE.	19	ENE.	19	ENE.	19	ENE.	18	ENE.	18	ENE.	18	ENE.	20	ENE.	18
Aug. 2	E.	15	E.	14	E.	13	E.	12	E.	12	ESE.	12	ESE.	9	E.	9	E.	8	E.	9	E.	7	E.	8
Aug. 3	ESE.	14	E.	14	ESE.	13	ESE.	13	E.	10	ESE.	12	E.	12	ESE.	14	ESE.	13	ESE.	15	E.	15	ESE.	15
Aug. 4	E.	20	E.	23	ESE.	22	E.	20	ESE.	20	ESE.	19	ESE.	19	E.	19	E	19	E.	20	ESE.	19	E.	22
Aug. 5	NE.	19	NE.	20	NE.	20	ENE.	24	ENE.	22	ENE.	20	ENE.	21	ENE.	20	NE.	18	NE.	18	NE.	18	NE.	20
Aug. 6	NE.	23	NE.	24	NE.	24	NE.	23	NE.	24	NE.	24	ENE.	20	ENE.	20	ENE.	20	NE.	19	ENE.	20	NE.	18
Aug. 7	ESE.	16	E.	15	ESE.	16	ESE.	15	ESE.	16	ESE.	15	ESE.	13	ESE.	15	ESE.	16	ESE.	17	SE.	17	SE.	17
Aug. 8	E.	11	ESE.	9	SE.	10	SE.	7	SSE.	10	SSE.	8	SSE.	9	SSE.	8	SSE.	9	S.	8	S.	11	S.	7
Aug. 9	ESE.	9	ESE.	9	ESE.	8	ESE.	10	ESE.	9	ESE.	8	ESE.	5	ESE.	10	ESE.	10	SE.	10	SE.	7	SE.	7
Aug. 10	ESE.	13	ESE.	11	ESE.	9	E.	8	E.	5	E.	8	ESE.	8	ESE.	13	E.	13	ESE.	13	ESE.	12	SE.	10
Aug. 11	SW.	18	SW.	12	SW.	11	SW.	12	SW.	10	SSW.	6	SW.	6	SW.	3	SW.	3	SW.	2	Calm.		NW.	1
Aug. 12	ESE.	6	ESE.	10	SE.	15	SE.	11	SE.	8	ESE.	8	ESE.	10	ESE.	11	ESE.	10	ESE.	10	E.	4	ESE.	10
Aug. 13	NNE.	9	ENE.	11	E.	6	E.	9	E.	8	ESE.	11	ESE.	15	E.	11	E.	5	E.	7	E.	9	E.	10
Aug. 14	NNE.	8	NNE.	7	NE.	9	NE.	10	NE.	4	NE.	3	NE.	7	NNE.	6	NE.	8	ENE.	7	E.	[illegible]	E.	9
Aug. 15	SW.	8	SW.	7	SW.	5	SW.	3	SW.	5	S.	3	S.	4	SW.	4	SW.	1	SSE.	1	ENE.	8	E.	8
Aug. 16	S.	6	SSW.	4	SSW.	2	SW.	6	SSW.	5	SSW.	9	SSW.	10	SW.	7	W.	5	W.	4	W.	3	N.	5
Aug. 17	E.	13	ENE.	13	ENE.	12	E.	8	E.	6	E.	3	ESE.	1	SSW.	3	W.	22	W.	23	W.	25	W.	22
Aug. 18	SSE.	12	ESE.	12	ESE.	12	E.	8	ESE.	9	ENE.	10	ESE.	12	NE.	11	NNE.	16	NNE	22	NNE.	22	NNE.	20
Aug. 19	N.	20	N.	17	N.	19	NNW.	19	NNW.	16	NNW.	14	N.	14	N.	14	N.	13	NNW.	10	NNW.	11	N.	12
Aug. 20	ESE.	7	E.	12	ESE.	14	E.	15	E.	16.	E	18	E.	20	ESE.	21	ESE.	22	ESE.	23	E.	25	E.	27
Aug. 21	ENE.	30	ENE.	29	ENE.	29	ENE.	30	NE.	29	NE.	29	NE.	30	NE.	29	NE.	28	NE.	30	NE.	30	NE.	28
Aug. 22	NNE.	14	NNE.	12	N.	10	NNW.	4	NNW.	3	NW.	2	NW.	5	WNW.	7	WNW.	6	WNW.	7	W.	10	W.	10
Aug. 23	WSW.	20	SW.	21	SW.	25	SW.	25	SW.	24	SW.	25	SW.	24	WSW.	24	WSW.	25	WSW.	25	W.	25	W.	28
Aug. 24	SW.	30	SW.	29	SW.	29	SW.	28	SW.	29	SW.	33	SW.	32	SW.	30	SW.	30	WSW.	30	WSW.	29	WNW.	30
Aug. 25	NE.	10	NE.	7	NE.	3	ENE.	2	ESE.	3	ESE.	2	SE.	4	SSE.	6	SSE.	9	S.	10	SSE.	12	SSE.	15
Aug. 26	SSE.	22	S.	20	SSW.	21	SSW.	24	SSW.	32	SW.	32	SW.	23	SW.	32	SW.	28	WSW.	34	W.	28	W.	30
Aug. 27*	NE.	7	N.	4	NNE.	8	NE.	7	E.	5	E.	9	ESE.	10	ESE.	13	ESE.	13	ESE.	16	ESE.	18	ESE.	19
Means ..	14.77		14.22		14.25		13.77		13.29		13.40		13.40		14.00		14.37		15.11		15.33		15.77	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.		7 p.m.		8 p.m.		9 p.m.		10 p.m.		11 p.m.		12 p.m.		Daily mean velocity.
	Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		Direction and velocity.		
1883.																									
Aug. 1	ENE.	20	ENE.	20	ENE.	20	ENE.	20	E.	18	E.	16	E.	19	E.	17	E.	18	E.	17	ENE.	16	E.	15	18.37
Aug. 2	E.	10	E.	8	E.	9	E.	10	E.	9	E.	10	E.	11	ENE.	10	E.	12	E.	12	ESE.	12	E.	13	10.58
Aug. 3	E.	15	E.	17	E.	18	E.	19	ESE.	18	E.	17	E.	19	E.	20	E.	22	E.	23	E.	23	E.	20	16.29
Aug. 4	E.	21	E.	21	E.	20	E.	20	E.	17	E.	18	E.	21	E.	19	E.	18	ENE.	18	ENE.	20	ENE.	19	19.75
Aug. 5	NE.	21	NNE.	22	NNE.	23	NE.	25	NE.	25	NE.	24	NE.	22	NE.	21	NE.	23	NE.	24	NE.	24	NE.	23	21.54
Aug. 6	ENE.	20	ENE.	20	ENE.	17	ENE.	18	E.	19	E.	19	ESE.	20	E.	17	E.	17	E.	17	E.	18	ESE.	17	19.91
Aug. 7	SE.	22	SE.	22	SSE.	21	SE.	22	SSE.	21	SSE.	19	SSE.	15	SE.	9	E.	10	E.	12	E.	11	E.	11	15.95
Aug. 8	SSW.	6	SW.	5	WSW.	5	WSW.	5	WSW.	4	WSW.	2	WSW.	3	N.	3	N.	4	N.	5	ENE.	5	E.	8	6.75
Aug. 9	SE.	13	SE.	11	SE.	14	ESE.	10	E.	10	ESE.	13	ESE.	12	ESE.	12	ESE.	12	ESE.	12	ESE.	10	ESE.	12	10.12
Aug. 10	ESE.	8	SW.	11	SSE.	11	SSE.	9	SW.	9	SW.	12	SW.	12	SSW.	20	SW.	24	SW.	20	SW.	19	SW.	16	12.25
Aug. 11	NNW.	4	ENE.	8	ESE.	7	ESE.	8	E.	12	E.	12	E.	12	NE.	13	ENE.	12	ENE.	9	E.	11	ESE.	11	8.45
Aug. 12	ESE.	9	ESE.	9	SE.	6	SE.	6	E.	7	WSW.	8	WSW.	4	NNE.	5	NNW.	5	N.	10	NNE.	9	NNE.	9	7.91
Aug. 13	NNE.	6	NNE.	9	NNE.	8	NNE.	8	NNE.	8	NNE.	8	NNE.	11	NNE.	10	NNE.	9	NNE.	10	NNE.	9	NNE.	8	8.95
Aug. 14	E.	9	ESE	8	E.	8	E.	8	E.	8	E.	7	E.	10	E.	10	ESE.	8	ESE.	8	SW.	4	SW.	5	7.50
Aug. 15	ESE.	11	SE	10	ESE.	16	ESE.	16	ESE.	12	WSW.	8	Calm.		WNW.	1	WNW.	5	NNW.	4	ENE.	4	ESE.	3	6.12
Aug. 16	N.	5	N.	7	NNE.	6	NNE.	7	N.	7	NNE.	12	NE.	11	E.	11	E.	10	E.	12	E.	14	E.	13	7.54
Aug. 17	W.	20	W.	12	SW.	13	SW.	8	SW.	11	SSW.	11	SW.	7	SSW.	3	SE.	11	S.	12	SE.	15	SE.	14	12.00
Aug. 18	N.	19	N.	18	N.	18	N.	16	N.	17	N.	20	N.	20	NNW.	21	N.	22	N.	21	N.	19	N.	18	16.45
Aug. 19	NNW.	12	NNW.	9	NNW.	7	NW.	7	NW.	6	NW.	8	NW.	6	N.	7	NNW.	4	NW.	3	NE.	6	SE.	5	10.79
Aug. 20	E.	29	E.	30	E.	30	E.	31	E.	32	E.	29	E.	32	E.	32	ENE.	31	ENE.	28	ENE.	28	ENE.	30	24.25
Aug. 21	NNE.	26	NE.	22	NNE.	22	NE.	22	NE	22	NNE.	21	NNE.	19	NNE.	18	NNE.	16	NNE.	18	N.	16	NNE.	14	24.45
Aug. 22	WNW.	12	WSW.	12	W.	14	WSW.	15	WSW.	19	WSW.	19	WSW.	17	WSW.	17	WSW.	20	WSW.	19	WSW.	20	WSW.	19	12.62
Aug. 23	W.	25	WSW.	22	WSW.	21	WSW.	22	WSW.	24	WSW.	24	WSW.	24	WSW.	24	SW.	23	SW.	25	SW.	27	SW.	27	24.12
Aug. 24	WNW.	26	NW.	21	NW.	28	NNE.	26	N.	28	N.	24	N.	24	N.	22	N.	19	N.	16	N.	13	NNE.	11	25.70
Aug. 25	SSE.	17	S.	19	SSE.	20	SSE.	18	SSE.	21	SSE.	24	SSE.	23	SSE.	26	SSE.	26	SSE.	22	SSE.	21	SSE.	21	14.20
Aug. 26	W.	31	W.	26	W.	27	W.	25	WNW.	23	NW.	19	NW.	16	NNW.	16	NNW.	15	NNW.	13	NNW.	11	N.	11	23.29
Aug. 27*	SE.	20	ESE.	20	ESE.	20	SE.	24	SE.	26	SE.	24	SE.	22	SE.	20	SE.	20	SE.	15	SE.	15	†SE.	15	15.41
Means ..	16.19		15.51		15.88		15.77		16.03		15.85		15.25		14.96		15.40		15.00		14.81		14.37		14.86

* Station abandoned August 27, 1883.

† Approximated.

Table showing the number of calms and 16 different wind directions, also mean monthly force of different winds after deducting number of calms.

Direction.	October, 1881. Number of hours.*	October, 1881. Mean force.	November, 1881. Number of hours.	November, 1881. Mean force.	December, 1881. Number of hours.	December, 1881. Mean force.	January, 1882. Number of hours.	January, 1882. Mean force.	February, 1882. Number of hours.	February, 1882. Mean force.
N......	63	20.22	26	11.34	27	12.00	27	8.62	42	15.38
NNE..	54	18.13	35	21.05	16	8.31	37	9.83	86	13.93
NE ...	37	21.56	112	22.95	98	11.25	94	7.10	29	14.27
ENE ..	6	5.00	243	18.45	118	11.33	106	17.48	49	12.25
E......	62	11.91	95	18.24	4	4.50	110	13.71	0	0
ESE...	8	10.62	15	17.66	14	7.71	28	11.10	0	0
SE.....	44	13.02	9	15.55	38	12.26	13	10.15	0	0
SSE ...	2	4.50	19	8.89	25	8.00	20	28.05	14	7.85
S	3	4.66	34	12.67	53	8.66	22	36.54	50	9.02
SSW ..	0	0	27	7.41	93	5.83	10	21.90	88	12.97
SW....	1	7.00	14	22.41	17	7.00	11	41.18	104	13.08
WSW..	0	0	3	18.66	11	8.63	26	38.61	114	12.52
W......	8	27.50	12	18.66	66	7.72	112	31.07	32	17.06
WNW.	1	24.00	25	20.00	74	7.59	69	10.84	39	7.15
NW ...	13	12.76	46	14.09	14	9.71	1	10.00	29	10.27
NNW..	7	17.57	5	12.80	20	7.10	0	0	4	3.00
Calms..	3	0	0	0	56	0	58	0	37	0

Direction.	March, 1882. Number of hours.	March, 1882. Mean force.	April, 1882. Number of hours.	April, 1882. Mean force.	May, 1882. Number of hours.	May, 1882. Mean force.	June, 1882. Number of hours.	June, 1882. Mean force.	July, 1882. Number of hours.	July, 1882. Mean force.	August, 1882. Number of hours.	August, 1882. Mean force.	September, 1882. Number of hours.	September, 1882. Mean force.
N......	24	8.37	9	3.33	13	12.46	65	12.17	34	7.97	14	10.21	33	18.30
NNE..	2	14.50	22	5.68	34	10.38	99	9.72	42	9.05	51	13.27	29	14.34
NE ...	15	16.86	0	0	130	16.55	92	9.97	18	13.00	117	13.96	73	14.51
ENE ..	24	19.79	3	4.33	158	18.89	66	11.18	55	13.13	75	9.35	86	15.23
E......	32	26.18	15	13.40	67	14.51	95	13.09	104	11.46	117	15.37	110	15.81
ESE...	109	20.22	130	10.27	39	19.77	49	8.69	71	12.51	69	16.41	67	10.24
SE.....	27	10.62	94	11.59	43	9.98	38	9.32	50	12.12	33	15.15	36	9.75
SSE ...	37	11.67	27	14.66	37	9.19	1	6.00	25	13.44	40	14.58	20	13.20
S	41	13.87	48	9.94	21	9.19	4	7.25	16	8.12	37	16.35	28	12.39
SSW ..	72	9.95	74	13.63	19	7.84	11	5.00	11	11.91	28	26.07	46	14.65
SW....	46	14.56	43	9.69	50	10.30	43	10.51	105	14.89	21	19.52	31	16.77
WSW..	51	17.88	39	6.89	34	11.32	29	7.83	79	10.38	27	19.11	27	12.04
W......	142	19.95	63	9.69	52	7.73	10	7.60	50	6.86	27	21.93	25	14.04
WNW.	74	15.24	131	13.90	11	8.36	21	12.14	22	6.32	24	16.00	37	12.70
NW ...	40	10.27	0	0	1	18.00	42	10.00	29	5.76	36	16.61	28	10.57
NNW..	1	3.00	0	0	29	14.66	53	10.15	19	6.53	26	15.54	42	16.31
Calms..	6	0	22	0	6	0	2	0	14	0	2	0	2	0

Direction.	October, 1882. Number of hours.*	October, 1882. Mean force.	November, 1882. Number of hours.	November, 1882. Mean force.	December, 1882. Number of hours.	December, 1882. Mean force.	January, 1883. Number of hours.	January, 1883. Mean force.	February, 1883. Number of hours.	February, 1883. Mean force.
N.....	28	8.43	5	11.20	33	7.39	119	8.10	23	9.60
NNE.	4	7.50	4	23.75	64	9.53	73	11.46	6	7.83
NE ..	126	20.62	114	22.14	64	9.75	19	8.78	27	4.44
ENE..	205	16.83	178	19.80	87	8.77	133	13.19	8	7.27
E......	95	12.37	103	21.12	82	7.12	77	26.29	27	8.40
ESE ..	43	7.14	109	20.92	49	8.86	68	15.77	41	12.85
SE....	39	11.10	22	12.00	97	7.74	39	10.87	39	12.79
SSE ..	37	13.03	20	7.75	4	6.25	5	7.40	16	11.00
S	28	6.25	13	8.08	20	13.17	3	8.66	32	12.65
SSW..	42	16.19	8	8.62	33	12.15	7	4.85	64	12.00
SW ...	12	15.42	7	16.14	16	13.44	13	24.23	49	13.22
WSW.	2	16.50	13	17.62	29	11.17	36	24.02	70	19 12
W	10	19.50	22	14.09	11	10.82	68	14.54	100	19.78
WNW	2	12.00	42	16.69	28	6.52	167	8.04	43	11.02
NW ..	18	5.22	49	19.29	28	7.43	8	13.37	26	9.34
NNW.	52	7.17	11	15.73	51	8.18	6	14.33	42	9.26
Calms,	1	0	0	0	44	0	3	0	11	0

Direction.	March, 1883. Number of hours.	March, 1883. Mean force.	April, 1883. Number of hours.	April, 1883. Mean force.	May, 1883. Number of hours.	May, 1883. Mean force.	June, 1883. Number of hours.	June, 1883. Mean force.	July, 1883. Number of hours.	July, 1883. Mean force.	August, 1883. Number of hours.	August, 1883. Mean force.
N.....	19	6.94	72	5.54	26	14.92	26	6.76	34	6.91	37	14.79
NNE.	7	7.85	28	7.75	82	14.47	91	9.38	138	11.88	41	12.48
NE ..	43	8.97	52	9.01	98	13.77	83	11.55	103	13.64	51	18.80
ENE..	117	16.54	104	15.57	96	15.55	173	17.65	171	14.69	53	18.49
E......	47	21.48	55	9.92	75	15.06	101	15.68	109	14.29	129	14.49
ESE ..	81	12.72	42	11.96	65	12.07	48	10.93	55	10.80	97	12.32
SE....	73	10.76	7	12.42	28	10.79	22	8.95	13	6.23	36	14.00
SSE ..	43	9.86	15	6.20	35	10.48	9	8.77	6	10.66	29	15.72
S	34	14.52	21	8.95	15	9.73	15	9.93	8	15.12	10	10.00
SSW..	38	8.86	34	6.76	49	9.63	13	7.15	2	8.50	14	11.14
SW ...	63	8.85	21	4.09	96	10.52	20	9.35	14	7.50	58	16.38
WSW.	86	9.54	36	3.94	19	8.00	36	7.41	49	8.06	32	17.62
W	50	11.44	110	6.94	9	7.22	12	6.33	19	9.84	21	19.76
WNW	22	12.13	36	8.00	20	9.60	15	7.13	9	4.33	9	14.11
NW ..	6	11.33	42	4.14	11	6.90	25	6.92	3	3.33	12	10.16
NNW.	10	14.40	25	12.28	7	10.28	27	7.33	6	1.66	17	10.41
Calms,	5	0	20	0	13	0	2	0	5	0	2	0

Year and month.	Prevailing direction.	Maximum hourly velocity.	Total movement.	Year and month.	Prevailing direction.	Maximum hourly velocity.	Total movement.
1881.				**1882.**			
November	ENE.	43	12,849	November	ENE.	44	13,570
December	ENE.	44	6,361	December	SE.	42	6,200
Whole period	ENE.	44	19,210	Whole period	ENE.	100	116,897
1882.				**1883.**			
January	E.	100	12,102	January	WNW.	57	10,149
February	SW.	28	7,952	February	W.	80	9,279
March	W.	40	11,839	March	ENE.	36	8,888
April	ESE.	38	7,752	April	W.	33	6,131
May	ENE.	29	10,379	May	NE.	30	9,201
June	NNE.	27	7,355	June	ENE.	37	8,631
July	SW. and E.	26	8,031	July	ENE.	28	8,958
August	E.	41	11,322	August	Incomplete.	Incomplete.	Incomplete.
September	E. and ESE.	39	10,032				
October	ENE.	38	10,363	Whole period	ENE.	80	61,237

* Number of hours observed blowing from the direction stated.

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1881.												
Oct. 18	1 st. 0	00	0 0	00	0 0	00	6 st. 0	00	9 st. 0	00	10 st. 0	00
Oct. 19	10 nim. 0	.—	10 st. W.*	.—	10 st. W.*	00	10 st. W.*	00	10 st. W.†	00	10 st. W.†	00
Oct. 20	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 21	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 22	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 23	10 nim. 0	.—	10 nim. 0	.—	0 0	.—	0 0	00	0 0	00	0 0	00
Oct. 24	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—
Oct. 25	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.01
Oct. 26	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01
Oct. 27	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 28	0 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	4 st. 0	00
Oct. 29	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.01	10 st. 0	00	10 st. 0	00
Oct. 30	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Oct. 31	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Means..	8.64		8.71		8.00		8.43		8.57		8.86	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1881.												
Oct. 18	10 nim. W.†	.—	10 st. W.†	.—	10 st. W.*	00	10 st. W.*	00	10 st. W.*	00	10 st. W.*	00
Oct. 19	10 st. 0	.—	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Oct. 20	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. SE.*	00	10 st. SE.*	00
Oct. 21	10 st. 0	00	10 st. 0	00	9 st. NE.†	00	9 st. N.†	00	10 st. N.†	00	10 st. N.†	00
Oct. 22	10 st. 0	00	10 nim. 0	.02	10 nim. 0	.01	10 st. NE.*	.—	10 st. NE.*	00	10 st. NE.*	00
Oct. 23	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. NE.†	.—	10 nim. NE.†	.—	10 nim. NE.*	.02
Oct. 24	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01
Oct. 25	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. N.†	00	10 nim. 0	.—	10 nim. 0	.—
Oct. 26	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Oct. 27	8 st. 0	00	5 st. 0	00	1 cir. 2 st. 0	00	1 cir. cum. 2 st. 0	00	8 st. 0	00	3 st. NE.†	00
Oct. 28	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.02	10 nim. 0	.01
Oct. 29	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Oct. 30	10 st. 0	00	9 st. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 31	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. E.*	00	10 st. E.*	00
Means..	9.14		9.57		8.00		8.71		9.14		8.79	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below, amount of precipitation on the right above.]

7 a. m.			8 a. m.			9 a. m.			10 a. m.			11 a. m.			12 m.			Amount of precipitation.
Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	.—
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.—
Dense fog.	SE. †	00	Dense fog.	SE. †	00	Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	.—
10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	9 st.	0	.—	9 st.	0	00	.—
10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—	.03
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01	10 st.	0	.—	.08
10 nim.	0	.—	10 nim.	0	.02	10 nim.	0	.03	10 nim.	0	.02	10 nim.	0	.03	10 nim.	0	.01	.28
10 nim.	0	.01	10 nim.	0	.03	10 nim.	0	.01	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	.13
10 nim.	0	.01	10 nim	0	.02	10 nim.	0	.02	10 nim.	0	.05	10 nim.	0	.02	10 st.	0	.01	.28
9 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9 st.	0	00	9 st.	0	00	.01
10 st.	0	00	9 st.	NE. *	00	10 st.	0	00	9 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	.07
10 nim.	0	.02	10 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	.07
4 st.	0	.—	1 cir. 3 st.	0	00	3 st.	0	00	1 cir. 2 st.	0	00	2 cir. 2 st.	0	00	4 st.	0	00	.—
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.—
8.79			8.79			8.79			8.71			8.71			8.71			.95

7 p. m.			8 p. m.			9 p. m.			10 p. m.			11 p. m.			12 p. m.			Daily means.
10 st.	W.*	00	10 st.	W.*	00	10 st.	W.*	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	8.58
Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	10 st.	0	00	6.25
10 st.	SE.*	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	7.68
10 st.	N. †	00	10 st.	N.*	00	10 st.	N. †	00	10 st.	N. †	00	10 st.	0	00	10 st.	0	00	9.83
10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	10.00
10 nim.	NE.*	.01	10 nim.	NE.*	.01	10 nim.	NE.*	.01	10 nim.	NE. †	.—	10 nim.	0	.—	10 nim.	0	.01	8.33
10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.02	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10.00
10 nim.	0	.—	10 nim.	0	.01	10 st.	0	.01	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10.00
10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10.00
3 st.	NE. †	00	4 st.	NE. †	00	4 st.	NE. †	00	2 st.	N. †	00	1 st.	0	00	0	0	00	6.71
10 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.01	10 st.	0	.—	10 st.	0	00	10 nim.	0	.—	7.88
10 st.	0	.—	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10.00
2 cir. 4 st.	0	00	5 cir. 1 st.	0	00	10 st.	0	00	10 st.	0	00	Dense fog.	0	00	1 cir. 1 st.	0	00	6.88
10 st.	E.*	00	10 st.	E.*	00	10 st.	E. †	00	10 st.	E. †	00	10 nim.	0	.—	10 nim.	0	.—	10.00
8.50			8.57			8.86			8.71			7.93			8.71			8.68

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds.	Precipitation.
1881.												
Nov. 1	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—
Nov. 2	10 nim. 0	.—	10 nim. NE.*	.01	10 nim. NE.*	.01	10 nim. NE.†	.—	10 st. NE.†	.—	10 st. NE.†	00
Nov. 3	10 nim. 0	.01	10 nim. NE.*	.01	8 st. E.*	.—	2 st. E.*	00	2 st. E.*	00	3 st. E.*	00
Nov. 4	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 5	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. SE.*	00	10 st. 0	00
Nov. 6	1 cir. 2 st. 0	00	2 st. NE.*	00	2 st. NE.*	00	2 st. NE.*	00	3 st. NE.*	00	4 st. NE.†	00
Nov. 7	D. haze. 5 st. NE.†	00	5 cir. 4 st. NE.†	00	2 cir. 6 st. NE.†	00	1 cir. 8 st. NE.†	00	10 st. 0	00	2 st. NE.†	00
Nov. 8	10 nim. 0	.—	10 st. SE.†	.—	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Nov. 9	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.01
Nov. 10	10 st. 0	00	10 st. NE.*	00	7 st. 0	00	Dense haze. 4 st. 0	00	Dense haze. 5 st. 0	00	5 st. 0	00
Nov. 11	9 st. 0	00	10 st. 0	00	9 st. 0	00	6 st. 0	00	4 st. 0	00	2 st. 0	00
Nov. 12	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00
Nov. 13	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 14	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 15	10 nim. 0	.01	10 nim. 0	.—	9 st. 0	.01	10 st. 0	00	10 st. 0	00	10 nim. 0	.01
Nov. 16	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 17	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 18	Dense fog. 0	00	Dense haze. 0	00	Dense haze. 0	00	Dense haze. 0	00	Dense haze. 0	00	Dense haze. 0	00
Nov. 19	4 st. 0	00	3 st. 0	00	3 st. 0	00	4 st. 0	00	4 st. 0	00	Light haze. 5 st. 0	00
Nov. 20	Dense haze. 0	00	Dense haze. 0	00	Dense haze. 0	00	1 st. 0	00	Dense haze. 0	00	Dense haze. 0	00
Nov. 21	10 nim. 0	.01	10 nim. 0	.01	10 st. 0	.01	10 st. 0	00	10 nim. 0	.—	10 st. 0	.01
Nov. 22	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 23	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 24	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 25	Dense haze. 0	00	Light haze. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 26	10 st. 0	00	10 st. 0	00	10 st. 0	00	5 st. 0	00	8 st. 0	00	8 st. 0	00
Nov. 27	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 28	9 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00
Nov. 29	4 cir. st. 4 st. 0	00	2 cir. st. 4 st. 0	00	1 cir. st. 5 st. 0	00	3 cir. st. 2 st. 0	00	2 cir. st. 5 st. 0	00	10 st 0	00
Nov. 30	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	5 st. 0	00	4 st. 0	00
Means.	6.23		6.03		5.77		5.27		5.27		5.13	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.	
1881.												
Nov. 1	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01
Nov. 2	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. E.*	.01	10 nim. E.*	.01
Nov. 3	10 nim. E.*	.01	10 nim. E.*	.—	10 st. 0	.—	10 st. 0	00	10 st. NE.†	00	10 st. NE.†	00
Nov. 4	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.05	10 nim. 0	.03
Nov. 5	9 st. E.*	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	2 cir. 3 st. NE.†	00	2 cir. 5 st. NE.†	00
Nov. 6	3 st. 0	00	10 st. 0	00	9 st. E.*	00	2 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 7	4 st. NE.†	00	2 st. 0	00	6 cir. 4 st. 0	00	4 cir. 3 st. NE.†	00	3 cir. 4 st. NE.†	00	2 cir. 7 st. NE.†	00
Nov. 8	2 cir. 7 st. 0	00	1 cir. 8 st. 0	00	8 st. Light haze. 0	00	7 st. Light haze. 0	00	5 st. NE.† Lt. haze.	00	8 st. NE.* Lt. haze.	00
Nov. 9	10 st. 0	00	10 st. 0	00	10 st. NNE.*	00	10 st. NNE.†	00	10 st. NNE.†	00	10 st. NNE.†	00
Nov. 10	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	10 st. 0	00
Nov. 11	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 12	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 13	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Nov. 14	2 cir. 3 st. 0	00	1 cir. 4 st. 0	00	1 cir. 5 st. 0	00	1 cir. 8 st. 0	00	8 st. 0	00	10 st. 0	00
Nov. 15	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NW.†	00
Nov. 16	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00
Nov. 17	0 0	00	0 0	00	7 cir. 0	00	7 cir. 0	00	5 cir. 2 st. 0	00	7 cir. st. 2 st. 0	00
Nov. 18	Light haze. 4 st. 0	00	Light haze. 3 st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	1 cir. 3 st. 0	00	5 st. 0	00
Nov. 19	10 st. 0	00	10 st. 0	00	9 st. 0	00	8 st. 0	00	8 st. 0	00	2 cir. st. 7 st. E.†	00
Nov. 20	2 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00	8 st. SW.*	00	10 nim. WSW.*	.—	10 nim. WSW.*	.—	10 st. W.*	.—
Nov. 21	10 nim. 0	.—	10 st. 0	.01	8 st. W.*	00	2 cir. st. 2 st. W.*	00	3 cir. st. 3 st. W.*	00	9 st. W.*	00
Nov. 22	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00
Nov. 23	0 0	00	0 0	00	0 0	00	2 cir. 0	00	0 0	00	0 0	00
Nov. 24	0 0	00	0 0	00	1 cir. st. 0	00	1 cir. st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 25	8 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 26	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 27	10 st. 0	.01	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01
Nov. 28	3 st. 0	00	4 st. 0	00	9 st. 0	00	9 st. 0	00	2 cir. st. 5 st. 0	00	2 cir. st. 7 st. 0	00
Nov. 29	10 nim. 0	.—	10 st. 0	.01	6 cir. st. 4 st. 0	00	6 cir. st. 4 st. 0	00	10 st. WSW.†	00	10 st. WSW.†	00
Nov. 30	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Means.	5.93		6.23		6.97		6.67		6.37		7.00	

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below, amount of precipitation on the right above.]

7 a. m.			8 a. m.			9 a. m.			10 a. m.			1a. m.			12 m.			
Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount of precipitation.
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	.10
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.10
10 nim.	0	.01	10 nim.	0	.05	10 nim.	0	.05	10 nim.	E.*	.03	10 nim.	E.*	.01	10 nim.	E.*	.01	.19
10 st.	NE.†	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.10
10 st.	NE.*	00	10 st.	NE.*	00	7 st.	E.†	00	9 st.	E.*	00	10 st.	E.*	00	6 st.	E.*	00	00
4 st.	0	00	2 st.	0	00	2 cir. 1 st.	NE.†	00	0	0	00	4 st.	0	00	10 st.	0	00	00
2 st.	0	00	Dense haze. 2 st.	0	00	10 st.	NE.*	00	10 st.	NE.†	00	5 st.	NE.†	00	4 st.	NE.†	00	.—
10 st.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	.01
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.03
4 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	4 st.	0	00	00
5 st.	NE.†	00	3 st.	0	00	2 st.	0	00	1 st.	0	00	2 st.	0	00	1 st.	0	00	00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
10 st.	0	00	10 st.	0	00	1 st.	0	00	0	0	00	0	0	00	2 cir.	0	00	.—
10 st.	0	.—	10 nim.	0	.—	10 st.	0	.—	10 nim.	0	.—	10 st.	0	.01	10 st.	0	00	.04
7 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
4 st.	0	00	4 st.	0	00	Light haze. 3 st.	0	00	Light haze. 2 st.	0	00	Light haze. 2 st.	0	00	Light haze. 4 st.	0	00	00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	00
Light haze. 4 st.	0	00	Light haze. 1 st.	0	00	Light haze. 1st.	0	00	Light haze. 1 st.	0	00	0	0	00	0	0	00	.02
10 st.	0	00	10 st.	NW.*	00	9 st.	0	00	2 st.	0	00	10 st.	0	00	10 st.	0	00	.05
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
Light haze.	0	00	Light haze. 2 st.	0	00	Light haze. 2 st.	0	00	Light haze.	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	9 st.	0	00	10 st.	0	00	10 st.	0	00	8 st.	0	00	00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	00
Dense haze.	0	00	0	0	00	8 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	.05
0	0	00	0	0	00	3 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	00
10 nim.	0	.—	10 st.	0	.—	10 nim.	0	.—	8 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.01	.04
4 cir. st. 3 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9 st.	0	00	9 st.	0	00	00
5.57			5.20			5.67			5.23			5.53			5.67			.73

7 p. m.			8 p. m.			9 p. m.			10 p. m.			11 p. m.			12 p. m.			Daily means.
10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	10 st.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10.00
10 nim.	E.*	.01	10 nim.	E.†	.01	10 nim.	E.†	.—	10 nim.	0	.—	10 nim.	0	.02	10 nim.	0	.01	10.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	E.†	00	10 st.	E.†	00	8.95
10 nim.	0	.—	10 st.	0	00	10 st.	0	00	10 st.	0	00	4 st.	NE.†	00	4 st.	NE.†	00	9.50
1 cir. 7 st.	NE.†	00	9 st.	NE.†	00	9 st.	NE.†	00	9 st.	NE.†	00	2 st.	0	00	1 st.	0	00	8.38
1 st.	0	00	1 st.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	3.00
1 cir. 8 st.	NE.†	00	10 st.	NE.†	00	10 st.	NE.†	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	7.25
9 st. NE.†	Lt. haze.	00	10 nim.	N.*	.—	10 nim.	N.*	.—	8 st.	0	.—	8 st.	0	00	10 st.	0	00	9.21
10 st.	NNE.†	00	10 st.	NNE.†	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	7.33
0	0	00	0	0	00	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	2.33
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.04
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	10 st.	0	00	.42
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	7.75
10 st.	NW.†	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9.96
1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	3.12
6 cir. st. 3 st.	0	00	2 cir. st. 7 st.	0	00	10 st.	0	00	Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	2.42
8 st.	0	00	8 st.	0	00	7 st.	0	00	7 st.	0	.00	8 st.	0	00	5 st.	0	00	3.50
9 st.	SE.*	00	9 st.	SE.*	00	4 st.	0	00	2 st.	0	00	1 st.	0	00	2 st.	0	00	6.83
10 nim.	W.*	.—	10 nim.	W.*	.01	10 nim.	W.†	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	4.67
9 st.	W.*	00	9 st.	W.*	00	6 st.	0	00	4 st.	0	00	2 st.	0	00	0	0	00	7.83
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.08
1 cir.	0	00	2 st.	0	00	2 st.	0	00	0	0	00	1 st.	0	00	0	0	00	.33
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	D. haze. D. haze.	0	00	.33
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	6.46
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9.62
10 nim.	0	.01	10 nim.	0	.01	10 st.	0	.01	10 st.	0	00	10 st.	0	00	10 st.	0	00	9.08
2 cir. st. 7 st.	0	00	6 st.	0	00	6 st.	0	00	8 st.	0	00	2 cir. st. 3 st.	0	00	3 cir. st. 3 st.	0	00	4.21
10 st.	WSW.†	.10	10 st.	WSW.†	00	10 st.	WSW.†	00	10 st.	0	00	8 st.	0	00	8 st.	0	00	9.00
10 st.	0	.10	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9.29
7.10			7.10			6.87			6.30			5.70			5.93			6.03

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds.	Precipitation.
1881.												
Dec. 1	3 cir. Light haze. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	10 st. NW.*	00
Dec. 2	10 nim. 0	.02	10 nim. 0	.02	10 st. 0	.01	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 3	10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.02
Dec. 4	Light haze. 5 st. 0	00	Light haze. 5 st. 0	00	Light haze. 4 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Dec. 5	D. haze. Lt. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00
Dec. 6	3 st. 0	00	2 st. 0	00	2 st. 0	00	4 st. 0	00	2 st. 0	00	1 st. 0	00
Dec. 7	8 st. W.†	00	10 nim. 0	.—	10 nim. 0	.01	10 st. W.†	.—	10 st. W.†	00	9 st. W.†	00
Dec. 8	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	8 st. 0	00	9 st. 0	00
Dec. 9	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00
Dec. 10	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 11	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	0 0	00	0 0	00	0 0	00	3 st. 0	00
Dec. 12	D. haze. D. haze. 0	00	1 st. 0	00	8 st. 0	00	9 st. 0	00	8 st. W.†	00	9 st. W.†	00
Dec. 13	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	2 st. 0	00
Dec. 14	1 st. 0	00	Lt. haze. D. haze. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 15	0 0	00	0 0	00	0 0	00	0 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Dec. 16	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Dec. 17	Light haze. 0	00	Light haze. 0	00	0 0	00	0 0	00	0 0	00	Light haze. 0	00
Dec. 18	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 19	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 20	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 21	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	0 0	00	0 0	00	Lt. haze. Lt. haze. 0	00
Dec. 22	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 23	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Dec. 24	4 st. 0	00	Light haze. 4 st. 0	00	0 0	00	2 st. 0	00	Light haze. 4 st. 0	00	Light haze. 4 st. 0	00
Dec. 25	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 26	2 cir. 0	00	2 cir. 1 st. 0	00	2 st. 0	00	Light haze. 3 st. 0	00	Light haze. 3 st. 0	00	Light haze. 3 st. 0	00
Dec. 27	Dense haze. 2 st. 0	00	Lt. haze. Lt. haze. 0	00	Dense haze. 1 st. 0	00	Lt. haze. Lt. haze. 0	00	10 st. 0	00	10 st. 0	00
Dec. 28	2 cir. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 29	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 30	Dense haze. 1 st. 0	00	Dense haze. 2 st. 0	00	Dense haze. 2 st. 0	00	Dense haze. 3 st. 0	00	Dense haze. 3 st. 0	00	Dense haze. 2 st. 0	00
Dec. 31	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense haze. 6 st. 0	00	0 0	00
Means.	2.32		2.22		2.58		2.64		3.03		3.32	

Date.	1 a.m.		2 a.m.		3 a.m.		4 a.m.		5 a.m.		6 a.m.	
1881.												
Dec. 1	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 2	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Dec. 3	10 st. 0	00	10 st. 0	00	10 st. 0	00	6 cir. st. 3 st. 0	00	5 cir. 1 st. 0	00	2 cir. 0	00
Dec. 4	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	2 cir. st. 5 st. 0	00	1 cir. st. 8 st. 0	00
Dec. 5	D. haze. Lt. haze. 0	00	D. haze. Lt. haze. 0	00	2 cir. st. 3 st. 0	00	10 st. 0	00	3 cir. st. 6 st. 0	00	3 cir. st. 6 st. 0	00
Dec. 6	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	10 st. S.†	00	10 st. S.†	00
Dec. 7	2 st. 0	00	3 st. 0	00	2 st. 0	00	10 st. W.†	00	10 st. W.†	00	10 st. W.†	00
Dec. 8	3 st. SW.†	00	4 st. SW.†	00	3 cir. st. 4 st. 0	00	9 st. SW.†	00	8 st. SW.†	00	4 cir. 2 st. 0	00
Dec. 9	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 10	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 11	4 st. 0	00	1 st. 0	00	0 0	00	0 0	00	4 st. 0	00	2 cir. st. 3 st. 0	00
Dec. 12	0 0	00	0 0	00	1 cir. 2 st. 0	00	4 st. 0	00	4 st. NW.*	00	3 st. 0	00
Dec. 13	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 14	3 st. 0	00	3 st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	4 cir. 3 cir. st. 1 st. 0	00	5 cir. 1 st. 0	00
Dec. 15	Light haze. 0	00	Light haze. 0	00	Light haze. 0	00	0 0	00	0 0	00	1 cir. 0	00
Dec. 16	10 st. 0	00	4 st. 0	00	1 cir. 4 st. 0	00	1 cir. 4 st. 0	00	2 st. 0	00	1 st. 0	00
Dec. 17	1 st. 0	00	1 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	7 cir. 0	00
Dec. 18	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 19	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 20	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	2 cir. 3 st. 0	00	3 cir. 3 st. 0	00	3 cir. 2 st. 0	00	1 cir. 1 st. 0	00
Dec. 21	0 0	00	2 cir. st. 2 st. 0	00	7 cir. st. 0	00	6 cir. st. 2 st. 0	00	5 cir. st. 2 st. 0	00	5 cir. st. 1 st. 0	00
Dec. 22	Lt. haze. Lt. haze. 0	00	4 st. 0	00	1 cir. 2 st. 0	00	1 cir. 8 st. 0	00	1 cir. 7 st. 0	00	3 cir. 2 st. 0	00
Dec. 23	4 st. 0	00	5 cir. 4 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 24	Lt. haze. Lt. haze. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	3 cir. 1 st. 0	00
Dec. 25	3 st. 0	00	2 st. 0	00	0 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00
Dec. 26	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 27	Lt. haze. 4 st. 0	00	4 cir. 3 st. 0	00	5 cir. st. 3 st. 0	00	5 cir. st. 3 st. 0	00	3 cir. st. 5 st. 0	00	3 cir. st. 5 st. 0	00
Dec. 28	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 29	Lt. haze. 4 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00
Dec. 30	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—
Dec. 31	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Means.	4.09		4.61		5.48		6.29		6.16		6.00	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below, amount of precipitation on the right above.]

7 a. m.			8 a. m.			9 a. m.			10 a. m.			11 a. m.			12 m.			
Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount of precipitation.
1 st.	0	00	4 cir. st. 2 st.	0	00	0	0	00	2 st.	0	00	10 st.	0	00	10 st.	0	00	.00
3 cir. cum. D. haze.	0	00	Lt. haze. D. haze.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.01	.17
10 st.	0	.—	10 st.	0	00	10 nim.	0	.02	9 st.	0	.02	10 st.	0	00	10 st.	0	00	.19
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	.00
D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.—
1 st.	0	00	0	0	00	7 st.	NW.*	00	9 st.	NW.*	00	4 st.	0	00	8 st.	0	00	.01
9 st.	0	00	9 st.	W.†	00	5 st.	W.†	00	4 st.	W.†	00	4 st.	W.†	00	4 st.	W.†	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.—
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	W.†	00	10 st.	0	00	10 st.	0	00	.—
3 st.	0	00	Dense haze.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00	0	0	00	0	0	00	.01
5 st.	0	00	2 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Light haze. 4 st.	0	00	2 st.	0	00	1 st.	0	00	0	0	00	1 st.	0	00	0	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	4 st.	0	00	4 st.	0	00	.00
Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	1 st.	0	00	0	0	00	0	0	00	Light haze.	0	00	.00
10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 st.	0	.—	10 st.	0	00	.03
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
D. haze. D. haze.	0	00	D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	Light haze. 5 st.	0	00	4 st.	0	00	3 st.	0	00	.00
Lt. haze. Lt. haze.	0	00	Dense haze.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Light haze.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	0	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	.03
Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	10 st.	0	00	10 nim.	0	00	10 nim.	0	.—	10 st.	0	.01	.00
Light haze. 4 st.	0	00	Light haze. 4 st.	0	00	Light haze. 1 st.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	.00
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2 st.	0	00	4 st.	0	00	.00
Light haze. 5 st.	0	00	Light haze. 4 st.	0	00	Light haze. 4 st.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00	.00
Lt. haze. D. haze.	0	00	9 st.	0	00	10 st.	0	00	10 st.	0	00	Light haze. 7 st.	0	00	Light haze. 5 st.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
1 st.	0	00	Dense haze. 1 st.	0	00	Dense haze. 1 st.	0	00	Dense haze.	0	00	Light haze. 3 st.	0	00	4 st.	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.01
9 st.	W.*	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	.00	.00
3.41			3.48			4.22			4.19			4.16			4.25			.45

7 p. m.			8 p. m.			9 p. m.			10 p. m.			11 p. m.			12 p. m.			Daily means.
10 st.	0	00	10 st.	0	00	10 st.	0	00	1 cir. st. 6 st.	0	00	Dense haze.	0	00	5 st. Lt. haze.	0	00	6.08
10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.02	10 nim.	0	.02	9.29
1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	7.04
2 cir. st. 7 st.	0	00	2 cir. st. 7 st.	0	00	10 st.	0	00	10 st.	0	00	D. haze. D. fog.	0	00	D. haze. D. fog.	0	00	7.00
1 cir. st. 7 st.	0	00	10 st.	0	00	10 st.	0	00	Lt. haze. 7 st.	0	00	2 st.	0	00	1 st.	0	00	2.95
10 st.	S.†	00	10 st.	S.†	00	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—	7.25
10 st.	W.†	00	8 st.	W.†	00	4 st.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	6.20
8 st.	0	00	9 st.	0	00	9 st.	0	00	9 st.	0	00	Lt. haze. 4 st.	0	00	Lt. haze.	0	00	5.50
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	5.00
10 st.	0	00	10 st.	0	60	10 st.	0	00	0	0	00	Lt. haze.	0	00	Lt. haze.	0	00	8.75
2 cir. st. 4 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.01	1 st.	0	.—	1 st.	0	00	2.41
2 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	2.41
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.41
1 cir.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	4.79
1 cir.	0	00	2 cir. st. 2 st.	0	00	10 st.	0	00	4 st.	0	00	2 st.	0	00	D. haze. 2 st.	0	00	1.04
1 st.	0	00	2 st.	0	00	1 st.	0	00	0	0	00	Lt. haze.	0	00	Lt. haze.	0	00	3.79
2 cir. 1 st.	0	00	2 cir. 2 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.83
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
1 cir. 2 st.	0	00	1 st.	0	00	2 st.	0	00	0	0	00	D. haze. Lt. haze.	0	00	D. haze. Lt. haze.	0	00	1.50
2 cir. st. 4 st.	0	00	4 st.	0	00	4 st.	0	00	4 st.	0	00	1 st.	0	00	0	0	00	2.12
1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	1.41
10 st.	0	00	10 st.	0	00	2 st.	0	00	2 st.	0	00	1 st.	0	00	3 st.	0	00	5.04
1 cir. 2 st.	0	00	1 cir. 2 st.	0	00	2 st.	0	00	2 st.	0	00	0	0	00	0	0	00	1:95
2 st.	0	00	8 st.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	1 st.	0	00	1 cir. 1 st.	0	00	1.20
10 st.	0	00	10 st.	0	00	10 st.	0	00	Lt. haze. 5 st.	0	00	Lt. haze. 5 st.	0	00	Lt. haze. 4 st.	0	00	4.70
2 cir. st. 6 st.	0	00	1 cir. st. 5 st.	0	00	2 cir. st. 4 st.	0	00	3 cir. st. 3 st.	0	00	1 cir. 2 cir. st.	0	00	3 cir.	0	00	5.79
1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.25
10 st.	0	00	10 st.	0	00	Lt. haze. 4 st.	0	00	Lt. haze. 5 st.	0	00	Lt. haze. 4 st.	0	00	3 cir. st. 3 st.	0	00	4.08
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	8.04
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9.37
5.67			5.67			5.00			4.00			2.41			2.51			4.07

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m.			2 a.m.			3 a.m.			4 a.m.			5 a.m.			6 a.m.		
	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.
1882.																		
Jan. 1	10 st.	0	00	10 st.	0	00	10 st.	0	00	3 cir. 2 st.	0	00	Light haze. 4 st.	SE.†	00	Light haze. 4 st.	0	00
Jan. 2	1 cir.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 3	0	0	00	0	0	00	0	0	00	1 st.	0	00	2 st.	0	00	Light haze. 2 st.	0	00
Jan. 4	5 cir. cum. 4 st.	0	00	2 cir. cum. 3 st.	0	00	3 cir. cum. 3 st.	0	00	4 cir. cum. 2 st.	0	00	4 cir. cum. 2 st.	0	00	1 cir. cum. 3 st.	0	00
Jan. 5	1 cir. st.	0	00	0	0	00	0	0	00	0	0	00	1 cir.	0	00	0	0	00
Jan. 6	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 7	1 cir.	0	00	1 cir.	0	00	0	0	00	2 cir.	0	00	2 cir.	0	00	0	0	00
Jan. 8	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 9	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 10	0	0	00	0	0	00	0	0	00	0	0	00	1 st.	0	00	0	0	00
Jan. 11	Light haze.	0	00	Light haze.	0	00	0	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00
Jan. 12	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.02	10 nim.	0	.02	10 nim.	0	.02
Jan. 13	10 nim.	0	.02	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01
Jan. 14	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 15	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 16	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 17	Light haze.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	Light haze.	0	00
Jan. 18	Light haze.	0	00	Light haze.	0	00	0	0	00	0	0	00	0			0	0	00
Jan. 19	5 st.	0	00	9 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 20	10 st.	0	00	10 st.	0	00	10 st.	0	00	8 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 21	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	10 st.	0	00
Jan. 22	10 nim.	0	.02	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.—
Jan. 23	0	0	00	0	0	00	9 st.	0	00	4 st.	0	00	1 st.	0	00	0	0	00
Jan. 24	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 25	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 26	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01	Lt. haze. Lt. haze.	0	.—
Jan. 27	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 28	0	0	00	0	0	00	0	0	00	Lt. haze. D. haze.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00
Jan. 29	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 30	0	0	00	0	0	00	0	0	00	[illegible]	0	00	0	0	00	0	0	00
Jan. 31	2 cir.	0	00	2 cir.	0	00	2 cir.	0	00	1 cir.	0	00	0	0	00	1 cir.	0	00
Means.	3.19			3.12			3.45			3.12			3.12.			2.61.		

Date.	1 p.m.			2 p.m.			3 p.m.			4 p.m.			5 p.m.			6 p.m.		
1882.																		
Jan. 1	1 st.	0	00	Light haze. 5 st.	0	00	10 st.	SE.*	00	8 st.	0	00	Dense haze. 2 st.	0	00	Dense haze. 4 st.	E.*	00
Jan. 2	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 3	Lt. haze. Lt. haze.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	1 cir.	0	00	1 st.	0	00
Jan. 4	0	0	00	0	0	00	0	0	00	0	0	00	10 cir. st.	0	00	5 cir. st. 5 st.	0	00
Jan. 5	1 cir. st. 4 st.	0	00	9 st.	0	00	9 st.	E.†	00	10 st.	0	00	10 st.	0	00	10 st.	E.†	00
Jan. 6	0	0	00	0	0	00	1 st.	0	00	2 cir. st.	0	00	3 cir. st.	0	00	2 cir. st.	0	00
Jan. 7	0	0	00	0	0	00	1 st.	0	00	1 cir. cum. 1 st.	0	00	1 cir. cum. 1 st.	0	00	0	0	00
Jan. 8	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 9	0	0	00	0	0	00	1 st.	0	00	1 cir. 1st.	0	00	2 cir. 1 st.	0	00	3 cir. 1st.	0	00
Jan. 10	0	0	00	5 cir. 2 st.	0	00	3 cir. cum.	0	00	3 cir. cum.	0	00	1 st.	0	00	1 st.	0	00
Jan. 11	Dense haze. 4 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 12	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.01	10 nim.	0	.01
Jan. 13	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	10 st.	0	00
Jan. 14	Light haze.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 15	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	1 cir.	0	00
Jan. 16	0	0	00	0	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 17	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	1 cir. 9 st.	0	00
Jan. 18	0	0	00	0	0	00	1 st.	0	00	10 st.	SE.*	00	10 st.	0	00	10 st.	0	00
Jan. 19	10 st.	0	00	7 cir. 3 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 20	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	W.†	00	10 st.	W.†	00	10 nim.	W.†	.—
Jan. 21	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 22	10 st.	0	00	10 st.	0	00	10 st.	SW.*	00	10 st.	0	00	10 st.	W.*	00	7 st.	W.*	00
Jan. 23	0	0	00	0	0	00	0	0	00	1 st.	W.*	00	0	0	00	1 st.	W.*	00
Jan. 24	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	1 cir.	0	00
Jan. 25	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01	10 st.	0	.—
Jan. 26	2 st.	0	00	1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00
Jan. 27	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 28	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 29	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 30	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 31	4 cir. 6 st.	0	00	Light haze. 6 st.	0	00	10 st.	0	00	Dense fog.	0	00	6 cir. Dense haze.	0	00	2 cir. Dense haze.	0	00
Means	3.29			3.87.			4.22.			4.25.			4.54.			4.38.		

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a.m.			8 a.m.			9 a.m.			10 a.m.			11 a.m.			12 m.			Amount of precipitation.
Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	
4 cir. 2 st.	SE. †	00	4 cir. 2 st.	SE. †	00	2 cir.	0	00	1 cir.	0	00	10 st.	0	00	Light haze. 7 st.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	.00
1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	1 cir.	0	00	2 cir. st. 1 st.	0	00	2 cir. st. 2 st.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
6 cir.	0	00	3 cir.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Dense haze. 3 st.	0	00	Dense haze. 2 st.	0	00	Dense haze. 2 st.	0	00	Dense haze. 2 st.	0	00	Dense haze. 3 st.	0	00	Dense haze. 3 st.	0	00	.01
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	9 st.	0	.01	9 st.	0	00	10 st.	0	00	.19
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	.09
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	4 st.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Light haze.	0	00	Lt. haze. 4 st.	0	00	Light haze. 3 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.—
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	4 st.	0	00	Dense haze. 4 st.	0	00	.02
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	10 st.	0	00	.06
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	2 st.	0	00	0	0	00	0	0	00	10 st.	0	00	.03
10 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.03
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
2 cir.	0	00	3 cir.	0	00	3 cir.	0	00	3 cir.	0	00	5 cir. 1 st.	0	00	6 cir. 4 st.	0	00	.00
3.19.			2.83.			2.67.			2.77.			3.06.			3.29.			.43

7 p.m.			8 p.m.			9 p.m.			10 p.m.			11 p.m.			12 p.m.			Daily means.
Dense haze. 2 st.	E. †	00	2 st.	0	00	2 st.	0	00	2 cir.	0	00	2 cir.	0	00	2 cir.	0	00	4.87
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.04
1 st.	0	00	Dense haze. 1 st.	0	00	1 st.	0	00	2 st.	0	00	Light haze.	0	00	10 st.	E. †	00	1.08
2 cir. st. 7 st.	0	00	10 st.	0	00	9 st.	0	00	1 cir. st. 4 st.	0	00	0	0	00	0	0	00	3.75
10 st.	E. †	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	3.12
1 cir. st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	1 st.	0	00	0	0	00	.66
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.45
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.04
6 cir. 1 st.	0	00	7 cir. st. 2 st.	0	00	4 cir. st. 2 st.	0	00	3 st.	0	00	2 st.	0	00	0	0	00	1.54
1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	1.29
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.01	5.37
10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.01	9.91
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	4.75
1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	.29
1 st.	0	00	1 st.	0	00	1 cir. 2 st.	0	00	1 cir. 2 st.	0	00	Light haze.	0	00	Light haze.	0	00	.54
1 cir. 9 st.	0	00	2 cir. 4 st.	0	00	1 cir. 3 st.	0	00	1 cir. 1 st.	0	00	2 st.	0	00	0	0	00	5.04
10 st.	SE.*	00	10 st.	SE.*	00	10 st.	SE.*	00	1 cir. 3 st.	0	00	3 st.	0	00	2 st.	0	00	2.91
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9.75
10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	9 st.	0	00	10 st.	0	00	5 st.	0	00	9.66
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.02	9.50
Lt. haze. 4 st.	W.*	00	Lt. haze. 5 st.	W.*	00	2 st.	W.*	00	2 st.	W.*	00	0	0	00	0	0	00	7.91
Dense haze. 3 st.	0	00	Lt. haze. 6 st.	W.*	00	1 st.	W.*	00	1 st.	W.*	00	1 st.	0	00	3 st.	W.*	00	1.29
1 cir.	0	00	1 cir.	0	00	1 cir.	0	00	1 cir.	0	00	0	0	00	0	0	00	.20
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.—	5.50
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	3.08
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.04
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	.08
8 cir. st. D. haze.	0	00	9 st. Dense haze.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00	3.58
4.58.			4.41.			3.74.			3.22.			2.64.			2.64.			3.42

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds.	Precipitation.
1882.												
Feb. 1	D. haze. Lt. hazé. 0	00	D. haze. Lt. haze. 0	00	D. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	0 0	00
Feb. 2	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	3 cir. 0	00
Feb. 3	Lt. haze. Lt. haze. 0	00	Lt. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 st. D. haze. 0	00
Feb. 4	D. haze. 2 st. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. 2 st. 0	00	Lt. haze. 2 st. 0	00	D. haze. 2 st. 0	00
Feb. 5	1 st. 0	00	0 0	00	3 cir. 0	00	5 cir. 0	00	10 st. 0	00	10 st. 0	00
Feb. 6	D. haze. 4 st. 0	00	10 st. D. haze. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 7	1 st. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. 8 st. 0	00
Feb. 8	0 0	00	Lt. haze. Lt. haze. 0	00	D. haze. D. haze. 0	00	10 st. D. haze. 0	00	10 st. 0	00	10 st. 0	00
Feb. 9	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	10 st. 0	00	10 st. 0	00
Feb. 10	Lt. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00
Feb. 11	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 12	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 13	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. 0	00	Lt. haze. 0	00
Feb. 14	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 15	0 0	00	2 st. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	D. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Feb. 16	1 ci. st. Lt. haze. 1 st. 0	00	L. haze. 2 st. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Feb. 17	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 18	1 st. 0	00	D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	D. haze. Lt. haze. 0	00	10 st. 0	00
Feb. 19	Lt haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 st. 0	00
Feb. 20	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 21	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	D. haze. 0	00	Lt. haze. 0	00
Feb. 22	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 23	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	0 0	00
Feb. 24	0 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	0 0	00	0 0	00
Feb. 25	0 0	00	1 cir. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 26	1 cir. 1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 27	5 cir. 0	00	7 cir. st. Lt. haze. 0	00	2 cir. 0	00	3 cir. 0	00	5 cir. st. 0	00	Lt. haze. 4 st. 0	00
Feb. 28	D. haze. 3 st. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Lt. ha. 4 ci. s. D. ha. 0	00	10 st. 0	00	8 cir. st. Lt. haze. 0	00
Means.	1.39		1.57		1.32		2.00		2.78		4.10	

Date.	1 p.m. Amount, kind, and direction of clouds.	Precipitation.	2 p.m. Amount, kind, and direction of clouds.	Precipitation.	3 p.m. Amount, kind, and direction of clouds.	Precipitation.	4 p.m. Amount, kind, and direction of clouds.	Precipitation.	5 p.m. Amount, kind, and direction of clouds.	Precipitation.	6 p.m. Amount, kind, and direction of clouds.	Precipitation.
1882.												
Feb. 1	Lt. haze. Lt. haze. 0	00	Lt. haze. 5 st. 0	00	Lt. haze. 4 st. 0	00	1 cir. 3 st. 0	00	2 st. 0	00	1 cir. st. 1 st. 0	00
Feb. 2	2 cir. 3 st. 0	00	4 cir. st. 5 st. 0	00	4 cir. 6 st. 0	00	3 cir. 3 st. 0	00	2 cir. 3 st. 0	00	2 cir. 2 st. 0	00
Feb. 3	D. haze. 3 st. 0	00	4 cir. 6 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—
Feb. 4	2 st. 0	00	3 st. 0	00	3 st. 0	00	2 st. 0	00	0 0	00	0 0	00
Feb. 5	3 st. 0	00	10 st. 0	00	2 cir. 8 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 6	4 st. 0	00	10 st. 0	00	10 st. 0	00	4 cir. 6 st. 0	00	3 cir. st. 3 st. 0	00	3 cir. st. 8 st. 0	00
Feb. 7	3 st. 0	00	2 cir. 3 st. 0	00	2 cir. 2 st. 0	00	1 cir. 2 st. 0	00	2 cir. st. 4 st. 0	00	2 cir. st. 3 st. 0	00
Feb. 8	D. haze. 5 st. 0	00	5 cir. 4 st. 0	00	8 cir. 8 st. 0	00	4 cir. 5 st. 0	00	2 cir. 6 st. 0	00	1 cir. 6 st. 0	00
Feb. 9	3 st. 0	00	D. haze. 2 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Feb. 10	D. haze. 6 st. 0	00	2 st. 0	00	3 st. 0	00	2 st. 0	00	0 0	00	0 0	00
Feb. 11	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 12	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 13	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 14	Lt. haze. 8 st. 0	00	2 cir. 2 st. 0	00	4 cir. 3 st. 0	00	4 cir. 3 st. 0	00	3 cir. st. 2 st. 0	00	3 cir. st. 2 st. 0	00
Feb. 15	2 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00
Feb. 16	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Feb. 17	0 0	00	0 0	00	4 cir. 0	00	6 cir. 0	00	5 cir. 0	00	7 cir. 0	00
Feb. 18	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 19	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 20	10 st. 0	00	10 st. 0	00	3 cir. 7 st. 0	00	6 cir. 3 st. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Feb. 21	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 22	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 23	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	2 cir. 0	00	3 cir. 0	00	3 cir. 0	00
Feb. 24	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	2 cir. 0	00
Feb. 25	0 0	00	0 0	00	5 cir. 0	00	Lt. haze. Lt. haze. 0	00	3 cir. st. 0	00	3 cir. st. 1 st. 0	00
Feb. 26	0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00	1 cir. 0	00
Feb. 27	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 28	10 st. 0	.01	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8 st. 0	00
Means.	3.28		4.42		4.78		4.35		3.75		3.71	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
0 0	00	0 0	00	0 0	00	0 0	00	Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	.00
2 cir. 0	00	Lt. haze. 0	00	1 cir. 0	00	Lt. haze. 2 st. 0	00	Lt. haze. 3 st. 0	00	3 cir. 3 st. 0	00	.00
10 st. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 st. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	.—
D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Lt. haze. 0	00	Lt. haze. 0	00	Lt. haze. 1 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	D. haze. 8 st. 0	00	2 st. 0	.00	3 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	5 st. 0	00	.00
10 st. 0	00	4 cir. st. 4 st. 0	00	2 cir. st. 6 st. 0	00	Lt. haze. 5 st. 0	00	4 st. 0	00	4 st. 0	00	.00
Lt. haze. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	8 st. 0	00	.00
10 st. 0	00	10 st. 0	00	Lt. haze. 4 st. 0	00	Lt. haze. 5 st. 0	00	Lt. haze. 3 st. 0	00	Lt. haze. 3 st. 0	00	.00
D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Lt. haze. 4 st. 0	00	D. haze. D. haze. 0	00	D. haze. 4 st. 0	00	D. haze. D. haze. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	Lt. haze. 0	00	Lt. haze. 0	00	Lt, haze. 0	00	Lt. haze. 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
D. haze. 7 st. 0	00	D. haze. 8 st. 0	00	10 st. 0	00	Lt. haze. D. haze. 0	00	D. haze. 4 st. 0	00	3 st. 0	00	.00
D. haze. Lt. haze. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.01
10 st. 0	00	10 st. 0	00	0 0 0	00	0 0	00	0 0	00	0 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
Lt. haze. 4 st. 0	00	Lt. haze. Lt. haze. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
10 st. 0	00	10 st. 0	00	10 st.		10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.—	.03
4.21		4.14		3.82		3.21		3.53		3.07		.04

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
2 st. 0	00	2 st. 0	00	2 st. 0	00	4 st. 0	00	D. haze. 3 st. 0	00	1 st. 0	00	1.29
3 st. 0	00	4 st. 0	00	4 st. 0	00	Lt. haze. 4 st. 0	00	D. haze. 2 st. 0	00	Lt. haze. Lt. haze. 0	00	3.16
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	D. haze. 4 st. 0	00	D. haze. 3 st. 0	00	5.41
0 0	00	0 0	00	0 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	.95
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Lt. haze. 3 st. 0	00	D. haze. 5 st. 0	00	7.20
2 cir. st. 4 st. 0	00	2 cir. st. 3 st. 0	00	10 st. 0	00	10 st. 0	00	1 cir. 2 st. 0	00	2 st. 0	00	7.95
1 cir. st. 4 st. 0	00	2 cir. st. 2 st. 0	00	2 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	0 0	00	3.70
1 cir. 7 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	Lt. haze. D. haze. 0	00	7.33
1 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	2.87
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1.04
0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	0 0	00	.04
0 0	00	2 cir. st. 1 st. 0	00	3 cir. st. 2 st. 0	00	Lt. haze. Lt. haze. 0	00	D. haze. 4 st. 0	00	Lt. haze. D. haze. 0	00	.50
0 0	00	1 cir. st. 0	00	1 cir. st. 1 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	.29
5 cir. st. 3 st. 0	00	4 cir. st. 4 st. 0	00	4 cir. st. 3 st. 0	00	2 cir. 2 cir. st. 2 st. 0	00	3 cir. st. 2 st. 0	00	1 st. 0	00	2.79
0 0	00	2 cir. st. 2 st. 0	00	1 cir. st. 3 st. 0	00	3 st. 0	00	5 cir. 1 st. 0	00	3 cir. Lt. haze. 2 st. 0	00	2.54
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.25
7 cir. 0	00	6 cir. 1 st. 0	00	5 cir. 2 st. 0	00	2 cir. st. 4 st. 0	00	3 cir. st. 4 st. 0	00	1 cir. st. 2 st. 0	00	5.83
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Lt haze. 5 st. 0	00	7.75
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.91
Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	1 cir. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	D. haze. 5 st. 0	00	Lt. haze. 2 st. 0	00	6.95
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.25
4 cir. 0	00	5 cir. 0	00	4 cir. 2 st. 0	00	1 cir. st. 3 st. 0	00	1 cir. D. haze. 0	00	1 st. 0	00	1.45
2 cir. 0	00	3 cir. 0	00	2 cir. 1 st. 0	00	1 cir. 2 st. 0	00	1 cir. 0	00	1 cir. 0	00	1.00
4 cir. st. 1 st. 0	00	5 cir. st. 2 st. 0	00	4 cir. st. 3 st. 0	00	2 cir. st. 3 st. 0	00	5 cir. D. haze. 0	00	1 cir. st. Lt. haze. 1 st. 0	00	1.83
3 cir. 0	00	3 cir. 0	00	2 cir. 2 st. 0	00	1 cir. st. 4 st. 0	00	5 cir. st. 1 st. 0	00	2 cir. Lt. haze. 1 st. 0	00	1.16
0 0	00	0 0	00	0 0	00	1 st. 0	00	8 st. 0	00	D. haze. 5 st. 0	00	1.83
1 cir. 3 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	6 cir. st. 1 st. 0	00	2 st. 0	00	7.75
3.85		4.53		4.85		4.71		4.14		2.35		3.50

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds.	Precipitation.
1882.												
Mar. 1	2 st. 0	00	1 cir. 2 st. 0	00	0 0	00	0 0	00	10 st. W.*	00	2 cir. 2 st. 0	00
Mar. 2	3 cir. 2 st. 0	00	1 cir. st. 2 st. 0	00	10 st. W.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 3	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	2 cir. 0	00	3 cir. 0	00
Mar. 4	10 st. W.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 5	10 st. 0	00	10 st. 0	00	1 cir. st. 4 st. 0	00	5 cir. st. 5 st. 0	00	6 st. 0	00	10 st. 0	00
Mar. 6	3 cir. st. 3 st. 0	00	3 cir. st. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	2 st. 0	00	4 cir. cum. 4 st. 0	00
Mar. 7	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 8	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.02	10 st. 0	.—	10 st. 0	00
Mar. 9	10 st. 0	00	10 st. 0	00	5 st. 0	00	5 st. 0	00	5 st. 0	00	4 st. 0	00
Mar. 10	9 st. 0	00	10 st. 0	00	Lt. haze. 5 st. 0	00	Light haze. 8 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 11	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.02
Mar. 12	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 13	1 cir. Lt. haze. 2 st. 0	00	1 cir. 2 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Mar. 14	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 15	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 16	2 cir. 1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 17	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00
Mar. 18	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 19	3 cir. 3 st. 0	00	1 cir. 8 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Mar. 20	10 nim. 0	.01	10 nim. 0	.—	3 st. 0	.—	0 0	00	0 0	00	0 0	00
Mar. 21	Lt. haze. 4 st 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 22	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. Lt. haze. 1 st. 0	00	Light haze. 3 st. 0	00	Light haze. 5 st. 0	00
Mar. 23	7 st. SW.†	00	1 st. 0	00	1 cir. 1 st. 0	00	Dense haze. 1 st. 0	00	Light haze. 9 st. 0	00	10 nim. 0	.—
Mar. 24	8 st. 0	00	8 st. NW.*	00	10 st. 0	00	1 st. 0	00	6 st. 0	00	9 st. 0	00
Mar. 25	1 st. W.*	00	1 st. W.*	00	1 st. 0	00	1 st. 0	00	0 0	00	Dense haze. 2 st. 0	00
Mar. 26	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	Dense haze. 1 st. 0	00	Dense haze. 2 st. 0	00
Mar. 27	2 st. 0	00	3 st. 0	00	Light haze. 5 st. 0	00	Dense haze. 4 st. 0	00	Light haze. 0	00	0 0	00
Mar. 28	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00
Mar. 29	9 st. 0	00	5 cir. st. 3 st. 0	00	1 cir. 2 st. W.†	00	1 cir. 1 st. 0	00	1 cir. 2 st. 0	00	2 st. 0	00
Mar. 30	10 st. 0	00	10 st. W.*	00	9 st. NW.*	00	8 st. NW.* D. haze.	00	10 st. NW.† Lt. haze.	00	10 st. 0	00
Mar. 31	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00
Means	5.35		5.00		4.19		3.80		4.77		5.12	

Date.	1 p.m.	Precipitation.	2 p.m.	Precipitation.	3 p.m.	Precipitation.	4 p.m.	Precipitation.	5 p.m.	Precipitation.	6 p.m.	Precipitation.
1882.												
Mar. 1	2 st. 0	00	3 cir.st. 5st. D.haz. 0	00	0 0	00	2 cir. 1 st. 0	00	3 cir. 1 st. 0	00	9 st. 0	00
Mar. 2	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 3	10 st. 0	00	2 cir. st. 7 st. 0	00	5 cir. 2 st. 0	00	5 cir. 0	00	2 cir. 0	00	4 cir. 0	00
Mar. 4	10 nim. 0	.01	10 st. 0	.01	5 cir. 2 st. 0	.00	6 cir. 3 st. 0	00	0 0	00	0 0	00
Mar. 5	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 6	2 cir. 6 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00
Mar. 7	3 cir. 5 st. 0	00	4 cir. 5 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00	9 st. 0	00
Mar. 8	10 st. 0	00	10 st. 0	00	10 st. 0	00	4 cir. 3 st. 0	00	5 cir. 1 st. 0	00	4 cir. 0	00
Mar. 9	2 cir. cum. 3 st. 0	00	10 st. 0	00	10 st. 0	00	4 cir. 4 st. 0	00	5 cir. cum. 2 st. 0	00	1 cir. cum. 1 st. 0	00
Mar. 10	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 11	1 cir. 2 st. 0	00	2 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 12	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—
Mar. 13	3 cir. 0	00	5 cir. 0	00	5 cir. 3 st. 0	00	6 cir. 2 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 14	4 cir. 4 st. 0	00	7 cir. 2 st. 0	00	8 nim. 0	.—	9 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—
Mar. 15	3 cir. 0	00	5 cir. 0	00	6 cir. 0	00	3 cir. 0	00	3 cir. 0	00	0 0	00
Mar. 16	5 cir. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 17	3 cir. 0	00	4 cir. 3 st. 0	00	6 cir. 2 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 18	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Mar. 19	2 cir. 1 st. 0	00	2 cir. 0	00	1 cir. 0	00	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—
Mar. 20	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 21	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 22	10 nim. 0	.01	10 st. 0	.—	4 cir. 3 st. 0	00	2 cir. 0	00	1 cir. 0	00	1 cir. 0	00
Mar. 23	10 st. 0	00	10 st. 0	00	3 cir. 5 st. 0	00	3 st. 0	00	3 cir. 1 st. 0	00	4 cir. 1 st. 0	00
Mar. 24	5 cir. 4 st. 0	00	3 cir. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00	3 cir. 1 st. 0	00	2 cir. 1 st. 0	00
Mar. 25	0 0	00	0 0	00	3 cir. 0	00	1 cir. 0	00	1 cir. 0	.00	1 cir. 0	00
Mar. 26	3 cir. 2 st. 0	00	2 cir. 2 st. 0	00	4 cir. 4 st. 0	00	6 cir. 3 st. 0	00	1 cir. 7 st. 0	00	10 nim. 0	.—
Mar. 27	5 cir. st. 1 st. 0	00	3 cir. 0	00	2 cir. 0	00	2 cir. 0	00	1 cir. 0	00	0 0	00
Mar. 28	2 cir. 6 st. 0	00	4 cir. 2 st. 0	00	4 cir. 5 st. 0	00	Lt. haze. Lt. haze. 0	.00	10 st. 0	00	10 st. 0	00
Mar. 29	0 0	00	0 0	00	3 cir. 0	00	3 cir. 0	00	5 cir. 2 st. 0	00	5 cir. 2 st. 0	00
Mar. 30	3 cir. 3 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 31	10 st. 0	00	10 st. 0	00	10 st. 0	00	4 cir. 5 st. 0	00	4 cir. 2 st. 0	00	2 cir. 2 st. 0	00
Means	6.29		6.19		6.20		5.45		5.58		5.41	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table, * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below, amount of precipitation on the right above.]

7 a.m.			8 a.m.			9 a.m.			10 a.m.			11 a.m.			12 m.			
Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount of precipitation.
2 cir. 4 st.	0	00	2 st.	0	00	10 st.	0	00	4 cir. st.	0	00	1 st.	0	00	1 cir. st. 2 st.	0	00	.00
10 st.	0	00	Light haze. 5 st.	0	00	3 cir. st. 3 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
10 st.	0	00	10 st.	0	00	10 nim.	0	.01	10 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.—	.03
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
2 cir. 2 st.	0	00	6 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	5 cir. 3 st.	0	00	.00
0	0	00	4 cir. Light haze.	0	00	5 cir. Light haze.	0	00	3 cir. st. 5 st.	0	00	2 cir. 4 st.	0	00	6 cir. 2 st.	0	00	.01
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.07
5 st.	0	00	6 st.	0	00	10 st	0	00	10 st.	0	00	2 st.	0	00	3 cir. 3 st.	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.01
10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	8 st.	0	.01	.12
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.05
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	5 cir. 3 st.	0	00	4 cir. 3 st.	0	00	.02
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	1 cir.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	3 cir.	0	00	.00
0	0	00	0	0	00	0	0	00	4 cir. st.	0	00	3 cir.	0	00	3 cir.	0	00	.00
10 st.	0	00	10 st.	0	00	10 nim.	0	.01	10 nim.	0	.02	10 st.	0	.01	10 st.	0	00	.04
10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.01	3 cir. st. 4 st.	0	.—	3 cir. st. 2 st.	0	00	4 cir st. 2 st.	0	00	.06
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.01
0	0	00	0	0	00	Light fog.	0	00	Light haze. 4 st.	0	00	D. haze. Lt. fog.	0	00	Dense haze.	0	00	.00
Light haze. 4 st.	0	00	Light haze. 6 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	.01
10 nim.	0	.01	10 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.01	.04
2 st.	0	00	10 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	6 cir. 3 st.	0	00	.00
Light haze. 5 st.	0	00	Light haze. 5 st.	0	00	2 st.	0	00	3 cir. 2 st.	0	00	0	0	00	0	0	00	.00
Light haze. 6 st.	0	00	8 st.	0	00	8 st.	0	00	2 cir. st. 8 st.	0	00	5 cir. 2 st.	0	00	3 cir. 2 st.	0	00	.02
0	0	00	0	0	00	1 st.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	.00
Light haze.	0	00	Light haze. 7 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
3 st.	0	00	4 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	4 cir. st. 4 st.	N. W. †	00	.00
2 st.	0	00	3 st.	0	00	4 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
5.38			6.00			6.41			7.00			6.00			6.32			.51

7 p.m.			8 p.m.			9 p.m.			10 p.m.			11 p.m.			12 p.m.			Daily means.
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	5.45
9 st.	0	00	9 st.	0	00	8 st.	0	00	4 cir. 2 st.	0	00	3 cir. 1 st.	0	00	1 cir. 1 st.	0	00	8.20
3 cir. cum. 2 st.	0	00	4 cir. cum. 2 st.	0	00	1 cir. cum. 7 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	W. †	00	6.58
3 cir.	0	00	3 cir. cum. 2 st.	0	00	2 cir. cum. 5 st.	0	00	9 st.	0	00	10 st.	0	00	10 st.	0	00	8.58
6 cir. cum. 2 st.	0	00	2 cir. cum. 6 st.	0	00	5 cir. cum. 2 st.	0	00	7 cir. cum. 1 st.	0	00	10 st.	0	00	3 cir. cum. 4 st.	0	00	9.12
9 st.	0	00	1 cir. 7 st.	0	00	4 cir. 2 st.	0	00	5 cir. 2 st.	0	00	1 cir. st. 3 st.	0	00	1 cir. 1 st.	0	00	6.70
10 st.	0	00	10 st.	0	00	1 cir. 7 st.	0	00	1 cir. 7 st.	0	00	10 nim.	0	.—	10 nim.	0	.01	5.91
4 cir. 3 cir. cum. 1 st.	0	00	1 cir. 8 st.	0	00	10 st.	0	00	10 st.	0	00	3 cir. cum. 4 st.	0	00	9 st.	0	00	9.16
3 cir.	0	00	1 cir.	0	00	7 st.	0	00	8 st.	0	00	10 st.	0	00	10 st.	W. *	00	6.62
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	9.66
0	0	00	0	0	00	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	5.20
10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.—	1 cir. 7 st.	0	.01	1 cir. 3 st.	0	00	8 st.	0	00	8.08
10 st.	0	00	3 cir. 2 st.	0	00	4 cir. 3 st.	0	00	3 cir. 4 st.	0	00	6 cir. cum. 3 st.	0	00	3 cir. cum. 3 st.	0	00	4.00
10 nim.	N. W. †	.—	10 st.	0	.01	2 cir.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	8.08
0	0	00	0	0	00	1 cir.	0	00	2 cir.	0	00	3 cir. 1 st.	0	00	3 cir. 1 st.	0	00	1.33
0	0	00	0	0	00	0	0	00	0	0	00	1 cir.	0	00	1 cir. 1 st.	0	00	.62
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	5.12
10 st.	0	00	10 st.	0	00	2 cir. 4 st.	0	00	3 cir. 4 st.	0	00	4 cir. 1 st.	0	00	3 cir. 3 st.	0	00	9.33
10 nim.	0	.—	10 st.	0	.—	10 st.	0	00	10 nim.	0	.—	1 cir. 9 nim.	W. *	.01	10 nim.	0	.—	8.29
0	0	00	0	0	00	1 cir.	0	00	1 cir.	0	00	2 cir. 2 st.	0	00	1 cir. Lt. haze. 3 st.	0	00	1.37
0	0	00	0	0	00	1 cir.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	.66
1 cir.	0	00	1 cir.	0	00	9 nim.	0	.—	3 cir. cum. 4 st.	0	.—	9 st.	0	00	9 st.	SW. *	00	5.54
2 cir. 6 st.	0	00	1 cir. 7 st.	0	00	1 cir. 6 st.	0	00	1 cir. 7 st.	0	00	7 st.	0	00	1 cir. 7 st.	NW. *	00	7.33
6 cir. 1 st.	0	00	5 cir. 1 st.	0	00	5 cir. 1 st.	0	00	2 cir. 1 st.	0	00	1 st.	W. *	00	1 st.	W. *	00	4.66
0	0	00	0	0	00	0	0	00	0	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1.37
10 nim.	0	.01	10 nim.	0	.—	4 cir. 1 st.	0	.01	2 cir. 1 st.	0	00	3 cir. st. 2 st.	0	00	2 st.	0	00	5.37
0	0	00	0	0	00	0	0	00	1 cir.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1.58
4 cir. 2 st.	0	00	2 cir. 6 st.	0	00	2 cir. 5 st.	0	00	2 cir. 3 cir. st. 2 st.	0	00	5 cir. st. 4 st.	0	00	4 cir. st. 5 st.	0	00	5.83
4 cir. 2 st.	0	00	2 cir. 4 st.	0	00	3 cir. 2 st.	0	00	9 st.	0	00	10 st.	0	00	10 st.	0	00	4.29
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	3.08
1 cir.	0	00	1 cir.	0	00	3 cir.	0	00	2 cir. 2 st.	0	00	4 cir. st. 2 st.	0	00	1 cir. 2 cir. st. 3 st.	0	00	4.70
5.61			5.51			5.51			5.67			6.03			5.90			5.61

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.		Precipitation.	2 a. m. Amount, kind, and direction of clouds.		Precipitation.	3 a. m. Amount, kind, and direction of clouds		Precipitation.	4 a. m. Amount, kind, and direction of clouds.		Precipitation.	5 a. m. Amount, kind, and direction of clouds.		Precipitation.	6 a. m. Amount, kind, and direction of clouds.		Precipitation.
1882.																		
Apr. 1	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 2	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 3	9 st.	0	00	9 st.	0	00	7 st.	0	00	2 cir. Lt. haz. 3 st.	0	00	Light haze. 4 st.	0	00	3 cir. st. 5 st.	0	00
Apr. 4	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	Light haze. 5 st.	0	00
Apr. 5	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st. Dense haze.	0	00	10 nim.	0	.—	10 nim.	0	.01
Apr. 6	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	2 st.	0	00	Light haze. 4 st.	0	00
Apr. 7	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 8	3 cir. 3 st.	0	00	4 cir. 2 st.	0	00	4 cir. 2 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	0	0	00
Apr. 9	9 st.	0	00	10 st.	0	00	Light haze. 7 st.	0	00	Dense haze. 5 st.	0	00	Dense haze. 7 st.	0	00	10 st.	0	00
Apr. 10	5 cir. st. 3 st.	0	00	Dense haze. 3 st.	0	00	Dense haze. 1 st.	0	00	Dense haze. 1 st.	0	00	Light haze. 8 st.	0	00	Light haze. 8 st.	0	00
Apr. 11	Dense fog.	0	00	Dense fog.	0	00	Light haze. D. fog.	0	00	Lt. haz. 1 st. D. haz.	0	00	Light haze.	0	00	1 st.	0	00
Apr. 12	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00
Apr. 13	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 cir. 2 st.	0	00	5 st.	0	00	10 st.	SE. †	00
Apr. 14	10 st.	WNW. *	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 15	10 st.	S. *	00	10 st.	0	00	10 st.	0	00	9 st.	0	00	3 cir. st. 6 st.	0	00	1 cir. st. 8 st.	0	00
Apr. 19	10 st.	S. †	00	10 nim.	0	.—	10 st.	SSW. *	.—	10 st.	SSW. *	00	10 st.	SSW.*	00	10 st.	SSW. †	00
Apr. 17	10 st.	W. †	.—	9 st. Dense haze.	0	.—	9 st.	W. †	.—	9 st.	W. †	.—	6 st.	0	.01	5 st.	0	00
Apr. 18	6 st.	NW. †	00	1 cir. st. 3 st.	0	00	2 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 19	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 20	4 cir. st. 3 st.	W. †	00	2 st.	0	00	3 st.	0	00	1 cir. 3 st.	0	00	4 st.	0	00	9 st.	0	00
Apr. 21	8 st.	0	00	8 st.	0	00	7 st.	0	00	1 cir. st. D. hz. 3 st.	0	00	4 cir. st. 1 st.	0	00	2 st.	0	00
Apr. 22	4 st.	NW. *	00	9 st. NW.* D. haze.		00	10 st. D. haze.	W.*	00	2 cir. st. D. hz. 3 st.	0	00	Light haze. 6 st.	0	00	Light haze. 5 st.	0	00
Apr. 23	0	0	00	1 cir.	0	00	1 cir.	0	00	1 cir.	0	00	0	0	00	0	0	00
Apr. 24	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	00
Apr. 25	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 26	3 cir. st. 1 st.	0	00	2 cir. st. 3 st.	0	00	1 cir. st. 3 st.	0	00	1 cir. 2 st.	0	00	1 cir. 4 st.	0	00	5 st.	0	00
Apr. 27	9 st.	0	00	9 st.	S. †	00	10 st.	SW. †	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 28	10 st.	W. *	00	1 cir. 7 st.	W. *	00	1 cir. 3 st.	W. *	00	1 cir. D. haz. 2 st.	W. †	00	Light haze. 4 st.	0	00	Light haze. 4 st.	0	00
Apr. 29	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	2 st.	0	00
Apr. 30	10 nim.	0	.01	10 nim.	0	.01	10 st.	0	.—	10 st.	0	00	10 st.	0	00	10 st.	0	00
Means.	6.93			6.70			6.26			6.03			6.30			6.93		

Date.	1 p. m.			2 p. m.			3 p. m.			4 p. m.			5 p. m.			6 p. m.		
1882.																		
Apr. 1	10 st.	0	00	10 st.	0	00	10 st.	0	00	7 st.	NW.*	00	8 st.	0	00	4 cir. 3 st.	0	00
Apr. 2	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 3	10 nim.	0	.—	10 st.	0	.—	4 cir. 4 st.	0	00	5 cir. 3 st.	0	00	4 cir. 5 st.	0	00	4 cir. 1 st.	0	00
Apr. 4	6 cir. st. 3 st.	0	00	5 cir. 4 st.	0	00	4 cir. 5 st.	0	00	9 st.	0	00	8 st.	0	00	5 cir. 1 st.	0	00
Apr. 5	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Apr. 6	8 st.	0	00	8 st.	0	00	4 cir. 4 st.	0	00	6 cir. 3 st.	0	00	4 cir. 2 st.	0	00	5 cir. 3 st.	0	00
Apr. 7	10 st.	0	00	10 st.	0	00	10 st.	0	00	5 cir. st. 3 st.	0	00	4 cir. st. 4 st.	0	00	5 cir st. 3 st.	0	00
Apr. 8	1 cir.	0	00	3 cir.	0	00	5 cir.	0	00	3 cir.	0	00	2 cir.	0	00	4 cir.	0	00
Apr. 9	9 nim.	0	.—	9 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	00
Apr. 10	D. fog. D. fog.	0	00	D. fog. D. fog.	0	00	Dense fog.	0	00	D. fog. D. fog.	0	00	5 cir. cum. 3 st.	0	00	6 cir. cum. 2 st.	0	00
Apr. 11	1 cir.	0	00	3 cir.	0	00	2 cir.	0	00	2 cir.	0	00	1 cir.	0	00	0	0	00
Apr. 12	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Apr. 13	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 st.	0	.01	10 st.	0	00	10 st.	0	00
Apr. 14	0	0	00	0	0	00	0	0	00	1 cir.	0	00	2 st.	0	00	2 cir. 4 st.	0	00
Apr. 15	4 cir. 3 cir. st.	0	00	8 st.	0	00	9 st.	0	00	10 st.	SE. †	00	10 st.	SE. †	00	9 st.	ESE. †	00
Apr. 16	4 cir. 2 st.	0	00	4 cir. Dense fog.	0	00	5 cir. 2 st.	0	00	6 cir.	0	00	2 cir. 1 st.	0	00	Lt. haze. Lt. haze.	0	00
Apr. 17	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Apr. 18	5 cir. Dense fog.	0	00	3 cir. Dense fog.	0	00	4 cir. Dense fog.	0	00	6 cir.	0	00	5 cir.	0	00	5 cir.	0	00
Apr. 19	10 st.	0	00	10 st.	0	00	10 st.	0	00	5 cir. 4 st.	0	00	Dense fog.	0	00	Dense fog.	0	00
Apr. 20	10 st.	0	00	10 st.	0	00	4 cir. st. 5 st.	0	00	4 cir. 5 st.	0	00	3 cir. 5 st.	0	00	2 cir. 6 st.	0	00
Apr. 21	3 cir. 4 st.	0	00	Dense haze.	0	00	D. haze. D. haze.	0	00	4 cir. 2 st.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00
Apr. 22	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Apr. 23	1 cir.	0	00	3 cir. st.	0	00	3 cir.	0	00	Dense haze.	0	00	Dense haze.	0	00	Dense haze.	0	00
Apr. 24	10 nim.	0	.02	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01
Apr. 25	7 st.	SSW. †	00	3 cir. 2 st.	0	00	Dense haze.	0	00	Dense haze.	0	00	3 cir. 1 st.	0	00	2 cir. 2 cir. st. 1 st.	0	00
Apr. 26	1 st.	0	00	1 st.	0	00	0	0	00	1 st.	0	00	1 cir.	0	00	1 cir. 1 st.	0	00
Apr. 27	Dense haze.	0	00	Dense haze. 2 st.	0	00	D. haze. D. hase.	0	00	D. haze. D. haze.	0	00	Dense haze.	0	00	5 cir. 2 st.	0	00
Apr. 28	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Apr. 29	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Apr. 30	2 cir.	0	00	2 cir.	0	00	0	0	00	6 cir.	0	00	3 cir.	0	00	2 cir. st.	0	00
Means.	5.14			5.00			4.80			5.00			4.54			4.66		

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below, amount of precipitation on the right above.]

7 a. m.		8 a. m.		9 a. m.		10 a. m.		11 a. m.		12 m.		Amount of precipitation.
Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
3 cir. st. 3 st. 0	00	3 cir. st. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	6 cir. st. 3 st. 0	00	.00
10 nim. 0	.—	10 st. 0	.01	3 cir. st. 7 st. 0	00	2 st. 0	00	1 st. 0	00	0 0	00	.02
Light haze. 7 st. 0	00	Light haze. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	.00
10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	.07
Light haze. D. fog. 0	00	Lt. fog. Lt. fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
1 st. 0	00	2 st. 0	00	Dense haze. 2 st. 0	00	0 0	00	0 0	00	0 0	00	.00
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	.00
10 st. 0	00	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	.05
10 st. 0	00	10 st. 0	00	8 st. WNW.†	00	2 st. WNW.†	00	0 0	00	0 0	00	.00
2 cir. st. 8 st. 0	00	4 cir. st. 4 st. 0	00	5 cir. st. 4 st. 0	00	4 cir. st. 2 st. 0	00	5 cir. 0	00	3 cir. 1 st. 0	00	.—
10 st. SSW.†	00	10 st. SSW.†	00	6 st. 0	00	Lt. haze. 6 st. SSW.†	00	4 cir. st. 3 st. W.†	00	4 cir. st. 4 st. W.†	00	.–
6 st. 0	00	9 st. SSW.†	00	9 st. SSW.†	00	8 st. SSW.†	00	4 cir. 3 st. SSW †	00	3 st. 0	.00	.01
10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense haze. 4 st. 0	00	Dense haze. 4 st. 0	00	Dense haze. 5 st. 0	00	.00
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.01	10 st. 0	00	.01
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
2 cir. st. 3 st. 0	00	9 st. 0	00	5 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.01	10 st. 0	00	.01
0 0	00	0 0	00	0 0	00	0 0	00	3 cir. 0	00	1 cir. 0	00	.00
10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.01	10 nim. 0	.01	.22
10 st. 0	00	10 st. 0	00	10 st. SW.†	00	10 st. 0	00	10 st. SW.†	00	8 st. SW.†	00	.00
4 st. 0	00	4 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	3 cir. 3 st. 0	00	.00
Light haze. 1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
2 st. 0	00	4 st. W.†	00	2 cir. 3 st. W.†	00	1 cir. 1 st. W.†	00	1 st. 0	00	0 0	00	.—
10 st. 0	00	10 st. 0	00	1 st. 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	.02
7.10		7.36		6.90		6.10		6.00		5.53		.41

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
3 cir. 3 st. 0	00	2 cir. 3 st. 0	00	1 cir. 2 st. 0	00	2 cir. 2 st. 0	00	9 st. NW.*	00	9 st. NW.†	00	8.66
10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	3 cir. 5 st. 0	00	9 st. 0	00	9.83
2 cir. 2 st. 0	00	3 cir. 3 st. 0	00	4 cir. 1 st. 0	00	2 cir. 2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	7.04
3 cir. 1 st. 0	00	2 cir. 5 st. 0	00	4 cir. 2 st. 0	00	6 st. 0	00	1 cir. 8 st. 0	00	9 st. 0	00	6.58
0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00	1 cir. 0	00	3.95
3 cir. 5 st. 0	00	1 cir. 8 st. 0	00	10 st. 0	00	9 st. 0	00	9 st. SW.†	00	9 st. S.†	00	6.91
5 cir. st. 4 st. 0	00	2 cir. st. 6 st. 0	00	3 cir. st. 5 st. 0	00	3 cir. 5 st. 0	00	3 cir. 1 st. 0	00	3 cir. 3 st. 0	00	9.04
5 cir. 0	00	4 cir. 2 st. 0	00	4 cir. 1 st. 0	00	3 cir. 2 st. 0	00	9 st. 0	00	9 st. NW.†	00	3.33
9 st. 0	00	9 st. 0	00	1 cir. 8 st. 0	00	1 cir. 8 st. 0	00	1 cir. 2 cir. st. 2 st. 0	00	2 cir. 2 cir. st. 2 st. 0	00	8.87
2 cir. 2 cir. cum. 1 st. 0	00	1 cir. 1 st. 0	00	0 0	00	0 0	00	1 st. Light haze. 0	00	0 0	00	2.29
0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 cir. 1 st. 0	00	.79
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.70
10 st. 0	00	10 st. 0	00	6 cir. cum. 1 st. 0	00	4 cir. cum. 2 st. 0	00	9 st. NW.*	00	10 st. WNW.*	00	8.12
Light haze. D. fog. 0	00	Lt. haze. D. fog. 0	00	Lt. fog. D. fog. 0	00	D. fog. D. fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	4.12
9 st. ESE.†	00	9 st. ESE.†	00	9 st. ESE.†	00	9 st. ESE.†	00	1 cir. st. 8 st. S.*	.—	9 st. S.*	00	8.58
Lt. haze. Lt. haze. 0	.—	Lt. haze. Lt. haze. 0	.—	3 cir. D. haze. 0	.—	2 cir. D. fog. 0	.—	1 cum. st. 8 st. S.†	.—	9 st. W.†	.—	6.50
0 0	00	0 0	00	3 cir. 0	00	4 cir. 1 st. 0	00	8 st. NW.†	00	9 st. NW.†	00	4.79
2 cir. 0	00	4 cir. 1 st. 0	00	3 cir. 3 cir. st. 2 st. 0	00	9 st. 0	00	8 st. W.†	00	1 cir. st. 7 st. W.†	00	6.37
Dense fog. 0	00	5 cir. 3 st. 0	00	9 st. 0	00	9 st. W.†	00	8 st. NW.†	00	2 cir. st. 5 st. SW.†	00	8.33
8 st. 0	00	4 cir. 4 st. 0	00	3 cir. 4 st. 0	00	4 cir. 2 st. 0	00	8 st. 0	00	9 st. W.†	00	7.87
D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	3 cir. 5 st. 0	00	1 cir. 2 st. 0	00	3 st. W.†	00	1 cir. 1 st. 0	00	4.54
2 cir. 1 st. 0	00	1 cir. 0	00	0 0	00	1 st. 0	00	0 0	00	0 0	00	6.83
Dense haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	1.83
10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.01	10.00
1 cir. 1 cir. st. 0	00	2 cir. 0	00	1 cir. 1 cir. st. 0	00	1 ci. s. 1 ci. cu. 2 s. 0	00	9 st. E.†	00	5 st. 0	00	6.79
1 cir. 1 st. 0	00	2 cir. 1 st. 0	00	3 cir. 1 st. 0	00	3 cir. 1 st. 0	00	4 st. 0	00	8 st. 0	00	2.87
D. haze. D. haze. 0	00	3 cir. st. 1 st. 0	00	1 cir. 1 cir. st. 2 st. 0	00	2 cir. 6 st. 0	00	9 st. 0	00	9 st. 0	00	6.54
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1.45
1 cir. st. 1 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	3.08
1 cir. st. 0	00	1 cir. 2 st. 0	00	6 st. W.†	00	8 st. NW.†	.00	9 st. NW.†	00	9 st. W.†	00	5.66
3.66		4.50		4.86		5.23		6.08		6.23		5.74

Statement showing the amount, kind and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.		Precipitation.	2 a. m. Amount, kind, and direction of clouds.		Precipitation.	3 a. m. Amount, kind, and direction of clouds.		Precipitation.
1882.									
May 1	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 2	1 st.	0	00	2 st.	0	00	9 st.	0	00
May 3	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01
May 4	10 st.	NE.†	00	10 st.	NE.†	00	10 st.	0	00
May 5	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 6	1 cir. 6 st.	E.†	00	5 cir. st. 1 st.	NE.†	00	3 cir. st. 1 st.	NE.*	00
May 7	10 nim.	NE.*	.01	10 nim.	NE.*	.—	10 nim.	NE.*	.—
May 8	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—
May 9	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01
May 10	8 st.	E.†	00	9 st.	E.†	00	9 st.	0	00
May 11	9 st.	0	00	10 st.	SE.†	00	10 st.	SE.*	00
May 12	10 st.	S.†	00	10 st.	SSW.†	00	9 st.	SSW.†	00
May 13	10 nim.	0	.—	10 nim.	SW.*	.01	10 nim.	SW.*	.—
May 14	10 st.	0	00	10 st.	0	00	10 nim.	0	.—
May 15	10 st.	SW.†	00	10 st.	0	00	10 st.	0	00
May 16	10 st.	0	00	Dense fog.	0	00	Dense fog.	0	00
May 17	10 st.	0	00	10 st.	0	00	10 st.	0	.—
May 18	10 st.	SSE.†	.—	10 st.	0	00	10 nim.	0	.—
May 19	10 st. Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00
May 20	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.01
May 21	10 nim.	0	.01	10 st.	0	.—	10 st.	0	00
May 22	10 st.	0	00	10 st.	0	00	Dense fog.	0	00
May 23	10 st.	0	00	10 nim.	0	.—	10 st.	E.*	.01
May 24	1 cir. 1 cir.st. 2 st.	E.*	00	1 cir. 1 cir. st. 1 st.	E.*	00	1 cir. 1 cir.st. 1 st.	E.*	00
May 25	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 26	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 27	9 st.	E.*	00	9 st.	E.*	00	9 st.	E.*	00
May 28	1 cir. st.	0	00	1 cir. st. 1 st.	E.*	00	1 cir. st. 1 st.	E.*	00
May 29	10 st.	E.*	00	10 st.	0	00	10 st.	0	00
May 30	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 31	10 nim.	0	.—	10 nim.	E.*	.—	10 nim.	E.*	.—
Means.	9.00			8.42			8.23		

Date.	4 a. m. Amount, kind, and direction of clouds.		Precipitation.	5 a. m. Amount, kind, and direction of clouds.		Precipitation.	6 a. m. Amount, kind, and direction of clouds.		Precipitation.
1882.									
May 1	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 2	10 st.	0	00	10 st.	0	00	10 nim.	0	.—
May 3	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01
May 4	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 5	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 6	3 cir. st. 1 st.	NE.*	00	4 cir. st. 1 st.	NE.†	00	2 cir. st. 4 st.	0	00
May 7	10 nim.	NE.*	.01	10 nim.	0	.—	10 nim.	0	.01
May 8	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 9	10 nim.	0	.02	10 nim.	0	.01	10 nim.	0	.—
May 10	9 st.	0	00	10 st.	0	00	10 st.	0	00
May 11	10 st.	0	00	10 nim.	0	.—	10 nim.	0	.—
May 12	9 st.	0	00	10 st.	0	00	10 st.	0	00
May 13	10 nim.	0	.—	10 nim.	0	.—	10 st.	0	.—
May 14	10 st.	W.†	.—	10 st.	W.†	00	10 st.	W.†	00
May 15	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 16	2 cir. Dense fog.	0	00	2 cir. Dense fog.	0	00	1 cir. Dense fog.	0	00
May 17	10 st.	0	.—	10 st.	0	00	10 st.	0	00
May 18	10 st.	0	.—	10 nim.	0	.—	10 nim.	0	.01
May 19	10 st. Dense fog.	0	00	10 st. Dense fog.	0	00	10 st.	W.†	00
May 20	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 21	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 22	10 st.	W.*	00	10 st.	0	00	10 st.	0	00
May 23	10 st.	0	.—	10 st.	0	00	10 st.	0	.—
May 24	1 cir. 1 st.	E.*	00	1 cir. 1 st.	E.*	00	10 st.	E.*	00
May 25	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 26	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 27	1 cir. st. 1 st.	E.*	00	1 st.	0	00	0	0	00
May 28	1 cir. st. 1 st.	E.*	00	0	0	00	1 cir. 1 st.	0	00
May 29	10 st.	0	00	10 st.	0	00	10 nim.	0	.—
May 30	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 31	10 st.	E.*	.—	10 st.	E.*	00	10 st.	E*.	00
Means.	8.71			8.71			9.00		

Date.	1 p. m.			2 p. m.			3 p. m.		
1882.									
May 1	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 2	4 cir. 3 st.	0	00	4 cir. 2 st.	0	00	3 cir. Dense fog.	0	00
May 3	Dense fog.	0	00	Dense fog.	0	00	3 cir.	0	00
May 4	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 5	5 cir. 4 st.	NE.†	00	4 cir. 2 st.	NE.†	00	3 cir.	0	00
May 6	10 st.	SW.†	00	9 st.	SW.†	00	4 cir. 5 st.	SW.†	00
May 7	10 st.	0	.01	10 st.	0	00	10 st.	0	00
May 8	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—
May 9	10 st.	0	00	6 cir. 1 st.	0	00	5 cir. 2 st.	0	00
May 10	9 st.	0	00	10 st.	E.†	00	4 cir. st. 5 st.	E.†	00
May 11	9 st.	0	00	9 st.	0	00	9 st.	0	00
May 12	10 st.	E.	.01	10 st.	0	00	D. haze. D. haze.	0	00
May 13	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 14	10 st.	0	00	10 st.	0	00	8 st.	0	00
May 15	10 st.	0	.00	10 st.	SW.*	00	10 st.	SW.*	00
May 16	3 cir.	0	00	2 cir.	0	00	Dense haze.	0	00
May 17	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 18	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 19	2 cir. 2 st.	0	00	2 cir. 2 st.	W.†	00	3 cir. 3 st.	W.†	00
May 20	7 st.	SE.†	00	10 st.	SE.†	00	10 st.	0	00
May 21	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 22	3 cir. st. 4 st.	NE.†	00	10 st.	NE.*	00	8 st.	NE.*	00
May 23	10 st.	0	00	10 st.	E.*	00	9 st.	E.*	.00
May 24	4 cir. 3 st.	E.*	00	4 st.	E.*	00	8 st.	E.*	00
May 25	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 26	3 cir. 2 st.	NE.†	00	1 st.	0	00	0	0	00
May 27	0	0	00	0	0	00	0	0	00
May 28	4 st.	NE.*	00	4 st.	NE.*	00	4 st.	NE.*	00
May 29	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00
May 30	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 31	10 st.	0	00	10 st.	NW.†	00	10 nim.	0	.—
Means	8.10			7.81			7.29		

Date.	4 p. m.			5 p. m.			6 p. m.		
1882.									
May 1	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01
May 2	D. fog. D. fog.	0	00	3 cir. st. 2 st.	N.*	00	5 cir. 3 st.	N.*	00
May 3	5 cir. 2 st.	0	00	D. haze. D. haze.	0	00	D. haze. D. haze.	0	00
May 4	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 5	3 cir.	0	00	0	0	00	1 cir.	0	00
May 6	3 cir. 6 st.	SW.†	00	10 st.	0	00	10 st.	0	00
May 7	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—
May 8	10 nim.	0	.01	10 nim.	0	.—	10 st.	0	.01
May 9	7 cir. 2 st.	0	00	10 st.	0	00	10 st.	0	00
May 10	3 cir. 5 st.	E.†	00	10 st.	0	00	10 st.	0	00
May 11	8 st.	0	00	9 st.	0	00	9 st.	0	00
May 12	10 st.	0	00	10 st.	0	00	Dense fog.	0	.—
May 13	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 14	10 st.	0	00	10 st.	0	00	9 st.	0	00
May 15	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 16	Dense fog.	0	00	10 st.	0	00	10 st.	0	00
May 17	10 st.	0	00	10 st.	W.†	00	10 st.	0	00
May 18	10 st.	0	00	10 st.	W.*	00	10 st.	0	00
May 19	4 cir. 4 st.	W.†	00	3 cir. 2 st.	ESE.*	00	5 cir. 3 st.	ESE.*	00
May 20	10 st.	0	00	10 st.	0	00	10 st.	0	.—
May 21	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00
May 22	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 23	8 st.	E.*	00	3 cir. 1 st.	E.*	00	2 cir. 2 st.	E.*	00
May 24	8 st.	E.*	00	10 st.	E.*	00	10 st.	E.*	00
May 25	9 st.	E.†	00	10 st.	0	00	10 st.	0	00
May 26	0	0	00	1 st.	NE.*	00	0	0	00
May 27	0	0	00	0	0	00	0	0	00
May 28	4 cir. st.	0	00	9 st.	NE.*	00	9 st.	NE.*	00
May 29	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 30	10 st.	0	00	10 st.	0	00	10 st.	0	00
May 31	10 st.	NW.*	.—	9 st.	E.*	00	9 st.	E.*	00
Means	7.77			8.13			7.97		

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.01
10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	5 cir. 4 st. NW.†	00	.01
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	Dense fog. 0	.01	.04
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. ENE.†	00	10 st. ENE.†	00	4 st. NE.†	00	00
1 cir. st. 5 st. SW.†	00	9 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	.—
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	.03
10 st. 0	00	10 st. Light fog. 0	00	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.01	10 nim. 0	.01	.09
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.01	.07
10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	00
10 st. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	9 st. 0	00	.01
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	.02
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. W.†	00	10 st. W.†	00	10 st. 0	00	.01
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
4 cir. Dense fog. 0	00	2 cir. Dense fog. 0	00	1 cir. Dense fog. 0	00	5 cir. Dense fog. 0	00	D. fog. D. fog. 0	00	3 cir. Dense fog. 0	00	00
10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 st. W.†	.—	10 st. 0	00	10 st. 0	00	.01
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	.02
10 st. W.†	00	1 cir. st. 7 st. W.†	00	3 cir. 3 st. 0	00	3 cir. 2 st. 0	00	3 cir. 0	00	2 cir. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. S.†	00	.02
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.01
10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	.—
10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.01
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	4 cir. 5 st. E.*	00	5 cir. 4 st. E.*	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. ENE.*	00	8 st. NE.†	00	5 cir. 4 st. NE.†	00	00
1 cir. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	00
1 cir. 1st. 0	00	2 cir. 1 st. 0	00	10 st. NE.†	00	10 st. ENE.† D. fog. 0	00	10 st. NE.†	00	10 st. NE.†	00	00
10 nim. 0	.01	10 nim. 0	.—	10 nim. Dense fog. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	.02
10 st. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.—
Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	9 st. W.†	00	10 st. W.†	00	10 st. W.†	00	.—
8.81		9.13		8.65		9.00		8.71		8.23		.44

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
10 st. 0	.—	9 st. N.†	00	5 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 st. N.*	00	1 st. 0	00	8.71
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. N.†	.—	7.92
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	10 st. NE.*	00	7.50
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
2 cir. 0	00	2 cir. 0	00	1 cir. 2 cir. st. 1 st. 0	00	4 cir. 1 st. 0	00	1 cir. 2 st. NE.*	00	1 cir. 4 st. NE.*	00	6.54
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. NE.*	.—	8.50
10 st. 0	.01	10 st. 0	00	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10.00
10 st. 0	00	9 st. 0	00	3 cir. 2 st. 0	00	4 cir. 2 st. 0	00	8 st. NE.†	00	3 cir. 4 st. 0	00	9.08
5 cir. 3 st. 0	00	4 cir. 4 st. 0	00	3 cir. 3 st. 0	00	2 cir. st. 4 st. 0	00	3 cir. st. 2 st. 0	00	9 st. 0	00	8.88
2 cir. 6 st. 0	00	1 cir. 7 st. 0	00	9 st. 0	00	2 cir. 6 st. 0	00	8 st. 0	00	10 st. 0	00	9.25
Dense fog. 0	.—	Dense fog. 0	.—	9 st. 0	.—	10 nim. 0	.—	3 cir. st. 5 nim. 0	.—	9 nim. SW.†	.01	8.08
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.—‡	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. SE.†	00	10 st. SE.†	00	10 st. SE.†	.—	9.88
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	4.79
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10.00
10 st. 0	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	10 st. Dense fog. 0	00	9.58
3 cir. 5 st. SE.*	00	10 st. 0	00	10 st. SE.*	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	6.96
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	9.88
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	Dense fog. 0	.—	10 st. 0	00	9.58
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.38
2 cir. 1 st. E.*	00	1 cir. 1 st. E.*	00	1 cir. 1 st. E.*	00	1 cir. 1 st. E.*	00	1 cir. 1 cir. st. 1 st. E.*	00	1 cir. 1 cir. st. 2 st. E.*	00	7.54
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.88
10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. E.*	00	10 st. 0	00	10 st. 0	00	9.92
0 0	00	0 0	00	1 cir. 1 st. NE.*	00	1 cir. 1 st. E.*	00	1 cir. 1 st. 0	00	1 cir. 1 st. E.†	00	5.46
0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00	1 cir. st. 0	00	1.50
9 st. NE.*	00	10 st. NE.*	00	10 st. 0	00	9 st. E.*	00	10 st. E.*	00	10 st. E.*	00	6.08
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	8.33
10 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. SW.†	00	9.04
8.32		8.32		8.48		8.35		7.71		8.65		8.40

‡ Light deposition of fine frozen particles.

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1882.												
June 1	4 cir. cum. 4 st. E.*	00	2 cir. 3 st. 0	00	10 st. E.*	00	Dense fog. 0	00	1 cir. Dense fog. 0	00	Dense fog. 0	00
June 2	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 3	10 st. NE.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 4	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.01	10 st. 0	00
June 5	10 nim. 0	.01	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. WSW.†	00
June 6	8 st. SW.†	00	8 st. SW.†	00	8 st. SW.†	00	6 st. SW.†	00	1 st. 0	00	1 cum. 1 st. SE.†	00
June 7	1 st. SW.†	00	1 st. SW.†	00	1 st. SW.†	00	1 st. SW.†	00	1 st. SW.†	00	3 st. SW.†	00
June 8	1 cir. st. 0	00	1 cir. st. 1 st. 0	00	1 cir. cum. 1 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 9	1 cir. st. 0	00	1 cir. st	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 0	00
June 10	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.* Light fog.	00	10 st. Light fog. 0	00
June 11	1 cir. st. 9 st. NE.†	00	3 cir. st. 7 st. NE.†	00	1 cir. st. 9 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 12	8 st. 0	00	8 st. S.†	00	9 st. SW.†	00	9 st. SSW.†	00	9 st. SSW.†	00	9 st. SSW.†	00
June 13	8 st. E.†	00	8 st. E.†	00	1 cir. st. 7 st. E.†	00	1 cir. st 6 st. E.†	00	4 cir. st. 5 st. E.†	00	5 cir. st. 4 st. NE.†	00
June 14	Dense fog. 0	00	Dense fog. 0	00	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.17	10 st. 0	.—
June 15	Dense fog. 0	00	10 nim. 0	.03	Dense fog. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	.02
June 16	9 st. NE.† Dense fog.	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 17	1 ci. 5s. NE.* Lt. fog.	00	1 ci. 4 s. NE.* Lt. fog.	00	1 ci. s. 3 s. NE.* L. fog.	00	1 cir. st. Lt. fog. 0	00	6 ci. st. Light fog. 0	00	Dense fog. 0	00
June 18	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 cir. Dense fog. 0	00	1 cir. Light fog. 0	00
June 19	9 st. SW.*	00	1 cir. st. 8 st. SW.*	00	9 st. SW.*	00	10 st. WSW.*	00	10 nim. 0	.—	10 nim. SW.†	.—
June 20	3 cir. st. 5 st. SW.*	00	9 st. SW.*	00	2 cir. st. 6 st. SW.*	00	2 cir. cum. 6 st. SW.*	00	7 st. SW.†	00	Dense fog. 0	00
June 21	Dense fog. 0	.01	Dense fog. 0	.—	Dense fog. 0	.—	10 nim, 0	.01	10 nim. 0	.—	10 nim. 0	.—
June 22	9 st. NNW.*	00	9 nim. NNW.*	.—	1 cir. st. 9 st. NNW.*	.—	9 st. NNW.* Lt. fog.	00	3 c. 3 s. NW.* L. fog.	00	9 nim. NW.*	.—
June 23	10 st. N.*	00	9 st. NNE.*	.—	10 st. NNE.*	.—	10 st. NNE.*	.—	10 st. NNE.†	00	10 st. NNE.†	00
June 24	1 ci. s. 8 s. NE.* Lt. f.	00	3 ci. 2 st. NE.* L. fog.	00	1 ci. s. 4 s. E.* Lt. fog.	00	1 ci. s. 1 s. E.† L. fog.	00	1 cir. st. 1 st. 0	00	1 cir. cum. 1 st. 0	00
June 25	3 cir. st. 0	00	3 cir. st. 1st. 0	00	1 ci. st. 1 ci. cu. 1 s. 0	00	1 cir. st. 1 st. NE.†	00	2 cir. 1 st. 0	00	1 cir. st. 1 st. 0	00
June 26	9 st. NW.†	00	8 st. NW.†	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.—
June 27	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 st. 0	.—	10 nim. 0	.01
June 28	10 nim. N.†	.—	10 st. N.†	.—	10 st. N.†	00	10 st. 0	.—	10 st. 0	00	10 st. 0	00
June 29	6 cir. st. 1 st. NNW.*	00	2 cir. st. D. fog. 0	00	1 cir. st. D. fog. 0	00	10 st. N.*	00	Dense fog. 0	00	Dense fog. 0	00
June 30	10 st. 0	00	10 st. 0	00	10 st. 0	00	1 cir. 9 st. NE.*	00	10 st. 0	00	Dense fog. 0	00
Means.	6.46		6.10		6.00		6.56		6.23		5.60	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1882.												
June 1	1 st. 0	00	1 cir. st. 1 st. 0	00	3 cir. st. 3 st. E.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 2	4 cir. st. NE.*	00	2 cir. st. 5 st. NE.*	00	2 cir. 4 st. NE.*	00	3 cir. 3 st. N.*	40	2 cir. st. 2 st. N.*	00	1 cir. st. 3 st. N.*	00
June 3	10 st. 0	01	10 st. 0	00	10 st. 0	00	3 cir. st. 4 st. NE.*	00	2 cir. 6 st. NE.†	00	1 cir. 5 st. NE.†	00
June 4	10 st. E.†	.01	10 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 5	Dense fog. 0	00	3 cir. st. 4 st. 0	00	4 cir. st. 4 st. 0	00	10 st. 0	00	9 st. S.†	00	9 st. S.†	00
June 6	1 cir. 1 cum. 0	00	2 st. 0	00	2 cir. 1 st. 0	00	2 st. 0	00	2 cir. st. 0	00	3 cir. st. 1 st. 0	00
June 7	2 cir. 5 st. SW.†	00	5 st. SW.†	00	5 cir. st. 0	00	3 cir. 2 st. 0	00	1 cir. 1 st. 0	00	0 0	00
June 8	2 st. 0	00	5 st. E.*	00	3 st. E.*	00	9 st. E.*	00	10 st. ESE.*	00	8 st. ESE.*	00
June 9	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. E.*	00	9 st. E.*	00
June 10	9 st. E.*	00	10 st. E.*	00	10 st. E.*	00	8 st. E.*	00	9 st. E.*	00	4 st. E.*	00
June 11	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	8 st. E.*	00	2 st. SW.†	00	0 0	00
June 12	9 st. SSW.†	00	6 st. SW.†	00	2 cir. 1 st. SW.†	00	1 st. 0	00	1 cir. 1 st. 0	00	2 cir. 2 st. 0	00
June 13	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 14	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00
June 15	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 cir. 7 st. NE.*	00	1 c. 7 s. NE.* Lt. fog.	00
June 16	Dense fog. 0	00	Dense fog. 0	00	Light fog. 0	00	Dense fog. 0	00	4 st. NE.†	00	5 st. NE.†	00
June 17	Dense fog 0	00	9 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	9 st. E.*	00	10 st. E.*	00
June 18	4 cir. cum. 3 st. 0	00	3 cir. 2 st. 0	00	6 cir. 2 st. 0	00	3 cir. 2 st. 0	00	10 st. W.†	00	9 st. W.†	00
June 19	9 st. SW.†	00	9 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00
June 20	10 nim. 0	.—	Dense fog. 0	.—	Dense fog. 0	00	10 st. 0	00	10 st. W.†	00	10 st. W.†	00
June 21	Dense fog. 0	00	8 st. E.†	00	10 st. E.†	00	10 st. NNE.†	00	10 st. 0	00	10 st. 0	00
June 22	9 nim. NW.†	.—	9 st. NW.†	.—	10 st. 0	00	10 st. 0	.—	10 st. 0	.—	10 st. 0	00
June 23	8 st. NW.†	00	8 st. NW.†	00	8 st. NW.†	00	6 st. N.†	00	4 st. NW.†	00	5 st. NW.†	00
June 24	5 cir. st. 1 st. 0	00	3 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 0	00
June 25	4 cir. cum. 1 st. 0	00	5 cir. 0	00	4 cir. 0	00	3 cir. 0	00	4 cir. 0	00	2 cir. 3 cir. st. 1 st. 0	00
June 26	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 27	8 st. NNW.†	00	6 st. NW.*	00	10 st. NW.*	00	10 st. NW.*	00	10 st. NW.*	00	8 st. NW.*	00
June 28	10 st. N.*	00	10 st. N.*	00	10 st. N.†	00	10 st. N.†	00	10 st. 0	00	9 st. W.†	00
June 29	10 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. N.†	00	10 st. 0	00	Dense fog. 0	00
June 30	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Means.	4.96		5.16		4.86		5.40		6.60		5.96	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a.m. Amount, kind, and direction of clouds.	Precipitation.	8 a.m. Amount, kind, and direction of clouds.	Precipitation.	9 a.m. Amount, kind, and direction of clouds.	Precipitation.	10 a.m. Amount, kind, and direction of clouds.	Precipitation.	11 a.m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 c. s. 2 s. L. fog. 0	00	3 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	1 ci. s. 2 s. Lt. fog. 0	00	10 st. NNE.*	00	2 cir. 5 st. NE.*	00	3 cir. st. 3 st. NE.*	00	.00
10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	00	10 nim. 0	.—	10 nim. 0	.—	.02
10 st. 0	00	10 st. 0	00	Dense fog. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	00	.13
10 st. WSW.†	00	3 ci. st. 5 st. WSW.†	00	1 cir. 5 st. WSW.†	00	9 st. WSW.†	00	8 st. WSW.†	00	4 st. WSW.†	00	.03
1 cir. 1 st. SE.†	00	1 cir. 1 cum. 0	00	1 cir. 1 cum. 0	00	1 cir. 1 cum. 0	00	1 cir. 1 cum. 0	00	1 cir. 1 cum. 0	00	.00
5 st. SW.†	00	5 st. SW.†	00	6 st. SW.†	00	8 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00	.00
Light fog. 0	00	Light fog. 0	00	4 st. ENE.* Lt. fog.	00	2 st. ENE.* Lt. fog.	00	0 0	00	0 0	00	.00
1 cir. 0	00	2 cir. 0	00	1 cir. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
10 st. Light fog. 0	00	10 st. 0	00	10 st. E.*	00	8 st. E.*	00	8 st. E.*	00	10 st. E.*	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
8 st. SSW.†	00	7 st. SSW.†	00	9 st. SSW.†	00	9 st. SSW.†	00	9 st. SSW.†	00	9 st. SSW.†	00	.00
8 cir. st. 1 st. NE.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
10 st. 0	00	10 nim. 0	.—	Dense fog. 0	.02	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.21
Dense fog. 0	00	Dense fog. 0	00	10 st. 0	.07	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.12
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	1 ci. st. Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
1 cir. Light fog. 0	00	1 cir. Light fog. 0	00	1 cir. cum. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.00
10 st. SW.†	.01	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 nim. SW.†	.—	10 st. SW.†	.—	.01
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	.05
10 st. 0	.—	10 st. 0	00	Dense fog. 0	.—	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00	.02
8 st. NW.†	.—	10 st. NW.†	00	10 nim. NW.†	.—	10 st. NW.†	.01	10 st. NW.†	00	10 nim. NW.†	.—	.01
8 st. NNE.†	.—	10 st. NNE.†	00	9 st. N.†	.—	9 st. N.†	.—	9 st. N.†	.—	9 st. NW.†	.—	.—
4 cir. cum. 1 st. 0	00	4 cir. st. 0	00	5 cir. st. 0	00	3 cir. cum. 2 cir. st. 0	00	3 cir. cum. 4 cir. st. 0	00	6 cir. st. 0	00	.00
2 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00	1 cir. cu. 2 ci. s. 1 s. 0	00	2 cir. cum. 2 cir. st. 0	00	3 ci. cu. 2 ci. st. 1 st. 0	00	3 cir. cum. 2 st. 0	00	.00
Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.—
10 st. NNW.*	.—	10 st. NNW.*	00	10 st. NNW.†	00	10 st. NNW.*	00	10 st. NNW.†	00	2 cir. 5 st. 0	00	.03
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. N.*	00	10 st. N.*	00	.—
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
5.00		5.10		4.73		4.70		4.66		5.00		.03

7 p.m. Amount, kind, and direction of clouds.	Precipitation.	8 p.m. Amount, kind, and direction of clouds.	Precipitation.	9 p.m. Amount, kind, and direction of clouds.	Precipitation.	10 p.m. Amount, kind, and direction of clouds.	Precipitation.	11 p.m. Amount, kind, and direction of clouds.	Precipitation.	12 p.m. Amount, kind, and direction of clouds.	Precipitation.	Daily means.
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1.87
9 st. N.*	00	10 st. N.*	00	10 st. N.*	.00	10 st. N.*	00	10 st. NE.*	00	10 st. NE.*	00	4.83
9 st. NE.†	00	1 cir. 7 st. NE.†	00	1 cir. 6 st. NE.†	00	9 st. NE.†	00	10 st. 0	00	10 st. 0	00	9.33
10 nim. 0	.—	10 nim. 0	.04	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.01	9.58
9 st. S.†	00	5 cir. cum. 3 st. 0	00	9 st. SSW.†	00	4 cir. cum. 2 st. 0	00	9 st. 0	00	9 st. 0	00	8.25
2 cir. st. 0	00	2 cir. 2 cir. st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2.95
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 cir. st. 0	00	1 cir. 0	00	3.25
1 st. ESE.*	00	0 0	00	1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 0	00	2.29
10 st. E.*	00	10 st. E.†	00	10 st. E.*	00	10 st. E.*	00	10 st. E.†	00	10 st. E.	00	3.79
8 st. E.*	00	9 st. E.*	00	10 st. E.†	00	9 st. E.†	00	9 st. E.†	00	9 st. NNE.†	00	9.16
0 0	00	0 0	00	0 0	00	0 0	00	1 cir. st. 4 st. SSW.†	00	1 cir. st. 7 st. 0	00	4.70
4 cir. 1 st. 0	00	3 cir. 1 st. 0	00	1 cir. 4 cum. st. 0	00	1 cir. 4 st. 0	00	8 st. 0	00	9 st. E.†	00	6.88
Dense fog. 0	00	1 ci. st. Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 cir. 9 st. E.* D. fog.	00	10 st. ESE.* D. fog.	00	3.29
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	5.41
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	2.75
4 st. NE.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	8 st. NE.* Lt. fog.	00	1.25
10 st. E.*	00	10 st. E.*	00	Dense fog. 0	00	10 st. ESE.†	00	Dense fog. 0	00	Dense fog. 0	00	3.37
10 st. SW.†	00	1 cir. 8 cum. st. SW.†	00	3 cir. 1 st. 0	00	3 cir. 1 st. 0	00	1 cir. st. 7 st. SW.*	00	8 st. SW.*	00	4.00
9 st. SW.†	00	10 st. SW.†	00	9 st. SW.†	00	10 st. SW.†	00	1 cir. 8 st. 0	00	1 cir. st. 8 st. 0	00	9.62
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.—	6.25
10 st. 0	00	10 nim. 0	.—	10 st. N.†	.—	10 st. N.†	00	10 nim. 0	.—	10 st. N.†	.—	6.58
10 st. 0	00	10 st. 0	00	10 st. 0	.—	9 st. N.*	00	10 st. N.*	00	10 st. N.*	00	9.46
1 cir. 4 st. NW.†	00	1 cir. 5 st. NW.†	00	8 st. NW.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	7.12
1 cir. 0	00	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 cir. st. 0	00	2 cir. 2 cir. st. 0	00	3.50
3 cir. 3 cir. st. 2 st. 0	00	5 cir. 3 st. SE.†	00	9 st. 0	00	9 cum. st. 0	00	9 st. 0	00	9 st. W.†	00	5.08
10 st. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. NW.*	00	10 st. NW.*	00	6.54
1 cir. 7 st. NW.*	00	2 cir. Dense fog.	00	1 cir. Dense fog.	00	2 cir. Dense fog.	00	Dense fog. 0	00	9 nim. N.†	.—	7.95
9 st. W.†	00	8 st. W.†	00	1 cir. 8 st. W.†	00	1 cir. 7 st. NW.*	00	10 st. NNW.*	00	1 cir. st. 8 st. NNW.*	00	9.66
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	5.79
Dense fog. 0	00	4 st. NNE.*	00	4 st. NNE.*	00	4 st. ENE.*	00	1 st. ENE.*	00	1 cir. st. 1 st. 0	00	4.37
6.23		5.73		5.66		5.70		6.13		6.53		5.62

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time,—5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1882.												
July 1	10 st. 0	00	Dense fog. 0	00	10 st. 0	00	9 st. 0	00	8 st. W. †	00	8 st. W. †	00
July 2	1 cir. st. 2 st. 0	00	2 cir. st. 2 st. 0	00	1 cir. cum. 3 st. 0	00	3 cir. cum. 2 st. 0	00	4 st. W. †	00	5 st. W. †	00
July 3	9 nim. 0	.01	9 nim. 0	.01	9 st. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
July 4	1 cir. st. 6 st. W. †	00	9 st. SW. †	00	9 st. SW.*	00	9 st. SW.*	00	9 st. SW. †	00	10 st. SW. †	00
July 5	3 cir. cum. 4 st. W. †	00	2 cir. cum. 7 st. W. †	00	1 cir. st. 9 st. W. †	00	9 st. W. †	00	8 st. W. †	00	9 st. W. †	00
July 6	3 cir. 2 cir. st. 1st. 0	00	3 cir. 3 cir. st. 1 st. 0	00	3 cir. 2 cir. st. 2 st. 0	00	2 cir. 2 cir. st. 1 st. 0	00	3 cir. 1 cir. st. 0	00	2 cir. 2 cir. st. 1 st. 0	00
July 7	1 cir. 1 st. 0	00	1 cir. 1 st. W. †	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 cum. 1 st. 0	00
July 8	2 cir. 2 st. 0	00	2 ci. 1 ci. st. 2 cu. st. 0	00	4 cir. 3 st. 0	00	4 cir. 3 st.	00	4 cir. st. 2st. 0	00	4 cir. st. 1 st. 0	00
July 9	1 cum. 7 st. NW. †	00	1 cum. 2 st. W. †	00	9 st. W.*	00	10 st. W. †	00	Dense fog. 0	00	Dense fog. 0	00
July 10	1 cum. 7 st. S. †	00	1 cir. st. 6 st S. †	00	1 cir. 2 st. 0	00	1 cir. st. 2 st. SW. †	00	1 cir. st. 4 st. SW. †	00	4 st. SW. †	00
July 11	9 st. SSW. †	00	9 st. SW. †	.02	1 cir. st. 8 nim. W. †	.05	1 cir. st. 8 st. SSW. †	.—	1 cir. 3 st. 0	00	4 st. WSW. †	00
July 12	9 st. SW.*	00	1 cir. st. 8 st. SW.*	00	1 cir. st. 7 st. SW.*	00	8 st. SW.*	00	8 st. SW*.0	00	8 st. SW.*	00
July 13	1 cir. st. 1 st. W. †	00	9 st. W.* Light fog.	00	1 cir. st. 8 st. W. †	00	1 cir. st. 7 st. W. †	00	9 st. W. †	00	9 st. W. †	00
July 14	1 cir. st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. W.*	00	1 cir. st. 1st. W.*	00	1 cir. 7 st. W. †	00	1 cir. 3 st. W. †	00
July 15	10 st. 0	00	10 st. N. †	00	1 cir. Dense fog.	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
July 16	1 ci. st. 7 st. E.* Lt. f.	00	8 st. E.* Light fog.	00	1 ci. st. 8 s. E.* Lt. fog	00	9 st. E.* Lt. fog.	00	9 st. E.* Light fog.	00	10 st. E.* Light fog.	00
July 17	10 nim. 0	.04	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.06
July 18	10 st. NN. W. † Lt. fog	00	10 st. Light fog. 0	00	10 st. NW. † Lt. fog.	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
July 19	9 nim. 0	.02	10 st. SW.*	.—	10 nim. S. W.*	.01	10 st. SW.*	.—	10 st. SW. †	00	10 st. SW. †	00
July 20	7 st SW. †	00	10 st. SW.*	00	10 st. SW.*	00	10 st. SW.*	00	10 st. SW. †	00	10 st. SW. †	00
July 21	3 cir. 2 st. 0	00	1 cir. st. 8 st. SW. †	00	1 cir. 7 st. 0	00	1 cir. st. 8 st. 0	00	1 cir. st. 9 st. SSW. †	00	1 cir. st. 9 st. S. †	00
July 22	1 cir. st. 8 st. SW. †	00	1 cir. 5 st. SW. †	00	8 st. SW.*	00	9 nim. SW.*	.—	9 st. SW. †	.—	9 st. SW. †	00
July 23	5 st. SW.*	00	9 st. SW.*	00	9 st. SW.*	00	9 st. SW.*	00	9 st. SW. †	.03	9 st. SW. †	00
July 24	2 cir. 5 st. SW. †	00	1 cir. st. 7 st. SW.*	00	2 cir. st. 6 st. SSW.*	00	1 cir. st. 9 st. SW.*	00	10 st. SW. †	00	4 cir. st. 6 st. SW. †	00
July 25	3 ci. cum. 2 st. SW. †	00	2 ci. cum. 2 st. SW. †	00	3 cir. st. 1 st. W. †	00	2 ci 1 ci. cu. 3 s. SW. †	00	2 cir. 2 st. 0	00	2 cir. 2 st. 0	00
July 26	9 st. SSW. †	00	9 st. S. †	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
July 27	10 nim. 0	.02	10 nim. 0	.—	Dense fog. 0	.01	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.—
July 28	10 st. 0	00	10 st. NE.*	00	10 st. NE.*	00	10 st. 0	00	10 st. NE.*	00	10 st. NE.*	00
July 29	9 st. ESE.*	00	9 st. ESE.*	00	9 st. ESE.*	00	9 st. SE.*	00	9 st. SE.*	00	9 st. SE.*	00
July 30	2 cir. 1 st. S.*	00	4 cir. 2 st. SSE	00	5 cir. 3 st. SSE.*	00	4 ci. 4 ci. cu. 1 s. SSE.*	00	3 cir. 3 cir. st. 2 st. 0	00	2 cir. 3 cir. st. 3 st. 0	00
July 31	1 cir. st. 3 st. SW.*	00	6 st. SW.*	00	1 cir. st. 7 st. SW*	00	1 cir. st. 4 st. SW.*	00	1 cir. st. 6 st. SW. †	00	1 cir. st. 5 st. SW. †	00
Means.	6.93		7.35		7.41		7.74		7.38		7.35	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1882.												
July 1	10 st.	00	10 st. ESE. †	00	9 st. 0	00	10 nim. ESE. †	.—	10 nim. 0	.—	10 nim. 0	.02
July 2	9 st. SW. †	00	9 st. SW. †	00	9 st. SW. †	00	7 st. SW.*	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00
July 3	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
July 4	8 st. SW. †	00	2 cir. 3 st. SW. †	00	9 st. W. †	00	10 st. W.*	00	1 cir. 8 st. W. †	00	9 st. W. †	00
July 5	10 st. W. †	00	10 st. W. †	00	3 cir. 3 st. W. †	00	4 st. 0	00	4 cir. 0	00	3 cir. 1 cum. st. 0	00
July 6	5 cir. 2 st. 0	00	5 cir. 2 st. 0	00	5 cir. 1 st. 0	00	4 cir. st. 2 st. 0	00	2 ci. 1 ci. s. 1 c. s. 1 s. W. †	00	1 c. 1 c. s. 2 cu. 2 s. W. †	00
July 7	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 0	00
July 8	1 cir. 0	00	1 cir. 0	00	0 0	00	0 0	00	0 0	00	1 cir. 1 cum. 0	00
July 9	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	4 cir. 3 cir. st. 0	00	3 cir. cum. 1 st. 0	00	1 cir. 1 cir. cu. 2 st. 0	00
July 10	3 cir. 3 st. 0	00	8 st. 0	00	8 st. N.*	00	1 cum. 3 st. 0	00	1 cir. 2 cum. 2st. SW. †	00	2 cir. 2 cum. 2st. SW. †	00
July 11	2 cir. 1 st. 0	00	4 cir. 2 st. 0	00	5 cir. 2 st. 0	00	4 cir. cum. 3 st. 0	00	1 c. 2 c. cu. 2 cu. 3 s. SW †	00	2 cir. 6 st. SW. †	00
July 12	10 st. S.*	00	Dense fog. 0	00	10 st. 0	00	10 st. SW.*	00	Dense fog. 0	00	Dense fog. 0	00
July 13	4 cir. 2 st. 0	00	5 cir. 0	00	4 cir. 1 st. 0	00	5 cir. 2 st. 0	00	3 cir. 3 cir. st. 1 st. 0	00	3 cir. 2 cir. st. 3 st. 0	00
July 14	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	.03	10 nim. 0	.02	10 nim. 0	.10	10 nim. 0	.13
July 15	1 cir. st. 5 st. N.* Lt. f.	00	1 ci. st. 3 s. NE. † Lt. f.	00	Light fog. 0	00	Dense fog. 0	00	1 cir. 9 st. NE.* D. fog.	00	Dense fog. 0	00
July 16	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
July 17	10 nim. 0	.05	10 nim. 0	.06	10 nim. 0	.04	10 nim. 0	.02	10 st. 0	.—	10 st. 0	00
July 18	10 st. SW. †	00	10 st SW. †	00	8 st. 0	00	9 st. 0	00	5 cir. 1 st. 0	00	2 cir. 2 cir. st. 2 st. 0	00
July 19	5 cir. st. 4 st. 0	00	3 cir. 5 st. W. †	00	3 cir. st. 4 st. SW. †	00	4 cum. 4 st. SW. †	00	2 c. 2 c. cu. 1 cu. 1 s. SW †	00	1 c. 2 c. c. 1 cu. 1 s. SW. †	00
July 20	4 cir. 5 st. SW. †	00	3 cir. 5 st. SW. †	00	9 st. S. †	00	9 st. SW. †	00	1 cir. 3 cum. 3 st. SW †	00	2 cir. 2 st. SW. †	00
July 21	10 st. 0	.—	10 nim. 0	.02	10 nim. 0	.07	Dense fog. 0	.04	3 cir. cum. 2 st. 0	00	Dense fog. 0	00
July 22	Dense fog. 0	00	8 st. 0	00	9 st. 0	00	8 st. 0	00	2 c. 2 ci. cu. 1 cu. 1 st. 0	00	1 ci. 2 ci. cu. 1 cu. 1 s. 0	00
July 23	9 st. SE. †	00	6 cir. st. 1 st. 0	00	5 cir. st. 2 st. 0	00	3 cir. 2 cum. 3 st. S. †	00	1 c. 1 c. s. 3 cu. 3 s. SW. †	00	1 ci. st. 4 cu. 4 st. SW. †	00
July 24	3 cir. 1 st. 0	00	2 cir. 2 st. 0	00	4 cir. 1 st. 0	00	3 cir. 1 st. 0	00	1 cir. 1 cir st. 2 st. 0	00	1 cir. st. 1 st. 0	00
July 25	4 cir. 3 st. 0	00	2 st. 0	00	9 st. S.*	00	9 st. S. †	00	9 st. SW.*	00	10 st. SW.*	00
July 26	7 st. 0	00	9 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00
July 27	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. NE.*	00	9 st. W. †	00	8 st. W. †	00
July 28	7 st. NE.*	00	8 st. NE.*	00	9 st. NE.*	00	9 st. NE.*	00	9 st. NE.*	00	9 st. NE.*	00
July 29	10 st. SE.*	00	9 st. SE.*	00	9 st. SE.*	00	8 st. SE.*	00	3 cir. 5 st. SE.*	00	1 ci. 1 ci. st. 3 st. SE.*	00
July 30	3 cir. 1 st. 0	00	3 cir. 2 st. 0	00	3 cir. 1 st. 0	00	5 cir. 1 st. 0	00	1 cir. 2 cir. st. 1 st. 0	00	2 cir. 2 cir. st. 1 st. 0	00
July 31	3 cir. st. 2 st. 0	00	3 cir. st. 2 st. 0	00	8 st. W.*	00	3 st. 0	00	8 st. SW.*	00	4 st. SW.*	00
Means.	6.09		5.77		6.25		6.58		6.25		5.54	

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m.		8 a. m.		9 a. m.		10 a. m.		11 a. m.		12 m.		
Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
8 st. W.†	00	1 cir. cum. 4 st. W.†	00	9 st. W.†	00	9 st. 0	00	2 cir. cum. 6 st. 0	00	9 st. 0	00	.02
7 st. W.†	00	6 st. W.†	00	9 st. SW.†	00	9 st. SW.†	00	10 st. SW.†	00	8 st. SW.†	00	.00
10 st. 0	00	10 st. 0	00	10 nim. 0.	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	.03
10 st. SW.†	00	8 st. SW.†	00	2 cir. 2 st. SW.†	00	2 cir. 2 st. SW.†	00	3 cir. 2 st. SW.†	00	3 st. SW.*	00	.00
10 st. W.†	00	9 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. W.†	00	.00
1 cir. 3 cir. st. 1 st. 0	00	5 cir. st. 1 st. 0	00	1 cir. 3 cir. st. 1st. 0	00	3 cir. 1 st. 0	00	3 cir. 1 st. 0	00	4 cir. 2 st. 0	00	.00
1 cum. 1 st. 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 cir. 0	00	.00
2 cir. 2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.04
5 st. SW.†	00	2 st. SW.†	00	1 cir. 1 st. 0	00	1 cir. 3 st. 0	00	1 cir. 3 st. 0	00	3 cir. 2 st. 0	00	.00
1 cir. 3 st. WSW.†	00	2 cir. 2 st. WSW.†	00	2 cir. 2 st. WSW.†	00	2 cir. 2 st. 0	00	1 cir. 1 st. 0	00	3 cir. 1 st. 0	00	.07
9 st. SW.*	00	10 st. SW.*	00	10 st. SW.†	00	10 st. SW.†	00	10 st. S.*	00	10 st. S.*	00	.00
8 st. W.†	00	3 cir. 1 st. W.†	00	3 cir. 1 st. W.†	00	4 cir. 0	00	5 cir. 3 st. 0	00	3 cir. 1 st. 0	00	.00
1 cir. 2 st. W.†	00	1 cir. 1 st. W.†	00	1 cir. 1 st. 0	00	1 cir. cum. 1 st. 0	00	1 cir. cum. 5 st. W.†	00	10 st. W.*	00	.32
Dense fog. 0	00	5 st. N.*	00	4 st. W.† Light fog	00	1 ci. st. 4 s. N.* Lt. f.	00	1 cir. st. 5 st. N.*	00	1 ci. st. 3 st. N.* Lt. f.	00	.00
10 st. E.* Light fog	00	Dense fog 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	.—
10 nim. 0	.07	10 nim. 0	.06	10 nim. 0	.05	10 nim. 0	.06	10 nim. 0	.06	10 nim. 0	.09	.69
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. S.†	00	.00
10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	.03
9 st. SW.†	00	5 st. SW.†	00	5 st. SW.†	00	1 cir. 3 st. SW.†	00	4 cir. 4 st. SW.†	00	10 st. SW.†	00	.00
1 cir. st. 9 st. S.†	00	10 st. S.†	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	.13
9 st. SW.†	00	9 st. SW.†	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	.—
9 st. SW.†	00	9 st. SW.†	00	4 cir. 2 st. SW.†	00	4 cir. 2 st. 0	00	4 cir. 1 st. 0	00	3 cir. 3 st. 0	00	.03
6 cir. st. 4 st. SW.†	00	2 cir. st. 8 st. SW.†	00	2 cir. st. 7 st. SW.†	00	4 cir. st. 5 st. SW.†	00	5 cir. st. 4 st. 0	00	3 cir. 2 st. 0	00	.00
1 cir. 2 st. 0	00	2 cir. 2 st. 0	00	3 cir. 1 st. 0	00	3 cir. 1 st. 0	00	3 cir. 2 st. 0	00	4 cir. 3 st. 0	00	.00
10 st. 0	.00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	8 st. SW.†	00	8 st. 0	00	.—
10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.—	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00	.10
10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	7 st. NE.*	00	.00
9 st. SE.*	00	10 st. SE.*	00	9 st. SE.*	00	10 st. SE.*	00	10 st. SE.*	00	10 st. SE.*	00	.00
1 cir. st. 9 st. SE.*	00	4 cir. st. 6 st. SE.*	00	10 st. SE.*	00	7 cir. st. 2 st. SE.*	00	7 cir. st. 1 st. 0	00	5 cir. 2 st. 0	00	.00
1 cir. 5 st. SW.†	00	2 cir. st. 4 st. SW.†	00	3 cir. st. 4 st. SW.†	00	5 cir. st. 3 st. SW.†	00	4 cir. st. 4 st. SW.†	00	4 cir. st. 4 st. SW.†	00	.00
7.25		6.64		6.58		6.00		6.67		6.87		1.46

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
10 st. 0	.—	10 st. 0	00	10 st. SW.†	00	9 st. SW.†	00	9 st. 0	00	2 cir. st. 3 st. 0	00	8.33
1 cir. 1 st 0	00	1 cir. 1 ci. cum. 1 s. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. st. 9 st. ESE.†	00	9 st. S.*	00	5.79
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 cir. 2 st. W.†	00	1 cir. st. 7 st. SSW.†	00	1 cir. st. 7 st. W.†	00	5.06
10 st. W.†	00	1 cir. 8 st. W.†	00	1 cir. 7 cum. st. 0	00	1 cir. 1 cir. st. 2 s. W.†	00	1 cir. st. 7 st. W.†	00	1 ci. 2 ci. st. 3 st. W.*	00	7.58
5 cir. 1 cum. 0	00	4 cir. 1 cum. 0	00	4 cir. 1 cum. 0	00	5 cir. 1 cum. 0	00	3 cir. 2 cir. st. 1 st. 0	00	5 cir. 1 st. 0	00	7.62
1 cir. 7 st. W.†	00	3 ci. 1 cu. st. 2 st. W.†	00	3 cir. 1 st. 0	00	1 cir. 1 cir. st. 0	00	1 cir. 0	00	1 cir. st. 1 st. 0	00	5.16
1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 cir. st. 1 st. 0	00	1.41
1 cir. 1 cum. 0	00	1 cir. 1 cum. 0	00	1 cum. st. 0	00	1 cir. 1 cum. st. 0	00	1 cum. st. 0	00	1 cum. st. 0	00	2.41
2 cir. 2 cir. cum. 1st. 0	00	3 cir. st. 1 st. 0	00	1 cir. 1 cir. st. 2 st. 0	00	9 st. 0	00	9 nim. SSW.*	.03	9 st. S.†	.01	3.54
1 ci. 2 c. cu. 2 cu. 1 s. SW†	00	1 c. 1 c. cu. 1 cu. 1 s. SW†	00	2 ci. 2 cu. s. 2 s. SW.†	00	1 ci. 1 ci. s. 2 cu. s. 1 s. SW†	00	1 cir. st. 7 st. SW.†	00	9 st. SSW.†	00	5.29
1 ci. st. 2 cu. 2st. SW.†	00	2 cir. st. 7 st. SW.†	00	8 st. SW.*	00	9 st. SW.*	00	9 st. SW.*	00	9 st. SW.*	00	6.41
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	9 st. W.* Light fog	00	1 ci. s. 1 s. W.* L. fog.	00	6.25
3 cir. 1st. 0	00	2 cir. 2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. st. 0	00	1 cir. st. 0	00	5.41
Dense fog. 0	.—	Dense fog. 0	.—	Dense fog. 0	.02	10 st. W.†	.02	10 st. N.†	00	10 st. N.†	00	4.33
1 c. 1 c. s. 4 s. NE.* D. fg	00	1 cir. st. 3 st. NE.*	00	1 cir. st. 3 st. NE.*	00	1 cir. 4 st. NE.†	00	1 ci. 7 s. NE.* Lt. fog.	00	1 ci. 7 st. E.* L. fog.	00	4.16
10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	7.62
10 st. E.*	00	9 st. NE.†	00	1 cir. 4 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	9.33
1 cir. 2 cir. st. 1 st. 0	00	3 cir. 2 cir. st. 1 st. 0	00	3 cir. 2 st. 0	00	2 ci. 2 ci. cu. 4 st. W.†	00	1 cir. st. 7 st. W.†	00	9 st. W.†	00	8.70
8 st. W.†	00	1 cir. 8 st. W.†	00	2 cir. 2 st. W.†	00	1 ci. 1 cu. st. 2 s. W.†	00	7 st. SW.†	00	8 st. SW.†	00	8.45
1 cir. 1 st. 0	00	1 ci. 2 ci. st. 3 s. SW.†	00	2 cir. 2 cir. st. 4 s. W.†	00	3 cir. st. 2 st. 0	00	2 cir. 3 st. 0	00	1 cir. 2 cir. st. 2 st. 0	00	7.29
1 cir. 4 st. Light fog. 0	00	1 cir. 4 st. 0	00	3 cir. 2 st. 0	00	2 cir. 2 st. 0	00	3 cir. 2 st. 0	00	1 ci. 1 ci. s. 4 s. SW.†	00	7.33
2 cir. 1 cum. 1 st. 0	00	1 cir. 2 cum. 2 st. 0	00	1 cir. 5 st. 0	00	8 st. 0	00	1 cir. 6 st. SW.*	00	9 st. SW.*	00	6.79
8 st. SW.†	00	8 st. SW.†	00	2 cir. 6 st. 0	.—	1 cir. 1 st. 0	00	1 cir. 3 st. SW.†	00	2 cir. 2 st. SW.†	00	7.20
1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. 1 cir. st. 2 st. 0	00	1 cir. s. 1 cu. s. 2 s. 0	00	1 cir. st. 2 st. 0	00	3 cir. cum. 3 st. 0	00	6.20
10 st. SW.*	00	9 st. SW.*	00	9 st. SW.†	00	5 st. SW.†	00	10 st. SW.*	00	10 st. SW.*	00	6.41
10 st. 0	00	10 st. SW.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	9.45
9 st. W.†	00	9 st. SW.†	00	9 st. SW.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	5.58
10 st. 0	00	10 st. E.*	00	10 st. E.*	00	8 st. E.†	00	8 st. ESE.*	00	10 st. ESE.*	00	9.33
1 cir. 2 ci. st. 3 st. SE.*	00	1 cir. st. 3 st. SE.*	00	1 cir. 1 st. SE.*	00	1 cir. 2 cir. s. 1 s. SE.*	00	4 cir. 1 st. 0	00	2 cir. 1 st. SE.*	00	7.70
2 cir. 3 cir. st. 1 st. 0	00	2 cir. 2 cir. st. 2 st. 0	00	2 cir. st. 2 st. 0	00	1 cir. st. 1 st. 0	00	1 ci. st. 1 cu. st. W.†	00	1 cir. st. 1 st. 0	00	6.08
1 cum. 4 st. SW.†	00	2 cir. 3 st. 0	00	1 st. 0	00	3 st. W.*	00	4 st. SW.†	00	8 st. W.*	00	5.75
5.01		5.32		4.72		5.03		6.35		6.06		6.40

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m.		2 a. m.		3 a. m.		4 a. m.		5 a. m.		6 a. m.	
	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.
1882.												
Aug. 1	9 st. W.†	00	10 st. SW.*	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.*	00
Aug. 2	Dense fog. 0	00	10 st. SW.*	00	10 st. SW.†	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.02
Aug. 3	1 ci. 1 ci. st. 5 st. SW*.	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Aug. 4	1 cir. st. 3 st. 0	00	5 st. SW.*	00	10 st. W.†	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00
Aug. 5	10 st. 0	00	Dense fog. 0	00	1 cir. st. 9 st. NE.*	00	10 st. E.*	00	10 st. E.†	00	10 st. 0	00
Aug. 6	10 nim. 0	.03	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.09	10 nim. 0	.02	10 nim. 0	.07
Aug. 7	10 nim. W.†	.01	1 cir. st. 9 nim. SW.*	.—	10 nim. SW.*	.—	10 nim. 0	.01	10 nim. 0	.02	10 st. W.*	.—
Aug. 8	4 cir. 4 st. W.*	00	9 st. W.*	00	9 st. W.*	00	9 st. W.*	00	10 st. W.*	00	10 st. W.*	00
Aug. 9	10 st. SW.*	00	10 st. SW.*	.—	10 st. SW.*	00	10 st. W.*	00	10 st. SW.†	00	10 st. SW.†	00
Aug. 10	10 st. WNW.*	00	10 st. WNW.*	00	10 st. W.*	00	10 st. WNW.*	00	10 st. SW.*	00	10 st. SW.†	00
Aug. 11	10 st. S.*	00	10 st. S.†	00	10 nim. SW.*	.—	10 st. SW.*	.—	10 st. SW.†	00	10 st. SW.†	00
Aug. 12	1 cir. st. 4 st. SW.†	00	3 st. SW.†	00	5 st. SW.†	00	3 st. SW.†	00	5 st. SW.†	00	5 st. SW.†	00
Aug. 13	10 nim. NW.*	.—	9 st. NW.*	.—	10 st. NW.*	00	10 st. NW.*	00	10 st. NW.†	00	10 st. NW.†	00
Aug. 14	9 nim. NE.†	.—	9 st. NE.†	.—	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00	10 st. 0	00
Aug. 15	1 cir. 7 st. E.*	00	9 st. E.*	00	10 st. E.†	00	10 st. E.†	00	10 nim. 0	.—	10 st. 0	.—
Aug. 16	9 st. ESE.*	00	6 st. SE.*	00	5 st. SE.*	00	7 st. SE.*	00	10 st. E.*	00	10 st. E.*	00
Aug. 17	1 cir. cum. 9 st. SE.*	00	1 cir. cum. 8 st. SE.*	00	10 st. ESE.*	00	10 st. ESE.*	00	10 st. ESE.*	00	10 st. ESE.*	00
Aug. 18	1 cir. st. 6 st. E.*	00	1 cir. st. 9 nim. E.*	.—	10 st. ENE.*	.—	10 st. E.*	00	10 st. E.*	00	10 nim. 0	.—
Aug. 19	6 st. E.†	00	2 st. E.†	00	1 cir. st. 2 st. E.†	00	1 cir. st. 2 st. E.†	00	2 st. E.†	00	2 st. E.†	00
Aug. 20	8 st. SW.†	00	9 st. SW.†	00	10 st. 0	00	10 st. SW.†	00	10 st. SW.†	00	10 st. 0	00
Aug. 21	1 cir. st. 9 st. E.*	00	3 cir. 4 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Aug. 22	1 cir. st. 9 st. NE.*	00	1 cir. st. 7 st. NE.*	00	6 st. NE.*	00	8 st. NE.*	00	10 st. 0	00	10 st. 0	00
Aug. 23	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Aug. 24	10 st. NE.*	00	10 st. NE.*	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01
Aug. 25	10 nim. E.†	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01
Aug. 26	10 nim. 0	.02	10 nim. NE.*	.01	10 nim. NE.*	.01	10 st. NE.*	.03	10 st. NE.*	00	10 st. 0	00
Aug. 27	10 st. NE.†	00	10 st. N.*	00	10 nim. N.*	.—	10 nim. NNE.*	.—	10 nim. 0	.01	10 nim. NE.*	.—
Aug. 28	10 st. E.†	00	10 nim. E.†	.—	10 nim. E.†	.—	10 nim. E.†	.—	10 nim. E.†	.—	10 nim. E.†	.—
Aug. 29	10 nim. ESE.†	.—	10 st. 0	.—	10 nim. 0	.—	10 nim. E.†	.—	10 nim. E.†	.—	10 st. E.†	.—
Aug. 30	10 st. NE.†	00	10 st. E.*	00	10 st. E.*	00	10 nim. NE.†	.—	10 st. NE.†	.—	10 st. NE.†	00
Aug. 31	10 st. 0	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Means.	8.73		8.22		8.96		9.03		8.93		8.93	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1882.												
Aug. 1	10 st. SW.*	00	10 st. SW.*	00	10 st. SW.*	00	10 st. SW.*	00	9 st. SW.*	00	Dense fog. 0	00
Aug. 2	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	.02	10 nim. 0	.01	10 nim. 0	.02
Aug. 3	10 st. 0	00	10 st. 0	00	10 st. 0	00	3 cir. 5 st. NW.†	00	1 cir. 3 st. SW.*	00	1 cir. 1 st. SW.*	00
Aug. 4	Dense fog. 0	00	10 st. N.*	00	10 st. N.*	00	10 st. N.*	00	10 st. W.*	00	10 st. W.*	00
Aug. 5	10 st. E.*	00	10 st. SE.†	00	10 st. E.†	00	10 st. SE.†	00	10 st. SE.†	00	10 st. SE.†	00
Aug. 6	7 st. SSW.†	00	8 st. S.†	00	8 st. S.†	00	8 st. S.†	00	8 st. SW.†	00	8 st. SW.†	00
Aug. 7	10 st. W.*	00	10 st. W.*	00	10 st. SW.†	00	10 st. SW.†	00	8 st. W.*	00	9 st. W.*	00
Aug. 8	8 st. S.†	00	9 st. S.†	00	3 cir. 1 st. 0	00	7 cir. 2 st. 0	00	1 cir. 8 st. 0	00	9 st. SW.†	00
Aug. 9	10 nim. SW.†	.03	10 st. W.*	.05	10 st. W.*	00	Dense fog. 0	00	10 st. 0	00	10 st. NW.*	00
Aug. 10	10 st. 0	00	10 st. SE.†	00	10 st. S.†	00	10 st. S.†	.02	10 st. SW.†	.—	9 st. SW.†	00
Aug. 11	10 st. S.†	00	10 st. S.†	00	10 st. S.†	00	10 st. S.†	.—	10 nim. 0	.—	4 cum. 4 st. 0	.01
Aug. 12	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	06	Dense fog. 0	00	10 nim. 0	.02	10 st. NW.*	.01
Aug. 13	10 st. NW.†	00	10 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00	8 st. NW.†	00
Aug. 14	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—
Aug. 15	10 st. ESE.*	.00	9 st. SSE.*	00	9 st. SE.*	00	1 cir. 8 st. ESE.*	00	1 cir. 8 st. ESE.*	00	1 cir. st. 7 st. ESE.*	00
Aug. 16	9 st. E.*	00	8 st. E.*	00	6 st. E.*	00	7 st. E.*	00	1 cir. st. 8 st. E.*	00	1 cir. cum. 5 st. E.*	00
Aug. 17	10 st. SE.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00
Aug. 18	10 st. E.*	00	10 nim. E.†	.—	9 st. E.†	.—	7 st. E.†	00	1 cir. 8 st. E.*	00	10 st. E.*	00
Aug. 19	6 cir. st. 1 st. 0	00	3 cir. 2 st. 0	00	3 cir. 1 st. 0	00	1 st. 0	00	1 st. E.†	00	1 st. E.†	00
Aug. 20	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. SE.†	00	9 st. SE.†	00
Aug. 21	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.*	00	10 st. NE.*	00
Aug. 22	3 cir. 4 st. NE.*	00	4 cir. 3 st. NE.†	00	5 cir. st. 3 st. W.†	00	1 cir. 2 cir. st. 6 st. 0	00	2 ci. st. 1 cum. 2 st. 0	00	1 cir. 2 cum. 2 st. 0	00
Aug. 23	10 st. 0	00	10 st. NE.†	00	10 st. NE.*	00	10 st. NE.†	00	10 st. E.†	00	10 st. E.†	00
Aug. 24	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. NNE.†	00	9 st. NE.†	00	10 st. 0	00
Aug. 25	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.01	10 nim. 0	.—
Aug. 26	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.*	00	9 st. NE.*	00
Aug. 27	10 st. N.*	.—	10 nim. N.*	.—	10 nim. N.*	—	10 st. N.†	.01	10 st. 0	00	10 st. 0	00
Aug. 28	1 cir. 8 st. E.†	00	9 st. E.†	00	10 nim. 0	.—	9 st. E.†	.—	8 st. NE.†	00	7 st. NE.†	00
Aug. 29	10 st. 0	00	10 st. ENE.†	00	10 st. ENE.†	00	10 st. ENE.†	00	10 st. ENE.†	00	10 st. NE.†	00
Aug. 30	10 nim. 0	.—	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00
Aug. 31	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	10 st. N.†	00	10 st. N.†	00	3 cir. 3 st. N.†	00
Means.	8.61		8.88		8.61		8.26		8.96		8.19	

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	1 cir. st. 6 st. SW.†	00	10 st. SW.†	00	10 st. 0	00	00
10 st. 0	.—	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.08
10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	00
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	00
10 st. 0	00	10 st. ENE.†	00	10 st. ENE.†	00	10 st. ENE.†	00	10 st. E.*	00	10 st. E.*	00	.38
10 nim. 0	.01	10 nim. 0	.—	8 st. S.†	.—	8 st. SW.†	00	8 st. SW.†	00	9 st. SW.†	00	.24
10 st. W.*	00	10 st. W.*	00	10 st. W.*	00	10 st. W.*	00	10 st. W.*	00	4 st. W.*	00	.04
1 cir. 1 st. W.*	00	1 cir. 1 st. 0	00	4 cir. 1 st. 0	00	4 cir. 0	00	5 cir. 2 st. 0	00	9 st. S.†	00	.10
10 nim. SW.†	.—	10 nim. SW.*	.01	10 st. SW.†	.—	10 st. SW.†	00	10 st. SW.†	00	10 nim. SW.†	.02	.11
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.02
10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. 0	00	.02
6 st. SW.†	00	5 st. SW.†	00	10 st. SW.*	00	10 st. SW.*	00	Dense fog. 0	0	Dense fog. 0	00	.03
10 st. NW.†	00	10 nim. NW.†	.—	10 nim. NW.†	.—	10 st. NW.†	.—	10 st. NW.†	00	10 st. NW.†	00	.—
10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. W.†	00	10 st. W.†	00	10 st. 0	00	.—
10 st. E.*	00	10 st. ESE.*	00	10 st. SSE.†	00	10 st. SE.*	00	9 st. SE*	00	10 st. SSE.*	00	.—
10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	00
10 st. ESE.*	00	10 st. ESE.*	00	10 st. ESE.*	00	10 st. ESE *	00	10 st. ESE.*	00	10 st. SE.*	00	00
10 st. E.*	.01	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	.—
1 st. 0	00	1 cir. 3 st. 0	00	3 cir. 1 st. 0	00	5 cir. 1 st. 0	00	5 cir. 2 st. 0	00	5 cir. 1 st. 0	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	00
10 st. NE.*	00	10 st. NE.*	00	2 cir. 4 st. NE.*	00	3 cir. 2 st. NE.*	00	3 cir. 2 st. NE.*	00	3 cir. 3 st. NE.*	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.01
10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	8 st. 0	00	.01
10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.03	.31
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.07
10 nim. NE.*	.—	10 st. 0	.—	10 nim. NE.*	00	10 nim. N.*	.—	10 nim. N.*	.—	10 nim. N.*	.—	.02
10 nim. E.†	.—	10 nim. E.†	.—	10 st. E.†	.—	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	.—
10 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. ENE.†	00	10 st. ENE.†	00	.—
10 st. NE.†	00	10 st. NNE.†	00	10 st. NE.†	.—	10 st. ENE.†	.—	10 st. ENE.†	.—	10 st. ENE.†	.—	.01
10 st. 0	00	10 st. NNE.†	00	10 st. S.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
9.00		8.74		8.48		8.38		8.26		8.12		1.45

7 p. m.	Precipitation.	8 p. m.	Precipitation.	9 p. m.	Precipitation.	10 p. m.	Precipitation.	11 p. m.	Precipitation.	12 p. m.	Precipitation.	Daily means.
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	6.87
10 st. 0	.—	10 st. 0	00	10 nim. 0	.01	8 st. SW.†	.—	1 cir. cum. 8 st. SSW.*	00	1 ci. s. 3 cu. 3 s. SW.*	00	6.00
Dense fog. 0	00	10 st. WNW*. D. fog.	00	Dense fog. 0	00	10 st. W.†	00	10 st. W.†	00	9 st. W.†	00	4.16
10 st. NW.*	00	1 cir. 3 st. NW.*	00	1 ci. 2 ci. st. 3 s. NW.*	00	1 ci. 1 ci. st. 6 st. N.*	00	1 cir. st. 9 st. N.*	00	10 st. N.†	00	5.29
10 nim. 0	.—	10 nim. 0	.06	10 nim. 0	.05	10 nim. 0	.10	10 nim. 0	.09	10 nim. 0	.08	9.58
8 st. SW.†	00	4 cum. 4 st. SW.†	00	4 cum. 5 st. SW.†	00	9 st. SW.†	00	9 nim. W.*	.—	9 nim. W.*	.02	8.83
8 st. W.*	.—	9 st. W.*	00	9 st. W.*	00	1 cir. 8 st. W.*	00	10 st. W.*	00	10 st. W.*	00	9.41
10 st. SW.†	00	10 nim. 0	.02	10 nim. 0	.03	10 nim. SW.†	.02	10 nim. SSW.*	.02	10 st. SSW.*	.01	8.00
10 st. NW.*	00	10 st. 0	00	10 st. NW.*	00	1 cir. 8 st. NW.*	00	10 st. WNW.*	00	10 st. WNW.*	00	9.54
1 cir. 8 st. SW.†	00	9 st. SW.†	00	10 st. 0	00	9 st. SW.†	00	1 cir. cum. 9 st. S.*	00	9 st. S.*	00	9.79
8 st. SW.†	00	1 cir. 4 st. SW.*	00	1 cir. 5 st. SW.†	00	7 st. SW.†	.01	1 ci. s. 2 cu. 2 s. SW.†	00	1 cir. st. 7 st. SW.†	00	9.04
10 st. NW.*	00	10 st. NW.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8 st. NW.*	00	5.62
9 st. NW.†	00	9 st. NW.†	00	1 cir. 8 st. NW.†	00	9 st. NW.†	00	9 st. NNW.*	00	9 st. NNE.†	00	9.54
10 st. E.†	.—	10 st. E.†	00	10 st. E.†	00	9 st. E.*	00	1 ci. 1 ci. st. 6 st. E.*	00	1 cir. cum. 8 st. SE.*	00	9.75
8 st. ESE.*	00	8 st. ESE.*	00	9 st. ESE.*	00	2 cir. st. 7 st. ESE.*	00	10 st. SE.*	00	10 st. SSE.*	00	9.33
3 cir. cum. 3 st. E.*	00	2 cir. cum. 4 st. E.*	00	2 cir. cum. 5 st. E.*	00	2 cir. cum. 6 st. E.*	00	1 cir. st. 9 st. ESE.*	00	1 cir. st. 8 st. ESE.*	00	8.25
10 st. E.*	00	9 st. E.*	00	10 st. E.*	00	1 cir. cum. 8 st. E.*	00	10 st. ESE *	00	10 st. E.*	00	9.87
10 st. E.*	00	9 st. E.*	00	10 st. E.*	00	10 st. E.†	00	9 st. E.*	00	8 st. E.†	00	9.50
1 st. E.†	00	1 cir. 1 st. 0	00	4 cir. 1 st. SE.*	00	2 ci. 2ci. cu. 2 st. SE.†	00	1 cir. 6 st. E.†	00	1 ci. 1 ci. s. 5 s. ESE †	00	3.87
9 st. SE.†	00	9 st. SE.†	00	10 st. 0	00	1 cir. st. 8 st. 0	00	1 cir. 7 st. 0	00	1 cir. 8 st. 0	00	9.54
10 st. NE.*	00	9 st. NE.*	00	10 st. NE.*	00	10 st. 0	00	10 st. NE.†	00	1 cir. st. 9 st. NE.*	00	9.83
1 cir. 5 st. 0	00	1 cir. cum. 7 st. N.†	00	1 cir. st. 8 st. N.†	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	7.79
10 st. 0	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. E.†	.01	10.00
9 st. NE.†	00	1 cir. 9 st. NE.†	00	9 st. NE.†	00	10 st. E.†	00	10 st. ESE.†	00	9 nim. S.†	.—	9.75
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. NE.*	.04	10 nim. 0	.02	10.00
1 cir. 7 st. NE.*	00	1 ci. 1 ci. st. 6 st. NE.*	00	1 ci. s. 3 cu. 4 s. NE.*	00	9 st. NE.†	00	9 st. NE.†	00	1 ci. cu. 4 cu. 5 s. NE.†	00	9.62
10 st. 0	00	10 st. 0	.—	9 st. E.†	00	10 st. NE.†	.—	2 cir. cum. 8 st. NE.†	.—	10 st. NE.†	.—	9.95
8 st. NE.†	00	9 st. NE.†	00	1 cir. 7 st. NE.*	00	10 st. 0	00	10 nim. 0	.—	8 st. NE.†	.—	9.37
10 st. NE.†	00	8 st. NE.†	00	8 st. NE.†	00	4 cum. 5 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	8.79
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
4 st. N.†	00	1 cir. st. 1 st. N.*	00	1 st. N.†	00	1 cir. 1 cir. st. 2 st. 0	00	8 st. 0	00	1 cir. 2 cir. st. 4 st. 0	00	8.41
8.09		8.09		8.12		8.67		9.06		8.88		8.59

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m.		2 a. m.		3 a. m.		4 a. m.		5 a. m.		6 a. m.	
	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.
1882.												
Sept. 1	7 st. 0	00	8 st. 0	00	10 st. NNW.*	00	10 st. NNW.†	00	10 st. 0	00	10 st. 0	00
Sept. 2	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 3	9 st. NW.†	00	9 st. NW.†	00	5 cir. st. 3 st. 0	00	4 st. 0	00	3 st. 0	00	3 st. 0	00
Sept. 4	10 st. 0	00	9 st. 0	00	4 cir. st. 3 st. 0	00	2 cir. st. 2 st. 0	00	Light haze. 4 st. 0	00	Light haze. 5 st. 0	00
Sept. 5	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	1 st. 0	00
Sept. 6	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Light fog. 0	00	Light fog. 0	00
Sept. 7	10 st. ENE.*	.—	10 nim. ENE.*	.—	10 nim. 0	.—	9 nim. ENE.†	.—	10 nim. 0	.—	10 nim. 0	.01
Sept. 8	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 9	10 st. E.†	00	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—
Sept. 10	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Sept. 11	10 nim. E.*	.01	10 nim. 0	.—	10 nim. 0	.01	5 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01
Sept. 12	9 st. NNE.*	00	9 st. NE.†	00	10 st. 0	00	6 st. NE.†	.—	8 st. 0	00	9 nim. 0	.—
Sept. 13	10 nim. NW.*	.—	10 nim. NW.*	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Sept. 14	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Sept. 15	Dense fog. 0	00	1 st. 0	00	1 st. 0	00	Light haze. 2 st. 0	00	10 st. 0	00	4 st. 0	00
Sept. 16	1 ci. st. 9 st. E.* d. ha.	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 17	10 st. 0	00	9 st. 0	00	10 nim. 0	.—	9 nim. NE.*	.—	10 nim. 0	.—	10 nim. 0	.—
Sept. 18	Dense fog. 0	00	10 st. SW.*	00	Light haze. 9 st. 0	00	6 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 19	1 cir. st. 9 st. NW.†	00	8 st. NW.†	00	8 st. N.†	00	6 st. NW.†	00	9 st. NW.†	00	10 st. NW.†	00
Sept. 20	10 nim. NW.†	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. NW.†	.—	10 st. 0	00	10 st. 0	00
Sept. 21	9 st. NW.†	00	Light haze. 7 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—
Sept. 22	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 23	1 cir. 1 st. E.†	00	7 st. E.*	00	7 st. E.*	00	Dense haze. 9 st. E.*	00	10 st. 0	00	10 st. 0	00
Sept. 24	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 25	10 st. N.*	00	1 cir. st. 9 st. N.*	00	9 st. N.*	00	1 cir. st. 4 st. N.*	00	9 cum. st. N.*	00	10 st. N.†	00
Sept. 26	1 cir. st. 9 st. SW.†	.04	9 st. SW.†	00	7 st. 0	00	4 st. SW.†	00	5 st. W.†	00	3 cum. 3 st. W.†	00
Sept. 27	10 st. 0	00	10 st. 0	00	10 st. W.†	00	10 st. W.*	00	10 st. W.†	00	10 st. W.†	00
Sept. 28	10 st. 0	00	9 st. S.†	00	10 nim. 0	.09	10 nim. 0	.02	10 st. SSW.†	.—	10 cum. st. SSW.*	00
Sept. 29	10 st. 0	00	10 nim. 0	.03	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Sept. 30	9 st. 0	.01	9 st. S.†	00	1 cir. st. 1 st. 0	00	Dense haze. 2 st. 0	00	Dense haze. 3 st. 0	00	2 cir. 3 st. 0	00
Means	8.23		8.16		7.96		7.40		8.36		8.43	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1882.												
Sept. 1	10 st. N.†	00	10 st. N.†	00	10 st. N.†	00	10 st. N.†	00	10 st. N.†	00	10 st. 0	00
Sept. 2	10 st. 0	.—	10 st. 0	.—	10 st. S.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 3	2 cir. 7 st. 0	00	1 cir. st. 8 st. 0	00	1 cir. st. 8 st. 0	00	3 cir. 3 st. 0	00	6 st. 0	00	6 st. 0	00
Sept. 4	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Sept. 5	1 cir. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Sept. 6	2 ci. 2 ci. cu. 1 cu. st. 0	00	2 cir. 3 cir. cu. 3 st. 0	00	4 cir. cum. 5 st. NE.†	00	Dense haze. 0	00	10 st. NE.†	00	10 st. NE.†	00
Sept. 7	10 st. NE.*	00	10 st. NE.*	00	10 st. NE*	00	10 st. NE.	00	10 st. NE.*	00	10 st. NE.†	00
Sept. 8	10 st. NE.†	.—	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 9	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 10	10 st. E.*	.—	10 st. E.*	.—	10 nim. 0	.01	10 st. E.*	.—	10 st. E.*	00	10 st. E.*	00
Sept. 11	10 st. E.†	00	10 st. 0	00	8 st. NE.†	00	8 st. NE.†	.—	8 st. NE.†	00	7 st. NE.†	00
Sept. 12	9 st. NW.†	00	10 st. 0	00	10 st. 0	00	8 st. NW.†	00	8 st. NW.†	00	10 st. NW.†	00
Sept. 13	10 st. N.†	00	1 cir. 9 st. N.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 14	10 st. E.†	.—	10 st. SE.†	00	1 cir. 7 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Sept. 15	4 st. 0	00	9 st. SE.†	00	1 cir. 8 st. SE.†	00	8 st. SE.†	00	2 cir. 4 st. SE.†	00	2 cir. 2 st. 0	00
Sept. 16	2 cir. 2 st. 0	00	1 cir. 1st. 0	00	1 cir. 1 cir. st. 2 st. 0	00	1 cir. st. 1 st. E.*	00	4 st. 0	00	7 st. 0	00
Sept. 17	10 st. 0	00	10 st. NE.*	00	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Sept. 18	10 st. SW.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00
Sept. 19	1 cir. cum. 9 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. SW.†	00	10 st. W.†	00
Sept. 20	10 st. 0	00	1 cir. cum. 7 st. 0	00	2 cir. cum. 6 st. 0	00	1 cir. 2 cir. cu. 2 st. 0	00	3 cir. cum. 5 st. 0	00	3 cir. 6 st. 0	00
Sept. 21	10 st. NE.	.—	10 st. NE.†	00	10 st. NE.†	00	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00
Sept. 22	3 cir. 5 st. 0	00	10 st. E.*	00	10 st. E.*	00	8 st. E.*	00	2 cir. 7 st. E.*	00	9 st. E.*	00
Sept. 23	1 cir. 4 st. ENE.†	00	1 cir. 5 st. E.†	00	2 cir. st. 3 st. E.†	00	3 cir. st. 2 st. E.†	00	3 cir. 2 cir. st. 1 st. 0	00	3 cir. 2 st. 0	00
Sept. 24	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. NNE.†	00	10 st. N.†	00	10 st. N.†	00
Sept. 25	10 st. NW.†	00	10 st. 0	.—	10 st. NW.†	00	10 nim. 0	.01	4 cum. 4 st. 0	.—	9 st. 0	00
Sept. 26	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	9 st. SW.†	.—	10 st. SW.†	00
Sept. 27	Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Sept. 28	Dense fog. 0	00	Dense fog. 0	00	3 cir. Dense fog. 0	00	8 cir. 5 st. SW.*	00	10 st. SW.*	00	10 st. SW.*	00
Sept. 29	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	10 st. 0	.—	Dense fog. 0	00
Sept. 30	2 cir. 2 cir. st. 2 st. 0	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00
Means.	7.73		8.50		8.20		7.33		7.46		7.26	

charactır of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continuéd.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 st. 0	00	10 nim. 0	.—	10 st. NNW.*	.—	10 nim. 0	.—	10 nim. 0	.01	10 st. 0	.—	.01
10 st. Light fog. 0	00	10 st. 0	.—	10 st. 0	.—	10 st. 0	.—	10 st. 0	.—	10 st. 0	.—	.—
3 st. 0	00	2 cir. cum. 3 st. 0	00	3 cir. cum. 4 st. 0	00	2 cir. 5 st. 0	00	3 cir. 5 st. 0	00	3 cir. 6 st. 0	00	.00
2 cir. 2 st. 0	00	2 cir. 3 st. 0	00	8 cir. 1 st. 0	00	6 cir. 2 st. 0	00	6 cir. 0	00	3 cir. 0	00	.00
2 st. 0	00	1 st. 0	00	1 cir. cum. 0	00	1 cir. cum. 0	00	1 cir. cum. 0	00	1 cir. cum. 0	00	.00
1 st. 0	00	1 st. 0	00	1 st. 0	00	5 cir. cum. 1 st. 0	00	4 cir. cum. 1 st. 0	00	6 cir cum. 1 st. 0	00	.—
10 st. ENE.†	.—	10 st. ENE.†	00	10 st. NNE.*	00	10 st. NNE.*	00	10 st. NE.*	00	10 st. NE.*	00	.01
10 st. 0	00	10 st. E.†	00	10 st. NE.†	00	10 st. NE.†	.00	10 st. NE.†	00	10 st. NE.†	.—	.—
10 st. E.†	00	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	.—	10 st. 0	.—	.—
10 nim. 0	.—	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00	10 st. E.*	00	10 nim. E.*	.—	.02
9 nim. 0	.—	10 st. ESE.†	.—	10 nim. E.†	.—	10 st. ESE.†	.03	10 st. E.†	.02	10 st. E.†	00	.08
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. WNW.†	00	1 cir. 8 st. WNW.†	00	.01
10 nim. 0	.01	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. N.†	00	10 st. N.†	00	.02
10 nim. 0	.01	10 nim. 0	.05	10 nim. 0	.05	10 nim. 0	.01	10 nim. ENE.†	.—	10 nim. ENE.†	.—	.15
Light haze. 0	00	0 0	00	Light haze. 1 st. 0	00	2 st. 0	00	1 st. 0	00	3 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. E.*	00	.00
10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. NE.*	00	.01
10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. WSW.*	00	10 st. WSW.*	00	10 st. WSW.*	00	.00
10 nim. 0	.—	10 nim. 0	.—	10 st. W.†	.—	10 st. W.†	00	10 st. W.†	00	2 cir. cum. 8 st. W.†	00	.—
10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	.—	10 st. 0	00	.—
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	.02
10 st. 0	00	10 st. 0	00	10 st. 0	00	3 cir. cum. 5 st. 0	00	2 cir. 3 cir. cu. 2 st. 0	00	5 ci. cum. 4 st. ENE.*	00	.00
10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. ENE.*	00	3 cir. cum. 6 st. ENE.*	00	2 ci. cum. 5 st. ENE.†	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 st. N.†	00	10 nim. N.†	.—	10 st. N.†	.—	10 st. NW.†	00	10 st. NW.†	.02	10 st. NW.†	00	.04
2 cum. 3 st. W.†	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	.06
10 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. 0	00	10 nim. 0	.—	Dense fog. 0	.—	.—
L. ha. 3 cu. 4 cu. s. SW.*	00	Lt. haz. 8 cu. st. SW.*	00	10 st. SW.* Light fog.	00	10 st. SW.* Light fog.	00	10 nim. SW.* Lt. fog.	.—	Dense fog. 0	.—	.11
10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.03	10 nim. 0	.01	10 nim. 0	.05	10 nim. 0	.04	.25
1 cir. 2 st. 0	00	2 cir. 1 st. 0	00	2 cir. 1 st. 0	00	2 cir 6 st. 0	00	3 cir. 5 st. 0	00	3 cir. cum. 6 st. 0	00	.30
8.13		8.43		8.73		9.00		8.83		8.23		1.09

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
10 st. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 nim. 0	.—	10 nim. 0	.—	9.37
6 cir. st. 3. st. S.*	00	7 cir. st. 3 st. 0	00	10 st. 0	00	10 st. SE.†	00	10 st. SE.†	00	3 cir. st. 5 st. SE.†	00	9.87
5 st. 0	00	2 cir. st. 5 st. 0	00	3 cir. 5 st. 0	00	2 cir. 6 st. 0	00	1 cir. 7 st. 0	00	8 st. 0	00	6.63
1 st. 0	00	0 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	2 st. 0	00	3.75
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0.95
9 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 nim. NE.†	.—	10 nim. NE.†	.—	5.08
10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	9.95
Dense haze. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.—	10 st. 0	00	10 st. 0	00	9.58
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00	10.00
10 st. E.*	00	8 st. NE.*	00	10 st. E.†	00	10 st. E.† Light fog.	00	10 nim. E.†	.—	10 nim. E.†	.—	9.91
3 cum. st. NE.†	00	3 cum. 0	00	7 st. NE.†	00	9 st. N.†	00	4 cum. N.*	00	9 st. N.†	00	8.33
10 st. NW.†	00	9 st. NW.†	00	10 st. NW.†	00	10 st. NW.†	00	10 st. NW.†	00	10 st. NW.†	00	9.33
10 st. 0	00	10 st. 0	00	10 st. N.†	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10.00
Dense fog. 0	00	Dense fog. 0	00	3 cir. Dense fog. 0	00	1 cir. st. 9 st. E.†	00	2 cir. st. 7 st. E.†	00	4 cir. st. 4 st. SE.†	00	7.41
1 cir. 1 st. 0	00	1 cir. 1 cum. st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	3.37
9 st. E.*	00	9 st. E.*	00	10 st. E.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	7.53
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.91
Dense fog. 0	00	Dense fog. 0	00	10 st. Light fog. 0	00	10 st. 0	00	10 st. 0	00	1 cir. 8 st. NW.†	00	7 66
9 st. NW.†	00	9 st. NW.†	00	9 st. NW.†	00	10 st. NW.†	00	10 st. 0	00	10 st. 0	00	9.50
2 cir. 8 st. 0	00	10 st. 0	00	10 st. SE.†	00	1 cir. 8 st. SE.†	00	9 st. SE.†	00	2 cir. 4 st. SE.†	00	9.25
10 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. NE.†	00	10 st. NE.†	00	9.53
8 st. E.*	00	8 st. E.*	00	6 st. NE.†	00	4 st. NE.†	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	8.33
3 cir. 4 st. 0	00	2 cir. 2 st. 0	00	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	7.66
10 st. N.*	00	10 st. N.*	00	10 st. N.*	00	10 st. N.*	00	10 st. N.†	00	10 st. 0	00	10.00
10 st. 0	00	8 st. 0	00	9 st. 0	00	9 st. W.†	00	9 st. W.†	00	10 nim. 0	.01	9.37
10 st. 0	00	10 st. 0	00	1 cir. 7 st. NW.†	00	5 st. NW.†	00	9 st. NW.†	00	10 st. NW.†	00	8.62
10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	9 st. S.†	00	10 st. S.†	00	9 st. S.†	00	7.41
10 st. SW.*	00	10 st. SW.*	00	9 st. SW.*	00	10 st. SW.†	00	10 st. SW.†	00	10 st. 0	00	8.08
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 nim. 0	.—	7.50
10 st. 0	00	10 nim. 0	.01	10 nim. 0	.15	10 nim. E.*	.12	10 st. E.*	.—	10 nim. E.*	.01	7.50
7.06		6.90		8.13		8.26		8.23		8.53		8.06

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m.		2 a. m.		3 a. m.		4 a. m.		5 a. m.		6 a. m.	
	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.
1882.												
Oct. 1	10 nim. 0	.10	10 nim. 0	.07	10 nim. 0	.04	10 nim. 0	.06	10 nim. 0	.05	10 nim. 0	.03
Oct. 2	9 st. 0	—	10 st. 0	00	10 st. 0	00	10 nim. SSW.*	.01	10 nim. 0	.01	10 nim. 0	.02
Oct. 3	10 nim. 0	.05	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 nim. 0	.01	10 nim. 0	—
Oct. 4	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	—	10 nim. 0	.01
Oct. 5	10 st. ENE.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. ENE.†	00
Oct. 6	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 7	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 8	3 st. NE.†	00	5 st. NE.†	00	Lt. haze. 6 st. NE.†	00	9 st. 0	00	10 st. 0	00	3 st. 0	00
Oct. 9	Light haze. 8 st. 0	00	Dense haze. 5 st. 0	00	D. haze. 6 st. 0	00	Lt. haze. 8 st. 0	00	Light haze. 7 st. 0	00	10 st. 0	00
Oct. 10	Dense haze. 7 st. 0	00	10 nim. 0	—	10 nim. 0	—	Lt. haze. 5 nim. 0	.01	Light haze. 3 st. 0	—	Lt. haze. 6 nim. 0	—
Oct. 11	10 nim. 0	—	10 nim. 0	—	9 nim. 0	—	4 st. 0	—	10 nim. 0	—	10 nim. 0	01
Oct. 12	Dense haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	.00	Dense haze. 0	00	Light haze. 0	00	Light haze. 0	00
Oct. 13	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00
Oct. 14	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Oct. 15	2 st. 0	00	2 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Oct. 16	0 0	00	Light haze. 0	00	Lt. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 st. 0	00	10 st. 0	00
Oct. 17	0 0	00	0 0	00	1 st. 0	00	0 0	00	2 st. 0	00	3 st. 0	00
Oct. 18	10 st. 0	00	10 st. 0	—	10 st. 0	—	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 19	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 20	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 21	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 nim. 0	.01	10 nim. 0	—	10 nim. 0	—
Oct. 22	10 st. 0	00	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 nim. 0	.01
Oct. 23	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	3 st. 0	00
Oct. 24	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 nim. 0	—	10 st. 0	—
Oct. 25	10 st. 0	00	10 st. 0	—	10 st. 0	—	10 st. 0	—	10 st. 0	—	10 st. 0	00
Oct. 26	10 st. 0	00	10 st. W.†	00	9 st. N.*	00	8 st. N.*	00	5 cir.cum.3 st. NNW.†	00	4 cum. 2 st. NNW.†	00
Oct. 27	1 cir. st. 2 st. 0	00	2 cir. st. 2 st. 0	00	3 cir. st. 2 st. 0	00	9 st. NW.†	00	6 cum. 3 st. 0	00	5 cum. 4 st. 0	00
Oct. 28	Dense haze. 3 st. 0	00	8 st. 0	00	9 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 nim. 0	—
Oct. 29	9 st. S.†	00	9 st. S.†	00	8 st. SE.*	00	8 st. SE.* D. haze.	00	5 cir. cum. 3 st. SE.†	00	2 st. 0	00
Oct. 30	10 nim. 0	—	10 nim. 0	—	10 nim. SSE.*	—	10 st. SSE.*	.01	10 st. SSE.*	00	10 st. SSE.†	00
Oct. 31	10 st. 0	00	10 st. S.†	00	9 st. SSW.†	00	10 st. SSW.†	00	10 st. SSW.†	00	10 st. SSW.†	00
Means	6.96		7.25		7.19		7.16		7.67		7.48	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1882.												
Oct. 1	2 cir. cum. 6 st. SW.†	00	9 st. 0	00	9 st. SW.†	00	1 cir. cum. 7 st. S.†	00	2 cir. cum. 4 st. SW.†	00	2 cir. cum. 1 st 0	00
Oct. 2	1 cir. 9 st. SW.†	00	1 cir. 7 st. SW.†	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	5 cir. 2 st. 0	00
Oct. 3	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	—	10 nim. 0	.01	10 nim. 0	—	10 nim. 0	—
Oct. 4	10 nim. 0	—	10 nim. 0	.01	10 nim. 0	—	10 st. E.*	—	10 st. E.*	00	10 st. E.*	00
Oct. 5	10 st. NE.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 6	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. NE.*	00	10 st. 0	00
Oct. 7	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 8	1 cir. 1 st. NE.*	00	1 cir. 1 st. NE.*	00	1 cir. 1 st. NE.*	00	1 cir. 1 st. NE.*	00	1 cir. 1 st. NE.*	00	2 st. NE.*	00
Oct. 9	10 st. 0	00	8 st. NE.†	00	9 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 10	9 st. NE.†	00	8 st. NE.†	00	8 st. NE.†	00	6 st. NE.†	00	5 st. 0	00	8 nim. 0	—
Oct. 11	10 nim. 0	.01	10 nim. 0	—	10 nim. 0	—	10 nim. 0	.01	10 nim. 0	—	10 nim. 0	—
Oct. 12	1 st. NE.†	00	1 st. NE.†	00	1 st. Dense haze. 0	00	Dense haze. 0	00	Dense haze. 0	00	0 0	00
Oct. 13	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Oct. 14	10 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 15	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Oct. 16	10 st. E.†	00	1 cir. 3 st. E.†	00	1 cir. 4 st. E.†	00	10 st. E.†	00	5 st. E.†	00	1 st. 0	00
Oct. 17	2 st. E.†	00	5 st. E.†	00	10 st. E.†	00	8 st. E.*	00	8 st. E.*	00	10 st. E.*	00
Oct. 18	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 19	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 20	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 21	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 22	10 st. 0	00	10 st. 0	00	9 st. 0	00	8 st. 0	00	8 st. 0	00	8 st. 0	00
Oct. 23	2 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	4 cir. 2 st. 0	00	2 st. 0	00
Oct. 24	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 25	10 st. 0	00	10 st. 0	—	10 st. 0	00	10 st. 0	—	10 st. 0	00	10 st. 0	00
Oct. 26	10 st. 0	00	10 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 27	6 cir. cum. 4 st. 0	00	7 cir. cum. 2 st. 0	00	7 cir. cum. 1 st. 0	00	4 cir. cum. 1 st. 0	00	2 cir. cum. 2 st. 0	00	4 cir. cum. 2 st. 0	00
Oct. 28	10 st. WSW.†	00	10 st. WSW.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Oct. 29	1 st. 0	00	2 st. 0	00	1 cir. 1 st. SE.*	00	4 st. SE.*	00	9 st. SE.†	00	10 st. SE.†	00
Oct. 30	5 st. 0	00	6 st. 0	00	8 st. 0	00	10 nim. 0	.01	10 nim. 0	02	10 nim. 0	.02
Oct. 31	10 st. 0	00	10 nim. 0	.01	10 st. W.†	00	9 st. W.*	00	9 st. W.†	00	9 st. W.†	00
Means	7.80		7.61		7.83		7.48		7.54		7.67	

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*.] Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m.		8 a. m.		9 a. m.		10 a. m.		11 a. m.		12 m.		
Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 nim. 0	.05	10 nim. 0	.05	10 nim. 0	.04	10 nim. 0	.02	1 cir. 8 st. 0	.01	8 st. S.†	00	.52
10 nim. 0	.—	10 st. SW.†	.01	10 st. SW.†	00	10 st. SW.†	00	5 cir. cum. 4 st. SW.†	00	10 st. SW.†	00	.06
10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.02	.20
10 nim. 0	.—	10 nim. 0	.01	10 nim 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	.09
10 st. ENE.*	00	Lt. haze. 9 st. ENE.†	00	3 cir. 7 st. ENE.†	00	10 st. ENE.†	.01	10 st. NE.*	00	10 st. NE.*	.01	.01
10 st. 0	00	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 st. NE.*	.—	10 st. NE.*	00	.01
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
3 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	3 st. ENE.*	00	2 st. NE.*	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. ENE.†	00	10 st. ENE.†	00	.00
Lt. haze. 8 nim. 0	.01	Lt. haze. 7 nim. 0	.—	Lt. haze. 8 st. 0	.—	10 nim. 0	.01	10 st. NE.†	.—	8 st. NE.†	00	.04
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	.05
Lt. haze. 0	00	0 0	00	Lt. haze. 0	00	Lt. haze. 0	00	Lt. haze. 1 st. 0	00	Lt. haze. 1 st. 0	00	.00
Lt. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. 1 st. 0	00	Lt. haze. 1 st. 0	00	.00
0 0	00	0 0	00	0 0	00	Lt. haze. 0	00	Lt. haze. 0	00	3 cir. 2 st. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	Lt. haze. 10 st. 0	00	9 st. 0	00	10 st. E.†	00	.00
2 st. 0	00	Lt. haze. 2 st. 0	00	Lt. haze. 2 st. 0	00	Lt. haze. 3 st. 0	00	Lt. haze. 1 st. 0	00	Lt. haze. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	Lt. haze. 9 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
Lt. haze. 3 st. 0	.—	Lt. haze. 2 st. 0	00	Lt. haze. 0	00	Lt. haze. D. haze. 0	00	10 st. 0	00	10 st. 0	00	.01
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	.01
3 st. E.†	00	2 st. 0	00	Lt. haze. 0	00	Lt. haze. 0	00	Lt. haze. 1 st. 0	00	Lt. haze. 1 st. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	.—
3 cum. 3 st. NNW.†	00	4 ci. cu. 2 st. NNW.†	00	6 ci. cu. 3 st. NNW.†	00	7 ci. cu. 2 st. NNW.†	00	4ci 3ci.cu.2s. NNW.†	00	5 ci. cu. 5 st. NNW.†	00	.00
6 cum. 2 st. 0	00	7 cum. 3 st. 0	00	8 cir. cum. 2 st. 0	00	8 cir. cum. 2 st. 0	00	7 cir. cum. 3 st. 0	00	7 cir. cum. 3 st. 0	00	.00
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	00	10 st. SW.†	.—	10 nim. WSW.†	.—	10 st. WSW.†	.—	.—
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	.00
10 st. SSE.†	00	10 st. SSE.†	00	3 st. 0	00	2 st. 0	00	3 st. 0	00	4 cum. 3 st. 0	00	.07
10 st. 0	00	10 st. 0	00	Lt. haze. 3 st. 0	00	8 cir. cum. 1 st. 0	00	7 cir. cum. 3 st. 0	00	4 cir. cum. 5 st. SW.†	00	.01
7.22		7.12		6.67.		6.90.		7.32		7.58.		1.08

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
3 cir. cum. 2 st. 0	00	3 cir. 1 st. 0	00	2 cir. cum. 6 st. 0	00	9 st. 0	00	10 st. 0	00	9 nim. 0	.—	8.54
Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.01	7.95
10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	10.00
10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.95
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	1 cir. 7 st. 0	00	5 st. NE.†	00	9 st. 0	00	9.66
2 st. NE.*	00	2 st. NE.*	00	8 st. NE.*	00	8 st. NE.*	00	8 st. NE.†	00	5 st. NE.†	00	3.87
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.20
10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	8.16
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	6 st. 0	00	9.54
0 0	00	0 0	00	1 st. 0	00	Dense haze. 0	00	2 st. Light fog. 0	00	2 st. Light fog. 0	00	.41
2 st. 0	00	4 st. 0	00	3 cir. st. 1 st. 0	00	2 st. 0	00	4 st. 0	00	1 st. 0	00	1.04
10 st. ENE.†	00	10 st. E.†	00	10 st. E.†	00	10 st. ESE.†	00	10 st. ENE.†	00	2 st. 0	00	4.95
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	4 st. NE.†	00	2 st. 0	.00	.87
1 st. 0	00	8 st. 0	00	9 st. E.†	00	10 st. E.†	00	10 st. E.†	00	4 st. 0	00	6.50
10 st. E.*	00	10 st. E.*	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	4.95
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.95
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8.54
9 st. 0	00	9 st. 0	00	10 st. 0	00	8 st. 0	00	4 st. 0	00	2 st. 0	00	8.95
5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	3.50
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.08
3 cir. cum. 2 st. 0	00	3 cir. cum. 2 st. 0	00	1 cir. cum. 3 st. 0	00	4 st. 0	00	4 st. 0	00	5 st. 0	00	6.91
10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	9 st. 0	00	5 st. 0	00	9.29
10 st. SE.†	00	10 st. SE.†	00	10 st. S.†	00	10 st. SE.†	00	10 st. 0	00	10 st. 0	00	5.79
9 st. S.†	.01	9 st. S.†	00	9 st. SSW.†	00	6 st. SSW.†	00	10 st. 0	00	9 st. SW.†	00	8.16
9 st. W.†	00	1 cir. st. 9 st. W.†	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	9.41
7.67		8.45		8.51		8.54		8.70		7.77		7.58

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1882.												
Nov. 1	5 st. 0	.—	3 cir. cum. 3 st. 0	00	9 st. 0	00	10 nim. 0	.01	10 st. 0	.—	10 nim. 0	.—
Nov. 2	1 st. 0	00	Light haze. 4 st. 0	00	1 st. 0	00	1 cir. st. 1 st. 0	00	Light haze. 4 st. 0	00	Light haze. 5 st. 0	00
Nov. 3	0 0	00	0 0	00	Dense haze. 1 st. 0	00	1 st. 0	00	Light haze. 3 st. 0	00	2 st. 0	00
Nov. 4	10 st. 0	00	9 st. 0	00	10 st. 0	00	Dense haze. 9 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 5	2 st. 0	00	Light haze. 2 st. 0	00	Dense haze. 4 st. 0	00	Dense haze. 5 st. 0	00	Dense haze. 6 nim. 0	.—	Light haze. 4 nim. 0	.—
Nov. 6	10 st. 0	00	Dense haze. 8 st. 0	00	10 st. Dense haze. 0	00	Dense haze. 5 st. 0	00	Dense haze. 4 st. 0	00	D. haze. D. haze. 0	00
Nov. 7	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 8	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense haze. 8 st. 0	00	10 st. 0	00
Nov. 9	0 0	00	L. haz. 4 s. NE.* D. haz.	00	0 0	00	0 0	00	0 0	00	2 st. 0	00
Nov. 10	10 nim. 0	.02	10 nim. 0	.01	Light haze. 3 st. 0	.—	10 st. NW.*	00	10 st. 0	00	10 nim. 0	.—
Nov. 11	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00
Nov. 12	10 st. 0	00	10 st. 0	00	8 st. 0	00	1 st. 0	00	2 st. 0	00	3 st. 0	00
Nov. 13	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 14	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 15	0 0	00	0 0	00	0 0	00	0. 0	00	0 0	00	0 0	00
Nov. 16	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	3 st. 0	00
Nov. 17	2 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	3 st. 0	00	2 st. 0	00
Nov. 18	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 19	10 st. Dense haze. 0	00	10 st. Dense haze. 0	00	10 st. Dense haze. 0	00	Dense haze. 8 st. 0	00	Light haze. 8 st. 0	00	10 st. 0	00
Nov. 20	Dense haze. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	Light haze. 2 st. 0	00
Nov. 21	9 st. ENE.*	00	9 st. ENE.*	00	9 st. ENE.*	00	1 cir. st. 2 st. E.*	00	3 st. 0	00	2 st. 0	00
Nov. 22	10 st. W.†	00	10 nim. 0	.—	10 nim. W.†	.02	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Nov. 23	10 st. WNW.*	00	10 st. WNW.*	00	10 st. 0	00	10 nim. WNW.*	.—	10 nim. WNW.†	.—	10 st. W.†	.—
Nov. 24	9 st. W.†	00	9 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00
Nov. 25	9 st. WNW.*	00	1 cir. st. 2 st. W.*	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 26	1 cir. st. 0	00	1 cir. st. 0	00	1 cir. st. 0	00	3 cir. st. 2 st. 0	00	5 cir. cum. 1 st. 0	00	5 cir. cum. 2 st. 0	00
Nov. 27	9 st. 0	00	Dense haze. 9 st. 0	00	1 cir. st. 8 st. 0	00	1 cir. st. 4 st. 0	00	2 cir. 3 st. 0	00	3 st. 0	00
Nov. 28	2 cir. st. 1 st. 0	00	1 cir. st. 2 st. 0	00	1 cir. 1 cir. st. 1 st. 0	00	2 cir. 2 cir. st. 2 st. 0	00	1 cir. st. 2 st. 0	00	3 st. 0	00
Nov. 29	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00
Nov. 30	0 0	00	0 0	00	0 0	00	0 0	00	2 st. 0	00	1 st. 0	00
Means.	5.46		5.50		5.23		4.93		5.10		4.93	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1882.												
Nov. 1	2 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	2 st. 0	00
Nov. 2	8 st. NW.*	00	8 st. NW.*	00	1 cir. 8 st. NW.*	00	9 st. NW.*	00	9 st. NW.*	00	10 st. NW.*	00
Nov. 3	10 st. 0	00	6 st. NW.†	00	4 st. NW.†	00	5 st. NW.†	00	4 st. NW.†	00	6 st. 0	00
Nov. 4	6 cir. 2 st. 0	00	2 cir. 7 st. 0	00	3 cir. 5 st. 0	00	1 cir. 4 st. 0	00	3 cir. 4 st. 0	00	Lt. haze. D. haze. 0	00
Nov. 5	Light haze. 6 st. 0	00	3 cir. cum. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 6	2 cir. cum. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00	10 st. E.†	00
Nov. 7	2 cir. 3 st. 0	00	1 cir. 4 st. 0	00	1 cir. 3 st. 0	00	5 cir. 2 st. 0	00	4 cir. 3 st. 0	00	3 cir. 3 st. 0	00
Nov. 8	10 st. 0	00	9 st. E.†	00	1 cir. 8 st. E.†	00	7 st. E.†	00	10 st. 0	00	10 st. 0	00
Nov. 9	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	8 nim. 0	.—	10 nim. 0	.01
Nov. 10	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 11	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Nov. 12	1 st. 0	00	2 st. NE.*	00	4 st. NE.*	00	1 cir. 5 st. NE.*	00	1 cir. 4 st. NE.*	00	3 st. 0	00
Nov. 13	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	0 0	00
Nov. 14	Light haze. 0	00	1 st. 0	00	1 st. 0	00	1 st. ESE.†	00	1 st. 0	00	1 st. 0	00
Nov. 15	1 cir. cum. 1 st. 0	00	2 st. 0	00	2 st. 0	00	1 cir. cum. 2 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00
Nov. 16	1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. NE.†	00	1 cir. 1 st. 0	00	1 cir. 3 st. 0	00
Nov. 17	5 st. 0	00	1 cir. cum. 5 st. 0	00	3 cir. cum. 3 st. 0	00	1 cir. 4 st. 0	00	1 cir. 4 st. 0	00	1 cir. 3 st. 0	00
Nov. 18	Light haze. 5 st. 0	00	6 st. 0	00	1 cir. 5 st. 0	00	1 cir. 4 st. 0	00	3 cir. st. 4 st. 0	00	9 st. 0	00
Nov. 19	9 st. 0	00	1 cir. cum. 5 st. 0	00	1 cir. 4 st. 0	00	1 cir. 1 st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00
Nov. 20	10 st. 0	00	10 st. 0	00	9 st. E.†	00	9 st. E.†	00	9 st. E.†	00	9 st. E.†	00
Nov. 21	Dense haze. 5 st. 0	00	8 st. 0	00	9 st. NE.†	00	1 cr. 2 cr. st. 5 st. NE.†	00	2 cir. 2 cir. st. 5 st. 0	00	9 st. 0	00
Nov. 22	6 st. 0	00	5 st. NW.†	00	10 st. NW.†	00	8 st. NW.†	00	9 st. W.*	00	9 st. W.*	00
Nov. 23	L. haz. 4 cum. 4 st. W.†	00	3 cum. 3 st. W.†	00	2 cum. 3 st. W.†	00	2 st. W.†	00	Light haze. 8 st. W.†	00	8 st. 0	00
Nov. 24	5 st. S.†	00	6 st. S.†	00	1 st. S.†	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 25	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 26	5 cir. 1 st. 0	00	4 cir. st. 4 st. 0	00	2 cir. st. 6 st. 0	00	1 cir. 2 cir. st. 5 st. 0	00	7 st. 0	00	1 cir. 4 st. 0	00
Nov. 27	4 cir. 2 st. 0	00	5 cir. L. haze. 3 st. 0	00	2 cir. 3 st. 0	00	1 cir. 4 st. 0	00	1 cir. 4 st. 0	00	2 cir. 4 st. 0	00
Nov. 28	1 cir. 0	00	1 cir. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Nov. 29	0 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00
Nov. 30	0 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Means.	5.23		5.53		5.46		5.16		5.46		5.33	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a.m. Amount, kind, and direction of clouds.	Precipitation.	8 a.m. Amount, kind, and direction of clouds.	Precipitation.	9 a.m. Amount, kind, and direction of clouds.	Precipitation.	10 a.m. Amount, kind, and direction of clouds.	Precipitation.	11 a.m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	8 st. 0	00	6 st. 0	00	4 st. 0	00	.01
Light haze. 6 st. 0	00	D. haze. D. haze.	00	Lt. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 nim. WNW.*	.01	3 c.L.hz.5 st. NNW.*	.—	.01
3 st. 0	00	1 st. 0	00	Lt. haze. 4 st. NW.†	00	Light haze. 2 st. 0	00	Light haze. 0	00	Light haze. 0	00	.00
10 st. 0	00	Light haze. 6 st. 0	00	3 st. 0. Lt. haze.	00	2 st. 0	00	Light haze. 1 st. 0	00	4 cir. 2 st. 0	00	.00
Light haze. 5 st. 0	.—	Light haze. 6 st. 0	00	Light haze. 6 st. 0	00	Light haze. 6 st. 0	00	Light haze. 7 st. 0	00	Light haze. 7 st. 0	00	.—
D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	10 nim. 0	.—	Light haze. 8 st. 0	.—	10 st. 0	00	3 cir. cum. 4 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	Light haze. 6 st. 0	00	5 st. 0	00	Dense haze. 4 st. 0	00	.00
10 st. 0	00	Dense haze. 8 st. 0	00	L. haze. 3 st. L. haze. 0	00	L. haze. 2 st. L. haze. 0	00	Lt. haze. Lt. haze. 0	00	Dense haze. 8 st. 0	00	.00
2 st. 0	00	Light haze. 3 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.01	.19
10 st. 0	.—	Light haze. 5 st. 0	00	Light haze. 7 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.03
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.01	.05
2 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	Dense haze. 0	00	1 st. 0	00	.00
2 st. 0	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. Light haze. 0	00	1 st. Light haze. 0	00	.00
2 st. 0	00	2 st. 0	00	Light haze. 0	00	Light haze. 0	00	Light haze. 0	00	Light haze. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	.00
2 st. 0	00	1 st. 0	00	Light haze. 0	00	0 0	00	0 0	00	1 st. 0	00	.00
Dense haze. 5 st. 0	00	10 st. 0	00	8 st. 0	00	3 st. 0	00	10 nim. 0	.—	2 st. 0	.—	.—
5 st. 0	00	4 st. 0	00	Light haze. 5 st. 0	00	L. haze. 1 st. D. haze. 0	00	L. haze. D. haze. 0	00	L. haze. 3 st. L. haze. 0	00	.00
10 st. 0	00	Dense haze. 6 st. 0	00	Dense haze. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
3 st. 0	00	3 st. 0	00	2 st. 0	00	2 st. 0	00	9 st. ESE.*	00	10 st. 0	00	.00
D. haze. D. haze. 0	00	Dense haze. 8 st. 0	00	Dense haze. 9 st. 0	00	Dense haze. 9 st. 0	00	Dense haze. 7 st. 0	00	Dense haze. 4 st. 0	00	.00
10 nim. 0	.01	3 cir. cum. 5 st. 0	.—	10 st. 0	00	Dense haze. 7 st. 0	.—	10 st. 0	00	10 st. 0	00	.05
10 st. W.†	00	10 st. WNW.†	00	8 cum. WNW.†	00	8 cum. WNW.†	00	9 cum. WNW.†	00	Light haze. 8 cum. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	1 st. S.*	00	.00
2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	.00
3 cir. 2 st. 0	00	5 cir. st. 3 st. 0	00	5 cir. 3 cir. cum. 2 st. 0	00	5 cir. cum. 5 st. 0	00	6 cir. 2 cir. cum. 2 st. 0	00	5 cir. 0	00	.00
1 cir. 2 st. 0	00	2 cir. 1 st. 0	00	3 cir. 4 cir. cum. 1 st. 0	00	4 cir. L. haze. 1 st. 0	00	3 ci. L. hz. 1 st. L. hz. 0	00	3 ci. L. hz. 1 st. L. hz. 0	00	.00
2 cir. 2 st. 0	00	2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 0	00	0 0	00	.00
0 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
3 st. 0	00	3 st. 0	00	1 cir. 0	00	Light haze. 0	00	Light haze. 0	00	Light haze. 0	00	.00
5.13		4.76		5.20		4.13		5.03		4.50		.34

7 p.m.		8 p.m.		9 p.m.		10 p.m.		11 p.m.		12 p.m.		Daily means.
3 st. 0	00	Dense haze. 3 st. 0	00	Dense haze. 3 st. 0	00	1 cir. 3 st. 0	00	2 st. 0	00	1 st. 0	00	5.21
10 st. NW.*	00	10 st. NW.*	00	10 st. NW.†	00	8 st. NW.†	00	4 st. 0	00	1 st. 0	00	5.71
Dense haze. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	4.45
6 cir. 3 st. 0	00	5 cir. 4 st. 0	00	10 st. E.†	00	7 st. 0	00	4 st. 0	00	2 st. 0	00	6.83
10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. E.*	00	4 st. 0	00	10 st. 0	00	6.95
10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.87
3 cir. 5 st. 0	00	3 cir. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8.12
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	5 st. 0	00	8.29
10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.02	7.04
10 st. 0	00	10 st. 0	00	10 st. 0	00	7 st. E.†	00	10 st. 0	00	9 st. E.†	00	9.20
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
4 st. 0	00	1 cir. 2 st. 0	00	4 st. NE.*	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	3.33
0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1.04
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	1 st. 0	00	.83
2 st. 0	00	2 st. 0	00	1 st. 0	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	1.00
3 cir. 3 st. 0	00	9 st. 0	00	1 cir. st. 5 st. 0	00	4 st. 0	00	3 st. 0	00	2 st. 0	00	2.29
										9 st. NE.†	00	
1 cir. 4 st. 0	00	1 cir. 4 st. 0	00	5 st. 0	00	3 st. 0	00	8 st. NE.†	00			4.87
10 st. 0	00	10 st. 0	00	9 st. 0	00	4 st. 0	00	4 st. 0	00	6 st. NE.†	00	6.62
Light haze. 2 st. 0	00	2 st. 0	00	4 cir. cum. 5 st. 0	00	9 st. E.†	00	9 st. E.†	00	9 st. E.†	00	7.29
9 st. E.†	00	9 st. E.†	00	8 st. E.†	00	8 st. E.†	00	3 st. 0	00	5 st. E.†	00	5.71
9 st. 0	00	9 st. 0	00	6 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.25
										10 st. 0	00	
10 st. W.†	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00			9.62
9 st. 0	00	7 st. 0	00	2 cir. 2 st. 0	00	1 cir. 2 st. 0	00	5 st. 0	00	10 st. 0	00	7.83
1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	10 st. 0	00	10 st. NW.†	00	10 st. 0	00	6.58
1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.33
3 st. 0	00	3 st. 0	00	3 st. 0	00	3 st. 0	00	5 st. 0	00	1 cir. 5 st. S.†	00	5.58
2 cir. 4 st. 0	00	2 cir. 3 st. 0	00	1 cir. st. 3 st. 0	00	3 st. 0	00	2 st. 0	00	1 cir. st. 2 st. 0	00	5.20
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1.79
1 st. 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.45
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.91
5.90		5.96		6.00		5.73		5.40		5.53		5.27

Statement showing the amount, kind, and direction of clouds, and amount and

Washington mean time. Correction to reduce mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m.		2 a.m.		3 a.m.		4 a.m.		5 a.m.		6 a.m.	
	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.
1882.												
Dec. 1	0 0	00	0 0	00	Light haze. 0	00	Light haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. Lt. haze. 0	00
Dec. 2	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	3 st. 0	00
Dec. 3	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Lt. haze. Lt. fog. 0	00	Lt. haze. Lt. fog. 0	00
Dec. 4	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 5	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00
Dec. 6	1 st. 0	00	3 st. 0	00	3 st. 0	00	2 st. 0	00	3 st. 0	00	2 st. 0	00
Dec. 7	10 st. 0	00	10 st. 0	00	5 st. 0	00	9 st. 0	00	Light haze. 5 st. 0	00	Light haze. 9 st. 0	00
Dec. 8	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00
Dec. 9	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00
Dec. 10	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00
Dec. 11	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 12	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 13	9 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	Light haze. 9 st. 0	00	Light haze. 3 st. 0	00
Dec. 14	Light haze. 4 st. 0	00	5 st. 0	00	4 st. 0	00	2 st. 0	00	3 st. 0	00	0 0	00
Dec. 15	1 st. 0	00	0 0	00	1 st. 0	00	1 st. 0	00	Dense haze. 9 st. 0	00	Dense haze. 8 st. 0	00
Dec. 16	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Dec. 17	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Dec. 18	2 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	2 st. 0	00
Dec. 19	2 cir. st. 1 st. 0	00	3 cir. st. 1 st. 0	00	5 cir. st. 2 st. 0	00	4 cir. st. 3 st. 0	00	1 cir. 2 st. 0	00	2 cir. st. 1 st. 0	00
Dec. 20	1 st. 0	00	1 st. 0	00	3 st. WNW.*	00	Light haze. 2 st. 0	00	Light haze. 1 st. 0	00	4 cum. 0	00
Dec. 21	4 st. W.*	00	Light haze. 3 st. 0	00	Dense haze. 5 st. W.*	00	Dense haze. 8 nim. 0	.—	3 st. 0	.—	2 st. 0	00
Dec. 22	0 0	00	0 0	00	0 0	00	Lt. haz. Dens. haz. 0	00	Lt. haze. Lt. fog. 0	00	Light haze. 1 st. 0	00
Dec. 23	1 st. 0	00	1 st. 0	00	2 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 24	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 25	3 cir. st. 4 st. 0	00	8 nim. 0	.—	9 nim. N.†	.—	9 nim. N.†	.—	Denze haze. 8 nim. 0	.—	Dense haze. 9 st. 0	.—
Dec. 26	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01
Dec. 27	0 0	00	1 cir. st. 1 st. 0	00	1 cir. cum. 1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Dec. 28	Lt. haz. Dense haz. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 29	10 st. 0	00	5 st. 0	00	1 cum. st. 7 st. 0	00	Dense haze. 7 st. 0	00	Dense haze. 8 st. 0	00	10 st. 0	00
Dec. 30	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 31	3 st. 0	00	3 st. 0	00	2 st. 0	00	1 st. 0	00	Light haze. 1 st. 0	00	Light haze. 2 st. 0	00
Means	2.77		2.74		2.93		2.83		2.61		2.70	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.	
1882.												
Dec. 1	Light haze. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. 1 cir. st. 2 st. 0	00	2 cir. st. 3 st. 0	00
Dec. 2	1 st. 0	00	1 st. 0	00	4 st. 0	00	5 st. 0	00	6 st. 0	00	5 st. 0	00
Dec. 3	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Dec. 4	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 5	Light haze. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 6	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00
Dec. 7	Light haze. 0	00	Light haze. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 8	1 st. 0	00	1 st. 0	00	2 st. 0	00	1 cir. st. 1 st. 0	00	2 st. 0	00	2 st. W.†	00
Dec. 9	Light haze. 4 st. 0	00	Light haze. 5 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 10	0 0	00	1 st. 0	00	1 st. 0	00	2 cir. cum. 3 st. 0	00	3 cir. 4 st. 0	00	3 cir. 5 st. 0	00
Dec. 11	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 12	Light haze. 1 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	3 st. 0	00
Dec. 13	Light haze. 9 st. 0	00	1 cir. 8 st. 0	00	1 cir. st. 8 st. 0	00	1 cir. st. 9 st. 0	00	1 cir. st. 8 st. 0	00	8 st. 0	00
Dec. 14	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 15	1 st. 0	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 16	1 st. 0	00	2 st. 0	00	2 st. 0	00	1 st. 0	00	2 st. 0	00	2 st. 0	00
Dec. 17	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 cir. st. 3 st. 0	00	4 cir. st. 4 st. 0	00	8 st. 0	00
Dec. 18	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Dec. 19	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	4 cir. st. 1 st. 0	00
Dec. 20	4 st. 0	00	5 st. 0	00	5 st. SW.†	00	1 cir. 4 st. W.†	00	1 cir. 4 st. W.†	00	2 cir. 4 st. W.†	00
Dec. 21	2 st. 0	00	1 st. 0	00	Light haze. 2 st. 0	00	Lt. haz. 2 st. D. haz. 0	00	Dense haze. 9 nim. 0	.—	Dense haze. 6 nim. 0	.—
Dec. 22	Lt. haz. Dens. haz. 0	00	Lt. haz. 2 st. D. haz. 0	00	Lt. haz. Dens. haz. 0	00	4 st. Dense haze. 0	00	Dense haze. 0	00	1 st. 0	00
Dec. 23	1 cir. Lt. haz. 1 st. 0	00	Light haze. 1 st. 0	00	Light haze. 1 st. 0	00	1 cir. Lt. haz. 1 st. 0	00	Light haze. 1 st. 0	00	Light haze. 1 st. 0	00
Dec. 24	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	0 0	00
Dec. 25	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Dec. 26	10 nim. 0	.—	10 nim. 0	.—	1 cir. 5 st. 0	.01	1 cir. 4 st. 0	00	1 cir. 4 st. 0	00	Dense fog. 3 st. 0	00
Dec. 27	0 0	00	8 st. SW.†	00	10 st. 0	00	10 st. 0	00	3 cir. st. 6 st. 0	00	4 st. 0	00
Dec. 28	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. st. 5 st. 0	00	2 cir. st. 6 st. 0	00	10 st. 0	00	10 st. 0	00
Dec. 29	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00
Dec. 30	0 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	3 cir. 1 st. 0	00	1 cir. 2 st. 0	00
Dec. 31	2 cir. st. 2 st. 0	00	1 cir. st. 3 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00
Means	2.29		2.83		2.80		3.19		3.70		3.54	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a.m. Amount, kind, and direction of clouds.		7 a.m. Precipitation.	8 a.m. Amount, kind, and direction of clouds.		8 a.m. Precipitation.	9 a.m. Amount, kind, and direction of clouds.		9 a.m. Precipitation.	10 a.m. Amount, kind, and direction of clouds.		10 a.m. Precipitation.	11 a.m. Amount, kind, and direction of clouds.		11 a.m. Precipitation.	12 m. Amount, kind, and direction of clouds.		12 m. Precipitation.	Amount of precipitation.
Lt. haze. Lt. haze.	0	00	Light haze. 2 st.	0	00	Light haze. 2 st.	0	00	Light haze. 2 st.	0	00	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00	.00
2 st.	0	00	2 st.	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	.00
Light haze. 1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
2 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	1 st.	0	00	2 st.	0	00	.00
1 st.	0	00	1 st.	0	00	0	0	00	2 st.	0	00	Light haze.	0	00	Light haze.	0	00	.00
1 st.	0	00	D. haze. D. haze.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.00
0	0	00	1 st.	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	.00
0	0	00	0	0	00	Dense haze.	0	00	Dense haze.	0	00	1 st. Light haze.	0	00	Light haze.	0	00	.00
0	0	00	1 st.	0	00	Light haze.	0	00	Light haze. 3 st.	0	00	Light haze. 3 st.	0	00	L. haz. 3 st. D. haz.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
10 st.	0	00	Dense haze. 9 st.	0	00	Lt. haze. D. haze.	0	00	Lt. haz. 3 st. D. haz.	0	00	L. haz. 4 st. D. haz.	0	00	L. haz. 4 st. D. haz.	0	00	.00
0	0	00	1 st.	0	00	0	0	00	Lt. haz. 1 st. L. haz.	0	00	L. haz. 1 st. L. haz.	0	00	Lt. haze. Lt. haze.	0	00	.00
Light haze. 2 st.	0	00	Dense haze. 8 st.	0	00	Dense haze. 8 st.	0	00	Light haze. 6 st	0	00	Light haze. 9 st.	0	00	10 st.	0	00	.00
1 st.	0	00	2 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
Dense haze. 6 st.	0	00	10 st.	0	00	10 st.	0	00	2 st.	0	00	4 st.	0	00	1 st.	0	00	.00
1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	1 st.	0	00	.00
1 st.	0	00	2 st.	0	00	3 st.	0	00	Light haze. 3 st.	0	00	Light haze. 3 st.	0	00	1 st.	0	00	.00
Light haze.	0	00	0	0	00	Light haze.	0	00	Light haze.	0	00	0	0	00	Light haze.	0	00	.00
2 cir. st. Lt. haze.	0	00	Light haze. 1 st.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	.00
5 cum.	0	00	2 cir. cum. 2 cum.	0	00	4 cum.	0	00	3 cir. cum. 2 cum.	0	00	Dense haze. 6 st.	0	00	Dense haze. 5 st.	0	00	.01
Light haze. 3 cum.	0	00	Light haze. 2 cum.	0	00	Lt. haze. 2 cum.	0	00	L. haz. 2 cu. L. haz.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	.—
Light haze. 2 st.	0	00	Lt. haze. 1 cum. st.	0	00	Lt. haze. 1 cum.	0	00	L. haz. 1 cu. L. haz.	0	00	Lt. haze. Lt. haze.	0	00	Lt. haze. Lt. haze.	0	00	.00
2 st.	0	00	1 cir. st. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. Lt. haz. 1 st.	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.—
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.—	.06
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	1 cir.	0	00	1 cir.	0	00	1 cir.	0	00	1 cir.	0	00	.08
Dense haze. 5 st.	0	00	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00	Lt. haze. Lt. haze.	0	00	0	0	00	0	0	00	.00
0	0	00	0	0	00	0	0	00	0	0	00	1 cir.	0	00	0	0	00	.00
Light haze. 3 st.	0	00	Light haze. 2 st.	0	00	1 cir. Lt. haz. 2 st.	0	00	2 cir. Lt. haz. 1 st.	0	00	2 cir.	0	00	2 cir.	0	00	.00
2.25			2.38			2.19			2.12			2.22			2.03			.15

7 p.m.			8 p.m.			9 p.m.			10 p.m.			11 p.m.			12 p.m.			Daily means.
3 st.	0	00	3 st.	0	00	3 st.	0	00	2 st.	0	00	1 st.	0	00	3 st.	0	00	1.62
Dense fog.	0	00	Dense fog.	0	00	Dense fog.	0	00	1 st. Light fog.	0	00	3 st.	0	00	4 st.	0	00	1.79
0	0	00	0	0	00	1 st	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	.33
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1.08
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	.91
10 st.	0	00	10 st.	0	00	2 cir. cum. 3 st.	0	00	4 st.	0	00	6 st.	0	00	10 st.	0	00	6.58
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2.45
1 cir. 2 st.	W. †	00	5 cir. 3 st.	W. †	00	4 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1.41
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1.54
Light haze. 3 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	1 st.	0	00	10 st.	0	00	1.87
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	4.25
4 st.	0	00	4 st.	0	00	1 cir. st. 3 st.	0	00	3 st.	0	00	3 st.	0	00	Light haze. 4 st.	0	00	1.45
2 cir. st. 5 st.	0	00	9 st.	0	00	4 st.	0	00	3 st.	0	00	3 st.	0	00	Light haze. 4 st.	0	00	7.37
1 st.	0	00	1 cir. st. 1 st.	NE. †	00	1 st.	NE. †	00	1 st.	0	00	2 st.	0	00	1 cir. st. 2 st.	0	00	1.41
1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	2.66
2 st.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1.00
4 cir. st. 4 st.	0	00	4 cir. st. 3 st.	0	00	4 cir. st. 3 st.	0	00	4 cir. st. 3 st.	0	00	3 cir. st. 3 st.	0	00	2 cir. st. 3 st.	0	00	3.50
1 st.	0	00	1 st.	0	00	1 cir. st. 3 st.	0	00	1 cir. st. 2 st.	0	00	2 cir. st. 2 st.	0	00	1 cir. st. 2 st.	0	00	1.41
4 cir. st. 2 st.	0	00	4 cir. st. 2 st.	0	00	3 cir. st. 2 st.	0	00	1 cir. st. 2 st.	0	00	2 st.	0	00	1 cir. st. 2 st.	0	00	2.91
8 st.	W. †	00	Light haze. 7 st.	W. †	00	9 nim.	0	.01	9 st.	0	.—	8 st.	SW. †	00	5 st.	SW. †	00	4.87
2 st.	0	.—	1 st.	0	00	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	2.54
1 st.	0	00	1 st.	0	00	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00	1 st.	0	00	.79
Light haze. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1.41
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2 st.	0	00	.33
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 nim.	0	00	9.58
10 st.	0	00	5 cir. 3 st.	0	00	2 st.	0	00	Light haze. 3 st.	0	00	2 st.	0	00	2 st.	0	00	7.75
3 st.	S.*	00	3 st.	0	00	3 st.	0	00	2 st.	0	00	3 st.	0	00	3 st.	0	00	2.62
10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.10	10 nim.	0	.03	10 nim.	0	.02	10 st.	0	.02	4.20
0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2.50
1 cir. 1 st.	0	00	1 cir. 2 st.	0	00	1 cir. st. 2 st.	0	00	3 st.	0	00	2 st.	0	00	Light haze. 2 st.	0	00	1.08
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2.00
3.32			3.41			2.87			2.54			2.58			3.09			2.74

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m.			2 a. m.			3 a. m.			4 a. m.			5 a. m.			6 a. m.		
	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.
1883.																		
Jan. 1	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	1 st.	0	00
Jan. 2	1 st.	0	00	1 st.	0	00	Light haze. 3 st.	0	00	Light haze. 3 st.	0	00	Light haze. 3 st.	0	00	Light haze. 3 st.	0	00
Jan. 3	Light haze. 5 st.	0	00	1 cir. st. 4 st.	0	00	4 st.	0	00	1 cir. st. 3 st.	0	00	3 st.	0	00	Light haze. 3 st.	0	00
Jan. 4	1 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	2 st.	0	00	1 st.	0	00
Jan. 5	Dense haze. 3 nim.	0	.—	3 nim.	0	.—	Light haze. 4 nim.	0	.—	Light haze. 3 nim.	0	.01	Light haze. 5 nim.	0	.—	Light haze. 4 nim.	0	.—
Jan. 6	Dense haze. 7 nim.	0	.—	Dense haze. 8 nim.	0	.—	Dense haze. 8 nim.	0	.—	10 nim.	0	.—	Dense haze. 9 nim.	0	.—	10 nim.	0	.01
Jan. 7	2 cir. cum. 6 st.	0	00	3 cir. st. 4 st.	0	00	1 cir. st. 1 st.	0	00	1 st.	0	00	1 st.	0	00	Light haze. 2 st.	0	00
Jan. 8	1 cir. st. 1 st.	0	00	1 cir. st.	0	00	1 cir. st. 2 st.	0	00	Light haze. 7 st.	0	00	Light haze. 7 st.	0	00	Dense haze. 8 st.	0	00
Jan. 9	0	0	00	0	0	00	Dense haze. 8 st.	0	00	10 st.	0	00	10 st.	0	00	7 st.	0	00
Jan. 10	1 cir. st. 1 st.	0	00	1 st.	0	00	9 st.	0	00	9 st.	0	00	Light haze. 8 st.	0	00	3 st.	0	00
Jan. 11	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00
Jan. 12	1 st.	0	00	1 st.	0	00	Lt. haz. 3 st. D. haz.	0	00	Lt. haz. 3 st. D. haz.	0	00	Light haze. 2 st.	0	00	0	0	00
Jan. 13	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 14	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 15	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 16	1 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	0	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00
Jan. 17	10 st.	0	00	9 st.	0	00	10 st.	SE.*	00	10 st.	SE.†	00	10 nim.	0	.—	10 nim.	0	.01
Jan. 18	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 19	0	0	00	1 st.	0	00	1 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	2 cir. st.	0	00	2 cir. st.	0	00
Jan. 20	0	0	00	1 st.	0	00	1 st.	0	00	1 cir. st. 1 st.	0	00	1 cir. cum. 1 st.	0	00	2 st.	0	00
Jan. 21	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 22	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00
Jan. 23	1 cir. st. 6 st.	0	00	3 cir. st. 4 st.	E.†	00	3 cir. st. 3 st.	E.†	00	9 st.	SSW.†	00	3 cir. cum. 6 st.	0	00	10 st.	0	00
Jan. 24	9 nim.	W.†	.—	10 nim.	0	.—	10 nim.	0	.01	9 nim.	W.*	.—	10 st.	W.†	.—	9 cum.	0	00
Jan. 25	2 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	0	0	00	1 st.	0	00	1 st.	0	00
Jan. 26	1 cir. st.	0	00	3 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	0	0	00	0	0	00
Jan. 27	1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 28	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 29	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 30	1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00
Jan. 31	Lt. haze. 1 st.	0	00	1 st.	0	00	0	0	00	1 cir. st.	0	00	0	0	00	0	0	00
Means.	2.19			2.22			2.64			2.83			2.72			2.45		

Date.	1 p. m.			2 p. m.			3 p. m.			4 p. m.			5 p. m.			6 p. m.		
1883.																		
Jan. 1	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 2	Light haze. 5 st.	SE.†	00	9 st.	SE.†	00	9 st.	SE.†	00	1 cir. st. 8 st.	SE.†	00	1 cir. st. 7 st.	SE.†	00	2 cir. cum. 7 st.	0	00
Jan. 3	1 st.	0	00	4 st.	0	00	8 st.	0	00	1 cir. 5 st.	0	00	9 st.	0	00	9 st.	0	00
Jan. 4	Light haze. 2 st.	0	00	Light haze. 4 st.	0	00	6 st.	0	00	1 cir. 5 st.	0	00	3 cir. 5 st.	0	00	8 st.	0	00
Jan. 5	Light haze. 5 st.	0	00	Dense haze. 8 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01	10 nim.	0	.—	10 nim.	0	.—
Jan. 6	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00	Dense haze. 5 st.	0	00	Light haze. 4 st.	0	00	1 cir. Lt. haze. 4 st.	0	00
Jan. 7	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	10 st.	0	.—	10 st.	0	00
Jan. 8	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.—	9 st.	0	.—	10 st.	0	00	10 st.	0	00
Jan. 9	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 10	2 st.	0	00	1 st.	0	00	1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 1 st.	0	00
Jan. 11	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 12	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 13	0	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00
Jan. 14	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00
Jan. 15	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 16	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00
Jan. 17	6 st.	SW.*	00	5 st.	SW.*	00	4 st.	SW.*	00	8 st.	SW.*	00	8 st.	SW.*	00	9 st.	SW.*	00
Jan. 18	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	Light haze. 1 st.	0	00
Jan. 19	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 20	1 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	1 cir. st. 1 st.	0	00	2 cir. st. 3 st.	0	00	9 st.	0	00	10 st.	0	00
Jan. 21	0	0	00	0	0	00	0	0	00	0	0	00	Light haze. 1 st.	0	00	Light haze. 1 st.	0	00
Jan. 22	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	Light haze. 1 st.	0	00
Jan. 23	10 st.	0	00	10 st.	0	00	9 st.	SW.†	00	10 nim.	0	.—	10 nim.	0	.—	10 nim.	0	.01
Jan. 24	3 ci. 3 ci. st. 2 st.	NW.†	00	2 ci. 3 ci. s. 4 st.	NW.†	00	2 cir. st. 6 st.	NW.†	00	1 cir. st. 7 st.	NNW.†	00	1 cir. st. 7 st.	NNW.†	00	2 cir. st. 6 st.	0	00
Jan. 25	Light haze. 1st.	0	00	Light haze. 1st.	0	00	Light haze. 2 st.	0	00	1 cir. st. 1st.	0	00	1 cir. st. 1 st.	0	00	Light haze. 2 st.	0	00
Jan. 26	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 27	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 28	1 st.	0	00	1 st.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 29	0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 30	0	0	00	1 cir.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00
Jan. 31	Den. haz. Den. haz.	0	00	Den. haz. Den. haz.	0	00	10 st.	0	00	9 st.	0	00	9 st.	0	00	10 st.	0	00
Means.	2.51			3.12			3.78			3.96			4.25			4.38		

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a.m. Amount, kind, and direction of clouds.	Precipitation.	8 a.m. Amount, kind, and direction of clouds.	Precipitation.	9 a.m. Amount, kind, and direction of clouds.	Precipitation.	10 a.m. Amount, kind, and direction of clouds.	Precipitation.	11 a.m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
2 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
Light haze. 8 st. 0	00	Dense haze. 8 st. 0	00	Dense haze. 4 st. 0	00	5 st. SE.†	00	8 st. SE.†	00	Light haze. 4 st. SE.†	00	.00
Light haze. 5 st. 0	00	Light haze. 8 st. 0	00	Light haze. 8 st. 0	00	3 cir. 3 st. 0	00	2 st. 0	00	2 st. 0	00	.00
2 st. 0	00	3 st. 0	00	3 st. 0	00	Lt.haz. 3 st. Lt.haz. 0	00	Lt.haz. 2 st. Lt.haz. 0	00	Lt. haz. 1 st. Lt.haz. 0	00	.00
Dense haze. 7 nim. 0	.—	Dense haze. 9 nim. 0	.01	Dense haze. 8 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	Dense haze. 8 st. 0	.—	.03
10 nim. 0	.—	Dense haze. 8 nim. 0	.—	Dense haze. 4 st. 0	.—	Dense haze. 4 st. 0	00	Dense haze. 3 st. 0	00	Dense haze. 2 st. 0	00	.01
10 st. 0	00	Dense haze. 8 st. 0	00	10 st. 0	00	Light haze. 8 st. 0	00	Light haze. 3 st. 0	00	Light haze. 5 st. 0	00	.—
Light haze. 7 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
Dense haze. 9 st. 0	00	5 st. 0	00	3 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.00
Light haze. 3 st. 0	00	Dense haze. 9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	1 st. 0	00	.00
0 0	00	0 0	00	Light haze. 2 st. 0	00	Dense haze. 8 st. 0	00	Dense haze. 6 st. 0	00	Light haze. 0	00	.00
0 0	00	Light haze. 1 st. 0	00	Light haze. 0	00	Light haze. 0	00	Light haze. 0	00	Light haze. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	Light haze. 0	00	.00
Lt. haze. Lt. haze. 0	00	Den. haz. Den. haz. 0	00	Dense haze. 6 st. 0	00	Dense haze. 7 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 nim. 0	.—	10 st. 0	.—	3 st. WSW.*	00	3 st. WSW.*	00	4 st. SW.*	00	5 st. SW.*	00	.01
0 0	00	0 0	00	Light haze. 0	00	Light haze. 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	Light haze. 0	00	Light haze. 0	00	.00
0 0	00	0 0	00	Light haze. 0	00	0 0	00	0 0	00	0 0	00	00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	2 cum. st. 8 st. 0	00	10 st. 0	00	.06
3 cum. 3 cum. st. W.†	00	3 cir. cum. 2 st. 0	00	2 cir. 1 cum. 0	00	1 cir. 9 cum. st. NW.†	00	1 cir. 5 cum. st. NW.†	00	1 cir. 6 cum. st. NW.†	00	.01
Light haze. Lt. fog. 0	00	Lt. haz. 1 st. Lt. fog. 0	00	Light haze. 1st. 0	00	2 cir. Lt. haze. 3 st. 0	00	Dense haze. 6 st. 0	00	Light haze. 1 st. 0	60	.00
0 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	Light haze. 0	00	1 st. 0	00	Dense haze. 1 st. 0	00	Dense haze. 3 st. 0	00	.01
2.87		3.19		2.80		3.29		2.93		2.29		.13

7 p.m.		8 p.m.		9 p.m.		10 p.m.		11 p.m.		1 p.m.		Daily means.
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.54
2 cir. cum. 6 st. 0	00	4 cir. 4 st. 0	00	2 cir. st. 2 st. 0	00	4 st. 0	00	Dense haze. 3 st. 0	00	Dense haze. 3 st. 0	00	5.41
8 st. E.†	00	3 cir. 5 st. E.†	00	1 cir. st. 3 st. E.†	00	2 st. 0	00	3 st. 0	00	2 st. 0	00	4.95
10 st. 0	00	10 st. 0	00	6 st. 0	00	10 st. 0	00	8 st. 0	00	Dense haze. 2 st. 0	00	4.33
10 nim. 0	.—	10 nim. 0	.—	5 st. N.†	.—	3 st. 0	00	6 st. N.†	00	Light haze. 2 st. 0	00	6.79
4 cir. cum. 2 st. 0	00	3 cir. cum. 5 st. 0	00	1 cir. st. 8 st. 0	00	6 st. 0	00	8 st. 0	00	10 st. 0	00	6.12
3 cir. cum. 3 st. 0	00	9 st. 0	00	10 st. 0	00	6 st. NW.†	00	1 st. 0	00	1 st. 0	00	6.58
9 st. 0	00	4 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	6.70
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2.79
2 cir. 1 st. 0	00	4 cir. 1 st. 0	00	2 cir. 3 st. 0	00	1 cir. 2 st. 0	00	1 st. 0	00	1 st. 0	00	4.33
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	1.20
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.95
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	.12
0 0	00	1 cir. 0	00	0 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	.41
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.45
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	6.54
9 st. SW.*	00	3 cir. 5 st. SW.*	00	5 st. SW.*	00	2 st. SW.*	00	1 st. SW.*	00	0 0	00	6.62
Light haze. 1 st. 0	00	1 st. 0	00	1 st. 0	90	1 st. 0	00	0 0	00	0 0	00	.37
Light haze. 1 st. 0	00	Light haze. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00	.91
7 st. E.*	00	4 st. 0	00	4 st. 0	00	2 cir. st. 3 st. 0	00	2 cir. st. 3 st. 0	00	1 cir. st. 3 st. 0	00	2.91
Light haze. 1 st. 0	00	Light haze. 1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	1 st. 0	00	.37
Light haze. 1 st. 0	00	Light haze. 1 st. E.†	00	2 cir. 1 st. 0	00	6 st. E.†	00	2 cir. 1 st. 0	00	2 cir. 1 st. 0	00	1.04
10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.02	9.45
10 st. 0	00	8 st. 0	00	5 st. N.†	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	7.12
Light haze. 2 st. 0	00	Light haze. 2 st. W.†	00	3 st. NE.†	00	1 cir. st. 2 st. NE.†	00	1 st. 0	00	1 st. 0	00	1.83
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1.00
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.54
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	.54
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.54
1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	2 st. 0	00	Light haze. 2 st. 0	00	.66
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 nim. 0	.—	4.41
4.25		4.16		3.48		3.22		2.83		2.38		3.11

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction reduced to mean local time, — 5 hours, 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1883.												
Feb. 1	9 st. 0	.—	10 st. 0	00	3 st. 0	00	Lt. haz. 3 st. 0	00	Lt. haze. 1 st. 0	00	0 0	00
Feb. 2	D. haz. 9 st. D. haz. 0	00	D. haz. 9 st. D. haz. 0	00	D. haze. 9 nim. 0	.—	D. haz. 7 st. D. haz. 0	.—	D. haze. D. haze 0	00	D. haze. D. haze. 0	00
Feb. 3	7 st. SW.*	00	D. haze. 9 st. 0	00	D. haz. 7 st. D. haz. 0	00	D. haz. 8 st. D. haz. 0	00	Lt. haze. 1 st. 0	00	0 0	00
Feb. 4	D. haze. 3 st. 0	00	D. haze. 10 st. 0	00	10 st. 0	00	10 st. 0	00	Lt. haze. 5 st. 0	00	Lt. haze. 4 st. 0	00
Feb. 5	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.01	10 nim. 0	.01
Feb. 6	7 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 7	D. haz. 4 st. D. haz. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 8	D. haz. 6 st. D. haz. 0	00	D. haz. 5 st. D. haz. 0	00	D. haz. 3 st. D. haz. 0	00	0 0	00	0 0	00	0 0	00
Feb. 9	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01
Feb. 10	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 11	0 0	00	0 0	00	0 0	06	0 0	00	0 0	00	0 0	00
Feb. 12	Lt. haze. 2 st. 0	00	Lt. haz. 3 st. D. haz. 0	00	D. haze. 8 nim. 0	.—	D. haz. 8 nim. 0	.01	D. haze. 9 nim. 0	.—	10 nim. 0	.—
Feb. 13	D. haze. 9 nim. 0	.01	4 cir. st. 3 st. 0	.—	1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	2 st. 0	00
Feb. 14	10 nim. 0	.—	10 nim. NW.†	.—	10 nim. NW.†	.01	D. haz. 6 nim. NW.†	.—	4 st. 0	.—	1 st. 0	00
Feb. 15	10 nim. W.†	.—	10 nim. W.†	.—	10 nim. W.†	.—	3 cum. 5 st. 0	.—	1 cum. 9 st. 0	00	10 st. 0	00
Feb. 16	0 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 7 st. NW.*	00	2 cir. st. 5 st. 0	00	1 cir. st. 3 st. 0	00
Feb. 17	10 st. 0	00	10 st. 0	00	D. haz. 4 st. D. haz. 0	00	1 cir. st. 4 st. 0	00	2 cir. cum. 2 st. 0	00	5 cum. 4 st. 0	00
Feb. 18	D. haz. 8 st. D. haz. 0	00	D. haz. 9 st. D. haz. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 19	10 st. 6	00	10 st. 0	00	10 st. 0	00	D. haze. 9 st. 0	00	Lt. haze. 8 st. 0	00	2 st. 0	00
Feb. 20	9 st. NW.†	00	10 st. NW.†	00	10 st. NW.†	00	10 st. NW.†	00	10 st. NW.†	00	10 st. 0	00
Feb. 21	8 st. SSE.†	00	6 st. S.†	00	1 cir. 1 cir. st. 5 st. S.†	00	1 cir. 2 cir. st. 3 st. 0	00	2 cir. 2 cir. st. 3 st. 0	00	5 cir. st. 2 st. 0	00
Feb. 22	1 cir. st. 0	.—	1 cir. st. 0	00	1 cir. st. 0	00	1 st. 0	00	0 0	00	0 0	00
Feb. 23	1 cir. st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 0	00	Lt. haze. 0	00	D. haze. D. haze. 0	00
Feb. 24	1 cir. st. 0	00	1 st. 0	00	1 cir. st. 0	00	0 0	00	0 0	00	0 0	00
Feb. 25	0 0	00	0 0	00	1 cir. st. 0	00	1 cir. st. 0	00	1 st. 0	00	0 0	00
Feb. 26	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 27	2 st. 0	00	D. haz. 4 st. D. haz. 0	00	Lt. haz. 3 st. 0	00	Lt. haz. 2 st. D. haz. 0	00	Lt. haze. 1 st. 0	00	Lt. haze. 3 st. 0	00
Feb. 28	10 nim. 0	01	D. haz. 8 st. 0	.—	10 st. 0	00	D. haz. 8 st. D. haz. 0	00	D. haze. D. haze. 0	00	D. haze. 9 st. 0	00
	5.92		6.64		6.11		5.82		4.42		4.67	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1883.												
Feb. 1	1 cir. cum. 1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	1 st. 0	00
Feb. 2	Dense haze. 5 st. 0	00	Lt. haz. 6 st. 0	00	1 cir. 5 st. SW.†	00	1 cir. 7 st. SW.†	00	1 ci. 5 st. SW. †D. fog.	00	D. haze. D. fog. 0	00
Feb. 3	9 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	4 cir. 5 st. SW.*	.—	10 st. SSW.*	00
Feb. 4	1 cir. cum. 8 st. 0	00	1 cir. cum. 8 st. 0	00	1 cir. cum. 7 st. SW.†	00	2 cir. 4 st. SW.†	00	5 cir. st. 3 st. SW.†	00	4 cir. st. 6 st. SW.†	00
Feb. 5	10 st. 0	.01	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	.01
Feb. 6	1 st. NW.*	00	1 cir. 1 st. NW.*	00	1 cir. 1 st. NW.*	00	2 cir. 0	00	3 cir. 1 st. 0	00	4 cir. 1 st. 0	00
Feb. 7	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.01	9 st. W.*	.01	5 st. W.*	00	3 st. W.*	00
Feb. 8	2 st. 0	00	4 st. 0	00	8 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—
Feb. 9	10 nim. 0	.01	9 st. 0	.01	9 st. 0	.—	8 st. 0	00	9 st. 0	00	10 st. 0	00
Feb. 10	Lt. haze. 4 st. WNW.*	00	5 st. WNW.*	00	5 st. W.*	00	4 st. W.*	00	3 st. W.*	00	3 st. W.*	00
Feb. 11	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Feb. 12	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01
Feb. 13	8 st. NW.†	00	8 st. NW.†	00	9 st. NW.†	00	9 st. W.†	00	5 st. W.†	00	1 cir. st. 4 st. 0	00
Feb. 14	10 st. 0	00	10 st. 0	00	8 st. W.†	00	1 cir. 4 st. W.†	00	1 cir. 4 st. W.†	00	1 cir. 6 st. W.†	00
Feb. 15	10 st. 0	00	10 st. 0	00	9 st. 0	00	8 st. W.†	00	8 st. W.†	00	8 st. W †	00
Feb. 16	1 cir. 1 st. 0	00	1 cir. 3 st. 0	00	2 cir. 2 st. 0	00	2 cir. 2 ci. st. 1 st. 0	00	3 cir. 3 cir. st. 1 st. 0	00	7 cir. 1 st. 0	00
Feb. 17	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00
Feb. 18	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 19	1 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Feb. 20	3 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 3 st. SW.†	00	1 ci. 2 ci. st. 5 st. SW.†	00	1 ci. 1 ci. st. 4 st. SW.†	00
Feb. 21	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 nim. 0	.—
Feb. 22	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00
Feb. 23	10 nim. 0	.—	4 cir. 4 st. 0	.—	2 cir. 7 st. 0	00	1 cir. 8 st. 0	00	3 cir. 6 st. 0	00	4 cir. 4 st. 0	00
Feb. 24	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00
Feb. 25	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	0 0	00	0 0	00	0 0	00
Feb. 26	0 0	00	0 0	00	1 st. 0	00	1 cir. 1 st. 0	00	3 st. 0	00	1 cir. 2 st. 0	00
Feb. 27	2 cir. cum. 6 st. SE.†	00	1 ci. cum. 4 st. SE.†	00	3 cir. cum. 5 st. SE.†	00	8 st. SE.†	00	7 cir. 2 st. SE.†	00	5 cir. 2 st. 0	00
Feb. 28	1 cir. 7 st. SSW.†	.—	1 cir. 8 st. SSW.†	00	10 nim. 0	.01	2 cir. 6 nim. 0	.—	10 st. 0	00	10 nim. 0	.—
	5.57		5.89		6.14		5.92		6.03		5.92	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	.—
Light haze. 3 st. 0	00	Light haze. 2 st. 0	00	D. haze. 4 st. 0	00	Dense haze. 5 st. 0	00	Dense haze. 5 st. 0	00	Dense haze. 6 st. 0	09	.—
0 0	00	0 0	00	0 0	00	0 0	00	1 st. S.†	00	4 st. S.†	00	.06
3 st. 0	00	Light haze. 3 st. 0	00	Light haze. 3 st. 0	00	Light haze. 2 st. 0	00	2 st. 0	00	9 st. 0	00	.10
10 nim. 0	.—	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	.16
10 st. 0	00	4 st. 0	00	0 0	00	2 st. W.*	00	1 st. W.*	00	1 st. W.*	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.03
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	1 st. 0	00	.04
10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	.15
D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Lt. haze. Lt. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	Lt. haze. D. haze. 0	00	00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	00
10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	.17
Light haze. 3 st. 0	00	Dense haze. 8 st. 0	00	Dense haze. 4 st. 0	00	Dense haze. 5 st. 0	00	Dense haze. 8 st. 0	00	Light haze. 8 st. 0	00	.01
0 0	00	3 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.02
9 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	3 st. 0	00	00
2 st. 0	00	Lt. haze. Lt. fog. 0	00	Lt. haze. Lt. fog. 0	00	Lt. haze. Lt. haze. 0	00	Light haze. 1 st. 0	00	1 st. Light fog. 0	00	00
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	3 st. 0	.—	.02
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
0 0	00	0 0	00	3 cir. cum. 2 st. SW.†	00	10 st. 0	00	10 st. 0	00	Light haze. 3 st. 0	00	00
5 cum. 3 st. NW.†	00	3 cum. 2 st. NW.†	00	3 cum. 1 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	00
6 cir. cum. 3 st. 0	00	6 cum. 3 st. 0	00	6 cum. 3 st. 0	00	Light haze. 8 st. 0	00	3 cir. cum. 3 st. 0	00	10 st. 0	00	.—
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.—
D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	D. haze. D. haze. 0	00	Dense haze. 7 st. 0	00	Dense haze. 8 st. 0	06	Light haze. 8 st. 0	00	.—
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	00
0 0	00	3 cir. cum. 1 st. 0	00	1 cir. 0	00	2 cir. 1 st. 0	00	1 cir. 3 st. 0	00	1 st. 0	00	00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	00
Light haze. 5 st. 0	00	Light haze. 6 st. 0	00	Light haze. 3 st. 0	00	1 st. 0	00	1 st. 0	00	4 cir. cum. 4 st. SE.†	00	.—
Dense haze. 8 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	.06
4.28		4.07		4.03		4.75		4.89		5.21		.82

7 p. m.	Precipitation.	8 p. m.	Precipitation.	9 p. m.	Precipitation.	10 p. m.	Precipitation.	11 p. m.	Precipitation.	12 p. m.	Precipitation.	Daily means.
5 cir. st. 1 st. 0	00	Light haze. 5 st. 0	00	Light haze. 3 st. 0	00	Light haze. 4 st. 0	00	Light haze. 4 st. 0	00	Light haze. 5 st. 0	00	2.45
D.fog.5st.SW.*D.fg.0	00	Den. fog. Den. fog. 0	00	10 st. SW.†	00	10 st. 0	00	9 st. 0	00	Dense fog. 0	00	5.16
10 st. 0	00	10 st. 0	00	10 nim. 0	.02	10 nim. 0	.03	10 st. 0	.—	2 st. 0	00	6.12
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.04	10 st. 0	.01	10 nim. 0	.03	7.25
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
5 cir. 2 st. 0	00	9 st. 0	00	4 st. 0	00	4 st. 0	00	4 st. 0	00	3 st. 0	00	5.08
9 st. SW.†	00	8 st. SW.*	00	10 st. 0	00	5 st. SW.*	00	7 st. W.†	00	3 st. 0	00	8.45
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	4.95
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.79
4 st. W.*	00	5 st. W.†	00	2 st. W.*	00	2 st. W.†	00	1 st. 0	00	1 st. 0	00	4.12
1 st. 0	00	1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	3 st. 0	00	3 st. 0	00	.50
10 nim. 0	.03	10 nim. 0	.03	10 nim. 0	.02	10 nim. 0	.01	9 nim. 0	.—	10 nim. 0	.01	9.12
2 cir. 4 st. 0	00	5 cir. 3 st. 0	00	3 cir. st. 5 st. 0	00	2 cir. st. 6 st. 0	00	10 st. 0	00	10 st. 0	00	6.33
2 cir. 5 st. W.†	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	7.75
8 st. W.†	00	8 st. W.†	00	7 st. W.†	00	1 cir. st. 3 st. W.†	00	2 st. 0	00	1 st. 0	00	6.37
5 cir. 3 st. 0	00	5 cir. 4 st. 0	00	2 cir. 5 st. 0	00	6 st. 0	00	10 st. 0	00	Light haze. 7 st. 0	00	4.33
0 0	00	0 0	00	1 st. 0	00	1 cir. st. 1 st. 0	00	2 st. 0	00	2 st. 0	00	4.70
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.87
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 st. NW.†	.—	9 st. NW.†	00	10 st. NW.†	00	7.58
1 cir. 7 st. SW.†	00	1 cir. st. 8 st. SW.†	00	9 st. 0	00	9 st. 0	00	9 st. N.†	00	9 st. N.†	00	7.58
10 nim. 0	.—	10 nim. 0	.—	9 st. N.†	.—	8 st. N.†	00	8 nim. N.†	.—	5 nim. N.†	.—	8.41
1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	.58
3 cir. 4 st. 0	00	4 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	4.08
1 cir. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.50
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.87
7 cir. 2 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	6 st. 0	00	5 st. 0	00	2.41
1 cir. 2 st. 0	00	8 st. 0	00	8 st. 0	00	9 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	5.50
5 cir. 3 st. 0	.—	9 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	3 st. 0	.—	8.66
6.71		6.96		6.92		6.64		6.67		5.46		5.65

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1883. Mar. 1	2 st. 0	00	Dense haze. 5 st. 0	.00	Light haze. 2 st. 0	.00	0 0	00	0 0	00	Light haze. 0	00
Mar. 2	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 3	2 cir. st. 1 st. 0	00	5 cir. cum. 2 st. 0	.00	2 cir. st. 2 st. 0	00	1 cir. st. 2 st. 0	00	1 st. 0	00	Light haze. 2 st. 0	00
Mar. 4	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 5	1 cir. st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 6	1 cir. st. 2 st. 0	00	Light haze. 3 st. 0	00	Light haze. 3 st. 0	00	1 cir. st. 2 st. 0	00	Light haze. 1 st. 0	00	Light haze. 1 st. 0	00
Mar. 7	2 st. 0	00	Lt. h'ze. 3 st. D. h'ze. 0	.00	Lt. h'ze. 2 st. D. h'ze. 0	00	3 st. 0 D. haze. 0	00	Light haze. 0	00	Light haze. 0	00
Mar. 8	D. h'ze. 5 st. D. h'ze. 0	00	D. h'ze. 4 st. D. h'ze. 0	00	D. h'ze. 2 st. D. h'ze. 0	00	Lt. h'ze. 3 st. D. h'ze. 0	00	2 st. 0	00	Light haze. 3 st. 0	00
Mar. 9	1 cir. st. 2 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00
Mar. 10	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 11	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	.00
Mar. 12	3 cir. st. 3 st. 0	00	1 cir. st. 2 st. 0	00	3 cir. st. 1 st. 0	00	7 cir. st. 2 st. 0	00	Light haze. 3 st. 0	00	2 st. 0	00
Mar. 13	9 st. 0	00	2 st. 0	00	4 st. 0	00	4 st. 0	00	3 st. 0	00	2 st. 0	00
Mar. 14	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 15	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 16	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	Light fog. 0	00
Mar. 17	1 cir. st. 1 st. 0	00	1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	0 0	00	2 st. 0	00
Mar. 18	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 19	1 st. NE.†	00	1 st. NE.†	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Mar. 20	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	3 st. 0	00
Mar. 21	1 cir. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	2 cir. st. 4 st. 0	00	3 cir. st. 2 st. 0	00	4 cir. st. 2 st. 0	00
Mar. 22	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 23	1 st. 0	00	1 st. 0	00	9 st. S.*	00	10 nim. 0	.—	10 nim. 0	.—	3 st. 0	.01
Mar. 24	3 cir. st. 4 st. SW.†	00	2 cir. st. 2 st. 0	00	5 cir. st. 3 st. 0	00	5 cir. st. 3 st. 0	00	3 cir. st. 5 st. 0	00	5 cum. 2 st. 0	00
Mar. 25	1 cir. st. 9 st. S.†	00	9 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.01
Mar. 26	1 st. 0	00	1 st. 0	00	1 st. 0	00	9 st. 0	00	3 st. 0	00	9 st. 0	00
Mar. 27	1 cir. st. 1 st. 0	00	D. h'ze. 8 st. D. h'ze. 0	00	Light haze. 4 st. 0	00	Dense haze. 5 st. 0	00	Dense haze. 3 st. 0	00	Light haze. 6 st. 0	00
Mar. 28	3 cir. st. 1 st. SW.†	00	1 c. s. 1 ci. cu. 2 s. SW.†	00	1 st. 0	00	1 st. 0	00	0 0	00	2 st. 0	00
Mar. 29	10 st. 0	00	10 st. 0	00	9 st. 0	00	1 cir. st. 6 st. 0	00	Dense haze. 8 st. 0	00	10 st. 0	00
Mar. 30	Dense fog. 0	00	2 cir. st. 3 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Mar. 31	9 st. W.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Means.	3.29		3.19		3.22		3.74		2.83		3.16	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1883. Mar. 1	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 2	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	5 cir. 1 st. 0	00	3 cir. 2 st. 0	00	4 cir. 2 st. 0	00	5 cir. 2 st. 0	00
Mar. 3	1 cir. 3 st. 0	00	2 cir. 2 st. 0	00	2 cir. 3 st. 0	00	1 cir. st. 3 st. 0	00	1 cir. st. 2 st. 0	00	1 cir. st. 2 st. 0	00
Mar. 4	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Mar. 5	10 st. 0	00	10 st. 0	00	10 st. WNW.†	00	8 st. NW.†	00	8 st. NW.†	00	6 cir. 3 st. 0	00
Mar. 6	1 st. 0	00	1 st. 0	00	1 st. 0	00	5 st. SW.†	00	7 cir. st. 3 st. 0	00	3 st. 0	00
Mar. 7	2 cir. 0	00	6 cir. 2 st. W.†	00	10 st. Dense fog. 0	00	2 cir. 7 st. D. fog. 0	00	10 st. Dense fog. 0	00	10 st. 0	00
Mar. 8	2 cir. 4 st. NW.†	00	2 cir. 6 st. NW.†	00	3 cir. 2 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	2 cir. 1 st. 0	00
Mar. 9	2 st. 0	00	2 st. 0	00	1 st. 0	00	0 0	00	1 st. 0	00	1 st. 0	00
Mar. 10	0 0	00	2 st. Light haze. 0	00	1 st. Light haze. 0	00	4 st. Light haze. 0	00	2 st. Light haze. 0	00	0 0	00
Mar. 11	4 cir. 0	00	3 cir. 1 st. 0	00	1 cir. 1 st. 0	00	2 cir. 2 st. 0	00	2 cir. 2 st. 0	00	2 st. 0	00
Mar. 12	9 st. 0	00	6 st. 0	00	5 st. NE.†	00	9 st. NE.†	00	9 st. NE.†	00	10 st. NE.†	00
Mar. 13	2 st. Light haze. 0	00	1 cir. 1 st. Lt. haze. 0	00	1 cir. 1 st. Lt. haze. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00
Mar. 14	1 st. Light haze. 0	00	2 st. Light haze. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 15	8 st. 0	00	4 st. 0	00	3 cir. 5 st. 0	00	2 cir. 3 st. 0	00	5 cir. 1 st. 0	00	5 cir. 1 st. 0	00
Mar. 16	2 st. 0	00	2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00
Mar. 17	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
Mar. 18	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 19	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Mar. 20	1 cir. 1 st. 0	00	1 cir. 4 st. D. fog. 0	00	1 cir. 7 st. D. fog. 0	00	2 cir. 4 st. D. fog. 0	00	1 cir. 3 st. 0	00	1 cir. 2 st. 0	00
Mar. 21	2 cir. 3 cir. st. 3 st. 0	00	4 cir. st. 4 st. 0	00	2 cir. st. 7 st. 0	00	1 cir. st. 8 st. E.†	00	10 st. E.†	00	10 st. E.†	00
Mar. 22	10 st. 0	00	10 st. 0	00	9 st. 0	00	9 st. 0	00	10 st. 0	00	10 nim. 0	.—
Mar. 23	1 cir. cum. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	4 cir. 1 st. 0	00	5 cir. 2 st. 0	00
Mar. 24	3 cir. 2 st. 0	00	4 cir. 1 st. 0	00	5 cir. 3 st. 0	00	3 cir. 3 cir. cum. 2 st. 0	00	6 cir. cum. 3 st. 0	00	10 st. 0	00
Mar. 25	3 cir. cum. 3 st. SW.†	00	1 cir. 7 st. SW.†	00	1 cir. 8 st. SW.†	00	1 cir. 6 st. SW.†	00	2 cir. 2 st. 0	00	2 cir. 2 st. 0	00
Mar. 26	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8 st. SE.*	00
Mar. 27	6 cir. cum. 2 st. 0	00	2 cir. cum. 8 st. 0	00	10 st. 0	.00	10 nim. 0	.—	10 nim. 0	.01	9 st. 0	.—
Mar. 28	5 cir. 3 st. 0	00	10 st. 0	00	4 cir. 5 st. 0	00	2 cir. 7 st. 0	00	9 st. 0	00	10 st. 0	00
Mar. 29	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.01	9 st. 0	.—	2 cir. 4 st. W.†	00
Mar. 30	3 cir. cum. 2 st. 0	00	5 cir. 0	00	3 cir. 2 st. SSW.*	00	1 cir. 5 st. SSW.*	00	1 cir. 8 st. S.†	00	1 cir. 1 st. S.†	00
Mar. 31	10 nim. 0	.—	7 cir. cum. 3 st. 0	.—	10 nim. 0	.—	8 st. NNW.†	.01	9 st. NNW.†	.—	10 st. NW.†	00
Means.	4.51		4.90		5.09		5.00		5.12		4.77	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m.			8 a. m.			9 a. m.			10 a. m.			11 a. m.			12 m.			Amount of precipitation.
Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	Amount, kind, and direction of clouds.		Precipitation.	
Light haze.	0	00	2 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	00
0	0	00	Light haze.	0	00	Light haze.	0	00	0	0	00	0	0	00	1 cir. 1 st.	0	00	00
Light haze. 3 st.	0	00	Light haze. 3 st.	0	00	Light haze. 1 st.	0	00	Light haze.	0	00	1 st. Light haze.	0	00	1 cir. 1 st. Lt. haze.	0	00	00
2 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	Light haze. 5 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	00
Light haze.	0	00	2 st.	0	00	2 st.	0	00	0	0	00	1 st.	0	00	1 st.	0	00	00
2 st.	0	00	1 st.	0	00	0	0	00	Light haze.	0	00	0	0	00	1 cir.	0	00	00
Light haze. 5 st.	0	00	Light haze. 5 st.	0	00	2 st.	0	00	2 st.	0	00	10 st.	W.†	00	10 st.	W.†	00	00
2 st.	0	00	3 st.	0	00	2 st.	0	00	1 st.	0	00	1 cir. 1 st.	0	00	4 st.	0	90	00
Light haze.	0	00	0	0	00	0	0	00	Light haze.	0	00	Light fog.	0	00	Light fog.	0	00	00
0	0	00	0	0	90	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	00
5 st.	0	00	4 st.	0	00	Light haze. 4 st.	0	00	1 cir. 3 st.	0	00	1 cir. 9 st.	NE.†	00	4 cir. 5 st.	NE.†	00	00
2 st.	0	00	2 st.	0	00	3 st.	0	90	1 st.	0	00	0	0	00	Light haze.	0	00	00
0	0	00	1 st.	0	00	0	0	00	Light haze.	0	00	Light haze.	0	00	Light haze.	0	00	00
0	0	00	0	0	00	0	0	00	1 st.	0	00	2 cir. 2 st.	0	00	5 st.	0	00	00
Light fog.	0	00	Lt. haze. Lt. fog.	0	00	Light fog.	0	00	1 st.	ENE.*	00	1 st.	ENE.*	00	1 cir. 1 st.	0	00	00
2 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	00
Light haze. 5 st.	0	00	Light fog.	0	00	Light fog.	0	00	10 st. Light fog.	0	00	Light haze. 5 st.	0	00	2 cir. 1 st.	0	00	00
3 st.	0	00	2 st.	0	00	2 st.	0	00	1 st.	0	00	3cir. 1ci.cum. 1st.	0	00	6 cir. 1 st.	0	00	00
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	.01
2 cir. cum. 1 st.	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.01
3 cir. st. 2 st.	0	00	4 cir. st. 3 st.	0	00	Light haze. 5 st.	0	00	3 cir. 4 st.	SE.†	00	1ci. 2ci.cu. 3st.	SE.†	00	5 cir. 2 st.	0	00	00
10 nim.	0	.—	10 nim.	0	.—	2 cir. 6 st.	SSE.†	.—	4 cir. cum. 2 st.	SSE.†	00	6 cir. cum. 1 st.	0	00	2 cir. cum. 1 st.	0	00	.02
10 st.	0	00	10 st.	0	00	9 st.	0	00	8 st.	ENE.†	00	10 st.	0	00	10 st.	0	00	00
2 st.	0	00	5 cir. cum. 2 st.	0	00	3 cir. cum. 3 st.	0	00	1 cir. cum. 1 st.	0	00	3 cir. cum. 3 st.	0	00	4 cir. cum. 3 st.	0	00	.01
1 st.	0	00	1 st.	0	00	0	0	00	1 st.	0	00	1 st.	0	00	1 cir.	0	00	00
Light haze. 6 st.	0	00	5 cir. cum. 3 st.	0	00	6 cir. cum. 2 st.	0	00	10 st.	0	00	10 st.	0	00	10 nim.	0	.—	.07
7 st.	0	00	1 st.	0	00	1 st.	0	00	0	0	00	1 cir. cum. 1 st.	0	00	1 st.	0	00	00
10 st.	0	00	2 cum. 6 st.	0	00	5 st.	0	00	10 st.	0	00	3 cir. cum. 7 st.	0	00	6 cir. cum. 4 st.	0	00	.01
3.06			2.87			2.45			2.77			3.64			3.77			.13

7 p. m.			8 p. m.			9 p. m.			10 p. m.			11 p. m.			12 p. m.			Daily means.
0	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	.87
6 cir. 1 st.	0	00	6 cir. 3 st.	0	00	1 cir. st. 4 st.	SE.†	00	1 cir. st. 2 st.	0	00	1 cir. st. 2 st.	0	00	1 cir. st. 2 st.	0	00	2.62
1 cir. st. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2.54
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	.70
6 cir. 3 st.	0	00	7 cir. st. 2 st.	0	00	1 cir. st. 3 st.	0	00	1 cir. st. 7 st.	NW.†	00	8 st.	NW.†	00	1 cir. st. 3 st.	0	00	5.54
1 st.	0	00	5 cir. st. 2 st.	0	00	1 cir. st. 2 st.	0	00	4 st.	SW.†	00	3 st.	0	00	4 st.	0	00	2.62
5 cir. 3 st.	0	00	4 cir. st.	0	00	2 st.	0	00	2 st.	0	00	3 st.	0	00	3 st.	0	00	3.54
1 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	3.58
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	1.20
0	0	00	0	0	00	0	0	00	0	0	00	1 st.	0	00	1 st.	0	00	.45
1 cir. 1 st.	0	00	2 cir. 1 st.	0	00	1 cir. 3 st.	0	00	6 st.	0	00	2 cir. 3 st.	NE.†	00	5 st.	NE.†	00	2.00
9 st.	NE.†	00	9 st.	NE.†	00	8 st.	W.†	00	6 st.	W.†	00	5 st.	W.†	00	5 st.	WNW.†	00	6.41
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	2.04
0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	0	0	00	.25
4 cir. 2 st.	0	00	5 cir. 2 st.	0	00	1 cir. 4 st.	0	00	1 cir. 4 st.	0	00	2 cir. st. 4 st.	0	00	3 cir. st. 3 st.	0	00	3.41
1 cir. 1 st.	0	00	4 cir. 1 st.	0	00	1 cir. 1 st.	0	00	1 cir. 3 st.	0	00	1 cir. 3 st.	0	00	1 cir. 4 st.	0	00	1.79
1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1 st.	0	00	1.60
0	0	00	0	0	00	1 st.	NE.†	00	1 st.	NE.†	00	1 st.	NE.†	00	1 st.	NE.†	00	.20
1 st.	0	00	9 st.	0	00	9 st.	0	00	9 st.	0	00	1 cir. st. 3 st.	0	00	1 cir. st. 3 st.	0	00	1.66
4 st. Dense fog.	0	00	Dense fog.	0	00	Light fog.	0	00	Dense fog.	0	00	8 st.	SE.†	00	2 st.	0	00	3.04
10 st.	E.†	00	10 st.	E.†	00	10 st.	E.†	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	6.54
10 nim.	0	.—	10 nim.	0	.01	3 st.	SE.†	.—	10 st.	0	00	10 st.	0	00	5 st.	0	00	9.37
3 cir. 2 st.	0	00	3 cir. 5 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	5 st.	0	00	4.33
2 cir. 7 st.	0	00	8 st.	0	00	9 st.	0	00	3 cir. 5 st.	0	00	9 st.	SE.†	00	9 st.	0	00	7.33
1 cir. 2 st.	0	00	10 st.	0	00	2 st.	0	00	5 st.	SW.†	00	1 st.	0	00	1 st.	0	00	6.79
8 st.	SE.†	00	8 st.	0	00	9 st.	SE.†	00	8 st.	SE.†	00	4 st.	SE.†	00	3 st.	0	00	7.45
1 cir. 5 st.	0	00	6 st.	SW.†	00	9 st.	0	00	7 st.	SW.†	00	6 st.	SW.†	00	5 st.	SW.†	00	6.41
10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	10 st.	0	00	9 st.	0	00	5.45
8 st.	W.*	00	10 st.	0	00	9 st.	W.†	00	2 st.	0	00	Dense fog.	0	00	Dense fog.	0	00	7.91
1 cir. 1 st.	0	00	1 cir. st. 5 st.	W.†	00	1 cir. 4 st.	W.†	00	1 cir. 5 st.	W.†	00	1 cir. st. 8 st.	W.†	00	9 st.	W.†	00	5.00
10 nim.	NNW.†	.—	3 cir. st. 3 st.	0	.—	4 cir. st. 2 st.	0	00	2 cir. 2 cir. st. 3 st.	0	00	2 cir. st. 6 st.	0	00	10 nim.	NNW.*	.—	9.00
4.48			5.22			4.22			4.48			4.32			3.70			3.90

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds.	Precipitation.
1883.												
Apr. 1	10 nim. NNW.†	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00
Apr. 2	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Apr. 3	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Apr. 4	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
Apr. 5	9 st. NE.†	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. NNE.†	.—	10 nim. 0	.—	10 nim. 0	.—
Apr. 6	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Apr. 7	3 cir. cum. 4 st. 0	00	4 st. 0	00	3 st. 0	00	2 st. 0	00	2 st. 0	00	3 st. 0	00
Apr. 8	1 cir. st. 1 st. 0	00	5 cir. st. 1 st. 0	.00	4 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	0 0	00	1 st. 0	00
Apr. 9	5 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	.00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	3 st. 0	00	Light haze. 8 st. 0	00
Apr. 10	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense haze. 9 st. 0	00	Dense haze. 9 st. 0	00	Light haze. 8 st. 0	00
Apr. 11	10 st. 0	00	D. haze. 8 st. ENE.†	00	D. haze. 7 st. ENE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Apr. 12	9 st. ENE.†	00	9 nim. E.†	.—	Dense haze. 8 nim. 0	.—	Dense haze. 6 nim. 0	.61	Light haze. 3 st. 0	.—	3 st. 0	00
Apr. 13	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	Dense haze. 4 nim. 0	.01	Light haze. 2 st. 0	.—	1 st. 0	00
Apr. 14	D. haze, 4 st. 0	00	Dense haze, 4 st. 0	00	Dense haze. 7 st. 0	00	4 cir. cum. 5 st. 0	00	5 cum. 4 st. 0	00	3 cir. cum. 5 st. 0	00
Apr. 15	3 cir. cum. 6 nim. 0	.—	5 cir. cum. 3 nim. 0	.—	5 cir. st. 2 st. 0	.—	4 cir. cum. 2 st. 0	00	7 cir. cum. 3 st. 0	00	6 cir. cum. 4 st. 0	00
Apr. 16	1 cir. st. 3 st. ENE.*	00	5 cir. cum. 4 st. ENE.†	00	9 st. ENE.†	00	10 st. Dense haze. 0	00	10 st. 0	00	9 st. 0	00
Apr. 17	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
Apr. 18	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00
Apr. 19	10 nim. 0	01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01
Apr. 20	10 st. 0	00	10 st. 0	00	10 nim. E.*	.—	10 st. E.*	.—	10 st. 0	00	10 st. 0	00
Apr. 21	10 nim. 0	.—	10 nim. 0	.01	10 nim. E.†	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Apr. 22	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Apr. 23	2 cir. 2 cir. st. 3 st. 0	00	5 cir. st. 3 st. 0	00	5 cir. st. 3 st. 0	00	3 cir. st. 3 st. 0	00	2 cir. st. 3 st. 0	00	10 st. Light fog. 0	00
Apr. 24	1 ci. st. 1 ci. cu. 7 st. SE.†	.00	9 st. SE.†	00	Dense haze. 8 st. 0	00	4 cir. st. 4 st. 0	00	2 cir. st. 3 st. SE.†	00	1 cir. st. 2 st. 0	00
Apr. 25	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Apr. 26	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—
Apr. 27	10 nim. E.†	.01	2 cir. cum. 7 nim. 0	.02	1 cir. cum. 6 nim. 0	.01	10 st. 0	.—	10 st. 0	00	10 st. 0	00
Apr. 28	9 nim. 0	.—	9 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
Apr. 29	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00
Apr. 30	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Means.	7.30		7.33		7.16		6.93		6.63		6.66	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.	
1883.												
Apr. 1	1 cir. 2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. st. 1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00
Apr. 2	0 0	00	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00
Apr. 3	0 0	00	0 0	00	1 cir. 0	00	1 cir. 0	00	0 0	00	0 0	00
Apr. 4	0 0	00	0 0	00	0 0	00	0 0	00	1 cir. 0	00	1 cir. 0	00
Apr. 5	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Apr. 6	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	9 st. S.†	00	10 st. 0	00
Apr. 7	10 nim. 0	.—	8 cir. cum. 2 st. 0	.—	1 cir. 8 st. 0	00	1 cir. 7 st. S.†	00	3 cir. 2 st. 0	00	2 cir. 2 st. 0	00
Apr. 8	8 cir. 1 st. 0	00	6 cir. 2 st. 0	00	5 cir. 3 st. 0	00	5 cir. 1 st. 0	00	2 cir. 1 st. 0	00	2 st. 0	00
Apr. 9	3 cir. 1 st. 0	00	2 cir. 2 st. 0	00	3 cir. st. 1 st. 0	00	2 cir. st. 3 st. 0	00	4 cir. st. 4 st. 0	.00	10 st. 0	00
Apr. 10	1 cir. 1 st. ENE.†	00	1 cir. 1 st. ENE.†	00	1 cir. 1 st. ENE.†	00	1 cir. 1 st. ENE.†	00	1 cir. 1 st. ENE.†	00	1 st. 0	00
Apr. 11	9 st. 0	00	2 cir. cum. 6 st. 0	00	1 cir. 5 st. 0	00	1 cir. 8 st. 0	00	1 cir. 7 st. 0	00	8 st. 0	00
Apr. 12	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	9 st. 0	.—	10 nim. 0	.—	10 st. 0	.—
Apr. 13	1 cir. 1 st. 0	00	2 cir. 3 st. 0	00	1 cir. 5 st. 0	00	1 cir. 7 st. D. fog. 0	.00	3 cir. 6 st. D. fog. 0	.00	Lt. haze. Lt. fog. 0	00
Apr. 14	10 nim. 0	.—	2 cir. cum. 8 nim. 0	.—	3 cir. cum. 7 nim. 0	.01	4 cir. cum. 5 st. 0	.—	5 cir. cum. 4 st. 0	00	4 cir. cum. 5 st. 0	00
Apr. 15	2 cir. st. 2 st. 0	00	2 st. 0	00	1 cir. st. 1 st. 0	00	2 cir. st. 4 st. NW.†	.00	1 cir. st. 1 st. 0	00	1 cir. 1 st. 0	00
Apr. 16	0 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	1 st. 0	00
Apr. 17	5 cir. 0	00	2 cir. 2 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00
Apr. 18	1 cir. 6 cir. cum. 2 st. 0	00	3 cir. 3 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Apr. 19	10 nim. 0	.—	10 st. 0	.01	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Apr. 20	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.03
Apr. 21	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.02	1 cir. cum. 9 nim. 0	.01	1 cir. cum. 6 st. 0	.—	3 cir. cum. 5 st. 0	00
Apr. 22	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	3 cir. 4 st. 0	00
Apr. 23	1 cir. 8 st. 0	00	3 cir. 5 st. 0	00	4 cir. 2 st. E.*	00	5 cir. 1 cir. st. 3 st. E.*	00	5 cir. 3 st. E.*	00	6 cir. 3 st. E.*	00
Apr. 24	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.†	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00
Apr. 25	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01
Apr. 26	1 cir. cum. 8 nim. 0	.—	10 nim. 0	.01	1 cir. cum. 9 nim. 0	.01	1 cir. cum. 8 nim. 0	.—	10 nim. 0	.—	10 st. SE.†	.—
Apr. 27	10 nim. 0	.—	10 nim. 0	.—	10 st. W.†	.01	10 st. 0	00	10 st. 0	00	9 st. 0	00
Apr. 28	3 cir. cum. 6 st. 0	00	5 cir. cum. 4 st. 0	00	4 cir. cum. 4 st. 0	00	3 cir. cum. 5 st. 0	00	3 cir. cum. 5 st. 0	.00	5 cir. st. 2 st. 0	00
Apr. 29	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Apr. 30	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. E.†	.00
Means	7.13		6.96		6.90		7.13		6.76		6.43	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
9 st. 0	00	9 st. 0	00	3 cir. cum. 5 st. 0	00	4 st. 0	00	1 cir. 3 st. 0	00	1 cir. 7 st. 0	00	.01
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	1 cir. st. 1 st. 0	00	2 cir. st. 0	00	1 st. 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
10 st. 0	.—	10 st. W.†	00	10 st. W.†	00	10 st. 0	00	10 nim. 0	—	10 nim. 0	.—	.—
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	.—
9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	.—
1 st. 0	00	0 0	00	1 st. 0	00	0 0	00	1 cir. 0	00	7 cir. 0	00	.00
Light haze. 8 st. 0	00	2 st. 0	00	1 st. 0	00	4 cir. 1 st. 0	00	5 cir. 2 st. 0	00	7 cir. 0	00	.00
Light haze. 6 st. 0	00	2 cir. st. 3 st. 0	00	8 st. 0	00	2 st. 0	00	4 cir. st. 3 st. ENE.†	.00	4 cir. cum. 2 st. 0	00	.00
10 st. 0	00	4 cum. 5 st. 0	00	4 cum. 6 st. 0	00	4 cum. 6 st. 0	00	7 cum. 3 st. 0	00	10 st. 0	00	.00
2 st. 0	00	2 cir. cum. 3 st. 0	00	3 cum. 5 st. 0	00	5 cum. 4 st. 0	00	6 cum. 4 st. 0	00	7 cum. 3 st. 0	00	.02
2 cir. cum. 1 st. 0	00	3 st. 0	00	1 cir. cum. 2 st. 0	00	5 cir. cum. 2 st. 0	00	10 nim. 0	.—	2 cir. 4 st. 0	.01	.02
3 cum. 4 st. 0	00	4 cum. 5 st. 0	00	6 cum. 3 st. 0	00	7 cum. 2 st. 0	00	7 cum. 3 st. 0	00	5 cum. 5 nim. 0	.—	.—
6 cir. cum. 4 st. 0	00	5 cir. cum. 3 st. 0	00	4 cir. cum. 5 st. 0	00	4 cir. cum. 4 st. 0	.00	3 cir. 6 st. 0	00	3 cir. st. 4 st. 0	.00	.—
2 cir. st. 3 st. 0	00	3 st. 0	00	2 st. 0	00	1 st. 0	00	0 0	00	0 0	00	.00
0 0	00	0 0	00	0 0	00	0 0	00	3 cir. cum. 0	00	4 cir. cum. 0	00	.00
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 cir. cum. 1 st. 0	00	.—
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	.03
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	.13
10 st. 0	.01	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.01	10 nim. 0	.01	.09
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
3 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 cir. 0	00	5 cir. 0	00	.00
3 st. 0	00	1 cir. st. 2 st. SE.†	00	Lt. haze. 5 st. SE.†	00	6 cir. 2 st. ENE.*	00	1 cir. 9 st. ENE.*	.00	10 st. ENE.†	00	.—
10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	.11
10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	.06
10 st. 0	00	10 st. 0	00	10 st. 0	00	4 cum. 6 st. 0	00	4 cum. 6 st. 0	00	7 cum. 3 st. 0	00	.05
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	.—
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
6.40		6.30		6.53		6.56		7.16		7.43		.52

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
0 0	00	0 0	00	0 0	00	1 st. 0	00	0 0	00	0 0	00	4.79
2 st. 0	00	1 st. 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.50
0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.45
0 0	00	0 0	00	0 0	00	1 st. 0	00	1 cir. 2 st. 0	00	3 st. 0	00	.37
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	9.95
10 st. 0	00	9 st. SW.†	00	1 cir. 8 st. SW.†	00	1 cir. 9 st. SW.†	00	1 cir. 8 st. SW.†	00	1 cir. 5 st. SW.†	00	9.66
1 cir. 2 cir. st. 1 st. 0	00	3 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	5.87
2 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	2 st. 0	00	3 st. 0	00	3.12
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	5.79
3 cir. 1 st. 0	00	6 cir. 2 st. 0	00	5 st. ENE.†	00	4 st. ENE.†	00	5 st. 0	00	7 st. ENE.†	00	5.54
9 st. 0	00	10 st. 0	00	9 st. 0	00	9 st. 0	00	5 st. 0	00	6 st. 0	00	8.75
10 st. SE.†	00	10 st. SE.†	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	8.37
Lt. haz. 7 st. D. fog. 0	00	Light haze. 6 st. 0	00	10 st. 0	00	10 st. 0	00	6 st. 0	00	6 st. 0	00	6.[illegible]0
4 cir. 5 st. 0	00	1 cir. cum. 8 nim. 0	.—	2 cir. cum. 7 nim. 0	.—	1 ci. cu. 9 nim. ENE.†	.—	1 ci. cu. 9 nim. ENE.†	.—	4 cir. cum. 6 nim. 0	.—	8.70
1 st. 0	00	1 cir. 1 st. 0	00	2 cir. 1 st. 0	00	2 cir. st. 3 st. 0	00	3 cir. 3 st. 0	00	4 st. NE.†	.00	5.83
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2.95
1 st. 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1.29
10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	5.54
10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 nim. E.†	.02	10 nim. E.†	.02	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.03	10 nim. 0	.01	10.00
2 cir. cum. 7 st. 0	00	2 cir. cum. 7 st. 0	00	10 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	9.66
5 cir. 2 st. 0	00	5 cir. 1 st. 0	00	2 cir. st. 5 st. SE.†	00	6 st. SE.†	00	7 st. SE.†	00	6 st. 0	00	9.00
4 cir. 3 st. 0	00	8 cir. 3 st. 0	00	3 st. 0	00	5 st. 0	00	8 st. SE.†	00	1 cir. st. 6 st. SE.†	00	5.91
10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	8.37
10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10.00
10 st. E.†	00	10 st. 0	00	5 cir. cum. 4 st. 0	00	3 cir. cum. 5 st. E.*	00	2 cir. cum. 7 nim. E.*	.—	2 cir. cum. 7 nim. E.†	.01	9.70
9 st. 0	00	5 cir. st. 4 st. 0	00	8 st. 0	00	2 cir. cum. 2 st. 0	00	8 st. 0	00	8 st. 0	00	9.20
2 st. 0	00	1 st. 0	00	1 st. 0	00	6 st. N.†	00	9 st. 0	00	10 st. 0	00	8.16
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10.00
7 st. ENE.†	00	10 st. 0	00	10 st. 0	00	2 cir. st. 4 st. E.*	00	10 nim. 0	.—	9 st. ENE.*	.—	9.62
6.33		6.40		6.30		6.36		6.73		6.63		6.76

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1883.												
May 1	9 st. NE.*	00	3 cum. 5 st. NE.†	00	10 st. NE.†	00	9 st. NE.†	00	10 st. NE.†	.00	10 st. NE.†	00
May 2	2 cir. st. 0	00	3 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00	2 cir. st. Lt. fog. 0	00	2 cir. st. Lt. fog. 0	00	3 st. 0	00
May 3	5 cir. st. 3 st. 0	00	2 cir. 2 cir. st. 3 st. 0	00	2 cir. st. 2 st. 0	00	1 cir. st. 1 st. 0	00	2 st. 0	00	2 st. 0	00
May 4	1 cir. st. 9 st. ESE.†	00	4 cir. 4 st. SE.*	00	4 cir. st. 3 st. 0	00	3 cir. st. 2 st. 0	00	1 cir. st. 2 st. 0	00	2 cir. st. 1 st. 0	00
May 5	1 cir. st. 9 st. 0	00	1 cir. st. 9 st. 0	00	9 st. S.†	00	1 cir. st. 9 st. 0	00	10 st. 0	00	10 st. 0	00
May 6	9 st. SW.†	00	5 st. SW.†	00	6 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00	9 st. 0	00
May 7	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
May 8	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 9	9 st. 0	00	9 st. E.†	00	9 st. 0	00	9 st. SE.†	00	3 cum. 6 st. 0	00	9 cum. E.†	00
May 10	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
May 11	1 cir. 6 st. SW.*	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 12	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. 0	00
May 13	10 st. 0	00	9 st. NE.*	00	1 cir. st. 8 st. NE.*	00	2 cir. cum. 7 st. NE.*	00	8 st. E.†	00	5 cum. 3 st. E.†	00
May 14	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.03
May 15	10 st. 0	00	10 st. NNW.†	00	10 st. NNW.†	00	10 st. NNW.†	00	10 st. 0	00	10 st. 0	00
May 16	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—
May 17	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00
May 18	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—
May 19	9 st. SW.†	00	1 cir. st. 8 st. SW.†	00	5 cir. st. 2 st. 0	00	4 cir. st. 2 st. 0	00	5 cir. st. 1 st. 0	00	3 cir. st. 2 st. 0	00
May 20	10 st. 0	00	10 st. S.*	00	Dense fog. 0	00	4 cir. st. Dense fog. 0	00	5 cir. st. Lt. fog. 0	00	3 cir. st. 2 st. SW.†	00
May 21	4 cir. cum. 3 st. 0	00	6 cir. cum. 1 st. 0	00	3 st. SW.†	00	3 st. 0	00	Dense fog. 0	00	4 cir. cum. 2 st. 0	00
May 22	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00
May 23	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 24	Dense fog. 0	00	1 cir. st. D. fog. 0	00	3 ci. s. 2 ci. cu. 2 s. SW.†	00	2 cir. st. 7 st. SW.†	00	3 ci. s. 6 st. Lt. fog. 0	00	5 cum. 3 st. SW.†	00
May 25	10 st. 0	00	10 st. 0	00	10 st. W.*	00	1 cir. st. 9 st. W.†	00	10 st. 0	00	10 st. 0	00
May 26	10 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00	9 st. SW.*	00	10 st. SW.†	00	10 st. 0	00
May 27	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	5 cir. st. 3 st. Lt. fog. 0	00
May 28	1 cir. st. 7 st. S.*	00	9 st. Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Lt. haze. 5 st. Lt. fog. 0	00
May 29	3 cir. Light fog. 0	00	Light fog. 0	00	1 cir. Light fog. 0	00	4 cir. st. Lt. fog. 0	00	4 cir. st. Lt. fog. 0	00	2 cir. st. 1 st. 0	00
May 30	10 st. 0	00	9 st. E.*	00	1 ci. 2 ci. cu. 3 st. E.*	00	1 ci. 2 ci. cu. 4 st. E.†	00	4 cum. 2 st. E.†	00	5 cum. 3 st. 0	00
May 31	2 cir. cum. 7 st. 0	00	1 cir. st. 9 st. SW.†	00	1 cir. st. 8 st. SW.†	00	1 cir. st. 8 st. SW.†	00	9 st. SW.†	00	3 cum. 5 st. SW.†	00
Means.	8.03		7.83		7.06		7.29		7.09		7.41	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1883.												
May 1	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00
May 2	5 cir. 1 st. 0	00	3 cir. 3 cir. st. 2 st. 0	00	4 cir. st. 5 st. 0	00	3 cir. st. 5 st. 0	00	3 cir. st. 5 st. 0	00	4 cir. st. 4 st. 0	00
May 3	0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	2 st. E.*	00	5 st. E.*	00
May 4	1 cir. st. 1 st. 0	00	3 cir. st. 1 st. 0	00	2 cir. 2 cir. st. 1 st. 0	00	3 cir. st. 2 st. 0	00	2 cir. st. 3 st. 0	00	4 cir. st. 3 st. 0	00
May 5	1 cir. 1 st. 0	00	2 cir. 4 st. SW.†	00	8 st. SW.†	00	9 st. SW.*	00	9 st. SW.*	00	8 st. SW.*	00
May 6	10 st. D. fog. N.*	00	10 st. N.*	00	10 st. N.†	00	10 st. N.†	00	10 st. NE.*	00	9 st. NNE.†	00
May 7	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.03	10 nim. 0	.01	10 st. 0	.—	10 st. 0	00
May 8	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	3 st. 6	00	2 cir. 1 st. 0	00
May 9	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 10	4 cir. 2 st. NE.†	00	3 cir. 6 st. 0	00	10 st. 0	00	10 st. 0	00	8 st. 0	00	4 cir. 4 st. SW.*	00
May 11	10 st. NE.†	00	10 st. Dense fog. 0	00	1 cir. 8 st. NE.*	00	1 cir. 7 st. NNE.*	00	10 st. 0	00	10 st. 0	00
May 12	9 st. 0	00	8 st. NE.†	00	2 cir. 2 st. NE.†	00	3 cir. 1 st. NE.†	00	4 cir. 4 st. NE.*	00	9 st. NE.*	00
May 13	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—
May 14	1 cir. 3 st. 0	.—	10 st. 0	00	10 st. 0	00	9 st. SW.†	00	9 st. SW.*	00	9 st. SW.*	00
May 15	1 cir. 8 st. N.*	00	8 st. N.†	00	3 cir. 5 st. N.*	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—
May 16	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00
May 17	10 st. 0	00	10 st. 0	00	9 st. SW.†	00	1 cir. 8 st. SW.†	00	9 st. SW.*	00	9 st. SW.†	00
May 18	10 st. 0	00	9 st. SW.†	00	9 st. SW.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 19	9 st. 0	00	9 st. 0	00	10 st. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00
May 20	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 st. 0	00	1 st. 0	00	2 cir. 1 st. SW.†	00
May 21	0 0	00	1 st. 0	00	Light fog. 0	00	Light fog. 0	00	Light fog. 0	00	Lt. fog. Lt. fog. 0	00
May 22	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 23	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 24	1 cir. 9 st. 0	00	1 cir. 8 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00
May 25	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 26	Dense fog. 0	00	Dense fog 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
May 27	4 st. SE.†	00	8 st. ESE.† D. fog.	00	6 st. D. fog. ESE.†	00	5 st. D. fog. ESE†	00	3 st. ESE.†	00	6 st. E.†	00
May 28	2 cir. 3 st. 0	00	1 cir. 3 st. 0	00	3 cir. 2 st. 0	00	4 cir. 2 st. 0	00	4 cir. 3 st. 0	00	4 cir. 3 st. 0	00
May 29	2 cir. 3 cir. st. 3 st. 0	00	4 cir. st. 5 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
May 30	6 cir. cum. 3 st. 0	00	4 cir. cum. 4 st. 0	00	1 cir. 8 st. E.†	00	1 cir. 8 st. E.†	00	3 cir. 5 st. E.†	00	2 cir. 5 st. 0	00
May 31	9 st. E.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Means	6.54		7.16		7.19		7.22		7.45		7.74	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
3 cir. 3 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00	.00
2 st. 0	00	1 cir. 1 st. 0	00	2 cir. 0	00	5 cir. 0	00	6 cir. 0	00	6 cir. 0	00	.00
2 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	.00
2 cir. st. 1 st. 0	00	3 cir. cum. 2 st. 0	00	3 cir. st. 2 st. 0	00	6 cir. cum. 1 st. 0	00	1 cir. cum. 6 st. E.*	00	7 st. E.*	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. 0	00	.00
10 st. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	Dense fog. 0	00	10 st. NNW.†	00	10 st. Light fog. 0	00	.00
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.02	.14
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	1 st. SW.†	00	1 st. SW.†	00	.00
10 st. 0	00	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	7 cir. cum. Lt. fog. 0	00	7 cir. 3 st. 0	00	7 cir. 3 st. 0	00	.00
10 st. 0	00	10 st. 0	00	8 st. NNW.†	00	10 st. NNW.†	00	10 st. 0	00	10 st. NNE.†	00	.00
10 st. 0	00	4 cum. 3 st. 0	00	8 st. NNE.†	00	1 cir. 1 st. 0	00	1 cir. 5 st. NE.†	00	8 st. NE.†	00	.00
6 cum. 2 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	.04
10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.01	.07
10 st. 0	00	10 st. Light fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.02
10 st. 0	.—	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	.03
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
10 st. 0	.—	5 cum. 4 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
2 cum. 4 st. W.†	00	1 cir. st. 2 st. 0	00	4 cum. 2 st. W.†	00	6 cum. 2 st. SW.†	00	7 cum. 2 st. SW.†	00	10 st. 0	00	.00
2 cir. st. 1 st. 0	00	2 st. 0	00	Light fog. 0	00	Light fog. 0	00	Light fog. 0	00	Light fog. 0	00	.00
3 cum. D. fog. 0	00	4 cum. D. fog. 0	00	5 cum. Lt. fog. 0	00	4 cum. Lt. fog. 0	00	Dense fog. 0	00	Light fog. 0	00	.00
10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
6 cum. 2 st. SW.†	00	5 cum. 3 st. SW.†	00	7 cum. 2 st. 0	00	10 st. SW.†	00	10 st. 0	00	10 st. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
3 cum. 6 st. SW.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
5 cir. st. 2 st. 0	00	6 cir. cum. 1 st. 0	00	5 cum. 5 st. 0	00	7 cir. cum. 2 st. 0	00	7 cir. cum. 1 st. 0	00	1 cir. 2 cir. cum. 1 st. 0	00	.—
Light haze. 3 st. 0	00	Dense fog. 0	00	1 cum. Lt. fog. 0	00	Light fog. 0	00	4 cir. Light fog. 0	00	6 cir. Light fog. 0	00	.00
3 cir. 2 st. 0	00	5 cum. 1 st. 0	00	3 cir. 3 cir. cum. 3 st. 0	00	5 cir. cum. 2 st. 0	00	5 ci. 4 ci. cu. 1 st. NE.†	00	5 cir. 3 cir. cum. 1 st. 0	00	.00
5 cum. 2 st. E.†	00	4 cir. cum. 2 st. 0	00	1 cir. 1 st. 0	00	2 cir. 1 st. 0	00	5 cir. 0	00	8 cir. cum. 0	00	.00
3 cum. 6 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	4 cir. cum. 6 st. ENE.*	00	.00
7.12		6.54		6.61		6.90		7.32		7.35		.30

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	3.41
6 cir. st. 3 st. 0	00	4 cir. st. 2 st. 0	00	2 cir. st. 4 st. 0	00	3 cir. 4 st. 0	00	2 cir. 6 st. 0	.00	2 cir. 6 st. 0	00	5.41
7 st. E.*	00	8 st. E.*	00	8 st. ESE.*	00	10 st. 0	00	9 st. ESE.†	00	10 st. ESE.†	00	3.87
5 cir. st. 2 st. 0	00	2 st. 0	00	4 st. 0	00	9 st. 0	00	7 st. E.†	00	9 st. E.†	00	5.66
2 st. SW.†	.00	1 st. 0	00	1 st. 0	00	8 st. SW.†	00	9 st. SW.†	00	9 st. SW.†	00	7.91
9 st. NNE.†	00	9 st. NNE.†	00	10 st. NNE.†	00	10 st. NNE.†	00	10 st. 0	00	10 st. 0	00	8.91
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	2 cir. cum. 2 st. 0	00	2 cir. cum. 3 st. 0	00	5.33
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.75
7 cir. 1 st. 0	00	5 cir. 2 st. 0	00	6 st. 0	00	1 cir. 6 st. 0	00	7 st. 0	00	1 cir. 4 st. 0	00	6.16
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.62
9 st. E.*	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 st. 0	.01	8.37
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.62
6 st. SW.†	00	8 st. 0	00	9 st. 0	00	10 st. ESE.†	00	10 st. 0	00	10 st. 0	00	9.33
10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	9.37
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10.00
9 st. SSW.†	00	9 st. SSW.†	00	9 st. SW.†	00	8 st. SW.†	00	8 st. SW.†	.00	9 st. SW.†	00	9.50
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.87
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9 st. S.†	00	7 st. S.*	00	8.20
1 cir. 1 st. SW.†	00	2 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	2.33
Light fog. 0	00	Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1.75
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.91
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	Dense fog. 0	—	9.58
10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	8 st. SW.†	00	10 st. 0	00	10 st. 0	00	8.41
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.16
10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	3.13
9 st. E.†	00	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	9 st. S.†	00	5.85
3 cir. 4 st. 0	00	3 cir. 4 st. 0	00	9 st. 0	00	1 cir. 7 st. 0	00	1 cir. 8 st. Lt. fog. 0	00	8 st. 0	00	4.91
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.41
2 cir. 3 st. 0	00	1 cir. 2 st. 0	00	2 cir. cum. 2 st. 0	00	1 cir. cum. 4 st. 0	00	7 st. E.†	00	9 st. 0	00	6.66
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. ENE.*	00	10 st. 0	00	10 st. 0	00	9.66
7.83		7.25		7.45		7.87		8.06		7.77		7.33

Statement showning the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, —5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds	Precipitation.
1883.												
June 1	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 2	10 nim. 0	.—	10 st. 0	.—	10 nim. NW.†	.—	10 st. NW.†	.—	10 st. 0	00	10 st. 0	00
June 3	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	6 cu. 3 cu. st. NW.†	.—
June 4	10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 5	10 st. SSW.*	00	10 st 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 6	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	2 cir. st. 0	00	1 cir. 0	00
June 7	2 cir. st. 0	00	1 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00	1 cir. 2 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00	1 cir. 1 cir. st. 1 st. 0	00
June 8	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. Light fog. 0	00	10 nim. 0	.—
June 9	10 nim. 0	.—	10 nim. E.*	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	8 cum. 0	.—
June 10	1 cir. 2 st. 0	00	1 cir. 1 cir. st. 2 st. 0	00	1 cir. 3 st. 0	00	1 cum. 5 st. SW.†	00	5 cum. 2 st. 0	00	3 cir. cum. 2 st. SSE.†	00
June 11	4 cir. 3 st. E.†	00	3 cir. 3 st. 0	00	1 cir. cum. 8 st. E.†	00	10 st. E.*	00	10 st. 0	00	10 nim. 0	.—
June 12	10 st. E.*	00	10 st. E.*	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 13	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.01
June 14	10 st. 0	00	10 st. 0	00	10 st. Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 15	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. 0	00	3 cum. 5 st. 0	.—
June 16	Dense fog. 0	00	Dense fog. 0	.—	Dense fog. 0	.—	10 st. NE.†	.—	10 st. 0	.—	10 nim. 0	.01
June 17	Dense fog. 0	00	Dense fog 0	00	Dense fog. 0	00	1 cir. Dense fog. 0	00	4 cir. Light fog. 0	00	5 cir. st. Lt. Fog. 0	00
June 18	1 ci. 2 ci. cu. 1 st. 0	00	5 cir. cum. 1 st. 0	00	1 cir. cum. 9 st. NE.*	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 19	10 st. E.†	00	10 st. E.*	00	9 st. E.*	00	10 nim. E.*	.—	10 nim. E.*	.—	10 st. 0	.—
June 20	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 21	1 st. NE.*	00	10 st. ENE.*	00	10 st. E.*	00	Dense fog. 0	00	Dense fog. 0	00	10 nim. Light fog. 0	.—
June 22	10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	Dense fog. 0	00	10 nim. 0	.—	10 nim. 0	.—
June 23	1 cir. cum. 9 st. E.*	00	1 cir. cum. 6 st. NE.*	00	Dense fog. 0	00	10 st. Lt. fog. N.E.*	00	10 st. NE.†	00	Dense fog. 0	00
June 24	1 ci. cu. 1 cu. st. 2 s. 0	00	1 cir. cum. 6 st. E.*	00	3 cir. cum. 6 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00
June 25	1 cir. cum. 6 st. E.†	00	2 ci. 1 ci. cu. 3 st. E.*	00	1 cir. 4 st. E.*	00	1 cir. 2 st. 0	00	5 cum. 2 st. 0	00	10 st. ENE.*	00
June 26	1 cir. st. 8 st. E.*	00	4 cir. cum. 4 st. E.*	00	1 cir. st. 9 st. E.*	00	1 cir. st. 9 st. E.*	00	5 cum. 3 st. E.†	00	10 st. E.*	00
June 27	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.—	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00
June 28	10 st. SSE.*	00	10 st. SSE.†	00	10 st. SSE.†	00	10 st. SSE.†	.—	10 st. SSE.†	00	3 cum. 6 st. S.†	00
June 29	2 cir. st. 2 st. 0	00	3 cir. st. 2 st. 0	00	3 cir. st. 2 st. 0	00	1 cir. st. 2 st. 0	00	5 cum. 2 st. 0	00	4 cum. 3 st. 0	00
June 30	10 nim. SSE.*	.02	10 nim. W.†	.03	1 cir. st. 9 st. W.*	.02	10 st. W.*	00	10 st. SW.†	00	6 cum. 3 st. Lt. fog. 0	00
Means.	6.63		7.03		6.80		6.56		7.60		7.46	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.	
1883.												
June 1	9 st. N.†	00	9 st. WNW.†	.00	10 st. W.†	00	10 st. 0	00	9 st. W.†	00	10 st. W.†	00
June 2	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 3	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 4	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 5	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Light fog. 0	00	Light fog. 0	00	10 st. 0	00
June 6	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00
June 7	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 8	10 st. 0	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00
June 9	10 nim. 0	.—	9 st. E.*	.—	8 st. E.*	00	1 cir. 1 st. E.*	00	1 cir. 1 st. E.*	00	1 cir. 1 st. 0	00
June 10	1 cir. cum. 8 st. 0	00	3 cir. cum. 5 st. E.†	00	2 cir. cum. 7 st. E.†	00	4 cir. cum. 2 st. 0	00	5 cir. cum. 3 st. 0	00	4 cir. cum. 4 st. 0	00
June 11	1 cir. 1 st. 0	00	3 cir. 2 st. NE.†	00	2 cir. 3 st. NE.†	00	1 cir. cum. 5 st. NE.†	00	2 cir. cum. 5 st. NE.†	00	7 st. 0	00
June 12	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 13	9 st. SSE.†	00	10 st. SSE.†	00	10 st. SE.†	00	9 st. SE.†	00	10 st. SE.†	00	9 st. SE.*	00
June 14	10 nim. 0	.—	10 st. E.*	.—	10 st. E.*	00	10 st. E.*	00	10 st. E.†	00	10 st. 0	00
June 15	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 16	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	—	9 st. E.†	.—	10 st. E.†	00	10 st. E.†	00
June 17	5 cir. st. 4 st. 0	00	2 cir. st. 6 st. 0	00	5 st. 0	00	1 cir. st. 7 st. 0	00	8 st. 0	00	1 cir. st. 5 st. 0	00
June 18	9 st. NNE.†	.—	9 nim. NNE.†	.—	10 st. 0	.—	9 st. NE.*	00	6 st. ENE.*	00	9 st. E.*	00
June 19	9 st. ENE.†	.—	9 st. NE.*	00	8 st. ENE.*	00	1 cir. 3 st. ENE.*	00	1 cir. 2 st. ENE.†	00	2 st. 0	00
June 20	1 cir. st. 8 st. ENE.†	00	3 cir. st. 2 st. ENE.†	.00	1 cir. st. 1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00
June 21	10 st. NNE.*	00	9 st. NE.*	00	9 st. NE.*	00	8 st. NE.*	00	5 st. NE.*	00	8 st. NE.*	00
June 22	10 st. 0	00	10 st. ENE.*	00	9 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. 0	00
June 23	10 st. 0	00	10 nim 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.01	8 st. E.*	00
June 24	1 ci. cu. 8 st. ENE.*	00	10 st. ENE.*	00	2 ci. cu. 6 st. ENE.*	00	10 st. ENE.*	00	9 st. ENE.*	00	8 st. ENE.*	00
June 25	10 st. E.*	00	10 st. ENE.*	00	10 st. 0	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. 0	00
June 26	10 st. 0	00	10 st. 0	00	10 st 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
June 27	Dense fog. 0	00	Dense fog. 0	00	Dense fog 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
June 28	1 cir. 1 st. 0	00	1 ci. 2 ci. cum. 1 st. 0	00	1 cir. 0	00	1 cir. 1 cum. st. 0	00	2 cir. 0	00	1 cir. 1 st. 0	00
June 29	6 cir. cum. 3 st. 0	00	2 ci. 3 ci. cu. 2 cu. st. S.† 1 st. 0	00	5 cir. cum. 3 st. 0	00	6 cir. cum. 3 st. 0	00	3 cir. cum. 3 st. 0	00	3 cir. cum. 5 cu. st. 0	00
June 30	10 st. 0	00	1 cir. 8 st. SW.†	00	9 st. SW.*	00	2 cir. 6 st. SW.*	00	6 st. SW.*	.00	9 st. SW.*	00
Means.	7.83		7.73		7.36		7.03		6.78		7.26	

character of precipitation, at Uglaamie, from October, 1881, *to August,* 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m. Amount, kind, and direction of clouds.	Precipitation.	8 a. m. Amount, kind, and direction of clouds.	Precipitation.	9 a. m. Amount, kind, and direction of clouds.	Precipitation.	10 a. m. Amount, kind, and direction of clouds.	Precipitation.	11 a. m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. N.†	00	10 st. 0	00	8 st. N.†	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
4 cu. 4 cu. st. NNW.†	00	10 st. 0	00	2 cum. 3 cum. st. N.†	00	3 cum. 0	00	10 cum. st. N.†	00	10 st. 0	00	.—
10 st. 0	00	10 st. Light fog. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	.—
10 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	00
1 cir. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	00
2 cir. 1 st. Lt. fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	00
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	4 cum. 6 st. ENE.*	.—	.01
10 st. E.*	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. E.*	.01	10 nim. E.*	.—	.03
5 cum. 3 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	00
10 nim. E.†	.—	10 nim. Lt. fog. 0	.01	6 ci. 2 s. ENE*. L. fog.	.00	6 ci. 2 s. NNE.† L. fog.	00	1 cir. 1 st. 0	00	1 cir. 0	00	.01
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	.—
10 nim. 0	.—	10 nim. Lt. fog. 0	.01	10 nim. Light fog. 0	.—	10 nim. ESE.†	.—	10 st. SE.†	.—	10 st. SSE.†	00	.03
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.—
3 cum. 6 st. ENE.†	00	9 cum. NE.†	00	1 cir. cum. 9 cu. NE.†	00	9 st. NE.†	00	8 st. ENE.†	00	9 st. NE.†	00	.—
10 nim. NE.†	.—	10 nim. NE.†	.—	3 cum. 6 cum. s. NE.†	.—	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	.01
5 cir. st. Lt. fog. 0	00	7 cir. st. 1 st. 0	00	8 cir. s. 1 s. Lt. fog. 0	00	8 ci. s. 1 s. Lt. fog. 0	00	8 cir. s. 1 s. Lt. fog. 0	00	7 cir. st. 2 st. 0	00	00
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	8 cum. 0	00	10 nim. 0	.—	8 nim. 0	.—	.—
10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	Dense fog. 0	00	10 st. ENE.*	00	10 nim. ENE.†	.—	.—
8 st. Light fog. NE.*	00	3 ci. cu. 4 s. L. fog. 0	00	4 cir. 3 st. ENE.*	00	3 cir. 4 cum. 0	00	8 cum. 0	00	5 cir. 2 cum. 0	00	00
10 nim. 0	.—	10 st. ENE.*	.—	10 st. Light fog. 0	00	10 nim. 0	.—	10 st. 0	.—	9 st. NE.*	00	.—
10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 st. NE.*	.—	10 st. NE.*	00	10 st. ENE.*	00	.01
10 st. Light fog. 0	00	10 st. E.*	.—	10 st. E.*	00	10 st. ENE.*	00	10 st. ENE.†	00	10 st. 0	00	.01
10 st. E.*	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	00
10 st. ENE.*	00	10 st. 0	00	10 st. 0	00	10 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	.03
5 cum. 3 st. Lt. fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.04
10 st. S.†	00	10 st. S.†	00	6 cir. cum. 1 cum. 0	00	1 cir. cum. st. 0	00	1 cir. cum. 2 st. ESE.†	00	2 cir. cum. 2 st. 0	00	.—
9 cum. st. S.†	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.03	10 nim. 0	.03	7 cir. cum 3 st. 0	.—	.06
6 cum. 2 st. WSW.†	00	4 cum. 3 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	.07
8.63		8.03		7.83		7.53		8.00		7.83		.31

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
8 st. SW.†	00	10 st. SW.†	00	1 cir. 2 st. 0	00	9 st. NW.†	00	9 st. NW.†	00	10 st. WNW.†	00	9.33
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.37
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	4.16
0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.33
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.83
10 st. E.*	00	10 st. E.*	00	10 nim. E.†	.—	10 st. E.†	.—	10 st. E.†	00	10 nim. E.†	.—	8.33
1 cir. 1 st. 0	00	2 cir. 1 st. 0	00	2 st. 0	00	1 cir. 2 st. 0	00	1 cir. 2 st. 0	00	1 cir. cum. 2 st. 0	00	6.95
3 cir. 3 st. 0	00	8 st. E.†	00	8 st. E.†	00	8 st. E.†	00	6 st. E.†	00	6 st. 0	00	7.41
3 cir. 2 st. 0	00	4 cir. 3 st. 0	00	8 st. 0	00	2 cir. 5 st. NE.*	00	9 st. NE.†	00	Dense fog. 0	00	6.62
10 st. 0	00	9 st. E.†	00	2 cir. cum. 6 st. 0	00	10 st. NE.†	00	10 st. 0	00	10 nim. 0	.—	9.45
4 st. E.*	00	3 st. E.*	00	10 st. E.*	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	8.50
10 st. 0	00	10 st. 0	00	10 st. E.†	00	10 st. 0	00	10 st. E.†	00	10 st. 0	00	10.00
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	9.25
10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	7.83
2 cir. st. 3 st. 0	00	5 cir. st. 3 st. 0	00	3 cir. 4 st 0	00	2 cir. cum. 6 st. 0	00	4 cir. cum. 3 st. 0	00	3 cir. cum. 2 st. 0	00	6.04
8 st. E.*	00	9 st. E.*	00	9 st. ENE.*	00	8 st. ENE.*	00	10 st. E.†	00	10 st. E.†	00	6.33
2 st. 0	00	5 st. E.*	00	6 st. E.*	00	10 st. E.†	00	10 st. 0	00	Dense fog. 0	00	7.37
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2.91
6 st. NE.*	00	8 st. NE.*	00	10 st. NE.†	00	Dense fog. 0	00	Dense fog. 0	00	9 st. NE.*	00	7.16
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.54
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00	5 st. ENE.†	00	8.75
3 cir. cum. 4 st. ENE.*	00	4 cir. st. 1 st. ENE.*	00	2 ci. cum. 5 st ENE.†	.00	2 ci. cum. 4 st. ENE.†	00	1 ci. cum. 7 st. ENE.†	00	1 ci. cum. 4 st. ENE.†	00	8.41
10 st. 0	00	5 st. ENE.*	00	8 st. ENE.*	00	7 st. ENE.*	00	9 st. ENE.*	00	9 st. ENE.*	00	8.58
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	03	9.79
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. E.*	00	2.41
1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	2 cir. cum. 2 st. 0	00	1 cir. 2 st. 0	00	1 ci. 1 ci. cum. 2 st. 0	00	1 cir. 2 st. 0	00	5.25
9 st. SSW.†	00	9 st. S.†	00	9 st. 0	00	10 st. SW.†	00	10 st. SE.†	00	10 st. ESE.†	00	8.12
2 cir. 6 st. SW.*	00	9 cir. 9 st. WSW.*	00	9 st. WSW.*	00	1 cir. st. 9 st. WSW.*	00	9 st. WSW.*	.00	10 st. W.*	00	9.20
6.76		7.06		7.00		6.70		6.86		6.23		7.27

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a. m. Amount, kind, and direction of clouds.	Precipitation.	2 a. m. Amount, kind, and direction of clouds.	Precipitation.	3 a. m. Amount, kind, and direction of clouds.	Precipitation.	4 a. m. Amount, kind, and direction of clouds.	Precipitation.	5 a. m. Amount, kind, and direction of clouds.	Precipitation.	6 a. m. Amount, kind, and direction of clouds.	Precipitation.
1883.												
July 1	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. SW.*	00	9 st. WSW.†	00	9 st. SW.†	00
July 2	10 nim. 0	.—	10 st. E.*	.—	10 nim. ESE.*	.—	10 nim. 0	.02	10 st. 0	.—	10 nim. 0	.01
July 3	10 st. 0	00	10 st. 0	00	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01
July 4	10 nim. E.†	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
July 5	10 nim. 0	.—	10 st. 0	.—	10 st. 0	.—	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
July 6	10 st. E.†	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 nim. Light fog. 0	.01
July 7	2 ci. 3 ci. s. 3 s. SSW.†	00	1 cir. st. 9 st. 0	00	1 cir. st. 9 st. S.†	00	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—
July 8	10 nim. S.†	.—	9 st. S.†	.03	10 st. S.†	.00	10 st. S.†	00	10 st. S.†	00	10 nim. S.†	.—
July 9	1 cir. st. 4 st. W.†	00	2 ci. 2 ci. st. 2 st. W.†	00	2 cir. 1 cir. st. 1 st. 0	00	4 cir. 1 st. 0	00	1 cir. 2 st. 0	00	2 cir. 1 st. 0	00
July 10	Dense fog. 0	00	Dense fog. 0	00	10 st. NE.* Dense fog.	00	10 st. NE.* Dense fog.	00	Dense fog. 0	00	Dense fog. 0	00
July 11	1 cir. 0	00	1 cir. st. 1 st. 0	00	6 st. NE.*	00	3 st. E.*	00	1 cir. cum. 2 st. E.†	00	1 cum. 2 st. E.†	00
July 12	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—
July 13	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 st. 0	.—	10 st. Light fog. 0	00
July 14	Dense fog. 0	00	.2 st. 0	00	1 cir. st. 7 st. WSW.†	00	1 cir. st. 5 st. WSW.†	00	3 st. 0	00	3 st. 0	00
July 15	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
July 16	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00
July 17	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	1 cir. Dense fog. 0	00	4 cir. 2 st. Lt. fog. 0	00	6 ci. s. 1 st. Lt. fog. 0	00
July 18	2 cir. 2 cir. st. 1 st. 0	00	4 cir. st. 1 st. 0	00	5 cir. st. 1 st. 0	00	4 cir. st. 1 st. 0	00	2 cir. 1 st. 0	00	2 cir. st. 1 st. 0	00
July 19	2 ci. 1 ci. cum. 2 st. 0	00	2 ci. 2 cir. cum. 2 st. 0	00	3 cir. 2 cir. cu. 2 st. 0	00	3 ci. 1 ci. cu. 3 s. SSE.†	00	4 cir. st. 1 st. 0	00	3 cir. st. 2 st. 0	00
July 20	1 cir. st. 8 st. E.*	00	10 st. E.*	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00
July 21	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
July 22	10 st. 0	.—	9 st. ENE.†	00	9 st. NE.†	00	9 st. NE.†	00	3 cum. 5 st. E.*	00	2 cum. 7 st. E.†	00
July 23	Dense fog. 0	00	1 cir. 6 st. E.*	00	9 st. E.*	00	Dense fog. 0	00	Dense fog. 0	00	9 st. E.* Light fog.	00
July 24	10 st. NE.*	00	10 st. ENE.*	00	10 nim. ENE.*	.—	10 nim. ENE.*	.01	10 nim. 0	.—	10 nim. 0	.—
July 25	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2 st. 0	00
July 26	1 cir. st. 2 st. E.*	00	9 st. E.*	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Lt. haz. 5 st. E.* Lt. fog.	.00
July 27	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	0 0	00	0 0	00
July 28	3 cir. 3 cir. st. 2 st. 0	00	2 cir. 2 cir. st. 4 st. S.†	00	9 st. 0	00	9 st. 0	00	2 cir st. 7 st. 0	00	10 st. 0	00
July 29	Dense fog. 0	00	10 st. ENE.*	00	1 cir. 9 st. E.*	00	10 st. E.*	00	10 st. 0	00	10 st. Light fog. 0	00
July 30	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 nim. 0	.—
July 31	2 cir. 2 cir. st. 1 st. 0	00	2 cir. 2 cir. st. 1 st. 0	00	1 cir. 1 cir. st. 1 st. 0	00	2 cir. 2 ci. st. 1 st. E.*	00	3 cir. st. 2 st. E.†	00	2 cir. st. 6 st. E.*	00
Means.	5.77		6.77		7.51		6.83		5.96		6.64	

Date.	1 p. m.		2 p. m.		3 p. m.		4 p. m.		5 p. m.		6 p. m.	
1883.												
July 1	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8 st. Light fog. 0	00	8 st. Light fog. 0	00
July 2	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.03	10 nim. 0	.04	10 nim. 0	.02	10 nim. 0	.03
July 3	Dense fog. 0	00	2 st. SW. Dense fog. †	00	10 st. SW.†	00	1 cir. 7 st. 0	.00	Dense fog. 0	00	5 cir. 4 st. 0	00
July 4	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	Dense fog. 0	.—	Dense fog. 0	.—
July 5	9 st. 0	00	1 cir. 8 st. D. fog. 0	00	2 cir. 6 st. WSW.†	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00
July 6	10 nim. 0	.02	10 nim. 0	.—	10 st. 0	.01	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
July 7	1 cir. 9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. S.†	00
July 8	10 st. 0	00	10 st. W.*	00	9 st. W.*	00	10 st. W.*	00	10 st. W.*	00	10 st. W.*	00
July 9	1 cir. st. 1 st. E.*	00	8 st. E.*	00	9 st. ENE.*	00	9 st. ENE.*	00	Dense fog. 0	00	Dense fog. 0	00
July 10	10 st. NNE.*	00	10 st. NE.*	00	10 st. NE.*	00	10 st. 0	00	3 st. E.*	00	2 st. E.*	00
July 11	0 0	00	1 cum. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
July 12	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
July 13	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00
July 14	10 st. WNW.†	00	8 st. WNW.†	00	1 cir. 7 st. WNW.†	00	2 cir. 7 st. W.†	00	3 cir. 6 st. SW.†	00	9 st. 0	00
July 15	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. N.†	00	10 st. 0	00
July 16	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
July 17	2 cir. 6 st. SE.†	00	9 st. ESE.†	00	10 st. ESE.†	00	8 st. ESE.†	00	8 st. ESE.†	00	9 st. ESE.†	00
July 18	1 cir. 0	00	1 cir. 0	00	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	2 cir. 0	00
July 19	2 cir. 2 cir. cum. 0	00	2 cir. 0	00	2 cir. 0	00	2 cir. 1 cir. cu. 1 st. 0	00	2 c. 1 ci. cu. 4 s. ESE.†	00	9 nim. ESE.*	.02
July 20	10 st. E.*	.—	10 st. ENE.*	.—	10 nim. 0	.01	10 st. ENE.*	.—	10 st. E.*	00	10 st. E.*	.—
July 21	2 cir. cum. 7 st. NE.†	00	9 st. NE.†	00	10 st. NNE.†	00	10 st. NNE.†	00	10 st. NNE.†	00	10 st. NNE.†	00
July 22	10 st. 0	00	10 st. NE.*	00	10 st. NE.*	00	10 st. ENE.*	00	9 st. ENE.*	00	2 cir. cu. 4 st. ENE.†	00
July 23	1 st. 0	00	1 st. 0	00	2 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
July 24	Dense fog. 0	00	1 cir. 1 st. ENE.†	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
July 25	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00
July 26	1 cir. 7 st. ESE.*	00	1 st. ESE.*	00	2 st. E.*	00	1 st. E.*	00	0 0	00	1 st. 0	00
July 27	4 cir. st. 2 st. 0	00	2 cir. st. 3 st. 0	00	3 cir. st. 1 st. 0	00	2 st. 0	00	2 st. 0	00	2 cir. 1 st. 0	00
July 28	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00	1 cir. 1 st. 0	00	1 st. 0	00	1 st. 0	00
July 29	1 cir. 9 st. NE.*	00	2 cir. 6 st. NE.*	00	3 cir. 6 st NE.*	00	10 st. NE.*	00	10 st. ENE.*	00	10 st. ENE.*	00
July 30	9 st. ENE.*	00	10 st. ENE.*	00	10 st. NE.*	00	9 st. ENE.*	00	10 st. ENE.*	00	7 st. E.*	00
July 31	10 st. E.*	00	3 cir. 2 cir. s. 3 st. E.*	00	2 ci. 2 ci. s. 1 s. ENE.*	00	1 ci. 3 ci. s. 2 s. ENE.*	00	4 cir. 3 st. ENE.*	00	9 st. ENE.*	00
Means.	6.38		6.32		6.58		6.58		5.48		6.09	

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a.m. Amount, kind, and direction of clouds.	Precipitation.	8 a.m. Amount, kind, and direction of clouds.	Precipitation.	9 a.m. Amount, kind, and direction of clouds.	Precipitation.	10 a.m. Amount, kind, and direction of clouds.	Precipitation.	11 a.m. Amount, kind, and direction of clouds.	Precipitation.	12 m. Amount, kind, and direction of clouds.	Precipitation.	Amount of precipitation.
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.04	.30
10 st. 0	.—	10 st. 0	00	10 nim. 0	.04	10 nim. 0	.01	10 nim. 0	.01	10 st. 0	.—	.12
10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.01	.09
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	6 cir. cum. 3 st. 0	00	6 cir. cum. 4 st. 0	00	10 st. 0	00	.—
10 nim. 0	.01	10 nim. E.†	.—	10 nim. 0	.01	10 nim. 0	.03	10 nim. 0	.05	10 nim. 0	.04	.18
10 nim. S.†	.01	10 cum. st. S.†	.—	7 cum. 3 st. S.†	00	3 cum. 6 st. S.*	00	10 st. S.*	00	4 cir. 6 st. S.*	00	.03
Dense fog. 0	.01	Dense fog. 0	00	10 st. WSW.*	00	10 nim. WSW.*	.—	10 st. 0	.—	10 st. WSW.*	00	.04
3 cir. st. 1 st. 0	00	1 cir. 1 st. 0	00	3 cir. 0	00	4 cir. 1 st. 0	00	1 cir. 9 st. E.†	00	1 cir. 2 cum. 0	00	.00
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. NNE.*	00	10 st. NNE.*	00	.00
1 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
10 nim. 0	.01	10 nim. Lt. fog. 0	.—	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.01
Dense fog. 0	00	10 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.01
2 st 0	00	3 cir. cum. 2 st. 0	00	9 cum. 0	00	10 st. WNW.†	00	10 st. NNW.†	00	10 st. WNW.†	00	.00
10 st. 0	00	10 st. W.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
Dense fog. 0	00	10 st. Light fog. 0	00	10 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. ENE.† Lt. fog.	00	.00
5 cir. st. 1 st. 0	00	5 cir. 2 st. 0	00	6 cir. Light fog. 0	00	6 cir. Light fog. 0	00	6 cir. 2 st. Lt. fog. 0	00	6 cir. 2 st. SE.† L. fog	00	.00
3 cir. st. 0	00	2 cir. st. 1 st. 0	00	2 cir. st. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 0	00	1 cir. 0	00	.00
2 ci. st. 2 st. Lt. fog. 0	00	4 cir. cum. 1 st. 0	00	7 cir. cum. 0	00	7 cir. cum. 0	00	5 cir. cum. 0	00	2 cir. cum. 0	00	.02
10 nim. E.*	.02	10 nim. E.†	.03	10 nim. E.†	.02	10 st. E.†	.02	10 nim. E.†	.08	10 nim. E.*	.03	.21
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	4 cir. cum. 6 st. NE†	00	.—
10 st. Light fog. 0	00	10 cum. 0	00	Dense fog. 0	00	9 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.—
9 st. NE.*	00	5 st. NE.* Lt. fog.	00	Light fog. 0	00	Light fog. 0	00	1 st. NNE.†	00	0 0	00	.00
10 nim. 0	.01	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.02
1 st. 0	00	2 st. 0	00	0 0	00	0 0	00	0 0	00	0 0	00	.00
Light haze. 4 st. 0	00	Light haze. 3 st. 0	00	Light haze. 2 st. E.†	00	1 st. ESE.† Lt. fog.	00	1 st. ESE.* Lt. fog.	00	3 st. SE.*	00	.00
0 0	00	0 0	00	0 0	00	1 cir. 0	00	2 cir. st. 0	00	5 cir. st. 0	00	.00
4 cir. st. 5 st. 0	00	6 cum. 2 st. 0	00	5 cum. 3 st. 0	00	3 st. 0	00	1 st. 0	00	1 st. 0	00	.00
Dense fog. 0	00	10 st. E.*	00	4 cir. 4 st. ENE.*	00	4 cir. 3 st. ENE.*	00	5 cir. 3 st. ENE.*	00	10 st. ENE.*	00	.00
10 nim. E.*	.01	10 nim. Light fog. 0	00	10 st. 0	.—	10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	.01
10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. ENE.*	00	1 cir. st. 9 st. ENE.*	00	1 cir. cu. 9 st. ENE.*	00	.00
5.58		6.22		5.35		5.77		5.70		6.22		1.04

7 p.m.		8 p.m.		9 p.m.		10 p.m.		11 p.m.		12 p.m.		Daily means.
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	8.50
10 nim. Light fog.	.04	10 st. 0	.—	10 st. 0	00	10 st. E.†	00	10 st. 0	00	10 st. SE.†	00	10.00
9 nim. S.†	.—	9 st. S.†	.—	10 nim. 0	.—	10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.01	8.62
3 st. 0	00	10 st. 0	00	10 st. WSW.†	00	10 st. SW.†	00	10 st. 0	00	10 nim. 0	.—	8.87
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.29
Dense fog. 0	00	10 st. 0	00	8 st. S.*	00	9 st. 0	00	9 st. S.†	00	2 cir. 5 st. 0	00	8.04
10 st. S.†	00	8 st. S.†	00	10 st. S.†	00	10 nim. 0	.—	10 st. 0	.—	2 cum. 5 st. SE.†	00	9.66
8 st. W.*	00	9 st. W.*	00	9 st. W.*	00	8 st. W.*	00	7 st. W.*	00	7 st. W.*	00	8.58
8 st. 0	00	10 st. 0	[illegible]	10 st. NE.*	00	10 st. NNE.*	00	10 st. 0	00	Dense fog. 0	00	5.37
1 st. E.*	00	1 st. E.*	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	3.79
1 st. 0	00	2 st. 0	00	1 cir. 1 st. 0	00	1 cir. st. 2 st. 0	00	1 cir. 2 st. NE.†	00	10 st. 0	00	1.87
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.08
Dense fog. 0	00	Dense fog. 0	00	9 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	8 st. 0	00	4.04
9 st. 0	00	9 st. 0	00	3 cir. 3 st. 0	00	1 cir. cum. 7 st. NW.*	00	9 st. 0	00	9 st. W.†	00	7.12
10 st. NE.†	[illegible]	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	9.95
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	7.08
9 st. 0	00	5 st. ESE.*	00	2 cir. 3 st. E.†	00	2 cir. 3 st. E.†	00	2 cir. 3 st. E.†	00	1 cir. 3 st. 0	00	5.83
2 cir. 0	00	1 cir. 0	00	1 cir. 1 st. 0	00	1 cir. 1 st. 0	00	1 cir. 2 st. 0	00	2 cir. cum. 2 st. 0	00	2.62
2 cir. cum. 3 st. 0	.—	4 cir. cum. 4 st. 0	00	1 cir. st. 8 st. ENE.†	00	3 cir. cu. 6 st. ENE.†	00	1 cir. st. 8 st. ENE.†	00	7 st. NE.†	00	5.83
10 st. E.*	.—	10 st. ESE.*	00	9 st. E.†	00	10 st. 0	00	10 st. ENE.†	00	10 st. 0	00	9.91
10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	5.75
8 st. E.*	[illegible]	8 st. ENE.*	00	10 st. NE.†	00	10 st. 0	00	8 st. NE.*	00	9 st. NE.*	00	7.95
1 st. 0	00	1 st. 0	00	2 st. 0	00	Dense fog. 0	00	8 st. NNE.*	00	Dense fog. 0	00	2.58
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	3.45
1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	.91
0 0	00	0 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	2.00
3 cir. st. 1 st. 0	00	4 cir. st. 1 st. 0	00	3 cir. st. 2 st. 0	00	2 cir. 2 st. 0	00	3 cir. st. 2 st. 0	00	3 cir. 1 st. 0	00	2.50
1 st. 0	00	1 st. 0	00	8 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	Dense fog. 0	00	5.04
10 st. ENE.†	00	10 st. ENE.†	00	10 st. NE.†	00	10 st. ENE.†	00	10 st. NE.†	00	10 st. NE.†	00	8.75
1 cir. 2 st. E.*	00	1 cir. 1 st. E.*	00	1 cir. 1 st. 0	00	2 cir. 1 st. 0	00	2 cir. 2 st. 0	00	2 cir. 2 cir. st. 2 st. 0	00	8.12
9 st. ENE.*	00	10 st. ENE.*	00	10 st. ENE.*	00	9 st. ENE.*	00	10 st. ENE.*	00	9 st ENE.*	00	8.04
5.58		6.16		6.77		6.90		7.22		6.66		6.29

Statement showing the amount, kind, and direction of clouds, and amount and

[Washington mean time. Correction to reduce to mean local time, −5 hours 17 minutes. Precipitation is given in inches. In this

Date.	1 a.m. Amount, kind, and direction of clouds.	Precipitation.	2 a.m. Amount, kind, and direction of clouds.	Precipitation.	3 a.m. Amount, kind, and direction of clouds.	Precipitation.	4 a.m. Amount, kind, and direction of clouds.	Precipitation.	5 a.m. Amount, kind, and direction of clouds.	Precipitation.	6 a.m. Amount, kind, and direction of clouds.	Precipitation.
1883.												
Aug. 1	10 st. ENE.*	00	10 st. E.*	00	10 st. ENE.*	00	10 st. E.*	00	10 st. ENE.*	00	10 st. E.*	00
Aug. 2	10 st. E.†	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00	10 st. Light fog. 0	00	10 st. E.* Lt. fog.	00
Aug. 3	10 st. E.*	00	Dense fog. 0	00	10 st. E.†	00	9 st. ESE.†	00	Dense fog. 0	00	3 cum. 5 st. ESE.†	00
Aug. 4	8 st. E.†	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Aug. 5	10 st. NE.†	00	10 st. 0	00	10 st. 0	00	10 st. ENE.* Lt fog	00	10 st. ENE.* Lt. fog.	00	Dense fog. 0	00
Aug. 6	9 st. NE.†	00	9 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00	Dense fog. 0	00
Aug. 7	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. ESE.†	00	10 st. 0	00	10 cum. 0	00
Aug. 8	2 cir. cum. 3 st. 0	00	2 cir. cum. 4 st. 0	00	3 cum. 5 st. S.†	00	10 nim. S.†	.—	10 nim. S.†	.—	10 nim. S.†	.02
Aug. 9	2 st. 0	00	3 st. 0	00	2 cir. st. 1 st. 0	00	3 cir. st. 2 st. Lt. fog.	00	2 cir. st. 1 st. 0	00	1 cir. st. 2 st. 0	00
Aug. 10	1 st. 0	00	1 st. 0	00	2 st. 0	00	1 st. 0	00	2 cum. 3 st. 0	00	3 st. 0	00
Aug. 11	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Aug. 12	4 cum. st. 6 st. S.†	.—	1 cir. cum. 9 st. SE.†	00	9 st. SSW.†	00	10 nim. S.†	.01	10 st. S.†	.—	10 st. S.†	00
Aug. 13	10 st. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. ESE.†	00	10 st. E.†	00	10 st. ESE.†	00
Aug. 14	6 st. NE.†	00	9 st. 0	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. 0	00
Aug. 15	6 st. SE.†	00	1 cir. cum. 2 st. 0	00	2 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Aug. 16	9 st. S.†	00	10 nim. S.†	.—	10 st. S.†	00	10 st. SW.†	.—	10 st. 0	00	10 st. SW.†	00
Aug. 17	10 nim 0	02	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.02	10 nim. 0	.02
Aug. 18	1 cir. 5 st. S.†	00	4 st. 0	00	4 st. SE.†	00	2 cir. cum. 5 st. E.†	00	10 st. E.†	00	10 nim. E.†	.—
Aug. 19	10 nim. N.†	.—	10 nim. N.†	.—	10 nim. N.†	.—	10 st. N.†	.—	10 st. NNW.†	00	10 st. NNW.†	00
Aug. 20	9 st. ESE.†	00	9 st. E.†	00	10 st. ESE.†	00	[illegible] E.†	00	10 st. E.*	00	10 st. 0	00
Aug. 21	10 nim. 0	.01	10 nim. 0	.01	10 nim 0	.—	10 nim. ENE.†	.01	10 nim. 0	.—	10 nim. ENE.†	.01
Aug. 22	9 st. NNE.†	00	9 st. NNE.†	00	10 st. NNE.†	00	10 st. 0	00	10 st. 0	00	9 st. 0	00
Aug. 23	10 st. WSW.†	00	10 st. SW.†	00	10 st. SW.*	00	10 st. SW.*	00	10 st. SW.*	00	Light haze. 9 st. 0	00
Aug. 24	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00
Aug. 25	7 st. NE.†	00	8 st. NE.†	00	8 cum. st. NE.†	00	10 st. 0	00	10 st. 0	00	8 cum. st. SE.†	00
Aug. 26	10 nim. 0	.06	10 nim. 0	.10	10 nim. 0	.09	10 nim. 0	.04	10 nim. 0	.02	10 nim. 0	.04
Aug. 27	10 nim. 0	.—	10 nim. 0	.—	10 nim. 0	.—	10 st. E.†	.—	10 st. 0	00	10 st. E.*	00
Means	7.66		6.70		7.62		7.85*		7.70		7.08	

Date.	1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.	
1883.												
Aug. 1	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Aug. 2	10 st. 0	00	9 st. E.*	00	1 cir. 7 st. E.*	00	9 st. E.*	00	9 st. ESE.*	00	6 st. SE.*	00
Aug. 3	Dense fog. 0	00	10 st. E.†	00	10 st. E.†	00	2 cir. cum. 7 st. E.†	00	4 cir. cum. 4 st. E.†	00	3 cir. cum. 5 st. E.†	00
Aug. 4	Dense fog. 0	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00
Aug. 5	10 st. NE.*	00	10 st. NNE.* Lt. fog.	00	10 st. NNE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00
Aug. 6	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00
Aug. 7	6 cir. cum. 3 st. SE.*	00	2 cir. cum. 7 st. SE.*	00	3 cir. cum. 5 st. SE.*	00	9 st. 0	00	10 st. 0	00	10 st. 0	00
Aug. 8	4 cir. cum. 1 st. SW.†	00	5 cir. cum. 1 st. SW.†	00	Dense fog. 0	00	5 cir. cum. 4 st. 0	00	3 cir. cum. 5 st. 0	00	Dense fog. 0	00
Aug. 9	8 st. 0	00	8 cir. cum. 1 st. 0	00	7 cir. cum. 1 st. 0	00	3 cir. 1st. 0	00	7 cir. cum. 1 st. 0	00	5 cir. 1 st. 0	00
Aug. 10	4 cir. cum. 5 cum. 0	00	1 cir. cum. 9 st. 0	00	2 cir. cum. 7 st. 0	00	3 cir. cum. 5 st. 0	00	10 nim. 0	.—	Dense fog. 0	.—
Aug. 11	Dense fog. 0	00	10 st. Light fog. 0	00	9 st. SE.†	00	8 st. SE.†	00	3 cir. 3 st. SE.†	00	3 cir. 2 st. 0	00
Aug. 12	3 cir. cum. 7 st. ESE.†	00	5 cir. cum. 2 st. ESE.†	00	5 cir. cum. 3 st. SE.†	00	8 st. SE.†	00	2 cir. st. 6 st. SE.†	00	9 st. 0	00
Aug. 13	10 st. 0	00	10 st. Light fog. 0	00	9 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00
Aug. 14	3 cir. cum. 7 st. E.†	00	10 st. E.†	00	10 st. ESE.†	00	10 st. E.†	00	10 st. E.†	00	10 st. 0	00
Aug. 15	Dense fog. 0	00	10 st. 0	00	10 nim. 0	.01	10 st. 0	.—	3 cir. 6 st. SE.*	00	8 st. S.*	00
Aug. 16	9 st. Light fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00
Aug. 17	9 st. W.*	00	8 st. W.*	00	8 st. SW.*	00	2 st. S.*	00	3 st. S.*	00	4 st. S.*	00
Aug. 18	5 cir. cum. 3 st. N.†	00	10 st. N.†	00	10 st. N.†	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0.	—
Aug. 19	9 st. N.†	00	9 st. N.†	.—	10 nim. N.†	.—	9 nim. N.†	.—	10 nim. N.†	.—	8 st. 0	.—
Aug. 20	10 st. 0	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 st. E.*	00	10 nim. E.*	.01
Aug. 21	10 st. 0	00	10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	10 st. NE.*	00	10 st. 0	00
Aug. 22	10 st. W.*	00	10 nim. W.*	.—	10 nim. W.*	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Aug. 23	10 st. W.†	00	10 st. W.†	00	10 st. W.†	00	10 st. 0	00	9 st. SW.*	00	8 st. SW.*	00
Aug. 24	10 st. WNW.* Lt. fog.	.01	10 st. NW.* Lt. fog.	00	10 st. NW.* Lt. fog.	00	10 nim. 0	.—	10 st. NNE.*	.—	10 st. NNE.*	00
Aug. 25	1 cir. cum. 9 st. SSE.*	01	1 cir. 9 st. S.*	00	5 cir. 3 st. SSE.*	00	1 cir. 9 st. SSE.*	00	2 cir. 7 st. SSE.*	00	2 ci. cum. 6 st. SSE.†	00
Aug. 26	10 st. 0	00	9 st. W.*	00	9 st. W.*	00	9 st. W.*	00	7 st. WNW.*	00	9 st. NW.*	00
Aug. 27*	10 st. 0	00	10 st. 0	00	10 nim. 0	.—	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00
Means.	7.62		9.11		8.66		8.66		9.03		9.35	

*Station abandoned August 27, 1883.

character of precipitation, at Uglaamie, from October, 1881, *to August*, 1883—Continued.

table * signifies *rapid*, † signifies *slow*. Daily means of amount of clouds on the right below; amount of precipitation on the right above.]

7 a. m.		8 a. m.		9 a. m.		10 a. m.		11 a. m.		12 m.		Amount of precipitation.
Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	Amount, kind, and direction of clouds.	Precipitation.	
10 st. ENE.*	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.00
10 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.00
4 cu. 5 st. ESE.† Lt. f'g.	00	3 cum. 5 st. ESE.†	00	4 cir. 6 st. ESE.†	00	2 ci. cu. 4 st. ESE.† L. f'g	00	Dense fog. 0	00	10 st. ESE.† Lt. fog.	00	.00
Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st. Light fog. 0	00	Dense fog. 0	00	10 st. ESE.* Lt. fog.	00	.00
10 st. Light fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	10 st Light fog. 0	00	10 st. Light fog. 0	00	10 st. 0	00	.00
Dense fog. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. Light fog. 0	00	10 st. 0	00	.00
10 cum. Lt. fog. 0	00	Dense fog. 0	00	10 st. ESE.* Lt. fog.	00	10 st. ESE.* Lt. fog.	00	10 st. SE.*	00	6 cum. 4 st. SE.†	00	.00
10 st. 0	.—	10 st. S.†	00	10 st. S.†	00	5 cir. cum. 4 st. 0	00	8 cir. cum. 1 st. 0	00	5 cir. cum. 0	00	.02
2 cir. st. 2 st. 0	00	4 st. SSW.†	00	1 cir. 8 st. SSW.†	00	1 cir. 9 st. 0	00	1 cir. st. 9 st. SSE.†	00	10 st. SSE.†	00	.00
1 cum. 3 st. 0	00	2 cum. 3 st. †	00	6 cum. 1 st. 0	00	3 cum. 0	00	1 cir. 1 cum. 0	00	4 cir. cum. 2 st. 0	00	.—
Dense fog. 0	00	2 ci. s. 5 s. SW.† L. f'g.	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	.02
10 st. 0	00	10 nim. 0	.01	10 nim. 0	.—	10 nim. 0	.01	10 nim. SE.†	.06	10 st. ESE.†	.02	.11
10 st. 0	00	10 st. ESE.†	00	10 st. ESE.†	00	4 cum. 5 st. 0	00	5 cir. 3 st. E.*	00	10 st. Light fog. 0	00	.00
10 st. 0	00	10 st. Light fog. 0	00	1 cir. cum. 1 st. NE.†	00	4 st. ENE.† Lt. fog.	00	Dense fog. 0	00	3 cir. cum. 6 st. E.†	00	.00
Dense fog. 0	00	3 st. Light fog. 0	00	1 cir. 2 st. S.*	00	9 st. 0	00	1 ci. cu. 8 st. D. fog.	00	Dense fog. 0	00	.01
10 st. SSW.†	00	3 cu. 6 cu. st. SSW.†	00	1 cir. cu. 3 st. Lt. fog.	00	1 cir. cum. 9 cum. 0	00	9 cum. Light fog.	00	9 cum. Light fog. 0	00	.08
10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.01	4 cum. 4 st. W.*	.—	10 st. W.*	00	9 st. W.*	00	.13
10 nim. E.†	.01	10 nim. 0	.01	10 nim. 0	.01	10 nim. 0	.03	10 nim. NNE.*	.02	4 ci. cu. 4 st. NNE.†	.—	.08
10 st. NNW.†	00	10 nim. N.†	.01	10 st. N.†	.—	10 nim. N.†	.—	10 nim. N.†	.—	10 st. N.†	.—	.—
10 st. 0	00	10 nim. 0	.—	10 st. 0	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	.08
10 st. NE.*	.—	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	.04
8 cum. st. 0	00	10 cum. st. NW.†	00	3 cir. 3 st. WNW.†	00	2 cir. 5 st. WNW.†	00	2 cir. 3 st. WNW.†	00	10 st. W.* Lt. fog.	00	.—
10 st. WSW.†	00	10 st. WSW.†	00	10 st. WSW.†	00	10 st. WSW.†	00	10 st. WSW.†	00	10 st. W.†	00	.00
Dense fog. 0	00	Dense fog. 0	00	10 nim. 0	.11	10 nim. 0	.04	10 nim. 0	.13	10 nim. 0	.06	.25
10 st. SE.†	00	10 cum. st. SE.†	00	10 st. SSE.†	00	10 st. S.†	00	10 st. SSE.†	00	10 st. SSE.†	00	.08
10 nim. 0	.04	10 nim. 0	.10	Dense fog. 0	.—	Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	.55
10 st. ESE.*	00	10 st. ESE.†	00	1 cir. 4 st. ESE.†	00	10 nim. ESE.†	.—	1 cir. 8 st. ESE.*	.—	10 st. ESE.†	00	.08
7.59		7.25		6.88		7.96		7.07		8.35		1.45

7 p. m.		8 p. m.		9 p. m.		10 p. m.		11 p. m.		12 p. m.		Daily means.
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. E.†	00	10 st. ENE.†	00	10 st. E.†	00	10.00
6 st. SE.*	00	8 st. ENE.*	00	1 cir. 6 st. E.*	00	9 st. E.*	00	8 st. ESE.*	00	7 st. E.*	00	6.91
4 cir. cum. 4 st. E.†	00	3 cir. cum. 3 st. E.†	00	2 cir. cum. 6 st. E.†	00	1 cir. cum. 4 st. E.†	00	9 st. E.*	00	9 st. E.†	00	7.08
10 st. E.*	00	10 st. E.*	00	10 st. E.†	00	10 st. ENE.†	00	10 st. ENE.†	00	10 st. ENE.†	00	5.75
10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	10 st. NE.†	00	9 st. NE.†	00	8.70
Dense fog. 0	00	Dense fog. 0	00	10 st. E.†	00	10 st. E.†	00	10 st. E.†	00	10 st. ESE.†	00	6.16
10 st. 0	00	10 st. 0	00	3 cir. cum. 5 st. E.†	00	5 cir. cum. 2 st 0	01	2 cir. cum. 6 st. E.†	00	2 cir. cum. 4 st. 0	00	8.91
5 cir. cum. 3 st. 0	00	5 cir. cum. 1 st. 0	00	1 cir. cum. 3 st. 0	00	1 cir. cum. 2 cum. 0	00	1 cir. cum. 2 st. 0	00	1 cir. cum. 2 st. 0	00	6.54
4 cir. 2 st. 0	00	2 cir. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	1 st. 0	00	5.04
Dense fog. 0	00	10 st. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	Dense fog. 0	00	4.00
4 cir. st. 2 st. 0	00	5 cir. st. 3 st. 0	00	10 st. ENE.†	00	10 nim. ENE.†	.—	9 nim. E.†	.—	10 nim. 0	.02	4.08
Dense fog. 0	00	Dense fog. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	10 st. 0	00	8.29
Dense fog. 0	00	8 st. 0	00	6 st. NNE.†	00	Dense fog. 0	00	5 st. NE.†	00	9 st. NNE.†	00	8.08
10 st. 0	00	10 st. 0	00	10 st. 0	00	10 st. 0	00	Dense fog. 0	00	9 st. 0	00	8.29
10 st. 0	00	9 st. 0	00	1 ci. cu. 4 cu. L. fog. 0	00	1 ci. cu. 4 cu. L. fog. 0	00	4 cum. 4 st. S.†	00	1 cum. 8 st. 0	00	5.33
Dense fog. 0	00	10 nim. 0	.06	10 st. 0	.—	10 nim. 0	.—	10 nim. 0	.01	10 nim. 0	.01	8.70
6 st. S.*	00	3 st. S.*	00	3 cum. 0	00	2 cum. 3 st. S.†	00	2 cum. 2 st. SE.†	00	5 st. SE.†	00	7.37
10 nim. 0	.—	10 nim. 0	.—	9 st. N.†	.—	9 st. N.†	00	9 st. N.*	00	9 st. N.*	00	8.87
8 st. 0	00	Dense fog. 0	00	7 st. 0	00	7 st. N.†	00	7 st. NE.†	00	9 st. SE.†	00	8.87
10 nim. E.*	.01	10 nim. E.*	.—	10 nim. 0	.02	10 nim. 0	.02	10 nim. 0	.01	10 nim. 0	.01	9.91
10 st. 0	00	10 st. 0	00	9 st. NNE.*	00	9 st. NNE.*	00	9 st. N.†	00	8 st. NNE.†	00	9.79
10 st. 0	00	10 st. WSW.†	00	10 st. WSW.†	00	10 st. WSW.†	00	10 st. WSW.†	00	10 st. WSW.†	00	9.29
6 ci. cu. 3 st. SW.*	00	6 ci. cu. 3 st. SW.†	00	10 st. SW.*	00	9 st. SW.†	00	10 st. SW.†	00	10 st. SW.†	00	9.70
10 st. NE.†	00	10 st. NE.*	00	10 st. N.†	00	9 st. N.†	00	9 st. N.†	00	8 st. NNE.†	00	6.50
8 st. SSE.†	00	10 st. SSE.†	00	10 st. SSE.†	00	10 st. 0	00	10 nim. 0	.01	10 nim. 0	.07	9.33
9 st. NW.†	00	9 st. NNW.†	00	10 nim. 0	.—	10 st. NNW.†	.—	10 st. NNW.*	00	10 nim. N.†	.—	8.79
1 cir. cum. 7 st. SE.†	00	9 st. SE.†	00	10 st. SE.†	00	Dense fog. 0	00	10 st. SE.†	00	10 st. SE.†	00	9.20
7.11		7.66		8.03		7.32		7.35		8.18		7.74

Precipitation—Rainfall or melted snow, in inches.

Month.	1881.	1882.	1883.
January	(*)	0.44	0.14
February	(*)	0.04	1.02
March	(*)	0.51	0.14
April	(*)	0.39	0.55
May	(*)	0.44	0.31
June	(*)	0.61	0.80
July	(*)	1.39	1.04
August	(*)	1.46	1.66
September	(*)	1.10	(*)
October	(*)	1.05	(*)
November	0.73	0.34	(*)
December	0.44	0.24	(*)
Whole period	1.17	8.01	5.16

* Not measured.

SOLAR RADIATION.

Observations on solar radiation were made with a pair of maximum thermometers, one black and one bright bulbed, *in vacuo*, exposed horizontally on a post 4 feet high on the knoll southwest of the station. They were mounted side by side in a movable frame so that they could be brought into the house in stormy weather. These thermometers were exposed for a short time on November 13 and 14, 1882, just before the departure of the sun, but the latter was too near the horizon to produce any sensible effect. On the return of the sun, January 29, 1883, they were exposed every day not stormy from sunrise to sunset, the indices being set and read at sunrise and read again at sunset, till February 19, and about midnight, Washington time, until May 14th, when, the sun being continually above the horizon, they were set at local midnight and read at Washington midnight. This was continued till the closing of the station.

Statement showing the solar radiation at Uglaamie from February, 1883, *to August*, 1883.

[A pair of maximum thermometers, one black and one bright bulbed, exposed for solar radiation. Washington time. Correction to reduce to mean local time, —5 h. 17 m.]

Date.	Time of observation.	Black bulb.	Bright bulb.	Difference.	Time.	Black bulb.	Bright bulb.	Difference.	Weather.
1883.									
Feb. 1	3.00 p.m.	— 9.8	— 9.8	0.0	8.00 p.m.	13.8	— 2.5	16.3	Clear.
Feb. 2	3.00 p.m.	— 5.2	— 6.2	1.0	7.30 p.m.	5.2	2.2	3.0	Fair.
Feb. 3	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	Light snow.
Feb. 4	3.00 p.m.	6.0	5.8	0.2	8.30 p.m.	14.2	11.0	3.2	Cloudy.
Feb. 5	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	Light snow.
Feb. 6	2.30 p.m.	0.2	— 0.4	0.6	10.00 p.m.	20.5	4.0	16.5	Fair.
Feb. 7	5.45 p.m.	31.2	29.0	2.2	7.00 p.m.	47.8	30.4	17.4	Fair.
Feb. 8	3.00 p.m.	1.0	0.0	1.0	8.00 p.m.	6.2	4.5	1.7	Light snow.
Feb. 9	3.00 p.m.	32.6	32.4	0.2	6.00 p.m.	60.0	45.0	15.0	Cloudy.
Feb. 10	3.50 p.m.	—11.0	—16.0	5.0	8.15 p.m.	1.4	—10.8	12.2	Fair.
Feb. 11	2.30 p.m.	—10.4	—15.0	4.6	9.00 p.m.	25.6	0.0	25.6	Clear.
Feb. 12	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	Light snow.
Feb. 13	2.00 p.m.	— 4.0	—13.2	9.2	10.00 p.m.	19.7	— 3.4	23.1	Fair.
Feb. 14	2.45 p.m.	— 4.6	—10.8	6.2	10.00 p.m.	31.7	0.8	30.9	Cloudy.
Feb. 15	3.00 p.m.	— 7.6	—13.7	6.1	10.15 p.m.	17.8	— 1.7	19.5	Cloudy.
Feb. 16	1.45 p.m.	—11.0	—26.0	15.0	9.10 p.m.	11.4	— 6.0	17.4	Fair.
Feb. 17	2.00 p.m.	— 2.2	— 9.2	7.0	9.00 p.m.	48.5	9.6	38.9	Clear.
Feb. 18	1.15 p.m.	3.5	3.0	0.5	11.00 p.m.	17.0	11.7	5.3	Cloudy.
Feb. 19	1.15 p.m.	— 1.0	— 1.6	0.6	11.00 p.m.	21.8	10.4	11.4	Cloudy.
Feb. 20	1.15 p.m.	—17.0	—17.5	0.5	12 m	7.8	— 6.0	13.8	Fair.
Feb. 21	1.20 p.m.	—13.1	—13.6	0.5	12 m	— 1.2	— 6.0	4.8	Cloudy and light snow.
Feb. 22	1.15 p.m.	—25.3	—27.9	2.6	12 m	41.6	7.5	34.1	Clear.
Feb. 23	12.50 p.m.	—24.2	—26.3	2.1	12 m	3.5	—11.5	8.0	Fair.
Feb. 24	12.25 p.m.	—28.6	—34.5	5.9	12 m	39.8	0.3	39.5	Clear.
Feb. 25	12.30 p.m.	—26.2	—28.8	2.6	12 m	49.4	7.4	42.0	Clear.
Feb. 26	12.25 p.m.	—36.8	—40.0	3.2	12 m	40.8	— 2.4	43.2	Fair.
Feb. 27	12.20 p.m.	—23.8	—25.2	1.4	12 m	42.0	3.0	39.0	Cloudy.
Feb. 28	12.20 p.m.	— 3.2	— 3.5	0.3	12 m	49.6	21.4	28.2	Cloudy.

* Not exposed.

***Statement showing the solar radiation at Uglaamie from February, 1883, to August, 1883*—Continued.**

Date.	Time of observation.	Black bulb.	Bright bulb.	Difference.	Time.	Black bulb.	Bright bulb.	Difference.	Weather.
1883.									
Mar. 1	12.10 p. m.	−27.9	−29.1	1.2	12 m	55.6	12.0	43.6	Clear.
Mar. 2	12 m	−37.5	−37.5	0.0	12 m	44.6	2.0	42.6	Fair.
Mar. 3	12 m	−28.5	−29.5	1.0	12 m	49.8	8.0	41.8	Clear.
Mar. 4	11.15 a. m.	−20.5	−20.5	0.2	12 m	52.3	10.7	41.6	Clear.
Mar. 5	12.10 p. m.	−3.0	−3.2	0.0	12 m	49.7	13.0	36.7	Cloudy.
Mar. 6	11.50 a. m.	−32.0	−32.0	0.0	12 m	51.1	8.8	42.3	Clear.
Mar. 7	11.50 a. m.	−35.0	−36.0	1.0	12 m	42.2	6.8	35.4	Fair.
Mar. 8	11.50 a. m.	−29.5	−30.0	0.5	12 m	45.5	−1.8	47.3	Clear.
Mar. 9	11.20 a. m.	−40.0	*−50.0	10.0	12 m	50.0	1.3	48.7	Clear.
Mar. 10	10.55 a. m.	−41.0	*−55.0	14.0	12 m	51.6	4.0	47.6	Clear.
Mar. 11	11.55 a. m.	−38.0	−40.0	2.0	12 m	56.2	7.4	48.8	Clear.
Mar. 12	10.55 a. m.	−21.2	−22.0	0.8	12 m	30.2	3.0	27.2	Fair.
Mar. 13	11.15 a. m.	−29.0	−30.0	1.0	12 m	63.3	19.3	44.0	Clear.
Mar. 14	11.20 a. m.	−34.6	−35.6	1.0	12 m	61.5	18.5	43.0	Clear.
Mar. 15	11.25 a. m.	−33.5	−34.0	0.5	12 m	55.8	11.2	44.6	Fair.
Mar. 16	11.25 a. m.	−18.0	−18.5	0.5	12 m	69.2	24.0	45.2	Clear.
Mar. 17	10.48 a. m.	−16.5	−17.0	0.5	12 m	68.3	19.4	48.9	Clear.
Mar. 18	10.48 a. m.	−21.0	−22.0	1.0	12 m	70.4	25.0	45.4	Clear.
Mar. 19	10.48 a. m.	−26.0	−26.8	0.8	12 m	53.2	12.8	40.4	Clear.
Mar. 20	10.50 a. m.	−25.3	−26.0	0.7	12 m	66.3	19.8	46.5	Fair.
Mar. 21	10.48 a. m.	−16.5	−17.0	0.5	12 m	33.8	9.7	25.1	Cloudy.
Mar. 22	10.48 a. m.	−6.5	−7.5	1.0	12 m	27.8	8.8	19.0	Cloudy.
Mar. 23	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	
Mar. 24	10.25 a. m.	−0.5	−1.0	0.5	12 m	81.5	35.2	46.3	Cloudy.
Mar. 25	10.25 a. m.	18.3	18.0	0.3	12 m	101.7	55.2	46.5	Fair.
Mar. 26	10.25 a. m.	7.8	7.3	0.5	12 m	48.5	33.2	15.3	Cloudy.
Mar. 27	10.25 a. m.	20.0	20.0	0.0	12 m	67.1	39.7	27.4	Cloudy.
Mar. 28	10.25 a. m.	−9.8	−10.0	0.2	12 m	51.3	23.4	27.9	Cloudy.
Mar. 29	10.25 a. m.	14.8	14.5	0.3	12 m	107.0	61.4	45.6	Cloudy.
Mar. 30	10.25 a. m.	−3.5	−4.0	0.5	12 m	92.0	41.3	50.7	Fair.
Mar. 31	....	......	......	......	....	......	......	......	
1883.									
Apr. 1	10.15 a. m.	−18.0	−18.5	0.5	12 m	78.4	27.4	51.0	Clear.
Apr. 2	9.55 a. m.	−22.0	−22.5	0.5	12 m	65.0	25.1	39.9	Clear.
Apr. 3	9.45 a. m.	−24.8	−24.8	0.0	12 m	79.8	31.4	48.4	Clear.
Apr. 4	9.48 a. m.	−25.0	−25.0	0.0	12 m	71.7	25.8	45.9	Clear.
Apr. 5	9.48 a. m.	−7.3	−7.8	0.5	12 m	39.0	15.8	23.2	Cloudy.
Apr. 6	9.50 a. m.	−8.0	−8.5	0.5	12 m	52.0	15.8	36.2	Cloudy.
Apr. 7	9.48 a. m.	−14.7	−15.0	0.3	12 m	72.5	23.5	49.0	Fair.
Apr. 8	9.40 a. m.	−24.7	−25.0	0.3	12 m	70.8	30.7	40.1	Fair.
Apr. 9	9.20 a. m.	−17.0	−18.0	1.0	12 m	72.7	28.2	44.5	Fair.
Apr. 10	9.20 a. m.	−6.0	−6.0	0.0	12 m	83.4	34.2	49.2	Fair.
Apr. 11	9.25 a. m.	−6.0	−6.0	0.0	12 m	50.6	19.5	31.1	Cloudy.
Apr. 12	9.25 a. m.	−6.0	−7.0	1.0	12 m	44.0	20.0	24.0	Cloudy and light snow.
Apr. 13	9.25 a. m.	−10.0	−10.5	0.5	12 m	78.7	36.0	42.7	Fair.
Apr. 14	9.25 a. m.	−6.0	−6.0	0.0	12 m	73.8	34.6	39.2	Cloudy and light snow.
Apr. 15	9.17 a. m.	−3.5	−4.0	0.5	12 m	100.7	50.4	50.3	Fair.
Apr. 16	8.30 a. m.	−21.6	−22.0	0.4	12 m	83.3	29.7	53.6	Clear.
Apr. 17	8.30 a. m.	−25.8	−26.0	0.2	12 m	85.2	35.2	50.0	Clear.
Apr. 18	8.30 a. m.	−29.0	−29.5	0.5	12 m	41.8	10.0	31.8	Cloudy and light snow.
Apr. 19	8.30 a. m.	−9.0	−9.5	0.5	12 m	42.7	19.7	23.0	Cloudy.
Apr. 20	8.30 a. m.	4.2	4.0	0.2	12 m	67.6	32.6	35.0	Cloudy and light snow.
Apr. 21	8.30 a. m.	9.0	8.8	0.2	12 m	99.6	41.8	57.8	Cloudy and light snow.
Apr. 22	8.30 a. m.	−3.0	−3.0	0.0	12 m	92.7	43.3	49.4	Cloudy.
Apr. 23	8.30 a. m.	−8.8	−9.0	0.2	12 m	86.2	41.1	45.1	Fair.
Apr. 24	8.30 a. m.	0.5	0.0	0.5	12 m	67.0	33.9	33.1	Cloudy.
Apr. 25	8.30 a. m.	9.0	9.0	0.0	12 m	52.3	28.8	23.5	Light snow.
Apr. 26	8.30 a. m.	9.2	9.1	0.1	12 m	78.0	36.7	41.3	Cloudy and light snow.
Apr. 27	8.30 a. m.	3.0	2.8	0.2	12 m	93.9	45.7	48.2	Cloudy.
Apr. 28	7.42 a. m.	7.0	6.8	0.2	12 m	109.0	57.4	51.4	Cloudy.
Apr. 29	7.42 a. m.	6.2	6.0	0.2	12 m	54.2	30.0	24.2	Cloudy.
Apr. 30	7.42 a. m.	4.0	3.5	0.5	12 m	94.4	44.1	50.3	Cloudy.

* Approximated. Mercury apparently frozen. † Disturbed by natives.

Statement showing the solar radiation at Uglaamie from February, 1883, to August, 1883—**Continued.**

Date.	Time of observation.	Black bulb.	Bright bulb.	Difference.	Time.	Black bulb.	Bright bulb.	Difference.	Weather.
1883.									
May 1...	7.20 a. m....	—12.0	—12.2	0.2	12 m	93.0	44.0	49.0	Clear.
May 2 ..	7.20 a. m....	— 8.5	— 8.5	0.0	12 m	96.6	49.6	47.0	Fair.
May 3....	7.20 a. m....	— 4.5	— 4.5	0.0	12 m	101.2	48.5	52.7	Clear.
May 4....	7.20 a. m....	— 1.0	— 1.0	0.0	12 m	99.7	51.5	48.2	Fair.
May 5....	6.45 a. m....	16.0	16.0	0.0	12 m	114.8	71.2	43.6	Cloudy.
May 6....	6.45 a. m....	28.1	28.0	0.1	12 m	100.9	56.0	44.9	Cloudy.
May 7...	6.40 a. m....	14.8	14.8	0.0	12 m	65.5	39.8	25.7	Cloudy & heavy snow.
May 8....	6.40 a. m....	18.5	18.4	0.1	12 m	115.1	72.8	82.3	Clear.
May 9...	6.40 a. m....	22.0	21.8	0.2	12 m	66.0	44.8	21.2	Cloudy.
May 10...	6.20 a. m....	18.6	18.5	0.1	12 m	109.2	63.3	45.9	Cloudy.
May 11...	6.20 a. m....	25.0	25.0	0.0	12 m	104.8	63.0	41.8	Cloudy.
May 12....	6.20 a. m....	22.0	22.0	0.0	12 m	102.7	62.7	40.0	Cloudy.
May 13...	5.25 a. m...	23.5	22.5	1.0	12 m	72.8	44.1	28.7	Cloudy and light snow.
May 14...	5.17 a. m....	23.6	23.5	0.1	12 m	120.4	73.6	46.8	Heavy snow & cloudy.
May 15....	5.17 a. m....	22.6	22.5	0.1	12 m	99.3	56.6	42.7	Cloudy and light snow.
May 16...	5.17 a. m....	27.0	27.0	0.0	12 m	70.7	47.9	22.8	Cloudy and light snow.
May 17...	5.17 a. m....	27.0	27.0	0.0	12 m	106.7	62.0	44.7	Cloudy.
May 18....	5.17 a. m....	22.0	22.0	0.0	12 m	62.3	39.9	22.4	Cloudy.
May 19...	5.17 a. m....	12.2	11.2	1.0	12 m	83.3	49.7	33.6	Cloudy.
May 20...	5.17 a. m....	16.5	16.0	0.5	12 m	109.5	69.6	39.9	Clear.
May 21....	5.17 a. m....	20.0	19.8	0.2	12 m	60.7	35.6	25.1	Cloudy.
May 22...	5.17 a. m....	24.0	23.8	0.2	12 m	98.7	58.7	40.0	Cloudy.
May 23 ..	5.17 a. m....	24.0	23.6	0.4	12 m	69.0	56.8	32.2	Cloudy.
May 24....	5.17 a. m....	31.5	31.0	0.5	12 m	78.0	55.4	22.6	Cloudy.
May 25....	5.17 a. m....	32.4	31.9	0.5	12 m	96.3	61.7	34.6	Cloudy.
May 26....	5.17 a. m....	28.8	28.0	0.8	12 m	109.2	68.7	40.5	Fair and light snow.
May 27...	5.17 a. m....	29.8	28.5	1.3	12 m	119.6	85.6	34.0	Fair.
May 28....	5.17 a. m....	30.2	28.0	2.2	12 m	87.3	57.4	29.9	Cloudy.
May 29...	5.17 a. m....	44.2	34.0	10.2	12 m	112.7	71.8	40.9	Fair.
May 30....	5.17 a. m ..	29.6	29.2	0.4	12 m	105.0	69.9	85.1	Cloudy.
May 31...	5.17 a. m....	31.2	30.0	1.2	12 m	103.7	63.8	39.9	Cloudy.
1883.									
June 1..	5.17 a. m....	31.2	30.0	1.2	12 m.....	103.7	63.8	39.9	Cloudy.
June 2...	5.17 a. m....	30.0	29.2	0.8	12 m......	73.3	50.8	22.5	Cloudy.
June 3...	5.17 a. m....	27.0	26.5	0.5	12 m......	87.0	49.7	37.3	Cloudy.
June 4...	5.17 a. m....	20.2	19.9	0.3	12 m......	93.6	59.3	34.3	Cloudy.
June 5...	5.17 a. m....	24.8	24.5	0.3	12 m......	79.4	47.7	31.7	Foggy.
June 6 ..	5.17 a. m....	49.5	37.0	12.5	12 m......	112.9	76.6	36.3	Clear.
June 7...	5.17 a m....	45.0	36.2	8.8	12 m	30.3	61.3	29.0	Foggy.
June 8..	5 17 a. m...	30.2	29.0	1.2	12 m......	95.0	60.0	35.0	Cloudy.
June 9...	5.17 a. m....	30.2	28.0	2.2	12 m	112.3	69.9	42.4	Fair.
June 10...	5.17 a. m....	48.4	33.8	14.6	12 m......	110.6	73.6	37.0	Cloudy.
June 11...	5.17 a. m...	27.5	26.2	1.3	12 m.....	109.8	72.8	37.0	Fair.
June 12 ..	5.17 a. m ..	30.0	29.5	0.5	12 m......	103.4	69.0	34.4	Cloudy.
June 13...	5.17 a. m....	32.6	32.0	0.6	12 m	109.7	70.2	39.5	Cloudy and light snow.
June 14 ..	5.17 a. m....	32.5	31.8	0.7	12 m.....	70.9	49.5	21.4	Cloudy.
June 15...	5.17 a. m....	31.5	31.0	0.5	12 m......	73.5	50.4	23.1	Cloudy.
June 16...	5.17 a. m....	32.8	30.6	2.2	12 m.....	114.2	73.7	40.5	Cloudy.
June 17...	5.17 a. m ..	29.8	26.5	3.3	12 m......	109.2	71.5	37.7	Fair.
June 18...	5.17 a. m...	30.4	29.5	0.9	12 m......	97.3	64.0	33.3	Cloudy.
June 19...	5.17 a. m ...	31.6	30.0	1.6	12 m......	107.2	71.3	35.9	Cloudy.
June 20...	5.17 a. m....	29.6	28.0	1.6	12 m......	112.5	77.3	35.2	Clear.
June 21...	5.17 a. m ..	30.2	29.4	0.8	12 m......	108.0	73.0	35.0	Cloudy.
June 22...	5.17 a. m....	28.8	27.2	1.6	12 m......	64.7	46.7	18.0	Cloudy.
June 23...	5.17 a. m....	31.4	30.6	0.8	12 m......	67.6	48.7	18.9	Cloudy.
June 24...	5.17 a. m....	34.2	33.8	0.4	12 m......	108.2	70.5	37.7	Cloudy.
June 25 ..	5.17 a. m....	36.0	33.0	3.0	12 m......	107.1	68.6	38.5	Cloudy.
June 26 ..	5.17 a. m ...	50.2	40.5	9.7	12 m......	59.7	40.5	19.2	Cloudy.
June 27...	5.17 a. m....	34.5	33.8	0.7	12 m......	85.3	58.0	27.3	Foggy.
June 28...	5.17 a. m....	35.8	35.2	0.6	12 m......	119.7	86.2	33.5	Fair.
June 29...	5.17 a. m....	64.2	49.0	15.2	12 m......	118.7	84.7	34.0	Cloudy.
June 30...	5.17 a. m....	40.8	39.6	1.2	12 m......	112.3	69.2	43.1	Cloudy.

Statement showing the solar radiation at Uglaamie from February, 1883, to August, 1883—Continued.

Date.	Time of observation.	Black bulb.	Bright bulb.	Difference.	Time.	Black bulb.	Bright bulb.	Difference.	Weather.
1883.									
July 1	5.17 a. m.	33.5	33.0	0.5	12 m.	63.4	48.3	15.1	Cloudy.
July 2	5.17 a. m.	34.5	34.0	0.5	12 m.	51.4	42.7	8.7	Cloudy and light rain.
July 3	5.17 a. m.	35.8	35.0	0.8	12 m.	108.8	73.8	35.0	Cloudy.
July 4	5.17 a. m.	36.5	35.8	0.7	12 m.	99.0	67.3	31.7	Cloudy and light rain.
July 5	5.17 a. m.	33.6	33.0	0.6	12 m.	96.8	65.6	31.2	Cloudy.
July 6	5.17 a. m.	34.5	33.5	1.0	12 m.	104.3	73.0	31.3	Cloudy and light rain.
July 7	5.17 a. m.	38.8	38.0	0.8	12 m.	78.0	60.2	17.8	Cloudy.
July 8	5.17 a. m.	47.5	46.8	0.7	12 m.	102.5	66.5	36.0	Cloudy.
July 9	5.17 a. m.	57.2	44.0	13.2	12 m.	112.4	74.0	38.4	Fair.
July 10	5.17 a. m.	30.8	29.8	1.0	12 m.	105.7	71.6	34.1	Fair.
July 11	5.17 a. m.	56.0	44.2	11.8	12 m.	109.1	74.2	34.9	Clear.
July 12	5.17 a. m.	34.5	34.0	0.5	12 m.	56.5	45.3	11.2	Cloudy.
July 13	5.17 a. m.	34.0	33.5	0.5	12 m.	91.3	60.2	31.1	Foggy.
July 14	5.17 a. m.	37.2	33.3	3.9	12 m.	114.1	79.5	34.6	Cloudy.
July 15	5.17 a. m.	35.7	34.7	1.0	12 m.	66.5	50.7	15.8	Cloudy.
July 16	5.17 a. m.	33.5	33.0	0.5	12 m.	59.0	47.2	11.8	Cloudy.
July 17	5.17 a. m.	29.6	28.5	1.1	12 m.	110.5	75.4	35.1	Fair.
July 18	5.17 a. m.	55.5	42.0	13.5	12 m.	118.6	90.0	28.6	Clear.
July 19	5.17 a. m.	57.0	43.8	13.2	12 m.	118.2	80.8	37.4	Fair.
July 20	5.17 a. m.	35.8	35.5	0.3	12 m.	94.3	63.0	31.3	Cloudy.
July 21	5.17 a. m.	32.8	32.0	0.8	12 m.	64.0	48.5	15.5	Cloudy.
July 22	5.17 a. m.	31.2	31.0	0.2	12 m.	100.5	66.4	34.1	Cloudy.
July 23	5.17 a. m.	30.4	29.8	0.6	12 m.	110.8	78.7	32.1	Clear.
July 24	5.17 a. m.	30.4	30.0	0.4	12 m.	110.0	75.7	35.3	Fair.
July 25	5.17 a. m.	50.0	42.8	7.2	12 m.	112.5	81.4	31.1	Clear.
July 26	5.17 a. m.	31.5	31.0	0.5	12 m.	109.8	75.0	34.8	Clear.
July 27	5.17 a. m.	41.5	36.0	5.5	12 m.	111.0	74.4	36.6	Fair.
July 28	5.17 a. m.	34.0	33.6	0.4	12 m.	109.3	72.3	37.0	Fair.
July 29	5.17 a. m.	30.5	30.2	0.3	12 m.	79.0	54.0	25.0	Cloudy.
July 30	5.17 a. m.	29.8	29.6	0.2	12 m.	108.4	68.6	39.8	Fair and light snow.
July 31	5.17 a. m.	29.6	29.0	0.6	12 m.	112.1	72.2	39.9	Cloudy.
1883.									
Aug. 1	5.20 a. m.	33.2	33.2	0.0	12 m.	73.5	52.7	20.8	Cloudy.
Aug. 2	5.30 a. m.	33.5	33.2	0.3	12 m.	108.0	72.3	35.7	Cloudy.
Aug. 3	5.30 a. m.	34.5	34.2	0.3	12 m.	96.0	65.9	30.1	Cloudy.
Aug. 4	5.30 a. m.	35.2	35.0	0.2	12 m.	57.7	45.1	12.6	Cloudy.
Aug. 5	5.30 a. m.	33.0	32.8	0.2	12 m.	64.4	49.0	15.4	Cloudy.
Aug. 6	5.30 a. m.	33.8	33.7	0.1	12 m.	67.4	49.5	17.9	Foggy.
Aug. 7	5.30 a. m.	33.2	33.0	0.2	12 m.	89.8	65.0	24.8	Cloudy.
Aug. 8	5.30 a. m.	44.0	44.0	0.0	12 m.	116.2	84.3	31.9	Fair.
Aug. 9	5.30 a. m.	43.0	43.0	0.0	12 m.	130.4	94.8	35.6	Cloudy.
Aug. 10	5.30 a. m.	37.6	37.6	0.0	12 m.	98.8	71.5	27.3	Cloudy.
Aug. 11	6.30 a. m.	40.7	40.6	0.1	12 m.	119.0	84.3	34.7	Foggy.
Aug. 12	6.30 a. m.	43.8	43.6	0.2	12 m.	111.0	81.6	29.4	Cloudy.
Aug. 13	6.30 a. m.	40.4	40.4	0.0	12 m.	98.2	63.9	34.3	Cloudy.
Aug. 14	6.30 a. m.	33.7	33.7	0.0	12 m.	64.6	49.4	15.2	Cloudy.
Aug. 15	6.30 a. m.	33.5	33.4	0.1	12 m.	100.0	73.0	27.0	Cloudy.
Aug. 16	6.45 a. m.	42.5	42.3	0.2	12 m.	65.8	48.8	17.0	Cloudy and light rain.
Aug. 17	6.50 a. m.	36.2	36.0	0.2	12 m.	113.0	78.5	35.5	Fair.
Aug. 18	6.50 a. m.	38.0	37.8	0.2	12 m.	87.2	56.5	30.7	Cloudy and light snow.
Aug. 19	6.50 a. m.	28.1	27.9	0.2	12 m.	97.0	62.1	34.9	Cloudy.
Aug. 20	6.50 a. m.	29.8	29.7	0.1	12 m.	41.0	35.0	6.0	Cloudy and light snow.
Aug. 21	6.50 a. m.	27.0	27.0	0.0	12 m.	62.9	44.2	18.7	Cloudy.
Aug. 22	6.50 a. m.	24.1	24.1	0.0	12 m.	77.5	53.2	24.3	Cloudy and light snow.
Aug. 23	6.50 a. m.	34.8	34.7	0.1	12 m.	95.4	67.0	28.4	Cloudy.
Aug. 24	6.50 a. m.	39.1	39.0	0.1	12 m.	71.6	48.4	23.2	Cloudy.
Aug. 25	7.25 a. m.	26.9	26.8	0.1	12 m.	61.8	45.0	16.8	Cloudy.
Aug. 26	7.10 a. m.	39.9	39.8	0.1	12 m.	91.8	60.0	31.8	Cloudy.
Aug. 27	7.20 a. m.	28.2	28.2	0.0	12 m.	67.6	47.4	20.2	Cloudy.

TERRESTRIAL RADIATION.

A minimum thermometer was exposed for terrestrial radiation from November 16, 1882, to the closing of the station, and read every day at Washington midnight. It was laid upon a board securely fixed upon the surface of the ground, and a box was provided with which it could be covered during snow storms, to prevent injury to the thermometer in digging it out of a snow-drift. Snow storms or drift of snow of course prevented observations with this thermometer.

On January 14, 1883, the Yale special minimum thermometer, No. 7 (carbon disulphide), was exposed beside this in its case, but was destroyed on January 25th by the Eskimo dogs, which gnawed off the end containing the bulb, attracted probably by the varnish on the case.

Statement showing the terrestrial radiation at Uglaamie from November, 1882, to March, 1883.

[Washington time. Correction to reduce to mean local time, — 5h 17m. Special minimum, CS₂, No. 7, exposed for terrestrial radiation January 14, 1883; destroyed by Eskimo dogs January 25, 1883. Terrestrial minimum and air minimum read at 12 midnight, Washington time.]

Day of month.	November, 1882.		December, 1882.		January, 1883.		February, 1883.		March, 1883.	
	Terrestrial.	Air.	Terrestrial.	Air.	Terrestrial.	Air.	Terrestrial.	Air.	Terrestrial.	Air.
1	....	....	—22.2	—12.7	(*)	—18.2	—22.6	—15.1	—33.2	—37.2
2	....	....	—25.2	—15.4	(*)	— 9.3	—16.4	—12.3	—42.2	—45.2
3	....	....	—29.6	—16.3	—10.6	— 8.2	— 5.8	— 1.9	—28.4	—32.2
4	....	....	—30.0	—16.4	—11.6	—10.2	(*)	5.0	—27.0	—28.3
5	....	....	—30.9	—19.0	—15.2	—15.3	3.6	0.2	—21.7	—23.2
6	....	....	—28.5	—16.2	—26.2	—20.7	—11.0	— 9.9	—34.8	—36.7
7	....	....	—34.8	—26.8	—28.0	—22.0	— 7.2	— 8.2	—36.8	—38.3
8	....	....	—38.0	—26.6	—22.2	—21.2	(*)	— 4.8	—39.2	—43.8
9	....	....	—35.8	—25.5	—35.7	—25.2	(*)	— 5.2	—47.4	—51.4
10	....	....	—34.5	—25.0	—36.8	—24.2	(*)	—21.8	—47.8	—46.7
11	....	....	—37.8	—20.3	—33.8	—30.3	—25.2	—20.6	—41.6	—43.4
12	....	....	—39.5	—28.0	—39.4	—38.8	—21.4	—19.2	—27.4	—30.1
13	....	....	—32.1	—26.2	—39.4	—39.2	—15.2	—13.8	—33.6	—32.7
14	....	....	—34.2	—26.4	(*)	—36.2	—25.0	—17.7	—38.4	—34.7
15	....	....	—36.0	—29.2	—40.8	—41.8	—27.2	—17.9	—35.4	—39.7
16	—25.0	—24.0	—36.5	—30.5	—40.4	—40.6	—27.4	—22.6	—24.4	—26.0
17	(*)	—16.5	—31.8	—25.1	(*)	— 8.7	—17.2	—15.6	—23.4	—21.1
18	(*)	—14.5	(*)	—29.5	—17.2	—18.7	—16.4	—14.9	—28.4	—27.7
19	(*)	—14.2	—43.5	—29.2	—32.4	—26.5	— 2.8	0.8	—29.7	—27.8
20	(*)	—12.0	—38.5	—25.2	—31.7	—30.0	—18.4	—17.1	—30.8	—32.2
21	(*)	— 9.5	—44.0	—26.3	—31.7	—22.0	—20.8	—17.4	—21.8	—24.1
22	(*)	— 4.8	—44.9	—31.8	(*)	—13.2	—31.6	—25.2	— 6.0	— 9.3
23	(*)	—18.4	—50.8	—32.2	(*)	— 4.3	—33.2	—25.1	—15.0	—15.9
24	—32.0	—21.5	—55.2	—39.0	—20.4	—19.3	—64.2	—27.5	—15.7	— 8.0
25	(*)	—16.6	—53.8	—36.7	—28.2	—28.4	—40.0	—27.4	8.6	9.6
26	—33.0	—24.1	—33.5	—22.0	—36.2	—31.2	—44.0	—34.3	— 0.4	0.7
27	—34.0	—16.6	—48.2	—23.3	—36.7	—36.0	—31.4	—25.0	8.3	4.0
28	—25.5	—18.2	—43.8	—23.1	—37.4	—36.2	—16.8	—18.6	— 8.6	—10.8
29	—21.6	—14.8	—49.8	—32.7	—40.5	—32.9	....	....	11.8	12.2
30	—21.4	—12.8	—51.2	—42.0	—43.5	—38.7	....	....	— 4.0	— 3.2
31	....	....	(*)	—26.2	—37.4	—35.2	....	....	— 4.0	— 3.2

* Not exposed on account of drifting snow.

Day of month.	April, 1883.		May, 1883.		June, 1883.		July, 1883.		August, 1883.	
	Terrestrial.	Air.	Terrestrial.	Air.	Terrestrial.	Air.	Terrestrial.	Air.	Terrestrial.	Air.
1	—22.0	—21.9	—13.2	—14.0	24.3	27.9	31.0	31.4	30.6	32.0
2	—31.0	—24.8	—10.7	—10.8	(*)	24.5	32.0	31.9	30.0	32.0
3	—34.0	—23.0	— 6.5	— 6.5	18.0	20.9	34.0	33.4	30.5	32.5
4	—33.0	—26.7	— 2.0	— 2.2	14.2	18.2	34.0	33.8	32.0	33.4
5	—11.4	—14.3	9.8	13.5	16.2	22.7	31.5	32.0	30.0	31.3
6	—13.0	—11.3	19.1	15.0	(*)	28.2	32.2	32.0	31.4	32.1
7	—27.0	—23.0	16.2	12.4	(*)	26.2	30.2	35.8	30.6	32.0
8	—29.5	—29.0	15.5	12.9	(*)	27.0	33.0	32.9	36.5	38.8
9	—22.0	—20.4	22.2	19.2	(*)	24.2	27.2	30.7	37.2	40.5
10	(†)	— 9.9	21.8	17.5	18.7	25.7	28.5	28.3	33.2	36.5
11	— 8.0	— 9.0	24.5	22.2	18.3	24.7	32.3	33.7	33.5	36.2
12	—16.0	—13.6	22.6	13.3	23.9	27.5	32.8	32.5	37.8	37.7
13	—14.2	—10.6	23.8	18.6	26.5	30.8	34.6	32.5	33.8	33.4
14	—12.8	—10.9	27.3	21.8	26.6	30.5	19.0	30.4	28.0	31.2
15	— 9.5	— 9.7	24.7	18.5	24.5	29.8	33.5	32.3	25.5	31.0
16	—26.2	—27.7	30.4	24.7	23.7	28.3	32.0	31.9	34.0	35.5
17	—34.0	—28.9	28.5	22.4	18.5	23.6	25.2	28.0	30.0	31.8
18	—35.2	—35.0	25.5	19.5	23.5	27.3	29.0	34.2	29.0	30.3
19	— 9.8	—11.8	11.0	7.6	24.0	26.5	30.6	34.8	19.0	26.2
20	1.0	2.8	13.0	11.5	20.7	25.6	33.5	34.0	24.0	27.2
21	6.0	— 3.4	17.8	11.5	22.0	25.7	30.5	31.0	23.5	24.0
22	— 3.5	— 5.5	25.5	19.2	21.5	25.4	28.0	29.4	19.8	22.4
23	—12.0	—10.1	30.0	22.8	(*)	26.0	(‡)	27.4	30.8	32.6
24	0.0	— 2.5	25.0	18.9	(*)	30.1	27.5	27.7	25.8	26.8
25	7.0	6.6	33.8	28.7	(*)	30.0	25.2	30.8	20.2	25.2
26	4.0	3.0	(*)	28.6	31.2	32.0	27.5	29.8	27.2	28.5
27	1.0	— 2.3	19.7	23.7	32.1	32.5	28.7	32.3	24.0	27.2
28	4.0	3.9	28.5	24.5	33.7	33.2	30.0	31.8	....	....
29	(‡)	5.0	21.4	26.2	35.1	35.5	27.0	27.9	....	....
30	(‡)	— 0.8	23.2	28.3	32.5	34.6	26.5	27.3	....	....
31	....	....	22.7	27.0	....	....	25.6	27.7	....	....

*Column broken. † Not exposed; drifting snow. ‡ Thermometer disturbed.

SEA-ICE TEMPERATURE.

On November 13, 1882, a wooden box, about 6 inches square on the bottom, with a sliding cover, was placed in an excavation about 4 inches deep made in the sea-ice about 50 yards from the shore. In this a spirit thermometer (No. 684) was set upright, and the bottom of the box filled with sea-water, which immediately froze, so as to inclose the bulb of the thermometer in ice.

A break in the ice near the shore occurred on the night of November 20, and the ice moved away, carrying the thermometer with it. Spirit thermometer No. 713 was exposed in a similar box on December 19, 1882, and was kept in place till June 6, 1883, when the ice was beginning to melt on the surface. These thermometers were read every day about local noon.

The ice formed to the depth of $5\frac{1}{24}$ feet, and while the temperature of the water immediately beneath it continued practically constant at about 29° F., the ice showed considerable variation. When the temperature of the air was low, the temperature of the ice was, as a rule, higher than that of the air. The reverse was true, as a rule, when the weather grew warmer.

TEMPERATURE OF THE SEA.

From November 11, 1881, till May 7, 1883, the temperature of the sea-water was observed once a day, from 12 m. to 2 p. m., local time, and hourly from May 7 to the end of the voyage home. It was taken at the surface and bottom in 17 feet of water, about 100 yards from the shore, through a hole in the ice in the winter, and by rowing out in a small boat when the water was open. The surface temperature only was taken from the vessel.

The temperature of the water in the various fresh and brackish lagoons was taken from time to time during the winter, and although ice was formed upwards of $6\frac{1}{6}$ feet thick, leaving scarcely any water underneath it, unfrozen mud was found at the bottom.

Statement showing the sea-ice temperature at Uglaamie from November, 1882, to June, 1883.

[Observations taken at noon, local time; water temperature taken on bottom, 17 feet deep, one-eighth mile from shore.]

Day of month.	November, 1882.				December, 1882.				January, 1883.				February, 1883.			
	Ice.	Air.	Diff.	Water.	Ice.	Air.	Diff.	Water.	Ice.	Air.	Diff.	Water.	Ice.	Air.	Diff.	Water.
1									− 4.5	−10.2	5.7	29.5	− 3.5	−10.4	6.9	29.2
2									− 0.4	− 3.4	3.0	29.4	− 0.8	− 4.2	3.4	29.1
3									1.1	− 4.7	5.8	29.5	5.7	6.2	0.5	29.4
4									1.1	− 4.4	5.5	29.5	0.7	6.4	0.3	29.3
5									− 1.2	− 7.8	6.6	29.3	11.9	16.0	4.7	29.5
6									− 3.5	−15.6	12.1	29.3	8.5	− 4.2	12.7	29.2
7									− 3.0	−17.7	14.7	29.4	11.4	19.0	7.6	29.4
8									− 1.7	−12.0	10.3	29.3	6.7	3.2	3.5	29.2
9									− 4.5	−20.5	16.0	29.5	(*)	17.2		(*)
10									− 3.5	−15.7	12.2	29.4	2.9	16.9	14.0	29.0
11									− 7.7	−24.5	16.8	29.2	− 1.7	12.4	15.1	29.2
12									− 9.1	−29.5	20.4	29.1	3.8	1.2	5.0	29.2
13	−25.0	−23.8	1.2	29.0					−11.0	−30.4	19.4	29.1	2.0	− 8.2	10.2	29.2
14	−17.0	−29.0	12.1	29.1					−11.6	−28.1	16.5	29.1	1.1	−10.4	11.5	29.2
15	−14.0	−19.6	5.6	28.9					−13.4	−34.7	21.3	29.1	1.1	−11.0	12.1	29.1
16	−10.0	−17.8	7.8	29.0					− 3.5	− 5.3	1.8	29.3	3.8	−15.0	18.8	29.2
17	1.0	− 7.9	10.9	29.0					1.1	− 0.8	0.2	29.4	1.1	−10.4	11.5	29.1
18	2.0	− 9.8	11.8	29.0					− 2.2	−12.8	10.6	29.0	5.7	3.7	2.0	29.2
19	3.0	− 9.5	12.5	29.1					− 7.2	−19.6	12.4	29.2	7.6	6.9	0.7	29.1
20	6.0	− 3.2	9.2	29.1	− 0.2	−18.7	18.5	29.5	− 6.8	−19.4	12.6	29.2	2.0	−12.3	14.3	29.1
21	(†)				− 0.3	−18.2	17.9	29.6	− 4.5	−11.2	6.7	29.0	2.9	− 7.8	10.7	29.1
22					− 0.4	−24.9	24.5	29.6	− 0.8	− 4.3	3.5	29.2	− 1.7	−19.7	18.0	29.1
23					− 0.6	−23.1	22.5	29.5	3.8	3.2	0.6	29.3	− 2.6	−15.2	12.6	29.1
24					− 1.1	−30.5	29.4	29.4	− 0.9	−13.1	12.2	29.2	− 6.3	−21.6	15.3	29.1
25					− 0.3	−18.8	18.5	29.3	− 3.0	−23.2	20.2	29.2	− 6.3	−18.7	12.4	29.1
26					− 7.7	−14.3	6.6	29.4	− 6.3	−23.2	16.9	29.4	− 8.2	−25.7	17.5	29.1
27					−10.1	−10.8	0.7	29.3	− 9.1	−30.3	21.2	29.2	− 5.4	−15.2	9.8	29.1
28					7.2	−11.7	0.5	29.2	− 9.1	−29.8	20.7	29.2	0.1	− 2.4	2.5	29.1
29					− 7.7	−22.9	15.2	29.6	−10.1	−24.5	14.4	29.2				
30					− 11.0	−25.5	14.5	29.5	−12.9	−32.0	19.1	29.2				
31					− 8.2	−12.6	4.4	29.5	− 8.2	−15.2	7.0	29.2				

* Impracticable.
† Ice thermometer carried off by the ice moving from shore November 21; impracticable to place another thermometer until December 20.

Statement showing the sea-ice temperature at Uglaamie from November, 1882, to June, 1883—Continued.

Day of month.	March, 1883.				April, 1883.				May, 1883.				June, 1883.			
	Ice.	Air.	Diff.	Water.	Ice.	Air.	Diff.	Water.	Ice.	Air.	Diff.	Water.	Ice.	Air.	Diff.	Water.
1	— 6.3	—27.5	21.2	29.1	5.7	—12.7	18.4	29.0	10.4	2.7	7.7	29.1	31.2	33.2	2.0	29.3
2	—10.1	—28.2	18.1	29.1	3.8	—10.0	13.8	29.1	11.4	8.2	3.2	29.1	32.2	30.3	1.0	29.2
3	— 7.2	—20.5	13.3	29.1	2.9	—11.2	14.1	29.0	12.3	5.1	7.2	29.0	30.3	27.4	2.9	29.2
4	— 5.4	—22.3	16.9	29.2	1.1	—11.4	12.1	29.1	12.3	12.0	0.3	29.1	31.2	26.1	5.1	29.2
5	— 2.6	—10.2	7.6	29.1	4.8	— 0.9	5.7	29.1	22.5	33.6	11.1	29.1	32.2	35.6	3.4	29.2
6	— 6.3	—20.3	14.0	29.1	4.8	— 3.1	7.9	29.1	20.5	20.1	0.4	29.0	32.2	38.6	6.4	29.2
7	— 5.4	—18.2	12.8	29.1	2.0	— 7.6	9.6	29.1	20.5	25.2	4.7	29.0	(*)	....	....	....
8	—10.1	—36.7	26.6	29.1	2.9	— 6.0	8.9	29.1	21.5	23.0	1.5	29.0	....	....	....	....
9	—12.9	—34.9	22.0	29.1	2.9	— 4.7	7.6	29.1	21.5	25.3	3.8	29.0	....	....	....	....
10	—11.9	—33.7	21.8	29.1	3.8	— 1.6	5.4	29.1	25.4	27.4	2.0	29.0	....	....	....	....
11	—12.9	—32.1	19.2	29.2	5.7	— 1.2	6.9	29.1	25.4	26.2	0.8	29.1	....	....	....	....
12	— 7.2	—14.9	7.7	29.1	5.7	5.5	0.2	29.0	24.9	21.7	3.2	29.0	....	....	....	....
13	— 9.1	—22.9	13.8	29.1	6.7	3.8	2.9	29.1	23.5	24.9	1.4	29.1	....	....	....	....
14	— 9.1	—23.5	14.4	29.1	7.6	6.3	1.3	29.1	24.4	31.5	7.1	29.1	....	....	....	....
15	— 9.1	—22.6	13.5	29.1	6.7	— 0.2	6.9	29.1	23.5	26.8	3.3	29.1	....	....	....	....
16	— 6.3	—10.4	4.1	29.1	2.9	—13.8	16.7	29.0	22.5	33.9	11.4	29.2	....	....	....	....
17	— 4.5	—12.3	7.8	29.0	3.8	—11.3	15.1	29.1	23.5	28.4	4.9	29.2	....	....	....	....
18	— 5.4	—10.5	5.1	29.1	2.0	— 6.7	8.7	29.1	22.5	28.4	5.9	29.2	....	....	....	....
19	— 7.2	—16.6	9.4	29.1	4.8	1.3	3.5	29.1	23.5	30.8	7.3	29.2	....	....	....	....
20	— 7.2	—14.6	7.4	29.0	8.5	12.5	4.0	29.1	25.3	27.1	1.8	29.3	....	....	....	....
21	— 4.5	— 8.4	3.9	29.1	9.5	— 0.5	10.0	29.1	25.4	26.4	1.0	29.2	....	....	....	....
22	— 1.7	— 4.6	2.9	29.0	10.4	4.4	6.0	29.1	25.4	25.9	0.5	29.2	....	....	....	....
23	— 0.8	— 7.8	7.0	29.1	10.4	7.4	3.0	29.1	27.3	33.2	5.9	29.2	....	....	....	....
24	2.9	9.8	6.9	29.1	11.4	8.9	2.5	29.0	28.3	35.4	7.1	29.2	....	....	....	....
25	8.5	21.6	13.1	29.1	13.3	15.6	2.3	29.1	30.3	37.8	7.5	29.2	....	....	....	....
26	9.5	22.5	13.0	29.1	12.3	8.5	3.8	29.1	30.3	32.5	2.2	29.2	....	....	....	....
27	12.3	18.1	5.8	29.2	14.3	14.4	0.1	29.1	31.2	33.2	2.0	29.2	....	....	....	....
28	9.5	10.3	0.8	29.1	15.4	13.7	1.7	29.1	31.2	32.5	1.3	29.2	....	....	....	....
29	13.3	25.5	12.2	29.1	14.3	13.6	0.7	29.1	31.2	32.5	1.3	29.2	....	....	....	....
30	11.4	10.6	0.8	29.1	11.4	5.3	6.1	29.1	31.2	34.4	3.2	29.2	....	....	....	....
31	11.2	3.9	7.3	29.1	....	....	....	....	31.2	34.9	3.7	29.2	....	....	....	....

* Discontinued; surface of ice melting.

Temperature of sea-water at Uglaamie, Alaska.

[From daily observations.]

Month.	Surface.				Bottom, 17 feet.			
	Mean.	Max.	Min.	Range.	Mean.	Max.	Min.	Range.
1882.	°	°	°	°	°	°	°	°
January	28.65	28.9	27.9	1.0	28.79	29.2	28.2	1.0
February	28.84	29.1	28.7	0.4	29.01	29.3	28.8	0.5
March	28.87	29.1	28.8	0.3	29.04	29.4	28.9	0.5
April	28.97	29.8	28.8	1.0	29.00	29.8	28.8	1.0
May*	28.97	29.1	28.9	0.2	29.05	29.2	28.9	0.3
June	30.65	33.0	28.9	4.1	30.46	32.0	28.9	3.1
July	37.35	49.4	30.7	18.7	37.42	49.1	29.9	19.2
August	42.47	49.1	34.2	14.9	42.34	49.1	32.5	16.6
September	33.31	37.6	29.8	7.8	33.40	37.0	30.0	7.0
October	29.20	32.0	28.0	4.0	29.43	32.4	28.9	3.5
November	28.98	29.2	28.8	0.4	29.15	30.0	28.9	1.1
December	29.09	29.5	28.9	0.6	29.22	29.6	28.9	0.7
Whole period	31.279	49.4	27.9	21.5	31.359	49.1	28.2	20.9

* May 2, temperature at "lead" of open water 2 miles from shore off station: surface, 29°.2; bottom, 78 feet, 29°.3.

TEMPERATURE OF THE EARTH.

A shaft was opened in the frozen earth for the observation of earth temperatures December 8, 1881, and continued down to a depth of 37 feet 6 inches. A thermometer protected by a wooden case was buried at the bottom of the shaft by the workman every night and read on beginning work the next morning. From May 28, 1882, to April 23, 1883, a thermometer was kept suspended in the meat cellar at a depth of 13 feet below the surface and read once a day. From April 23, 1883, to the closing of the station the thermometer was let down by a cord to the bottom of the shaft and drawn up and read once a day. At this level the temperature remained constant at + 12° F.

Temperature of the earth at Uglaamie, Alaska, from December 8, 1881, to February 17, 1883.

Date.	Temperature. Earth.	Temperature. Air.	Depth. Ft.	Depth. In.	Formation.	Number of thermometer.	Observer.	Remarks.
1881.	° *Fahr.*	° *Fahr.*	*Ft.*	*In.*				
Dec. 8	— 5.0	—18.0	Surface.		....	752	Ray...	Two feet of snow.
Dec. 8	— 4.0	—18.0	1		Turf and clay.....	752	..do ...	Tundra covered with ice when the snow fell.
Dec. 9	— 3.0	—31.0	2		Clay and gravel...	752	..do ...	Tenacious and very hard. Black; when melted resembled mud taken from docks.
Dec. 13	— 2.0	—23.0	3		....do	752	..do ...	Tenacious and very hard. Large pieces of pure fresh-water ice, with gravel.
Dec. 14	— 1.5	—24.0	5		....do	752	..do ...	Tenacious and very hard. Put in blast, which blew out without moving any earth.
Dec. 17	4.1	— 6.6	6		Gravel............	752	..do ...	Work suspended; shaft covered.
1882.								
Apr. 15	7.1	— 6.2	*6		....do	752	..do ...	
Apr. 17	7.2	— 6.2	6	6	....do	752	..do ...	
Apr. 19	7.3	— 1.4	8	1	Clay and gravel...	752	..do ...	
Apr. 21	7.9	—12.0	9	2	....do	752	..do ...	Very hard and tenacious. Temperature taken as before, in the shaft; thermometer buried each time over night.
Apr. 22	7.2	—12.0	11		....do	752	..do ...	
Apr. 23	8.3	— 8.3	12		Gravel............	752	..do ...	Dry, and easily worked.
Apr. 24	8.5	18.0	13		....do	752	..do ...	Excavated room for meat.
Nov. 23	17.5	— 5.0	15		Clay..............	752	..do ...	Quite dry, but firmly frozen. Resumed work November 23, sinking two feet. Temperature of store cellar for meat, +16°.2, on same level of bottom of shaft.
Nov. 24	17.5	—13.0	16	6	....do	752	..do ...	Dry black clay.
Nov. 25	17.5	—15.0	18		....do	752	..do ...	Strongly impregnated with chlorine.
Dec. 1	14.5	— 5.0	19	8	....do	752	..do ...	Quite dry. Containing sufficient water to firmly solidify it when frozen.
Dec. 4	14.5	—14.0	20	8	....do	752	..do ...	
Dec. 5	14.5	—17.0	21	4	....do	752	..do ...	Dry and very hard. Containing sufficient water to firmly solidify it when frozen.
Dec. 7	14.5	—20.0	22		....do	752	..do ...	
Dec. 8	14.2	—12.5	23		....do	752	..do ...	
Dec. 9	14.2	—23.5	23	8	Sand..............	752	..do ...	
Dec. 11	12.5	—17.0	24	4	Clay..............	752	..do ...	
Dec. 12	12.5	—27.0	25		....do	752	..do ...	
Dec. 13	12.2	—20.0	25	8	....do	752	..do ...	
Dec. 14	12.0	—22.0	26	4	Sand..............	752	..do ...	Sand and fine gravel. Layers dip to SSW. 45°. A pair of wooden goggles found, also fragments of clam-shells,‡ at 27 feet 3 inches. Stopped work on the 14th. On the morning of the 18th found water and mud in bottom of shaft, with temperature of earth +14°; water very salt; stood at 15° F. when brought to the surface.
Dec. 18	14.0	—27.0	27	3	....do	752	..do ...	Suspended work.
1883.								
Jan. 19	14.0	—27.0	28		....do	752	..do ...	Resumed work after bailing out one foot of water. No more came in.
Jan. 21	13.0	— 9.0	29		....do	752	..do ...	
Jan. 27	11.0	—35.0	30		....do	752	..do ...	
Feb. 3	11.0	0	31		....do	755	..do ...	
Feb. 6	12.0	— 7.0	32	8	....do	755	..do ...	
Feb. 12	12.0	— 6.0	34		....do	755	..do ...	
Feb. 14	12.5	— 7.4	34		....do	755	..do ...	
Feb. 15	12.2	—13.6	35		....do	755	..do ...	
Feb. 16	12.2	—18.4	36		....do	755	..do ...	
Feb. 17†	12.2	—13.0	37	6	....do	755	..do ...	

* Five feet of snow was removed from over the shaft. The thermometer was buried in bottom, same as on December 17, when the temperature was taken.

† From this date until the closing of the station the temperature was observed daily at this depth, and found to be constant at 12°.

‡ *Mya truncata.*

METEOROLOGY OF MEADE RIVER RECONNAISSANCE.

These observations were taken by Lieut. P. H. Ray, and Mr. A. C. Dark, during the sledge journey towards the headwaters of Meade River, from March 28 to April 7, 1883, inclusive. The instruments used were one aneroid barometer, and two ordinary spirit-thermometers, protected by tubular wooden cases open at the bottom, and exposed by hanging them to the mast of the sled, four feet from the ground. The velocity of the wind was estimated, and its direction indicated by a fly of bunting at the masthead.

Meteorological record of the reconnaissance to ***Meade River, Alaska.***

[Washington time.]

Day and date of observation.	Time of observation.	Barometer.	Thermometer (exposed).	Corrected barometer.	Latitude north.	Longitude west.	Wind. Direction.	Wind. Velocity per hour.	Upper clouds. Kind.	Upper clouds. Amount in tenths.	Upper clouds. Direction (moving from—).	Lower clouds. Kind.	Lower clouds. Amount in tenths.	Lower clouds. Direction (moving from—).	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow (inches and hundredths).	State of weather.
1883.					° ′ ″	° ′												
Mar. 28	3 p.m.	29.780	6.8	29.860	71 00 1	157 00	E.	12s	Cir.	2	0	Strat.	3	0	......	......	00	Fair.
	7 p.m.	29.735	17.7	29.810	70 54 00	157 15	E.	9s	Hidden.			Strat.	10	0	......	......	00	Cloudy.*
	11 p.m.	29.715	24.3	29.790	70 47 00	157 12	E.	8s	Cir.	1	0	Strat.	10	0	......	......	00	Cloudy.
Mar. 29	3 a.m.	29.720	16.0	29.800	70 47 00	157 12	SE.	2s	Cir.	2	0	Strat.	7	0	......	......	00	Cloudy.
	7 a.m.	29.760	17.7	29.840	70 47 00	157 12	SE.	4s	Haze.			Strat.	5	0	......	......	00	Cloudy.
	11 a.m.	29.800	16.4	29.880	70 47 00	157 12	SW.	5s	Hidden.			Nimb.	10	0	a.m.	......	.—	H'y snow.
	3 p.m.	29.820	29.2	29.900	70 37 00	157 11	W.	10s	Cir.	6	0	Strat.	3	0	......	p.m.	.15	Cloudy.
	7 p.m.	29.920	27.1	30.000	70 30 00	157 11	NW.	8s	0	0	0	Strat.	1	0	......	......	00	Clear.
	11 p.m.	29.910	3.4	29.990	70 28 00	157 17	SW.	2s	0	0	0	Strat.	1	0	......	......	00	Clear.
Mar. 30	3 a.m.	29.935	−2.0	30.020	70 28 00	157 17	S.	4s	Haze.			Strat.	2	0	......	......	00	Hazy.
	7 a.m.	29.940	−6.4	30.020	70 28 00	157 17	S.	4s	0	0	0	Strat.	1	0	......	......	00	Clear.†
	11 a.m.	29.900	17.3	29.980	70 28 00	157 17	S.	6s	Cir.	2	Es	Strat.	0—1	0	......	......	00	Clear.
	3 p.m.	29.900	20.0	29.980	70 20 00	157 30	SSE.	7s	Cir.	3	0	Strat.	1	0	......	......	00	Fair.
	7 p.m.	29.870	27.0	29.950	70 19 00	157 37	SSE.	2s	Cir.	3	0	Strat.	4	Es	......	......	00	Fair.
	11 p.m.	29.880	19.3	29.960	70 16 00	157 55	S.	2s	0	0	0	Strat.	7	0	......	......	00	Fair.
Mar. 31	3 a.m.	29.88	11.5	29.96	70 16 00	157 55	S.	4s	Hidden.			Strat.	10	0	......	......	00	Cloudy.
	7 a.m.	29.88	6.3	29.96	70 16 00	157 55	SSE.	6s	Haze.			Strat.	4	0	......	......	00	Hazy.
	11 a.m.	29.89	3.5	29.97	70 16 00	157 55	SE.	3s	Cir.	5	0	Strat.	4	0	......	......	00	Cloudy.
	3 p.m.	29.91	16.9	29.99	70 16 00	157 55	W.	10s	0	0	0	Strat.	8	0	......	......	00	Cloudy.
	7 p.m.	29.99	9.2	30.07	70 16 00	157 55	W.	12s	0	0	0	Strat.	5	NWs	......	......	00	Fair.
	11 p.m.	30.08	0.5	30.15	70 16 00	157 55	NW.	14s	Cir.	2	0	Strat.	4	NWs	......	......	00	Fair.
Apr. 1	3 a.m.	30.10	−5.0	30.18	70 16 00	157 55	W.	8s	0	0	0	Strat.	5	0	......	......	00	Fair.
	7 a.m.	30.11	−9.6	30.19	70 16 00	157 55	NNW.	4s	0	0	0	Strat.	8	0	......	......	00	Cloudy.
	11 a.m.	30.19	−11.3	30.27	70 16 00	157 55	N.	5s	Hidden.			Strat.	10	0	......	......	00	Cloudy.
	3 p.m.	30.26	−14.6	30.34	70 16 00	157 55	N.	6s	Cir.	2	Ns	Strat.	4	0	......	......	00	Fair.
	7 p.m.	30.25	−13.8	30.33	70 16 00	157 55	N.	4s	0	0	0	Strat.	3	0	......	......	00	Clear.
	11 p.m.	30.24	−14.7	30.32	70 16 00	157 55	N.	5s	0	0	0	Strat.	2	0	......	......	00	Clear.
Apr. 2	3 a.m.	30.30	−15.8	30.38	70 16 00	157 55	Calm.		0	0	0	0	0	0	......	......	00	Clear.
	7 a.m.	30.25	−31.8	30.33	70 16 00	157 55	Calm.		0	0	0	0	0	0	......	......	00	Clear.
	11 a.m.	30.18	−28.3	30.26	70 16 00	157 55	Calm.		0	0	0	Strat.	1	0	......	......	00	Clear.
	3 p.m.	29.80	−0.8	29.88	70 13 00	157 52	Calm.		0	0	0	Strat.	1	0	......	......	00	Clear.
	7 p.m.	29.90	−2.0	29.98	69 55 00	157 40	Calm.		0	0	0	0	0	0	......	......	00	Clear.
	11 p.m.	29.85	−1.7	29.93	69 55 00	157 40	S.	5s	0	0	0	Strat.	2	0	......	......	00	Clear.
Apr. 3	3 a.m.	28.87	−23.2	30.51	69 55 00	157 40	S.	3s	0	0	0	Strat.	2	0	......	......	00	Clear.
	7 a.m.	28.87	−31.8	30.51	69 55 00	157 40	N.	2s	Haze.			Strat.	2	0	......	......	00	Clear.
	11 a.m.	28.87	−34.7	30.51	69 55 00	157 40	Calm.		0	0	0	0	0	0	......	......	00	Clear.
	3 p.m.	28.87	−17.6	30.51	69 58 00	157 40	N.	4s	0	0	0	Strat.	1	0	......	......	00	Clear.
	7 p.m.	28.70	−7.3	30.34	70 10 00	157 49	E.	4s	Cir.	2	0	Strat.	1	0	......	......	00	Clear.
	11 p.m.	28.45	−12.5	30.09	70 16 00	157 52	E.	3s	0	0	0	0	0	0	......	......	00	Clear.
Apr. 4	3 a.m.	28.49	−31.2	30.13	70 16 00	157 52	Calm.		0	0	0	0	0	0	......	......	00	Clear.‡
	7 a.m.	28.49	−37.8	30.13	70 16 00	157 52	Calm.		0	0	0	0	0	0	......	......	00	Clear.§
	11 a.m.	28.45	−26.0	30.09	70 16 00	157 52	Calm.		0	0	0	Strat.	1	0	......	......	00	Clear.
	3 p.m.	28.43	3.1	30.07	70 16 00	157 52	Calm.		0	0	0	0	0	0	......	......	00	Clear.
	7 p.m.	28.21	8.3	29.85	70 16 00	157 52	Calm.		0	0	0	Strat.	1	0	......	......	00	Clear.
	11 p.m.	28.39	2.4	30.03	70 16 00	157 52	W.	1s	0	0	0	Strat.	2	0	......	......	00	Clear.
Apr. 5	3 a.m.	28.31	−32.2	29.95	70 16 00	157 52	S.	3s	0	0	0	Strat.	[illegible]	0	......	......	00	Clear.
	7 a.m.	28.30	−26.3	29.94	70 16 00	157 52	S.	3s	Hidden.			Strat.	10	0	......	......	00	Cloudy.
	11 a.m.	28.27	−18.5	29.91	70 16 00	157 52	S.	2s	Hidden.			Strat.	10	0	......	......	00	Cloudy.
	3 p.m.	28.17	−8.6	29.81	70 21 00	157 45	W.	2s	Hidden.			Strat.	10	0	......	......	00	Cloudy.
	7 p.m.	28.21	−7.7	29.85	70 27 00	157 25	Calm.		Cir.	7	0	Strat.	1	0	......	......	00	Cloudy.
	11 p.m.	28.20	−10.6	29.84	70 28 00	157 17	Calm.		Cir.	3	0	Strat.	4	0	......	......	00	Fair.
Apr. 6	3 a.m.	28.10	−13.4	29.74	70 28 00	157 17	Calm.		Hidden.			Strat.	10	0	......	......	00	Cloudy.
	7 a.m.	28.09	−14.8	29.73	70 28 00	157 17	Calm.		Hidden.			Strat.	10	0	......	......	00	Cloudy.
	11 a.m.	28.01	−13.4	29.65	70 28 00	157 17	Calm.		Hidden.			Strat.	10	0	......	......	00	Cloudy.
	3 p.m.	28.01	−24.0	29.65	70 33 00	157 15	Calm.		Cir.	3	0	Strat.	5	0	......	......	00	Cloudy.
	7 p.m.	28.00	−3.2	29.64	70 42 00	157 10	S.	5s	Hidden.			Strat.	10	0	......	......	00	Cloudy.
	11 p.m.	28.00	−9.8	29.64	70 47 00	157 12	Calm.		0	0	0	Strat.	7	0	......	......	00	Fair.
Apr. 7	3 a.m.	28.10	−27.3	29.74	70 47 00	157 12	Calm.		0	0	0	Strat.	4	0	......	......	00	Fair.
	7 a.m.	28.15	−22.2	29.79	70 47 00	157 12	Calm.		Hidden.			Strat.	10	0	......	......	00	Cloudy.
	11 a.m.	28.10	−22.3	29.70	70 47 00	157 12	Calm.		Cir.	3	0	Strat.	4	0	......	......	00	Fair.
	3 p.m.	28.05	−10.4	29.69	70 57 00	157 15	ESE.	5s	Cir.	4	0	Strat.	4	0	......	......	00	Cloudy.
	7 p.m.	28.00	−8.8	29.64	71 00 00	157 00	ESE.	7s	Cir.	2	0	0	0	0	......	......	00	Clear.

* Parhelion at 3.30 p.m.; also at 11 p.m. † Aurora E. & NE., altitude 25°. ‡ Aurora in S. § Aurora in S. & SW.

Correction for barometer, April 7, + 1.64 by comparison upon return to station; applied from 3 a.m. April 3. Number of barometer used during trip, Aneroid No. 165. Instrumental error, + .076.

METEOROLOGY OF THE VOYAGE FROM POINT BARROW TO SAN FRANCISCO.

These observations are the direct continuation of the regular meteorological work of the station, and were taken as above described.

Meteorological record of the voyage of the schooner Leo from Point Barrow, Alaska, to San Francisco, California.

AUGUST 28, 1883.

[Washington time. Correction to reduce to local time, —5 hours 17 minutes. Italic *s* signifies *slow*; *r* signifies *rapid*. Schooner abreast of station, Uglaamie, Alaska, latitude 71° 17′ N., longitude 156° 23′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch*			
*1 a. m.	....	.....	.....	.....	....	....	....	.....	....	....	.....	....	.....	.....	.....	.....	....	...
*2 a. m.	....	.....	.....	.....	....	....	....	.....	....	....	.....	....	.....	.....	.....	.....	....	...
*3 a. m.	....	.....	.....	.....	....	....	....	.....	....	....	.....	....	.....	.....	.....	.....	....	...
*4 a. m.	....	.....	.....	.....	....	....	....	.....	....	....	.....	....	.....	.....	.....	.....	....	...
*5 a. m.	....	.....	.....	.....	....	....	....	.....	....	....	.....	....	.....	.....	.....	.....	....	...
6 a. m.	†29.700	43.4	43.4	100	SE.	Fresh..	Hidden.			Stratus.	10	SW.*s*	......	......	00	......	Cloudy....	D.
7 a. m.	29.700	42.5	42.5	100	SE.	Fresh..	0	0	0	Stratus..	8	SW.*s*	......	......	00	......	Cloudy....	D.
8 a. m.	29.670	42.0	42.1	.....	SE.	Fresh..	0	0	0	Stratus.	8	SW.*r*	......	......	00	33.8	Cloudy....	C.
9 a. m.	29.670	41.0	40.8	98	SE.	Fresh..	Cirrus..	1	0	Stratus.	7	SW.*r*	......	......	00	33.2	Cloudy....	C.
10 a. m.	29.670	42.6	42.5	99	SSE.	Fresh..	Cir. cu...	6	0	Stratus.	4	SW.*s*	......	......	00	33.5	Cloudy....	G.
11 a. m.	29.660	43.5	43.7	.....	SSE.	Fresh..	Cirrus..	4	SW.*s*	Stratus.	4	SW.*s*	......	......	00	36.1	Cloudy....	G.
12 m.	29.640	44.0	44.0	100	SSE.	Fresh..	Cirrus..	2	SW.*s*	Stratus.	7	0	......	......	00	36.0	Cloudy....	M.
1 p. m.	29.630	44.3	44.0	97	SSE.	Fresh..	Cirrus..	2	0	Stratus	5	S.*s*	......	......	00	36.1	Fair......	M.
2 p. m.	29.635	48.4	48.0	96	S.	Fresh..	Hidden.			Stratus.	10	S.*s*	......	......	00	36.2	Cloudy....	M.
3 p. m.	29.645	50.5	50.0	93	S.	Fresh..	Hidden.			Stratus.	10	S.*s*	......	......	00	36.5	Cloudy....	M.
4 p. m.	29.635	52.3	52.2	99	S.	Light..	Hidden.			Stratus	10	0	......	......	00	36.7	Cloudy....	M.
5 p. m.	29.610	53.0	50.0	80	S.	Light..	Hidden.			Stratus.	10	0	......	......	00	36.8	Cloudy....	M.
6 p. m.	29.610	55.0	51.0	76	S.	Light..	Hidden.			Stratus.	10	0	......	......	00	37.0	Cloudy....	M.
7 p. m.	29.650	52.0	49.5	83	S.	Light..	Hidden.			Stratus.	10	0	......	......	00	36.5	Cloudy....	M.
8 p. m.	29.660	42.1	42.1	100	W.	Light..	Hidden.			Nimbus.	10	0	7.30	......	.01	36.7	Light rain.	M.
9 p. m.	29.665	45.0	44.6	96	Calm.		0	0	0	Stratus.	9	0	......	......	.01	36.0	Cloudy....	A.
10 p. m.	29.675	48.2	47.8	97	E.	Light..	0	0	0	Cumulus Stratus.	5 3	0	......	9.20	.—	36.2	Cloudy....	A.
11 p. m.	20.685	47.5	46.4	02	ESE.	Light..	Hidden.			Stratus.	10	0	......	......	00	36.5	Cloudy....	A.
12 p. m.	29.675	46.6	46.0	93	SSW.	Light..	Hidden.			Stratus.	10	S.*s*	11.25	11.50	.—	36.3	Cloudy....	A.

AUGUST 29, 1883.

[From Uglaamie, Alaska, to Seahorse Islands, latitude 70° 51′ N., longitude 156° 25′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.680	43.0	41.5	88	SW.	Light..	0	0	0	Stratus.	9	SW.*s*	......	......	00	36.3	Cloudy....	S.
2 a. m.	29.685	41.6	40.6	91	SW.	Light..	0	0	0	Stratus.	8	SW.*s*	......	......	00	36.2	Cloudy....	S.
3 a. m.	29.680	42.2	41.3	93	E.	Light..	0	0	0	Stratus.	8	0	......	......	00	36.0	Cloudy....	S.
4 a. m.	29.680	41.3	40.8	96	SE.	Gentle.	Cir. cu..	2	0	Stratus.	7	SE.*s*	......	......	00	35.8	Cloudy....	S.
5 a. m.	29.680	40.5	40.0	96	ESE.	Gentle.	Cir. cu..	3	0	Stratus.	6	SE.	......	......	00	36.0	Cloudy....	D.
6 a. m.	29.685	39.7	39.2	95	E.	Light..	0	0	0	Stratus.	5	E.*s*	......	......	00	35.8	Fair......	D.
7 a. m.	29.685	40.3	39.9	96	ENE.	Gentle.	0	0	0	Stratus.	9	ENE.*s*	......	......	00	35.8	Cloudy....	D.
8 a. m.	29.650	40.0	39.5	95	E.	Light..	0	0	0	Stratus.	9	E.*s*	......	......	00	35.7	Cloudy....	D.
9 a. m.	29.630	38.5	38.1	96	ENE.	Light..	Cir. cu..	2	0	Stratus.	6	E.*s*	......	......	00	36.0	Cloudy....	A.
10 a. m.	29.625	39.0	38.7	97	ENE.	Gentle.	0	0	0	Stratus.	7	E.*s*	......	......	00	36.4	Fair......	A.
11 a. m.	29.615	40.8	40.6	08	E.	Fresh..	Cir. cu..	3	0	Stratus	5	0	......	......	00	36.5	Cloudy....	A.
12 m.	29.610	42.5	42.4	99	SE.	Gentle.	Hidden.			Nimbus	10	0	11.30	......	.01	35.8	Light rain.	A.
1 p. m.	29.610	42.3	42.3	100	SSE.	Gentle.	Hidden.			Nimbus.	10	0	......	......	.—	36.0	Light rain	G.
2 p. m.	29.595	43.2	43.2	100	SSE.	Gentle.	Hidden.			Nimbus.	10	0	......	......	.01	36.0	Light rain	G.
3 p. m.	29.580	43.0	43.0	100	NE.	Gentle.	Hidden.			Stratus.	10	0	......	2.30	.—	37.0	Cloudy....	G.
4 p. m.	20.570	44.6	44.2	96	NE.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	38.5	Cloudy....	G.
5 p. m.	29.570	47.0	44.9	85	E.	Fresh	Cirrus.. Cir. st..	3 2	0	Stratus.	3	0	......	......	00	38.5	Cloudy....	C.
6 p. m.	20.560	47.0	44.9	92	SE.	Fresh..	Cir. st..	7	0	Stratus.	2	0	......	......	00	38.0	Cloudy....	C.
7 p. m.	29.560	49.5	46.9	83	SE.	Fresh	Cir. cu.. Cir. st..	2 3	0	Stratus.	2	0	......	......	00	38.5	Fair......	C.
8 p. m.	29.570	50.0	46.9	80	SE.	Fresh	Cir. cu.. Cumulus	2 2	0	Stratus.	5	0	......	......	00	39.0	Cloudy....	C.
9 p. m.	29.580	50.2	46.6	75	SE.	Fresh..	Cirrus..	1	0	Cumulus Stratus	2 3	0 0	......	......	00	42.0	Fair......	M.
10 p. m.	‡29.603	48.0	45.6	81	WSW.	Light..	Cirrus..	1	0	Cumulus Stratus.	2 2	0 0	......	......	00	42.0	Fair......	M.
11 p. m.	29.608	46.0	44.2	85	W.	Light..	Cirrus..	2	0	Stratus.	4	0	......	......	00	42.0	Fair......	M.
12 p. m.	23.625	47.1	45.1	85	SW.	Light..	Cirrus..	1	0	Stratus	6	0	......	......	00	41.5	Fair......	M.

*Observations interrupted while moving instruments from shelter to the schooner. †Aneroid barometer used until 10 p. m. August 29th. ‡Marine barometer used at and after this observation.

Meteorological record of the voyage of the schooner Leo, &c.—**Continued.**

AUGUST 30, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. **Schooner off Seahorse Islands, latitude 70° 51′ N., longitude 158° 25′ W.**]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29.551	45.3	44.0	90	SSW.	Light ..	Cirrus ..	1	0	Stratus .	3	0	......	......	00	41.6	Fair.......	S.
2 a. m.	29.568	45.0	43.8	90	SW.	Fresh ..	Cirrus ..	2	0	Stratus .	4	SW. *r*	......	......	00	41.0	Fair.......	S.
3 a. m.	29.586	44.6	44.0	95	S.	Gentle .	Cir. cu ..	1	0	Stratus .	8	S. *s*	......	......	00	41.4	Cloudy....	S.
4 a. m.	29.593	44.0	43.9	98	S.	Fresh ..	Cir. cu ..	3	0	Stratus .	7	S. *r*	3.25	3.45	.—	41.2	Cloudy....	S.
5 a. m.	29.621	41.5	40.7	93	SW.	High...		Hidden.		Stratus .	10	SW. *r*	......	......	00	41.6	Cloudy....	D.
6 a. m.	29.661	35.4	35.0	94	W.	High...		Hidden.		Stratus .	10	W. *r*	......	......	00	40.4	Cloudy....	D.
7 a. m.	29.721	34.3	33.8	95	WNW.	High...		Hidden.		Stratus .	10	0	......	......	00	40.2	Cloudy....	D.
8 a. m.	29.754	35.0	34.3	93	NW.	Gentle .	0	0	0	Stratus .	8	0	......	......	00	40.4	Cloudy....	D.
9 a. m.	29.747	33.5	33.4	99	W.	Brisk ..		Hidden.		Nimbus.	10	0	8.20	......	.—	40.6	Light snow	A.
10 a. m.	29.773	33.0	32.9	99	SW.	Brisk ..		Hidden.		Nimbus.	10	0	......	......	.—	40.5	Light snow	A.
11 a. m.	29.788	34.0	33.9	99	SSW.	Brisk ..		Hidden.		Nimbus.	10	0	......	......	.—	40.8	Light snow	A.
12 m.	29.806	35.8	35.3	95	SSW.	Fresh ..	Cumulus	5	0	Stratus .	3	0	......	11.10	.—	40.8	Cloudy....	A.
1 p. m.	29.829	36.7	35.2	85	SW.	Fresh ..	Cir. cu ..	1	0	Stratus .	9	SW. *s*	......	......	00	40.7	Cloudy....	G.
2 p. m.	29.859	39.0	36.5	77	SSW.	Brisk ..	0	0	0	Cumulus	6	SSW. *s*	......	......	00	41.1	Fair.......	G.
3 p. m.	29.865	39.7	36.7	73	SSW.	Fresh ..	0	0	0	Cumulus	4	SSW. *s*	......	......	00	42.1	Fair.......	G.
4 p. m.	29.879	40.5	39.5	91	SW.	Fresh ..	0	0	0	Cumulus	7	SW. *s*	......	......	00	42.0	Fair.......	G.
5 p. m.	29.888	40.0	38.4	87	SW.	Fresh ..	0	0	0	Cu. str ..	8	SW. *s*	4.20	4.45	.—	42.0	Cloudy....	C.
6 p. m.	29.916	41.5	39.4	83	SW.	Fresh ..		Hidden.		Cu. str ..	9	SW. *s*	5.10	5.20	.—	42.5	Cloudy....	C.
7 p. m.	29.918	39.0	37.9	91	SW.	Fresh ..		Hidden.		Nimbus	9	SW. *s*	6.45	......	.—	42.5	Light rain.	C.
8 p. m.	29.925	39.5	37.9	87	SW.	Fresh ..	0	0	0	Cu. str ..	7	SW. *s*	......	7.05	.—	42.5	Fair.......	C.
9 p. m.	29.925	40.6	37.8	75	WNW.	Fresh ..	0	0	0	Stratus .	6	W. *s*	......	......	00	42.2	Fair.......	M.
10 p. m.	29.948	39.8	37.5	79	W.	Fresh ..	0	0	0	Stratus .	9	W. *r*	......	......	00	42.2	Cloudy....	M.
11 p. m.	29.943	39.8	37.5	79	WNW.	Fresh ..	0	0	0	Stratus .	9	WNW. *s*	......	......	00	42.1	Cloudy....	M.
12 p. m.	29.946	39.6	39.6	82	W.	Fresh ..	0	0	0	Stratus .	9	W. *s*	......	......	00	42.1	Cloudy....	M.

AUGUST 31, 1883.

[From Seahorse Islands to Point Belcher, latitude 70° 47′ N., longitude 159° 30′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.956	39.8	38.9	92	WSW.	Gentle .	0	0	0	Stratus .	9	WSW. *s*	......	......	00	42.0	Cloudy....	S.
2 a. m.	29.968	39.5	38.3	87	W.	Gentle .	0	0	0	Stratus .	9	W. *s*	......	......	00	42.3	Cloudy....	S.
3 a. m.	29.962	39.0	38.0	91	SW.	Light ..	0	0	0	Stratus .	8	0	......	......	00	42.2	Cloudy....	S.
4 a. m.	29.956	38.8	37.6	89	S.	Gentle .	Cir. st ..	2	0	Stratus .	6	0	......	......	00	42.0	Cloudy....	S.
5 a. m.	29.950	39.4	38.5	91	S.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	42.0	Cloudy....	D.
6 a. m.	29.944	38.5	37.5	90	SSE.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.9	Cloudy....	D.
7 a. m.	29.930	38.5	37.5	90	SSE.	Light ..		Hidden.		Stratus .	10	0	......	......	00	42.0	Cloudy....	D.
8 a. m.	29.904	38.7	37.8	91	S E.	Light ..	0	0	0	Stratus .	7	0	......	......	00	42.0	Fair.......	D.
9 a. m.	2[illegible].894	39.0	38.5	95	SE.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.8	Cloudy....	A.
10 a. m.	29.876	38.8	38.4	96	ESE.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.9	Cloudy....	A.
11 a. m.	29.867	39.0	38.4	94	SSE.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	42.0	Cloudy....	A.
12 m.	29.846	39.5	38.5	91	SE.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.7	Cloudy....	A.
1 p. m.	21.831	38.2	37.0	92	SSE.	Fresh ..		Hidden.		Nimbus.	10	0	12.30	......	.—	41.7	Light rain.	G.
2 p. m.	29.807	37.3	37.1	98	S.	Gentle		Hidden.		Nimbus.	10	S. *s*	......	......	.01	41.4	Light rain.	G.
3 p. m.	29.786	37.7	37.6	99	S.	Gent e .		Hidden.		Nimbus.	10	S. *s*	......	......	.—	41.4	Light rain.	G.
4 p. m.	29.762	38.0	37.8	98	S.	Gentle .		Hidden.		Nimbus.	10	S. *s*	......	......	.01	41.8	Light rain.	G.
5 p. m.	29.747	38.0	37.4	95	SSE.	Gentle .		Hidden.		Nimbus.	10	S. *s*	......	......	.—	41.5	Light rain	C.
6 p. m.	29.730	37.5	36.9	94	S.	Gentle .		Hidden.		Nimbus.	10	S. *s*	......	......	.—	41.5	Light rain	C.
7 p. m.	29.725	38.0	37.4	95	Calm.			Hidden.		Nimbus.	10	0	......	......	.—	41.5	Light rain	C.
8 p. m.	29.712	38.0	37.6	96	Calm.			Hidden.		Nimbus	9	0	......	......	.—	41.3	Light rain.	C.
9 p. m.	29.724	38.4	37.7	93	NW.	Gentle .		Hidden.		Stratus .	10	0	......	9.00	.—	41.2	Cloudy....	M.
10 p. m.	23.724	38.0	37.0	90	NW.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.4	Cloudy....	M.
11 p. m.	29.737	37.1	36.4	93	NW.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.2	Cloudy....	M.
12 p. m.	29.741	35.0	34.3	93	NW.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	41.0	Cloudy....	M.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 1, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 70° 29' N., longitude 16[illegible] W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											Inch.			
1 a. m.	29.775	34.6	34.2	96	NW.	Light ..	Cirrus .	4	0	Stratus	2	NW.*s*	......	......	00	43.0	Fair	S.
2 a. m.	29.770	34.0	33.7	97	NW.	Gentle	Hidden.			Stratus	10	0	......	......	00	[illegible]	Cloudy ...	S.
3 a. m.	29.774	33.5	33.3	98	NW.	Light ..	Hidden.			Dense fog.			......	......	00	42.2	Foggy ...	S.
4 a. m.	29.794	33.0	32.4	99	NW.	Light ..	Hidden.			Dense fog.			......	......	00	42.5	Foggy ...	S.
5 a. m.	29.805	30.0	30.1	.....	N.	Light ..	Hidden.			Dense fog.			......	......	00	42.5	Foggy ...	D.
6 a. m.	29.804	31.2	31.0	98	N.	Light ..	Hidden.			Dense fog.			......	......	00	43.0	Foggy ...	D.
7 a. m.	29.815	30.8	30.5	97	N.	Light ..	Hidden.			Stratus .	10	0	......	......	00	43.0	Cloudy ...	D.
8 a. m.	29.822	30.5	30.2	97	N.	Light ..	Hidden.			Stratus .	10	0	......	......	00	42.1	Cloudy ...	D.
9 a. m.	29.825	30.0	29.9	99	N.	Light ..	Hidden.			Stratus	10	0	......	......	00	42.8	Cloudy ...	A.
10 a. m.	29.830	30.0	29.9	99	NW.	Gentle .	Hidden.			Stratus	10	0	......	......	00	42.6	Cloudy ...	A.
11 a. m.	29.836	30.5	30.5	100	N.	Gentle .	Hidden.			Stratus .	10	0	......	......	00	41.2	Cloudy ...	A.
12 m.	29.822	32.2	32.1	99	N.	Gentle .	Hidden.			Stratus .	10	0	......	......	00	40.0	Cloudy ...	A.
1 p. m.	29.804	33.0	33.9	100	ENE.	Fresh ..	Hidden.			Stratus .	10	0	......	......	00	39.3	Cloudy ...	G.
2 p. m.	29.791	33.9	33.8	99	ENE.	Fresh ..	Hidden.			Stratus .	10	0	......	......	00	40.1	Cloudy ...	G.
3 p. m.	29.795	35.4	35.5	.....	ENE.	Fresh ..	Hidden.			Stratus .	10	0	......	......	00	39.7	Cloudy ...	G.
4 p. m.	29.770	36.3	36.2	99	ENE.	Fresh ..	Hidden.			Stratus .	10	0	......	......	00	41.1	Cloudy	G.
5 p. m.	29.761	37.5	37.0	95	ENE.	Fresh ..	Hidden.			Stratus .	10	0	......	......	00	41.2	Cloudy ...	C.
6 p. m.	29.724	38.3	38.0	98	E.	Fresh ..	Hidden.			Nimbus.	10	0	5.15	......	.—	43.3	Light rain.	C.
7 p. m.	29.723	39.0	39.0	100	E.	Fresh ..	Hidden.			Nimbus.	10	0	......	......	.02	43.9	Light rain	C.
8 p. m.	29.695	40.2	40.1	99	E.	Brisk ..	Hidden.			Nimbus	10	0	......	......	.02	43.9	Light rain.	C.
9 p. m.	29.676	41.0	40.8	98	ENE.	Brisk ..	Hidden.			Stratus	10	0	......	8.30	.—	43.0	Cloudy ...	M.
10 p. m.	29.633	41.1	41.0	99	ENE.	Brisk ..	Hidden.			Nimbus.	10	0	9.50	......	.—	43.8	Light rain.	M.
11 p. m.	29.628	43.4	43.4	100	ENE.	Brisk ..	Hidden.			Nimbus	10	0	......	......	.01	44.5	Light rain	M.
12 p. m.	29.620	44.5	44.5	100	S.	Gentle .	Hidden.			Nimbus	10	0	......	......	.02	44.6	Light rain	M.

SEPTEMBER 2, 1883.

[Latitude 68° 08' N., longitude 164° 59' W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds kind.	Amount in 10ths.	Direction (moving from—)	Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.599	45.0	45.0	100	SW.	Light ..	Hidden.			Stratus .	10	0	......	12.50	.01	45.0	Cloudy	S.
2 a. m.	29.608	44.8	44.0	100	SW.	Light ..	Hidden.			Nimbus	10	0	1.10	......	.02	45.0	Light rain	S.
3 a. m.	29.633	44.5	44.3	98	WSW.	Light ..	Hidden.			Stratus .	10	0	......	2.30	.—	45.2	Cloudy ...	S.
4 a. m.	29.677	44.2	43.7	96	NNW.	Light ..	Hidden.			Stratus	10	0	......	......	00	45.2	Cloudy ...	S.
5 a. m.	29.720	42.5	42.0	95	NNW.	Gentle .	Hidden.			Stratus .	10	0	......	......	00	45.3	Cloudy ...	D.
6 a. m.	29.741	40.0	40.0	100	NNW.	Fresh ..	Hidden.			Stratus	10	0	......	......	00	45.3	Cloudy	D.
7 a. m.	29.777	38.9	38.8	99	NNE.	Gentle .	Hidden.			Stratus .	10	0	......	......	00	45.2	Cloudy	D.
8 a. m.	29.802	39.4	39.3	99	NNE.	Gentle .	Hidden.			Stratus	10	0	......	......	00	45.5	Cloudy ...	D.
9 a. m.	29.834	39.2	39.1	99	NW.	Gentle .	Hidden.			Stratus .	10	0	......	......	00	45.5	Cloudy	A.
10 a. m.	29.861	39.2	39.0	98	NW.	Gentle .	Hidden.			Stratus .	10	0	......	......	00	45.3	Cloudy	A.
11 a. m.	29.863	39.5	39.4	99	NW.	Light ..	Hidden.			Stratus .	10	0	......	......	00	45.3	Cloudy ...	A.
12 m.	29.891	40.0	39.7	97	NW.	Light ..	Hidden.			Stratus	10	[illegible]	......	......	00	45.2	Cloudy	A.
1 p. m.	29.932	40.2	40.2	100	NNW.	Light ..	Hidden.			Stratus .	10	0	......	......	00	45.4	Cloudy	G.
2 p. m.	29.932	40.3	40.2	99	NNW.	Light ..	Hidden.			Stratus .	10	0	......	......	00	45.4	Cloudy	G.
3 p. m.	29.944	41.3	41.0	97	NNW.	Light ..	Hidden.			Stratus .	10	0	2.10	2.40	.—	45.4	Cloudy	G.
4 p. m.	29.979	40.8	40.6	98	NW.	Light ..	Hidden.			Nimbus	10	0	3.55	......	.—	45.3	Light rain	G.
5 p. m.	29.994	40.8	40.5	97	NNW.	Fresh ..	Hidden.			Nimbus.	10	0	......	......	.—	45.0	Light rain.	C.
6 p. m.	30.023	40.5	40.0	95	NNW.	Brisk ..	Hidden.			Stratus .	10	0	......	......	.—	45.2	Cloudy ...	C.
7 p. m.	30.041	40.0	39.2	94	NNW.	Brisk ..	Hidden.			Stratus .	10	0	......	5.45	00	45.8	Cloudy	C.
8 p. m.	30.072	39.4	38.7	94	NNW.	Brisk ..	Hidden.			Stratus .	10	0	......	......	00	45.8	Cloudy ...	C.
9 p. m.	30.084	39.5	38.0	83	N.	Brisk ..	Hidden.			Stratus .	10	0	......	......	00	45.0	Cloudy	M.
10 p. m.	30.100	39.8	37.8	82	NNE.	Brisk ..	Hidden.			Stratus	10	0	......	......	00	45.8	Cloudy ...	M.
11 p. m.	30.105	39.6	37.6	82	NNE.	Brisk ..	Hidden.			Stratus .	10	N.*s*	......	......	00	45.8	Cloudy ...	M.
12 p. m.	30.121	39.0	37.0	82	NNE.	Brisk ..	Hidden.			Stratus	10	N.*s*	......	......	00	45.6	Cloudy	M.

Meteorological record of the voyage of the schooner Leo, &c.—**Continued.**

SEPTEMBER 3, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 65° 53′ N., longitude 168° 22′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct											Inch.			
1 a. m.	30.158	37.2	36.2	90	NE.	Brisk ..		Hidden.		Stratus .	10	NE.*s*	......	......	00	44.8	Cloudy....	S.
2 a. m.	30.149	38.0	36.8	88	NE.	Brisk ..		Hidden.		Stratus .	10	NE.*s*	......	......	00	45.0	Cloudy....	S.
3 a. m.	30.163	37.7	36.1	85	N.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	45.0	Cloudy....	S.
4 a. m.	30.177	37.3	35.4	82	N.	Brisk ..	Cirrus ..	2	0	Stratus .	6	0	......	......	00	44.2	Cloudy....	S.
5 a. m.	30.177	37.2	35.3	82	N.	Brisk ..	Cirrus ..	2	0	Stratus .	7	0	......	......	00	43.8	Cloudy....	D.
6 a. m.	30.191	37.6	35.5	81	N.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	38.9	Cloudy....	D.
7 a. m.	30.197	36.4	35.0	86	NNE.	Brisk ..	0	0	0	Stratus .	10	0	......	......	00	37.6	Cloudy....	D.
8 a. m.	30.208	36.4	35.0	86	N.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	37.8	Cloudy....	D.
9 a. m.	30.209	37.0	35.9	89	N.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	37.8	Cloudy....	A.
10 a. m.	30.197	37.0	35.9	89	N.	Brisk ..		Hidden.		Stratus .	10	N.*r*	......	......	00	37.9	Cloudy....	A.
11 a. m.	30.192	36.8	35.6	88	N.	Brisk ..		Hidden.		Stratus .	10	N.*r*	......	......	00	38.2	Cloudy....	A.
12 m.	30.202	37.0	35.9	89	N.	Brisk .		Hidden.		Stratus .	10	N.*r*	......	......	00	38.6	Cloudy....	A.
1 p. m.	30.209	37.3	36.8	95	NNE.	Brisk ..		Hidden.		Stratus .	10	NNE.*r*	......	......	*.—	40.5	Cloudy....	G.
2 p. m.	30.206	38.0	37.0	90	N.	Brisk ..		Hidden.		Stratus .	10	N.*r*	......	......	00	44.2	Cloudy....	G.
3 p. m.	30.191	39.0	37.8	88	NNE.	Brisk ..		Hidden.		Stratus .	10	NNE.*r*	......	......	00	46.5	Cloudy....	G.
4 p. m.	30.168	40.5	39.0	87	NNE.	Brisk ..	0	0	0	Cumulus	9	NNE.*r*	......	......	00	46.9	Cloudy....	G.
5 p. m.	30.150	40.2	38.9	87	NNE.	Brisk ..	0	0	0	Cumulus	9	NNE.*r*	......	......	00	47.0	Cloudy....	C.
6 p. m.	30.121	41.0	39.9	90	NE.	High...		Hidden.		Cum. st.	10	NE.*r*	......	......	00	47.0	Cloudy....	C.
7 p. m.	30.110	41.0	40.0	91	NE.	High...		Hidden.		Stratus	10	NE.*r*	......	......	00	46.0	Cloudy....	C.
8 p. m.	30.075	42.0	41.1	92	NNE.	High...		Hidden.		Stratus .	10	NE.*r*	......	......	00	46.0	Cloudy....	C.
9 p. m.	30.007	44.5	43.0	88	NE.	High...		Hidden.		Stratus .	10	NE.*r*	......	......	*.—	47.8	Cloudy....	M.
10 p. m.	29.983	43.8	42.8	92	ENE.	High...		Hidden.		Stratus .	10	ENE.*r*	......	......	00	47.8	Cloudy....	M.
11 p. m.	29.984	44.8	43.8	92	E.	High...		Hidden.		Stratus .	10	E.*s*	......	......	00	47.9	Cloudy....	M.
12 p. m.	29.980	46.2	45.2	92	ENE.	High...		Hidden.		Nimbus.	10	0	11.40	......	.02	48.0	Light rain.	M.

SEPTEMBER 4, 1883.

[Latitude 75° 15′ 30″ N., longitude 157° 30′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.970	49.0	47.8	91	ENE.	Brisk ..		Hidden.		Stratus .	10	0	......	12.15	.—	48.0	Cloudy....	S.
2 a. m.	29.970	50.2	48.8	90	ENE.	Light ..		Hidden.		Stratus .	10	0	......	......	00	48.4	Cloudy....	S.
3 a. m.	29.971	51.3	49.3	86	NW.	Light ..		Hidden.		Stratus .	10	0	......	......	00	48.3	Cloudy....	S.
4 a. m.	29.975	49.9	48.8	91	NW.	Light ..		Hidden.		Stratus .	10	0	......	......	00	48.5	Cloudy....	S.
5 a. m.	29.975	50.2	48.3	87	Calm.			Hidden.		Stratus .	10	0	......	......	00	48.4	Cloudy....	D.
6 a. m.	29.969	50.2	48.3	87	ENE.	Light ..		Hidden.		Nimbus.	10	0	5.10	......	.—	48.3	Light rain.	D.
7 a. m.	29.969	49.3	48.3	92	ENE.	Light ..		Hidden.		Stratus .	10	0	......	6.15	.—	48.3	Cloudy....	D.
8 a. m.	29.969	49.3	48.3	92	E.	Light ..		Hidden.		Stratus .	10	0	......	......	00	48.6	Cloudy....	D.
9 a. m.	29.971	49.0	48.9	99	ENE.	Light ..		Hidden.		Lt. fog.. .... Stratus .	10	0	......	......	00	48.1	Cloudy....	A.
10 a. m.	29.961	48.5	48.4	99	E.	Light ..		Hidden.		Lt. fog.. .... Stratus .	10	0	......	......	00	48.2	Cloudy....	A.
11 a. m.	29.966	48.8	48.8	100	ESE.	Light ..		Hidden.		Dense fog.		0	......	......	00	48.0	Foggy	A.
12 m.	29.945	49.0	49.0	100	ESE.	Light ..		Hidden.		Lt. fog.. .... Stratus .	10	0	......	......	00	47.8	Cloudy....	A.
1 p. m.	29.950	49.1	49.8	.....	ESE.	Light ..		Hidden.		Lt. fog.. .... Stratus .	10	0	......	......	00	47.8	Cloudy....	G.
2 p. m.	29.935	49.3	49.3	100	ENE.	Light ..		Hidden.		Lt. fog.. .... Stratus	10	0	......	......	00	47.0	Cloudy....	G.
3 p. m.	29.930	49.2	49.4	....	E.	Light ..		Hidden.		Stratus .	10	0	......	......	00	48.1	Cloudy....	G.
4 p. m.	29.925	49.7	49.9	.....	E.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	48.0	Cloudy....	G.
5 p. m.	29.908	50.5	49.7	94	ENE.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	49.2	Cloudy....	C.
6 p. m.	29.899	50.7	50.1	94	ENE.	Fresh	Cir. cu . Cir. st ..	2 2	0 0	Stratus .	4	0	......	......	00	40.0	Cloudy....	C.
7 p. m.	29.880	50.7	50.1	95	ENE.	Fresh ..	Cir. st ..	3	0	Stratus .	5	0	......	......	00	49.0	Cloudy....	C.
8 p. m.	29.849	51.0	50.4	96	ENE.	Fresh ..	Cir. st ..	3	0	Stratus .	7	0	......	......	00	49.0	Cloudy....	C.
9 p. m.	29.832	51.7	50.4	91	ENE.	Fresh ..		Hidden.		Nimbus.	10	0	8.50	......	.01	48.7	Light rain.	M.
10 p. m.	29.819	51.7	50.4	91	ENE.	Light ..		Hidden.		Stratus .	10	E.*s*	......	9.15	.01	48.7	Cloudy....	M.
11 p. m.	29.799	52.2	50.7	90	E.	Light ..		Hidden.		Stratus .	10	E.*s*	......	......	00	48.6	Cloudy....	M.
12 p. m.	29.788	52.3	50.3	86	ESE.	Light ..		Hidden.		Stratus .	10	SE.*s*	......	......	00	48.9	Cloudy....	M.

*Light showers between observations.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 5, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 61° 50′ N., longitude 16 ° 47′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29.789	50.1	49.1	93	ESE.	Light..	Hidden.			Nimbus.	10	0	12.45	......	.—	48.0	Light rain.	S.
2 a. m.	29.791	47.2	47.2	100	ESE.	Gentle.	Hidden.			Nimbus.	10	0	......	......	.02	47.3	Light rain	S.
3 a. m.	29.781	47.0	47.0	100	ENE.	Brisk..	Hidden.			Nimbus.	10	0	......	......	.01	45.2	Light rain	S.
4 a. m.	29.770	46.9	46.9	100	ESE.	Brisk..	Hidden.			Nimbus.	10	0	......	......	.01	43.0	Light rain	S.
5 a. m.	29.757	46.8	46.8	100	ESE.	Brisk..	Hidden.			Stratus.	10	0	......	4.20	.—	43.0	Cloudy....	D.
6 a. m.	29.703	45.8	45.6	98	ESE.	Brisk..	Hidden.			Stratus.	10	0	......	......	00	43.0	Cloudy....	D.
7 a. m.	29.700	45.1	45.1	100	ESE.	Brisk..	Hidden.			Nimbus.	10	0	6.10	......	.01	42.8	Light rain.	D.
8 a. m.	29.698	48.6	48.6	100	SE.	Brisk..	Hidden.			Nimbus.	10	0	......	......	.—	43.5	Light rain.	D.
9 a. m.	29.698	49.0	49.0	100	ESE.	Brisk..	Hidden.			Nimbus	10	0	......	......	.—	46.8	Light rain.	A.
10 a. m.	29.698	49.8	49.8	100	ESE.	Brisk..	Hidden.			Nimbus.	10	0	......	......	.01	45.8	Light rain	A.
11 a. m	29.678	48.5	48.4	99	SE.	Brisk..	Hidden.			Stratus.	10	SE.	......	10.25	.—	47.4	Cloudy....	A.
12 m.	29.672	47.2	47.1	99	ESE.	Fresh..	Cumulus	3	0	Stratus.	5	0	......	......	00	45.6	Cloudy....	A.
1 p. m.	29.677	48.4	48.2	98	SE.	Fresh..	Hidden.			Stratus.	10	SE.*s*	......	......	00	48.1	Cloudy....	G.
2 p. m.	29.681	50.0	49.7	97	SE.	Brisk..	Hidden.			Stratus.	10	SE.*s*	......	......	00	48.7	Cloudy....	G.
3 p. m.	29.694	50.6	50.2	95	SE.	Brisk..	Hidden.			Stratus.	10	SE.*s*	......	......	00	49.0	Cloudy....	G.
4 p. m.	29.707	50.1	49.3	94	SSE.	Brisk..	Hidden.			Stratus.	10	SE.*r*	......	......	00	49.0	Cloudy....	G.
5 p. m.	29.706	50.0	48.9	93	SE.	Brisk..	Hidden.			Nimbus.	10	SE.*r*	4.50	......	.—	49.2	Light rain.	C.
6 p. m.	29.701	49.4	49.4	100	SE.	Brisk..	Hidden.			Nimbus.	10	SE.*r*	......	......	.02	49.2	Light rain	C.
7 p. m.	29.686	49.7	49.1	96	SE.	Brisk..	Hidden.			Stratus.	10	SE.*r*	......	6.45	.—	49.2	Cloudy....	C.
8 p. m.	29.681	50.0	49.5	96	SE.	Brisk..	Hidden.			Stratus.	10	SE.*r*	......	......	00	49.2	Cloudy....	C.
9 p. m.	29.681	50.3	49.0	91	ESE.	Brisk..	Hidden.			Stratus.	10	SE.*r*	......	......	00	49.2	Cloudy....	M.
10 p. m.	29.667	50.3	49.0	91	SE.	Brisk..	Hidden.			Stratus.	10	SE.*r*	......	......	00	49.4	Cloudy....	M.
11 p. m.	29.659	50.3	49.0	91	SE.	Brisk..	Hidden.			Nimbus.	10	SE.*s*	10.35	......	.01	49.1	Light rain.	M.
12 p. m.	29.661	50.0	49.0	93	SSE.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.01	49.0	Light rain	M.

SEPTEMBER 6, 1883.

[Latitude 64° 30′ N., longitude 166° 30′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.662	50.8	49.7	92	SSE.	Fresh..	Hidden.			Stratus.	10	0	......	12.30	.—	49.4	Cloudy....	S.
2 a. m.	29.659	50.7	50.1	96	SSE.	Fresh..	Hidden.			Nimbus.	10	0	1.45	......	.—	49.2	Light rain.	S.
3 a. m.	29.648	49.2	49.2	100	SSE.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.02	48.7	Light rain.	S.
4 a. m.	29.626	48.4	48.4	100	SSE.	Gentle.	Hidden.			Nimbus.	10	0	......	......	.01	47.0	Light rain.	S.
5 a. m.	29.623	46.8	46.8	100	SSE.	Light..	Hidden.			Nimbus.	10	0	......	......	.—	46.8	Light rain.	D.
6 a. m.	29.611	45.4	45.4	100	SSE.	Light..	Hidden.			Nimbus.	10	0	......	......	.—	46.0	Light rain.	D.
7 a. m.	29.595	45.0	45.0	100	SSE.	Light..	Hidden.			Stratus.	10	0	......	6.20	.01	45.5	Cloudy....	D.
8 a. m.	29.579	44.7	44.7	100	SSE.	Light..	Hidden.			Stratus.	10	0	......	......	00	44.2	Cloudy....	D.
9 a. m.	29.554	45.4	45.4	100	SE.	Gentle.	Hidden.			Nimbus.	10	0	8.30	......	.—	43.5	Light rain.	A.
10 a. m.	29.559	46.5	46.5	100	SE.	Fresh..	*Hidden.			Nimbus.	10	0	......	......	.01	44.8	Light rain.	A.
11 a. m.	29.562	47.8	47.6	98	SE.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.01	48.2	Light rain.	A.
12 m.	29.558	48.2	48.1	99	SE.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.—	48.8	Light rain.	A.
1 p. m.	29.570	48.1	48.0	99	SE.	Fresh..	Hidden.			Stratus.	10	0	......	12.40	.—	49.5	Cloudy....	G.
2 p. m.	29.582	47.3	47.0	97	SE.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	48.5	Cloudy....	G.
3 p. m.	29.576	47.3	47.0	97	SSE.	Fresh..	Hidden.			Stratus.	10	0	......	......	.—	48.1	Cloudy....	G.
4 p. m.	29.575	48.6	48.1	96	SE.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	49.5	Cloudy....	G.
5 p. m.	29.577	48.8	48.1	95	SE.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	49.5	Cloudy....	C.
6 p. m.	29.540	48.2	47.7	96	SE.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	48.8	Cloudy....	C.
7 p. m.	29.535	47.0	46.9	99	SE.	Fresh..	Hidden.			Nimbus.	10	0	6.25	......	.01	46.0	Light rain.	C.
8 p. m.	29.507	46.0	46.0	100	SE.	Fresh..	Hidden.			Nimbus	10	0	......	......	.02	44.7	Light rain.	C.
9 p. m.	29.510	45.9	45.4	96	SE.	Fresh..	Hidden.			Stratus.	10	SE.*s*	......	8.45	.01	44.7	Cloudy....	M.
10 p. m.	29.507	46.2	45.5	94	SE.	Fresh..	Hidden.			Stratus.	10	SE.*s*	......	......	00	44.8	Cloudy....	M.
11 p. m.	29.505	46.2	45.5	94	SE.	Fresh..	Hidden.			Stratus.	10	SE.*s*	......	......	00	46.2	Cloudy....	M.
12 p. m.	29.502	47.0	45.8	94	SSE.	Fresh..	Hidden.			Stratus.	10	SE.*s*	......	......	00	49.1	Cloudy....	M.

* Light shower of rain between observations.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 7, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 63° 44′ N., longitude 164° 30′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct											Inch			
1 a. m.	29.509	46.8	45.7	91	SE.	Fresh..	Cirrus..	1	0	Stratus.	8	SE.*s*	......	......	00	49.2	Cloudy....	S.
2 a. m.	29.519	47.0	46.0	92	SSE.	Fresh..		Hidden.		Stratus.	10	0	......	......	00	49.0	Cloudy....	S.
3 a. m.	29.524	47.2	46.3	93	SSE.	Brisk..		Hidden.		Stratus.	10	0	......	......	00	49.0	Cloudy....	S.
4 a. m.	29.529	47.0	46.1	93	SSE.	Gentle.	0	0	0	Stratus.	8	0	......	......	00	48.4	Cloudy....	S.
5 a. m.	29.517	46.0	45.3	94	SSE.	Gentle.	0	0	0	Stratus.	8	0	......	......	00	46.0	Cloudy....	D.
6 a. m.	29.509	45.0	45.0	100	SE.	Gentle.		Hidden.		Nimbus.	10	0	5.40	......	.—	45.0	Light rain	D.
7 a. m.	29.489	45.0	45.0	100	SE.	Gentle.		Hidden.		Nimbus.	10	0	......	......	.—	45.0	Light rain	D.
8 a. m.	29.466	44.3	44.1	98	S.	Gentle.		Hidden.		Nimbus.	10	0	......	......	.—	44.8	Light rain	D.
9 a. m.	29.462	44.2	44.0	98	SSE.	Fresh..		Hidden.		Stratus.	10	0	......	8.30	.—	45.0	Cloudy....	A.
10 a. m.	29.448	44.8	43.0	92	S.	Fresh..		Hidden.		Stratus.	10	0	......	......	00	45.0	Cloudy...	A.
11 a. m.	29.463	44.8	43.0	92	S.	Fresh..	0	0	0	Stratus.	9	0	......	......	00	45.2	Cloudy....	A.
12 m.	29.462	45.0	44.5	96	S.	Fresh..		Hidden.		Stratus.	10	S.*s*	......	......	00	45.4	Cloudy...	A.
1 p. m.	29.484	45.0	44.5	96	S.	Brisk..		Hidden.		Stratus.	10	S.*s*	......	......	00	44.8	Cloudy....	G.
2 p. m.	29.491	45.0	44.8	98	S.	Brisk..		Hidden.		Stratus.	10	S.*r*	......	......	00	46.1	Cloudy....	G.
3 p. m.	29.516	45.0	44.5	96	SSW.	Brisk..		Hidden.		Stratus.	10	SSW.*r*	......	......	00	46.6	Cloudy....	G.
4 p. m.	29.522	45.1	44.6	96	SSW.	Brisk..		Hidden.		Nimbus.	10	SSW.*r*	3.55	......	.—	46.7	Light rain.	G.
5 p. m.	29.522	45.5	44.5	92	SW.	Brisk..		Hidden.		Stratus.	10	SW.*r*	......	4.20	.—	47.0	Cloudy...	C.
6 p. m.	29.528	45.8	44.3	89	SW.	Brisk..		Hidden.		Stratus.	10	SW.*r*	......	......	00	47.0	Cloudy...	C.
7 p. m.	29.545	46.2	45.0	91	SW.	Brisk..		Hidden.		Cu. str..	10	SW.*s*	......	......	00	47.5	Cloudy....	C.
8 p. m.	29.557	46.5	45.0	89	SW.	Brisk..		Hidden.		Cu. str..	10	SW.*s*	......	......	00	48.0	Cloudy....	C.
9 p. m.	29.574	46.5	45.0	88	SW.	Brisk..		Hidden.		Stratus	10	SW.*s*	......	......	00	48.8	Cloudy....	M.
10 p. m.	29.596	47.0	45.0	85	SW.	Fresh..	0	0	0	Stratus. Cu. str..	7 2	SW.*s* 0	......	......	00	49.7	Cloudy....	M.
11 p. m.	29.606	47.2	45.2	85	WSW.	Fresh..	0	0	0	Stratus. Cu. str..	7 2	WSW.*s* 0	......	......	00	50.0	Cloudy....	M.
12 p. m.	29.611	47.0	44.8	83	WSW.	Fresh..	0	0	0	Stratus.	8	WSW.*s*	......	......	00	50.3	Cloudy...	M.

SEPTEMBER 8, 1883.

[Latitude 63° 28′ N., longitude 161° 33′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.622	47.5	46.0	87	W.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.2	Cloudy....	S.
2 a. m.	29.636	47.2	45.8	89	W.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.4	Cloudy....	S.
3 a. m.	29.642	46.7	44.8	85	W.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.4	Cloudy....	S.
4 a. m.	29.651	46.2	44.6	87	W.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.6	Cloudy....	S.
5 a. m.	29.652	45.2	43.9	89	WSW.	Light..		Hidden.		Stratus.	10	0	......	......	00	50.4	Cloudy....	D.
6 a. m.	29.652	45.0	44.0	92	WSW.	Gentle.	0	0	0	Stratus.	9	0	......	......	00	50.3	Fair	D.
7 a. m.	29.652	45.0	44.0	92	WSW.	Gentle.	0	0	0	Stratus	8	0	......	......	00	50.4	Cloudy....	D.
8 a. m.	29.651	44.8	43.7	91	WSW.	Gentle	0	0	0	Stratus.	8	0	......	......	00	50.4	Cloudy....	D.
9 a. m.	29.649	44.0	43.6	96	WSW.	Gentle.	0	0	0	Stratus.	9	0	......	......	00	50.5	Cloudy...	A.
10 a. m.	29.664	43.5	43.0	95	WSW.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.2	Cloudy....	A.
11 a. m.	29.672	43.8	42.8	92	SW.	Gentle		Hidden.		Stratus.	10	0	......	......	00	50.3	Cloudy....	A.
12 m.	29.662	44.0	43.3	94	SW.	Gentle.	Cumulus	2	0	Stratus.	8	SW.*s*	......	......	00	50.8	Cloudy....	A.
1 p. m.	29.679	44.0	43.9	99	SW.	Gentle.		Hidden.		Nimbus.	10	SW.*s*	12.20 12.40	12.25	.—	50.7	Light rain.	G.
2 p. m.	29.685	45.0	43.8	91	SW.	Gentle.		Hidden.		Stratus.	10	SW.*s*	......	1.50	.01	51.0	Cloudy....	G.
3 p. m.	29.686	45.8	45.0	93	SW.	Gentle.		Hidden.		Stratus.	10	SW.*s*	2.10	2.30	.—	51.0	Cloudy....	G.
4 p. m.	29.694	47.0	45.5	98	SW.	Fresh..	0	0	0	Cumulus	6	SW.*r*	......	......	*.—	51.1	Fair	G.
5 p. m.	29.708	46.0	44.7	90	SW.	Fresh..		Hidden.		Nimbus.	10	SW.*r*	......	......	*.—	50.9	Light rain.	C.
6 p. m.	29.710	46.7	44.7	84	SW.	Fresh..		Hidden.		Stratus.	10	SW.*r*	......	......	*.—	49.0	Cloudy....	M.
7 p. m.	29.722	46.6	44.6	84	SW.	Fresh..		Hidden.		Stratus.	10	SW.*s*	......	......	00	50.7	Cloudy....	M.
8 p. m.	29.729	47.0	45.0	85	SW.	Fresh..	0	0	0	Stratus.	9	SW.*s*	......	......	00	50.5	Cloudy....	M.
9 p. m.	29.731	48.0	44.9	77	SW.	Fresh	0	0	0	Cu. str..	6	SW.*s*	......	......	00	50.4	Cloudy...	M.
10 p. m.	29.742	45.8	44.5	90	SW.	Fresh..		Hidden.		Nimbus	10	SW.*r*	9.40	......	.—	48.6	Light rain.	M.
11 p. m.	29.747	45.0	43.5	98	SW.	Fresh..		Hidden.		Stratus.	10	SW.*r*	......	10.15	.—	50.0	Cloudy....	M.
12 p. m.	29.755	45.1	45.1	84	SSW.	Light..		Hidden.		Stratus.	10	SSW.*s*	......	......	00	50.0	Cloudy....	M.

* Light showers at short intervals.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 9, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 6[illegible] 28′ N., longitude 161° 33′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											Inch.			
1 a. m.	29.759	44.2	42.8	87	SSW.	Light..		Hidden.		Stratus	10	0	......	......	00	50.0	Cloudy....	S.
2 a. m.	29.762	42.0	41.8	93	SSW.	Light..	0	0	0	Stratus.	10	0	......	......	00	50.1	Fair	S.
3 a. m.	29.760	42.3	41.3	91	SSE.	Gentle.	0	0	0	Stratus.	10	0	......	......	00	50.1	Fair	S.
4 a. m.	29 769	41.1	40.3	92	SSE.	Gentle.	0	0	0	Stratus.	5	0	......	......	00	50.0	Fair	S.
5 a. m.	29.769	40.2	39.4	92	SSW.	Light..	0	0	0	Stratus.	5	0	......	......	00	50.2	Fair	D.
6 a. m.	29.769	40.8	39.8	91	S.	Light..		Hidden.		Stratus.	10	0	......	......	00	50.3	Cloudy....	D.
7 a. m.	29.756	40.8	39.8	91	ESE.	Light..	0	0	0	Stratus.	6	0	......	......	00	50.2	Fair	D.
8 a. m.	29 806	41.0	40.0	91	SSE.	Gentle..		Hidden.		Stratus.	10	0	......	......	00	50.0	Cloudy....	D.
9 a. m.	29.714	42.0	41.3	89	SSE.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.2	Cloudy...	A.
10 a. m.	29 689	43.0	41.4	87	SSE.	Gentle		Hidden.		Stratus	10	0	......	......	00	50.6	Cloudy...	A.
11 a. m.	29.680	43.0	41.3	86	SSE.	Gentle		Hidden.		Stratus.	10	SSE.	......	......	00	50.3	Cloudy....	A.
12 m.	29.659	43.4	41.8	87	SSE.	Gentle.		Hidden.		Stratus..	10	0	......	......	00	50.1	Cloudy....	A.
1 p. m.	29.630	45.0	43.0	84	SE.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	50.1	Cloudy	G.
2 p. m.	29 620	45.0	43.1	85	SE.	Gentle.		Hidden.		Nimbus	10	0	1.20	......	.—	50.0	Light rain.	G.
3 p. m.	29 589	45.2	43.2	84	SE.	Gentle		Hidden.		Nimbus.	10	0	......	......	.01	50.2	Light rain	G.
4 p. m.	29.572	45.4	44.0	89	SE.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.01	50.1	Light rain.	G.
5 p. m.	29.544	46.0	44.0	84	SE.	Fresh..		Hidden.		Stratus.	10	SE.*r*	......	4.20	.—	50.1	Cloudy...	G.
6 p. m.	29.517	46.7	45.7	92	SE.	Fresh..		Hidden.		Nimbus.	10	SE.*r*	5.25	......	.01	50.0	Light rain.	G.
7 p. m.	29.484	47.0	44.5	81	SE.	Fresh..		Hidden.		Nimbus.	10	SE *s*	......	......	.01	50.1	Light rain	M.
8 p. m.	29.456	47.0	44.6	82	SE.	Fresh..		Hidden.		Nimbus.	10	SE *s*	......	......	.01	50.1	Light rain.	M.
9 p. m.	29.413	47.3	44.6	80	SSE.	Fresh..		Hidden.		Stratus.	10	SSE.*s*	......	8.12	.—	50.1	Cloudy....	M.
10 p. m.	29.383	48.0	45.0	78	SSE.	Brisk..		Hidden.		Stratus.	10	SSE.*s*	......	......	00	50.0	Cloudy...	M.
11 p. m.	29.370	48.3	45.3	78	SSE.	Fresh..		Hidden.		Stratus.	10	SSE *r*	......	......	00	50.1	Cloudy...	M.
12 p. m.	29.345	48.0	45.0	78	SSE.	Fresh..		Hidden.		Stratus	10	SE.*r*	......	......	00	50.1	Cloudy....	M.

NOTE.—2.45 a. m. two meteors observed passing from Cygnus to Lyra.

SEPTEMBER 10, 1883.

[Latitude 63° 28′ N., longitude 161° 33′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.324	47.5	46.0	89	ESE.	Fresh..		Hidden.		Nimbus	10	0	12.45	......	.—	50.0	Light rain.	A.
2 a. m.	29.299	47.0	44.8	84	SE.	Fresh..		Hidden.		Stratus.	10	0	......	1.30	.01	50.0	Cloudy	A.
3 a. m.	29.272	45.0	44.0	93	SSE.	High ..		Hidden.		Nimbus	10	0	2.20	......	.—	50.2	Light rain.	A.
4 a. m.	29.227	45.5	44.3	90	SE.	Brisk..		Hidden.		Stratus.	10	0	......	3.35	.01	50.1	Cloudy...	A.
5 a. m.	29 195	45.5	44.3	90	SE.	Brisk..		Hidden.		Stratus	10	0	......	......	00	49.8	Cloudy...	A.
6 a. m.	29.156	45.0	44.3	95	SE.	Brisk..		Hidden.		Nimbus.	10	0	5.10	......	.—	49.8	Light rain.	A.
7 a. m.	29.110	44.0	43.5	96	SE.	High ..		Hidden.		Nimbus.	10	0	......	......	.01	49.7	Light rain.	A.
8 a. m.	29.066	43.5	42.6	93	ESE.	High ..		Hidden.		Nimbus.	10	0	......	......	.—	49.6	Light rain.	A.
9 a. m.	29.052	43.1	42.1	92	ESE.	Brisk..		Hidden.		Nimbus	10	0	......	......	.02	49.4	Light rain.	M.
10 a. m.	29.032	43.8	42.3	88	ESE.	Brisk..		Hidden.		Nimbus	10	0	......	......	.01	49.0	Light rain.	M.
11 a. m.	29.005	45.5	43.5	84	SE.	Brisk..		Hidden.		Stratus.	10	0	......	10.10	.—	48.8	Cloudy...	M.
12 m.	28.978	46.0	43.8	83	SSE.	Brisk..		Hidden.		Stratus.	10	SSE.*s*	......	......	00	49.2	Cloudy...	M.
1 p. m.	28.963	47.0	44.3	79	SSE.	Brisk..		Hidden.		Stratus.	10	SSE *s*	......	......	00	49.2	Cloudy...	M.
2 p. m.	28.980	47.7	45.5	83	SSE.	Brisk..		Hidden.		Stratus.	10	SSE.*s*	......	......	00	49.2	Cloudy....	M.
3 p. m.	28.991	48.0	46.3	87	SSE.	Fresh..		Hidden.		Stratus	10	SSE.*s*	......	......	00	49.4	Cloudy...	A.
4 p. m.	28.991	48.0	46.3	87	SSE.	Fresh..	0	0	0	Stratus.	8	SSE *s*	......	......	00	49.5	Cloudy ..	A.
5 p. m.	28.990	51.0	48.6	84	S.	Gentle.		Hidden.		Stratus.	10	SSE.*s*	......	......	00	49.6	Cloudy....	A.
6 p. m.	28.996	51.0	47.5	76	SSW.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	49.4	Cloudy....	A.
7 p. m.	28.995	52.3	48.1	82	SSW.	Gentle.	Cir. Cu.	1	0	Stratus.	8	SSW.*s*	......	......	00	48.7	Cloudy....	G.
8 p. m.	28.992	51.0	49.2	92	SSW.	Gentle.		Hidden.		Stratus	10	SSW.*s*	......	......	00	48.2	Cloudy....	G.
9 p. m.	28.984	51.7	48.0	85	SSW.	Gentle.	Cirrus	2	0	Cumulus	7	SSW.*s*	......	......	00	48.6	Cloudy....	G.
10 p. m.	18.981	50.8	48.2	87	SSW.	Gentle.		Hidden.		Stratus.	10	SSW.*s*	......	......	00	48.5	Cloudy....	G.
11 p. m.	28.990	49.0	47.5	89	SW.	Light..	Cirrus..	1	0	Stratus.	9	SSW.*s*	......	......	00	48.7	Cloudy....	G.
12 p. m.	28.988	48.3	46.8	89	SSE.	Light..		Hidden.		Nimbus.	10	SSW.*s*	11.50	......	.—	48.6	Light rain.	G.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 11, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 63° 28′ N., longitude 161° 33′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather	Observer.
				P. ct.											*Inch*			
1 a. m.	29.005	48.0	48.0	100	SE.	Light..		Hidden.		Nimbus	10	0	......	......	.01	48.5	Light rain.	S.
2 a. m.	29.011	47.7	47.6	99	SE.	Light..		Hidden.		Nimbus.	10	0	......	......	.—	48.6	Light rain.	S.
3 a. m.	29.013	47.3	47.0	98	ENE.	Light..		Hidden.		Nimbus.	10	0	......	......	.—	48.5	Light rain.	S.
4 a. m.	29.014	47.0	47.0	100	ENE.	Light..		Hidden.		Nimbus.	10	0	......	......	.01	48.3	Light rain	S.
5 a. m.	29.015	46.3	45.8	96	Calm.		0	0	0	Nimbus.	8	0	......	......	.—	48.2	Light rain.	S.
6 a. m.	29.022	45.6	45.3	98	SE.	Light..		Hidden.		Nimbus.	10	0	......	......	.01	48.2	Light rain.	S.
7 a. m.	29.038	45.3	45.2	99	SSW.	Light..		Hidden.		Nimbus.	10	0	......	......	.01	48.5	Light rain.	G.
8 a. m.	29.053	45.0	45.0	100	SW.	Gentle.		Hidden.		Nimbus.	10	0	......	......	.—	48.5	Light rain	G.
9 a. m.	29.068	45.0	45.0	100	SW.	Gentle.		Hidden.		Nimbus.	10	0	......	......	.01	48.5	Light rain.	G.
10 a. m.	29.085	46.0	45.9	99	SW.	Gentle.		Hidden.		Stratus .	10	SW. *s*	......	9.20	.—	48.5	Cloudy....	G.
11 a. m.	29.104	46.2	46.1	99	WSW.	Fresh..		Hidden.		Nimbus.	10	SW. *r*	10.40	......	.01	48.7	Light rain.	G.
12 m.	29.131	46.1	45.9	98	SW.	Fresh..		Hidden.		Stratus .	10	SW. *r*	......	11.20	.01	48.9	Cloudy....	G.
1 p. m.	29.173	45.8	45.6	98	SW.	Fresh..		Hidden.		Nimbus.	10	SW. *r*	12.15	......	.01	49.0	Light rain.	D.
2 p. m.	29.193	45.0	44.5	96	SW.	Gentle.		Hidden.		Nimbus.	10	SW. *r*	......	......	.—	49.0	Light rain.	D.
3 p. m.	29.220	45.2	44.7	96	SW.	Gentle.	0	0	0	Stratus .	6	SW. *r*	......	2.40	.—	49.0	Fair.......	D.
4 p. m.	29.235	46.2	45.2	92	WSW.	Light..	0	0	0	Stratus .	9	W. *s*	......	......	.00	49.0	Cloudy....	D.
5 p. m.	29.267	45.2	44.5	96	WSW.	Fresh..		Hidden.		Nimbus.	10	W. *s*	4.45	......	.—	49.0	Light rain.	L.
6 p. m.	29.280	45.0	45.0	100	WNW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.—	49.2	Light rain.	L.
7 p. m.	29.275	45.0	44.5	96	WSW.	Brisk..		Hidden.		Cu. st...	10	W. *s*	......	6.15	.—	49.0	Cloudy....	L.
8 p. m.	29.330	45.0	44.5	96	WSW.	Fresh..		Hidden.		Cu. st...	10	W. *s*	......	......	.00	49.3	Cloudy....	L.
9 p. m.	29.335	44.5	43.0	88	WSW.	Brisk..		Hidden.		Nimbus.	10	0	8.45	......	.—	48.8	Light rain.	M.
10 p. m.	29.350	44.7	43.7	92	WSW.	Brisk..		Hidden.		Stratus .	10	WSW. *s*	......	9.20	.—	48.8	Cloudy....	M.
11 p. m.	29.370	44.3	43.4	92	SW.	Brisk..		Hidden.		Nimbus	10	SW. *s*	10.40	......	.01	48.7	Light rain.	M.
12 p. m.	29.383	44.0	43.3	94	SW.	Brisk..		Hidden.		Stratus .	10	SW. *s*	......	11.30	.—	48.6	Cloudy....	M.

SEPTEMBER 12, 1883.

[Latitude 63° 48′ N., longitude 161° 12′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather	Observer.
1 a. m.	29.391	43.8	43.4	97	SW.	Brisk..		Hidden.		Nimbus.	10	0	12.15	......	.01	48.7	Light rain.	S.
2 a. m.	29.400	43.6	43.4	98	SW.	Brisk..		Hidden.		Nimbus.	10	0	......	......	.01	48.6	Light rain.	S.
3 a. m.	29.418	44.0	43.7	98	SSW.	High..		Hidden.		Nimbus.	10	0	......	......	.02	48.6	Light rain.	S.
4 a. m.	29.434	43.7	43.6	99	S.	High..		Hidden.		Nimbus.	10	0	......	......	.01	48.5	Light rain.	S.
5 a. m.	29.448	42.8	42.6	98	SSW.	High..		Hidden.		Nimbus.	10	0	......	......	.03	48.5	Light rain	D.
6 a. m.	29.452	43.2	43.1	99	SSW.	High..		Hidden.		Nimbus.	10	0	......	......	.02	48.5	Light rain.	D.
7 a. m.	29.455	43.4	43.8	99	SSW.	High..		Hidden.		Nimbus.	10	0	......	......	.01	48.5	Light rain.	D.
8 a. m.	29.480	43.0	42.8	98	SW.	Brisk..		Hidden.		Nimbus.	10	0	......	......	.01	48.4	Light rain.	D.
9 a. m.	29.490	44.6	44.6	100	SW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.01	48.6	Light rain.	A.
10 a. m.	29.516	45.0	44.8	98	SW.	Fresh..		Hidden.		Nimbus	10	0	......	......	.—	48.8	Light rain.	A.
11 a. m.	29.532	45.0	44.8	98	WSW.	Gentle.		Hidden.		Nimbus.	10	W. *s*	......	......	.01	49.0	Light rain.	A.
12 m.	29.555	45.2	44.6	95	WNW.	Fresh..		Hidden.		Stratus .	10	0	......	11.20	.—	48.6	Cloudy....	A.
1 p. m.	29.583	45.0	43.6	89	NW.	Fresh..		Hidden.		Stratus .	10	NW. *r*	......	......	00	48.6	Cloudy....	G.
2 p. m.	29.602	45.5	43.3	84	NW.	Fresh..	Cir. cu..	1	0	Cumulus	9	NW. *r*	......	......	00	49.1	Cloudy....	G.
3 p. m.	29.621	45.1	43.1	84	NW.	Fresh..	Cir. cu..	2	0	Stratus .	7	NW. *r*	......	......	00	49.0	Cloudy....	G.
4 p. m.	29.628	45.2	42.8	81	NW.	Fresh..	Cir. cu..	1	0	Stratus .	9	NW. *s*	......	......	00	49.0	Cloudy....	G.
5 p. m.	29.652	45.3	44.0	88	NW.	Fresh..		Hidden.		Cu. st...	10	NW. *s*	......	......	00	49.0	Cloudy....	L.
6 p. m.	29.659	45.5	44.0	88	NW.	Fresh..	Cir. cu..	2	0	Cu. st...	6	0	......	......	00	49.4	Cloudy....	L.
7 p. m.	29.676	45.0	44.0	92	NW.	Light..	Cir. st.. Cir. cu..	1 1	0 0	Cu. st..	4	0	......	......	00	49.2	Fair.......	L.
8 p. m.	29.671	46.0	44.0	84	NW.	Light..	Cir. st..	2	0	Cu. st...	4	0	......	......	00	49.4	Fair.......	L.
9 p. m.	29.678	46.0	43.0	77	WNW.	Fresh..	Cir. st..	2	0	Cu. st...	5	0	......	......	00	49.0	Fair.......	M.
10 p. m.	29.684	46.0	42.7	75	NW.	Fresh..	Cir. st..	2	0	Cu. st...	5	0	......	......	00	49.0	Fair.......	M.
11 p. m.	29.683	45.8	42.8	77	NW.	Fresh..	Cir. cu..	2	0	Cu. st... Stratus .	5 2	0 NW. *s*	......	......	00	48.9	Cloudy....	M.
12 p. m.	29.685	46.0	42.8	76	NW.	Fresh..	Cir. st..	2	0	Cu. st...	3	0	......	......	00	49.0	Fair.......	M.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 13, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 64° 15′ N., longitude 162° 20′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											Inch			
1 a. m.	29.697	45.0	42.8	81	NW.	Fresh..	Cir. st ..	2	0	Cu. & st.	6	0	......	......	00	48.8	Cloudy....	S.
2 a. m.	29.700	45.2	42.8	80	WNW.	Fresh..	Cir. st ..	4	0	Stratus .	2	0	......	......	00	48.7	Fair	S.
3 a. m.	29.708	45.2	42.8	80	WNW.	Gentle.	Cir. cu ..	3	0	Stratus .	6	0	......	......	00	48.9	Cloudy ..	S.
4 a. m.	29.715	45.1	42.7	80	WNW.	Gentle.	Cirrus ..	1	0	Stratus .	4	0	......	......	00	49.0	Fair	S.
5 a. m.	29.715	45.1	42.7	80	WSW.	Gentle.	0	0	0	Stratus .	8	0	......	......	00	49.3	Cloudy....	D.
6 a. m.	29.729	45.0	42.6	80	WSW.	Gentle.		Hidden.		Nimbus.	10	0	5.15	......	.01	49.3	Light rain.	D.
7 a. m.	29.707	44.8	42.4	80	WSW.	Light ..	0	0	0	Stratus	6	0	......	6.50	.01	49.3	Fair	D.
8 a. m.	29.699	44.5	42.2	81	W.	Gentle.	0	0	0	Stratus .	3	0	......	......	00	49.5	Clear......	D.
9 a. m.	29.672	44.0	42.0	84	WNW.	Gentle.	0	0	0	Stratus .	9	0	......	......	00	49.3	Cloudy....	A.
10 a. m.	29.657	43.5	42.3	90	WSW.	Gentle.	0	0	0	Nimbus.	9	0	9.45	......	—	49.2	Light rain	A.
11 a. m.	29.642	43.0	41.6	88	WSW.	Fresh..		Hidden.		Stratus .	10	0	......	10.35	.01	48.9	Cloudy....	A.
12 m.	29.622	43.0	41.3	86	SW.	Gentle.		Hidden.		Stratus .	10	0	......	......	00	48.8	Cloudy ..	A.
1 p. m.	29.621	43.0	42.8	99	SW.	Fresh..		Hidden.		Nimbus.	10	0	12.40	......	—	49.0	Light rain.	G.
2 p. m.	29.613	43.0	41.0	83	WSW.	Fresh..		Hidden.		Nimbus	10	0	......	......	—	48.8	Light rain.	G.
3 p. m.	29.597	42.9	41.5	88	WSW.	Fresh..		Hidden.		Stratus .	10	WSW.*s*	......	2.45	.01	48.5	Cloudy....	G.
4 p. m.	29.575	43.0	41.5	87	WSW.	Fresh..		Hidden.		Stratus .	10	WSW.*s*	......	......	00	48.8	Cloudy....	G.
5 p. m.	29.565	43.0	42.0	92	SSW.	Gentle.		Hidden.		Stratus .	10	SSW.*s*	......	......	00	49.0	Cloudy....	L.
6 p. m.	29.557	43.0	42.0	92	SSW.	Gentle.		Hidden.		Nimbus.	10	SSW.*s*	5.40	......	—	49.2	Light rain.	L.
7 p. m.	29.520	43.5	42.5	92	SSW.	Light ..	0	0	0	Nimbus.	9	SSW.*s*	......	......	—	49.0	Light rain.	L.
8 p. m.	29.480	43.5	42.0	88	SSE.	Gentle.	0	0	0	Cu. st...	9	SSE.*s*	......	7.20	—	49.2	Cloudy....	L.
9 p. m.	29.460	43.0	40.5	79	SSE.	Light ..	0	0	0	Cu. st... Stratus .	7 2	0 S.*s*	......	......	00	49.2	Cloudy....	M.
10 p. m.	29.441	43.7	42.0	86	NE.	Gentle.	0	0	0	Cu. st... Stratus .	2 6	0 NE.*s*	......	......	00	49.3	Cloudy....	M.
11 p. m.	29.421	43.8	41.8	84	NE.	Fresh..	0	0	0	Cu. st... Stratus .	3 6	0 NE.*s*	......	......	00	49.2	Cloudy....	M.
12 p. m.	29.414	42.2	40.5	88	NNE.	Gentle.	0	0	0	Stratus .	9	NNE.*s*	11.25	11.58	.01	49.2	Cloudy....	M.

SEPTEMBER 14, 1883.

[Latitude 62° 57′ N., longitude 168° 16′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.419	43.0	42.0	92	NE.	Fresh..		Hidden.		Nimbus	10	0	12.40	......	—	49.8	Light rain.	S.
2 a. m.	29.422	43.2	42.1	91	NE.	Fresh..	Cir. cu..	2	0	Stratus .	7	NE.*r*	......	1.45	.01	48.7	Cloudy....	S.
3 a. m.	29.422	43.0	41.0	83	NE.	Brisk ..	0	0	0	Stratus .	2	0	......	......	00	48.6	Clear......	S.
4 a. m.	29.411	42.3	39.4	82	NNE.	Brisk ..	0	0	0	Stratus .	1	0	......	......	00	47.9	Clear......	S.
5 a. m.	29.415	41.1	39.2	82	N.	Brisk ..	0	0	0	Stratus .	1	0	......	......	00	47.3	Clear......	D.
6 a. m.	29.395	41.1	39.2	82	NNE.	Brisk ..	0	0	0	0	0	0	......	......	00	47.0	Clear......	D.
7 a. m.	29.395	40.3	38.3	82	NNE.	Brisk ..	0	0	0	0	0	0	......	......	00	46.5	Clear......	D.
8 a. m.	29.395	40.5	38.7	83	NNE.	Brisk ..	0	0	0	0	0	0	......	......	00	46.3	Clear......	D.
9 a. m.	29.398	40.2	38.0	81	NNE.	Brisk ..	0	0	0	Stratus .	3	0	......	......	00	45.8	Clear......	A.
10 a. m.	29.393	40.2	38.0	81	NNE.	Brisk ..	0	0	0	Stratus .	5	0	......	......	60	42.5	Fair	A.
11 a. m.	29.391	39.0	37.3	84	NNW.	Brisk ..	0	0	0	Stratus .	5	0	......	......	00	41.0	Fair	A.
12 m.	29.394	39.0	36.8	80	NNW.	Brisk ..	0	0	0	Cumulus	4	0	......	......	00	39.6	Fair	A.
1 p. m.	29.386	39.1	38.5	95	NNW.	Brisk ..	0	0	0	Stratus .	9	NNW.*r*	......	......	60	40.5	Cloudy....	G.
2 p. m.	29.391	38.8	38.4	96	NNW.	Brisk ..	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.0	Cloudy....	G.
3 p. m.	29.395	39.0	38.5	95	NNW.	Brisk ..		Hidden.		Stratus .	10	NNW.*r*	......	......	00	42.1	Cloudy....	G.
4 p. m.	29.383	39.3	38.6	94	NNW.	Brisk ..		Hidden.		Stratus .	10	NNW.*r*	......	......	00	42.1	Cloudy....	G.
5 p. m.	29.383	41.0	40.0	91	NNW.	Brisk ..	0	0	0	Cu. st...	5	NNW.*r*	......	......	00	41.2	Fair	L.
6 p. m.	29.375	40.5	39.0	87	NNW.	Brisk ..	0	0	0	Cu. st...	7	NNW.*r*	......	......	00	40.8	Fair	L.
7 p. m.	29.362	41.5	40.5	91	NNW.	Brisk ..		Hidden.		Cu. st...	10	NNW.*s*	......	......	00	41.0	Cloudy....	L.
8 p. m.	29.366	44.0	43.0	92	NNW.	Brisk ..	0	0	0	Cu. st...	9	NNW.*s*	......	......	00	42.0	Cloudy....	L.
9 p. m.	29.351	39.5	38.0	86	NNW.	Brisk ..	Cirrus ..	1	0	Stratus .	6	NNW.*s*	8.45	8.55	—	41.8	Fair	M.
10 p. m.	29.347	39.2	37.7	86	NNW.	Brisk ..	0	0	0	Nimbus.	9	NNW.*s*	9.50	......	—	42.1	Light rain.	M.
11 p. m.	29.336	40.0	38.0	82	NNW.	Brisk ..	0	0	0	Cu. st...	6	NNW.*s*	......	10.15	—	42.5	Fair	M.
12 p. m.	29.336	39.2	39.2	86	NNW.	Brisk ..		Hidden.		Nimbus.	10	NNW.*s*	11.50	......	.01	43.2	Light rain.	M.

Meteorological record of the voyage of the schooner Leo, &c.—**Continued.**

SEPTEMBER 15, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 59° 9′ N., longitude 169° 33′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29.339	39.8	38.6	89	NNW.	Brisk ..	0	0	0	Stratus .	6	NNW.*r*	......	12.30	.—	43.7	Fair......	S.
2 a. m.	29.346	40.0	38.6	87	NNW.	High...		Hidden.		Stratus .	10	0	......	......	00	43.6	Cloudy....	S.
3 a. m.	29.350	39.7	38.7	91	NNW.	High...	Cirrus ..	2	0	Stratus .	7	NNW.*r*	......	......	00	43.7	Cloudy....	S.
4 a. m.	29.348	39.5	38.6	92	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	43.5	Cloudy....	S.
5 a. m.	29.328	39.3	38.3	91	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	43.5	Cloudy....	D.
6 a. m.	29.331	39.0	38.2	92	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	43.8	Cloudy....	D.
7 a. m.	29.341	39.0	38.1	91	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	44.0	Cloudy....	D.
8 a. m.	29.349	38.4	37.5	91	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	44.1	Cloudy....	D.
9 a. m.	29.359	37.0	36.5	95	NNW.	High ..		Hidden.		Nimbus.	10	0	8.30	......	.—	44.3	Light rain	A.
10 a. m.	29.336	38.0	37.0	95	NNW.	High ..		Hidden.		Stratus .	10	0	......	9.55	.01	43.8	Cloudy...	A.
11 a. m.	29.329	38.5	38.3	98	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	43.5	Cloudy....	A.
12 m.	29.357	38.2	38.0	98	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	43.2	Cloudy...	A.
1 p. m.	29.384	37.0	36.9	99	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	43.0	Cloudy....	G.
2 p. m.	29.384	36.8	36.6	98	NNW.	High..		Hidden.		Stratus .	10	NNW.*r*	......	......	*.—	43.1	Cloudy...	G.
3 p. m.	29.434	36.3	36.2	99	NNW.	High...		Hidden.		Nimbus.	10	NNW.*r*	2.10	......	.—	43.1	Light snow	G.
4 p. m.	29.413	37.6	36.6	90	NNW.	Gale ...		Hidden.		Stratus .	10	NNW.*r*	......	3.40	.—	43.0	Cloudy....	G.
5 p. m.	29.417	38.0	37.5	95	NNW.	Gale		Hidden.		Cu. st...	10	NNW.*r*	......	......	00	42.5	Cloudy....	L.
6 p. m.	29.429	40.0	39.0	91	NNW.	Gale ...		Hidden.		Cu. st ..	10	NNW.*r*	......	......	00	43.0	Cloudy....	L.
7 p. m.	29.444	39.0	38.0	91	NNW.	Gale ...		Hidden.		Cu. st...	10	NNW.*r*	......	......	00	43.5	Cloudy....	L.
8 p. m.	29.437	38.0	37.0	90	NNW.	High...	0	0	0	Cu. st...	9	NNW.*r*	......	......	00	42.9	Cloudy....	L.
9 p. m.	29.451	38.5	37.8	91	NNW.	High...		Hidden.		Nimbus.	10	NNW.*s*	8.50	......	.—	42.3	Light snow	M.
10 p. m.	29.481	38.5	37.0	86	NNW.	High...		Hidden.		Stratus .	10	NNW.*s*	......	9.06	.—	41.8	Cloudy....	M.
11 p. m.	29.486	38.0	36.0	81	NNW.	High...	0	0	0	Stratus .	9	NNW.*s*	......	......	00	41.6	Cloudy....	M.
12 p. m.	29.491	38.0	36.0	81	NNW.	High...	0	0	0	Stratus .	9	NNW.*s*	......	......	00	41.7	Cloudy....	M.

SEPTEMBER 16, 1883.

[Latitude 55° 59′ N., longitude 167° 18′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.506	37.7	36.1	85	NNW.	High...	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.8	Cloudy....	S.
2 a. m.	29.517	37.9	36.2	84	NNW.	High...	0	0	0	Stratus .	8	NNW.*r*	......	......	00	41.5	Cloudy....	S.
3 a. m.	29.530	38.0	36.2	83	NNW.	High...	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.6	Cloudy....	S.
4 a. m.	29.543	38.7	36.7	81	NNW.	High...	0	0	0	Stratus .	8	NNW.*r*	......	......	00	41.4	Cloudy....	S.
5 a. m.	29.556	37.7	35.8	82	NNW.	High...	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.7	Cloudy...	D.
6 a. m.	29.566	37.0	35.3	83	NNW.	High...	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.7	Cloudy....	D.
7 a. m.	29.570	36.8	34.8	81	NNW.	High...	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.6	Cloudy....	D.
8 a. m.	29.573	37.4	35.5	82	NNW.	High...	0	0	0	Stratus .	9	NNW.*r*	......	......	00	41.6	Cloudy....	D.
9 a. m.	29.551	38.0	36.3	84	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	41.4	Cloudy....	A.
10 a. m.	29.561	37.5	35.9	85	NNW.	High...		Hidden.		Stratus .	10	NNW.*r*	......	......	00	41.5	Cloudy....	A.
11 a. m.	29.576	37.5	35.9	85	NNW.	High...		Hidden.		Stratus .	10	NNW.*s*	......	......	00	41.2	Cloudy....	A.
12 m.	29.596	37.8	36.3	86	NW.	High...		Hidden.		Nimbus.	10	NW.*s*	......	......	†.—	43.0	Light snow	A.
1 p. m.	29.604	37.4	36.4	90	NW.	High...		Hidden.		Stratus .	10	NW.*s*	......	......	†.—	43.5	Cloudy....	G.
2 p. m.	29.622	38.4	36.4	81	NW.	Brisk ..		Hidden.		Stratus .	10	NW.*s*	......	......	†.—	44.0	Cloudy....	G.
3 p. m.	29.617	39.5	37.3	80	NW.	Brisk ..	0	0	0	Stratus .	10	NW.*r*	......	......	00	44.9	Cloudy....	G.
4 p. m.	29.625	40.0	37.2	74	NW.	Brisk ..		Hidden.		Stratus .	10	NW.*r*	......	......	†.—	45.4	Cloudy....	G.
5 p. m.	29.625	40.0	38.0	82	NW.	Brisk ..		Hidden.		Stratus .	10	NW.*r*	......	......	00	45.2	Cloudy....	L.
6 p. m.	29.627	40.0	38.5	86	NNW.	Brisk ..		Hidden.		Cu. st...	10	NW.*r*	......	......	00	45.6	Cloudy...	L.
7 p. m.	29.696	41.0	38.3	70	NW.	Brisk ..		Hidden.		Cu. st...	10	NW.*r*	......	......	00	45.7	Cloudy....	L.
8 p. m.	29.707	41.5	39.3	82	NW.	Brisk ..		Hidden.		Cu. st...	10	NW.*r*	......	......	00	45.8	Cloudy....	L.
9 p. m.	29.702	41.6	38.8	76	NW.	Brisk ..		Hidden.		Stratus .	10	NW.*s*	......	......	00	44.8	Cloudy....	M.
10 p. m.	29.727	42.0	39.0	74	NW.	Brisk ..		Hidden.		Cu. st...	10	NW.*s*	......	......	00	46.0	Cloudy....	M.
11 p. m.	29.746	42.0	39.0	74	NW.	Brisk ..		Hidden.		Cu. st...	10	NW.*s*	......	......	00	45.2	Cloudy....	M.
12 p. m.	29.750	41.9	38.9	74	NW.	Brisk ..		Hidden.		Cu. st...	10	NW.*s*	......	......	00	44.8	Cloudy....	M.

* Light snow at intervals.

† Snow squalls at intervals.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 17, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 54° 24′ N., longitude 166° 20′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch*			
1 a. m.	29.773	42.2	39.1	74	NW.	Brisk..	Hidden.			Stratus.	10	NW.*r*	......	......	00	44.2	Cloudy...	S.
2 a. m.	29.787	42.0	39.0	74	NW.	Fresh..	Hidden.			Stratus.	10	NW.*r*	......	......	00	44.3	Cloudy...	S.
3 a. m.	29.808	42.0	38.9	73	NW.	Fresh..	Hidden.			Stratus.	10	NW.*r*	......	......	00	44.4	Cloudy...	S.
4 a. m.	29.821	41.9	38.9	74	NW.	Fresh..	0	0	0	Stratus.	9	NW.*r*	......	......	00	44.4	Cloudy....	S.
5 a. m.	29.823	42.0	38.9	73	NNW.	Fresh..	Hidden.			Stratus.	10	NW.*r*	......	......	00	44.5	Cloudy...	D.
6 a. m.	29.835	41.8	38.8	74	NW.	Fresh..	Hidden.			Stratus.	10	NW.*r*	......	......	00	44.6	Cloudy...	D.
7 a. m.	29.823	41.8	38.8	74	N.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	44.2	Cloudy....	D.
8 a. m.	29.818	41.6	38.6	74	N.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	44.0	Cloudy....	D.
9 a. m.	29.611	41.5	39.8	85	N.	Fresh..	0	0	0	Stratus.	8	0	......	......	00	43.8	Cloudy....	A.
10 a. m.	29.783	41.0	39.3	85	NW.	Gentle.	0	0	0	Stratus.	7	0	......	......	00	43.8	Fair	A.
11 a. m.	29.783	41.0	39.3	85	NW.	Gentle.	0	0	0	Stratus.	9	NW.*s*	......	......	00	44.0	Cloudy....	A.
12 m.	29.775	41.2	39.6	87	WNW.	Light..	Cir. cu..	3	0	Stratus.	6	0	......	......	00	43.7	Cloudy....	A.
1 p. m.	29.785	42.2	40.0	81	NW.	Gentle.	Cir. cu..	3	0	Stratus.	6	0	......	......	00	43.8	Cloudy...	G.
2 p. m.	29.778	42.6	40.1	80	NW.	Gentle.	Hidden.			Stratus.	10	0	......	......	00	43.8	Cloudy....	G.
3 p. m.	29.775	43.0	40.1	77	NNW.	Light..	Cirrus..	3	0	Stratus.	6	0	......	......	00	44.7	Cloudy....	G.
4 p. m.	29.765	43.0	40.0	75	NNW.	Light..	Cir. cu..	5	0	Cumulus Stratus.	2 1	0 0	......	......	00	44.6	Cloudy...	G.
5 p. m.	29.742	43.5	42.0	87	NNW.	Light..	Cir. cu..	3	0	Stratus.	3	0	......	......	00	45.0	Fair	L.
6 p. m.	29.757	44.0	41.5	76	NW.	Light..	Cir. cu..	2	0	Cu. st...	7	NW.*s*	......	......	00	45.3	Cloudy...	L.
7 p. m.	29.757	45.0	42.8	84	NW.	Light..	Cir. cu..	2	0	Cu. st...	5	NW.*s*	......	......	00	45.3	Fair	L.
8 p. m.	29.752	44.0	41.8	84	NW.	Gentle.	0	0	0	Stratus. Cu. st...	3 3	NW.*s* NW.*s*	......	......	00	45.8	Fair	L.
9 p. m.	29.736	43.8	40.8	76	NNE.	Fresh..	0	0	0	Cumulus Stratus.	3 3	0 0	......	......	00	45.0	Fair	M.
10 p. m.	29.737	43.4	40.4	76	NNE.	Fresh..	0	0	0	Cumulus Stratus.	3 4	0 0	......	......	00	45.0	Fair	M.
11 p. m.	29.745	43.0	40.0	76	NNE.	Fresh..	0	0	0	Cumulus Stratus.	3 4	0 0	......	......	00	45.8	Fair	M.
12 p. m.	29.747	42.5	39.5	76	NNE.	Gentle.	0	0	0	Cumulus Stratus.	3 3	0 0	......	......	00	44.7	Fair	M.

SEPTEMBER 18, 1883.

[Schooner in outer harbor, Ŭnalaska, latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Upper clouds amount.	Upper clouds direction.	Lower clouds kind.	Lower clouds amount.	Lower clouds direction.	Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.765	42.2	39.2	74	NNE.	Gentle.	0	0	0	Stratus.	2	0	......	......	00	44.6	Clear......	S.
2 a. m.	29.777	42.5	39.3	73	NNE.	Gentle.	0	0	0	Stratus.	8	0	......	......	00	44.2	Cloudy....	S.
3 a. m.	29.789	42.0	39.8	81	NNE.	Gentle.	0	0	0	Stratus.	9	NNE.*s*	2.30	2.55	.01	44.0	Cloudy....	S.
4 a. m.	29.795	41.6	39.8	84	NNW.	Gentle.	Hidden.			Nimbus.	10	0	3.35	......	.01	44.0	Light rain.	S.
5 a. m.	29.820	41.2	38.9	81	N.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.01	44.3	Light rain.	A.
6 a. m.	29.823	40.5	37.6	75	N.	Fresh..	Hidden.			Stratus.	10	N.*s*	......	5.40	.—	44.5	Cloudy....	A.
7 a. m.	29.832	39.5	37.5	82	NNW.	Fresh..	Hidden.			Nimbus.	10	0	6.30	......	.01	44.4	Light rain.	A.
8 a. m.	29.837	39.5	37.9	85	N.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.01	44.3	Light rain	A.
9 a. m.	29.837	39.5	37.9	85	N.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.—	44.1	Light rain.	A.
10 a. m.	29.841	39.2	38.4	92	N.	Fresh..	Hidden.			Stratus.	10	N.*s*	......	9.45	.—	43.8	Cloudy....	G.
11 a. m.	29.842	39.5	37.8	84	NNW.	Fresh..	Hidden.			Stratus.	10	NNW.*s*	......	......	00	44.1	Cloudy....	G.
12 m.	29.845	39.3	37.8	86	NNW.	Fresh..	Hidden.			Stratus.	10	NNW.*s*	11.30	......	*.—	43.6	Cloudy....	G.
1 p. m.	29.860	39.7	37.7	82	NNW.	Fresh..	Hidden.			Stratus.	10	NNW.*r*	......	......	*.—	44.2	Cloudy....	G.
2 p. m.	29.870	41.2	38.2	74	NNW.	Fresh..	Cirrus..	1	0	Stratus.	9	NNW.*r*	......	......	*.—	44.0	Cloudy....	G.
3 p. m.	29.890	40.0	39.0	91	NNW.	Fresh..	0	0	0	Nimbus	9	NNW.*s*	......	......	.01	44.0	Light rain	L.
4 p. m.	29.881	42.0	40.0	83	NNW.	Fresh..	Hidden.			Nimbus.	10	0	......	......	*.—	45.0	Light rain	L.
5 p. m.	29.885	41.0	38.8	82	NNW.	Fresh..	Cir. cu..	1	0	Cu. st...	5	NNW.*s*	......	......	*.—	44.8	Fair	L.
6 p. m.	29.887	42.0	41.0	91	NNW.	Fresh..	0	0	0	Cu. st...	8	NNW.*s*	......	......	*.—	45.0	Cloudy...	L.
7 p. m.	29.900	42.0	40.0	83	NW.	Fresh..	Hidden.			Nimbus	10	0	......	......	*.01	44.6	Light rain.	L.
8 p. m.	29.896	42.5	39.5	75	NNW.	Fresh..	Hidden.			Stratus.	10	0	......	7.35	*.—	44.6	Cloudy...	M.
9 p. m.	29.896	41.8	39.8	83	NNW.	Fresh..	Hidden.			Nimbus.	10	NNW.*s*	8.10	....	*.01	44.5	Light rain	M.
10 p. m.	29.900	40.4	38.4	82	NW.	Fresh..	0	0	0	Cu. st...	9	NW.*s*	......	9.25	.—	44.2	Cloudy....	M.
11 p. m.	29.898	40.5	38.5	82	WNW.	Fresh..	Hidden.			Stratus.	10	0	......	......	00	41.0	Cloudy....	M.
12 p. m.	29.899	39.5	38.0	86	WNW.	Fresh..	Hidden.			Nimbus	10	WNW.*s*	11.35	......	.01	43.7	Light rain	M.

*Short squalls of rain and snow at intervals.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 19, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Schooner in inner harbor, Unalaska, latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Kind.	Upper clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Lower clouds. Kind.	Amount in 10ths.	Direction (moving from—)	Rain or snow. Commenced.	Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
a. m. 2?..	29.918	39.5	38.9	94	NW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.—	43.8	Light rain.	S.
	29.346 . 40?	39.3	38.3	91	NW.	Fresh..		Hidden.										
1 a. m.	?.350 . 39.7	38.?	??.6	88	NW.	Fresh..		Hidden.		Nimbus	10	NW.*r*	......	......	.—	43.9	Light rain.	S.
2 a. m.	29.92?	38.6	[illegible]	92	NNW.	High..		Hidden.		Nimbus.	10	0	......	......	.01	43.7	Light rain.	S.
3 a. m.	29.924	39.9	[illegible]	[illegible]	NNW.	High..	Hidden.			Nimbus.	10	0	......	......	.01	43.8	Light rain.	S.
4 a. m.	29.923	39.8	38.7	90	NW.	Fresh..	Hidden.			Stratus.	10	W.*r*	......	4.30	.—	43.8	Cloudy....	A.
5 a. m.	29.918	40.2	38.9	88	W.	Brisk..		Hidden.		Stratus.	10	0	......	......	00	44.0	Cloudy....	A.
6 a. m.	29.919	40.0	38.7	88	NW.	Fresh..		Hidden.		Stratus.		NW.*r*	......	......	00	43.8	Cloudy....	A.
7 a. m.	29.919	40.8	39.4	87	NW.	Brisk..		Hidden.		Stratus.	10	N...	7.25	......	.01	43.7	Light rain.	A.
8 a. m.	29.921	41.5	39.8	85	NW.	Brisk..		Hidden.		Nimbus.	10	NW.*r*	......	......	.01	43.8	Light rain.	A.
9 a. m.	29.921	41.0	39.8	89	NW.	High..		Hidden.		Nimbus.	10	NW.*r*	......	9.30	.—	43.8	Cloudy....	G.
10 a. m.	29.938	42.0	40.7	88	NW.	High..	0	0	0	Cumulus	9	NW.*r*	......	......	*.—	43.7	Cloudy....	G.
11 a. m.	29.955	41.7	40.2	87	NW.	High..		Hidden.		Stratus.	10	NW.*r*	......	......	.—	43.8	Cloudy....	G.
12 m.	29.970	41.7	40.5	89	NW.	High..	0	0	0	Stratus.	9	NW.*r*	......	......	—	43.4	Cloudy....	G.
1 p. m.	29.978	42.6	41.0	87	NW.	Brisk..		Hidden.		Stratus.	10	NW.*r*	......	......	*.	43.7	Cloudy....	G.
2 p. m.	30.013	42.2	41.0	89	NW.	Fresh..	0	0	0	Stratus.	9	NW.*r*	......	......	*.0	44.0	Cloudy....	L.
3 p. m.	30.027	42.0	41.6	96	NW.	Fresh..	0	0	0	Stratus.	9	NW.*r*	......	......	*.—	?2	Cloudy....	L.
4 p. m.	30.031	41.0	43.0	92	NW.	Fresh..	0	0	0	Stratus.	8	NW.*s*	......	......	*.—	[illegible]	Cloudy....	L.
5 p. m.	30.033	41.0	42.3	87	NW.	Brisk..	0	0	0	Cumulus / Cum. st.	3 / 4	NW.*r* / NW.*r*	......	......	00	44.	?loudy....	L.
6 p. m.	30.043	43.8	43.0	92	NW.	Brisk..	0	0	0	Cum. st.	8	NW.*r*	......	......	00	44.0	?ldy....	L.
7 p. m.	30.039	44.0	43.0	92	NW.	Fresh..		Hidden.		Cum. st.	10	NW.*s*	......	......	*.—	44.4	Cdy....	M.
8 p. m.	30.045	43.0	40.0	75	WNW.	Fresh..		Hidden.		Cum. st.	10	NW.*s*	......	......	00	44.0	Cly....	M.
9 p. m.	30.046	44.0	41.0	75	NW.	Fresh..		Hidden.		Nimbus.	10	NW.*s*	......	......	00	44.0	Cl..ain.	M.
10 p. m.	30.048	43.0	41.0	83	NW.	Fresh..		Hidden.		Nimbus.	10	NW.*s*	9.30	......	.—	44.0	Ligain.	M.
11 p. m.	30.043	43.0	41.2	85	NW.	Fresh..		Hidden.		Nimbus	10	NW.*s*	......	......	.—	44.0	Ligain.	M.
12 p. m.	30.043	43.0	41.3	85	NW.	Fresh..		Hidden.		Nimbus.	10	NW.*r*	......	......	.01	44.0	Lig.	

SEPTEMBER 20, 1883.

[Unalaska harbor, latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Amount in 10ths.	Direction.	Lower clouds kind.	Amount in 10ths.	Direction.	Commenced.	Ended.	Amount of rain.	Surface water.	State of weather.	Observer.
1 a. m.	30.047	43.0	41.3	86	NW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.01	44.0	Light rain.	
2 a. m.	30.053	42.3	41.0	89	NW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.—	43.9	Light rain.	
3 a. m.	30.055	41.5	40.8	94	NW.	Light..		Hidden.		Nimbus.	10	0	......	......	.—	43.8	Light rain.	
4 a. m.	30.055	41.2	40.2	91	NW.	Gentle.		Hidden.		Nimbus	10	0	......	......	.—	43.7	Light rain.	
5 a. m.	30.051	40.8	39.8	91	WNW.	Gentle.		Hidden.		Stratus.	10	0	......	4.50	.—	43.7	Cloudy...	
6 a. m.	30.045	40.5	39.6	92	NW.	Fresh..		Hidden.		Nimbus.	10	0	5.30	......	.01	43.8	Light rain.	
7 a. m.	30.036	40.0	39.1	92	NW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.01	43.7	Light rain.	
8 a. m.	30.019	40.0	39.0	91	NW.	Brisk..		Hidden.		Nimbus.	10	0	......	......	.—	43.6	Light rain.	
9 a. m.	29.997	40.0	38.5	87	NW.	Fresh..		Hidden.		Stratus.	10	NW.*r*	......	8.25	.01	43.8	Cloudy....	
10 a. m.	29.987	40.5	39.5	91	NW.	Fresh..		Hidden.		Stratus.	10	NW.*r*	......	......	00	43.0	Cloudy....	[illegible]
11 a. m.	29.985	40.4	39.8	95	NW.	Fresh..		Hidden.		Stratus.	10	NW.*s*	......	......	00	43.1	Cloudy....	[illegible]
12 m.	29.968	41.0	39.8	89	NW.	Fresh..		Hidden.		Stratus.	10	NW.*s*	......	......	00	43.1	Cloudy....	[illegible]
1 p. m.	29.955	41.0	39.8	89	WNW.	Fresh..	Cir. cu..	4	0	Stratus.	6	NW.*s*	......	......	00	43.2	Cloudy....	[illegible]
2 p. m.	29.971	42.3	40.3	83	WNW.	Fresh..	Cir. cu..	2	0	Stratus.	8	NW.*s*	......	......	00	43.4	Cloudy....	[illegible]
3 p. m.	29.972	43.0	40.0	75	WNW.	Gentle.	0	0	0	Cum. st.	8	NW.*s*	......	......	00	43.8	Cloudy....	I
4 p. m.	29.965	43.5	40.3	75	WNW.	Gentle.	0	0	0	Cum. st.	7	NW.*s*	......	......	00	43.8	Fair	L
5 p. m.	29.931	44.2	42.2	84	WNW.	Gentle.	0	0	0	Stratus.	9	NW.*s*	......	......	00	44.0	Cloudy....	L.
6 p. m.	29.958	45.0	42.8	84	NW.	Gentle.	Cir. cu..	2	0	Cumulus	4	NW.*s*	......	......	00	44.0	Fair	L.
7 p. m.	29.958	44.0	42.3	80	WNW.	Gentle.	0	0	0	Cum. st. / Cumulus	3 / 3	NW.*s* / NW.*s*	......	......	00	44.0	Fair	L.
8 p. m.	29.963	44.4	40.9	72	NE.	Gentle.	Cir. st...	2	0	Cumulus / Stratus.	2 / 2	0 / 0	......	......	00	44.3	Fair	M.
9 p. m.	29.963	42.8	40.3	72	NE.	Gentle.	0	0	0	Cumulus	3	0	......	......	00	44.8	Clear	M.
10 p. m.	29.963	43.5	40.0	72	NE.	Gentle.	0	0	0	Cumulus	2	0	......	......	00	44.9	Clear	M.
11 p. m.	29.956	42.4	39.2	74	NE.	Light..	0	0	0	Stratus.	1	0	......	......	00	45.0	Clear	M.
12 p. m.	29.975	40.8	38.3	78	NE.	Light..	Cirrus..	1	0	Stratus.	2	0	......	......	00	44.7	Clear	M.

* Occasional rain squalls between observations.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 21, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Unalaska, latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29.906	37.7	36.4	87	SE.	Light..	0	0	0	Stratus .	2	0	......	......	00	44.8	Clear	S.
2 a. m.	30.005	37.2	35.9	87	Calm.		0	0	0	0	0	0	......	......	00	44.2	Clear	S.
3 a. m.	30.010	36.0	34.9	89	E.	Light..	Cirrus ...	2	0	0	0	0	......	......	00	44.5	Clear	S.
*4 a. m.	30.012	37.1	36.0	89	Calm.		Cir. st ..	5	0	0	0	0	......	......	00	44.3	Fair	S.
*5 a. m.	29.991	37.5	36.1	85	Calm.		Cir. st ...	3	0	0	0	0	......	......	00	44.3	Clear	A.
*6 a. m.	29.967	40.5	38.0	78	SE.	Light	Haze. Light. / Cir. st ..	3	0	0	0	0	......	......	00	44.5	Clear	A.
*7 a. m.	29.953	42.0	38.9	74	SE.	Light..	Hidden.			Haze. Dense.		0	......	......	00	44.0	Hazy	A.
8 a. m.	29.943	43.0	39.8	73	SE.	Gentle.	Hidden.			Haze. Dense.		0	......	......	00	43.2	Hazy	A.
9 a. m.	29.920	42.8	39.8	75	SE.	Gentle.	Haze. Light.			Stratus .	8	0	......	......	00	42.7	Cloudy....	A.
10 a. m.	29.879	45.0	42.0	76	SE.	Fresh..	Hidden.			Stratus .	10	0	......	......	00	42.8	Cloudy....	G.
11 a. m.	29.871	45.9	42.4	73	SE.	Fresh..	Hidden.			Stratus .	10	SE.*s*	......	......	00	42.8	Cloudy....	G.
12 m.	29.873	46.0	43.3	82	SSE.	Fresh..	Hidden.			Nimbus.	10	SSE.*s*	11.40	......	.—	42.8	Lt. rain ...	G.
1 p. m.	29.854	47.0	45.0	85	S.	Gentle.	Hidden.			Stratus .	10	SSE.*s*	......	12.10	.—	42.9	Cloudy....	G.
2 p. m.	29.859	48.0	46.0	85	S.	Gentle.	Hidden.			Stratus .	10	S.*s*	......	......	00	43.1	Cloudy....	G.
3 p. m.	29.857	44.5	45.5	96	SE.	Gentle.	Hidden.			Stratus .	10	SE.*s*	......	......	00	44.0	Cloudy....	L.
4 p. m.	29.875	50.0	47.5	79	SE.	Gentle.	Hidden.			Stratus .	10	0	......	......	00	44.0	Cloudy....	L.
5 p. m.	29.870	52.0	50.0	86	SE.	Fresh..	Cir. cu..	2	SE.*s*	Stratus .	6	SE.*s*	......	......	00	44.5	Cloudy....	L.
6 p. m.	29.871	53.8	52.0	87	SE.	Gentle.	Cir. cu..	2	SE.*s*	Stratus .	4	SE.*s*	......	......	00	45.2	Fair.......	L.
7 p. m.	29.864	54.5	52.3	87	SE.	Gentle.	Cir. st ..	3	0	Cu. st...	4	SE.*s*	......	......	00	45.5	Fair.......	L.
8 p. m.	29.864	54.0	51.0	80	SE.	Fresh..	Cir. st ..	2	0	Stratus .	4	SE.*s*	......	......	00	45.0	Fair.......	M.
9 p. m.	29.864	53.8	50.3	77	SE.	Gentle.	Cirrus ..	2	W.*s*	Stratus .	4	SE.*s*	......	......	00	45.0	Fair.......	M.
10 p. m.	29.873	53.4	50.9	83	SE.	Light..	0	0	0	Stratus .	9	0	......	......	00	45.4	Cloudy....	M.
11 p. m.	29.877	51.8	49.3	83	SE.	Light..	0	0	0	Stratus .	9	0	......	......	00	45.5	Cloudy....	M.
12 p. m.	29.877	51.4	49.1	84	SE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.3	Cloudy...	M.

SEPTEMBER 22, 1883.

[Latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.880	51.4	49.3	85	SE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.9	Cloudy....	S.
2 a. m.	29.889	48.2	46.2	85	Calm.		Hidden.			Stratus .	10	0	......	......	00	45.8	Cloudy....	S.
3 a. m.	29.892	48.0	46.8	91	Calm.		Hidden.			Stratus .	10	0	......	......	00	45.8	Cloudy....	S.
4 a. m.	29.865	47.3	46.8	96	ENE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.7	Cloudy....	S.
5 a. m.	29.823	47.9	46.3	88	ENE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.5	Cloudy....	D.
6 a. m.	29.803	41.0	49.0	86	ENE.	Fresh..	Hidden.			Stratus .	10	0	......	......	00	45.5	Cloudy....	D.
7 a. m.	29.779	41.0	49.0	86	ENE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.6	Cloudy....	D.
8 a. m.	29.737	41.0	49.0	86	ENE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.6	Cloudy....	D.
9 a. m.	29.692	50.2	46.8	77	ENE.	Light..	Hidden.			Stratus .	10	0	......	......	00	45.4	Cloudy....	A.
10 a. m.	29.643	50.0	46.6	77	ESE.	Fresh..	Hidden.			Stratus .	10	0	......	......	00	45.2	Cloudy....	A.
11 a. m.	29.578	50.0	46.8	79	SE.	Brisk..	Hidden.			Stratus .	10	SW.*s*	......	......	00	45.0	Cloudy....	A.
12 m.	29.541	51.0	48.0	80	SE.	Brisk..	Hidden.			Nimbus.	10	SW.*s*	11.30	......	.01	45.1	Lt. rain ...	A.
1 p. m.	29.478	53.5	50.0	77	SE.	Brisk..	Hidden.			Nimbus.	10	SW.*r*	......	......	.—	45.1	Lt. rain ...	G.
2 p. m.	29.445	52.3	49.8	83	SE.	Fresh..	Hidden.			Nimbus	10	SW.*r*	......	......	.01	45.4	Lt. rain ...	G.
3 p. m.	29.415	51.0	49.0	86	SE.	Fresh..	Hidden.			Nimbus.	10	SW.*r*	......	......	.03	45.3	Lt. rain ...	G.
4 p. m.	29.384	51.0	49.2	85	SE.	Fresh..	Hidden.			Nimbus.	10	SW.*r*	......	4.35	.02	45.3	Lt. rain ...	G.
5 p. m.	29.361	52.0	49.8	86	SE.	Fresh..	Hidden.			Stratus .	10	0	......	......	.—	46.0	Cloudy...	L.
6 p. m.	29.357	51.0	51.8	86	S.	Fresh..	Hidden.			Stratus .	10	0	......	......	00	46.0	Cloudy...	L.
7 p. m.	29.365	50.5	49.0	89	SW.	Fresh..	Hidden.			Stratus .	10	0	......	......	00	46.3	Cloudy...	L.
8 p. m.	29.417	48.0	46.3	87	NW.	Fresh..	Hidden.			Nimbus.	10	0	7.10	......	.01	46.3	Lt. rain ...	L.
9 p. m.	29.443	46.7	45.3	90	WNW.	Fresh..	Hidden.			Nimbus.	10	0	......	......	.01	45.0	Lt. rain ...	M.
10 p. m.	29.472	45.0	43.8	90	NW.	Fresh..	Hidden.			Stratus .	10	0	......	9.30	.—	45.2	Cloudy....	M.
11 p. m.	29.497	44.0	41.8	82	WNW.	Brisk..	Hidden.			Stratus .	10	NW.*s*	......	......	00	45.0	Cloudy....	M.
12 p. m.	29.521	44.0	41.0	76	WNW.	Brisk..	0	0	0	Cu. st...	8	WNW.*s*	......	......	00	44.9	Cloudy....	M.

* Complete lunar halo at 4 a. m., 5 a. m., 6 a. m., 7 a. m.

Meteorological record of the voyage of the schooner Leo, &c.—**Continued.**

SEPTEMBER 23, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Unalaska, latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29.521	44.0	41.8	82	WNW.	Fresh..	0	0	0	Stratus .	8	WNW.*r*	......	......	00	44.8	Cloudy....	S.
2 a. m.	29.531	44.2	40.9	73	WNW.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	44.8	Cloudy...	S.
3 a. m.	29.545	44.0	40.3	70	NW.	High .	0	0	0	Stratus .	6	0	......	......	00	44.7	Fair.......	S.
4 a. m.	29.558	43.4	41.3	83	NW.	Brisk ..	0	0	0	Stratus .	8	0	......	......	00	44.5	Cloudy....	S.
5 a. m.	29.574	42.9	40.5	79	NW.	High ..	0	0	0	Stratus .	6	0	......	......	00	44.7	Fair.......	D.
6 a. m.	29.581	43.2	41.1	83	NW.	Brisk ..	0	0	0	Stratus .	6	0	......	......	00	44.7	Fair.......	D.
7 a. m.	29.583	43.0	41.0	83	NW.	Fresh..	0	0	0	Stratus	5	0	......	......	00	44.5	Fair.......	D.
8 a. m.	29.587	43.0	41.0	83	NW.	Brisk ..	0	0	0	Stratus .	9	0	......	......	00	44.5	Cloudy....	D.
9 a. m.	29.590	42.2	41.0	89	NW.	Brisk ..		Hidden.		Nimbus	10	0	8.30	......	.—	44.4	Light rain.	A.
10 a. m.	29.590	42.0	40.8	89	NW.	Brisk ..		Hidden.		Nimbus.	10	0	......	......	.01	44.5	Light rain.	A.
11 a. m.	29.592	42.5	40.8	86	NW.	Fresh..		Hidden.		Stratus .	10	NW.*s*	......	10.25	.—	44.2	Cloudy....	A.
12 m.	29.608	42.5	40.8	86	WNW.	Fresh.		Hidden.		Stratus .	10	NW.*r*	......	......	00	44.2	Cloudy....	A.
1 p. m.	29.608	43.2	41.7	87	NW.	Fresh..		Hidden.		Stratus .	10	NW.*r*	......	......	00	44.2	Cloudy....	G.
2 p. m.	29.621	43.5	41.8	86	NW.	Fresh..		Hidden.		Stratus .	10	NW.*r*	......	......	00	44.4	Cloudy....	G.
3 p. m.	29.627	43.0	41.8	90	NW.	Fresh..		Hidden.		Stratus .	10	NW.*r*	......	......	*.—	44.4	Cloudy....	G.
4 p. m.	29.630	43.2	41.7	87	WNW.	Fresh..		Hidden.		Stratus .	10	NW.*r*	......	......	*.—	44.4	Cloudy....	G.
5 p. m.	29.641	43.0	42.3	91	NW.	Brisk ..		Hidden.		Nimbus.	10	NW.*s*	......	......	*.—	44.0	Light rain.	L.
6 p. m.	29.635	43.0	42.6	96	NW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.—	44.2	Light rain.	L.
7 p. m.	29.634	43.0	42.3	91	WNW.	Fresh..		Hidden.		Stratus .	10	NW.*s*	......	......	*.—	44.5	Cloudy....	L.
8 p. m.	29.637	43.0	42.6	95	WNW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.—	44.6	Light rain.	L.
9 p. m.	29.639	42.0	40.0	83	W.	Fresh..	0	0	0	Cu. st...	[illegible]	W.*r*	......	......	.—	44.6	Cloudy...	M.
10 p. m.	29.624	41.2	39.9	88	WNW.	Fresh..		Hidden.		Nimbus.	10	W.*s*	9.40	......	.—	44.6	Light rain	M.
11 p. m.	29.626	40.7	39.0	85	WNW.	Fresh..	0	0	0	Nimbus.	8	WNW.*r*	......	......	.01	44.0	Light rain	M.
12 p. m.	29.638	41.0	38.3	76	WNW.	Fresh..	0	0	0	Cu. st...	9	WNW.*r*	......	11.20	.—	44.5	Cloudy....	M.

SEPTEMBER 24, 1883.

[Latitude 53° 53′ N., longitude 166° 32′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.644	41.3	38.9	77	WNW.	Fresh..	0	0	0	Stratus .	8	WNW.*r*	......	......	00	44.6	Cloudy....	S.
2 a. m.	29.649	40.0	38.7	88	WNW.	Gentle.	0	0	0	Stratus .	9	WNW.*s*	......	......	00	44.5	Cloudy....	S.
3 a. m.	29.653	37.4	36.9	95	Calm.			Hidden.		Stratus .	10	0	......	......	00	44.3	Cloudy....	S.
4 a. m.	29.639	38.2	37.7	95	WSW.	Light ..	0	0	0	Stratus .	6	0	......	......	00	44.2	Fair.......	S.
5 a. m.	29.632	35.6	34.7	91	WNW.	Light ..	0	0	0	Stratus .	4	0	......	......	00	44.2	Fair.......	D.
6 a. m.	29.634	35.9	35.2	93	NW.	Gentle.	0	0	0	Stratus .	8	0	......	......	00	44.2	Cloudy....	D.
7 a. m.	29.632	36.2	35.3	91	NW.	Gentle.		Hidden.		Stratus .	10	0	......	......	00	44.3	Cloudy....	D.
8 a. m.	29.624	36.0	35.2	92	NW.	Gentle.		Hidden.		Stratus .	10	0	......	......	00	44.3	Cloudy....	D.
9 a. m.	29.621	38.5	36.5	82	WSW.	Gentle.	0	0	0	Cu. st...	8	WSW.*s*	......	......	00	44.2	Cloudy....	A.
10 a. m.	29.601	39.2	36.4	76	W.	Gentle.	0	0	0	Cu. st...	9	W.*s*	......	......	00	44.0	Cloudy....	A.
11 a. m.	29.598	37.5	35.9	85	Calm.			Hidden.		Stratus .	10	W.*s*	......	......	00	43.8	Cloudy....	A.
12 m.	29.573	38.2	36.9	87	WSW.	Gentle	Cumulus	3	W.*s*	Stratus .	5	W.*s*	11.25	11.50	.01	43.5	Cloudy...	A.
1 p. m.	29.561	39.0	37.8	80	W.	Fresh..		Hidden.		Nimbus.	10	W.*s*	12.20	......	.02	43.3	Light rain.	G.
2 p. m.	29.551	39.8	38.0	84	WSW.	Fresh..		Hidden.		Nimbus.	10	W.*s*	......	......	.01	43.2	Light rain.	G.
3 p. m.	29.553	39.7	38.7	91	NNW.	Fresh..		Hidden.		Stratus .	10	NW.*s*	......	2.40	.02	43.5	Cloudy....	G.
4 p. m.	29.554	40.2	39.4	93	NNW.	Brisk ..		Hidden.		Nimbus.	10	0	3.40	......	.01	43.5	Light rain.	G.
5 p. m.	29.512	41.0	39.8	91	NW.	Fresh..		Hidden.		Stratus .	10	0	......	4.00	.—	43.9	Cloudy....	L.
6 p. m.	29.497	39.8	39.0	91	NNW.	Fresh..		Hidden.		Nimbus.	10	0	5.20	......	.01	44.0	Light rain.	L.
7 p. m.	29.494	39.0	39.0	100	NW.	Fresh..		Hidden.		Nimbus.	10	0	......	......	.01	43.6	Light rain.	L.
8 p. m.	29.479	40.0	40.0	100	NW.	Brisk ..		Hidden.		Stratus .	10	NW.*r*	......	7.10	.—	44.0	Cloudy....	L.
9 p. m.	28.469	39.8	38.8	91	NW.	Brisk ..	0	0	0	Stratus .	9	0	......	......	00	44.0	Cloudy....	M.
10 p. m.	29.464	40.0	39.0	91	NW.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	44.0	Cloudy....	M.
11 p. m.	29.465	40.5	39.0	86	NW.	Brisk ..	0	0	0	Cu. st...	9	NW.*s*	......	......	00	44.0	Cloudy....	M.
12 p. m.	29.479	40.5	39.0	86	NW.	Brisk ..	0	0	0	Cu. st...	9	NW.*s*	......	......	00	44.4	Cloudy....	M.

* Occasional light rain between observations.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 25, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 52° N., longitude 163° 40′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29.496	40.2	39.7	95	NW.	Brisk..	0	0	0	Stratus.	8	NW.*s*	......	......	00	44.0	Cloudy....	S.
2 a. m.	29.511	40.8	40.0	93	NW.	Brisk..	0	0	0	Stratus.	5	0	......	......	00	43.5	Fair.......	S.
3 a. m.	29.521	40.9	39.7	90	NW.	Fresh..	0	0	0	Stratus.	2	0	......	......	00	44.2	Clear......	S.
4 a. m.	29.523	41.0	39.8	90	NW.	Fresh..	0	0	0	Stratus.	4	0	......	......	00	45.0	Fair	S.
5 a. m.	29.525	41.3	40.1	90	NW.	Fresh..	0	0	0	Stratus.	3	0	......	......	00	46.0	Clear......	D.
6 a. m.	29.526	42.3	41.1	90	NW.	Fresh..	0	0	0	Stratus.	2	0	......	......	00	46.3	Clear......	D.
7 a. m.	29.526	42.0	41.0	91	NW.	Fresh..	0	0	0	Stratus	2	0	......	......	00	46.0	Clear......	D.
8 a. m.	29.526	42.0	41.0	91	NW.	Fresh..	0	0	0	Stratus	1	0	......	......	00	46.2	Clear......	D.
9 a. m.	29.524	42.2	39.8	81	NW.	Fresh..	0	0	0	Cumulus	3	0	......	......	00	46.8	Clear......	A.
10 a. m.	29.524	42.2	39.8	81	NW.	Fresh..	0	0	0	Cum. st.	8	0	......	......	00	47.0	Cloudy....	A.
11 a. m.	29.536	42.3	39.8	80	NW.	Fresh..	0	0	0	Cum. st.	8	0	......	......	00	47.0	Cloudy....	A.
12 m.	29.539	42.5	39.8	78	NW.	Fresh..	0	0	0	Cum. st.	7	0	......	......	00	47.0	Fair	A.
1 p. m.	29.539	43.0	40.5	79	NW.	Fresh..	Cumulus	1	0	Stratus	5	0	......	......	00	47.0	Fair	G.
2 p. m.	29.534	43.8	41.3	79	NW.	Gentle.	Cumulus	2	0	Stratus.	7	0	......	......	00	47.0	Cloudy....	G.
3 p. m.	29.544	43.0	39.8	74	NW.	Fresh..	Cirrus ..	1	0	Cumulus	7	0	......	......	00	47.0	Cloudy....	G.
4 p. m.	29.557	43.0	40.6	80	NW.	Fresh..	0	0	0	Cumulus	7	0	4.15	......	00	47.2	Fair.......	G.
5 p. m.	29.552	43.5	41.8	87	NW.	Fresh..	0	0	0	Cumulus	7	NW.*s*	......	4.40	.—	45.0	Fair	L.
6 p. m.	29.535	44.2	41.8	81	NW.	Fresh..	0	0	0	Cumulus	8	NW.*s*	......	......	00	46.8	Cloudy....	L.
7 a. m.	29.546	44.8	42.8	84	NW.	Fresh..	0	0	0	Cumulus	7	NW.*s*	......	......	00	47.0	Fair.......	L.
8 p. m.	29.526	45.0	42.0	76	NW.	Gentle.	0	0	0	Cumulus	7	NW.*s*	......	......	00	47.0	Fair.......	L.
9 p. m.	29.536	44.0	41.0	76	WNW.	Gentle.	0	0	0	Cum. st.	9	NW.*s*	......	......	00	47.0	Cloudy....	M.
10 p. m.	29.540	44.0	40.5	72	WNW.	Gentle.	0	0	0	Stratus. Cumulus	4 5	NW.*s* 0	......	......	00	47.1	Cloudy....	M.
11 p. m.	29.554	44.2	40.2	68	NW.	Gentle.	0	0	0	Stratus. Cumulus	4 4	NW.*s* 0	......	......	00	47.0	Cloudy....	M.
12 p. m.	29.561	44.0	41.0	76	NW.	Gentle.	0	0	0	Nimbus	9	NW.*s*	11.59	12.02	.—	47.0	Light rain.	M.

SEPTEMBER 26, 1883.

[Latitude 51° 15′ N., longitude 160° 27′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.572	43.0	40.8	81	NW.	Gentle.	0	0	0	Stratus.	2	0	......	......	00	47.0	Clear......	S.
2 a. m.	29.579	43.0	41.0	83	NW.	Gentle.	0	0	0	Stratus.	6	0	......	......	00	46.9	Fair.......	S.
3 a. m.	29.580	43.2	41.3	84	NW.	Gentle.	0	0	0	Stratus.	4	0	......	......	00	47.0	Fair.......	S.
4 a. m.	29.592	43.8	41.4	80	NW.	Gentle.		Hidden.		Stratus.	10	0	......	......	00	47.3	Cloudy....	S.
5 a. m.	29.597	44.0	41.6	80	NW.	Gentle.	0	0	0	Stratus.	9	0	......	......	00	48.0	Cloudy....	D.
6 a. m.	29.590	43.8	41.4	80	NW.	Gentle.	0	0	0	Stratus.	6	0	......	......	00	48.0	Fair.......	D.
7 a. m.	29.587	43.5	42.0	87	NW.	Gentle.	0	0	0	Stratus.	4	0	......	......	00	47.7	Fair.......	D.
8 a. m.	29.578	44.2	42.7	87	NW.	Gentle.	0	0	0	Stratus.	1	0	......	......	00	48.2	Clear......	D.
9 a. m.	29.585	43.5	41.0	80	NW.	Gentle.	0	0	0	Cumulus	3	0	......	......	00	48.2	Clear......	A.
10 a. m.	29.582	43.5	41.0	80	WNW.	Gentle.	0	0	0	Cum. st.	5	0	......	......	00	47.5	Fair.......	A.
11 a. m.	29.570	43.8	40.8	76	WNW.	Gentle.	0	0	0	Cumulus	8	0	......	......	00	47.4	Cloudy...	A.
12 m.	29.553	43.6	40.8	78	W.	Gentle.	0	0	0	Cum. st.	6	0	......	......	00	47.0	Fair.......	A.
1 p. m.	29.551	44.0	41.8	82	SW.	Fresh..	Cirrus ...	3	0	Stratus.	6	0	......	......	00	47.0	Cloudy....	G.
2 p. m.	29.550	44.0	40.8	74	S.	Light..	Cirrus ..	5	0	Stratus.	5	0	......	......	00	47.1	Cloudy....	G.
3 p. m.	29.546	45.8	42.5	74	S.	Gentle.	Cirrus .. Cir. cu ..	3 2	0 0	Cumulus	2	S.*s*	......	......	00	47.3	Fair......	G.
4 p. m.	29.531	46.0	42.5	73	SE.	Fresh..	Cirrus ..	5	0	Cumulus	3	0	......	......	00	47.3	Cloudy....	G.
5 p. m.	29.521	47.2	43.2	70	SE.	Gentle.	Cumulus	3	0	Cum. st.	5	SE.*s*	......	......	00	47.5	Cloudy....	L.
6 p. m.	29.521	47.0	43.0	70	SE.	Gentle.	Cirrus ..	1	0	Cum. st.	4	SE.*s*	......	......	00	48.0	Fair.......	L.
7 p. m.	29.496	48.0	44.0	70	SE.	Fresh..	0	0	0	Cumulus	6	SE.*s*	......	......	00	48.0	Fair.......	L.
8 p. m.	29.476	47.5	43.8	74	SE.	Fresh..	0	0	0	Cum. st.	7	SE.*s*	......	......	00	48.0	Fair.......	L.
9 p. m.	29.476	43.7	42.0	71	S.	Light..	0	0	0	Cum. st.	9	0	......	......	00	47.8	Cloudy....	M.
10 p. m.	29.468	46.0	42.3	71	ESE.	Light..	0	0	0	Cum. st.	9	0	......	......	00	47.8	Cloudy....	M.
11 p. m.	29.467	45.5	42.0	73	E.	Light..	0	0	0	Cum. st.	9	0	......	......	00	47.4	Cloudy....	M.
12 p. m.	29.480	45.0	43.0	84	ENE.	Gentle.	0	0	0	Cum. st.	8	0	......	......	00	47.2	Cloudy....	M.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 27, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 50° 10′ N., longitude 157° 53′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch*			
1 a. m.	29.492	45.0	43.0	84	ENE.	Fresh..		Hidden.		Stratus .	10	0	......	......	00	47.3	Cloudy....	S.
2 a. m.	29.598	45.2	43.0	82	ENE.	Fresh..	0	0	0	Stratus	5	0	......	......	00	47.4	Fair.......	S.
3 a. m.	29.520	45.2	43.0	82	ENE.	Fresh..	0	0	0	Stratus .	4	0	......	......	00	47.2	Fair.......	S.
4 a. m.	29.528	44.8	42.8	84	ENE.	Light..	0	0	0	Stratus	2	0	......	......	00	47.0	Clear......	S.
5 a. m.	29.573	44.8	42.8	84	ENE.	Gentle.	0	0	0	Stratus .	3	0	......	......	00	47.4	Clear......	D.
6 a. m.	29.565	44.8	42.8	84	ENE.	Gentle	0	0	0	Stratus .	2	0	......	......	00	47.7	Clear......	D.
7 a. m.	29.565	44.8	42.8	84	ENE.	Gentle.	0	0	0	Stratus	3	0	......	......	00	47.7	Clear......	D.
8 a. m.	29.569	44.6	42.7	85	ENE.	Gentle	0	0	0	Stratus .	4	0	......	......	00	47.5	Clear......	D.
9 a. m.	29.593	45.0	42.8	82	NE.	Gentle	0	0	0	Cu. str..	9	0	......	......	00	47.8	Cloudy....	A.
10 a. m.	29.613	44.7	42.2	80	NNE.	Gentle.	0	0	0	Cu. str..	5	0	......	......	00	47.8	Fair.......	A.
11 a. m.	29.636	44.8	41.8	77	NNW.	Fresh..	0	0	0	Cumulus	8	0	......	......	00	47.7	Cloudy....	A.
12 m.	29.642	44.0	41.3	79	NNW.	Fresh..	Cir. cu..	3	0	Cu. str..	4	NNW.*s*	......	......	00	47.8	Fair.......	A.
1 p. m.	29.650	44.1	41.7	80	NNW.	Fresh .	Cir. cu..	3	0	Cumulus Stratus .	3 3	NNW.*s* NNW.*s*	......	......	00	47.9	Cloudy....	G.
2 p. m.	29.678	44.5	41.6	77	NNW.	Fresh..	0	0	0	Stratus .	9	NNW.*s*	......	......	00	48.2	Cloudy....	G.
3 p. m.	29.679	45.0	41.8	75	NNW.	Fresh..	Cir. cu..	3	0	Cu. str..	3	NNW.*s*	......	......	00	48.3	Fair.......	G.
4 p. m.	29.682	46.0	43.1	77	NNW.	Fresh..	Cir. cu..	5	0	Cu. str..	4	NNW.*s*	......	......	00	48.3	Cloudy....	G.
5 p. m.	29.696	45.0	43.3	88	NNW.	Fresh..	0	0	0	Cu. str..	7	NW.*s*	......	......	00	48.5	Fair.......	L.
6 p. m.	29.688	45.8	43.3	80	NNW.	Fresh..	0	0	0	Cu. str..	8	NW.*s*	......	......	00	48.8	Cloudy....	L.
7 p. m.	29.702	46.5	43.5	84	NNW.	Fresh..	0	0	0	Cu. str..	9	NW.*s*	......	......	00	48.6	Cloudy....	L.
8 p. m.	29.706	46.0	43.0	77	NNW.	Fresh..	0	0	0	Cumulus Cu. str..	2 3	NW.*s* NW.*s*	......	......	00	48.5	Fair.......	L.
9 p. m.	29.721	46.0	41.0	62	NW.	Brisk ..	0	0	0	Cumulus Stratus .	4 3	0 NW.*s*	......	......	00	48.7	Fair.......	M.
10 p. m.	29.721	46.2	42.2	69	NW.	Brisk ..	0	0	0	Cu. str..	9	NW.*s*	......	......	00	48.7	Cloudy....	M.
11 p. m.	29.725	46.2	41.2	62	NW.	Brisk ..	0	0	0	Cumulus Stratus .	3 4	0 NW.*s*	......	......	00	49.0	Fair.......	M.
12 p. m.	29.738	45.5	41.5	69	NW.	Brisk ..	0	0	0	Stratus .	6	NW.*s*	11.30	11.40	.—	49.0	Fair.......	M.

SEPTEMBER 28, 1883.

[Latitude 48° 26′ N., longitude 154° 4′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
1 a. m.	29.759	44.9	41.8	75	NW.	Brisk ..	0	0	0	Stratus .	8	0	......	......	00	48.9	Cloudy....	S.
2 a. m.	29.767	45.2	42.5	78	NW.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	48.8	Cloudy....	S.
3 a. m.	29.774	45.0	42.5	79	NW.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	48.8	Cloudy....	S.
4 a. m.	29.782	44.7	42.4	81	NW.	Brisk ..	0	0	0	Stratus .	9	0	......	......	00	48.8	Cloudy....	S.
5 a. m.	29.792	44.6	42.3	81	NW.	Brisk ..	0	0	0	Stratus .	4	0	......	......	00	49.0	Fair.......	D.
6 a. m.	29.795	44.6	43.8	98	NW.	Brisk ..	0	0	0	Stratus .	9	0	......	......	00	49.0	Cloudy....	D.
7 a. m.	29.798	44.0	43.1	92	NW.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	48.3	Cloudy....	D.
8 a. m.	29.802	44.7	43.9	92	NW.	Brisk ..	0	0	0	Stratus .	8	0	......	......	00	49.0	Cloudy....	D.
9 a. m.	29.817	45.0	42.0	77	NW.	Fresh..	0	0	0	Cu. str..	7	0	......	......	00	48.8	Fair.......	A.
10 a. m.	29.819	45.0	42.8	83	WNW.	Fresh..	0	0	0	Cu. str..	3	0	......	......	00	48.9	Clear......	A.
11 a. m.	29.812	45.5	42.5	77	WNW.	Gentle .	Cumulus	3	0	Cu. str..	5	0	......	......	00	49.3	Cloudy....	A.
12 m.	29.802	45.5	42.8	79	WNW.	Gentle .	Cumulus	5	0	Cu str..	2	0	......	......	00	49.6	Fair.......	A.
1 p. m.	29.810	46.5	43.0	73	W.	Fresh..	Cir. cu ..	2	0	Cumulus	5	0	......	......	00	49.7	Fair.......	G.
2 p. m.	29.819	47.0	44.5	81	WSW.	Fresh..	Cir. cu ..	2	0	Cumulus	4	WSW.*s*	......	......	00	49.6	Fair.......	G.
3 p. m.	29.816	49.2	46.5	80	WSW.	Fresh..	Cir. cu ..	2	0	Cumulus	2	WSW.*s*	......	......	00	50.1	Fair.......	G.
4 p. m.	29.805	50.8	47.8	79	W.	Fresh..	Cir. cu ..	4	0	Cumulus	3	W.*s*	......	......	00	50.2	Fair.......	G.
5 p. m.	29.701	48.5	46.8	89	W.	Fresh..		Hidden.		Stratus .	10	0	......	......	00	51.0	Cloudy....	L.
6 p. m.	29.713	49.0	46.8	85	W.	Fresh..		Hidden.		Stratus .	10	0	......	......	00	51.0	Cloudy....	L.
7 p. m.	29.674	49.8	47.0	79	W.	Fresh..		Hidden.		Stratus .	10	0	......	......	00	51.0	Cloudy....	L.
8 p. m.	29.686	49.5	47.5	85	W.	Fresh..		Hidden.		Stratus .	10	0	......	......	00	51.0	Cloudy....	L.
9 p. m.	29.774	49.0	47.0	85	SW.	Fresh..		Hidden.		Stratus .	10	SW.*s*	......	......	00	50.5	Cloudy....	M.
10 p. m.	29.728	48.8	47.3	89	SSW.	Brisk ..		Hidden.		Nimbus.	10	0	9.45	......	.—	50.5	Light rain.	M.
11 p. m.	29.725	48.6	47.6	93	SSW.	Brisk ..		Hidden.		Nimbus.	10	0	......	......	.—	50.3	Light rain.	M.
12 p. m.	29.719	48.6	47.6	93	SSW.	Brisk ..		Hidden.		Nimbus.	10	0	......	......	.—	50.3	Light rain.	M.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

SEPTEMBER 29, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 47° 36′ N., longitude 150° 55′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											*Inch.*			
1 a. m.	29. 706	49. 7	49. 1	95	SSW.	High ..	Hidden.			Nimbus.	10	0	......	......	. —	50. 2	Light rain.	S.
2 a. m.	29. 685	49. 3	49. 3	100	SSW.	High ..	Hidden.			Nimbus.	10	0	......	......	. 01	50. 3	Light rain.	S.
3 a. m.	29. 654	49. 2	49. 2	100	SSW.	High ..	Hidden.			Nimbus.	10	0	......	......	. 01	50. 2	Light rain.	S.
4 a. m.	29. 615	49. 5	49. 5	100	SSW.	Gale ...	Hidden.			Nimbus.	10	0	......	......	. 02	50. 4	H'vy rain .	S.
5 a. m.	29. 587	50. 9	50. 9	100	SSW.	Gale ...	Hidden.			Nimbus.	10	0	......	......	. 01	50. 8	Light rain.	D.
6 a. m.	29. 550	51. 0	51. 3	100	SSW.	Gale ...	Hidden.			Nimbus.	10	0	......	......	. 01	51. 0	Light rain.	D.
7 a. m.	29. 499	52. 0	52. 0	100	SSW.	Gale	Hidden.			Nimbus.	10	0	......	......	. —	51. 7	Light rain.	D.
8 a. m.	29. 499	52. 0	52. 0	100	SSW.	Gale ...	Hidden.			Nimbus.	10	0	......	......	. 02	51. 8	H'vy rain .	D.
9 a. m.	29. 473	53. 0	53. 0	100	SSW.	Gale ...	Hidden.			Nimbus.	10	0	......	......	. 01	52. 0	Light rain.	A.
10 a. m.	29. 468	53. 0	53. 0	100	SSW.	High ..	Hidden.			Stratus .	10	0	......	9. 45	. 01	51. 4	Cloudy....	A.
11 a. m.	29. 455	53. 2	52. 9	98	S.	High ..	Hidden.			Stratus .	10	0	......	......	00	51. 2	Cloudy....	A.
12 m.	29. 435	53. 2	53. 2	100	SSW.	High ..	Hidden.			Nimbus.	10	0	11. 30	......	. 01	51. 0	Light rain.	A.
1 p. m.	29. 428	53. 1	53. 1	100	SSW.	High ..	Hidden.			Nimbus.	10	0	......	......	. —	51. 0	Light rain.	G.
2 p. m.	29. 410	53. 2	53. 2	100	SSW.	High ..	Hidden.			Nimbus.	10	SSW. *r*	......	......	. 01	50. 8	Light rain.	G.
3 p. m.	29. 418	53. 0	53. 0	100	SSW.	High ..	Hidden.			Nimbus.	10	SSW. *r*	......	......	. 01	50. 5	Light rain.	G.
4 p. m.	29. 433	52. 3	52. 3	100	SW.	Fresh..	Hidden.			Nimbus.	10	SW. *r*	......	......	. 01	50. 6	Light rain.	G.
5 p. m.	29. 458	52. 0	52. 0	100	W.	Fresh..	Hidden.			Stratus.	10	0	......	......	. —*	51. 0	Cloudy....	L.
6 p. m.	29. 431	51. 5	51. 5	100	W.	Fresh..	Hidden.			Nimbus.	10	0	......	......	. 01*	51. 0	Light rain.	L.
7 p. m.	29. 463	51. 0	49. 7	96	W.	Fresh..	Hidden.			Stratus .	10	0	......	......	. —	51. 0	Cloudy....	L.
8 p. m.	29. 496	51. 5	51. 2	97	WNW.	Fresh..	0	0	0	Stratus .	8	0	......	......	00	51. 2	Cloudy....	L.
9 p. m.	29. 533	51. 5	50. 0	90	W.	Fresh..	Cir. cu..	1	0	Stratus .	4	W. *s*	......	......	00	51. 0	Fair.......	M.
10 p. m.	29. 533	51. 2	49. 7	90	WNW.	Fresh..	0	0	0	Stratus .	5	WNW. *s*	......	......	00	51. 0	Fair.......	M.
11 p. m.	29. 547	51. 0	49. 8	90	WNW.	Fresh..	0	0	0	Stratus .	3	0	......	......	00	51. 0	Clear......	M.
12 p. m.	29. 605	51. 0	49. 5	90	WNW.	Brisk ..	0	0	0	Stratus .	3	0	......	......	00	51. 0	Clear......	M.

* Rain at intervals.

SEPTEMBER 30, 1883.

[Latitude 45° 56′ N., longitude 146° 24′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Upper clouds amount.	Upper clouds direction.	Lower clouds kind.	Lower clouds amount.	Lower clouds direction.	Commenced.	Ended.	Amount of rain.	Surface water.	State of weather.	Observer.
1 a. m.	29. 611	51. 5	49. 8	88	WNW.	Brisk ..	0	0	0	Stratus .	2	0	......	......	00	51. 3	Clear......	S.
2 a. m.	29. 616	51. 4	49. 5	86	WNW.	Brisk ..	0	0	0	Stratus .	2	0	......	......	00	51. 5	Clear......	S.
3 a. m.	29. 623	51. 8	49. 6	85	WNW.	Brisk ..	0	0	0	Stratus .	4	0	......	......	00	51. 7	Fair.......	S.
4 a. m.	29. 657	52. 0	49. 7	84	WNW.	Brisk ..	0	0	0	Stratus .	8	0	......	......	00	52. 0	Cloudy....	S.
5 a. m.	29. 683	52. 1	49. 8	84	WNW.	Brisk ..	0	0	0	Stratus .	3	0	......	......	00	52. 1	Clear......	D.
6 a. m.	29. 697	52. 3	50. 1	85	WNW.	Brisk ..	0	0	0	Stratus .	2	0	......	......	00	52. 1	Cloudy....	D.
7 a. m.	29. 732	52. 0	49. 0	79	WNW.	Brisk ..	0	0	0	Stratus .	2	0	......	......	00	52. 2	Clear......	D.
8 a. m.	29. 761	52. 0	49. 0	79	WNW.	Brisk ..	0	0	0	Stratus .	1	WNW. *r*	......	......	00	52. 3	Clear......	D.
9 a. m.	29. 772	52. 5	49. 0	77	WNW.	Fresh..	0	0	0	Stratus .	2	0	......	......	00	53. 0	Clear......	A.
10 a. m.	29. 807	51. 8	48. 8	80	WNW.	Fresh..	0	0	0	Cu. str..	5	0	......	......	. —	53. 0	Fair.......	A.
11 a. m.	29. 839	51. 2	48. 2	79	W.	Fresh..	0	0	0	Cumulus	5	W. *s*	......	......	00	53. 4	Fair.......	A.
12 m.	29. 864	52. 5	49. 0	77	W.	Fresh..	0	0	0	Cumulus	6	W. *s*	......	......	00	53. 9	Fair.......	A.
1 p. m.	29. 889	53. 0	49. 7	78	W.	Fresh..	0	0	0	Cumulus	6	W. *s*	......	......	00	54. 0	Fair.......	G.
2 p. m.	29. 928	54. 0	50. 7	78	W.	Fresh..	0	0	0	Cumulus	4	W. *s*	......	......	00	54. 2	Fair.......	G.
3 p. m.	29. 942	55. 0	51. 0	74	W.	Fresh..	0	0	0	Cumulus	6	W. *s*	......	......	00	54. 8	Fair.......	G.
4 p. m.	29. 983	55. 0	50. 8	73	W.	Fresh..	0	0	0	Cumulus	8	W. *s*	......	......	00	54. 6	Cloudy....	G.
5 p. m.	30. 016	55. 0	51. 6	84	W.	Fresh..	0	0	0	Cumulus	4	0	......	......	00	54. 9	Fair.......	L.
6 p. m.	30. 026	53. 5	51. 6	86	W.	Fresh..	0	0	0	Cumulus	5	W. *s*	......	......	00	55. 0	Fair.......	L.
7 p. m.	30. 058	54. 5	52. 3	87	W.	Fresh..	0	0	0	Cumulus	5	W. *s*	......	......	00	55. 4	Fair.......	L.
8 p. m.	30. 047	54. 5	52. 0	84	W.	Fresh..	0	0	0	Cumulus	5	W. *s*	......	......	00	56. 0	Fair.......	L.
9 p. m.	30. 059	54. 5	50. 5	74	WNW.	Brisk ..	0	0	0	Cumulus	4	W. *s*	......	......	00	55. 4	Fair.......	M.
10 p. m.	30. 067	54. 3	50. 3	74	W.	Fresh..	0	0	0	Cumulus	6	W. *s*	......	......	00	56. 0	Fair.......	M.
11 p. m.	30. 111	54. 2	50. 3	74	W.	Brisk ..	0	0	0	Stratus .	4	W. *s*	......	......	00	56. 4	Fair.......	M.
12 p. m.	30. 133	54. 5	51. 4	79	W.	Brisk ..	0	0	0	Stratus .	5	0	......	......	00	56. 3	Fair.......	M.

* Light rain between observations.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

OCTOBER 1, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 44° 26′ N., longitude 142° 28′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.)	Surface water.	State of weather.	Observer.
				P. ct.											Inch.			
1 a. m.	30.156	54.8	51.9	81	W.	Brisk ..	0	0	0	Stratus .	4	0	......	......	00	56.8	Fair	S.
2 a. m.	30.182	55.0	52.1	81	W.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	56.8	Cloudy....	S.
3 a. m.	30.192	54.9	51.9	80	W.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	56.8	Cloudy....	S.
4 a. m.	30.213	54.8	51.9	81	W.	Brisk ..		Hidden.		Stratus .	10	0	......	......	00	56.7	Cloudy....	S.
5 a. m.	30.219	55.8	52.8	80	W.	Brisk ..	0	0	0	Stratus .	8	0	......	......	00	56.7	Cloudy....	D.
6 a. m.	30.234	55.6	52.3	79	W.	Brisk ..	0	0	0	Stratus .	2	0	......	......	00	56.5	Clear......	D.
7 a. m.	30.247	55.0	51.8	80	W.	Fresh ..	0	0	0	0	0	0	......	......	00	57.0	Clear......	D.
8 a. m.	30.259	55.0	52.0	80	W.	Fresh ..	0	0	0	Stratus .	4	0	......	......	00	57.0	Fair	D.
9 a. m.	30.287	55.8	53.3	84	W.	Fresh ..	0	0	0	Stratus .	9	0	......	......	00	56.7	Cloudy....	A.
10 a. m.	30.309	55.7	53.2	84	W.	Fresh ..	Cir. cu ..	2	0	Stratus .	7	0	......	......	00	56.8	Cloudy....	A.
11 a. m.	30.317	56.0	53.5	84	W.	Fresh ..	Cir. cu ..	4	0	Cum. st.	5	W.*s*	......	......	00	58.0	Cloudy....	A.
12 m.	30.324	56.0	53.5	84	W.	Gentle .	Cum	3	0	Cum. st.	5	W.*s*	......	......	00	58.0	Cloudy....	A.
1 p. m.	30.327	57.7	53.7	76	W.	Fresh ..	Cir. cu ..	2	0	Stratus .	8	W.*s*	......	......	00	58.7	Cloudy....	G.
2 p. m.	30.347	59.0	54.8	73	W.	Fresh ..	Cir. cu ..	1	0	Cumulus	2	W.*s*	......	......	00	58.6	Clear	G.
3 p. m.	30.353	60.0	55.5	74	W.	Fresh ..	Cir. cu ..	3	0	Cumulus	2	W.*s*	......	......	00	58.6	Fair	G.
4 p. m.	30.354	60.9	55.4	68	W.	Fresh ..	0	0	0	Cumulus	2	W.*s*	......	......	00	58.6	Clear	G.
5 p. m.	30.395	61.0	55.5	68	W.	Fresh ..	0	0	0	Cumulus	4	W.*s*	......	......	00	59.0	Fair	L.
6 p. m.	30.371	61.0	55.5	63	W.	Fresh ..	0	0	0	Cumulus	6	W.*s*	......	......	00	58.8	Fair	L.
7 p. m.	30.363	60.0	55.5	73	W.	Fresh ..	0	0	0	Cumulus Cum. st.	3 3	W.*s* W.*s*	......	......	00	58.5	Fair	L.
8 p. m.	30.382	59.0	56.5	85	W.	Fresh ..	0	0	0	Cum. st.	8	W.*s*	......	......	00	57.9	Cloudy....	L.
9 p. m.	30.409	58.0	54.0	76	W.	Fresh ..	0	0	0	Cum. st.	9	W.*s*	......	......	00	57.6	Cloudy....	M.
10 p. m.	30.389	57.0	52.0	60	W.	Fresh ..	0	0	0	Stratus .	9	W.*s*	......	......	00	57.8	Cloudy....	M.
11 p. m.	30.399	57.2	52.2	69	WSW.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	57.8	Cloudy....	M.
12 p. m.	30.413	57.2	52.5	71	WSW.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	57.8	Cloudy....	M.

OCTOBER 2, 1883.

[Latitude 43° 56′ N., longitude 140° 17′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.)	Surface water.	State of weather.	Observer.
1 a. m.	30.431	57.0	53.5	78	WSW.	Fresh ..	0	0	0	Stratus .	9	0	......	......	00	57.7	Cloudy....	S.
2 a. m.	30.442	57.2	53.3	75	WSW.	Fresh ..	0	0	0	Stratus .	8	0	......	......	00	57.5	Cloudy....	S.
3 a. m.	30.448	57.0	52.7	73	SW.	Fresh ..	0	0	0	Stratus .	9	0	......	......	00	57.2	Cloudy....	S.
4 a. m.	30.454	57.1	53.1	75	SW.	Fresh ..	0	0	0	Stratus .	9	0	......	......	00	57.0	Cloudy....	S.
5 a. m.	30.466	58.2	54.2	75	SW.	Fresh ..	0	0	0	Stratus .	9	0	......	......	00	57.4	Cloudy....	D.
6 a. m.	30.471	58.0	53.1	70	SW.	Fresh ..	0	0	0	Stratus .	8	0	......	......	00	57.6	Cloudy....	D.
7 a. m.	30.457	58.0	53.1	70	WSW.	Fresh ..	0	0	0	Stratus .	3	0	......	......	00	57.6	Cloudy....	D.
8 a. m.	30.451	58.0	53.1	70	SW.	Fresh ..	0	0	0	Stratus .	8	0	......	......	00	57.8	Cloudy....	D.
9 a. m.	30.462	58.0	53.5	74	SSW.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	58.2	Cloudy....	A.
10 a. m.	30.477	58.2	53.2	71	SSW.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	58.7	Cloudy....	A.
11 a. m.	30.492	58.8	53.7	70	SSW.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	58.8	Cloudy....	A.
12 m.	30.494	59.0	53.7	69	WSW.	Light ..		Hidden.		Stratus .	10	0	......	......	00	59.6	Cloudy....	A.
1 p. m.	30.486	60.0	54.7	69	WSW.	Gentle		Hidden.		Stratus .	10	0	......	......	00	59.6	Cloudy....	G.
2 p. m.	30.484	60.4	54.3	65	WSW.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	59.5	Cloudy....	G.
3 p. m.	30.494	61.0	55.3	65	SW.	Light ..		Hidden.		Stratus .	10	0	......	......	00	59.2	Cloudy....	G.
4 p. m.	30.489	61.0	55.5	69	SW.	Light ..		Hidden.		Stratus .	10	0	......	......	00	59.1	Cloudy....	G.
5 p. m.	30.453	61.0	55.9	74	W.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	59.5	Cloudy....	L.
6 p. m.	30.473	61.0	56.7	74	W.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	59.6	Cloudy....	L.
7 p. m.	30.444	60.0	56.5	77	W.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	59.5	Cloudy....	L.
8 p. m.	30.411	60.0	56.5	79	W.	Gentle .		Hidden.		Stratus .	10	0	......	......	00	59.6	Cloudy....	L.
9 p. m.	30.445	60.0	56.0	76	S.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	59.6	Cloudy....	M.
10 p. m.	30.441	60.0	56.5	79	S.	Fresh ..		Hidden.		Stratus .	10	0	......	......	00	59.7	Cloudy....	M.
11 p. m.	30.435	60.0	56.5	79	S.	Fresh ..	0	0	0	Stratus .	5	0	......	......	00	59.7	Fair	M.
12 p. m.	30.435	60.0	57.0	82	S.	Fresh ..	0	0	0	Stratus .	6	0	......	......	00	59.7	Fair	M.

Meteorological record of the voyage of the schooner Leo, &c.—Continued.

OCTOBER 3, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 42° 59′ N., longitude 136° 39′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction moving from—	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											Inch.			
1 a. m.	30.434	60.0	57.7	86	S.	Gentle		Hidden.		Stratus	10	0	......	......	00	59.5	Cloudy	S.
2 a. m.	30.422	59.9	57.5	85	S.	Gentle		Hidden.		Stratus	10	0	......	......	00	59.6	Cloudy	S.
3 a. m.	30.410	59.9	57.5	85	SW.	Fresh		Hidden.		Stratus	10	0	......	......	00	59.7	Cloudy	S.
4 a. m.	30.403	59.8	57.4	85	SW.	Fresh		Hidden.		Stratus	10	0	......	......	00	59.7	Cloudy	S.
5 a. m.	30.388	59.0	58.0	94	W.	Fresh	0	0	0	Stratus	8	0	......	......	00	60.1	Cloudy	D.
6 a. m.	30.388	60.3	58.5	89	W.	Fresh		Hidden.		Stratus	10	0	......	......	00	60.2	Cloudy	D.
7 a. m.	30.371	60.3	58.5	89	W.	Fresh	0	0	0	Stratus	2	0	......	......	00	60.3	Clear	D.
8 a. m.	30.361	60.3	58.5	89	W.	Gentle	0	0	0	Stratus	2	0	......	......	00	60.4	Clear	D.
9 a. m.	30.348	60.2	58.7	91	W.	Gentle	0	0	0	Stratus	5	0	......	......	00	60.5	Fair	A.
10 a. m.	30.343	60.5	58.7	89	WNW.	Gentle		Hidden.		Stratus	10	0	......	......	00	60.8	Cloudy	A.
11 a. m.	30.345	61.0	59.5	91	WNW.	Gentle		Hidden.		Nimbus	10	0	10.35	......	.—	60.8	Light rain.	A.
12 m.	30.328	61.0	59.8	93	WNW.	Gentle		Hidden.		Nimbus	10	0	......	......	.01	61.0	Light rain.	A.
1 p. m.	30.324	61.2	60.7	97	WNW.	Fresh		Hidden.		Nimbus	10	0	......	......	.01	61.2	Light rain.	G.
2 p. m.	30.306	61.4	60.9	97	WNW.	Fresh		Hidden.		Nimbus	10	0	......	2.10	.—	61.7	Light rain.	G.
3 p. m.	30.299	62.0	61.0	[illegible]	WNW.	Fresh		Hidden.		Stratus	10	0	......	......	.—	62.2	Cloudy	G.
4 p. m.	30.259	62.0	61.5	[illegible]	WNW.	Fresh		Hidden.		Stratus	10	0	......	......	00	62.0	Cloudy	G.
5 p. m.	30.251	62.0	59.9	88	WNW.	Fresh		Hidden.		Stratus	10	0	......	......	00	62.0	Cloudy	L.
6 p. m.	30.226	62.0	59.5	88	WNW.	Fresh		Hidden.		Stratus	10	0	......	......	00	62.0	Cloudy	L.
7 p. m.	30.221	61.0	61.0	100	WNW.	Fresh		Hidden.		Nimbus	10	0	6.30	......	.—	62.4	Light rain.	L.
8 p. m.	30.194	61.0	60.5	97	WNW.	Brisk	0	0	0	Cum. st.	8	NW.*s*	......	7.10	.—	62.6	Cloudy	L.
9 p. m.	30.177	61.0	60.0	94	WNW.	Brisk		Hidden.		Stratus	10	0	......	......	00	62.5	Cloudy	M.
10 p. m.	30.169	61.0	60.0	94	WNW.	Brisk		Hidden.		Stratus	10	0	......	......	00	63.0	Cloudy	M.
11 p. m.	30.159	60.5	59.0	91	WNW.	Brisk		Hidden.		Stratus	10	0	......	......	00	62.5	Cloudy	M.
12 p. m.	30.161	60.5	59.0	91	WNW.	Brisk		Hidden.		Stratus	10	0	......	......	00	62.6	Cloudy	M.

OCTOBER 4, 1883.

[Latitude 41° 28′ N., longitude 132° 10′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Upper clouds amount.	Upper clouds direction.	Lower clouds kind.	Lower clouds amount.	Lower clouds direction.	Commenced.	Ended.	Amount of rain.	Surface water.	State of weather.	Observer.
1 a. m.	30.192	61.2	59.3	89	NNW.	Brisk		Hidden.		Stratus	10	0	......	......	.—	62.0	Cloudy	S.
2 a. m.	30.194	61.0	58.9	87	NNW.	Brisk	0	0	0	Stratus	8	0	......	......	00	62.4	Cloudy	S.
3 a. m.	30.190	60.3	58.3	88	NNW.	Brisk	0	0	0	Stratus	8	0	......	......	00	62.6	Cloudy	S.
4 a. m.	30.179	60.0	58.2	89	N.	Brisk		Hidden.		Stratus	10	0	......	......	00	62.7	Cloudy	S.
5 a. m.	30.161	60.0	55.0	71	N.	Brisk	0	0	0	Stratus	4	0	......	......	00	63.0	Fair	D.
6 a. m.	30.172	60.0	54.1	70	N.	Brisk	0	0	0	Stratus	8	0	......	......	00	63.1	Cloudy	D.
7 a. m.	30.167	60.0	55.0	71	N.	Brisk	0	0	0	Stratus	8	0	......	......	00	63.6	Cloudy	D.
8 a. m.	30.194	59.5	(†)	(†)	N.	Brisk	0	0	0	Stratus	9	0	......	......	00	63.2	Cloudy	D.
9 a. m.	30.208	59.5	(†)	(†)	NNW.	Brisk	0	0	0	Stratus	9	0	......	......	00	63.0	Cloudy	A.
10 a. m.	30.202	59.7	(†)	(†)	N.	Brisk	0	0	0	Cum. st.	9	N.*s*	......	......	00	63.2	Cloudy	A.
11 a. m.	30.198	60.5	(†)	(†)	N.	Brisk		Hidden.		Cumulus	10	N.*s*	......	......	00	63.6	Cloudy	A.
12 m.	30.185	60.0	(†)	(†)	N.	Brisk	0	0	0	Cumulus	9	N.*s*	......	......	00	63.8	Cloudy	A.
1 p. m.	30.208	‡59.7	56.2	79	NNW.	Brisk	Cum	1	0	Stratus	9	NNW.*s*	......	......	00	64.0	Cloudy	G.
2 p. m.	30.216	59.8	54.5	68	NNW.	Brisk		Hidden.		Stratus	10	NNW.*r*	......	......	00	64.0	Cloudy	G.
3 p. m.	30.228	60.2	53.9	63	NNW.	Brisk	Cir. cu	3	0	Cumulus	6	NNW.*r*	......	......	00	64.4	Cloudy	G.
4 p. m.	30.233	59.0	54.5	73	NNW.	Brisk		Hidden.		Cumulus	10	NW.*r*	......	......	00	64.0	Cloudy	G.
5 p. m.	30.230	60.0	54.7	69	NW.	Brisk		Hidden.		Stratus	10	0	......	......	00	64.4	Cloudy	L.
6 p. m.	30.230	59.8	54.7	69	NNW.	Brisk	0	0	0	Cum. st.	8	NW.*s*	......	......	00	64.6	Cloudy	L.
7 p. m.	30.250	60.0	55.0	71	NW.	Brisk	0	0	0	Cum. st	9	NW.*s*	......	......	00	64.5	Cloudy	L.
8 p. m.	30.260	59.5	54.7	73	NW.	Brisk	0	0	0	{ Cumulus Cum. st.	2 4	NW.*s* NW.*s* }	......	......	00 00	64.0	Fair	L.
9 p. m.	30.260	58.8	53.2	67	NNW.	High	0	0	0	Cum. st.	6	0	......	......	00	63.0	Fair	M.
10 p. m.	30.262	57.5	54.0	79	NW.	Brisk		Hidden.		Nimbus	10	0	9.40	......	.01	63.1	Light rain.	M.
11 p. m.	30.263	58.2	54.2	76	NW.	Brisk	0	0	0	Stratus	7	NW.*s*	......	10.20	.01	63.0	Fair	M.
12 p. m.	30.274	58.0	53.0	70	NW.	Brisk	0	0	0	Stratus	9	NW.*s*	......	......	00	63.6	Cloudy	M.

* Light shower of rain between observations.
† Exposed thermometer broken; wet bulb used as exposed.
‡ A thermometer substituted for the broken one.

Meteorological record of the voyage of the schooner Leo, &c.—**Continued.**

OCTOBER 5, 1883.

[Washington time. Italic *s* signifies *slow*; *r* signifies *rapid*. Latitude 39° 56′ N., longitude 128° 28′ W.]

Time of observation.	Corrected barometer.	Hygrometer (corrected). Dry bulb.	Hygrometer (corrected). Wet bulb.	Relative humidity.	Wind. Direction.	Wind. Kind.	Upper clouds. Kind.	Upper clouds. Amount in 10ths.	Upper clouds. Direction (moving from—)	Lower clouds. Kind.	Lower clouds. Amount in 10ths.	Lower clouds. Direction (moving from—)	Rain or snow. Commenced.	Rain or snow. Ended.	Amount of rain or melted snow.	Surface water.	State of weather.	Observer.
				P. ct.											Inch.			
1 a. m.	30. 293	50. 8	50. 0	71	NW.	Fresh...	0	0	0	Stratus.	4	0	......	......	00	63. 7	Fair.......	S.
2 a. m.	30. 303	59. 0	54. 5	73	NW.	Fresh...		Hidden.		Nimbus	10	0	1. 45	......	.—	63. 6	Light rain.	S.
3 a. m.	30. 306	59. 0	54. 3	72	N.	Brisk..		Hidden.		Stratus.	10	0	......	2. 10	. 01	63. 6	Cloudy....	S.
4 a. m.	30. 304	59. 2	54. 2	70	N.	Brisk..	0	0	0	Stratus.	5	0	......	......	00	63. 8	Fair.......	S.
5 a. m.	30. 306	59. 3	54. 0	68	N.	Brisk..	0	0	0	Stratus.	2	0	......	......	00	64. 4	Clear.......	D.
6 a. m.	30. 304	59. 0	54. 3	72	N.	Fresh..	0	0	0	Stratus.	4	0	......	......	00	64. 4	Fair.......	D.
7 a. m.	30. 299	57. 4	53. 9	78	N.	Brisk..	0	0	0	Stratus.	4	N.*r*	......	......	00	64. 3	Fair.......	D.
8 a. m.	30. 297	57. 4	53. 9	78	N.	Brisk..	0	0	0	Stratus.	5	N.*s*	......	......	00	64. 5	Fair.......	D.
9 a. m.	30. 296	58. 5	54. 0	74	N.	Fresh...	Cumulus	2	0	Cu. str..	6	0	......	......	00	63. 8	Cloudy....	A.
10 a. m.	30. 299	58. 0	53. 5	74	N.	Fresh..	Cu. st...	3	0	Cu. str..	2	N.*s*	......	......	00	63. 8	Fair.......	A.
11 a. m.	30. 309	58. 8	55. 2	79	N.	Brisk..		Hidden.		Cumulus	10	N.*s*	11. 10	......	00	63. 8	Cloudy....	A.
12 m.	30. 316	58. 8	54. 3	74	NNE.	Brisk..	Cumulus	4	0	Cu. str..	3	0	......	11. 55	.—	63. 9	Fair.......	A.
1 p. m.	30. 314	59. 0	54. 5	73	N.	Fresh..	Cirrus..	2	0	Cumulus	7	N.*s*	......	......	00	63. 4	Cloudy....	G.
2 p. m.	30. 295	59. 0	54. 5	73	N.	Fresh..	Cirrus..	1	0	Cumulus	6	N.*s*	......	......	00	63. 2	Fair.......	G.
3 p. m.	30. 317	59. 3	53. 3	65	N.	Fresh..	Cirrus..	3	0	Cumulus.	4	N.*s*	......	......	00	63. 1	Fair.......	G.
4 p. m.	30. 315	59. 2	54. 2	70	N.	Fresh..	Cirrus..	2	0	Cumulus	5	N.*s*	......	......	00	63. 4	Fair.......	G.
5 p. m.	30. 297	59. 5	53. 7	68	N.	Fresh..	Cir. cu..	2	0	Cumulus	3	N.*s*	......	......	00	60. 5	Fair.......	L.
6 p. m.	30. 279	59. 0	53. 7	68	N.	Fresh..	Cir. cu..	3	0	Cumulus	3	N.*s*	......	......	00	60. 0	Fair.......	L.
7 p. m.	30. 267	59. 0	53. 7	67	NNW.	Fresh..	Cir. cu..	2	0	Cumulus	4	N.*s*	......	......	00	59. 8	Fair.......	L.
8 p. m.	30. 254	59. 0	54. 7	76	N.	Fresh..	0	0	0	Cumulus	5	N.*s*	......	......	00	60. 8	Fair.......	L.
9 p. m.	30. 256	58. 2	54. 7	79	NNW.	Fresh..	Cirrus..	2	0	Cumulus	5	NNW.*s*	......	......	00	60. 6	Fair.......	M.
10 p. m.	30. 261	58. 5	54. 5	76	NNW.	Fresh..	Cirrus..	2	0	Cumulus	5	NNW.*s*	......	......	00	60. 7	Fair	M.
11 p. m.	30. 273	57. 7	55. 0	83	NNW.	Fresh..	Cirrus..	2	0	Cumulus	5	NNW.*s*	......	......	00	61. 0	Fair.......	M.
12 p. m.	30. 256	57. 8	55. 0	82	NNW.	Fresh..	0	0	0	Stratus.	5	0	......	......	00	61. 2	Fair.......	M.

OCTOBER 6, 1883.

[Latitude 38° 39′ N., longitude 124° 47′ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Upper clouds amount.	Upper clouds direction.	Lower clouds kind.	Lower clouds amount.	Lower clouds direction.	Rain commenced.	Rain ended.	Amount of rain.	Surface water.	State of weather.	Observer.
1 a. m.	30. 246	57. 0	55. 5	90	NNW.	Fresh..	0	0	0	Stratus.	9	0	......	......	†.—	60. 7	Cloudy....	S.
2 a. m.	30. 242	56. 3	54. 4	87	NW.	Brisk..	0	0	0	Stratus.	6	0	......	......	00	60. 6	Fair.......	S.
3 a. m.	30. 239	57. 0	55. 0	87	NW.	Brisk..	0	0	0	Stratus	4	0	......	......	00	63. 8	Fair.......	S.
4 a. m.	30. 232	57. 2	55. 4	88	NW.	Fresh..	0	0	0	Stratus.	2	0	......	......	00	60. 6	Clear.......	S.
5 a. m.	30. 189	57. 1	55. 3	88	NW.	Fresh..	0	0	0	Stratus.	3	0	......	......	00	61. 0	Clear.......	D.
6 a. m.	30. 172	56. 3	53. 7	83	NW.	Fresh..	0	0	0	Stratus.	2	0	......	......	00	61. 7	Clear.......	D.
7 a. m.	30. 160	56. 2	54. 8	91	NW.	Fresh..	0	0	0	Stratus.	2	NW.*r*	......	......	00	61. 0	Clear.......	D.
8 a. m.	30. 155	56. 2	54. 8	91	NW.	Fresh..	0	0	0	Stratus.	1	0	......	......	00	60. 5	Clear.......	D.
9 a. m.	30. 163	56. 5	53. 5	81	NW.	Fresh..	0	0	0	Cu. str..	5	0	......	......	00	56. 1	Fair.......	A.
10 a. m.	30. 168	56. 8	53. 8	81	NW.	Fresh..	Cumulus	3	0	Cu. str..	2	0	......	......	00	58. 8	Fair.......	A.
11 a. m.	30. 170	56. 0	53. 5	84	NW.	Fresh..	0	0	0	Cu. str..	2	0	......	......	00	55. 6	Clear.......	A.
12 m.	30. 173	55. 5	53. 2	85	NW.	Fresh..	0	0	0	Stratus.	1	0	......	......	00	54. 4	Clear.......	A.
1 p. m.	30. 171	54. 7	52. 4	85	NW.	Fresh..	0	0	0	Stratus.	1	0	......	......	00	54. 0	Clear.......	G.
2 p. m.	30. 171	54. 5	51. 0	77	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	53. 9	Clear.......	G.
3 p. m.	30. 161	54. 8	51. 5	78	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	54. 1	Clear.......	G.
4 p. m.	30. 131	54. 5	51. 5	80	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	52. 8	Clear.......	G.
5 p. m.	30. 114	55. 0	51. 7	71	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	53. 5	Clear.......	L.
6 p. m.	30. 074	56. 0	53. 2	81	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	53. 2	Clear.......	L.
7 p. m.	30. 081	55. 0	52. 7	84	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	53. 8	Clear.......	L.
8 p. m.	30. 065	54. 5	52. 0	84	NNW.	Fresh..	0	0	0	0	0	0	......	......	00	53. 8	Clear.......	L.
9 p. m.	30. 120	54. 0	51. 0	60	NNW.	Brisk..	0	0	0	Cumulus	1	0	......	......	00	54. 0	Clear.......	M.
10 p. m.	30. 075	53. 0	50. 0	80	NW.	Brisk..	0	0	0	0	0	0	......	......	00	53. 3	Clear.......	M.
11 p. m.	30. 063	52. 6	50. 1	83	NW.	Brisk..	0	0	0	0	0	0	......	......	00	53. 5	Clear.......	M.
12 p. m.	30. 047	52. 6	50. 6	86	NW.	Brisk..	0	0	0	0	0	0	......	......	00	53. 6	Clear.......	M.

OCTOBER 7, 1883.

[Latitude 37° 48′ 26″ N., longitude 122° 24′ 30″ W.]

Time of observation.	Corrected barometer.	Dry bulb.	Wet bulb.	Relative humidity.	Wind direction.	Wind kind.	Upper clouds kind.	Upper clouds amount.	Upper clouds direction.	Lower clouds kind.	Lower clouds amount.	Lower clouds direction.	Rain commenced.	Rain ended.	Amount of rain.	Surface water.	State of weather.	Observer.
1 a. m.	30. 050	53. 2	51. 2	86	NW.	Fresh..	0	0	0	Stratus.	1	0	......	......	00	54. 2	Clear.......	S.
2 a. m.	30. 054	53. 0	51. 3	88	NW.	Fresh..	0	0	0	Stratus.	1	0	......	......	00	54. 0	Clear.......	S.
3 a. m.	30. 052	53. 8	52. 0	88	NW.	Gentle.	0	0	0	0	0	0	......	......	00	55. 5	Clear.......	S.
‡4 a. m.	30. 052	53. 5	52. 0	88	S.	Light..	0	0	0	Stratus.	1	0	......	......	00	57. 0	Clear.......	S.

10.30 a. m. small, incomplete rainbow.

† Light shower of rain between observations.

‡ 4.35 a. m. passed the "Heads" into the Harbor of San Francisco.

AURORA.

The aurora was observed hourly during the whole period when there was sufficient darkness to allow it to be visible, and any extraordinary appearances observed between the hours were also noted.

The bearings given all refer to the true meridian, and as well as the altitudes are all estimated, as the aurora was never quiet enough for instrumental observation.

The brightness of the aurora was estimated on a scale of 0 to 4.

AURORAL RECORD, OOGLAAMIE, ALASKA, 1881, 1882, 1883.

Time of beginning and time of ending—Washington time.

October 17, 1881, 1.57 *a. m. to* 3.35 *a. m.*—From a point 30° W. of N. through Ursa Major and the Pleiades to a point about 15° E. of S. It was a brilliant arch of white light showing very little tremulous or lateral motion and only a few merry-dancers were observed. As a whole it had a motion to the S. and moved nearly 45° past the zenith before it was obscured.

October 22, 1881, 2.40 *a. m. to* 6.30 *a. m.*—From the NNW. to the SE., passing through Ursa Major, the Pleiades and Hyades. Very brilliant white light without any changes of color. Very bright toward its southern end. Several arches appeared in succession. Very little lateral motion.

October 27, 1881, 7 *a. m.* to 7 *a. m.*—Observed through breaks in the clouds. It was apparently brilliant, but the weather was too cloudy to allow it to be observed.

October 27 *and* 28, 1881, 10.30 *p. m. to* 8 *a. m.*—From a point 5° W. of N. to the SE. Not remarkably brilliant, but displayed a good deal of tremulous motion, and sometimes assumed the curtain form. At first it was white, but changed to sulphur yellow. Position constantly changing, but the change confined to the higher part of the arch, the ends retaining a comparatively fixed position. Time of ending is the time last seen.

October 30, 1881, 7 *a. m. to* 10 *a. m.*—General position as usual, and not stationary for any time. A bright arch of the curtain character possessed a good deal of motion, both of vibration and translation. A few streamers at 7.30 a. m.

November 3, 1881, 2.30 *a. m. to* 5 *a. m.*—NW. to SE., passing through Ursa Major and the Pleiades. An arch of irregular form and pale color. Cloudiness prevented much observation. But little motion observed.

November 6, 1881, 12.15 *a. m. to* 7.10 *a. m.*—From NNW. to nearly SE. Position constantly changing. Not very brilliant, but dimmed by the superior brilliance of the moon. There were intervals of cessation amounting at times to an hour and more, when it became imperceptible. At 7 a. m. it flashed into great brilliance for a short time. It then extended from the horizon NNW. through Cygnus to Cassiopeia, where it curved back toward the NW. It was then full of quivering vibratory motion, the motion being mainly lateral or back and forward from E. to W.

November 7, 1881, 6 *a. m. to* 8.10 *a. m.*—General direction from NW. to SE.; position constantly changing. Three bands sometimes uniting and forming one, and sometimes two arches. Very brilliant at times and a great deal of vibratory motion observed.

November 11, 1881, 9 *a. m. to* 10 *a. m.*—N. to NE. Faint bands changing rapidly and vertical to the horizon. There were several patches of flocculent light, sometimes approaching the curtain form, but always very faint.

November 12, 1881, 4.50 *a. m. to* 8.30 *a. m.*—When first seen it was low down near the northern horizon extending from NNW. to SE., and rising slowly. At 7 a. m. it extended through Ursa Major and Leo down to the SE. At 8 a. m. nothing remained but a short curtain directly below Cygnus. A faint and irregular arch with a slow upward motion. Very few traces of color and very little quivering or lateral motion. Rendered fainter by the moonlight. Weather clear.

November 12 *and* 13, 1881, 10.50 *p. m. to* 10.30 *a. m.*—North, low down. At 12 m. a very faint arch with its center in Gemini. At 7 a. m. a faint light extending from Orion to the moon. A streamer in the E. at 9 a. m.; still visible at 10 a. m. Faint rays perpendicular to the horizon, sometimes scarcely perceptible, but possessing a quick flashing motion as if it were the reflection of lights below the horizon. When the arch appeared it had no apparent motion and only lasted a short time; the light in the S. at at 7 a. m. resembled a band of faintly illuminated cirrus cloud.

November 15, 1881, 3 *a. m. to* 3.15 *a. m.*—Position not observed. Seen through breaks in the clouds.

November 16, 1881, 6.45 *a. m. to* 10.30 *a. m.*—NW. to SE.; position continually changing. First seen at 6.45 a. m., when the clouds rolled off. At 8 a. m. an irregular curtained arch ran from the NW. horizon, passing S. of the Pleiades through Orion and down to the moon. Below this to the S. was a complete arch elevated about 15° above the horizon with a well defined dark segment below it. Patches of nebulous light were, at the same time, visible in different parts of the sky to the N. and NE. At 9 a. m. several detached segments of curtains were scattered over the zenith and N. and NE. sky, while a broad and pale band extended round the southern sky from the NW. to the SE., forming a semicircle elevated about 10° above the horizon with the "dark segment" below it. At 10 a. m. all that remained was a pale narrow band passing through the zenith, and at 10.30 all had faded away.

November 16, 1881, 9.30 *p. m. to* 11.55 *p. m.*—From NNW. to SE., constantly changing both in position and appearance. Arch developed rapidly into a broad curtain with a number of streamers at its northern end. It rose rapidly, passed the zenith and soon faded away, and was succeeded by another very brilliant one, of intense sulphur-yellow color, running through the zenith from NW. to SE. There was a quick quivering motion, curtains formed and faded, and faint rays shot upward in the well-known form of flames arising from burning alcohol; these arches followed each other in quick succession and seemed mostly to be propagated from the SE. to the NW. Disappeared at 11.35 p. m.

November 17, 1881, 7 *a. m. to* 11.40 *a. m.*—NW. to SSE. A low arch passing through the belt of Orion, brightness 2. Another narrow band (brightness 3) reached from NW. horizon to the Hyades. Very little change was exhibited except that the light grew gradually paler, and at 9 a. m. had resolved itself into a number of nebulous patches scattered over the southern half of the sky, but at the same time a bright curtain appeared near the northern horizon. All faded and became more diffused, and finally disappeared at 11.40 a. m.

November 18, 1881, 1 *a. m. to* 1 *p. m.*—Large auroral streamers rising from near the northern horizon almost to the zenith, first seen at 1 a. m., and had disappeared at 2 a. m. At 7.20 a. m. it reappeared, and several bands or irregular arches appeared, passing through the zenith from NW. to SE., but being, to a great extent, obscured by clouds, their position and peculiarities could not well be determined. The arches had changed at 9 a. m. to a broad band of very pale diffused light to the southward running through Orion. Seen at intervals, though very indistinct, until 1 p. m., when it entirely disappeared.

November 19, 1881, 3.10 *a. m. to* 3.30 *a. m.*—A pale narrow band appeared in the zenith running from from NW. to SE. Disappeared at 3.30 a. m.

November 19, 1881, *and* 20, 1881, 8 *p. m. to* 10.40 *a. m.*—This aurora was a very extensive one and assumed a very great variety of shapes and positions. It was at no time very brilliant as a whole, though some of the curtains were quite bright. There were but few traces of color other than bright sulphur yellow and white. There seemed two foci from which the rays, bands, and arches seemed to spring, one in the NNW. and the other in the SE. From these points the arches were mostly propagated in direction of their length, not simultaneously but very irregularly. The development of the arches was always rapid, and, once they were formed, their motion upward to the zenith and to the southward, though not very perceptible at any particular instant, was also very rapid. At 7 a. m. the greater part of the sky was more or less illuminated; bands, curtains, and patches of pale nebulous light were scattered over it in great confusion. After this it began to fade, and disappeared at 10.40 a. m.

November 21, 1881, 9 *a. m. to* 10.20 *a. m.*—Indistinct and dim; seen through the clouds, so that peculiarities, if any, could not be observed.

November 21 *and* 22, 1881, 12 *mid-day to* 10.40 *a. m.*—Had some short intervals of intermission and periods of comparative brilliancy. The light was very pale and diffusive, the bands mostly broad and ill-defined. At 7 a. m. reached its greatest brilliance, when a bright irregular arch was formed, narrow at the ends and very broad at the top. The broad part consisted of a number of bands, sometimes reaching the number of six, but mostly fewer. When at their broadest they extended from Regulus to the head of Orion. All the arches that appeared had the usual motion to the southward. There was a good deal of vibratory motion, but the vibrations being extremely short they were scarcely perceptible. Most of the arches were propagated laterally from the SE. Finally it broke up into numerous rays and nebulous patches scattered over the sky and disappeared.

November 23, 1881, 1 *a. m. to* 10.20 *a. m.*—Commenced as faint diffused light near the northern horizon, which soon brightened and extended to the eastward, so as to form a bright curtained arch which at 2 a. m. extended through Ursa Major, through Gemini, and a little above Orion, with both its ends sharply curved toward the N. From its upward side rose numerous slender quivering rays of almost imperceptible light, which sometimes separated from the parent arch and united laterally at their bases, forming a second but less brilliant arch above the old one. Occasional streamers appeared at its north end. I may here remark that the sharp curvature of the ends of arches toward the N. is a general feature up to the present. At 7 a. m. reduced to a broad band extending a few degrees along the northern horizon with steady light and brightness 3. Very faint arches in the S.

Eight a. m. low arch running from SSE. to SW., E. end brilliant, highest point between Orion and the Hyades; at 9 this arch had developed into a broad fan-shaped sheaf of pale streamers rising nearly to the zenith. After this it gradually faded and disappeared at 10.20 a. m.

November 23 *and* 24, 1881, 9.30 *p. m.*, 12 *noon.*—Faint streaks and partly developed rays in the SE. at 9.30 p. m. Soon afterwards developed into several broad bands of very irregular shape extending from SE. to NW. through Ursa Major. Very bright spiral whorls in the SE. at 11 p. m. while a faint band crossed to the NW. At 12 p. m. top of arch was in Cygnus pale in the SE. but bright in the NW. with an occasional streamer. After this slowly faded, and all that remained until 6 a. m. was a band of very pale diffused light lying along the S. and SW. horizon.

At 7 a. m. a pale semicircular arch extended around the horizon with an elevation of about 15° from a point right under Regulus through the head of Orion, and ended in the NW. In the W., when brightest, a number of pale converging rays shot up occasionally towards the zenith, which soon afterwards rose and formed an imperfect corona with converging point exactly in the zenith. There was a great display of motion—very rapid—up and down and lateral, but with nothing approaching regularity. Merry dancers, whorls, and convolutions followed each other in quick succession. The general motion was from S. to N., the opposite of what it usually is. After it passed the zenith it became very bright in the NW. so that the illumination cast therefrom on the snow was distinctly visible; occasional dark rays at this time shot across it upwards towards the zenith. They appeared very dark, and seemed like shadows of some opaque bodies thrown across the surrounding brightness. At 9 a. m. it was considerably faded, and all that remained was the usual faint band lying near the southern horizon running from SE. to NW. At about 11 a. m. it brightened somewhat again and a few rays again appeared in the NW. and extended nearly to the zenith. Disappeared at 12 m.

November 25, 1881, 5 *a. m. to* 9 *a. m.*—Faint patches appearing at intervals at different parts of the sky, principally in the E.; at 8 a. m. had developed into a broad wavy line running from SE. horizon through zenith to the NW., its brightest point being in the SE. At 8 a. m. a small arch from SE. to N. about 15° above the horizon, and another broken irregular arch from the same point to the NW. but very faint; still seen through breaks in the clouds at 9 a. m., but immediately afterwards obscured.

November 26, 1881, 2.20 *a. m. to* 3.30 *a. m.*—Occasional glimpses of auroral bands through the clouds to the SE. during this time.

November 27, 1881, 1 *a. m. to* 9 *a. m.*—Probably brilliant, but the clouds prevented it being satisfactorily seen. At 2 a. m. the light appeared to form a circle round the zenith, a corona being probably formed. An arch of irregular shape ran from N. to SE. at an elevation of about 15° above the northern horizon at 7 a. m., brightest at the N. end, with occasional streamers. After this it became much dimmer, but did not disappear until it was obscured by clouds about 9 a. m.

November 28, 1881, 2 *a. m. to* 1 *p. m.*—When first observed it appeared as two low broken arches running from the SE. to a point NNW. At the same time the sky was covered with patches of nebulous light resembling cirro-cumulus cloud. Changed rapidly, and was succeeded by a brilliant convoluted arch running up through Orion's "belt," through Taurus, and through Cassiopeia, which was in the zenith towards the NW. Faint and irregular until 7 a. m., when there was another burst of brilliancy. A brilliant serpentine arch extended from the NNW. through Ursa Major to the SE. It exhibited none of the usual quiescence, but was rapidly and intensely in motion with streamers shooting upwards and converging towards a point in Auriga. There was no predominant direction of motion, and the general characters changed with great rapidity. The sky near the zenith was filled with bands, patches, and segments of arches, but all was changing every minute. The amount of light was 2, but no traces of color appeared other than white and pale sulphur yellow. After this there was no further display. The light became diffused and difficult to locate, with isolated patches appearing at intervals in different parts of the sky until it finally faded about 1 p. m.

November 28 *and* 29, 1881, 11.50 *p. m to* 6 *a. m.*—First observed as a faint band starting exactly at Arcturus and running a little below Ursa Major until lost in the clouds near Gemini. This was rapidly succeeded by other bands and patches in various parts of the sky until about 1.50 a. m. of the 29th, when a magnificent burst of energy occurred. Over every part of the sky uncovered by clouds masses of light of every shape and form flashed out all in a condition of intense vibration. There seemed to be three foci of activity, one E., one S., and one W. (magnetic), each about 20° above the horizon. The changes in character were extremely rapid, so that it was impossible to get a mental image of the whole phenomena at any particular instant of time owing to this fact; the variety and multiplicity of features being such that the mind could not grasp them all at once. A brilliant but irregularly formed corona appeared with its converging point in Cassiopeia, which was then in the zenith, and flashed and gyrated, changing its character and shape every instant. The colors displayed were various and very intense—orange, green, pink, rose, yellow, and crimson; green and rose predominated. Magnet at this time was deflected 4° 17′ to the west of magnetic meridian. The display lasted about twenty minutes, after which it gradually faded and assumed the usual diffused and indistinct form. The increasing cloudiness prevented its being clearly observed afterwards, but traces were visible until 6 a. m.

November 30, 1881, 4.30 *a. m. to* 7.25 *a. m.*—Patches of nebulous light, incipient arches, and occasional pale rays slowly developed in various parts of the sky, all more or less diffused, but constantly changing in character. A pale wavy arch at 7 a. m. ran from the NW. through Cygnus to Arcturus, where it bent off to the S. until lost in the clouds at the feet of Orion. Sky obscured after 7 a. m.

December 1, 1881, 1.50 *a. m. to* 10 *a. m.*—Faint band appeared extending from a point almost due N., passing through Taurus and ending in Orion; narrow and moving slowly to the southward. Patches and bands and much diffused light succeeded, but assumed no very definite forms; obscured by clouds about 5.30 a. m.; still visible, though faint, until 10 a. m.

December 5 *and* 6, 1881, 11 *p. m. to* 2 *a. m.*—First observed as a faint band running from E. to SSW., with an altitude of 20°. Remained faint, and faded away occasionally, but very difficult to observe from the haziness of the sky. At 12 m. several bands appeared to the northward, passing through Ursa Major. Not seen after 2 a. m. of the 6th, but as the magnetic needles were constantly disturbed for several hours afterwards, it probably still continued, though obscured by clouds.

December 7, 1881, 8 *a. m.*—Small patches of curtain aurora in NW. at 8 a. m., with an altitude of 10°, sending up one long streamer; changing rapidly.

December 8, 1881, 12.30 *a. m. to* 12 *midday.*—This was one of the most magnificent displays that has yet occurred here. First appearance was in the S. and SE., and for several hours nothing appeared but a few pale arches and bands which had no remarkable feature worthy of notice except the rapidity with which they changed their position and character. They appeared faded, and reappeared in various parts of the sky so quickly that it was very difficult to localize them. At 2.40 a. m. a narrow greenish-yellow arch with a beautiful rosy fringe developed in the SSE. and in a few minutes extended through Taurus, Cassiopeia, and Cygnus down to the N., and for about ten minutes displayed some extremely beautiful tints, especially along its northern half; it seemed to be composed of an infinite number of short rays in a condition of intense vibration, the motion being principally in direction of its length, while flashes of the most vivid coloring beamed out in most bewildering variety. At the same time numerous rays and patches of quivering light appeared in various parts of the sky in quick succession, dancing and gyrating to and fro swift as the lightning's flash. While the northern half of the arch remained thus brilliant, the southern half faded away. A few minutes afterwards a patch of rosy greenish light appeared in the middle of Orion and in a minute or two developed into numerous sheafs of rays with the greatest variety and intensity of motion and displaying the most brilliant colors as they rose and converged to a point close to the star Algol, forming an imperfect but most brilliant corona, which swayed and swirled and eddied round our zenith with a kaleidoscopic magnificence utterly indescribable; the changes of tint, aspect, and position were so rapid and numerous that the eye strove to following their bewildering confusion in vain. The general motion was to the N., though a brilliant curtain was at the same time moving towards the zenith from the N. The brilliance of the moon seemed to have little effect on the intensity of the colors which appeared. The colors were very numerous, orange, yellow, rose, ruby-red, peach-blossom, emerald-green, and numerous intermediate tints changed and interchanged in beautiful confusion; the whole phenomena of waving wreaths, flickering fumes, rays, curtains, fringes, bands, and flashing colors, the strange confusion of light and motion, presented a picture of which words can convey a very poor idea. The whole display lasted about 30 minutes. There was also intense magnetic disturbance during this time, the needles being almost unmanageable. A peculiarity of this Aurora was its lowness in the atmosphere, several patches of cloud apparently not very elevated appearing far above it. Did not entirely disappear until about 12 midday. The apparent elevation of the cloud may have been caused by an optical illusion.

December 8 *and* 9, 1881, 10.50 *p. m. to* 10 *a. m.*—First appeared as a patch of nebulous light immediately below Ursa Major; other patches soon afterwards appeared, and several partially developed arches were observed up to midnight, when it brightened a little and several broad diffused bands were found passing through the zenith. Quivering rays appeared to the SE. in Orion, and a partly formed corona in the zenith at 1 a. m. After this to 10 a. m. occasional bands, patches, and rays of light appeared in various parts of the sky, and several times a complete arch was formed, but mostly pale and ill-defined. The magnetic needles were disturbed to a considerable extent about 8 a. m.

December 10, 1881, 10.30 *p. m. to* 12 *m.*—Faint detached rays appeared in various parts of the northern quarter of the sky, and a few converged towards the zenith from Ursa Major. Soon afterwards they faded considerably, and for intervals of half an hour at a time were entirely invisible.

December 11, 1881, 5 *a. m. to* 8 *a. m.*—Faint and irregular in shape, no variety of color, and but little motion other than the general motion of translation.

December 11, 1881, 11 *p. m. to* 11.15 *p. m.*—Straight auroral bands converging towards the zenith, all faint and pale, lasted about 20 minutes.

December 12, 1881, 2 *a. m. to* 10.50 *a. m.*—Two narrow bands (brightness 2) running from the north point to the SE. For the next four hours the sky was clouded, but at 7 a. m. a pale curtained band low down in the north under Cygnus with a few rays above it; this rose and expanded into numerous others, which covered the sky for about 20° on each side of the zenith, running from NW. to SE. There was very little motion at this time, but the magnetic needles were a good deal disturbed. At 9 a. m. there was a very irregular curtained arch in the zenith which constantly and rapidly changed both its position and character, the magnets being still disturbed. From 9.20 to 10.30 a. m. the aurora was invisible, but at 10.30 it reappeared in the shape of several bands and patches of flocculent light in various parts of the sky and lasted 20 minutes, when it finally disappeared.

December 12 *and* 13, 1881, 9 *p. m. to* 10.30 *a. m.*—First seen at 9 p. m. as a broad pale arch of lambent luminiferous vapor running from N. to SE. with its center in Gemini. From this position it did not materially change until nearly 1 a. m. of the 13th. The dark segment was very strongly marked below it. This is the first aurora of this kind I have seen since our arrival; it is also the first that has remained for so long a period stationary—nearly four hours. About 1 a. m. it began moving upwards and augmented greatly in brightness, and in a few minutes developed into an extremely brilliant band of yellowish white light rising from the horizon due N., making a great sweeping curve upwards, and extending through Cygnus to the zenith, Taurus, and down into Orion. There was much quiet movement, the vibrations being very short, mostly in direction of its length, but no variety of coloring. The pale hazy arch and dark segment reformed underneath, and hung for some time longer in the N. and NE. The bright arch above, however, soon moved to the southward, and a very brilliant series of broken curtains and convolutions appeared in Orion, but all soon faded considerably, and nothing appeared except numerous disconnected bands and patches of diffused and flocculent light until about 4.30 a. m., when it disappeared for nearly an hour. About 6 a. m. there was another brilliant burst in the N. moving very rapidly towards the horizon. Up to this time the magnets showed very little disturbance, but immediately on this display the disturbance became very great, the unifilar magnet being deflected out of the field to the W. so far that the azimuth circle had to be removed 2° 10′ to bring it back so as to point the telescope on its axis. After 6 a. m. there were occasional rays and bands in various parts of the sky, but mostly pale and indistinct. All disappeared about 10.30 a. m.

December 14, 1881, 1 *a. m. to* 1 *p. m.*—First seen very indistinct near the SE. point of horizon, and afterwards only at intervals glimpses were had of it through the clouds, and was last seen as a narrow band of white light extending from NW. to SE. with its highest point in Ursa Minor at 1 p. m.

December 14 *and* 15, 1881, 10 *p. m. to* 2.30 *p. m.*—Faint traces in NE., where it remained as a series of irregular patches and partly arches, disappearing and reappearing from time to time up to about 2 a. m. of the 15th, when it became more extensive but still retained its diffused and irregular character. At 4 a. m. the magnets were much disturbed, though the display at the time was very faint; the weather being very hazy however at the time, it was difficult to determine its extent. Occasional bands formed and moved southward up to 12 midday, when several bands appeared and remained for a short time, but displayed no remarkable features. Disappeared about 2.30 p. m.

December 15, 1881, 11 *p. m, to* 11 *a. m. December* 16.—Pale arch in NE. with its highest point in Gemini, but as the clouds soon increased rapidly its after position could not be determined, though occasional traces were observed through breaks. At 9 a. m., 16th, a broad pale band was visible through the clouds. It was not seen afterwards, but at 11 a. m. the magnets were greatly disturbed; the unifilar needle being so strongly deflected to the eastward that it was necessary to move the azimuth circle 3° 4′ so as to enable observer to point on axis. It remained in this condition for nearly three hours.

December 16 *and* 17, 1881, 11 *p. m. to* 10.30 *a. m.*—Faint traces of auroral light low down in the NE.; at 12 midnight a still arch, broad, pale, and with the dark segment strongly marked below it, extended from the center of Boötes through Gemini down to the head of Orion. Very little motion was perceptible, and soon afterwards it disappeared, but soon reappeared again as a few straggling rays in Boötes, which continued to fade and flicker for a time and then faded away for a short interval, and so it fluctuated until about 6 a. m. of the 17th, when it suddenly became more brilliant. A brilliant series of bands and arches extended across the sky from NW. to SE., passing through and on both sides of the zenith with a general southward motion. There was much, but not to a remarkable degree, internal vibratory motion. The unifilar magnet was deflected so strongly to the westward that the azimuth circle had to be moved 7° 12′ to bring it into the field. Numerous bands and arches, though not very brilliant, succeeded each other rapidly until about 8 a. m., when the phenomena became less distinct, and about 10.30 a. m. all had faded. The magnets remained in a disturbed condition until 8 a. m.

December 17 *and* 18, 1881, 11 *p. m. to* 1 *p. m.*—Pale nebulous patches appeared low down in the N. and NE. and a scarcely perceptible arch accompanied by a few slowly waving rays formed about 12 m. Afterwards patches appeared and disappeared at intervals, and occasional arches were formed, principally low in the NE. About 6.30 it began to brighten, and a rather bright arch passed down to the southward and faded away into a band of nebulous haze. After a few minutes' quiescence a brilliant patch appeared in the SE. and rapidly developed into an irregular curtained arch which shot up numerous slender rays, and exhibited very intense activity. In a few minutes it had risen to the zenith, where a brilliant but imperfect corona was formed, which whirled round and quivered and vibrated for a minute or two with intense rapidity and then slowly moved to the northward, its coronal character changing into the irregular curtain form. There were some beautiful flashes of rosy red and deep green, but in general the color was an intensely brilliant yellowish white, and the light emitted was such as to render objects distinctly visible half a mile away. The magnets were disturbed, but not extremely. At 8 a. m. the greater portion of the sky seemed covered by a faintly luminous haze, and a very pale circle of diffused light extended all around the sky at an elevation of a few degrees above the horizon. After this only occasional streaks and patches appeared until about 1 p. m., when it disappeared.

December 18 *and* 19, 1881, 10.50 *p. m. to* 1.30 *p. m.*—A very faint arch formed in the NE., low down, which rose slowly with a few flickering rays shooting from its upward side, and at 12 m. its highest point just touched Cor Caroli in Canes Venatici. After this there was but little display other than a few straggling patches and rays scattered irregularly over the sky until about 8 a. m., when the brightness increased considerably and streamers appeared in various parts of the sky. Several narrow bands or arches rose from the N. and NE., broke up into irregular curtains, and finally passed down to the south, when they faded away into a kind of faintly luminous haze. The magnetic needles were deflected to the W. An intermittent period again intervened until about 10 a. m., when another period of brilliancy occurred. Several bright curtains and streamers appeared in the S. and W. but did not exhibit much apparent motion. The magnets were again deflected, this time to the E. After this no noticeable features appeared, and at 1.30 p. m. a few pale bands were visible in the zenith, but they soon disappeared before the brightening twilight.

December 19 *and* 20, 1881, 11 *p. m. to* 11 *a. m.*—Auroral light pale and diffused and appearing in the NE. as usual, but rather unusually stretching thence as a broad diffused band towards the W. At 11.30 this band faded away into a kind of luminous haze, which covered the greater part of the sky, and across this, stretching from Boötes down to the SW., two parallel black bands appeared, which slowly rose towards the zenith, still retaining the same shape and relative positions and looking exactly like a jet-black aurora. They possessed all the characteristics of ordinary auroral bands except the color, and occasionally rays of shadow, if I may use the expression, streamed from their upper side, much the same as rays of light ordinarily do from auroral arches. The cause of this phenomenon seemed to be that two long rents appeared in the luminous haze and took and maintained for a considerable time the form of long bands stretching across the sky. They were certainly not streaks of cloud, for the stars shone brighter through them than in any part of the neighboring sky; their motion was not that of cloud, and their black color was given by contrast with the surrounding luminous haze. After passing the zenith they disappeared, but afterwards nothing appeared for several hours other than a few nebulous patches here and there, and the faintly luminous haze, which still remained unchanged as long as it could be observed, observation being rendered difficult by the increasing cloudiness. From 8 to 10 a. m. several bands appeared through the clouds in and near the zenith, and during that time the magnets were very much disturbed. Last traces observed at 11 a. m.

December 20 *and* 21, 1881, 11 *p. m. to* 10.30 *a. m.*—Faint nebulous masses of faint light low down in the NE., which soon expanded into a narrow still arch running from Arcturus through Canes Venatici and down until lost in the haze in the SE. It rose very slowly, and as it approached the zenith divided into two, and afterwards into several, which passed towards the S., where they faded into a nebulous haze and at 4.15 of the 21st nearly all the visible sky was covered with bands, patches, and imperfect arches, the general direction of which was from NW. to SE. This condition of things remained until about 10 a. m., when there was a brilliant burst of short duration, consisting chiefly of vertical rays in extremely rapid motion, and converging towards the zenith where a brilliant but imperfect corona was formed, lasting for a few minutes. A broad waving band moved up rapidly from the N. and collected into a mass at the zenith, and passed as rapidly to the SE. The brightness was fully 4, and the colors principally white and yellow with tinges of green and rose on the edges. Magnets much disturbed. Unifilar deflected towards the east. In about twenty minutes the display was over, and all that remained were numerous patches of light all round the horizon, which soon also disappeared.

December 21 *and* 22, 1881, 10 *p. m. to* 1 *p. m.*—As has been usual for some time back in the commencement of auroras, a few flocculent patches of hazy light appeared low down in the NE., which slowly changed from time to time; those first appearing soon fading away and giving place to others of similar character until about 11.30, when they assumed the form of a regular arch, quiet and narrow, and extending from N. to SE. with an altitude of about 20 degrees. It rose very slowly and showed varying degrees of brightness, but was generally pale. At 3 a. m. of the 22d its center was in Ursa Major, and between 6 and 7 a. m. its center was in Auriga. After it passed the zenith it imperceptibly faded into a diffused luminous haze, which covered the greater part of the visible sky. Sections of half-formed curtains and arches appeared from time to time, and afterwards a very bright one formed in the E. about 11 a. m. Traces of it were still visible at 1 p. m.

December 22 and 23, 1881, 11.30 *p. m. to* 2.15 *p. m.*—Faintly luminous haze appeared in the NE. at 11.30, but soon afterward disappeared in the haze which covered the sky. About 2 a. m., 23d, it reappeared in nearly the same position and apparently shining through the haze. After this it became brighter, showed more motion, and developed more rapidly. Faint arch succeeded faint arch, and bands and curtains flourished and faded too numerously and too irregularly to particularize, until about 4 a. m., when an imperfect corona was formed with its culminating point almost in the zenith. There was considerable variety of colors, yellow, pink, red, and white, the total light emitted being probably equal to that of a full moon, but as the emitting surface covered the greater part of the sky the light was much more diffused than moonlight. This period of intensity continued until about 5.30 a. m., when the bands and arches gave place to a diffused light spreading over the greater part of the visible sky. There was great magnetic disturbance during the period of maximum displays. The unifilar magnet was deflected to the E. so as to necessitate the movement of the azimuth circle through 4° 10′, while the dip of the weighted dip needle increased 2° 15′. Last traces were observed at 2.15 p. m.

December 23 and 24, 1881, 8.30 *p. m. to* 2.15 *p. m.*—At 8.30 p. m. a faint pinkish ray rose from the SE. and extended upwards almost to the zenith, but lasted only a few minutes. Luminous patches soon afterward appeared in the NE., and a narrow quiet arch soon was formed, which remained quiescent for about half an hour, when it began to move rapidly, shooting out rays as it approached the zenith, forming a pale but imperfect corona with its culminating point in Cassiopeia. This is the first occasion of such activity at such an early hour. It was of short duration, however, and was succeeded by the usual diffused light or luminous haze occasionally interspersed by bands and patches of deeper light. Several bands developed about 1 a. m. of the 24th, and afterwards became numerous, forming generally low down in the NE. and moving slowly toward the zenith, where they generally became broader and more diffused, sometimes dividing into two or more. The brightness seldom exceeded 2, but the haziness of the sky dimmed it to a great extent. At 7 a. m. all that remained was a rather bright light low down in the SW. behind the clouds, with patches of luminous haze in various parts of the sky. Although the phenomenon at this time showed no appearance of intense activity, yet the magnets were greatly disturbed. The horizontal force was greatly increased, as was also the vertical, while the needle of the declinometer was deflected first to the W. and then to the E., the former deflection taking the magnet out of the field of the telescope. Very little brilliancy was exhibited until about 1 p. m., when there was quite a burst of light and intensity. Rays, bands, convoluted curtains, and flashes of quivering light appeared over the greater part of the sky. Numerous rays shot up from all sides toward the zenith, but no proper corona was formed. Magnetic disturbance lasted all through the display, which finally disappeared about 2.15 p. m.

December 24 and 25, 1881, 9 *p. m. to* 10 *a. m.*—Patches of light low down in the NE., which broadened out into luminous haze, that extended slowly upward toward the zenith, shooting up occasional rays, which about 1 a. m. developed into a faint arch near the zenith. Other arches increasing in brightness succeeded this in quick succession until about 3 a. m., when the light was spread all over the sky, sometimes as curtains and bands and broken segments of arches, sometimes as large flocculent masses looking like cumulous clouds illuminated by transmitted light. There were periods of quiescence alternating with brief displays of activity. No colors, however, were observed beyond the usual white and yellow, but these at times were very intense, reaching the maximum of brightness. After lasting for about an hour the display gradually subsided, and until 7 a. m. only occasional patches and bands appeared irregularly in various parts of the sky, but being mostly brightest in the W. From 7 to 8 a. m. the brilliance rapidly increased. Curtains, broken arches in every variety of convolution spread extensively over the sky, being propagated from the E. toward the W., and being brightest in the S. and W. Declination and vertical force increased and the horizontal intensity decreased. Ended at 10 a. m.

December 26, 1881, 1 *a. m. to* 10 *a. m.*—Very pale and irregular in shape and position. Seldom a complete arch appeared, and when it did its outlines were mostly very undefined and its continuance very brief. The sky was very hazy, so that it was only near the zenith that the phenomenon could be observed. At 9 a. m. a narrow but bright arch formed in the NE. and rose rapidly toward the zenith. As it rose it displayed a peculiar intermittent kind of activity, especially when it reached the zenith. Pulsations of intense vibratory motion passed along it from NW. to SE. in direction of its length at short intervals, each succeeded by brief intervals of quiescence. Once it reached the zenith it began to fade, or, rather, its outlines became indistinct, and it slowly passed down to the southward, when it changed into the usual luminous haze. The magnets at this time showed great increase in vertical force and decrease in horizontal intensity. Previously, at 6 a. m., they showed another period of disturbance, although scarcely any aurora was visible. There was at no time a brilliant display, but during most of the time the magnets were as much disturbed as during the most brilliant ones.

December 26 *and* 27, 1881, 11 *p. m to* 7 *a. m.*—A faint arch running from N. to E. very low down appeared behind the haze, and afterwards traces of light and portions of bands were observed in various parts of the sky near the zenith, until about 7 a. m. the 27th. The night was however so cloudy and hazy, that its characteristics could not well be observed.

December 27 *and* 28, 1881, 11 *p. m. to* 1 *p. m.*—A faint diffused arch appeared low down in the NE., which remained with but very little change for several hours. This aurora lasted with several periods of intermission until 1 p. m. of the 28th, but there was no brilliant display of either light or color. Occasional arches and parts of arches formed in various parts of the sky, but they were always pale and of brief duration. The only noticeable peculiarity of this aurora was the extent and brightness of the luminous haze. It covered most of the sky, and at times assumed a peculiar stratified appearance, like numerous polar bands very close together. Sometimes it broke up into patches of deeper density, and sometimes was so diffused as to almost disappear. At 5 a. m. the magnets were considerably disturbed, the unifilar being strongly deflected to the east.

December 29, 1881, 4 *a. m. to* 2 *p. m.*—First appeared as narrow bands running from the SE. towards the zenith, which soon rose and spread over the sky, assuming the usual hazy and diffused character. Bands, rays, and partly formed arches appeared from time to time, but presented no marked features worthy of notice. There was no apparent internal motion and no variety of color. At 8 a. m. it was at its brightest, and covered the greatest extent of the sky, but did not reach a brightness exceeding 2. The magnets were however a good deal disturbed, the vertical force and eastern declination increased and horizontal intensity decreased. These conditions continued with but slight change until 10 a. m., after which the magnetic disturbance decreased, and the auroral light faded away, but did not entirely disappear. Traces of it were visible until about 2 p. m.

December 30, 1881, 1 *a. m. to* 1 *a. m.*—Traces of aurora seen through haze at 1 a. m., but it was too cloudy to observe either its beginning or ending.

January 1, 1882, 7 *a. m. to* 7 *a. m.*—Traces of aurora bands seen through the clouds at 7 a. m. Beginning or ending not observed, owing to cloudiness of weather.

January 2, 1882, 4.15 *a. m to* 10.30 *a. m.*—Narrow arch running from W. to SE. low down toward the southern horizon. Very little motion, and brightness about 2. It rose very slowly toward zenith where it became broken up, and assumed the diffused character. After this it maintained a fluctuating existence until 10 a m. At 8 a. m. a few rather bright streamers appeared in the N., and extended themselves across the sky toward the SE. but soon faded away. Magnets were slightly disturbed.

January 3, 1882, 7 *a. m. to* 9 *a. m.*—A few patches appeared at intervals between 7 a. m. and 9 a. m. None of them were bright; all were irregular in shape and seemed to start from no point in particular but apparently seemed suddenly to burst out of the sky and after flickering for a short time, disappeared. Magnets were slightly disturbed.

January 4, 1882, 2 *a. m.* to 9 *a. m.*—Faint arch low down in the NE., scarcely distinguishable from a long band of cirrus cloud which after languishing for a short time disappeared and did not reappear until 7 a. m., when a few fugitive bands appeared in the NE. which soon developed into a well marked curtain (brightness 3). There was but little vibratory motion and not much change in color. Declinometer needle deflected slightly to the E. and vertical intensity increased, accompanied by a slight decrease in horizontal intensity. After this there was very little visible except an occasional patch or ray, lasting generally only a few minutes. All disappeared at 9 a. m.

January 5, 1882, 1 *a. m. to* 8.30 *a. m.*—Occasional rays, curtains and patches of light from 1 a. m. to 7 a. m., none very bright and all of brief duration. There was very little apparent motion. The various curtains and patches did not usually have a regular forward motion in any direction. They appeared to burst out of the sky, fluctuate for a few minutes, and then disappear. At 7 a. m., however, an irregular curtained arch appeared ascending from Taurus to Boötes with its center slightly N. of zenith. It exhibited momentary bursts of vibratory motion and was brighter at its southeastern end. Its brightness was about 2. The magnets were greatly disturbed, the horizontal force decreased, the vertical intensity greatly increased, and the declination to E. also increased; ended about 8.30 a. m.

January 5 *and* 6, 1882, 11 *p. m. to* 3.30 *p. m.*—Appeared as a narrow pale arch running from N. to SE., with its center in Gemini. It lasted only a short time, and exhibited no apparent motion. It reappeared at rather lengthened intervals, mostly low down in the N. and NE., and never very bright or high, and was last observed at 3.30 p. m.

January 6 *and* 7, 1882, 11 *p. m. to* 7.30 *p. m.*—Luminous haze all round the horizon, with a dark circle of about 5° width, corresponding to the well-known dark segment below it. From this haze numerous rays, so faint and ethereal as to be almost imperceptible, shot up towards the zenith. In fact, it appeared as if a series of pulsations or ethereal quiverings, which almost eluded the grasp of vision, passed over the sky in a kind of rythmic unison; the converging point of motion being the zenith. This phenomenon continued until the light of the moon, which soon rose, rendered it invisible. Occasional curtains and arches, mostly pale and irregular in shape, followed. At 7 a. m. a very pale arch ran from NW. to SE., through Taurus and Boötes, and after remaining a short time it slowly faded away.

January 8, 1882, 1 *a. m. to* 10.40 *a. m.*—Appeared first in the usual form of a faint still arch, extending from N. to SE., and possessing a slow upward motion. At 2 a. m. it had risen to the zenith, when it divided into six or seven narrow bands, brightness about 2, with considerable vibratory motion, but no streamers. After passing the zenith it became diffused and soon disappeared. Bands and curtains, patches of light, and detached rays succeeded in quick succession, appearing in various parts of the sky, but none were very brilliant or of long duration. There were intervals of quiescence when scarcely any light, other than the usual luminous haze, was visible, and this was generally by an interval of display more or less brilliant until about 10 a. m., when there was quite a brilliant one. Several rays appeared in the NW. and the SE., which propagated themselves toward the zenith where they met, forming an irregular but brilliant arch, exhibiting an extremely rapid motion. Numerous short rays shot up and whirled to and fro, beautiful tints of pink, yellow, and green flashed out, convoluted curtains appeared and rolled and unrolled themselves, swaying to and fro, as if hung out by invisible hands, but all changing so rapidly that it was very hard to point their place. The brightness at this time was fully 4. At 10.30 a. m. it began to fade; in about twenty minutes all had disappeared.

January 8 *and* 9, 1882, 10 *p. m. to* 10 *a. m.*—Occasional rays appeared in the SE., just above the head of Orion, and soon afterwards a pale arch was formed extending from NW. to SE., which grew brighter as it rose, and at 12 m. formed quite a brilliant arch, with its center in Ursa Major, and after remaining for a time in zenith slowly faded away towards the S. Occasional arches, bands, and flocculent patches followed, but presenting no remarkable features until about 7 a. m., when there was a great increase in brilliancy, lasting for about half an hour. A series of great semi-circular whorls spread over the sky in a condition of intense agitation. There was one in Orion, one in Boötes, one in Andromeda, and a very brilliant one curved through Ursa Major. The color was bright sulphur yellow, with some tints of pink and rose. The magnets were considerably disturbed. Horizontal force decreased, and vertical intensity greatly increased, while the declination was irregular, being sometimes easterly and sometimes westerly. After this display was over the light greatly faded and finally disappeared about 10 a. m.

January 9 *and* 10, 1882, 10 *p. m. to* 1.50 *a. m.*—Appeared as a quite still arch, low down in the NE., with the dark segment distinctly visible below it. About 12 m. it had risen almost to zenith and grown considerably brighter, but at no time did the brightness exceed 2. There was some slight vibratory motion, but it soon began to fade, and after nearly disappearing brightened up and formed a broad irregular arch, running from the NW. through Cygnus, through the zenith and down through Canis Minor, displaying considerable vibratory motion; this was at 1 a. m. of the 10th. At 2 a. m. all had disappeared. Magnets very little disturbed.

January 10 *and* 11, 1882, 11 *p. m. to* 8 *a. m.*—Traces of hazy light appeared low down in the E.; afterwards succeeded by several faint arches, which rose slowly and generally faded or became very diffused as they approached the zenith. At 3 a. m., 11th, a bright broad arch ran from NW. to SE. through Cygnus, Ursa Major, and Leo. Several whorls and patches succeeded until about 8 a. m., when all had disappeared.

January 13, 1882, 11 *p. m. to* 12 *m.*—Auroral arches observed through the clouds and drifting snow near the zenith between 11 p. m. and 12 m.

January 14 *and* 15, 1882, 10 *p. m. to* 12 *midnight.*—Pale narrow arch appeared low down in the NE., which rose slowly and as it approached the zenith was succeeded by others below, flocculent patches and much diffused light at the same time in various parts of the sky. This condition of arches, patches, and bands and diffused light constantly changing, but the general features remaining the same, continued till 10 a. m., after which they became paler and entirely disappered at 12 m.

January 15, 1882, 10 *p. m. to* 6.30 *a. m.*—The usual low arch appeared in the NE. with the dark segment for a time clearly visible, but as the arch arose the segment disappeared. This arch rose very slowly, but presented an appearance of an extremely rapid internal quivering while numerous short rays fringed its upper side which swayed and flickered like the flame of burning alcohol. A succession of similar arches followed until 5 a. m. They were all pale, and after the latter hour only a few patches were visible, and all had disappeared at 6.30 a. m.

January 17, 1882, 1 *a. m. to* 7 *a. m.*—Faint low arch in NE. remained stationary for a time and then rose slowly and became broken up and diffused; sometimes it entirely disappeared for a time, reappeared as occasional patches and curtains which maintained a fluctuating existence until 7 a. m. when it had disappeared.

January 17 *and* 18, 1882, 10 *p. m. to* 8 *a. m.*—Quiet arch low in NE. It rose very slowly, and about 2 a. m. 18th, had reached the zenith where it had broken up into sundry bands and patches which soon faded away into an extensive luminous haze which continued until about 8 a. m.

January 19, 1882, 1 *a. m. to* 4 *a. m.*—Traces visible through rents in the clouds near zenith at 1 a. m. and 4 a. m.

January 20, 1882, 4 *a. m.*—Several bands in the zenith visible through rents in the clouds at 4 a. m.

January 21, 1882, 4 *a. m. to* 4.30 *a. m.*—At 4 a. m. the sky which had been previously cloudy suddenly cleared up and a pale arch appeared extending from NW. to south and elevated about 20° above the SW. horizon. After rising slowly for a few minutes it suddenly burst into a state of intense activity, and at the same time moved rapidly toward the zenith, the distance between the head of Orion and the zenith being passed over in about five minutes. Numerous swirling rays ran along it shooting upwards and apparently converging toward Capella. A kind of compressed or foreshortened corona was formed, and from the rapidly changing swirls and convolutions various brilliant colors flashed out, green, pink, rose, and yellow being the prevailing tints. The magnetic instruments were strongly deflected. The horizontal force decreased, the vertical intensity increased and the easterly declination increased. The sky became clouded at 4.30. No more was observed.

January 23, 1882, 12 *a. m. to* 10 *a. m.*—A patch of flocculent light appeared near the horizon in the NE. Others soon after appeared and several times approached the arch form until 2 a. m. From that time there was a period of cessation until 4 a. m., when a faint arch appeared to the S. and moved slowly up toward the zenith, where it divided into a broad series of bands running from N. to SE. After a time the diffused condition succeeded, and remained until 10 a. m.

January 23 *and* 24, 1882, 10.30 *p. m. to* 8 *a. m.*—A few patches low down in the NE. soon rose and formed a pale broad arch with its center touching Ursa Major, which soon faded away and did not appear until about 4 a. m. of the 24th, when a low pale arch appeared to the southward with its center in Orion. This slowly rose until it approached the zenith, when it became stationary and remained in an irregular hazy condition until about 8 a. m.

January 25, 1882, 2 *a. m. to* ——.—Patches of light appeared low down in the E., which slowly gave place to a series of faint irregular arches running from the N. to NE., which mostly faded away as they approached the zenith into a faintly luminous haze. Several bright whorls appeared in the E. at various times, but did not extend higher than 30° from the horizon. Time of ending not reported.

January 27, 1882, 4 *a. m. to* ——. —A very pale band running from NW. to SE., and rising very slowly, reached the zenith, where it divided into pale, very broad, and ill-defined arches, and at 6 a. m. nothing was visible except a few patches of flocculent and a great deal of diffused light. Termination not reported.

January 28, 2 *a. m. to* 2.30 *a. m.*—A few faint rays appeared low in the N. from 2 a. m. to 2.30 a. m.

January 29, 1882, 4 *a. m. to* 7 *a. m.*—A faint ray rose from the N., and after reaching the zenith curved to the eastward, forming a broad irregular arch. At 5 a. m. the N. end had faded away, or rather seemed to be drawn up towards the zenith, when it became twisted into a series of whorls and convolutions; the other end at the same time extended in irregular curves to the SE. There was a slow motion to the northward, the light at the same time fading away. At 6 a. m. there was a repetition of the phenomenon, but at this time the convolutions and whorls extended from the zenith down towards the N. horizon. Last reported at 7 a. m.

January 29 *and* 30, 1882, 10 *p. m. to* 8 *a. m.*—Faint arch from N. to E., with altitude of about 10°, a few streamers at its N. end. It rose slowly in the usual manner until it reached the zenith, when it slowly faded away. Others of a similar character followed at intervals, accompanied by flocculent whorls and much diffused light. Occasionally several bands passed through the zenith at the same time, always from the NW. to SE., but none of them were brilliant. Last observed at 8 a. m.

January 31, 1882, 3 *a. m. to* 6 *a. m.*—Faint patches of light appeared low in the NE., which soon arranged themselves into the usual form of a faint broad arch, which rose slowly, and had reached the zenith at 4 a. m., when it looked exactly like an immense tail of a comet, curving from the NW. to the SE. horizon. It soon afterwards faded, and was succeeded by faint nebulous light in various parts of the sky, chiefly in the NE. Last reported at 6 a. m.

February 1, 1882, 6 *a. m. to* 9 *a. m.*—A few very faint arches were formed, differing from the usual character in the circumstance that their general direction was from N. to S.

February 2, 1882, 1 *a. m. to* 7.30 *a. m.*—First observed as a narrow wavy band, running from NW. to S., with an altitude of about 50°. At 2 a. m. it had become lower and more sinuous and exhibited a rapid vibratory motion, its lower edge being slightly tinged with pink. It soon afterwards faded away, and was succeeded by occasional patches and whorls until 7.30 a. m., when it entirely disappeared. For the last few days the light of the aurora has been much dimmed by the brilliance of the moon.

February 2, 1882, 11 *p. m. to* ——.—At this hour a few streaks and patches were observed in the E., but the haziness and cloudiness prevented further observation.

February 4, 1882, 11 *p. m. to* 9 *a. m. February* 5.—Low arch in the NE., indefinite outlines, and rising very slowly. At 12 m. a few streamers appeared at its N. end, but did not continue long. Several similar irregular arches appeared up to 3 a. m. Streaks, patches, and bands appeared also at intervals during the same time, but afterwards it was too cloudy, and nothing more was observed until 9 a. m., when a few streaks were seen through breaks in the clouds in the zenith.

February 5, 1882, 11 *p. m. to* ——.—At this time traces of auroral light were visible low in the NE., but the weather being cloudy nothing was had but an occasional glimpse through breaks in the clouds, so it was impossible to give a description. Magnets read very irregularly.

February 6, 1882, 10.30 *p. m. to* 9 *a. m. February* 7.—An irregular but rather bright arch appeared low in NE., with faint rays occasionally shooting from its N. end. Occasional arches followed, but they could not well be observed, owing to cloudiness. Last observed at 9 a. m. of the 7th. Magnetic needles very irregular.

February 7 *and* 8, 1882, 11 *p. m. to* 7 *a. m.*—Faint arch low in NE., rising slowly. The cloudiness of the sky prevented observation, but occasional glimpses were had of arches near the zenith up to 7 a. m. of the 8th.

February 8 *and* 9, 1882, 10.30 *p. m. to* 11 *a. m.*—Beginning of display could not well be observed in consequence of haziness of the sky, but occasional glimpses were had until 3 a. m. of the 9th, when there was quite a brilliant interval. Several bands passed through the zenith and on each side of it, running from N. to SE. The haziness was such, however, that it was only near the zenith that a distinct view could be had. It was still visible from time to time until about 11 a. m.

February 9 *and* 10, 1882, 10.30 *p. m. to* 10 *a. m.*—Commenced low down in the N. and extended as low arches towards the SE. and SW., and afterwards rose to the zenith, but the haziness of the sky still obstructed observation. Last seen at 10 a. m.

February 10 *and* 11, 1882, 11 *p. m. to* 10 *a. m.*—This was the most brilliant display that has been observed for some time past. It commenced the usual way, as an irregular arch low in NE., which rose slowly, and became brighter as it rose towards the zenith, but after reaching that point it immediately faded away. This was followed, in rapid succession, by other arches, brighter and broader, which mostly faded away on reaching the zenith, or broke up into numerous fleecy masses of light, which often spread over the greater part of the sky, and which, though individually not of great brightness in the aggregate, yielded an amount of light approaching that of a full moon. It differed, however, from moonlight in its more diffused character, but still large objects, over a mile distant, were clearly visible. Several times during the night arches were formed, which deserved the name much better than auroral arches usually do. Instead of being large and concentric or parallel, as is usually the case, they were end to end, small, and resting on long straight columns, running down to the horizon, as many as five appearing at one time. One in SE., one in the E., one in the NE., one in the N., and one in the NW. In most cases two arches sprang from one column and went in opposite directions. None of the arches were, of course, exactly symmetrical, but sometimes they approached it closely. Faint tints of pink and green were occasionally visible, but the prevailing color was yellowish white. The magnets displayed much irregularity.

February 12, 1882, 12 *a. m.* to 11.30 *a. m.*—Began very faint and went through the same succession of changes, but with much less brilliancy than last night. After 9 a. m. it was very irregular and mostly faint, and finally disappeared at about 11.30 a. m. The needles, as usual, disturbed and irregular.

February 12 *and* 13, 1882, 11.30 *p. m. to noon.*—Began as usual faint and low in the NE., but did not increase much in brightness or become very extensive until after 3 a. m. of the 13th. After that hour arches, bands, and fleecy masses of light, very extensively distributed, succeeded each other quite rapidly. There was very little appearance of the parallelism usually observed, and seldom more than one band or arch appeared at the same time, but as each arch which retained its shape approached the zenith it generally became very broad and hung overhead like a great elongated canopy, and again it stretched across the sky in graceful convolutions like an immense scroll, but the commonest form was that of irregular detached masses which spread over the greater part of the sky and faded into a sort of nebulous haze. The general motion was from N. to S. and rather slow. The magnets read irregularly, but there was not very much disturbance even when the whole sky was nearly covered with light. Ended about 12 noon.

February 14, 1882, 12.30 *a. m. to* 10 *a. m.*—Began as faint irregular patches low in NE., afterwards succeeded by the usual series of irregular arches, bands, and patches, but at no time was the display very brilliant; less so than on the two last preceding evenings. Last observed at 10 a. m.

February 14 *and* 15, 1882, 11.45 *p. m. to.* 10 *a. m.*—Began as a faint light low down on the N. and NNE. horizon, appearing like twilight behind the haze and light clouds. Several arches afterwards appeared in the zenith through the clouds, extending in the usual direction from NW. to SE., but they presented no marked feature other than the slowness of their movement. This slowness of motion seems to be increasing as the brilliance of the display decreases. Maintained a fluctuating existence until 10 a. m. of the 15th, after which it was no more seen. Needles, as usual, reading irregularly.

February 15 *and* 16, 1882, 11.30 *p. m. to* 7 *a. m.*—Began as faint light behind the clouds on the NW. horizon, and afterwards an occasional band or arch was dimly visible in the zenith through the clouds and were apparently for the most part stationary, and the last time they were visible was 7 a. m. of the 16th.

February 17, 1882, —— *to* 10 *a. m.*—Time of beginning could not be ascertained, owing to the cloudiness, nor could the extent be observed from the same cause. Was last seen at 10 a. m.

February 18, 1882, 1 *a. m. to* ——.—First observed at 1 a. m., but owing to the increasing cloudiness no proper observation of its extent or brilliance could be had. Bands and whorls were sometimes visible in and near the zenith, where they seemed in or very near to the haze or thin cloud. To the eye they seemed below it, but this could not be really the fact or more of their length would have been visible than what appeared in the zenith. After 5 a. m. the clouds were too thick for any light to get through.

February 19, 1882, —— *to* ——.—Beginning or ending could not be observed, owing to the cloudiness. The display seemed to be quite brilliant, however, at times as its light could be seen through the clouds, although no stars could be seen at the time. The magnets were, as usual, considerably disturbed.

February 20, 1882, —— *to* ——.—Time of beginning not observed, owing to the cloudiness, and only occasional glimpses of it were had during the night, when in the zenith. Needles disturbed.

February 20 *and* 21, 1882, 11.30 *p. m. to* 10.30 *a. m.*—This was a rather brilliant display and exhibited somewhat more motion than has been usual for some time. It commenced as pale nebulous patches, sometimes in the NE., in N., and NW., but always rose rapidly and culminated in the zenith, after reaching which it remained stationary for a time, sometimes flashing and gyrating, and then gradually fading into a luminous haze to the southward. At 5 a. m. of the 21st, the whole sky for about 60°, on each side of the zenith, was filled with light which looked like a luminous cloud. There were periods of activity lasting about half an hour, with similar intervals of quiescence, which constituted a succession of waves which culminated in or near the zenith. Continued until obliterated by daylight, about 10.30 a. m.

February 22, 1882, 1 *a. m. to* 10.30 *a. m.*—First appeared as luminous patches in the NE., which soon rose and formed a narrow, faintly luminous arch and rose slowly to the zenith, where it broke up into numerous patches which, after a time, faded away in a kind of luminous haze to the southward. Faint arches and patches thus succeeded each other at short intervals until a little before the dawn, when they entirely faded away.

February 23, 1882, 2 *a. m. to* 10.20 *a. m.*—Begun as usual, very faint in the NE., and the usual succession of phenomena occurred. Narrow arches were found to be succeeded by whorls, patches, and nebulous haze, but on the whole there was more activity than has been displayed for some days. Occasional rays appeared and several imperfect coronas were formed. At 5.15 a. m. one of these was quite brilliant. Numerous faint rays appeared converging in Ursa Major, then S. of zenith. The motion was very rapid and some flashes of color appeared—green, yellow, and rose. The general motion during the display, and for some time before and after, was from S. to N.; the arches generally appearing as patches in the S. or SE. and were propagated to the northward. The display lasted, with periods of intermission, till daylight. The magnets were considerably disturbed.

February 23, 1882, 11.30 *p. m. to* ——.—Began in the usual manner in the NE., but although several faint coronæ were formed they were not so brilliant as on the previous evening and there was besides considerably more diffused light and luminous haze.

February 24, 1882, 12.30 *a. m. to* 10 *a. m.*—Appeared first as faint patches, which developed into faint, narrow bands and irregular arches, and faded away into the usual luminous haze. At no time was this display very brilliant, nor did it apparently pass through any of the active stages. The bands often broke into detatched masses which were scattered irregularly over the sky. Disappeared before the advance of the dawn at 10 a. m. The needles were disturbed.

February 25, 1882, 2 *a. m. to* 10 *a. m.*—Commenced in the usual way in the NE., but seldom assumed the arched form so common on other nights. Irregular-shaped masses of hazy light appeared in various parts of the sky, principally in the N. and SE., which extended imperceptibly upwards until they formed broad cloud-shaped masses in or near the zenith, and then after a time faded away into the usual luminous haze. Needles disturbed. Disappeared before daylight; about 10 a. m.

February 26, 1882, 6 *a. m. to* 7.30 *a. m.*—A faint patch appeared in the SE. and one in the N., which soon extended towards each other and formed a faint arch, which rose slowly until it reached the zenith, when it broke up into irregular-shaped masses, which arranged themselves round the zenith in a form almost circular. A period of activity then ensued, and numerous short rays shot upward and converged directly overhead. While in this condition it was simply a corona with the center wanting. A few tints of green, rose, and yellow were observed during this active period, but they were of very brief duration. The display lasted about fifteen minutes, and then gradually faded, and was no more visible after 7.30 a. m.

February 27, 1882, 3 *a. m. to* 7 *a. m.*—Impossible to determine the beginning or end of this aurora, owing to the cloudiness of the sky. It was occasionally seen until 7 a. m. The magnets were slightly disturbed.

February 28, 1882, —— *to* ——.—Too cloudy to permit observation. Auroral light was only seen once, near the zenith to the NE. Needles somewhat disturbed.

March 1, 1882, 7 *a. m.*—Seen through the clouds in the SE. at 7 a. m., but the rest of the night the sky was clouded.

March 2, 1882, 9.15 *a. m. to* ——.—At 9.15 a. m. the clouds rolled off for a few minutes and left a rather bright auroral band visible, passing through the zenith in a NW. and SE. direction.

March 3, 1882, 3 *a. m. to* ——.—Commenced faint and irregular, and at 4 a. m. there were two arches at right-angles to each other, the brightest running from N. to SE. Soon afterwards they became broken up into segments, and soon faded into the usual luminous haze, and as the sky soon became obscured by clouds the termination of the display could not be ascertained. The magnets, as usual, were agitated.

March 4 *and* 5, 1882, —— *to* ——.—On the 4th and 5th, especially the former, there was magnetic disturbance at times, but being cloudy no aurora could be seen.

March 6, 1882, 2 *a. m. to* 8 *a. m.*—First observed about 2 a. m., when three somewhat sinuous rays or bands extended from N. to SE. about 10° west of zenith. Between 2 and 3 a. m. there was quite a brilliant interval when the sky in and near the zenith was covered with fleecy cloud-shaped aurora. There was very little apparent motion, and after 3 a. m. there was a constant decrease in brilliance, and after 4 a. m. but little light was seen. The last was seen at 8 a. m., when a faint ray was visible in the W. The increasing cloudiness, however, prevented its termination from being observed.

March 7, 1882, 1 *a. m. to* 9 *a. m.*—Commenced as faint rays in the N. and SE., which soon formed a narrow arch with a few streamers at its northern end. Occasional arches and scattered streamers followed at intervals, but none were very brilliant and there was much less of the luminous haze which has been so common during last month. After 4 a. m. only an occasional ray appeared until 6 a. m., after which no more were visible until just as the dawn began to appear at 9 a. m. (3.43 a. m. local time), when a few rays appeared for a few moments just above the line of light in the E. and parallel to the rays of light coming from below the horizon.

March 8, 1882, 5.15 *a. m.*—The night was cloudy and only one glimpse of auroral light was had at 5.15 a. m. The magnets were considerably agitated.

March 9, 1882, 3 *a. m. to* 8 *a. m.*—Commenced about 3 a. m. while the sky was partly covered by clouds. There were occasional displays of streamers, irregular curtains, and arches, accompanied by considerable motion. The streamers were long, pale and slender, and sometimes approached the coronal form converging towards the zenith. The prevailing character, however, was the diffused form distributed in patches all over the sky; the light threw the intervening clouds into strong relief and seemed on many occasions similar to the diffused brightness of the dawn. The general motion was from N. to S., but it was mostly very difficult to determine its direction owing to the cloudiness and the extensive distribution of the light. The sky became entirely cloudy after 8 a. m. and no more of the display was observed. The magnets were very much disturbed and the perturbations were more than usually intense after sunrise and continued up to noon, local time.

March 10, 1882, 3 *a. m.*—Commenced about 3 a. m., but very little of it was seen owing to the cloudiness. There was considerable magnetic disturbance.

March 12, 1882, 3 *a. m. to* 5 *a. m.*—The usual time of commencement for some time back has been about 3 a. m. (10 p. m. local time). This was quite a brilliant display while it remained visible. At 4 a. m. there was a very broad irregularly convoluted arch through the zenith from NW. to SE. with a number of scattered whorls. There was little apparent motion, but still constant change; a little before 5 a. m. the clouds came suddenly up and obscured the sky, but the thinner portions were rendered quite luminous by the light behind them at 5 a. m., but it was not visible afterwards. The magnets were disturbed.

March 13, 1882, 1 *a. m. to* 9 *a. m.*—Appeared as soon as the twilight had faded sufficiently to permit it to be visible as a broken and sinuous arch from N. to SE. with an elevation of about 45°, which soon afterwards reached the zenith where it remained stationary for a short time, and then passed to the southward. Other arches followed, mostly broken and bright in places, with occasional rays shooting toward the zenith. The general motion was, as usual, from N. to S., but most of the arches that appeared to swing round on their northern end as a pivot until they reached a position running from N. to SW., and an elevation of about 35° or 40°, when they became stationary. After 6 a. m. they became paler, but did not wholly disappear until the twilight rendered them invisible about 9 a. m. (4 a. m. local time); but slight magnetic disturbance.

March 14, 1882, 6 *a. m. to* 9 *a. m.*—Probably extensive, but the clouds were very dense and no observation could be had. At 6 a. m. and 9 a. m. light shone through near the zenith. The needles were slightly disturbed.

March 15, 1882, 1 *a. m. to* 10 *a. m.*—Began probably during daylight, for it appeared as a narrow arch high up even before twilight had faded. After this, arch succeeded arch until the approaching daylight rendered them invisible. The movement of the arches was in general from N. to S. Sometimes, however, after passing the zenith some of them seemed to pause and retrogade toward the N., at the same time casting out numerous short rays from their upper side and exhibiting a good deal of motion. Sometimes tints of green and rose were visible, but they were faint and transient. Several of the arches on reaching the zenith expanded into broad, irregular canopies which extended down on all sides as much as 25°. Sometimes several arches and irregular shaped curtains appeared at the same time, and faint, almost invisible, rays shot up to the zenith. At times the arches became broken up into numerous broken rays scattered over the sky, but close enough together and with enough parallelism to give them a very peculiar appearance, like patches of luminous scud swept along by the wind; in fact a kind of luminous or auroral drift. Another peculiarity of those arches was that they did not rise from a low point near the horizon, as was usually the case earlier in the winter, but first appeared as faint rays in various parts of the sky, mostly in the N. and SE., and then rapidly developed into arches mostly rather brilliant but mostly very narrow. There was besides a good deal of the usual haziness, especially towards the southward after the arches had passed the zenith. The magnets were somewhat disturbed, but not remarkably so.

March 16, 1882, 3 *a. m. to daylight.*—This was a much more brilliant display than has occurred for some time; the degree of brightness was higher, there was more activity, and the variety of feature was greater. For some weeks back the successive phases of the phenomenon followed each other rather slowly, and even the culminations were not characterized by much intensity or brilliance, but on this occasion it was different; there was rapidity of motion both collective and vibratory, and brilliant culminations. The arches, bands, and whorls were very numerous and very irregular both in position and shape, the perfectly arched form being seldom reached until the light masses had passed the zenith and become pale to the southward. Sometimes the whole sky overhead was covered with a great field of fleecy light, which after passing through a variety of changes mostly seemed to fade away from the center, while the surrounding margin seemed to sink down towards the horizon like a great ring, which, as it slowly faded, gave birth somewhere in its northern or southeastern quarter to rays or wherls which soon developed into new arches or bands and new phases of the phenomenon. There were numerous rays, fringes, and curtains, and often small canopies or imperfect coronæ were formed in the zenith. The culminating point was at 6 a. m., when a brilliant canopy of dancing rays, circling whorls, and waving banners covered the sky overhead and extended down on all sides 30 or 40 degrees. The culminating point was in Ursa Major, and the whirling, gyratory motion was not in the plane of an arch, but in that of a circle having its center almost in the zenith. There was but little variety of color—pink, rose, and green appearing occasionally at the base of the rays and columns. The brightness was at the maximum, the ice surface along the horizon out to sea being pretty clearly visible. The magnets were greatly disturbed.

March 17, 1882, 4 *a. m. to* 7 *a. m.*—This was not an extensive display, nor was it of long duration. The arches were not numerous nor very bright, and were very irregular in shape, more like great whorls or scrolls than arches. The only noticeable feature about them was that they never passed the zenith to the southward, but generally faded on reaching it. They commenced probably in the north and extended towards the SE., but displayed little motion and but few rays appeared. After 7 a. m., or 2 a. m., local time, it was no more visible. The magnets were very slightly disturbed.

March 20, 1882, 3 *a. m. to* 8 *a. m.*—Began probably some time earlier than 3 a. m., as immediately on the clouds rolling off, a bright sinuous but broken arch was visible extending from NNW. to SE., and passing close to the zenith. After this for three hours there was quite a rapid succession of bands, arches, and whorls, accompanied by much internal or vibratory motion. The general motion of the arches was from N. to S., but on several occasions they seemed to part in the middle when near the zenith, and the broken ends became folded up like a rope that had broken at a high tension; generally, however, on reaching the zenith the arch broadened or divided up into several, or spread out into an immense field or canopy, dim at first in the center, and brighter round the margin. When this form was reached, numerous rays shot up from this bright margin towards the zenith, where a more or less bright but irregular shaped corona was formed which swirled and swayed and assumed a great variety of form, but was always of brief duration. At 4 a. m. (11 p. m. local time), the display had reached its maximum, where there was an immense canopy covering a great part of the sky, numerous streamers, several imperfect coronæ, and great vibratory activity. There were numerous flashes of color at the base of the streamers; red and yellow were the predominant colors. This period did not last more than fifteen minutes, and was succeeded by the usual hazy condition of the sky, with a whorl and patch here and there. At 6 a. m. there was another period of activity, similar to the above, but on a smaller scale. The activity was probably equal, but the brilliance and extent of their display was much less. There was one bright arch extending from about N. to SE., through the zenith with much paler light on each side of it. Its center when overhead broadened, and being like a curtain swaying to and fro, and looked remarkably near. After slightly passing the zenith it remained stationary for some minutes, and its upper side became very jagged or serrated, and seemed as if a strong wind were blowing against it, while projecting points protected it in front. This condition remained nearly ten minutes, and was indeed very peculiar. The jagged appearance was too irregular and too persistent to be caused by a series of rapid undulations, and conveyed very strongly the idea that a strong wind was blowing across the arch. After this there was very little activity and but few arches, and all faded at the approach of the dawn. The magnetic disturbance was very great, especially during the appearance of greatest activity. There was great decrease in horizontal force and increase in vertical intensity, and a large increase in declination to the eastward.

March 21, 1882, 2 *a. m. to daylight.*—Not a brilliant display, but there was great rapidity of change and motion. There were very few perfect arches, the general form being that of whorls and patches, which were scattered nearly all over the sky. It was last visible at 9 a. m. (4 a. m. local time), when there was a period of great activity, the flashing of the light being faintly visible overhead, notwithstanding the brightness of the twilight. There was very great magnetic disturbance, the greatest we have had since this year commenced. The needles were very much agitated, but at 9 a. m. the agitation became extreme; the bifilar needle went far out of the field and remained for two hours out, the force greatly decreased. The unifilar was deflected 2° 30′

from the meridian towards the E. and the dip increased about 2° above its average amount. The needles did not get back to their normal condition until about 4 p. m.

March 22, 1882, 3 *a. m. to* 7 *a. m.*—A faint and irregular display, with very little motion. A few faint arches developed in the NE. and rose slowly to the zenith, but as clouds lay along to the southward the light soon became lost behind them. At 7 a. m. the sky was completely overcast, which rendered it impossible to determine whether the display continued till daylight or not. The needles were but slightly disturbed.

March 23, 1882, 3 *a. m. to* ———.—A faint display as far as observed, but clouds soon obscured the sky and hid it from view. The magnetic needles were somewhat disturbed all through the night, especially towards daylight.

March 24, 1882, 4 *a. m. to* ———.—Very irregular and not brilliant, but as the sky was mostly cloudy until the coming of daylight it could not be well observed. The needles were only slightly disturbed.

March 25, 1882, 3 *a. m. to* 8 *a. m.*—Faint and very irregular, but could not well be observed, owing to the cloudiness; was last seen at 8 a. m.; needles reading irregularly, but not much agitated.

March 26, 1882, 3 *a. m. to* ———.—A few irregular arches appeared in the E. and NE., which generally rose to the zenith and then faded into indistinct diffused light. The display was at no time brilliant, and owing to the cloudiness could not well be observed. There was very little apparent motion and the needles were less disturbed than during any display for some time past.

March 27, 1882, 2 *a. m. to daylight.*— Rather more brilliant than the preceding one. The arches were much more numerous and bright, but the brightness of the moon dimmed them considerably. The arches mostly formed in the NE., but seldom rose higher than the zenith until about 7 a. m., when they began to pass to the S. At 8 a. m. (2.43 a. m. local), there was a bright convoluted curtain in the NE., just outside of the boundary line of the advancing twilight, which exhibited much lateral and vibratory motion and the needles were considerably agitated.

March 28, 1882, 3 *a. m. to* 6.15 *a. m.*—The beginning of auroras cannot now be determined with much correctness owing to long continuance of daylight. They are generally first seen about two hours after sunset and generally high up near the zenith and at present the brightness of the moon dims their brightness considerably. This display was first observed as a pale streak rising vertically from SSE., and occasional pale arches followed without exhibiting much brilliance and mostly faded out in the zenith. At 6 a, m. (12.43 a. m. local), a convoluted arch appeared to the southward at an elevation of about 50° where it hung for a short time and passed through a variety of changes until about 6.15 a. m., when it suddenly moved upwards to the zenith where it formed a very brilliant corona and exhibited the most intense activity, swirling and gyrating with great rapidity. The principal motion was not that of detached vibrating rays but that of a kind of intertwined curtain or fringe which was bent back and folded on itself into a kind of true lover's knot, which seemed to hang out of the sky. The vibrations followed each other from right to left in direction of length of the figure, passing round every turn and convolution and coming back to their starting point with too great a rapidity for the eye to follow. There was great variety of color from the intensest red, yellow and green through every shade and variety of those colors; rose being probably the predominating color. The whole period of activity lasted about ten minutes after which the corona expanded, lost its activity, and spread over the sky as a kind of milky haze. Clouds soon afterward intervened and no further display was seen. During the active period the vertical intensity was greatly increased accompanied by a strong easterly deflection, and a decrease in the horizontal force.

March 29, 1882, 3 *a. m. to* 7 *a. m.*—When first observed as daylight faded the arch had already passed the zenith but was very pale. The display was not a noticeable one, mostly appearing as hazy masses and partly formed bands or curtains of no great brilliance and was not observed after 7 a. m. The needles only slightly disturbed.

March 30, 1882, 2 *a. m. to* ——.—Was probably visible as the decrease of daylight permitted, but the sky being cloudy only glimpses of it were had during the hours of comparative darkness. The needles were considerably agitated.

March 31, 1882, 4 *a. m. to* 8.15 *a. m.*—Began later than usual and was very faint. It was mostly confined to a single ray rising from the SE. towards the zenith and occasionally extended through to the NW. Sometimes none were to be seen for a short time, but the brightness of the moon may have hidden it. It was last seen after 8.15 a. m. (2.43 a. m. local), but the needles which had been steady during the greater part of the night became disturbed and read very irregularly for several hours afterwards.

April 3, 1882, 2 *a. m. to* 7 *a. m.*—Very pale and irregular shaped. Appeared only occasionally and mostly near the zenith. The cloudiness of the sky prevented it being observed. The moon being about the full and the clouds somewhat striated it was often difficult to say which was cloud and which aurora. Magnets somewhat disturbed.

April 4, 1882, 4 *a. m. to* 6 *a. m.*—First seen at 4 a. m. The brightness of twilight and the moon being too great to permit of its being observed much sooner. First appeared as a faint narrow arch running from from N. to SE. with an elevation of about 20°. A few rays appeared and the arch assumed a curtain form, which was soon succeeded by the usual hazy condition of the sky. At 5 a. m. a similar curtain appeared for a short time, extending from NW. to SE. and elevated about 30° above the horizon. At 6 a. m. a faint corona was formed with long, slender, and very faint rays converging towards zenith, but although displaying considerable motion no variety of colors was noticeable. It was only of few minutes' duration and was again succeeded by the hazy condition of the sky. Clouds soon afterwards covered the sky so that nothing further could be seen. The needles were considerably agitated.

April 5, 1882, —— *to* ——.—Beginning or end not known in consequence of the cloudiness, but at 5 a. m. (11.43 p. m. local of the 4th) the clouds around the zenith were all rendered luminous by transmitted light, the aurora behind them being apparently very bright. The magnets were very much disturbed, the disturbance continuing until the afternoon.

April 6, 1882, 4 *a. m. to* ——.—The brightness of twilight prevents the beginning of displays being correctly ascertained, and when this one was first observed it was rather brilliant in the SE. at an elevation of 40°. While in this position, rays and streamers were rapidly developed which shot up towards the zenith while individually possessing a rapid swirling motion. An arched form combined with that of the curtain was then assumed, which extended across towards the NW., rising at the same time towards the zenith, the motion of translation being from W. to NE. After reaching the active condition it ceased and was succeeded by the usual hazy appearance of the sky. During the burst of activity the base of the whirling rays was often tinged with pink and rose; the prevailing color was yellow. During this time the magnets were much disturbed, the vertical intensity on eastern declination being largely increased and the horizontal force decreased. Afterwards but little was seen, but as the cloudiness increased very rapidly it was impossible to say if any further bursts occurred. The needles were occasionally disturbed until several hours after sunrise.

April 7, 1882, —— *to* ——.—The 7th was cloudy, but the magnetic disturbance was large.

April 8, 1882, 4 *a. m. to* 7 *a. m.*—Began as a narrow band in the SE. stretching toward the N., which after a few minutes' quiescence became active and displayed considerable motion and a few traces of color, but very soon broke up into hazy patches. At 5 a. m. a narrow pale yellow arch extended across from NW. to SE. at an altitude of about 35° above the S. horizon. After remaining stationary for a short time it rose towards the zenith. Pale slender rays shot up from its eastern end, and several small patches of yellow light in a condition of rapid motion appeared along it. There was a slight approach to the coronal form, but all faded very rapidly, and at 5.20 no trace of it remained; no more appeared until about 7 a. m., when a faint ray appeared in the N. just outside of the line of twilight. There was a strong easterly deflection of the declination needle and an increase in the vertical intensity and decrease in horizontal force.

April 9, 1882, 4 *a. m. to* ——.—A sudden burst of auroral activity a few minutes after 4 a. m. occurred, but only lasted about ten minutes. When first seen it was in and around the zenith, which was filled with whirling vibrating rays. Flashes of green and rose appeared, but yellow, as usual, was the prevailing color. The magnets were considerably disturbed, the vertical intensity increasing, the horizontal force decreasing, and the deflection sometimes E. and sometimes W. The night became cloudy and no more was seen.

April 10, 1882, 3 *a. m. to* 4 *a. m.*—The sky was hazy and partly covered with foggy stratus clouds, so that only the larger stars were visible, and then only near the zenith; besides, the twilight was so bright behind the clouds that it was sometimes very difficult to say which was twilight and which aurora. At 3 a. m. several pale white bands, probably auroral, extended from SE. to N. and to the E. of zenith. At 3.15 a. m. a pale yellow arch, certainly auroral, appeared in the SW. with an altitude of about 20°. At 4 a. m. there were luminous traces in the SE., but the clouds soon afterwards became too dense, and nothing more was seen. Needles slightly disturbed.

April 11, 1882, 4 *a. m. to* 6 *a. m.*—About the usual time as a faint ray running from SE. to NW. with an altitude of about 30° above the SW. horizon. At 5 a. m. it had moved up to the zenith, where a kind of elongated corona was formed, the elongation being in direction of the length of the arch. This had been the general form of all the coronæ that have appeared. Elongated in direction of the arch and compressed at right angles to it. I may here remark that the auroral light is almost always something more, apparently, than simply so many areas of light of various shapes. It is composed of luminous medium which seems quite tangible, more like luminous cloud or dense vapor than anything else. Its distinctness of character and outline strongly tends to give it an appearance of nearness which I had never noticed any place else, but at the same time I have never been able to observe a case of where it appeared below any cloud strata. The clouds are often rendered luminous by it, but I am almost certain that in every case it was by transmitted light. At 6 a. m. a faint streak was visible in the NE., but the twilight soon became too strong to permit its being visible.

April 12, 1882, 4 *a. m. to* 6 *a. m.*—Very faint, but interfered with by the increasing brightness of the twilight. At 4 a. m. there was a pale narrow arch running from the SE. horizon, S. of zenith, to NW. with an altitude of about 30°. After a short time this broke up into hazy patches which occasionally emitted a few rays, and appearing and disappearing from time to time until 6 a. m., after which the daylight was too bright to allow them to be seen. Magnets steady during the time display was visible, but some time after sunrise they were largely disturbed, the disturbance, however, lasting only for a short time.

April 13, 1882, 5 *a. m.* ——?.—A few patches appeared in the SE. at 5 a. m., exhibiting considerable motion. The highest and brightest was immediately below α Boötis. They being immediately afterwards overcast, no more was seen. The needles were considerably disturbed for several hours after.

April 15, 1882, 5.50 *a. m. to* —— ? .—Weather cloudy, but about 5.50 a. m. (12.30 a. m. local) auroral light appeared a little southward of zenith and apparently in rapid motion, the direction of motion being from S. to N. From the character of the light when in zenith there was a corona formed possessing a rapid gyratory motion. The magnets were largely disturbed, the horizontal force decreased, and vertical intensity being increased, and the easterly declination also increased; the needle swinging out of field, but afterwards there was a westerly deflection, but not so pronounced as the easterly. No more of the display was seen, but the needles continued unsteady for several hours afterwards.

April 16 *and* 17, 1882, *magnetic storm.*—On the 16th, about 1 p. m. (8 a. m. local) a very intense magnetic storm set in, which continued at intervals until about 9 a. m. of the 17th. The night was cloudy and no aurora was seen; the greatest disturbance, however, took place in the daytime. At first there was a strong E. deflection attended by a decrease in the horizontal and an increase in the vertical intensities, but about 7 p. m. there was a great change, the deflection changed to the W. so that the azimuth circle had to be moved several degrees to bring the needle into the field. An increase took place in horizontal force and an increase in the vertical intensity. Again, after a period of about five hours another change took place to the E., the vertical intensity increasing and the horizontal decreasing as usual, which conditions continued to the end.

April 20, 1882, 5 *a. m. to* —— ? .—At 5 a. m. auroral light was discernible a little S. of zenith. The twilight was too bright to allow a distinct view to be had. The magnets were considerably disturbed. A very intense disturbance, however, took place some hours previously, commencing at 11 p. m. (5.43 p. m. local) of the 19th, and continuing more or less to 6 p. m. (12.43 p. m. local) of the 20th. The range of the various changes of declination amounted to over 10°, while that of the dipping needle amounted to 7°. The greatest deflection was westerly, but the E. was of much longer duration. As formerly, the westerly deflection was accompanied by an increase in horizontal force and a decrease in the vertical intensity, and the E. by an increase in the vertical intensity and a decrease in the horizontal force.

September 3, 1882, 4 *a. m. to* 4.30 *a. m.*—When first noticed at the 4 a. m. observation, the twilight was still bright in the N. The aurora appeared in the constellation Auriga, as a small arched band rapidly shifting, extending in azimuth from about N. 70° E. to N. 90° E. (brightness 2) and showing faint tinges of red, green, and yellow. In fifteen minutes the whole aurora had risen and greatly extended, forming a number of sinuous shifting bands, color white brightness 2, extending from the NNE. horizon to SSW., passing through Ursa Major, Ursa Minor and Cygnus. At this time the needles were slightly agitated, while the earth currents showed no disturbance. Fifteen minutes later the aurora had disappeared, except a few scattered streaks, which continued faintly visible for an hour.

September 4, 1882, 4 *a. m. to* 4.05 *a. m.*—The sky was still quite light and overspread with enough hazy cirro-stratus cloud to dim the stars slightly. When noticed at the 4 a. m. observation the aurora occupied mostly the whole of the eastern sky, reaching the zenith. Color white; brightness 2; form utterly inconstant, shifting with the rapidity of lightning. In general the bands had a north and south direction and were inclined to be sinuous. The display was most prominent in the constellations Cassiopeia, Auriga, and Camelopardalis. In five minutes only a few pale streaks were faintly visible. The magnetic needles were slightly agitated.

September 5, 1882, 2 *a. m. to* 7.30 *a. m.*—The aurora appeared at 2 a. m., while the twilight was so bright that no stars were visible. It was then a slightly luminous band, white and unstable, extending from the SE. horizon to NW. about 10° W. of zenith; brightness 1 to 2. At 3 a. m. the bands were broad and more numerous, sinuous and shifting, running from N. to SE. through Ursa Major, Ursa Minor, Cassiopeia, and Pegasus; brightness 2; color white, with several paler arched bands in SW., one of which at 3.15 had reached the brightness of 3, with a bright yellow color, while the main aurora had somewhat faded. The magnetic needles were slightly agitated. At 4 a. m. the aurora overhead had almost wholly disappeared, while a new band had appeared in Taurus near the NE. horizon, extending into Gemini. This band was yellow, sinuous, and rapidly changing in form, approaching, however, the curtain type. Altitude about 20°; brightness 3, brightest in Hyades. It was replaced at 4.15 by a comparatively steady pale (1) arch with streamers, reaching its greatest altitude close above α Geminorum, extending in azimuth about 40°. At 5 a. m. a sinuous band with streamers was observed in Canis Minor, stretching into Hydra close to eastern horizon (brightness 2). At 6 a. m. there was an extensive sinuous band, approaching the curtain form, mostly in Hydra and Virgo. This showed violet color in Hydra, where it was brightest (3; elsewhere 2). The whole aurora was exceedingly changeable and shifting, ending with a long sinuous band, pale (brightness 1), running through Ophiuchus, Corona Borealis, and Canes Venatici.

September 6, 1882, 3.30 *a. m. to* 6 *a. m.*—As early as 3.30 a. m. streaks of auroral light were visible through the fog, and at 4 a. m. a definite aurora in the form of a pale band stretched across from the southern horizon to the W. of the zenith, starting in Aries and passing through Triangulum, Andromeda, Lacerta, and Cygnus, and ending near α Lyræ. This band moved towards the zenith, fading and reappearing, and at 4.05 passed through Cassiopeia. The fog cleared as the night grew darker, and the aurora appeared as bright horizontal bands near Aquila. At 5 a. m. a bright (2 to 3) sinuous arched band with streamers ran along the western horizon, from Libra, through Hercules and Vulpecula, to Pegasus. At 5.30 a brilliant whirl in the S. sent up streaming bands, one through Cassiopeia across the zenith, ending in Boötes; a second through Andromeda and Cepheus, ending in Corona Borealis; a third through Pisces to Aquila. The aurora ended with a single sinuous band running up through Taurus and Auriga from the southern horizon and reaching to Ursa Major.

September 12, 1882, 4.17 *a. m. to* 4.50 *a. m.*—The clouds which had covered the sky during all the evening cleared off near the zenith at 4 a. m., and at 4.17 a white, hazy but well defined rather narrow band, shifting its position, appeared stretching from NE. to SW., passing through Ursa Major, Ursa Minor close to the zenith, and Cepheus, ending in Cygnus (brightness 1). The magnetic declination and vertical force were but little affected, while the horizontal force was very greatly increased. The band was invisible at 4.50, and the sky soon clouded over.

September 15, 1882, 2 *a. m. to* 7 *a. m.*—As early as 1 a. m, while the twilight was still bright, pale whitish bands were to be seen crossing the sky from the N. to SE. These at 2 a. m. had developed into an aurora, brightness as high as 2, beginning near the SE. horizon in Pegasus, where it was brightest, narrow, and of a yellow color. As it approached the zenith in the form of a sinuous shifting band it became somewhat paler, and stretched in width from Cassiopeia to Cygnus, narrowing again and ending in the twilight just below Ursa Major. Most of the aurora was white in color. At 3 a. m. a broad arch (brightness 3) passed from the SE. horizon, beginning in Pisces and running through Pegasus, Andromeda, Lacerta, Draco, and the tail of the Dipper, and ending in Canes Venatici. Slight magnetic disturbance. At 4 a. m. the sky was hazy and no aurora visible, and at 5 a. m. the sky was clouded over. At 6 a. m. pale bands (brightness 1) stretched across the sky from Taurus and Aries in the SE. through Ursa Major near the zenith, ending in Corona Borealis. At 7 a. m. there was one pale band (brightness 1) in SE., occupying the constellations Gemini and Leo, and another similar but smaller band low in W., in Hercules and Vulpecula.

September 25, 1882, 2.17 *a. m. to* ——.—Up to 2 a. m. the sky was completely covered by heavy stratus clouds, but at 2.17 these broke away near the zenith, exposing several horseshoe-shaped concentric sinuous arches rising from the N. The apex of the brightest arch was near Polaris, and other paler bands apparently forming part of similar arches were visible in Cassiopeia. The near arch had a brightness of 2, the others about 1, and all appeared quite unstable. The sky continued much covered with rapidly moving clouds and the aurora was only visible at intervals through openings between them. At 3.17 a. m. three pale (0 to 1), motionless, slightly arched horizontal bands were visible in the N., in the constellation Canes Venatici. At 4 a. m. the sky was much clearer, and a band of streamers pointing towards zenith flashed across the sky from NW. to S. on an arched course at an altitude of about 45°. The motion of translation from N. to S. was very rapid and accompanied by a rapid vibration from S. to N., and *vice versa.* The brightest part of the display was tinged with red and yellow, and reached a brightness of 3. At 4.17 there was a a small patch of aurora reaching a brightness of 3 in the constellation Aries on the SE. horizon. This had the form of a vertical sinuous streak, and showed red and yellow colors, fading rapidly and shifting and twisting. At the same time the clouds in the SW. were illuminated with a bright greenish auroral glow. After this the sky became completely overcast. A magnetic disturbance began in the afternoon and continued all night (local time), the declination varying through a range of 1° 38′, the horizontal force .424 and the vertical force .055.

September 26, 1882, 3 *a. m. to* 6 *a. m.*—At 3 a. m. the clouds had broken away so as to leave the northern sky clear, and then there appeared three horizontal curtains taking in about 45° of azimuth from the N. to NE., the altitude of the highest being about 30°. They occupied for the most part the constellation Leo, though with the twilight and moonlight it was impossible to see the stars distinctly. Their brightness was 3, the lower edge of each curtain colored bright rose, then yellow, and finally pale yellowish green. There was a rapid lateral vibration and the whole had completely faded in about five minutes, leaving only a few bright streaks, and a new curtain then formed a little farther to the E. At 4 a. m. there were small patches in Boötes and a quiet narrow arch, greenish with a faint rose tinge on lower edge, brightness 3, running from near Arcturus, on the northern horizon between Castor and Pollux, and ending in the clouds near the Hyades. This had entirely faded at 4.17, when a broad sinuous band rapidly developed from the N. running from near Arcturus, through Ursa Major, Ursa Minor, Cassiopeia, and Taurus, toward the SE. horizon. This moved rapidly towards the W., reaching Cygnus in two minutes and quickly fading there, the southeast end in the meanwhile having broken into irregular streaks. At 5 a. m. the aurora was faint and pale yellowish green, in the form of two streaks running through Leo, Gemini and Cancer. At 6 a. m. a broad bright sinuous band crossed the sky from N. to S., passing through the zenith and moving rapidly toward the E. Brightness 3. The sky then became cloudy. A large magnetic disturbance lasted through the aurora, with decrease of all three elements.

September 30, 1882, 1.17 *a. m. to* 4.30 *a. m.*—The aurora was fully developed at 1.17 a. m., when the clouds broke away sufficiently to allow it to be visible. It was very pale (0 to 1) and in the form of a sheaf of narrow, quiescent, white, hazy bands, stretching across the sky in the NE. from a point near Arcturus in the N. through Ursa Major, Auriga, and Perseus. At 2.17 the clouds were merely open enough to show traces of aurora in the form of pale streaks in Ursa Major, in the N. and overhead. At 3 a. m. the sky was quite clear, and only pale, quiet, white bands, radiating from a point in Boötes near the NW. horizon and converging to a point in Taurus near the SE. horizon, covered nearly the whole sky. The light was much dimmed by the full moon. At 3.17 and at 4 the aurora was essentially unchanged, though some bands faded and others were formed, and the whole was much obscured by haze at 4. At 4.17 there was rapidly developed near the southern horizon, dimly visible through the haze, a twisted horizontal band with a rapid motion and indications of color which must have had a brightness of 3. The stars near it were invisible. After this the aurora faded, none being observed at 5 a. m.

October 1, 1882, 1 *a. m. to* ——.—At 1 a. m. there was a break in the clouds in the N. and a portion of a vertical band of aurora (brightness 1 to 2) was visible. No stars were to be seen. The opening soon closed, and the weather continued rainy most of the night. A large and long-continued magnetic disturbance indicated a considerable aurora.

October 8, 1882, —— *to* 8.30 *a. m.*—The sky was alternately clear and overcast during the early part of the night, but no aurora was noticed until 4.45 a. m., when bright bands, white and motionless, crossed the zenith from N. to S. The sky soon clouded and no aurora was observed at the 5 a. m. observation. At 6 a. m. a quiet yellowish band had passed up from Orion on the SE. horizon nearly to Cassiopeia, then declining towards Andromeda (brightness about 1). At 7 a. m. a small yellowish patch in Taurus (brightness about 1) was all the aurora visible. At 8 a. m. another pale yellowish green arch stretched from the N. to the E. point of the horizon, reaching an altitude of about 20°. At 8.30, though the sky was perfectly bright and clear, no aurora was to be seen. Neither the galvanometers nor magnetic instruments indicated any disturbance.

October 10, 1882, 2 *a. m. to* 6 *a. m.*—Light snow fell during most of the night, but the sky cleared at intervals. At 2 a. m. traces of aurora were visible through the hazy clouds, in the form of a quiet band running across from N. to SE. near the zenith. At 4 a. m. the sky cleared off, showing a bright patch in Aries near the S. horizon with some horizontal bands in SW., brightness 2 to 3. At 4.17 bands, brightness 2, beginning in Lyra and passing through Cygnus. There was no rapid motion or vibration, only a slow drifting and breaking of the bands, which quickly faded and new ones developing, especially one somewhat twisted and undulating from Lyra, through Cygnus and Andromeda, to Aries on the S. horizon. At 5 a. m. the arch was in the SW., running from W. to S., yellowish in color and vibrating rapidly, also twisting up and down vertically. At 6 a. m. a bright band passed from NE. to SE. with a rapid lengthwise vibratory motion, several times parting in the middle. The clouds then became too thick for the aurora to be seen. A considerable magnetic disturbance commenced at 6 a m., continuing twelve hours.

October 11, 1882, 3 *a. m. to* 4.30 *a. m.*—Light snow was falling up to 3 a. m., when the hazy nimbus cloud broke rapidly away, disclosing a white hazy band (brightness 0 to 1), quiet, stretching across from Hercules in the N., through Cygnus, Lyra, Cassiopeia, and Andromeda, ending in clouds near Aries in SE. This was a little brighter at the SE. end at 3.17, when the horizon again thickened up. At 4 a. m. the sky was again clear, but the aurora had faded to a pale band on the edge of the clouds in the SW., and in 10 minutes there was only a vague luminosity in the E. and SW. During the rest of the night the sky was cloudy.

October 12, 1882, 12 *midnight, October* 11, *to* 9 *a. m.*—The sky cleared suddenly, disclosing an arch in the NE., with its crown in Andromeda, and its extremities buried in the clouds. Its brightness was 2, and it continued to rise and spread till, at 1 a. m., a broad, bright sinuous band ran from the N. to SE. horizon, occupying mostly the constellations Corona Berenices, Ursa Major, Camelopardalis, Perseus, and Aries. Until 1.17 the only change was a slow spreading and undulation, moving from the zenith eastward and slowly back again. The N. and SE. ends remained quiet, the SE. end the brightest, while the center changed into one, two, and three bands of vertical streamers and back again to wavy bands. The brightness of the band was from 3 to 4, and the edges were tinged with rose and green. There was a magnetic disturbance, with increased declination and decreased horizontal force. At 2 a. m. there was merely a quiet arch, with streamers running from Leo, on the N. horizon, reaching its greatest height above α Geminorum, passing through the Hyades and ending at a point below these on the SE. horizon. This had faded almost completely at 2.17, and a few pale streaks crossed the zenith from N. to SE. The aurora was similar in character to this at 3, but the arch passed between Castor and Pollux. The magnetic needles had in the mean time returned to their normal readings since the disturbance at 1 a. m. At 4 a. m. a broad hazy band stretched from Boötes close to zenith through Cygnus and Lyra to the SE. in Aries. At 5.17 this began to spread and break up, rapid gyratory motion commencing in Cassiopeia, and spreading in a few minutes all over the sky except the NE. There was an indescribable confusion of smoke-like wreaths, whirls, curtains, and shooting streamers. The motion was all gyratory, or motion of translation, very rapid and in no given direction. A special center of gyration, whirling from N. to S., developed rapidly and as rapidly disappeared in Perseus. The display reached a brightness of 3 to 4, and showed rather faint colors—green, rose, and peach-blossom. In about 5 minutes all became suddenly pale and quiet, but showed sign of breaking out again. At 5 a. m. a pale yellowish band ran from N. to SE. horizon, reaching an altitude of about 40°, quiescent (brightness 1 to 2). At 6 a. m. three arches were observed forming a triangle (brightness 1 to 2). At 7 a. m. one broad band crossed the zenith from NW. to ESE. (brightness 1 to 2). No aurora was observed at 8, but at 9 a. m. a pale, arched band (brightness 0 to 1) was observed low in the SW. (20° altitude), running from Canis Minor in the SE. to the lower part of Taurus, through Orion. This was the end of the aurora, fading before daybreak.

October 13, 1882, 2 *a. m. to* 9.50 *a. m.*—The haze which overspread the sky was quite thin at 2 a. m., and a hazy, quiet, arched, and slightly sinuous band, white in color, passed from a point in Taurus on the SE. horizon to a point in Coma Berenices on the northern. The arch slowly rose, the crown being just above Castor and Pollux at 2, close to Capella at 2.10, and when last observed at 2.17 just above Capella and still rising, the band spreading slightly (brightness 1, rising to 2 at the N. end at 2.10). At 3 and 4 this aurora was replaced by a few vague traces. Up to 9 a. m. no aurora was observed, the weather being hazy. At that time a white, quiet arch was observed passing from the ESE. through Canis Minor and Taurus to the WNW., about 2° in breadth, altitude 50° brightness 2. At 9.20 there was a second arch about 2° above and parallel to the first, not continuous, but consisting of a series of luminous patches resembling long-drawn cirrus clouds, motionless, and similar in brightness to the first arch. At 9.40 a. m. the western extremity of the first and broader arch was observed to slowly change form until it resembled the folds of a curtain, when the whole slowly drifted southward and disappeared about 9.50 a. m.

October 14, 1882, 2 *a. m. to* 9.46 *a. m.*—At 2 a. m. a narrow and barely perceptible band, perfectly straight, ran from the SE. horizon through Andromeda nearly to the zenith, paler than the Milky Way. This was perceptibly brighter at 2.20, and there was a pale glow along the horizon in the NE. At 3 this had developed into a slightly sinuous band running from the SE. horizon through Pegasus across the sky through Cygnus and Lyra to the NNW. (brightness 1). Also a pale arched band, much curled at the east end, from Taurus through Auriga, running close to the Dipper and fading in the N. The main arch drifted to the SW. slowly and beamed brighter (1 to 2), dividing longitudinally into three bands, while the eastern aurora faded. At 4 a. m. three bands crossed the southwestern sky, united at the horizon, and spreading at the center from the SE. to NW. Altitude about 20°, breadth at broadest part 10°, brightness 2 to 3, occupying constellations Pegasus, Delphinus, Aquila, and Ophiuchus. Upper band somewhat broken into streamers, especially at SE. end. This was all fading rapidly at 4.20. At 5, two luminous yellowish bands (brightness 2 to 3), passed from SW. to NW. through Delphinus and Serpens. At 6, one arch, with bright streamers moving from W. to E. and vibrating, passed from Orion through Ursa Major and ended in Boötes (brightness 3). At 7, a band (brightness 2 to 3) ran from Cancer through Ursa Minor. At 8, a band with bright streamers at the north crossed the zenith from NNW. to SSE. (brightness 3 to 4). The whole moved slowly southward. At 9, a broad, broken, vaporous arch from N. to S. crossed the zenith. This changed its form a little but not its position, until it faded about 9.46 (brightness 0 to 1).

October 15, 1882, 12.5 *a. m. to* 10 *a. m.*—The aurora commenced as a narrow pale band, beginning near the Pleiades and running along the horizon fading in Gemini. This was a little brighter at 12.20. At 1.20 it extended across the zenith from Aries on the SE. horizon to Leo on the northern, consisting of several sinuous bands, shifting and somewhat wavy, occupying Taurus, Perseus, Cassiopeia, Ursa Minor, and Ursa Major (brightness 3 to 4), color white, with tinges of green and yellow; motion undulating and rather rapid. At 2 a. m. the aurora passed through α Boötes to Leo Minor and to Gemini. At 3, two bands rose together from Serpens near the horizon, one passing through Pegasus and Cygnus, and the other through Andromeda and Lacerta, while an arched band crossed the eastern sky from Boötes in the N. to Taurus in the SE., passing through Ursa Major. Both sets of aurora were quiet and yellowish (brightness 3 to 4). At 4, a broad, quiet, white band (brightness 2) crossed the zenith from Leo Minor through Ursa Major, Ursa Minor, and Cygnus, ending in Sagitta. At 5, three bands (brightness 3) crossed the zenith, occupying Lyra, Cygnus, Cassiopeia, Pegasus, and Taurus, with a few bright streamers in the NNW. At 6 a. m. an arch (brightness 2) ran from Boötes through Canes Venatici and Lynx, ended in Gemini, while a double arch (brightness 0 to 1) lay about 10° above the SW. horizon, running from NNW. to ESE. This arch was still in the same position at 8 and had become a single band at 10. At 7 there were pale patches of yellowish light in the NNE. near the horizon. Between 9 and 10 the arch in the SW. was bright, quiet, and well defined, with tremulous streamers (brightness 3 to 4), colors bright green, yellow, and rose. Extensive magnetic disturbance.

October 16, 1882, 12.40 *a. m. to* 4 *a. m.*—Streamers flashed up in the E., forming a low arch from Taurus in the SE. to Leo in the N., with the crown in Gemini (brightness 1). At 1 a. m. there was a definite narrow arched band with one end in Leo in the N. and the other in the lower part of Aries in the SE., with the highest part in Auriga and Perseus. From the northern end numerous long quiet streamers ran up as high as Ursa Major (brightness 1). The whole was rising slowly when last observed at 1.20. From 2 to 2.20 the aurora was in the form of a broad band, narrow at the ends and spreading, and crossed the zenith from Pisces in the SE., near the horizon, to a point in Boötes, near the northern horizon. It occupied chiefly the constellations Andromeda, Perseus, Cassiopeia, Ursa Minor, and the western portion of Ursa Major. The band was slightly sinuous, and by imperceptible degrees changed its shape without changing its position, breaking into several bands, and consolidating itself into one again, its brightness increasing from 1 to 2. An eastern band joining this at the ends passing through Auriga was well defined at 2.17, and almost wholly gone at 2.20. At 3 the aurora was in the same place, but had grown paler and more diffused, while at 3.15 the eastern band was again well developed and the aurora was spreading westward as far as Cygnus. At 4 the sky was so hazy that only the brightest stars were visible, but through the haze twisted bands of aurora in rapid motion were to be seen. After this the cloud thickened up and no more aurora was observed. A magnetic disturbance commenced at 3 and lasted till 7 a. m., with decrease of horizontal force from .530 to .215, while the declination increased 6° 07′, the vertical force being but slightly affected.

October 17, 1882, 11 *p. m., October* 16, *to* 10 *a. m.*—Before the stars were definitely visible a twisted band of aurora was observed across the zenith from the NNW. to the SE. (brightness 1). At 2.17 there were three bands nearly overhead, running from NW. to SE. through Ursa Major, Ursa Minor, Cepheus, Canes Venatici, and Boötes. These bands were white, tinged with greenish (brightness 2), with undulating motion, the ends shifting and disappearing. The magnets were slightly disturbed. At 1 a. m. there were two small horizontal curtains in Taurus, from whose western end rose a broad, spreading, sinuous band across the zenith to Boötes in the N., occupying Andromeda, part of Cassiopeia, and Ursa Major, spreading W. into Cygnus and Lyra (brightness 2), with slight wavy motion. This was breaking up and paler at 1.10, and had become a single twisted band, with a tendency to divide lengthwise at 1.17. At 2 the aurora was in essentially the same position, but the western part was brighter, and had sunk lower in the SW., passing through β Cygni and Vulpecula. This portion reached a brightness of 3 at 2.17, while the rest had paled considerably. At 3 there was a twisted mass of light in Taurus, and a narrow bright (3) band running along the SW. horizon through Aquila, extending about 90° in azimuth. At 3.17 a brilliant display began, which was observed up to 3.25. The aurora developed from the SW. up to the zenith and a little past it with great rapidity in the form of whirling, circling bands and smoke-like wreaths, mingled with pale streamers, which latter formed an imperfect corona at 3.20 in Cassiopeia at the zenith, which disappeared quickly. The motion was very rapid, and the light reached a brightness of 3 to 4. The light was mostly yellowish-white, but tinged on the lower edge with greenish and rose. The magnets were violently disturbed, with great decrease of horizontal force. At 4 a. m. three bands ran along the SW. from Orion to Aquila at an altitude of about 25°. These reached a brightness of 3 at 4.15, and then quickly paled, while the aurora developed from Orion and spread over the eastern sky in broad, sinuous, undulating bands (brightness 1 to 2), which formed a very transient, imperfect corona. This aurora was brightest in Ursa Major, and spread over the whole sky at 4.20. The motion was comparatively slow, and the magnets less disturbed. At 5 there were two quiet greenish bands (brightness 2), one in the NE. through Gemini, Leo Minor, and Coma Berenices, and the other in NW. from Boötes through Hercules and Aquila. At 6 a pale broad band ran from the western to the southern horizon, and at 7 a similar band in the NE. ran from Gemini through Ursa Major and ended in Boötes. At 8 there were numerous streaks (brightness 2 to 3) in the NE. moving rapidly westward. No aurora was observed at 9, but at 10 there were traces of a pale arch extending from the NNW. to ESE. at an elevation of about 12° above the southern horizon. The extremities were lost in the haze and cloud which obscured the horizon.

October 21, 1882, 7 a. m. to 8 a. m.—Up to and during the 6 o'clock a. m. observation the sky was clouded over and it was snowing; but at 7 a. m. it was clear, and a stationary yellowish-white band of aurora was observed running from Hercules in the WNW. through Pegasus to Taurus in the SSE. At the WNW. end there were vertical streamers, vibrating upwards rapidly (brightness 2 to 3). At 8 a greenish band without motion crossed the zenith from Boötes through Ursa Minor to Triangulum (brightness 2 to 3), while at 9 a. m. the same band, somewhat paler (2), passed beyond Triangulum into the haze on the eastern sky. Magnetic instruments showed no signs of disturbance.

October 22 and 23, 1882, 10.30 p. m. to 10.20 a. m.—As soon as it was dark enough for an aurora to be seen, a slightly sinuous, narrow, hazy band was observed crossing the zenith from N. to the SE., passing straight up through the middle of the Dipper. In the twilight it appeared a pale rosy color, and a slight wavy motion was observed (brightness 0 to 1). Next observed at 11.15 in the shape of a broad, waving band from the NNW. to SE., not reaching the horizon at either end, passing through Ursa Major, Draco, and Cygnus (brightness 1), color yellowish. At 12.15 a. m. October 23 it was a narrow arch from the NW. to SSE. through Vulpecula, Delphinus, Cygnus, and Lyra to Boötes, with little or no motion (brightness 1). At 1 a. m. a low arch (brightness 2), somewhat tinged with yellow, lay in the SW., taking in about 40° in azimuth and reaching an altitude of about 20° near α Aquilæ. All the stars on the SW. horizon were obscured by the bright moonlight. This arch had not changed its position when last noticed at 1.20, while at 1.10 an additional hazy, wavy band had developed in the NE., running from Taurus in the SE. through Auriga to Coma Berenices in the N. (brightness 1). At 2 a. m. the starting point of the aurora was in Taurus, near the SE. horizon. From this ran a band of streamers to the NNW. through Aries, Pegasus, highest in Cygnus, near β Cygni, through Lyra and Hercules round to Boötes (brightness 1 to 2), and also bands (brightness 1) across zenith passing through Cassiopeia. From 2.10 to 2.20 the western band became brighter, with considerable motion, and gradually faded, while the eastern bands, still pale, spread eastward into Auriga, developing a bright patch in Canes Venatici. The magnets were slightly disturbed. At 3 a. m. the western streamers were replaced by a pale (0 to 1) band, and another band equally pale crossed the zenith from the same starting point. At 3.10 to 4 an additional sinuous band (1 to 2) developed in the E. from Orion just rising in the SE., through Gemini, Leo Minor, and Canes Venatici to a point in Boötes, now just above the northern horizon.

From 4 to 4.10 there was an extensive display, which would have been brilliant had it not been for the moonlight. Starting from Orion it spread into Taurus, Aries, and Auriga in the shape of twisted forks, one streak crossing the zenith to NNW., with a band nearly in the position of the western band seen at last observation. This latter band had risen about 10° at 4.10. No rapid motion was observed (brightness 2 to 3). The whole was fading rapidly at 4.17. There was a great magnetic disturbance, the horizontal force falling too low to be read, and the declination rising. At 5 a. m. only one pale (0 to 1) band was visible running from Leo to Ursa Major, resembling hazy cirrus cloud. At 6 a. m. there was a pale arch over the NE. horizon, and at 8 a. m. another similar arch (brightness about 1). At 9 and 10 a. m. there was simply a trace of aurora in the form of an arch closely resembling the twilight curve, spanning the southern horizon at an altitude of about 40°, the extremities hidden in the haze which obscured the horizon. This had wholly disappeared at about 10.20 a. m.

October 27, 1882, 1 *a. m. to* 4 *a. m.*—The clouds which had covered the sky broke away about 1 a. m., having a few patches of fleecy cirrus-stratus clouds hiding the stars in the SE. At the 1 a. m. observation two hazy, narrow, sinuous bands crossed the zenith from this bank of clouds, ending near Arcturus in the NNW., about 15° above the horizon, passing through Cassiopeia, Cepheus, and Draco. At 1.17 the top of the arch had drifted west to Cygnus and Lyra, the ends remaining fixed, while the arch itself showed a tendency to split lengthwise (brightness 1); brightest in Boötes, where it had a faint ruddy tinge. There was a slight magnetic disturbance. At 2 a. m. an arched narrow band (brightness 2) stretched from a point in Serpens about 10° above the NW. horizon to the bank of clouds in the SSE., reaching an altitude of about 30° near *α* Aquilæ. There was a faint suggestion of green and rose color at the northern end. At 2.10 to 2.19 the band faded slightly, and at 2.17 the crown rose about 2°, while at the same time there were also faint traces of a band in the position of the one observed at 1 a. m. From 3 to 3.17 there was a broad aurora running from a point in Boötes W. of Arcturus just above the northern horizon up through Ursa Major, Ursa Minor, and Perseus, ending in the clouds near Taurus (brightness 1 to 2). It consisted of broad, hazy, waving bands and twisted streaks fading and reappearing quickly, with slight motion, shifting rather to the westward. At 2.10 there were whirls approaching the curtain shape in Canes Venatici, and a low ill-defined arch in the NE. in Leo Minor, and at 2.17 also a faint band through Cygnus in the W. The magnetic disturbance increased in violence, all the elements being much diminished. From 4 a. m. onwards the sky was obscured by thin clouds. During the whole time the aurora was visible its brightness was much dimmed by the exceedingly bright moonlight.

October 27 *and* 28, 1882, 10.30 *p. m. to* 1.17 *a. m.*—As soon as it was dark enough for the aurora to show, a bright patch with bright streamers was observed in the SE., about 20° above the horizon. At 11.13 the aurora was in the form of a hazy arch, with its crown passing through Cygnus and Lyra, and its extremities hidden in the haze NW. and SE. At 12.13 the sky was so hazy and the moonlight so brilliant that the position of the aurora among the stars could not be definitely traced. It had the form of a faint arch of hazy light. The crown of the arch bore SW. at an altitude of about 30°. Extremities bore SE. and W. by N. At 1 a. m. only the brightest stars were visible through the haze. One broad band made up of transverse streamers, moving rapidly westward with quick undulations from N. to S., crossed the zenith from the N., ending in the clouds in the SE. Several paler secondary bands W. of the main band. The whole aurora was paler and much broken at 1.10. At 1.17 it had almost wholly faded, but quickly reappeared in the N. in the form of curled streaks, covering a large extent of sky. A large magnetic disturbance commenced at 10 p. m., continuing all night. The horizontal force ranged through .517, the declination through 2° 54′, and the vertical force through .088. At 2 a. m. the sky was clouded, and no more aurora was seen.

October 29, 1882, 5 *a. m. to* 11.30 *a. m.*—Up to 5 a. m. the sky was covered by thin, patchy, stratus clouds, through which the moon shone; after this the sky cleared off. Soon after dusk faint traces of aurora were seen through the clouds. At 2.13 a. m. a bright streak showed through the clouds in the NNE., the base about 20° above the horizon and running up towards the zenith. At 3 to 3.10 the sky was clear enough near the zenith to expose a band crossing from the N. when it was visible through the clouds to the SE. It could be seen to pass through Lyra and Cassiopeia. At 5 a. m. a band, partly covered with clouds, ran from Boötes through Draco, ending in Andromeda. It was pale and hazy (brightness 0 to 1), and moved slowly to the W. No more aurora was visible till 9 a. m., when a band passed from Ursa Major through Camelopardalis, ending in Cassiopeia (brightness 1). At 10 a. m. a band ran from Leo Minor to Perseus, passing through *α* Aurigæ (brightness 2). At 11 a. m. a patch was visible in Gemini. A violent magnetic disturbance commenced at 3 a. m., lasting all night. The horizontal force fell too low to be read.

November 2, 1882, 12.30 *a. m. to* 4 *a. m.*—From 12.30 to 12.45 a pale, glowing segment, resembling the twilight curve, was discernible in the NE., extending from N. to SE., and reaching an altitude of about 30° in the NE. It was very pale, a little brighter in the N., and continued indistinctly visible until 3, when it developed into two or three definite, but wavy, pale (0 to 1) bands crossing the zenith from the N. to the SE., one from Taurus up through Cassiopeia to Cygnus, and another from Boötes also reaching Cassiopeia through Draco. At 3.17 there was also a streak in Leo in the NE. Very faint traces of these bands were still discernible at 4 a. m., but no more aurora was observed.

November 3, 1882, 12.17 *a. m. to* 8 *a. m.*—Streamers of a slightly yellowish tinge (brightness 1 to 2) shot up all round the horizon, being brightest in the NW. and SE. At 1 a. m. they had arranged themselves in the form of an arch of streamers (brightness 1), running from Taurus in the ESE. through Auriga to Ursa Major in the N. This had faded a good deal at 1.10 and was replaced by a pale arched band at 1.17. At 2 there was a vertical streak in the N. in Boötes, running up from near the horizon into Draco, and a few additional streamers were to be seen in Ursa Major at 2.10. This had faded at 2.17 and there appeared a pale arched band in Leo in the NE. At 3 a. m. there was a pale glow in the S. and SW., and at 3.10 a definite band (brightness 1) from Aries in the SE. up through Perseus and Andromeda to Cassiopeia near the zenith. At 3.17 there were merely patches of pale glow in the N. and NE. At 4 a. m. these bands (brightness 1 to 2) ran from the SE. to the NNW., not reaching the northern horizon (brightest in the SE.); one (the brightest) from Orion through Taurus, Perseus, Cassiopeia, Cygnus, and Lyra; a second (paler) through Aries and Andromeda and just above *α* Aquilæ; and the third (palest) close to the horizon. These bands were in essentially the same position and a little brighter at 4.10, but had faded to 0 to 1 at 4.17. At 5 a. m. there was a pale band (0 to 1) in the NE. through Leo and Gemini. At 7 a. m. two bands (brightness 1) of a slightly greenish tinge crossed the zenith from Serpens to Cassiopeia and Camelopardalis. At 8 a. m. there was an arch of very pale light over the SE. horizon, and after this no more aurora was observed.

November 4, 1882, 4.10 *a. m. to* 9.30 *a. m.*—The sky was covered with rather thin hazy stratus clouds which cleared away more or less at intervals. At 4.10 a. m. there was a quiet arch (brightness 1) visible through the clouds in the NE. There were no stars visible near this, so it could not be charted. The crown bore NE. altitude about 30°, and the extremities NNE. and ENE. altitude about 10°. This was wholly observed at 4.17. At 9 a. m. the sky was clear and a faint arch (brightness 0 to 1), extending from NNW. to ENE. with an altitude of about 30°, was observed, lasting until 9.30.

November 5, 1882, 1 *a. m. to* 6 *a. m.*—At 1 a. m. there was an arched bank of clouds in the NE. on the horizon, and above this a pale steady glow gradually fading into the starlight. At 2 a. m. this glow had faded, but at 2.10 a broad definite band (brightness 1) crossed the NE. sky, white and motionless, from a point in Orion near the ESE. horizon, reaching its greatest height at Castor and Pollux in Gemini and ended in the upper part of Leo in the NNE. Its altitude was about 5° less at 2.17. Clouds and haze obscured the aurora till 6 a. m when an arched band was observed, with essentially the same bearing, running from Orion through Auriga to Ursa Major (brightness 2) and color slightly greenish, sometimes varying slightly in color and brightness, especially in the SE., where a few streamers were observed. No more aurora seen.

November 6, 1882, 7 *a. m. to* 7.15 *a. m.*—Up to 7 a. m. the sky was not clear enough to allow any aurora to be seen. An arch of pale yellowish green was then visible through the haze, running from Orion to Leo through Gemini (brightness 0 to 1). This was invisible at 7.15 and no more was observed.

November 7, 1882, 4.17 *a. m. to* 11.20 *a. m.*—The weather was stormy and the clouds thick during the early part of the night. At 4.17 a. m. an arched band was visible through the clouds in the SW. at an altitude of about 40°, quickly disappearing, while a similar streak in the NW. moved rapidly towards the zenith. No stars were visible at this time. There was a slight magnetic disturbance, with a decrease of horizontal force and declination and an increase of vertical force. The earth currents were notably increased in strength. At 11 a. m. the sky was comparatively clear, and a band was observed stretching from Andromeda through Ursa Minor to Canes Venatici, characterized by frequent flashes from W. to E. and a rapid vibratory motion. At 11.10 a. m. it had moved further toward the NE. and extending from N. to E. through Cygnus, Draco, and Boötes. It now consisted of a broad regular arch formed of streamers about 10° in length and perpendicular to the magnetic meridian. The streamers were agitated by a vibratory motion and a motion of translation to the E. (brightness 2). The aurora disappeared about 11.20 a. m.

November 8, 1882, 4 *a. m. to* 10.35 *a. m.*—During the early part of the night the sky was covered with thick clouds, but at 4 a. m. these had thinned away sufficiently to allow a few of the brightest stars to be seen, and broad bands of aurora, apparently in rapid motion, were observed crossing the zenith from the NNW. to ESE., spreading out at the zenith to a trail some 40° in width. No more aurora was observed until 9.10 a. m., when it appeared for about twenty minutes in the form of a quiescent faint band across the zenith from NW. to SE., with the extremities lost in the haze. At 10.10 a. m. a band (brightness 0 to 1) encircled the entire horizon, about 10° in breadth, and resting on a dark band of uncertain character (apparently hazy and stratus cloud) of about the same breadth. At the same time a second similar band formed an arch intersecting the first in the SE. and N., with its crown at an altitude of about 45°. At about 10.35 the sky clouded over and no more aurora was observed. A magnetic disturbance commenced about 4, chiefly affecting the horizontal force, which was largely decreased.

November 9, 1882, 12.30 *a. m. to* 7.30 *a. m.*—At midnight no aurora was observed, but at 1 it was already well developed in the form of a brilliant zone (2) from a point in Taurus in the ESE. horizon into Ursa Major and Leo Minor on the N. In the NE. it did not reach lower than Gemini, but extended also into Auriga. The zone consisted of three or four bands changing rapidly, but not moving fast, forming sometimes whorls and streamers, and had spread into Perseus and Andromeda at 1.10. At 1.17 it had faded a good deal, while two streamers started up in the N. and ESE., meeting across the zenith, while a large whorl formed in Canes Venatici. At 2 a. m. the zone was still broader and contracted at the horizon, ran from Hercules in the N. to Taurus in the SE., mostly west of the zenith, occupying Pegasus, Cassiopeia, Cygnus, and Lyra, drifting westward with rapid shooting and circling motion from SE. to NW. It had faded a little at 2.10, and was quiet, while quiet glowing banks of light replaced the 1 o'clock aurora. At 2.17 the western aurora had almost wholly faded, and the eastern developed into a regular arch, which lost its regularity in a few minutes. At 3 a. m. the eastern zone had developed again from Orion in ESE. to Boötes in NNW., narrowing at the horizon, in the middle stretching from Gemini up to Ursa Minor (brightness 3), made up of sinuous bands, sometimes narrow, sometimes broad, with some longitudinal motion from N. to S., spreading a little towards the W., and not so bright at 3.17. At 4 there was a similar broad band or zone, but quiescent (2 to 3) from a point in Monoceros in the ESE. through Orion, Taurus, Pegasus, Cygnus, and Lyra, to a point in Ophiuchus near the NNW. horizon, also spreading eastward in paler bands to Ursa Major, growing paler at 4.17. At 5 a. m. two parallel bands 4° to 5° apart crossed the zenith from Taurus, through Perseus and Cassiopeia, to Corona (brightness 2), drifting slowly S., with a rapid waving motion from W. to E. At 6 a band with a few streaks above it, moving slowly to the S., stretched from Orion through Gemini to Leo Minor. 7 a. m. saw a luminous band stretching round close to the horizon, without motion, extending from Pegasus to Serpens. Haze then began to cover the sky, and soon became clouds. A magnetic disturbance, affecting the horizontal force, and to a less degree the declination also, commenced at 2 a. m., and continued several hours after the end of the aurora.

November 10, 1882, 3 *a. m. to* 9.10 *a. m.*—The sky was cloudy during most of the night. When it cleared, at 3 a. m., no aurora was observed. A faint glow in the N. and NW. may have been auroral. At 5.15 a. m. the clouds again broke away sufficiently to show an arch from Taurus through Pegasus to Lacerta from SE. to SW., partly hidden by clouds and haze (brightness 1). At 8 a. m. the sky partly clouded again, disclosing a motionless band from Orion to Leo, about 5°–8° above the horizon, showing through haze (brightness 0 to 1). At 9.10 a. m. a few faint traces of aurora were visible through the haze and clouds. The magnetic needles were very slightly affected.

November 12, 1882, 3 *a. m. to noon.*—During the early part of the night a furious storm of wind and snow was raging, accompanied by a violent magnetic storm affecting all three elements, which lasted several hours after the aurora disappeared. Through a break in the clouds at 3 a. m. sinuous bands and streamers (brightness 2) were observed in the N., in and near Ursa Major. At 3.17 the sky was nearly clear, and sinuous bands from the NNW. to ESE. occupied most of the western sky, the ends of the bands being lost in haze, while an incomplete corona formed E. of the zenith (brightness 2). Accurate observation was rendered impossible by the violence of the weather. From this time on the storm moderated. At 4 a. m. a whirling band ran up from Orion's belt in the SE. towards the Pleiades, and two arched and nearly parallel bands ran along the SW. horizon, the upper band the broader and brighter, through Taurus, Cetus, and Pisces into the lower part of Pegasus below the square (brightness 2). It had faded considerably at 4.10, but at 4.17 had developed into two bands of curtains and streamers, with rapid vibration and play of colors, yellow, green, and rose (brightness 3), intermittent, sometimes sinking to 2 or rising in places to 4. At 5 a. m. two yellowish green bands ran from WSW. to WNW., through Aquila to Hercules, with a few streamers on the WNW. end (brightness 1 to 2). At 6 a. m. there were several bands and streamers in the northern sky, the streamers vibrating from W. to E. At 7 a pale arch with streamers ran from the SE. to SW., about 9° or 10° above the horizon (brightness 1). At 8 there was a sheaf of beams in the NNE. from Leo to Camelopardalis, with slow lateral vibration, changing in brightness from 1 to 2. At 9 a. m. the horizon was encircled by a band of pale quiet white light 10° in breadth, from which arose a perfect fringe of streamers, some approaching the zenith, most of them, however, not exceeding 10° or 15° in length, and apparently motionless. This display continued for nearly an hour, with but slight change, when a broad white band (brightness 0 to 1) was observed to start from the luminous base in the W. through the Pleiades and Ursa Major, stopping at a point about 30° E. of the zenith. No further change was observed till 11 a. m., when a second like arch was formed about 6°–8° in breadth and 60° in diameter, having its crown in the zenith. From this band streamers shot out and formed a complete corona. At this time the magnetic disturbance was particularly great. The corona continued apparently unchanged and motionless until it faded before the dawn.

November 12 and 13, 1882, 9.30 p. m. to 11.30 p. m.—As soon as the sky grew dark enough for an aurora to be visible, it appeared well developed and probably a continuation of the preceding aurora. At 10.17 p. m. a waving band of light extended across from SE. to NW., brightest in the SE., where it had the curtain form, with the streamers in the same direction. At 11.17 there was a faint streak (brightness 1) through Andromeda, Cassiopeia, Draco, and Boötes, with bright curtains in Pegasus and Cygnus. At 12.17 there was an arch whose extremities bore SE. and NW., and below this, on the horizon, a well marked dark segment, with wavy faint streamers above it, and faint patches of light in Andromeda and Cassiopeia. At 1 a. m. there was a broad bright zone occupying nearly all the western sky, and extending east of the zenith, from Boötes, in the NNW., through Ursa Major, round above Capella to Taurus, in the ESE. The zone was composed of several broad sinuous bands, converging near the horizon, and sometimes developing streamers (brightness 2 to 3). It drifted westward, and had passed the zenith at 1.10, in motion especially on the edge, in the N., and at the zenith, waving and vibrating, with some slight display of colors, yellow, green, and rose. There was a particularly bright portion in the SE. The whole had sunk low in the SW. at 1.17. From 2 to 2.17 a. m. the aurora was reduced to two bands lying low in the SW., from Ophiuchus in the NW. through Aquila to Pegasus in the S., with streamers from the upper band, all growing gradually smaller (brightness 2 to 3). At 3 a. m. a broad bright zone of the usual type crossed the zenith from Orion and Taurus in the SE. to Boötes, with streamers forming a half corona E. of the zenith, centering in Cassiopeia (brightness 2). At 3.10 the half corona was W. of the zenith, with the bands as before, developing wavy curtains at the zenith. At 3.17 there were bands low in the NE., running from Procyon through Leo Minor and Canes Venatici to Boötes, made up of streamers flashing rapidly from N. to S., and showing beneath them a well-marked dark segment (brightness 2 to 3). At 4 a. m. these bands had become curtains; there was a broad band (1) in the S. and sinuous streaks covered most of the sky at right angles, roughly speaking, to the magnetic meridian, converging towards the horizon in the NW. and SE. At 4.10 to 4.17, radiating from Aquila in the NW., near the horizon, and Canis Major, near the SE., bands, streaks, and streamers covered most of the sky, constantly changing and shifting, with much flickering motion. There was a special center of activity in the N., where curtains were developed. At 5 the aurora consisted of two bands, with yellowish streamers. At 6 it was an arch made up of curtains and streamers in rapid motion (brightness 2 to 3). At 7 there were only faint traces around the horizon, while at 8 no aurora was visible, but it broke out again at 9 in the form of a white striated band (brightness 2 to 3), about 30° in width, passing from the SE. to NW., about 3° to 5° SW. of the zenith. There was much wave-like motion from W. to E., with considerable change of form, but not of position. The horizon was fringed with streamers, generally about 20° long and motionless. From 10.15 to 10.30 the aurora filled almost the entire southern half of the sky, passing from SE. to NW. north of the zenith. The lower half of the sky was filled with curtains brilliantly colored, green, yellow, and red predominating, in narrow bands parallel to the magnetic meridian, the whole in rapid motion from E. to W. (brightness 2). At 11.20 there was a perfect corona, with curtains in the S. and a luminous band on the northern horizon from the SE. to NW., sending up streamers to the zenith, white and quiet (brightness 1 to 2). At 11.17 the corona still continued, and the whole aurora was of the same general type, but moving slightly. It faded about 11.30 a. m. The magnetic needles were but slightly disturbed up to 3 a. m., when the disturbance became very violent, not subsiding until about 5 p. m. All these elements were affected, especially the horizontal and vertical force, the former decreasing and the latter increasing so much that it was frequently impossible to measure them, while the declination ranged from 310 to 510.

November 13 *and* 14, 1882, 11.17 *p. m. to* 1.20 *p. m.*—The aurora commenced at dusk and was first observed (11.17 p. m.) as a wavy band through Pisces, Perseus, Auriga, Leo Minor, and Coma Berenices, whence a faint streak rose to the Pole star, through Ursa Major. At 11.17 a. m. the same or a similar band passed through Perseus, Draco, Lacerta, Ursa Major, and Canes Venatici, with faint streaks also in Cygnus. At 1 a. m. a rather broad arched band (brightness 0 to 1) extended from Taurus in the ESE. through Auriga to Ursa Major below the Dipper and Canes Venatici, brightest at the northern end, and sending off one or two long streamers at the ESE. end. This had faded greatly and become much broken at 1.10. At 1.17 a broad zone of the ordinary type of sinuous bands crossed the zenith from a point in Boötes, near the northern horizon, to Taurus in ESE. This zone was pale, only reaching a brightness of 1 in a few places. At 2 a . m. this had condensed into a twisted band 4° to 5° wide (brightness 2) from Eridanus on the ESE. horizon through Taurus, where it was much twisted like a smoke wreath, Perseus, close to Cassiopeia, through Ursa Minor and Draco to Corona Borealis. The whole was drifting slowly westward, having reached Cygnus and Lyra at 2.17, changing but little in character. At 3 a. m. there was a pale band low in the SW., while another zone crossed the zenith, spreading over the eastern sky with the bands much twisted, and forming something like curtains, varying in brightness from 1 to 3, with slight motion, and some faint rosy orange tinges in SE. The extremities were in Monoceros in the ESE., where it had a curdled appearance, and reached a brightness of 3 at 3.17. At 4 a. m. the aurora was of the same character, but paler (0 to 1), and lying more in the SW. At 4.17 there was a well-pronounced zone, which only reached a brightness of 1 in places, radiating from points in the lower part of Orion in the ESE. and Serpens in the NNW., so broad as to cover most of the sky, arching above the square of Pegasus in the SW. At 5 a. m. two arches ran from Orion through Andromeda to Cygnus, with bright streamers of various colors from yellow to red, blue and green, vibrating rapidly from W. to E. (brightness about 3). At 6 there was an arch from S. to W., with green streamers at the western end. At 7 there were simply traces around the horizon, and at 8 only faint traces. At 9.17 there was a broad, quiet, white nebulous band from Orion through Gemini, Ursa Major, and Canes Venatici to Boötes (brightness 1). At 10.20 there was a corona of pale, white, quiet streamers from the horizon to the zenith (brightness 0 to 1). At 11.10 a. m. pale, white, quiet striated bands running E. and W., filling the sky from about 10° west of Polaris to the southern horizon. Only faint traces were visible at 12.17 p. m., and continued to be visible, especially in Ursa Major and the NW., till broad daylight. The magnetic needles were but slightly disturbed up to 9 a. m., when a disturbance of great violence set in. This had not ended at midnight.

November 14 *and* 15, 1882, 9 *p. m. to* 12.15 *p. m.*—While the twilight was still bright the aurora appeared as pale, vertical streamers in the ESE. in Perseus and Andromeda at about 20° above the horizon, and at 10 p. m. had developed into an arch of streamers still pale (0 to 1), from Leo Minor, some distance above the northern horizon, through Auriga ending in Triangulum, maintaining essentially the same position and character up to 11 p. m., though growing brighter. At 12, midnight, a twisted band 4° or 5° wide passed from Boötes in the N. through Ursa Major and Ursa Minor to Pegasus, and there were also faint bands in Cassiopeia, Andromeda, and Draco. At 1.17 a zone of the usual type crossed 4° or 5° W. of the zenith, from a point low in Taurus in the ESE., through Aries, Triangulum, Andromeda, Cygnus, Lyra, and Corona Borealis to Boötes, close to the horizon in the NNW. This zone was much twisted in the N. (brightness 2), showing a faint rose tinge in the N. and SE. At 2 a. m. it was in the form of two bands, one from Canes Venatici through Ursa Minor to Andromeda, the other across the zenith from Ursa Major to Taurus (brightness 3). Between this observation and the next the aurora reached its maximum, being a great display of the usual type, bands, curtains and streamers covering the whole sky, with much play of colors, and vibration, fading rapidly. At 3 a. m. there were three bands with streamers, two from Aquila in the NW., through Cygnus and Hercules, and one arch from Pegasus to Aries (brightness 1 to 2), displaying yellow, green and pale blue colors, and vibrating rapidly. Between this observation and the next the aurora was again brilliant, but at 4 a. m. had faded to a quiet band (brightness 0 to 1), round the horizon, and at 5 there were two similar bands from NW. to SE. At 6.17 there was a faint illumination in the southern horizon, and quiet curtains in the N. At 7 a. m. there was a faint band in the SW., from Pegasus through Taurus to Gemini, with pale streamers moving slightly at the western end, and also several patches in Lacerta, Cassiopeia, and Cepheus. At 8.15 there were a few pale, white, quiet streamers between the N. and SE., and no aurora was seen at the next observation; but at 10.15 there was a faint arch from the SE. to SW., with an altitude of about 20°, with the lower edge well defined and showing a dark segment. At 11.15 there were faint streamers in the E., passing from the horizon through Canes Venatici, Coma Berenices, Boötes, and Lyra, and converging to a point just above α and β Ursæ Majoris. At 12.15 there were very pale streaks in Ursa Major, nearly reaching the zenith, and traces of aurora in the NW. obscured by clouds. The magnetic disturbance of yesterday continued pretty violent up to about 6 a. m., since which time the instruments have been comparatively quiet.

November 16, 1882, 12.15 *p. m. to* 11.20 *a. m.*—The aurora did not begin till some time after dark, first appearing as a faint streak of light in Leo Minor. At 1 a. m. there was a pale glow all around the horizon, brightest in the N., when at 3.17 three vertical streaks had developed, the largest running from near Arcturus to Draco, very pale (0 to 1). At 2 a. m. there was a narrow hazy band (brightness 0 to 1) across zenith from a point in the lower part of Taurus in the ESE. through Perseus, Triangulum, and Cassiopeia to Draco, brightest close to the SE. part, where it reached brightness 1 at 2.17, the crown having drifted westward to Cygnus and the band broadened a little, running down closer to the NNW. horizon in Corona Borealis. At 3 a. m. there was a broad, pale zone, much broken (brightness 0 to 1) from the same points in the NNW. to SE., from the SW. horizon to an altitude of about 20°, beginning to brighten and develop streamers at 3.10. At 3.17 it was rising in the form of an arch of streamers, approaching the curtain form, till it reached the square of Pegasus, Cygnus, and Lyra, where it began to fade and then develop into a paler zone of sinuous streaks. There was some vibration from E. to W. and a faint green tinge on the upper edge, shading through yellow to pale rose. There was a similar but smaller arch in the E. in Gemini and Cancer, and another in Leo. At 4 a. m. there was a broad zone of the usual type (brightness 2 to 3) from a point in Monoceros close to the ESE. horizon to a point in Serpens in NNW. occupying Orion, Taurus, Auriga, Perseus, Andromeda, Cassiopeia, Pegasus, Cygnus, and Lyra. The eastern edge was the brightest and much twisted. The aurora in the E. was essentially unchanged. There were additional streamers from the tail of Ursa Major to the zenith at 4.10. At 4.17 the bands of the zone were separating and growing paler except the westernmost (brightness 3). At 5 a. m. there was a band with motionless streamers from Canis Minor through Orion to Pisces about 5° to 8° above the horizon, and a paler band shaped like a horseshoe from Orion to Leo. At 6 a. m. a bright band crossed the zenith from Lyra through Ursa Minor to Gemini, moving slowly to the south. At 7 there were two faint arched bands around the horizon. At 8 there was a corona, with its center a little W. of the zenith, covering almost the whole sky. From the center beams extended to bands and streamers. It was nearly gone at 8.20 a. m. (brightness 1 to 2). At 9.17 there was a broad white quiet band (brightness 1) from Andromeda through Cassiopeia, Camelopardalis, and Ursa Minor, ending in Boötes, with also a faint glow on the southern horizon. The band had disappeared at 10.17, and the glow had developed into an arch with its corona at an altitude of about 20°, with short streamers from the arch. There were also streamers 45° long in the NE., E. and S. about 20° above the horizon. At 11.20 there were a few faint quiet streamers in the NE. The needles were but slightly disturbed; most so about 4 a. m.

November 17, 1882, 12.15 *a. m. to* 12.30 *p. m.*—At 12.15 a. m. faint streamers were observed in the N., partially obscured by clouds. At 1 a. m. there was merely a pale glow all around the horizon, but ten minutes after there was rather a broad arched streak (brightness 1) running up from close to Arcturus in the N. near the horizon, through Canes Venatici and Ursa Major, ending close above Castor and Pollux. At 1.17 there was a twisted band from the same point in the N. up to Ursa Major. From 2 to 2.17 there was a pale glow all around the horizon, with occasional faint streamers close to the horizon in the SE. At 3 a. m. there was a pale band (brightness 1), divided lengthwise, so the ends overlapped at the zenith, crossed the zenith from Auriga high in the ESE., through Cassiopeia to Draco, reaching down towards Boötes at 3.10 and fading at the E. end. There were also traces in the E. in Orion, Cancer, and Leo Minor, developing into a pale arch of streamers at 3.17, while the rest of the aurora faded. At 4 a. m. there were pale bands and streamers in the NE., developing at 4.17 into a twisted vertical band in the NE. (brightness 1), occupying Leo Minor and the whole of Ursa Major, and spreading pale and hazy toward the zenith. The horizontal force fell suddenly with the development of this band. There was also a pale band in Lyra in the NW. At 5 a. m. there was a pale arch from Hercules to Serpens, and three or four bunches of streamers in Cygnus, Lyra, and Corona Borealis (brightness 0 to 1), and no motion. At 6 a. m. there was a quiet band from Pegasus, through Triangulum to Taurus, with no motion. This was almost hidden by haze at 6.20. After this the sky became covered with clouds, only clearing at intervals. Traces of aurora were observed at 9.17 and 10.17, at the latter observation giving indication of an extensive aurora behind the clouds. Traces were again visible at 11.20 through the clouds. At 12.15 p. m. the sky cleared, and was observed to be encircled by a broad band of white, quiet light. In a few minutes the sky from the NE. to SE. points became colored a bright rosy red, the color fading away towards the zenith. About the same time a large white curtain formed across the rest of the sky, remaining nearly motionless for several minutes, and then gradually disappeared, while the red color spread farther S., and bright rays shot up towards the zenith, forming a perfect corona, which continued about forty minutes. The streamers of the corona were white and motionless. When the red color first appeared the light was striated with the rays parallel to the magnetic meridian, and several stars were visible showing through the colored portion with undiminished brilliancy. At 1 a. m. traces of aurora were observed in Boötes. The magnetic were almost undisturbed up to 6 a. m., when a violent disturbance commenced, still going on at daylight.

November 18, 1882, 7 *a. m. to* 12.17 *p. m.*—The weather was stormy during most of the night, but the clouds thinned away from 7 a. m. to 12.30 p. m., permitting portions of the aurora to be seen. At 7 a. m., a band of streamers vibrating up and down, and also from E. to W. (brightness 1 to 2) was seen stretching from Orion through Aries to Pegasus, while another band without streamers ran from Orion through Perseus and Cassiopeia to Cygnus, moving slowly towards the SW. At 8 there was a faint arch (brightness 0 to 1) from Orion to Pegasus. Traces were seen through the clouds at 9.17 and at 10.17 in the E. and SE. At 12.17 there was a quiet white nebulous band (brightness 0 to 1) from the SE. to the N., reaching an altitude of about 40° above the horizon, in the S.

November 18 *and* 19, 1882, 9.15 *p. m. to* 9.17 *a. m.*—During most of the night the sky was covered by thin hazy stratus clouds, through occasional breaks of which traces of aurora were observed from time to time, beginning as early as 9.15 p. m. on the 18th. At 10.15 the sky was clear enough to display a waving band (brightness 1) from Coma Berenices in the NNW. through Canes Venatici, Ursa Major, Ursa Minor, Cassiopeia to Pegasus in the ESE. It was brightest in Ursa Major, where it was broken into streamers. At 11.15 an arch was observed through the haze, very dim and wide in places, broken into three parallel bands, with its extremities bearing NW. and SE. The next hour it was cloudy, but the clouds appeared luminous here and there. At 1 a. m. on the 19th there were traces of aurora through the clouds in the N., and at 3 a. m. traces of bands crossing the zenith from NW. to SE. were seen through the clouds. At 4 similar traces were seen in the NE., and at 8 and 9.17 a. m. in the S. and W., and at the last hour also at the zenith. There was considerable magnetic disturbance during the whole night.

November 19 *and* 20, 8 *p. m. to* 11.17 *a. m.*—Just before the 8 p. m. observation, the sky being clear and the twilight still bright, pale streaks of aurora were observed in the N., high up in the sky. No aurora was recorded at the 8 p. m. observation. The sky then clouded over and did not clear again until 1 a. m. on the 20th, when there was visible a band from near [ε] Ursæ Majoris in the NNW. across the zenith to Cassiopeia, with a corresponding band in the ESE. running up towards it but not meeting it, from Taurus through Aries and Andromeda (brightness 1). There were pale broken bands in the W. and an arch low in the NE. in Canis Minor and Leo. The SE. part of the band was gone at 2.17, the eastern aurora was paler, and there was an additional streak in Ursa Major. At 2 a. m. there were two broad streamers in Ophiuchus in the NNW., about 5° above the horizon (brightness 1); pale and shifting at 2.10 to 2.17. At 3 a. m. there was a pale band from the same point in the NNW. to Eridanus in the SE., passing close to β Cygni and through Pegasus. This developed rapidly into a band of curtains and streamers, forming an incomplete corona, which centered near α Cygni at 3.10. These streamers vibrated rapidly from E. to W. and from W. to E. The curtains were 2 to 3 in brightness, the streamers were 1, brightest in the NW.; and brightly colored yellow and green, succeeding one another in the order named, from the horizon up. At 3.17 there was a rosy glow in the NW. and a broad zone across the zenith, made up of writhing, twisting bands of streamers in exceedingly rapid motion, both rotating and shooting from N. to S. and the reverse. There were the usual green, yellow, and red colors, bright, and the brightness was 2 to 3, possibly 4 in places, though much dimmed by the bright moonlight. The magnetic disturbance which had hitherto affected only the horizontal force now extended to the declination, which fell over 6°. At the same time a semi-corona was formed from Ursa Major to Andromeda. At 4 there were streamers all around the horizon except in Andromeda (brightness 1 to 2), white, about 45° long and 10° or 15° above the horizon. The whole faded rapidly, having nearly disappeared at 4.17. The declination increased about 13°. At 5 a. m. there was another complete corona (brightness 1 to 2), centering in Camelopardalis, a few degrees SW. of the zenith. At 6 there were several yellowish-green arched bands with streamers from Gemini through Cepheus, Cassiopeia, Andromeda, and Lacerta to Cygnus, slightly vibrating. At 6.15 the whole had moved a few degrees southward (brightness 1 to 2). At 7 there were two faint arches (brightness 0 to 1), one from Taurus to Pegasus, and the other from Hercules to Boötes. At 8 there was a short, broad, yellowish-green band (brightness 1 to 2), from Monoceros to Taurus in the S., sending up motionless streamers. At 9.17 there was another perfect corona, with the rays brightest and most numerous in the SE., S., and SW., apparently motionless, and white (brightness 1 to 2). The corona still continued at 10.17 a. m., but its rays in the NE. no longer sprang from the horizon, but from a bright arch whose extremities were in the SE. and NW., and its crown about 40° northeast of the zenith. The rays vibrated slightly; traces of aurora were still to be seen through the clouds at 11.17 a. m., but after that the sky was completely covered. The magnetic disturbance continued during the night, though its maximum was reached between 3 and 9 a. m.

November 21, 1882, 4 *a. m. to* 12.30 *p. m.*—The early part of the night was cloudy, and when it cleared at 4 a. m. there was only a pale glow in the N. and NE., and two or three very faint arched streaks close to the southern horizon, which wholly faded away. The sky became clouded at 9, clearing partially at 11.17, when traces of aurora were visible for an instant only through the clouds, apparently without color or motion. At 12.17 a. m. a corona was observed (brightness 3 to 4) in the form of a circle all round the horizon, fringed with short rays, centering towards the zenith, but not reaching it, lasting only a few minutes. Its color was white, and the streamers vibrated slightly. At 12.30 another corona was observed in the form of an ellipse, with its longest diameter E. and N., with long streamers converging to the zenith, and fringed with streamers on the outer edge, colored bright rose, with interspaces of bright myrtle green (brightness 3 to 4). There was considerable rapid E. and W. vibration, and the display lasted only a few minutes. The magnetic needles were exceedingly quiet up to about 8 a. m., when a disturbance commenced, lasting till 10 p. m., especially affecting the horizontal force and declination, reaching its maximum at the time of the formation of the corona.

November 25, 2 *a. m. to* 12.17 *p. m.*—When the sky cleared at 2 a. m. there was observed a forked vertical band in the N. from near the horizon towards the zenith, starting at a point in Boötes, one branch running to the NE. through Ursa Major, the other up through Ursa Minor to the zenith (brightness 0 to 1). This had faded at 2.15, and a hazy arched band (brightness 1) ran from Hercules high in the NW. through β Cygni and the square of Pegasus, disappearing in the moonlight in the S. At 3 a. m. there were traces of aurora in the NE., which at 3.15 had developed into an arched band (brightness 2) with faint tinges of red and yellow from a point in Monoceros close to the horizon in the ESE. through Leo to a point in Boötes near the N. horizon. At 4.10 there was an arched band (brightness 1), curved into an ellipse in the NE. some 10° or 15° above the horizon, in Canis Minor, Cancer, Leo Minor, and Canes Venatici. This had nearly faded at 4.15, and none was observed at 5 a. m. At 6 an arch crossed the southern horizon from SE. to SW. with streamers on the SE. half, running from Canis Minor, through Orion and Taurus, to Andromeda. The streamers crossed rapidly from W. to E., with play of colors, yellow, green, and red (brightness about 2). At 7 a. m. there was a band (brightness 1 to 2) from Cygnus through Corona Borealis to Boötes, but at 7.15 there was only a faint small arch in Ursa Major. At 8 there were merely faint traces over the NE. horizon, and no more was observed till 12.17 p. m., when there was a corona of long, slender white streamers, a few of them brighter than the rest, stretching about 30° above the horizon (brightness 0 to 1). The whole aurora was much dimmed by the exceedingly brilliant moonlight. The magnetic needles were almost undisturbed up to 7 a. m., when a disturbance, chiefly affecting the intensity with decrease of horizontal and increase of vertical force, commenced, lasting till 3 p. m.

November 26, 12.30 *a. m. to* 4 *a. m.*—Preliminary evanescent streamers were noticed in Ursa Major high in the NNE. at 8.45 p. m. (3.30 local); but no more aurora was seen till at the 1 a. m. observation, when pale streaks were observed in the N., developing at 1.15 into a pale zone of the ordinary type, white and quiet (brightness 0 to 1), across the zenith, converging at points in Boötes in the NNW. and Cetus in the SE. close to the horizon. There were three main bands in the zone, one through Ursa Major and Auriga, one through Ursa Minor, and one through Cassiopeia and Andromeda. At 2 a. m. the western band alone of this zone still remained, and there were besides three or four arched bands of short bright streamers in the NE. in Canis Minor, Cancer, Leo, and Coma Berenices, with considerable vibration from N. to S. (brightness 2 to 3), tinged with green, yellow, and red, while pale streaks and streamers near the zenith moved rather rapidly, tending to form an imperfect corona. At 2.10 the eastern aurora had subsided into pale bands, and one serpentine streak (0 to 1) ran from Ursa Major through Polaris to the square of Pegasus approximately parallel to the magnetic meridian. There was considerable magnetic disturbance with increase of the horizontal force and slight diminution of the other two elements. The aurora had mostly faded at 2.15. At 3 a. m. there was a pale band in the place of the eastern aurora described at 2 o'clock. At 3.15 to 17 there was an arched band with a reversed curve at the SE. end from Canis Minor through Gemini into Ursa Major, gradually breaking into streamers at the northern end. The magnetic needles were comparatively quiet. At 4 a. m. the sky was overspread with polar bands of cloud, which allowed only indistinct traces of aurora to be seen, and during the rest of the night similar clouds prevented the observation of aurora. The aurora was much dimmed by the moonlight.

November 27, 1882, 3 *a.m. to* 4.10 *a. m.*—At 3 a. m. part of the pale, narrow, quiet band was observed through the thin clouds in the NE. at right angles to the magnetic meridian. At 4 a. m. there was a broad hazy band (0 to 1) from the NW. to SE., visible only from Cygnus through Cassiopeia, and had moved 20° eastward at 4.10, leaving only traces through the clouds at 4.15. At 5 a. m. a pale yellowish band (0 to 1), motionless, ran from Leo through Ursa Major to Draco. At 6 there was a pale motionless arch from Cygnus through Andromeda to Perseus, and a patch in Auriga (brightness 0 to 1). Clouds prevented further observation. The magnetic needles were comparatively quiet most of the night. There was a slight disturbance at 3.05, the horizontal force rising and then falling below the normal, and another at 10.12, the horizontal force falling slightly.

November 27 *and* 28, 1882, 9.15 *p. m. to* 1.15 *p. m.*—At 9.15 p. m. on the 27th there were faint horizontal streaks through Taurus, Gemini, and Leo in the NE. No more aurora was observed, the sky being partly obscured by streaks of cloud, until 1 a. m., when the sky was clear, and streaks were noticed in the N. and E., which developed at 1.15 into a broad hazy twisted band (brightness 1) from a point in Boötes below Arcturus close to the horizon NNW. through Draco, Ursa Minor, Perseus, and the Pleiades, ending in the lower part of Taurus close to the horizon ESE. From 2 to 2.15 a. m. there was a rather broad zone of the usual type (brightness 2) from a point in Serpens close to the horizon NNW., to a similar point in Orion ESE., occupying Lyra, Cygnus, Andromeda, Cassiopeia, Aries, and Taurus. At 4 a. m. the zone was rather lower, occupying Aquila and the square of Pegasus, and much brighter (3) with motion beginning to develop at the ESE. end. It rose rapidly, being at 3.10 at the position of the 2 o'clock aurora, with very rapid waving and gyratory motion (brightness 2 to 3). At 3.15 it crossed the zenith, reaching east to Ursa Major and Gemini, much paler (1 to 2) and quieter. There was a large magnetic disturbance, chiefly affecting the horizontal force, which fell very low. At 4 a. m. only traces of aurora were visible. At 5 a. m. there was a band (brightness 2) from Lyra to Ursa Major across the NE., and at 6 a. m. a broad band ran from Pegasus through Cygnus, Cepheus, and Ursa Major to Leo. Another band of the same color and brightness (1 to 2) from Andromeda through Cassiopeia and Auriga to Gemini, both having a rapid lengthwise motion from W. to E., resembling steam or smoke driven by a brisk wind. From 7 a. m. to 1.15 p. m. there were merely traces of aurora visible, though the sky was clear. The traces a 1.15 were low in the SSE. and developed into a pale streak across the zenith, fading at dawn.

November 28 *and* 29, 1882, 10 *p. m. to* 10.15 *a. m.*—The whole night was clear. At 10.15 an arch was observed in the northeast with an altitude of about 25°, its extremities being NNW. to E. by S. The color was a faint yellow (brightness 1). At 11.15 the arch was in a similar position, but somewhat higher. At 12.15 it was still in the same position, but had developed streamers at the NNW. end reaching to Ursa Major. No aurora was visible at 1 a. m., but at 1.10 to 2.15 there was a narrow arched band (brightness 1) from a point in Boötes near the horizon N. through Leo Minor, ending in Gemini below Castor and Pollux, at an altitude of about 25°. From this time to 5 a. m. there was no aurora, but at 5 a band (brightness 0 to 1) crossed the zenith from NNW. to S., from Vulpecula through Cygnus, Cassiopeia, Cepheus, and Camelopardalis, ending in Auriga and Lynx. At 6 the arch was yellow and made of streamers, waving from E. to W., and varying slightly in brightness (1 to 2). Faint traces only were visible at 7 a. m. from Hercules to Boötes. At 8 a. m. there was a motionless band from Pegasus through Taurus and Orion to Canis Minor. Traces only, soon disappearing, were visible at 10.10 a. m., and no more aurora was seen. The magnetic needles were comparatively undisturbed all night.

November 30, 1882, 12.15 *a. m. to* 11.30 *a. m.*—The whole night was clear. About midnight, Washington time (between 7.30 and 7.40 p. m. local), there was a low arch in the NE. (brightness 1 to 2) from Taurus, where it was very faint through Gemini, Leo Minor, where it was brightest, and Coma Berenices, sending up faint streamers in the last two constellations. At 1 to 1.15 a. m. there was a broad twisted band, white and quiet (brightness 2 to 3), from a point in Taurus near the horizon in the ESE. across the zenith, through Andromeda, Cassiopeia, Cepheus, and Draco, to a point in Boötes, close to the horizon in the NNW. At 2 a. m the aurora was unchanged in bearing, altitude, and brightness, but started from Orion in the ESE., and was split in two parts, one on each side of Polaris, while from the southeast end a band was beginning to shoot up towards the northeast. This had developed into an arched band through Gemini and Ursa Major, at an altitude of about 40°, reaching Boötes in the N., while the western bands had almost faded out. At 2.15 these bands had developed into a zone of the ordinary type from the same points of the horizon, reaching W. to Cygnus and Lyra and E. below Gemini. The eastern bands were the brightest (2 to 3), and in the ESE. showed a faint yellow and rose tinge. At 3 a. m. the zone was mostly reduced to a broad band, brightest in the lower edge (2 to 3), along the SW. horizon, with an altitude of about 25° at its highest point, running from Orion's belt below the square of Pegasus to a point in Serpens in the NW. This continued at 3.15, and in addition a zone of paler bands (1 to 2) covered most of the sky as far E. as Ursa Major and Gemini. The southeast base of the zone was very broad, some 20° of the azimuth. 4 a. m. found the aurora in essentially the same position, but much paler (0 to 1), and it was still more faded and broken at 4.15. At 5 a. m. there were two bright (2 to 3) yellowish bands from Pegasus in the NW., one through Cygnus, Cassiopeia, and Gemini to Canis Minor in the S. across the zenith; the other through Taurus to Orion in the SW., but showing rapid motion from NW. to S. At 6 there was a quiet, greenish band (brightness 1) from Pegasus, through Pisces, to Orion. Traces only were visible at 7 a. m., but at 7.15 a brilliant corona (2 to 3) formed, with its center a little N. of the zenith. The streamers were bright yellow, and moved round the center, vibrating from W. to E. and from E. to W., keeping the same relative position. Other bands and streamers moved in almost every direction. Traces of this corona were still visible at 8, and continued to be seen up to about 11.30, last appearing as faint streamers in the E., ESE., and W. The magnetic needles were comparatively undisturbed all night.

November 30 *and December* 1, 1882, 9.15 *p. m. to* 10.30 *a. m.*—The aurora began as a few vertical streaks in the ESE. in Aries and Perseus, and developed into a regular arch of streamers (1), crossing through Gemini and Ursa Major into Boötes in the NNW. This had faded at 10.10, and the aurora was the same as at the beginning, with a few additional streaks in Lynx and Auriga. At 11.15 there were traces only of aurora in the S. near the horizon. At 12.10 a bright band crossed the zenith from α Tauri to Hercules, slightly tinged with yellow, and vibrating. At 1.15 a narrow, twisted streak crossed the zenith from ESE., close to the horizon, to the NNW., through Orion, Auriga, Camelopardalis, Ursa Minor, Draco, and Corona Borealis (brightness 1 to 2). From Orion it was broken up into streamers. There was also a pale, hazy, perfectly quiet and regular arch in the SW., reaching an altitude of about 25°. At 2.15 traces only were visible in Orion, and 3.15 traces of bands crossing the zenith from NW. to SE. were seen. At 6.15 two pale white bands (brightness 1) extended from ESE. to WNW., the larger from Gemini, through Auriga and Lacerta, to Cygnus, about 12° or 15° south of the zenith, the second being somewhat shorter and about 10° below the first. At 7.15 several yellowish bands (brightness 2 to 3), vibrating rapidly from W. to E., extended from Andromeda, through Cassiopeia, Camelopardalis, and Ursa Major to Leo and Coma Berenices. The whole drifted slowly southward. At 8.17 a broad, irregular band of white, quiet light extended from Leo Minor, through Ursa Major and Draco, to Cygnus (brightness 2). At 9.15 two bands (brightness 0 to 1) extended from Aries, through Gemini, to Canis Minor and Cancer, and only faint traces were visible at 10.17. There was a slight magnetic disturbance from 7 to 10 a. m., but otherwise the needles were remarkably quiet.

December 1 *and* 2, 1882, 9.15 *p. m. to* 10.17 *a. m.*—At 9.15 p. m. there was a faint patch of light in Aries in the ESE. After this preliminary flash no more aurora was seen till 12.15 a. m., when there were very faint streamers in Coma Berenices and Canes Venatici, and a broad, low, hazy arch from Coma Berenices, through Boötes, Hercules, Aquila, and Delphinus, to Pegasus. The dark segment was quite strongly marked below the arch. From 1 to 1.15 there were faint horizontal bands low in the NE. from Orion through Canis Minor and Leo, and a very evanescent band from α Boötis to the tail of Ursa Major, and at 1.15 a very faint band across the zenith from Lyra to Taurus (brightness 0 to 1). At 2 to 2.15 the aurora was essentially the same, with the addition of some well-defined streamers (0 to 1) in Leo and Leo Minor. There were also very faint traces crossing the zenith. At 3 a. m. there were very faint traces of a band from Cygnus across Pegasus in the western sky and traces in the east and south. At 3.10 there was a patch of streamers (1) in Coma Berenices and Boötes in the NNE., one reaching up to Ursa Minor. These had faded to traces at 3.15. At 4 a. m. there was a bright (2) yellowish band crossing up through Canes Venatici in the NE., then across through Ursa Major to Lyra near α Lyræ, and a corona of streamers (brightness 1) reaching down about 40° from the zenith, incomplete from Ursa Major and brightest in the NNW. Only this portion remained at 4.10, and the band in the north was reduced in size and brightness. The whole was fading to traces at 4.15. At 5 a. m. there were merely faint traces over the horizon from W. to S. At 6 a. m. a yellowish-green quiet band (brightness 1) extended from Andromeda through Aries and Gemini to Canis Minor. At 7 a yellowish band (brightness 1 to 2) with streamers vibrating slowly from E. to W. stretched from Pisces through Taurus and Orion to Canis Major. At 8 an arch (brightness 1 to 2) ran from Cygnus through Cassiopeia and Auriga to Cancer, moving slowly towards the zenith. At 9.17 there was a broad, white, quiet band (brightness 0 to 1) from Coma Berenices through Lynx and Auriga to the Pleiades, and at 10.17 there was a broad, irregular, striated band, white and quiet (brightness 1), from Corona Borealis through Ursa Major to Taurus. The magnetic needles were unusually quiet all night, being slightly disturbed about 11 a. m.

December 3, 1882, 4 *a. m. to* 12.30 *p. m.*—The first traces of aurora were seen at 4 a. m. shining through the fog, in the form of the upper portion of a pale, regular, quiet arch in the SW., reaching an altitude of about 45°, and an arched streak in the NE. at an altitude of about 60°. The sky gradually became much clearer, and at 5 a. m. a yellowish-green band extended from Andromeda through Aries and the Pleiades to Canis Minor (brightness 1). At 6 a. m. there was a broad, yellowish, quiet band (brightness 1 to 2) across the zenith from Pegasus through Andromeda, Auriga, Cassiopeia, and Camelopardalis to Leo. At 7 the aurora had the same position and character as at 5. At 8 a. m. an arch (brightness 1) extended from Boötes through Draco and Cygnus to Pegasus. At 9.17 there were two white and quiet bands (brightness 0 to 1) started together from Boötes in the SE. and met in Taurus in the W., one running about 30° above the southern horizon and the other crossing the zenith. At 10.10 the lower band had disappeared, but the one across the zenith remained unchanged, while another band appeared extending from the Pleiades to Perseus, Cassiopeia, and Cepheus to near Hercules. At 11.17 there was a white, quiet band (brightness 0 to 1) from the SE. to NW. through the Pleiades and Coma Berenices and close to Ursa Major. Only faint traces were visible at 12.17 p. m., and these had wholly disappeared at 1 p. m. The magnetic needles were unusually quiet, only showing signs of disturbance at 9 a. m. and 12 and 1 p. m.

December 3 and 4, 1882, 9.15 *p. m. to* 1.15 *p. m.*—At 9.15 p. m. the aurora commenced as pale lines of light in NE. through Gemini and Taurus, with faint streamers in Lynx. At 10.15 there was a quiet arched band (brightness 0 to 1) through Taurus, Gemini, Leo Minor, and Coma Berenices, with streamers in Leo Minor and Ursa Major. It was brightest in Leo Minor and very faint in Gemini. For several hours the bearing of the aurora was unchanged, but it appeared in different constellations as they rose. At 11.15 there were no streamers. At 12.15 the arch passed through Orion, Gemini, Leo, Leo Minor, Coma Berenices, with streamers in Coma and Ursa Major (brightness 1). At 1 a. m. there were merely traces along the eastern sky from the E. to ESE., but these soon developed into an arch of pale streamers (brightness 0 to 1) from Orion's belt in the ESE. through Canis Minor, Cancer, and Leo, ending close to α Boötis, here sending off long streamers towards the zenith. From 2 to 2.15 a. m. there were two principal arched bands, the upper sending off short streamers, starting from a point in Monoceros close to the horizon in the ESE. and meeting at a point in Serpens similarly close to the horizon in the NNW. (brightness 1 to 2), through Gemini, Lynx, Ursa Major, and Canes Venatici, rising slowly and sending off pale narrow bands from the northern end, which gradually stretched up towards the zenith. At 3 a. m. streaks and curved bands, varying in brightness from 1 to 3, covered most of the sky. The starting points were in Serpens in the NNW. and Monoceros in the ESE. It was brightest in Cygnus and Pegasus, when it formed an irregular ellipse, with its longest diameter N. and S., with considerable whirling motion, and across through Canis Minor, Leo, Leo Minor, Canes Venatici, Ursa Major, and Hercules, where it was a band of streamers vibrating rapidly from N. to S. The brightest part was slightly tinged with greenish-yellow and rose. At 3.10 it was broken and paler and the eastern band had split into three, and was fading at 3.15, still brightest in the NE. At 4 a. m. there was a faint, low, quiet, and regular arch in the SW. from the NW. to S., reaching an altitude of about 15°, and bright, curling, wreathing bands (2 to 3), which in 10 minutes spread over most of the sky, coming up from a point in Serpens near the horizon in the NW., one main branch crossing the zenith and spreading out to Ursa Major and Gemini; another through Pegasus. There were also bright disconnected whorls in the NE. The main band moved slowly with a waving motion to the west. At 4.15 it was more spread out and not so bright. At 5 there was a bright corona, yellowish in color (brightness 3 to 4), centering a little south of the zenith. The northern streamers of the corona vibrated rapidly in every direction. The corona had disappeared at 5.20, leaving the sky covered with faint luminous bands resembling stratus clouds. There was a magnetic disturbance. At 6 a. m. there were two motionless arches (brightness 1), one through Taurus and Orion to Canis Minor and the other from Sagitta to Boötes. At 7 there were only faint traces of bands. At 8 a band (brightness 0 to 1) extended from Cygnus through Draco, Ursa Minor, Ursa Major, and Cassiopeia to Leo Minor and Gemini. At 9 there were merely a few traces over the southern horizon. No aurora was seen at 10, but at 11 a. m. there were two yellowish-green arches (brightness 1), one through Orion and Canis Minor to Leo, and the second from Taurus across the zenith to Coma Berenices. At 12 m. there were only traces of aurora, and at 1.15 p. m. the last of the aurora appeared as a narrow band (brightness 2) extending from Cassiopeia through Perseus to Gemini. The needles were considerably agitated at 3 and 4 a. m., much disturbed at 5 a. m., the horizontal force being too small to register, and again at 12 m. The other two elements were but little affected.

December 4 *and* 5, 1882, 9.45 *p. m. to* 1.15 *p. m.*—A very evanescent streak appeared in Auriga about 9.45 p. m. After this there was a pale glow around the horizon, beginning to take the form of horizontal bands in the S. and SW. at 1 a. m. At 2 a. m. there was a belt of two or three streaks, white and quiet (brightness 0 to 1), from a point in Monoceros in the ESE. to one in Boötes in the NNW. through Gemini and Ursa Major. At 2.15 the belt was slightly higher, brighter, and more homogeneous. It was brightest in the NNW. At 3 a. m. there was a broad zone of the usual type, but very pale (brightness 0 to 1), with its stationary points in Monoceros in the ESE. just below Procyon and in Serpens in the NNW. The eastern edge passed through Canis Minor, Cancer, Leo Minor, Canes Venatici, and Boötes, the western through Canis Minor, Gemini, Auriga, Camelopardalis, the upper part of Cassiopeia, Cygnus and Lyra, Draco and Hercules. It was somewhat broken and pale at 3.15. At 4 the zone was reduced to two very pale (0 to 1) bands starting together from a point in Hydra close to the ESE. horizon, one crossing about 20° E. of the zenith, and the other through Orion to near the horizon in the SW. At 5 there were merely traces around the horizon. At 6 a pale yellowish-green band (brightness 0 to 1) stretched through Andromeda, Perseus, and Auriga to Canis Minor. At 7 there were two similar arches one above the other from Pegasus through Pisces, Taurus, and Orion to Monoceros. At 8 a. m. a bright band (1 to 2) with streamers waving slowly from W. to E. extended from Pegasus through Cygnus, Lyra, and Hercules to Boötes. At 9 there were merely traces in Cygnus, Lyra, and Hercules. No more aurora was seen till 1 p. m., when there was an arched band (brightness 1) from Andromeda through Lacerta and Cygnus to Lyra. This had faded to traces at 1.15. The magnetic needles were comparatively undisturbed, though up to 5 a. m. the horizontal force was rather greater than usual.

December 5 *and* 6, 1882, 12.55 *p. m. to* 8 *a. m.*—At 11.55 p. m. five pale streamers were seen in Coma Berenices and Canes Venatici in the NNE. These were seen again in the same position at 1 a. m. but very much paler. At 1.15 there were two faint arched bands (brightness 0 to 1) in the E., one from Orion to Gemini, the other from Canis Minor through Cancer. From 2 to 2.15 there were two hazy and quiet bands (brightness 1) stretching from a point in Monoceros low in the ESE. to one in Serpens in the NNW. through Gemini and Ursa Major. The upper band was the broader, and the light was brightest in the ESE. At 3 a. m. there was a broad, pale (0 to 1) zone of the ordinary type with its starting point in the ESE. and NNW. in Monoceros and Hercules, below α Lyrae, about 10° or 15° above the horizon, crossing the zenith and extending west to Cassiopeia, Cygnus, and Lyra. It was brightest in ESE., where it also sent off a broad band (brightness 2) through Leo, Leo Minor, and Canes Venatici to Corona Borealis in the N. This band was paler and somewhat broken at 3.15. At 4.15 the aurora was unchanged in character but had spread westward to the Pleiades and the square of Pegasus, with a slow drifting movement to the west. At 5 a. m. there were two arches (brightness 1), without motion, one from Cygnus through Cassiopeia and Gemina, and the other from Lyra through Ursa Major to Leo Minor. At 6 there was a pale (0 to 1) yellowish-green arch in the SW. from Andromeda through Aries and Taurus to Canis Minor. At 7 a. m. the aurora was brighter (1 to 2), and formed an arch, with streamers vibrating slowly, extending from Hercules through Corona Borealis and Boötes to Coma Berenices. There was another pale, motionless arch close to the horizon from the SW. to SSE. The weather was hazy at 8 a. m. but traces of aurora were still visible. After this the sky became overcast, preventing further observation. The magnetic needles were unusually quiet, though the horizontal force was rather higher than usual.

December 7, 1882, 3 *a. m. to* 1.30 *p. m.*—Though the sky was partially clear at 3 a. m. no aurora was visible except a pale glow along the southern horizon. At 5 a. m. a pale yellowish band crossed from Cygnus through Draco to Canes Venatici, motionless (brightness 0 to 1). Clouds prevented the 6 a. m. observation. At 7 a. m. there was another extensive aurora crossing the zenith. The western and southern limits ran from Pegasus through Auriga and Gemini to Leo, the eastern and northern from Ursa Major through Draco and Cepheus and Lacerta. It was a belt of arches without streamers, varying slightly in brightness (1 to 2). No motion was noticed, but at 7.15 a. m. the position was a little changed. At 8 two yellowish-green bands, motionless, and brightness 1 to 2, extended from Taurus through Orion to Canis Minor and Monoceros. At 9.17 there was a broad, quiet, white arch of diffused light from the SE. to NNW., having at the crown an altitude of 25° or 30°. At the same time a large portion of the sky northeast of the zenith was filled with bands which united with the first in the SE. and NNW. (brightness 0 to 1). At 10.17 nothing remained but traces of the arch in the southwest. At 11.17 the southern horizon was mottled with faint, white spots, and at the same time a band of white, quiet light (brightness 0 to 1) passed from the NW. horizon through the Pleiades and Gemini a short distance southeast of Ursa Major. At 12.10 p. m. there was an extensive aurora of parallel bands, white and quiescent, running ESE. and NNW., and extending from the southern horizon to a point about 15° north of Cassiopeia. The aurora was unchanged at 1 p. m. but had faded to traces at 1.15. The magnetic needles were somewhat disturbed from 11 a. m. to 1. p. m., the horizontal force being diminished and the declination and vertical force increased.

December 8, 1882, 3 *a. m. to* 10.15 *a. m.*—There was a faint glow along the horizon as the twilight faded, and at 3 a. m. there appeared faint traces of streamers in the ESE. below Procyon. At 4 a. m. there was a somewhat sinuous white and quiet band (brightness 1) from a point in Hydra low in the ESE. up through Cancer, Leo Minor, Ursa Major, and Draco, ending near *α* Lyrae in the NW. At 4.15 it was brighter (2) in the ESE., more sinuous, and spreading a little, with an additional pale band reaching to *β* Cygni. At 5 a. m. a motionless band (brightness 1) extended from Pegasus in the NW. through Aries, Taurus, and Orion to Canis Minor in the SE. This band was in the same position at 6 a. m. but brighter (1 to 2). At 7 a. m. bright bands (1 to 2) extended from Vulpecula to the zenith and N. and E. of the zenith through Cygnus, Lyra, Draco, Hercules, Boötes, and Ursa Major to Leo. No motion was noticed. At 8 a. m. a pale band (0 to 1) stretched from Andromeda through Perseus, Auriga, and Gemini to Cancer. At 9.15 a. m. a broad, bright (1 to 2) band, white and quiet extended from Canes Venatici through Ursa Major and Cassiopeia to Andromeda. At 10.15 traces only were visible and no more was observed. The magnetic needles showed no signs of disturbance.

December 8 *and* 9, 1882, 10.45 *p. m. to* 2 *p. m.*—At 10.45 p. m. there was a faint (0 to 1) but definite arch of streamers low in the NE. in Gemini and Cancer. Nothing but a pale glow on the horizon was seen until 12.15 a. m., when there were bright streamers in Canes Venatici and Coma Berenices, and three wavy bands, one through Taurus, the Pleiades, Perseus, Ursa Major, and Boötes, the second through Taurus, Auriga, Ursa Major, and Boötes, and the third through Taurus, Orion, Gemini, Leo Minor, and Coma Berenices. These bands were all pale except in Boötes, where they reached a brightness of 2. At 1 a. m. there was a broad zone crossing a little SE. of the zenith, with its starting points in Serpens in the NW. and Monoceros in the ESE., the eastern edge passing through Cassiopeia and the western through Cygnus and the square of Pegasus, with considerable motion on the eastern edge. At 1.15 the whole of the sky from Pegasus in the SW. to Gemini in the NE. was covered with serpentine bands and streamers, one starting from Cygnus in the NW. and running towards the SE. through Cassiopeia to the Hyades, where it turned on itself and ran along the NE. sky through Auriga and Ursa Major, here blending into a bright mass of curtains and whorls in the N. There was considerable motion, both twisting and vibratory, the whole moving westward rapidly. There were faint colors and a brightness of 2 to 3. The declination fell about a degree and a half. At 2 a. m. the western portion was nearly gone, and the eastern formed three or four bands from Serpens through Ursa Major and Canes Venatici to Gemini and Cancer, where they curled round into curtains (brightness 2). There was a magnetic disturbance specially marked by a high horizontal force. At 3 a. m. nothing was left except faint traces of a band from the same starting points across the zenith through Cassiopeia. The magnetic needles were nearly back to their normal position. At 4 a. m. these traces appeared as at the last observation, and had nearly disappeared at 4.15, while a patch of aurora was beginning to develop in the lower part of Leo, low in the NE. At 5 a. m. there were merely traces in the N. At 6 several yellowish-green bands extended from Pegasus through Triangulum, Aries, Taurus, Orion, Auriga, Gemini, and Canis Minor to Cancer, with some quiet streamers in Cancer (brightness 1). At 7 a. m. a zone of yellowish-white bands crossed the zenith through Cygnus, Cassiopeia, Perseus, Camelopardalis, and Lynx to Leo, with a rapid waving motion (brightness 1 to 2). At 8 a. m. there was a faint (0 to 1) motionless band through Hercules, Lyra, and Draco to Boötes and Coma Berenices. At 10.10 and 12.10 p. m. there were faint traces only visible. At 1.10 p. m. a band (brightness 1) extended from Leo Minor through Ursa Major and Ursa Minor to Cepheus, and faint streaks ran from Gemini towards Ursa Major. Patches of aurora were also visible through breaks in the clouds in the N. At 2 p. m. there were still traces in Auriga and Gemini. There was another magnetic disturbance between 11 a. m. and 2 p. m., the horizontal force falling low.

December 9 *and* 10, 9 *p. m. to* 11.10 *a. m.*—At 9 p. m. the aurora began as a faint band in the E. in Taurus, Gemini and Lyra. At 10.15 there was an arch from Taurus through Orion, Gemini, Cancer, Lynx and Leo Minor to Coma Berenices. It was very faint, except in Taurus, Coma Berenices and Leo Minor, and in the latter constellation was broken into streamers, brightness 1. At 11.15 there was merely a faint arched streak through Cancer, Gemini and Lynx. At 12.15 a. m. the faint arch was in nearly the same position, but extended through Orion, Cancer, Leo Minor and Coma Berenices. There were also two stationary streamers (brightness 1) in Coma Berenices and Canes Venatici. At 1 a. m. the pale arch (brightness 1) extended from Orion's belt in the S.E. up through the lower part of Gemini, Leo Minor, Lynx, Canes Venatici and Boötes, ending below Boötes in the N. It was much paler at 1.15. At 2 a. m. there was in the E. a belt of two or three pale bands, the third and lowest very indistinct, starting from a point in Monoceros in the ESE. near, but not on, the horizon, through Gemini, Lynx and Ursa Major to Boötes in the N. (brightness 1). At 2.15 it was condensed to a single band (brightness 2), the lower end passing through Canis Minor, Leo Minor and Canes Venatici to Boötes. It was brighter in the ESE. From 3 to 3.15 there was an arched, slightly sinuous, band from a point in Hydra low in the ESE. through Leo, Coma Berenices and Boötes to a point in Hercules in the NNW. where it sent up a pale streamer into Draco. It was somewhat convoluted in the ESE. (brightness 1). At 4 to 4.15 an arched band (1) starting low in Leo in the E. ran through Coma Berenices and faded out high in Boötes in the NNE. It was fading slowly, and there were also traces in the S. At 5 two short bands (brightness 0 to 1) extended from Pisces through Triangulum to Perseus, and the other from Pegasus through Cygnus and Lyra. At 6 there were merely traces on the southern sky, but at 7 a band of streamers (brightness 2 to 3) in rapid motion from W. to E., and changing color from yellow to green and red, extended across the western sky through Pisces, Andromeda, Perseus, Auriga, Taurus and Orion to Canis Minor. At 8 there was a quiet yellowish arch from Pegasus through Cygnus and Draco to Boötes high in the NE.; 9.10 a. m. showed a broad, low, quiet, white arch on the southern horizon from the SSE. to WNW., with a segment of an arch in the north and a quiet corona of faint white streaks at zenith. The arch in the S. was still visible at 10.10, but the aurora had faded to mere traces at 11.10. The magnetic needles were comparatively quiet all night, though both horizontal and vertical intensity read somewhat higher than usual.

December 11, 1882, 2 *a. m. to* 2.10 *p. m.*—At 2 a. m. a broad band (brightness 2) showed across the zenith from NW. to SE., while the clouds were still so thick as to allow but one or two stars to be seen. This was wholly gone at 2.15, but there were traces of a similar band at 3, which was much brighter and better defined at 3.15. At 4.15 broad, bright, shifting, and sinuous streaks in rapid motion across the zenith. This must have been a very brilliant aurora, as it showed brightly through the clouds and was accompanied by a large magnetic disturbance, with decreased intensity and increased declination. After 8 a. m. the sky cleared, but only traces were observed (at 10.10 a. m.) until 1 p. m., when there was a pale (0 to 1) zone of five distinct bands running NW. and SE.; two of them from Gemini to Boötes, one through Leo Minor, and the other through Ursa Major, two from Auriga to Corona Borealis, one through Ursa Minor, and the other through Cassiopeia and Cepheus, and the fifth from Perseus to Hercules through Andromeda and Lacerta. The middle band was the brightest. At 2 a. m. there were faint traces at the zenith, which were wholly gone at 2.12. Besides the disturbance already mentioned there was a lesser one just before and during the zone aurora last noted.

December 11 *and* 12, 1882, 9.15 *p. m. to* 1 *p. m.*—At 9.15 p. m. an arch surmounted by streamers extended from Cetus through Taurus, Auriga, Gemini, Cancer, Lynx, and Leo Minor. It was very faint, except in Taurus, where the streamers reached a brightness of 2, with the light constantly varying in brilliancy. At 10.15 a similar arch extended through Taurus, Orion, Gemini, Cancer, Leo Minor, Leo, and Coma Berenices to Boötes, with a brightness of 1, except at the ends, where it was 2. There were also faint bands extending, one through Boötes, Draco, Cepheus, Cassiopeia, Andromeda, and Pisces, and the other through Corona Borealis, Lyra, Cygnus, Pegasus, and Pisces with a large mass of luminous haze in the SW., extending from Boötes to Aquila. There was little or no motion. At 11.15 there was an arch through Orion, Gemini, Leo Minor, and Coma Berenices (brightness 1), with streamers in Coma Berenices and Canes Venatici. At 12.15 there was a similar arch through Orion, Gemini, Lynx, Ursa Major, Canes Venatici, and Boötes, and a streak in the N. shooting up from Boötes through Corona Borealis and Draco to Cepheus. At 1 a. m. a sinuous band (brightness 2), starting from the lower part of Orion in the ESE., extended through Gemini, Ursa Major, Canes Venatici to a point low in Boötes in the NNW., with a band below it not quite so bright going only half way to the west, and a still more indistinct third band. The middle band was the brightest at 1.15, and what had been mere traces of bands starting from the same point and crossing west of the zenith had developed a brightness 1. At 2.15 the band (brightness 1 to 2) now started in Monoceros in the ESE., and passed through Canis Minor, Cancer, Leo Minor, and Canes Venatici to Boötes, with the western band very faint, and brightest in the NNW. At 3 a. m. most of the sky was covered with luminous haze somewhat segregated into bands from the NNW. to ESE., one brighter than the rest (nearly 1) from Hercules across the zenith, one from Hercules to Orion through Lyra, Draco, Cepheus, Camelopardalis and Auriga. The eastern bands of the last observation had paled to 1, and the whole was fading at 3.15. At 4 there were several faint bands, the most distinct (brightness 1) in NNW. from Hercules in the NNW. up through Lyra, Draco, Ursa Major, and Leo Minor to Leo in the ESE. This had moved west about 15° and had faded to a trace at 4.15, and the only distinct band (0 to 1) was in the south from Monoceros to Orion's belt. At 5 a. m. several bright (2 to 3) yellowish green bands moving slowly, one band composed of streamers vibrating rapidly from W. to E. extended from Pisces through Cetus, Aries, Taurus, Orion, Gemini, and Canis Minor to Cancer. At 6 a. m. there were several patches of faint streamers (0 to 1) in the E. and N. At 7 a. m. quiet bands (brightness 1) ran from Cygnus through Andromeda, Cassiopeia, Auriga, and Gemini to Leo and Cancer. At 8 a. m. a quiet band (brightness 1) extended through Cygnus, Draco, and Böotes to Leo. At 9.10 a. m. a faint white quiet band lay along the horizon from the NE. to the W., and from NE. to NW. a (0 to 1) quiet band at an altitude of about 25°. The band on the horizon continued at 10, but had faded somewhat, and there were traces of (0 to 1) aurora in the NNWW. and NNE. The aurora was the same at 11.10 with the addition of faint patches in the NE. and ENE. At 12.17 the entire southern half of the sky was covered by broad parallel bands running from the NE. to SW., with a broad band on the northern side at an altitude of about 48°. The magnets were considerably disturbed. At 1 p. m. pale bands running from ESE. to WNW. covered the sky from Leo Minor to Andromeda, but at 1.12 there were only traces in the SE. and faint traces of several bands through the zenith and Ursa Major. Apart from the disturbance above mentioned the needles were very quiet, though early in the evening the horizontal force was rather high.

December 12 *and* 13, 1882, 11.15 *a. m. to* 1 *p. m.*—At 11.15 p. m. there was a faint flush in the NE. in Cancer and Gemini, but the sky soon became overcast and did not clear again till 6 a. m., when there was a broad, faint (0 to 1), motionless band from Perseus through Auriga, Camelopardalis and Ursa Major to Leo Minor and Coma Berenices. At 7 a faint (0 to 1) band ran from Auriga through Cassiopeia, Cepheus, Cygnus, and Corona Borealis to Boötes. Clouds interfered greatly with the observation of the rest of the aurora, though traces were observed through the haze and clouds at 8, 9, 10, and 10.10 a. m. At 1 p. m. patches of pale white light were seen through breaks in the clouds near the southern horizon and at the zenith. The magnets were comparatively quiet, though the horizontal force was high early in the evening and lower toward midnight.

December 14, 1882, 2 *a. m. to* 12.10 *p. m.*—Beginning with the darkness there was more or less pale glow along the NE. horizon, but no definite aurora till 2 a. m., when there was an arched band (1) from α Canis Minoris through Cancer to Leo Minor, where it disappeared in the clouds. This was much fainter at 2.15. At 3 there was a broad hazy (0 to 1) band starting in Monoceros in the ESE. up through Canis Minor, Cancer, Lynx, and Ursa Major, where it faded out. At 3.15 it extended on to Hercules in the NNW. At 4 it had merely risen slightly, but at 4.15 it had developed into a broad, hazy, and somewhat sinuous band (1 to 2) from Hydra in the ESE. to Hydra in the NNW. through Cancer, Gemini, Lynx, Auriga, Camelopardalis, Ursa Minor, Cepheus, Draco, Cygnus, and Lyra, slowly drifting westward. At 5 a. m. a motionless band (brightness 1) extended from Pisces through Taurus to Orion. At 6 there were two motionless yellowish green bands (brightness 1 to 2), one from Pegasus through Aries and Taurus to Gemini, and the other through Pegasus, Cygnus, Draco, and Canes Venatici to Coma Berenices. At 7 a. m. a yellowish-white arch (brightness 2) rapidly waving, extended from Andromeda through Cassiopeia, Camelopardalis, and Ursa Major to Leo Minor and Coma Berenices. At 8 there was a faint (0 to 1) band low in the SE., through Cetus, Taurus, Orion, and Monoceros. At 9.17 there was a broad white quiet band in the SW. horizon from SE. to NNW., and faint parallel bands running SE. and NW. covering the sky from the SW. horizon to the zenith. The aurora was essentially unchanged at 10.17. At 11.10 the band on the border of the horizon had disappeared and the other bands now running E. and W. had grown fainter. They were reduced to mere traces at 11.17. Faint traces of similar bands across the zenith were visible at 12.10 p. m. There was a slight disturbance at 9 a. m., chiefly affecting the horizontal force.

December 15, 1882, 1.12 *a. m. to* 12.15 *p. m.*—More or less pale glow and very faintly luminous haze was noticed earlier, but no definite aurora till 1.15, when there were traces of faint streamers in the NE., in Cancer and Canis Minor. At 3.15 there was a faint luminous band extending from Canis Minor, through Gemini to Lynx, and a faint band of motionless streamers through Lyra, Hercules, Draco, and Ursa Major to Canes Venatici (brightness 0 to 1). At 4.15 there was a quiet yellowish arch from Leo through Lynx, Camelopardalis to Perseus and to Triangulum. At 5.15 traces only were visible. At 6.17 traces of a band running SE. and NW. were visible through the clouds. At 10.15 there was a white, quiet arch (brightness 0 to 1) spanning the SW. horizon from SE. to NW., with an altitude of about 10°, and also a few bright (0 to 2) streamers in the NE. At 12.12 p. m. there were traces of a band running from Taurus to Boötes, between Gemini and Auriga, and traces of patches near the northern horizon. The needles were quiet till 12 m., when the horizontal force began to fall, going very low between 3 and 4 p. m., and then gradually rising, the other two elements meanwhile reading slightly higher.

December 15 *and* 16, 1882, 8.10 *p. m. to* 2.45 *p. m.*—At about 3 p. m. of the local day, while the sky was still quite light, there appeared stretching across the zenith from SE. to NW. a broad hazy band running through Pegasus, Andromeda, Cassiopeia, Cepheus, Ursa Minor, and Ursa Major. Its color was a deep, clear crimson, paling somewhat toward the extremities. It was brightest in Cassiopeia and then faded and became brightest in Ursa Major (brightness 1 to 2), but was wholly gone in about 15 minutes. At 9.15 ruddy streamers, particularly rosy in the N. and S., filled the whole eastern half of the sky centering in Cepheus. These also soon disappeared. At 10.15 they had reappeared as before with some additional streamers on the west, forming a cape round the zenith. These showed rapid motion shooting from the zenith, and faded soon. At 11.15 there was simply a belt of streamers showing only a faint rosy tint across the eastern sky from Boötes to the Pleiades and Perseus. At 12.15 a band (brightness 1) bearing short streamers at intervals passed through Orion, Gemini, Lynx, Ursa Major, and Canes Venatici across the NE. sky. There were streamers in Boötes and one long one from Corona Borealis, through Cepheus and Draco. Nearly the whole sky was covered at 1 a. m. In the NE. were three bands of streamers from NNW. to ESE., the highest passing a little east of the zenith, breaking in on the corona which centered near Polaris, its streamers reaching down to Cygnus and Lyra, and forming curtains in the W. which reached down nearly to Pegasus. The brightest was 1 to 2, constantly changing while the band and streamers shifted, continually twisting and waving slowly. At 1.15 the corona was mostly east of the zenith and the western aurora had assumed the form of a broad zone from Orion to Hercules, the highest part taking in Cassiopeia, Andromeda, and part of Pegasus. When the light reached a brightness of 2 it was tinged with green and rose. At 2 a. m. it was all west of the zenith in a broad zone of three main bands from Orion in the SE. to Serpens in the NW., the highest through Andromeda and the lowest below the square of Pegasus. These bands were made up of streamers flickering rapidly from the W. to E. At 2.15 there were four bands in the east, the highest extending along from Canis Minor to Orion and converging in the N. The lowest passed through Gemini and Ursa Major while the rest filled the eastern sky nearly to the zenith, when they were succeeded by a broad zone with the same origin as at 2 a. m., passing through Cassiopeia. The color was greenish, with tinges of rose (brightness 2 to 3), and they shifted and waved slowly. At 3 a. m. the main body of the aurora was in essentially the same position but had paled to 1, was somewhat more diffused, with a convoluted mass of curtains in the NW. in Delphinus and Vulpecula. At 3.15 it was more broken and still paler with some bright patches in the NE. At 4 a. m. the eastern end of the zone stretched from Leo in the E. to Canis Minor in the ESE., but the whole converged to Serpens in the NNW. The upper band passed through Leo and Gemini and below Cassiopeia, while the remaining four or five bands filled the whole southern and western sky nearly to the horizon. They were all sinuous (brightness 2 to 3) and the upper band was beginning to develop coronal bands, which vibrated rapidly, north of the magnetic meridian S. to N., south of it N. to S. The bands were more broken and paler at 4.15 and a large corona was rapidly developing. At 6 a. m. five bands covered nearly the whole sky, some made up of streamers in rapid motion, others motionless (brightness 1 to 2). At 7 there were three bands, yellowish, and brightness 2 to 3, one from Cancer through Ursa Major and Draco to Cygnus, one from Gemini to Cygnus across the zenith, and the third from Canis Minor to Andromeda through Perseus. At 8 a. m. there was a faint arch from the S. to SW. from Leo to Orion and a few patches in the E. (brightness 0 to 1). At 9.15 there was a white and quiet semi-corona in the S. from E. to W., and from 10° above the horizon to the zenith (brightness 1 to 2). At 10.15 there was very little change in the character of the aurora except that it had approached nearer the zenith on the southern side, and a broad band with streamers extended along the southern horizon from E. to W. There were also a few streamers on the northern side forming a nearly complete corona. At 11.15 the band along the horizon had disappeared and the main body of the aurora shifted north of the zenith, and grown paler (1). There was slight motion. At 12.15 p. m. there was a white, quiet arch on the southern horizon from the SSE. to the W. with but 10° altitude, a band from the SE. through Boötes, Canes Venatici, near Ursa Major, through Auriga to Taurus, and streamers in the SE. and W. The whole was white and quiescent (brightness 0 to 1). At 1 p. m. the band on the southern horizon was unchanged and there was a complete corona. At 2 p. m. there were faint traces in Cassiopeia and Auriga, but at about 2.30, although the sky was quite bright, streaks fully 1 in brightness flashed up in the NW. and crossed the zenith to the SE. while streaks and streamers forming almost a corona in very rapid motion, both circling and vibrating appeared and disappeared round the zenith with great rapidity. A magnetic disturbance of considerable violence commenced about 10 p. m. December 15, and lasted till 5 p. m. December 16.

December 17, 1882, 3.15 *a. m. to* 11.15 *a. m.*—A faint streak or two was noticeable in the S. and SE. at 12.15 and 2 a. m., but there was no definite aurora till 3.15, when there was a pale band of streamers (brightness 0 to 1) in the E. from Regulus to Procyon and a still paler band from Procyon in the ESE. to Hercules in the NNW. passing through Ursa Minor close to the zenith. At 4 a. m. there was a partial corona (brightness 1) centering near the zenith extending in azimuth from Auriga in ESE. to Cygnus in NNW. with its streamers longest, about 50 degrees long, in the constellation Ursa Major. There was also a fan-shaped bunch of secondary streamers in Leo in the E. It had faded at 4.15, except the lower streamers in the E. and NE. At 5 there were merely traces in the SW. and S. and no more was seen till 8 a. m., when there were two faint bands from Andromeda to Orion, and the other from Taurus through Orion to Hydra (brightness 0 to 1). From 9.15 to 11.15 there were merely faint traces of aurora through the clouds which obscured the horizon. The magnetic needles were comparatively quiet all night.

December 17 *and* 18, 1882, 11.15 *p. m. to* 7 *a. m.*—At 11.15 p. m. there was a faint arch without streamers, motionless, in the NE., passing through Gemini, Lynx, Leo Minor, Canes Venatici, and Coma Berenices. Between 11 and 12 pale shifting streamers developed above this arch, but were gone at 12.15, when there was a waving band of pale, hazy light passed through Orion, Gemini, Auriga, Lynx, Ursa Major, and Canes Venatici, and also streamers in Ursa Major, Camelopardalis, Ursa Minor, Draco, and Cepheus (brightness 0 to 1). No more aurora was seen except faint traces at 2 and 7 a. m. The magnetic needles were undisturbed all night.

December 18 *and* 19, 1882, 10.15 *p. m. to* 2.12 *p. m.*—At 10.15 there was a band of waving white light from SE. to NW. nearly overhead through the constellations Corona Borealis, Hercules, Draco, Cygnus, Andromeda, Cepheus, Triangulum, and Pisces (brightness 1 to 2). At 11 p. m. there was only a faint patch of light in the south in Pegasus, Vulpecula, and Delphinus. At 12 there was simply a narrow arch in the south with its extremities bearing SE. and SW. and its crown at an altitude of about 25 degrees (brightness 0 to 1), but at 12.30 it had developed into a brilliant display, beginning as four or five bands of streamers across the western sky, from Orion in the ESE. to Hercules in the NNW., the highest through Cassiopeia and the lowest close to the horizon (brightness 3 to 4). The streamers were in rapid motion, vibrating in alternate bands from N. to S. and vice versa, with the rapidity of lightning, while the changes in color and brightness were almost instantaneous. The colors were green, yellow, and rose (one of the party says he saw blue), the latter especially bright and approaching a peach-bloom color. The motion was mostly confined to the middle of the bands and most violent near the zenith, where smaller bands and coronal streamers were shooting and twisting. It soon spread east of the zenith, developing from the NW. in one specially brilliant band of streamers in rapid vibration through Ursa Major and Gemini. Other bands developed across the NE. sky, while the western aurora faded, and globes of red light shot up from the NW. at 12.50-55. At 1 the bands in the east were twisted and curled into spirals and fading at 2 in brightness and the two bands through Ursa Major and Cassiopeia still remained motionless, and brightness 1 to 2. At 1 all had faded to brightness 1 and become hazy and the colors were very faint. Polar bands of cirro-stratus clouds were distinctly seen across part of the aurora when the display was at its height. There was a magnetic disturbance with high easterly declination and rather low horizontal force. At 2 a. m. there was nothing left but three or four bands starting in the clouds in the ESE., two of them reaching Hercules in the NW., one through Canis Minor, Gemini, Lynx, and the upper part of Ursa Major, and the other through Orion, Taurus, Perseus, Andromeda, Lacerta, Cygnus, and Lyra, and a slightly brighter band in the W. from Aquila to Pegasus (brightness 1). All were slightly brighter (1 to 2) and somewhat broken at the NW. end. The needles were very near their normal position. At 3 a. m. the sky was nearly covered with polar bands and between them were traces of the auroral bands as before, brightest (nearly 2) in the NW. and NE. The declination was reading very low. At 4 a. m. the bands overhead were very pale, with a bright patch in the NE. and a similar one in the NNW. At 4.15 the needles were nearly back to their normal position and remained undisturbed the rest of the night. There were traces seen at 5 a. m. and again at 10.10 a. m., but at 2.12 p. m. four narrow streamers (brightness 0 to 1) ran up from the NNW. horizon and met in Auriga vibrating very rapidly between Gemini and Taurus. This was the last seen.

December 19 *and* 20, 1882, 11.15 *p. m. to* 3 *p. m.*—At 11.15 p. m. there was a faint arch (brightness 0 to 1) in the NE. through Orion, Gemini, Leo Minor, Canes Venatici, and Coma Berenices; this latter growing gradually paler till nearly 12 midnight, but had faded at that observation. At 1.15 there was a yellowish, quiet, and regular arch (brightness 1), quite narrow, from Canis Minor in the ESE. through Cancer, Leo Minor, Lynx, and Canes Venatici, ending in Boötes in the NNW. At 2 a. m. there were rounded, hazy patches in Canes Venatici, and a "zone" of three or four bands from a point in the upper part of Serpens, in the NW., through Cygnus, Lyra, Cepheus, and Cassiopeia, and then dwindling to a single band through Perseus and Taurus, fading in Orion. The whole had faded to traces at 2.15. At 3 a. m. there was a bright sinuous yellow band in the NW. (brightness 2 to 3) from Serpens close to β Cygni and through Pegasus, fading under the moon. At 3.15 these had risen and developed into a very extensive zone (brightness 2), with its starting points in Orion in the SE. and Serpens in the NW., stretching in breadth from Pegasus to Leo. The streaks were yellow and very sinuous, some spiral in Cygnus, with a rather slow writhing motion at the zenith. There was a sudden and violent magnetic disturbance, the horizontal force falling too low to read and the eastern declination increasing over 1°. From 4 to 4.15 there was a sinuous, broken arched band, rather narrow and yellowish (brightness 1 to 2), from Leo in the E., through Coma Berenices and Boötes, to Hercules in the NNW., and at 4.15 also a pale streamer up into Lyra. The magnets had become quiet. At 5 a. m. there was a faint, motionless band (brightness 0 to 1) above the southern horizon, and at 6 merely traces in the SW. At 8 a. m. there were traces of a very faint corona, resembling luminous clouds, and the needles were very much disturbed, the E. declination increasing 5°. At 9.10 there were only faint traces of aurora, but the disturbance continued. There were also traces at 10.10 a. m., after which no more was seen till 1 p. m., when there were two quiet bands (brightness 0 to 1), one from Cassiopeia through Cygnus and Lyra to Hercules, and the other from Gemini through Leo Minor and Canes Venatici to Corona Borealis, and a corona in Ursa Minor (brightness 0 to 1), moving sluggishly. At 2.15 p. m. there still remained traces of the corona in rapid motion, and also traces of the northern band, and at 3 p. m. there were still traces in the NW. This last aurora was accompanied with a violent magnetic disturbance.

December 21, 1882, 1 a. m. to 3 p. m.—At 1 a. m. there was a curved yellow band in the NW. (brightness 2) from just below α Aquilæ towards Pegasus, but more or less obscured by the bank of clouds that lay on the western horizon, and still more obscured at 1.15. At 2.15 a. m. an arched band, somewhat sinuous (brightness 2), from Hercules in the NNW. through Corona Borealis, Canes Venatici, Leo, and Leo Minor, ending in the haze. It was gradually breaking into streamers. It had risen at 2.15 about 5° higher, with considerable flickering vibration in the streamers, showing pale colors, green, yellow, and red, not rose (brightness 2 to 3); and there was also a zone (brightness 1 to 2), with its starting points in the SE. and NW., hidden by hazy clouds, and crossing the zenith W. of Polaris and drifting slowly westward. At 3 a. m. there was a rather pale band coming from the clouds near Cancer in the ESE. across the zenith from Ursa Major to Cassiopeia and ending in the clouds in the NNW. At 3.15 it was partly faded, and finally obscured by clouds. At 4 a. m. there were only traces in the N. through the clouds which now covered the sky. At 5 a. m. bands with streamers vibrating from W. to E. and back, yellowish in color, and brightness 1 to 2, ran from Orion through Taurus and Aries to Pegasus. At 6 a. m. a quiet band (brightness 1) extended from Pegasus through Cygnus, Draco, and Ursa Major to Leo, while at 8 traces only were visible through the haze. At 9.10, 10.10, and 12.10 faint traces were seen. At 1 p. m. the aurora was extensive in bands and streamers (brightness 0 to 1), paling and vanishing quickly. The bands extended from Gemini and Auriga to Ursa Major, and from Hercules through Corona Borealis and Canes Venatici to Leo Minor; the streamers through Cygnus and Lyra and from Ursa Major to Ursa Minor, forming half a corona. There were also streamers up from Boötes. At 2.12 p. m. there was a sinuous band (brightness 0 to 1) in rapid motion, starting near Taurus and running through Perseus and Cassiopeia to Cepheus. At 3 p. m. there were faint traces of a band and a few streamers in the N. and NNW. The needles were more or less disturbed during the whole twenty-four hours, the disturbance being at its highest at 2 and 3 a. m.

December 21 and 22, 1882, 11 p. m. to 11 a. m.—At 11 p. m. there was a faint streak through Boötes, Coma Berenices, Leo Minor, and Gemini. At 12.15 a. m. there was a faint regular arch through Orion, Gemini, Leo Minor, Coma Berenices, and Boötes. At 1 to 1.15 a. m. the arch was still narrow and greenish (brightness 1), from the ESE. to NNW. through Canis Minor, Cancer, Leo Minor, Canes Venatici, and Boötes to Serpens. At 2 a. m. there was a very pale and somewhat sinuous band (brightness 0 to 1) from Monoceros in the SE. through Orion, Taurus, Perseus, Cassiopeia, Cepheus, and Cygnus to Hercules in the NW. This had drifted W. to Andromeda at 2.15, and a short band had developed in the SE. from Canis Minor to Leo (brightness 1 to 2). This band was rather broad, and flared into short hazy streamers on the upper edge. At 3 a. m. there was a broad zone of the usual type across the zenith from Monoceros in the ESE. to the NW., where its base occupied 20° in azimuth in Hercules. The eastern boundary passed through Leo and Ursa Major, while the main zone spread west to Cassiopeia, and the northwestern bands reached Andromeda and Pegasus. At 3.15 it was brighter (brightness 1 to 2) and had spread about 10° each way, showing faint tinges of color in the E. and broken into cloudlike masses in the SW. At 4 a. m. only the extreme western part of the eastern band remained, and the whole had faded to traces at 4.15. At 5 pale traces of bands crossed the zenith from N. to S. At 6 a. m. a yellowish, quiet band (brightness 0 to 1) ran from Pegasus through Perseus, Auriga, and Gemini to Cancer. At 7 a. m. there were quiet bands (brightness 0 to 1) from Orion through Taurus, Auriga, Lynx, and Ursa Major to Leo and Coma Berenices. Faint traces were seen over the southern horizon at 8 a. m., and the last faint traces were noticed at 11 a. m. The needles were quiet up to 3 a. m., when they were considerably disturbed, the horizontal force being most effected. This disturbance lasted three hours, and there was another slight disturbance at 5 and 6 a. m.

December 22 and 23, 1882, 11.55 p. m. to 2 p. m.—At 11.55 p. m. there was a pale, regular arch in the NE. from NNW. to ESE., the altitude of the crown being about 25°. This had wholly disappeared at 12 midnight. Nothing more was observed till 2 a. m., when there was a broad, hazy band across the zenith from Monoceros, in the ESE., to Hercules in the NW., through Gemini, Auriga, Camelopardalis, Ursa Minor, Cepheus, Cygnus, and Lyra. This had drifted west and faded to a trace at 2.15, and in the NE. there had developed three or four sinuous and somewhat convoluted bands (brightness 1 to 2), and yellow, from Hercules to Leo in the E., the brightest through Ursa Major and the lowest close to the horizon. There was a slight magnetic disturbance. At 3 a. m. a somewhat sinuous arched band (brightness 1 to 2) extended from a point in Hercules in NNW., through Lyra, Draco, Boötes, Canes Venatici, Ursa Major, Leo Minor, and Leo, ending in the clouds in the E. At 3.15 it was slightly higher and was developing into a zone of several bands. At 4 a. m. there was a regular narrow arch (brightness 1) from α Lyræ to α Leonis, the crown passing close to η Ursæ Minoris, and a broad, hazy band (brightness 1) in the NW., through Cygnus, Cepheus, Draco, and Ursa Minor, ending in Camelopardalis. The whole had faded to traces at 4.15. 5 a. m. showed only faint traces in the NE., and traces were also observed at 10.10 and 12.10 p. m. At 1.12 p. m. there was a quiet yellowish and white band from Gemini through Ursa Minor and Cygnus, and a few streamers through Lacerta (brightness 0 to 1). The last faint traces were seen at 2 p. m. in Cassiopeia and Lacerta. Besides the disturbance already mentioned there was slight disturbance at 8, 9, and 11 a. m.

December 24, 1882, 1.15 *a. m. to* 10.10 *a. m.*—At 1.15 there was a hazy band (brightness 0 to 1) from Hercules through Corona Borealis, Boötes, Ursa Major, Lynx, and Gemini, quickly fading and appearing again. It was invisible at 2, but well developed at 2.15, and passing through the same constellations in the N., but a little higher, and through Cancer instead of Gemini to Canis Minor. At 3 there was a hazy band (brightness 0 to 1) up through Cygnus in the NW., Cepheus, Cassiopeia, and Perseus, ending in Auriga, and a trace in Monoceros in the ESE. At 3.15 the whole was very faint and the main band had risen a degree or two. At 4 there was a broad, rather hazy belt in the NE. (brightness 1) from Boötes to Leo, and a quiet, regular arch in the SW. from the lower part of Pegasus to Orion's Belt. This arch still remained at 4.15, but the eastern belt had faded to a trace. Across the zenith, from Cygnus to Auriga, was a broad, convoluted band, with considerable writhing and twisting motion. There was a slight magnetic disturbance. At 5 a. m. there were faint, motionless bands, yellowish green (brightness 1), from Orion, through Canis Minor, to Leo, and from Leo to Ursa Major and to Draco, and from Draco, through Cygnus, Lacerta, and Andromeda, to Pisces. Traces were seen at 8 and again at 10.10 a. m. In addition to the disturbance already mentioned there was quite a considerable one from 8 to 11 a. m.

December 25, 1882, 2 *a. m. to* 2.15 *a. m.*—Clouds covered the sky during the greater part of the night, but at 2 a. m. they were sufficiently thin and broken in the N. and NW. to show pale streaks in the NW. streaming up towards the zenith. These streaks were near α Lyræ, which was the only star visible in that part of the heavens. At 2.15 there was a sinuous streak (brightness 1 to 2) visible through the clouds from near the horizon in the NW. to a point about 10° west of the zenith, where it ended in the clouds. No more aurora was seen. There was a slight magnetic disturbance at 4 a. m. and again at 7 a. m.

December 26 *and* 27, 1882, 10.15 *p. m. to* 9.10 *a. m.*—There was a bunch of scarcely discernible streamers in the NE. at 10.15, and at 11.15 a faint patch in Gemini. At 12.15 a. m. there was merely a faint flush in the NE. At 1 a. m. there was only a portion of a pale (0 to 1) arch lying low in the NE. in Coma Berenices and Leo, and at 1.15 there were also two or three shifting streamers of the same brightness in Boötes and Corona Borealis. At 2 there was a sinuous band (brightness 1) in the NE. from Cancer through Leo, Canes Venatici, Boötes, and Corona Borealis, ending in Hercules in the NNW. At 2.15 it was brighter (1 to 2), and a second band had developed above it through Cancer, Leo, Leo Minor, Canes Venatici, Ursa Major, close to η Boötis, Corona Borealis, and Hercules. Streamers in Hercules stretched from the lower band through the upper. The upper band was observed to break gradually into short streamers, with considerable flickering from the N. to S. There was also a hazy patch (brightness 0 to 1) in Orion and Taurus, SSE. At 3 a. m. a broad zone of the common type crossed from Canis Minor in the SE. to Cygnus below β Cygni in the NW. The western edge, which was the brightest, ran through the head of Orion, Aries, Taurus, Triangulum, and Andromeda, the top of Pegasus and Vulpecula, and the eastern, which was very pale west of the zenith, through Gemini (inclosing δ Geminorum), Auriga, Camelopardalis, Ursa Minor, and Cepheus. At 3.15 it had condensed into a single rather broad band in the position of the western edge of the zone (brightness 2 to 3), tinged on the upper edge with green and with rose on the lower. This band was unchanged in position at 4, but was a little paler, and the constellation had set through it a little. It had regained its former brightness at 4.15 and had risen to the position of the middle of the former zone, while incipient sinuous and convoluted bands were developing in the E. from Hydra through Leo and Coma Berenices. At 5 there were two faint, quiet bands (brightness 1), one through Cygnus, Cassiopeia, Auriga, Gemini, and Cancer, and the other through Leo Minor, Ursa Major, and Draco. At 6 there was a quiet band (brightness 0 to 1) from Canis Minor through Orion, Taurus, and Aries. At 7 there were traces of a faint band from the W. to NW., and at 8 faint traces in the SW. The last traces were seen at 9.10 a.m. The magnetic needles were practically undisturbed all night.

December 27 and 28, 10.15 p. m. to 9.10 p. m.—At 10.15 p.m. there was an arch in the NE. with its curve at α Geminorum, altitude about 30°, and extremities being NNW. to SE., passing through Taurus, Gemini, Lynx, Leo Minor, and Coma Berenices. It was narrow, except in Coma Berenices, where it was broken into 5 streamers. At 11.15 there was a band like a half arch, passing through Gemini, Leo Minor, Coma Berenices, and Boötes (brightness 1), and a faint streak from Cygnus to Cassiopeia. At 12.15 a.m. there was an arch in the NE. through Orion, Gemini, Lynx, Ursa Major, Canes Venatici, and Boötes, very broad in Ursa Major, with streamers in Boötes (brightness 1). This had risen at 1 a.m. into a broad zone (brightness 1), with its bands very sinuous and broken and in motion across the zenith from the NNW. to the ESE., the extremities rising from the haze. The western edge ran through Orion, Taurus, Andromeda, Pegasus, and Cygnus, and the eastern through Gemini and Ursa Major. At 1.15 it was quieter and narrower, being confined to the part west of the zenith. The aurora was still in the form of a zone at 2 a.m., with its starting points in Monoceros ESE. and Hercules NNW. It consisted of three main bands. The western and brightest (brightness 1 to 2) band was in rapid waving motion, and ran through Orion, Taurus (not inclosing the Hyades or Pleiades), Perseus, Cassiopeia, Cepheus, close to δ Cygni and Lyra, the eastern barely reaching Gemini and Ursa Major. At 2.15 it was quieter and spread about 15° each way. At 3 the zone still continued (brightness 1 to 2), with its starting points in Monoceros ESE. and Aquila NNW., stretching west to the square of Pegasus and east to Canes Venatici, with additional bands in the NE. through Leo, Coma Berenices, and Boötes. It was quiet and brightest in Cygnus. At 3.15 it was in the same position but paler (brightness 0 to 1); 4 a.m. showed only traces of the extreme east and west bands, but at 4.15 the eastern traces had developed into convoluted bands (brightness 1) through Leo, Coma Berenices, Boötes, and Corona Borealis. At 5 there were only traces over the horizon from NW. to SE. At 6 there were two motionless bands (brightness 1), one through Pegasus, Perseus, Cassiopeia, Camelopardalis, and Lynx, and a short band from Ursa Major to Boötes. At 7 a.m. there was a band (brightness 0 to 1) from Pisces through Aries, the Pleiades, and Orion through Canis Minor. At 8, 9, 10, and 10.10 a.m. there were still faint traces. The horizontal force read high during the early part of the evening, and was somewhat agitated at 2 and 3 a.m., while at 6 and 7 there was a lively disturbance, the force falling too low to be read. The other elements were slightly or not at all affected.

December 28 and 29, 1882, 11.10 p. m. to 2.12 p. m.—Though the sky was completely covered with clouds at 11.10 p.m., bands of aurora, which must have been very bright, appeared across the zenith from NW. to SE. in rapid sinuous motion. At 2 a.m. the sky was partially clear, and broad diverging bands (brightness 1), radiating from Cygnus in NW., stretched across zenith towards the SE. At 2.15 a bank of clouds about 15° high lay along the western horizon, and above this nearly to the zenith the sky was covered with almost parallel broad bands from the NW. to the SW. The lowest resting on the banks of clouds was the brightest (brightness 2 in NW.), and the highest brightness (1) ran through Cygnus, Cassiopeia, and Leo, ending in the clouds. At 3 portions of bright bands could be seen through the clouds in the NW. and SE. at an altitude of about 40° At 3.15 a broad bright band could be seen across the zenith from NW to SE. through the hazy clouds. At 4 there were broad hazy bands across the zenith from NW. to SE., apparently in motion, but much obscured by haze, and also a brighter band lower in the W. All was obscured by haze at 4.15 except traces of the last band. No more was seen till 7, when the clouds partially cleared again, and a broad band (brightness 0 to 1), and motionless, through Lyra, Corona Borealis, Boötes, and Coma Berenices, was visible. At 8 the sky was wholly clear, and two or three bands (brightness 1 to 2), with streamers, some of them reaching the zenith and all vibrating rapidly from W. to E. Their color was yellowish, and they occupied Taurus, Orion, Auriga, Camelopardalis, Gemini, Lynx, Leo, and Hydra. There were a few traces in the NW. and E. at 9.15. The 10.15 observation showed a luminous patch (brightness 0 to 1) in Taurus in the NW. horizon, and extending through Auriga, and another similar patch in Cygnus. At 11.10 a narrow white band (brightness 1) extended from the SE. to the W., with its crown at an altitude of about 20°, its western end being somewhat broader. A white, quiet band also extended from the horizon SW. to Polaris. At 12.17 p. m. there was an aurora reaching the horizon in the NE. and W. (brightness 1), white and quiet. At 1 p. m. there was a zone of the usual type, with its starting points NNW. and SSE., starting from Lacerta and reaching to Leo Minor. This was reduced to traces at 1.12, and faint traces were still discernible at 2.15. A magnetic disturbance began at about 2 a. m. and reached its maximum at 8 a. m., the horizontal force falling too low to be read, and the eastern declination increasing over a degree. The disturbance was large again at 1 p. m.

December 19 *and* 30, 1882, 10.15 *p. m. to* 3 *p. m.*—At 10.15 p. m. there was a low arch (brightness 1), with its extremities bearing E. by S. and N. by W., passing through Orion, Gemini, Lynx, and Leo Minor, and faint recurved streamers in Coma Berenices and Canes Venatici. At 11.15 the arch was irregular and waving (brightness 2), and passed through Orion, Gemini, Leo Minor, Lynx, Coma Berenices, and Boötes. At 12.12 a. m. there was an irregular and waving arch, very low in the NE., through Canis Minor, Leo, Coma Berenices, and Boötes, with a few faint streamers in Boötes (brightness 1). The arch had risen at 1 into a broad zone, with its starting points in Hercules in the NNW. and Monoceros in the ESE. The western band (brightness 1) crossed through Cassiopeia, but faded before reaching Monoceros. The next band only reached Ursa Major, while the eastern, which was the brightest (brightness 2) and yellowish in color, passed through Corona Borealis, Boötes, Canes Venatici, Leo Minor, and Cancer, and there were also below this two or three paler partial bands. At 1.15 the whole had faded to traces except the band in the E., which now ran through Leo. At 2 a. m. there was an arched band in the same place (brightness 1) and a streamer from the NNW., and reaching into Lyra. This streamer was gone at 2.15, the band was paler, and there was a streamer in the ESE. From 2 to 3.15 there was a broad zone (brightness 0 to 1) of hazy bands, broad and somewhat shifting. The starting points were in Hercules in the NNW., and a line in Monoceros and Hydra from the SE. to the ESE., and the sky was covered by the zone between Leo in the NE. and the lower part of Pegasus in the SW., except between the zenith and Ursa Major. At 4 the zone had nearly all faded except the eastern band and another about 20° broad through Cassiopeia. This had shifted westward into Perseus and Andromeda at 4.15, and was fading rapidly. At 6 there was a motionless band (brightness 2) in the SW. through Canis Minor, Cancer, Gemini, Orion, Taurus, and Pisces. At 6 a. m. an extensive zone (brightness 1 to 2) covered the sky. The starting points were in Pegasus WNW. and Leo ESE., the edges running through Aries, Gemini, Coma Berenices, Boötes, Corona Borealis, Lynx, Cygnus, and Lacerta. There was a slow waving motion, and some of the bands were broken into streamers. At 7 there was a faint band (brightness 0 to 1) through Delphinus, Hercules, and Boötes. At 8 a band (brightness 2 to 3) with streamers in rapid motion, colors changing from yellow to green and red, ran through Triangulum, Aries, Taurus, Perseus, Auriga, Gemini, and Leo. At 9.10 there was a bright patch in the E. and NE. at an altitude of about 20°, with long faint streamers extending to Polaris. It was white and quiet (brightness 2). At 10 there were a few faint traces, but no more was seen till 1 p. m., when the aurora revived as a sigmoid band (brightness 0 to 1) extending from Leo Minor in the SW. to Boötes in the S. A twisted band ran through Ursa Major from Gemini to Hercules, while a crown of the same brightness, fading very rapidly, was found in Ursa Minor. At 2 there was a broad band (brightness 0 to 1) in the NE., through Cygnus, Perseus, Lacerta, and Auriga, and faint traces of coronal streamers and of streamers in the SW. The last faint traces were still visible in the NE. at 3 p. m. The horizontal force instrument was agitated between 2 and 4 a. m., and there was considerable disturbance, chiefly affecting the horizontal force, from 8 a. m. to 3 p. m.

December 30 *and* 31, 1882, 10.15 *p. m. to* 2 *p. m.*—The aurora began at 10.15, with a flush in the NE., continuing but little changed at 11.15. At 12.15 a. m. it had developed into a definite though pale band, through Gemini, Leo Minor, and Canes Venatici. From 1 to 1.15 the eastern horizon was much obscured by haze, and there was a regular but rather narrow arch in the NE., with its crown apparently in Coma Berenices, at an altitude of about 25°, with its extremities about N.

and ESE. At 2 the horizon was still obscured and the arch was higher and brighter (brightness 1 to 2) with its extremities ESE. (observed to be near Regulus) and NNW. There was also a broad forked hazy band (brightness 0 to 1) from the NNW. end up through Lyra and Cepheus. The arch only remained at 2.15. At 3 the arch was somewhat irregular (brightness 1) from the ESE. to the NNW., passing through Leo, Leo Minor, Ursa Major, Draco, and Lyra to Aquila. At 3.15 it was brighter (brightness 1 to 2) and an additional band (brightness 0 to 1) through Ursa Minor connected it into a zone. At 4 a. m. there was a broad hazy zone (brightness 0 to 1), with its starting points in Hydra ESE. and Aquila NNW., passing through Cancer, Gemini, Auriga, Perseus, Cassiopeia, Andromeda, Pegasus, and Lacerta, and a band (brightness 1 to 2) in the NE. from starting points through Leo, Coma Berenices, Boötes, Corona Borealis, Hercules, and Serpens. This band was in the same place, but the zone was farther E. and narrower and passed through Ursa Major and Ursa Minor. At 5 a. m. a quiet yellowish band (brightness 1) passed from Pisces through Taurus, Orion, and Monoceros. At 6 there was a band (brightness 1) waving slightly from W. to E. through Aries, Taurus, Gemini, and Canis Minor. There were faint traces at 7 and 8, also at 10.10 and 12.10. There was a definite aurora at 1 again; a narrow band (brightness 0 to 1) passing between Gemini and Auriga, through Ursa Minor to Cygnus in the ESE. Faint traces were still visible in the NW. and in Cassiopeia at 2 p. m. There was a disturbance, not very great, with decrease of horizontal force and increase of the other elements at 7 to 8 a. m., and again much less violent at 1 to 2 p. m.

December 13, 1882, *January* 1, 1883, 10.15 *p. m. to* 12.17 *p. m.*—At 10.15 there were faint bands surmounted by very faint streamers in the NE., passing through Gemini, Lynx, and Leo Minor. This had faded at 11.15 to a more hazy streak just above the NE. horizon, with its extremities bearing N. by W. and E. This disappeared again before the next observation; was beginning to develop again at 1 a. m. At 2 there were three faint, ill-defined arches (brightness 0 to 1) in the NE., from Hercules to Leo, through Corona Borealis, Boötes, and Coma Berenices, with a faint streamer running up into Draco at the NNW. end. There were three or four additional streamers in the same place at 2.15. At 3 the arches had risen and become a broad hazy zone (brightness 0 to 1), brightest on the edges, with its starting points in Hydra ESE., and Aquila NNW. The highest point of the eastern edge passed through the top of Canes Venatici and of the western through the lowest part of Andromeda. This zone lasted two hours, with its starting points having the same bearing, of course changing its relations to the constellations as they moved through it, and its band varying slowly in brightness (from 0 to 1 to 1 to 2) and position. At 5 there were two bands (brightness 1 to 2), one short with streamers on the western end, and a long one below it with streamers in the E., vibrating slowly from W. to E., running through Pegasus, Lacerta, Cygnus, Lyra, Draco, Corona Borealis, Boötes, and Coma Berenices. At 6 a quiet band (brightness 0 to 1) ran from Pegasus to Hercules and Boötes. A similar but brighter (brightness 1) band at 7 a. m. passed through Canis Minor, Orion, Taurus, Aries, and Pisces. At 8 a. m. a comparatively narrow zone (brightness 1 to 2) crossed the zenith from Pegasus to Leo Minor, through Cassiopeia, Ursa Major, and Ursa Minor. There were besides two bands S. of the zenith from Leo to Andromeda through Cancer, Gemini, Auriga, and Perseus, with several patches of streamers between the bands vibrating rapidly, and a few beams of light from Ursa Major towards the S. (brightness 1 to 2). At 9.17 there was a broad band (brightness 1 to 2) from the SE. to NW., with a smaller band meeting it at its SE., and in Canis Minor in the W., about 5° apart in the middle, with white and quiet streamers above and from the smaller band extending towards the zenith. Traces of aurora continued visible till 12.17 p. m. The magnetic needles were remarkably quiet up to 4 a. m., when there was a slight disturbance, lasting over two observations—a decrease of all three elements. They again became quiet at 8 a. m., the horizontal force suddenly fell too low to read, and gradually recovering itself during the next two observations, while the other elements were almost undisturbed, both rising slightly.

January 1 *and* 2, 1883, 10 *p. m. to* 7 *a. m.*—At 10 p. m. there was a patch of aurora in the NE. in Cancer and Leo Minor, forming an irregular arch, with ill-defined streamers. This had wholly disappeared in ten minutes. At 11.15 there was an example of a new form of aurora, two arches arranged longitudinally, one narrow and rather irregular from Boötes through Coma Berenices, Leo, and Cancer to Canis Minor, reaching an altitude of about 15° in the NE., and the second paler and lower from Canis Minor to Orion's belt. At 1 a. m., there was a very faint arch (brightness 0 to 1) in the NE., with an altitude of about 10°, through Leo, Coma Berenices, and Boötes. Beneath was a well-defined dark segment. No more was seen till 4.17 a. m., when there was a band (brightness 0 to 1) from N. to E. through Coma Berenices and Corona Borealis. At 5.17 a yellowish-green band (brightness 1) ran from Cygnus through Lyra, Hercules, and Boötes. Faint traces were observed at 7 a.m., while clouds prevented observation during the rest of the night. The magnetic needles were comparatively undisturbed up to about 7 a. m., when a considerable disturbance began, which was still going on after daylight.

January 3, 1883, 3 *a. m. to* 11.15 *a. m.*—A bank of clouds lay along the horizon all the early part of the morning, and above them there seemed to be considerable glow, though no definite aurora was seen till 3 p. m. (8.43 p. m. local time, January 2), when there was a broad hazy band (brightness 1) somewhat sinuous near the horizon, stretching across the zenith from a point in Hydra in the ESE. to Aquila NNW. through Cancer, Lynx, Ursa Minor, Cepheus, Draco, and Cygnus. This band was about three times as broad at 3.15, embracing also part of Gemini, all of Auriga, part of Perseus, all of Camelopardalis, Cassiopeia, and Cepheus, and part of Draco, Lacerta, and Sagitta. At 4 a. m. it had shifted west of Cassiopea, and was much broken, but a band rapidly developed through Cassiopeia from the SE., waving gently. At 4.15 the whole sky was covered with broad bands winding in large sinuous curves, one especially from Lyra in the N. up to Cassiopeia, then to Aries and the Pleiades and to Auriga. There was a bright, hazy, irregular patch of large extent in the NW. The brightness of the whole was 1, and all shifted slowly, with gentle undulations. The intensity of the magnetic needle had been low for over twelve hours, and the horizontal force needle was now agitated. At 5 it had subsided into two broad, quiet bands, starting from Pegasus (brightness 1), one going S. to Orion, and the other N. to Hercules. At 6 there were only traces of a band from SE. to W., at an altitude of about 45°. At 7 a broad, yellowish-green band waving rapidly from W. to E. (brightness 1 to 2) ran from Pegasus through Andromeda, Cassiopeia, Camelopardalis, Ursa Minor, Ursa Major, and Canes Venatici. No more aurora was seen till 11.15 p. m., when there were faint traces in the E. The intensity continued low, being consideraly disturbed at 9 a. m.

January 4, 1883, 3 *a. m. to* 8 *a. m.*—At 3 a. m. (10 p. m. local time) there was a very faint vertical streamer about 20° long running from near the horizon ESE. This was prolonged at 3.15 into a narrow band (brightness 0 to 1) from Hydra, through the top of Leo, Leo Minor, and Ursa Major, then burning very pale through Draco and fading in Lyra W. of *α* Lyræ. At 4 traces of the band were perceptible a little higher, and at 4.15 the traces crossed the zenith. At 5 a yellowish quiet band (brightness 0 to 1) ran from Cygnus in the NNW. through Lyra, Hercules, Corona Borealis, Boötes, and Coma Berenices. At 6 a. m. a broad, motionless band (brightness 1) extended through Aries, Taurus, Orion, and Canis Minor. After this traces only were noticed in the NE. at 7 and from the NW. to W. at 8. The magnetic intensity continued low, especially the horizontal component, but there was no disturbance.

January 5, 1883, 12.15 *a. m. to* 5 *a. m.*—There was a faint glow in the NE. at 12.15 a. m., which had developed at 1.15 into a regular, narrow, quiet arch through the haze in the NE. (brightness 1), with its extremities bearing ESE. and NNW. and its crown at an altitude of about 30°. The stars in the neighborhood were obscured by a bank of haze. There was also a band of the same brightness beginning in a bank of haze in the NNW. and running through Lyra, Draco, Ursa Minor, Camelopardalis close to *β* Aurigæ and Gemini, fading in a few minutes. At 2 a. m. there were two sets of auroral bands starting from nearly the same place in the haze in the ESE. and NNW., one a broad band, hazy and twisted, waving gently through Lyra, Cygnus, Cassiopeia, Auriga, and the western side of Gemini and Canis Minor, and the other a zone of three or four quiet bands in the NE., the highest through Ursa Major, and the lowest through Leo. The brightness of the whole was 1. At 2.15 the western band was gone, except its NNW. end, and the zone had increased to six or seven bands. At 3 a. m. a very broad hazy zone (brightness 0 to 1) covered nearly the whole of the sky. The starting points were hidden in the ESE. and NNW., and the eastern edge reached the hazy clouds close to the horizon, while the western passed through Cygnus, Andromeda, Perseus, Taurus, the upper part of Orion, and Monoceros. It was very much faded at 3.15, though the eastern edge was growing bright. At 4 only that part of the zone which was NE. of the zenith remained, very pale and hazy, while at 4.15 it was very much broken and hazy, and traces of the western band were reappearing. The horizontal force was low and agitated. The haze and clouds continued increasing, and a few faint traces were seen at 5 a. m. The needles were hardly disturbed all night, though the intensity was comparatively low, much higher, however, than for the last twenty-four hours.

January 5 and 6, 1883, 10.15 p. m. to 2 p. m.—Flashes and streamers, very pale, began to appear in the NE. about 4.30 p. m. local time (9.15 Washington time), and at 10.15 had developed into a band of short bunches of streamers extending from the N. to E. through Orion, Gemini, Lynx, and Ursa Major (brightness 1). This soon disappeared, and no more was seen, the sky being partially obscured by haze till 2 a. m., when there was a motionless narrow band across the zenith (brightness 0 to 1) visible through the haze from the NNW. to ESE. near Gemini. This was wholly visible at 2.15. Several bands showed through the clouds at 3 a. m., one in particular in the NE. (brightness 2) at an altitude of about 40°. At 3.15 the band had reached an altitude of about 60° and the whole sky round the zenith was covered with waving bands. The sky then became completely obscured, only clearing partially at 8 a. m., when yellowish bands (brightness 0 to 1), waving slowly and partly hidden by clouds, were visible, running from Ursa Major through Auriga, Perseus, and Aries. The sky rapidly cleared at 9.17, and there was a quiet white band (brightness 0 to 1) near the southern horizon, running E. and W., sending up streaming patches through Leo and Coma Berenices, and at the W. end in and near Canis Minor. The aurora was unchanged at 10.17 except for additional patches in the N. in Triangulum, Pegasus, and Andromeda. Traces only were seen the next two hours. At 1 p. m. there were two bands (brightness 0 to 1) from Boötes to Cygnus, through Corona Borealis and Hercules, and a band through Ursa Major, Ursa Minor, Cepheus, and Cygnus. The last traces were seen at 2 p. m. close to the zenith and near Cassiopeia. The horizontal force was unusually high about an hour before the aurora began, and a disturbance commenced at 4 a. m. lasting about twelve hours. It reached its maximum at 9 a. m., and had a second period of violence at 2 p. m., the horizontal force being most affected both times and falling low.

January 7, 1883, 12.15 a. m. to 11.17 a. m.—The weather was cloudy early in the evening, but the clouds began to break away at about 7 p. m. local time (12 midnight Washington); an auroral light was visible through the clouds in the NE. At 1 a. m. a zone (brightness 1), and much obscured by the now breaking clouds, was observed passing about 15° west of the zenith from NW. to SE. At 1.15 the zone was more broken into separate bands, and the middle band, which was brightest, was observed to pass through Cygnus, Cassiopeia, Perseus, and Orion. The sky was rapidly clearing at 2, but the aurora was still much obscured. It appeared to be the same general form, but much broader and brighter, one bright streak in particular (brightness 2 to 3) across the zenith. At 2.15 the zone had sunk towards the NE., still hidden in the bank of clouds, with an altitude of about 60°. There was also a bright patch showing through the clouds in the NNW. close to the horizon. The sky was clear at 3, and starting from Aquila low in the NNW. came a broad band across zenith through Cygnus, Cepheus, Ursa Minor, Camelopardalis, and ending in Gemini (brightness 1), much twisted near the zenith, and a hazy band through Corona Borealis, and ending in a bright patch (1 to 2) in Boötes in the NE. At 3.15 there were four rather broad arched bands across the eastern sky, starting from the same place in the NNW. and ending in the clouds in the SE. near Leo, the highest through Ursa Minor and the lowest close to the horizon. These, however, only lasted a few minutes. At 4 the zone was very broad and consisted of three widely separated bands, broad and hazy (brightness 0 to 1); the starting points were close to *α* Hydræ in the ESE., and *α* Aquilæ in the NNW. The western band was narrow, and ran through Orion and the lower part of the square of Pegasus; the middle was broader and ran through Cygnus, Cepheus, Cassiopeia, Cameleopardalis, Gemini, and Cancer; and the eastern ran through Lyra and Ursa Major, going no farther than Leo. At 4.15 the middle and eastern bands were brighter (brightness 1), and the middle band had moved about 5° west. At 5 a. m. the whole sky was covered with bands running from Pegasus in the NNW. to Leo in the ESE., the SW. edge being in Aries, Taurus, Orion, and Canis Minor, and the NW. in Coma Berenices, Boötes, Corona Borealis, Lyra, Cygnus, and Lacerta. The SW. half was quiet (brightness 1) with confluent bands, but in the NE. half there were several bands of streamers approaching the curtain form and vibrating rapidly from W. to E., slightly tinged with green and rose, and varying in brightness from 1 to 2. Only a few traces overhead were left at 6, and for the next three hours the sky was clouded over, though there were traces in the S. at 8. It was clear again at 10.17, and an irregular white quiet band was seen running from SE. to NW., through Draco, Ursa Major, and Canes Venatici. There was a broad streamer in Lyra in the E. about 30° long, and a bright patch in the NW. in Triangulum, Aries, Taurus, and Perseus. At 11.17 the SW. half of the sky was covered with white quiet bands converging in the E. and W. (brightness 0 to 1), and there were also streamers from Sagitta and Cygnus in the NE. to Triangulum in the NW. This was accompanied by a violent disturbance, the horizontal force being too low to read, and the declination rising over two degrees, with large increase of the vertical component of the force. The display at 5 was accompanied by a disturbance affecting chiefly the horizontal force. After 11.17 the sky became permanently cloudy.

January 7 *and* 8, 1883, 10.15 *p. m. to* 7 *a. m.*—At 10.15 there was an arch of fine short streamers in the NE. with its extremities bearing NW. by NE. by S., and an altitude of about 30°. This faded, and none was seen till 12.15 a. m., when there was a zone, with its starting points in Orion and Serpens. Of these bands two were close together and parallel, passing nearly overhead, and the third through Serpens, Hercules, Cygnus, and Pegasus; thence to Orion it was broken into streamers. In Serpens and Boötes the band had the curtain form (brightness 1). The zone form continued at 1 a. m. (brightness 1), with its starting points in Monoceros ESE. and Hercules NNW. The main portion (three bands, two narrow and one broad, considerably twisted) ran through Lyra, Draco, Cepheus, Ursa Minor, Camelopardalis, Auriga, Gemini, and Canis Minor, and a paler band passed through Canis Minor, Lynx, and Ursa Major, then fading towards the N. This eastern band was brightest at 1.15. At 2 the starting points of the zone were just below α Leonis E. by S. and near ζ Aquilæ NNW. From α Leonis to Monoceros ESE. it was horizontal, and the eastern edge then passed through Cancer, Gemini, Auriga, Camelopardalis, Ursa Minor (W. of Polaris), Cepheus, Draco, and Cygnus, and the western through Canis Minor, Orion, Taurus, Aries, Triangulum, Andromeda, Pegasus, Vulpecula, and Sagitta (brightness 1 to 2). The horizontal portion was gone at 2.15. At 3 a. m. bands and streamers (brightness 1) approaching the curtain form, especially in Leo, filled the NE. sky from Leo ESE. to Hercules NNW. and from near the horizon to Ursa Major. This was broken and paler at 3.15 and a pale streamer was shooting up from the NNW. ending in Cassiopeia. The sky was half overcast with hazy clouds at 4, and at 4.15 traces were visible through the clouds in the N. At 5 there was a pale yellowish band (brightness 1) in the SW. from Monoceros and Canis Minor through Orion, Taurus, and Aries The sky then became more cloudy and traces only were observed in the S. at 6 a. m., and in the NE. at 7 a. m. The sky then became wholly obscured. The magnetic needles were comparatively quiet, being slightly disturbed from 3 to 8 a. m. and again from 12 m. to 2 p. m.

January 8 *and* 9, 1883, 10 *p. m. to* 2.12 *p. m.*—There was a glow in the NE. at 10 p. m. which at 10.15 had developed into a faint arch, with its extremities bearing N. and E. and its crown at an altitude of about 20°. This was gone at 11, but at 12.15 a. m. there was a patch of hazy light in the N. in Canes Venatici, Coma Berenices, and Ursa Major, and a line of faint streamers through Corona Borealis, Boötes, Ursa Major, and Lynx. At 1 there was a slightly sinuous arched band (brightness 1) in the NE. from Monoceros ESE. through Canis Minor, Cancer, the top of Leo, Leo Minor, the lower part of Ursa Major, Canes Venatici, Boötes, and Corona Borealis to Hercules in the NNW. The northern end appeared to be breaking into streamers. These had developed at 1.15 into a bunch shooting up into Draco, and the band had split into two. At 2 a. m. these started from Hercules in the NNW., three or four diverging bands stretching across the eastern sky growing paler towards the SE.; one through Lyra, Ursa Minor, Ursa Major, and Lynx; one through Corona Borealis, Boötes, Canes Venatici, Leo Minor, and Leo, and one or two between this and the horizon with traces of a band which was developed at 2.15 through Cygnus, Cepheus, Cassiopeia, Camelopardalis, and Auriga to Gemini, while the eastern bands were fading. The sky then became overcast. Traces of a zone across the zenith were visible through the hazy clouds at 3, and similar traces of a band at 4 a. m., which appeared to be moving W. Traces were seen again in the NE. at 6 a. m. The sky was partially clear at 8.17, and a quiet band (brightness 1) ran from Andromeda through Lacerta, Cygnus, Draco, and Boötes. The sky cleared off permanently after this. At 9.17 there was a broad, quiet, white band (brightness 1) along the southern horizon from E. to NNW. and a similar band from SE. horizon through Leo to Canis Minor. A third, narrower band, ran from E. to W. close to Ursa Major. There were faint streamers in Lyra, Cygnus, Lacerta, and Cassiopeia, also S. in Boötes, Coma Berenices, and Leo Minor, faint, white, and quiet. There were bright (brightness 2) streamers in the W. and NW. in Taurus, Pleiades, Perseus, and Auriga. They were rose-colored and vibrating rapidly. At 10.17 there was a broad faint white band on the southern horizon, and a band across the zenith SE. to NW., white and quiet (brightness 0 to 1) At 11.17 there was a broad, quiet, white arch (brightness 0 to 1) from E. to W., through Corona Borealis, Ursa Major, and Gemini. At 12.17 p. m. there were 3 such bands, one through Polaris and the lowest at an altitude of about 45°. At 1 p. m. these bands (brightness 0 to 1) started together from Gemini and ran as follows: One, the broadest and brightest, through Leo Minor, Boötes, Corona Borealis, and Hercules; one through Ursa Major, Draco, and Cygnus, and one through Ursa Minor to Cygnus. These bands were constantly shifting, rising towards the zenith and then receding southward. The last traces were seen near the zenith at 2.12 p. m. The magnetic needles were quiet up to 9 a. m., when the horizontal force began to fall, culminating in a disturbance at 1 p. m., with very low horizontal force, high easterly declination, and almost undisturbed vertical intensity.

January 9 *and* 10, 11.15 *p. m. to* 1 *p. m.*—At 11.15 there was a hazy light in the NE. which developed into a faint pale arch, and faded completely before midnight. At 1 a. m. there was a pale glow in the NE. At 2 there was an extraordinary zone parallel to the magnetic meridian instead of at right angles to it as usual. It was so pale as to be scarcely perceptible. The starting points were in Coma Berenices NE., and Pisces SW., extending in breadth from the lower part of Draco to *α* Tauri. At 2.15 there was an arch in the NE. (brightness 1), across the base of the zone, through Leo, Ursa Major, Canes Venatici (including) *α* Boötis, Corona Borealis, and into Hercules. The sky then suddenly clouded over and remained cloudy until 6, when it cleared, and there was a faint band (brightness 0 to 1) from Boötes through Corona Borealis, Lyra, and Cygnus, and another from Pegasus and Andromeda to Cassiopeia. At 7 there was a quiet, bright band from Leo through Cancer, Gemini, Orion, and Taurus. The sky then became again overcast, and continued so until 12.10 when it was clear, and a few faint traces were observed near the zenith. At 1 the last faint traces were seen in the S. in Boötes and Canes Venatici. The magnetic needles were comparatively quiet all night.

January 10 *and* 11, 10.15 *p. m. to* 7 *a. m.*—At 10.15 p. m. there was a faint band of light in the NE. nearly parallel to the horizon and about 20° above it. At 11.15 this had developed into a low arch (brightness 1) with its extremities bearing NNW. and ESE. passing through Canis Minor, Cancer, Leo, Coma Berenices, and Boötes, sending up streamers in Boötes. The altitude of the crown of the arch was about 15°. At 12.15 a. m. it was reduced to a few very faint streamers in the NE. At 1 there was a very faint arched segment in the SW. There was a similar trace in the west at 2, also in the SE. at 2.15. At 3 there was a pale glow fading insensibly into the sky with a well-defined dark segment below it, lying close to the horizon, from E. to SSW. At 3.15 the whole sky appeared to be covered by the palest possible broad bands, separated by narrow dark spaces, parallel to the magnetic meridian and appearing to converge in the NE. and SW. There were slight traces at 4. At 5 a pale, yellowish band (brightness 0 to 1) ran through Boötes, Corona Borealis, Hercules, and Lyra to Sagitta. At 6 there were mere traces in the N., but at 7 a broad, quiet band stretched from Pegasus through Andromeda, Cassiopeia, Ursa Minor, Ursa Major, and Canes Venatici. This was the last seen. The magnetic needles were unusually quiet.

January 12, 1883, 1 *a. m. to* 1 *p. m.*—At 1 a. m. there was a quiet, regular, and narrow arch (brightness 1) from the ESE. in Monoceros to the NNW. in Serpens, through Leo (*μ* Leonis), Leo Minor, Ursa Major, just above *α* Canum Venaticorum, Boötes, and Corona Borealis. At 1.15 it was broader and somewhat sinuous. At 2 there was only a partial arch (brightness 1) from the ESE. in Hydra, through Leo (*δ* Leonis) and Coma Berenices ending in Boötes at an altitude of about 20°. This was fading at 2.15. At 3 and 4 the western horizon was obscured by haze, and traces only were visible. No aurora was seen at 5, but at 6 a quiet band (brightness 1) stretched from Andromeda, through Perseus, Auriga, Gemini, Cancer, and Leo. At 7 a similar band ran through Cygnus, Lyra, Draco, Ursa Major, and Leo. At 8 there were simply traces in the N. At 10.10 there were traces in the E. and SE. and again at 11.10 in the NE. At 12.10 there was a white, quiet arch from E. to. W. through Corona Borealis, Canes Venatici, Ursa Major, Lynx, Gemini, and Canis Minor, and streamers in the E. and NE. (brightness 0 to 1). At 1 p. m. there was a band in the SW. (brightness 0 to 1) from Boötes through Coma Berenices to Leo Minor. This disappeared in a few minutes. There was a slight disturbance at 1 p. m.

January 13, 1883, 8 *a. m. to* 12.17 *p. m.*—There were faint traces of auroral light all round the horizon all the early part of the night, but no definite aurora till the 8 a. m. observation (quarter of 3 a. m., local time). There was then a quiet, yellowish band (brightness 0 to 1) from Taurus through Auriga, Gemini, and Lynx. At 9.17 there was a broad arch, white and quiet (brightness 0 to 1) from the ESE. to the W., with its crown at an altitude of about 20°, and a luminous patch similar in color and brightness in Corona Borealis. At 10.17 the arch had risen to an altitude of 35°, and faint luminous patches appeared between the arch and the horizon. At the same time there was a semi-corona of long, narrow, quiet streamers (brightness 2) which reached from the SE. extremity of the arch to Auriga in the W., and from Andromeda to a point near the zenith. This faded in a few minutes, leaving only the arch. At 11.17 a broad, irregular band, formed of patches of white, quiet light extended along the southern horizon from ESE. to W. There was also a narrow, quiet, white arch (brightness 0 to 1) from the E. to NNW. through Sagitta, Vulpecula, Lacerta, Andromeda, Triangulum, Aries, and the Pleiades. From the northern end of the arch streamers extended up through Perseus. At 12.17 p. m. there were three pale white, striated, parallel bands running from the ESE. to the W., the lower, narrow, through Boötes and Coma Berenices; the middle, broad, through Leo Minor and Canes Venatici to Hercules, and the upper band from the ESE. through Lyra, Draco, Ursa Major, Leo Minor, and Cancer. Faint streamers filled the space between the southern horizon and the lower band. There was also a white, quiet, semi-corona (brightness 1) extending from Lyra though Cygnus, Cepheus, Cassiopeia, and Camelopardalis to Ursa Major. This was all gone at 1 p. m. There was a slight disturbance of the magnetic instruments at 11 a. m. and 12 m.

January 14, 1883, 2.15 *a. m. to* 1.17 *p. m.*—Faint, indefinite light, probably auroral, was visible in the E., close to the horizon, as soon as the twilight disappeared, but the first definite aurora was noticed at 2.15 a. m. (about 9 p. m. local), having developed since the 2 a. m. observation. It was a rather narrow, arched band (brightness 0 to 1) in the NE. from the NNW. in Hercules near horizon to the E. by S. in Cancer, through Lyra, Hercules, Draco, Ursa Major, Leo Minor, and Leo (μ Leonis), with a short broader band shooting up from the NNW. end through Cygnus. At 3 a. m. a rather broad sinuous band (brightness 2) extended from the ESE. in Hydra to the NNW. in Aquila, passing W. of the zenith, through Canis Minor, Gemini, Auriga, Perseus, Andromeda, Lacerta, Cygnus, and Vulpecula. It was fading slightly at 3.15, and had drifted W., now passing through Monoceros, Canis Minor, Orion, Taurus (ϵ Tauri and Pleiades), Aries, Andromeda, Pegasus (β Pegasi), and Delphinus. At 4 a. m. there was a rather broad zone. The middle portion was the brightest (brightness 2), and was made up of narrow, twisted streaks, and the edges of about the same breadth were paler (brightness 1). The starting points were ESE. in Hydra and NNW. in Pegasus. The eastern edge passed through Leo, Leo Minor, Ursa Major, Ursa Minor, Cepheus, Andromeda, and Pegasus; the western through Leo, Cancer, Lynx, Auriga, Perseus, Andromeda, and Pegasus. At 4.15 the whole had drifted about 10° westward and was breaking into separate bands and growing paler (brightness 1). At 5 it was reduced to a quiet, yellowish band from Pegasus, through Andromeda, Cassiopeia, Camelopardalis, Ursa Major, Leo Minor, and Leo. At 6 there was a band in the SW. (brightness 0 to 1), through Pisces, Auriga, Gemini, and Cancer. At 7 a belt of bands (brightness 1) passed through Aries, Taurus, Orion, Gemini, Cancer, Canis Minor, and Hydra. This was reduced at 8 to traces over the southern horizon. At 9 these traces had developed into an arch, spanning the horizon from ESE. to NNW., with its crown at an altitude of about 15°, white and quiet (brightness 0 to 1). At the same time a broad, irregular arch extended from the ESE., through Corona Borealis, Draco, Cepheus, Cassiopeia, and Perseus, to the Pleiades, in the NNW. It was in rapid whirling and vibratory motion, and at times was tinged with a bright rose color (brightness 4), and lasted but a few moments. At 9.17 there was a very broad arch (brightness 0 to 1) from the ESE. to the NNW., with its corona at an altitude of about 18°, and fringed on the upper edge with very short pale streamers, and at the same time a white, quiet band ran from the E., through Hercules, Lyra, Cygnus, and Lacerta, to Leo. There was a band in the S. side from Corona Borealis, through Ursa Major, to Gemini, with a slight fringe of streamers, and streamers in the E., N., and W., forming with the band in the S. a well-defined corona. There was no motion except a slight vibration of the streamers in the N. At 10.17 the arch on the southern horizon was still visible, but its streamers had faded. There were faint streamers, quiet and white (brightness 0 to 1), in the NE., in Sagitta and Cygnus, and in the NNW., in Triangulum and Aries. At 11.17 there was a quiet, faint, white arch on the southern horizon from ESE. to WNW. At 12.17 a narrow band (brightness 1) extended from ESE. to WNW., through Hercules, Ursa Major, Lynx, and Gemini, with luminous spots also in Cygnus, Lacerta, and Cassiopeia. At 1 p. m. a band (brightness 0 to 1) ran from Aquila, in the ESE., through Ursa Minor, to Gemini, in the WNW., and the last faint traces were seen at 1.17. The magnetic intensity was slightly increased at 5 a. m., and there was a slight disturbance at 1 to 3 p. m.

January 15, 1883, 5.17 *a. m. to* 12.17 *p. m.*—At 5.17 a motionless band (brightness 1) crossed the sky from NW. to ESE., west of the zenith, through Pegasus, Andromeda, Cassiopeia, Camelopardalis, Ursa Major, Leo Minor, and Leo. At 6.17 series of white curtains (brightness 1) with gentle motion covered the sky from the eastern horizon to Auriga and Perseus in the W., and from Leo Minor in the S. to Cygnus in the N. There were also luminous patches in Draco, Pegasus, Triangulum, Aries, and Taurus. At 7.17 yellowish-green bands (brightness 1 to 2), waving slowly from W. to E., extended from Pegasus through Lacerta, Cygnus, Lyra, Hercules, Corona Borealis, Boötes, and Coma Berenices. At 8.15 a broad arch spanned the southern horizon from ESE. to W., with its crown at an altitude of about 15°. A broad band extended from the western end through Gemini and Leo Minor to Ursa Major, and a narrow irregular band from the ENE. through Cygnus, Lacerta, Andromeda, and then through Cepheus, Cassiopeia, and Perseus. The whole was quiet and white. At the next hour there were merely traces in the S. and NW. At 10.17 a white and quiet arch lay over the southern horizon from ESE. to WNW., with its crown at an altitude of about 15°, with a narrow band from the ESE. through Corona Borealis, Ursa Major, and Gemini. At 11.15 there was a large patch of luminous haze in the S., and at 12.17 there was a zone (brightness 0 to 1), with its starting points ESE. in Aquila and WNW. in Gemini, extending in breadth from Boötes SSW. to Cassiopeia NNE. Streamers of the same brightness as of the zone ran from Taurus in the NW. up into Perseus. The horizontal force and declination were more or less disturbed from 7 a. m. to 12 m., the force decreasing and the eastern declination increasing.

January 16, 1883, 2.15 *a. m. to* 7 *a. m.*—Vague arched bands, which could not with certainty be distinguished from cirro-stratus clouds, were visible at times early in the evening, but there was no definite aurora till 2.15 a. m. (about 9 p. m. local), when there was part of a pale arch in the ESE. in Leo, running from below α to β (brightness 0 to 1). At 3 two broad bands (brightness 1 to 2), nearly straight, slanted up from E. by S. in Leo through Coma Berenices, Boötes above α Boötis, into Corona Borealis. At 3.15 it had changed to a narrow arch (brightness 1) from the E. in Leo through the same constellations, fading in the NNE. At 4 there were only evanescent traces over the southern horizon. At 5 a quiet band (brightness 0 to 1) passed from Cygnus through Lyra, Hercules, and Serpens to Boötes. At 6 there were merely traces in the SE. At 7 a yellowish band (brightness 1) with a few vibrating streamers ran from Pisces through Aries, Taurus, Orion, and Gemini to Cancer. The haziness now increased, and traces only were observed at the next two observations, after which the sky clouded over and the weather became stormy. There was a slight magnetic disturbance at 6 a. m.

January 17, 1883, 9.10 *a. m. to* 12.17 *p. m.*—The storm began to break about 9 o'clock p. m., local time. At 9.10 a. m. (Washington time) the sky was clear enough to exhibit a white, quiet arch (brightness 1 to 2) from the ENE. to the NNW., through Sagitta, Vulpecula, Lacerta, Cygnus, and Andromeda to Triangulum, with faint light, partly masked by the clouds in the southern horizon. Traces only were visible at 10, though the sky was clear. The weather then became stormy again, and only traces of the aurora could be observed. Traces of a corona at 11.15 and a few white and quiet traces at 12.17. A disturbance of all three elements commenced at 4 a. m. and lasted till 12 m., reaching to maximum at 11 a. m.

January 18, 1883, 12.15 *a. m. to* 1.17 *p. m.*—At 12.15 there was a waving band of curtains (brightness 1) crossing near the zenith from SE. in Canis Minor to NW. in Hercules, through

Gemini, Lynx, Ursa Major, Draco, Ursa Minor, and Lyra. At 1 a. m. there was a small zone of two bands in the NE. (brightness 1). The starting points were in Hydra ESE. and Hercules NNW., with the upper band through α and β Ursæ Majoris, and the lower just above α Canum Venaticum. At 1.15 the zone was condensed to a single rather sinuous band (brightness 1 to 2), from the same starting points, running through Leo, Leo Minor, Ursa Major, Canes Venatici, below α Boötis and Corona Borealis. At 2 there were two irregular bands in the NE. from the ESE. in Hydra to the NNW. in Aquila, reaching their greatest altitude near α Ursæ Majoris, and a shifting band developing from the same starting points through Ursa Minor. At 2.15 the lower bands were in nearly the same place, and the upper band starting below Procyon ran through Gemini, Auriga, Camelopardalis, Cassiopeia, Cepheus, and Cygnus (brightness of all 1 to 2). At 3 there was a broad belt of two or three yellow shifting bands (brightness 2 to 3) low in the SW., from NW. in Aquila to SE. in Monoceros, through Pegasus, Triangulum, Aries, Taurus, and Orion, gradually beginning to wave. Traces of these bands still remained in the NW. at 3.15, while a band (brightness 2 to 3) crossed the zenith from NNW. in Aquila to ESE. in Monoceros. North of the zenith the band was composed of short streamers vibrating rapidly from N. to S., and south of the zenith of serpentine streaks waving from S. to N., all shifting rapidly. The lower edge of the band was tinged with rose. At 4 there were only traces in the NE. At 5.15 quiet bands (brightness 0 to 1) ran from Leo through Canes Venatici, Ursa Major, Corona Borealis, and Hercules. At 6.15 a broad, yellowish band (brightness 1), with streamers moving slightly in Cygnus and Draco, ran through Cygnus, Lyra, Draco, Corona Borealis, Ursa Major, Coma Berenices, Leo, and Leo Minor. At 7.15 there were merely traces in the NE., and none were seen at 8. At 9 and 10 faint traces began to appear, and at 11.15 a white, quiet band (brightness 0 to 1) ran from ENE. to NNW. through Hercules, Draco, Ursa Minor, and Gemini. At 12 a similar band, but broad, ran from the ESE. to NW., through Corona Borealis, Canes Venatici, Leo Minor, Cancer, and Canis Minor, with luminous patches near the southern horizon. The last faint traces were observed at 1 p. m. The magnetic instruments were slightly disturbed from 3 a. m. to 2 p. m., the disturbance reaching its maximum at 1 p. m.

January 19, 3.15 *a. m. to* 1.25 *p. m.*—At 3.15 there was a vertical twisted streak in the E., starting in Virgo close to the horizon and running up into Leo, where it blended into two nearly straight bands through Coma Berenices and Boötes, growing pale towards the N. (brightness 1 to 2). The streak waved and shifted slowly. At 4 none was perceptible, but at 4.15 there were faint traces close to the eastern horizon. No more was seen till 7.15, when there were two bands, one from Andromeda through Lacerta, Cygnus, Lyra, Hercules, Corona Borealis, and Boötes, and the other and upper band through Draco and Canes Venatici, waving slowly towards the zenith (brightness 1). There were faint traces over the northern horizon at 8.15. At the next two observations there were faint traces over the southern horizon. At 11.15 a zone of broad bands crossed from ESE. to WNW., white and quiet (brightness 1), covering most of the sky from Boötes in the S. to Cassiopeia in the N. This remained essentially unchanged at the next observation, except that the bands were narrower and more clearly defined. At 1 p. m. a band (brightness 0 to 1) ran from the NW. in Gemini to the E. in Sagitta, through Auriga, Perseus, Triangulum, and Andromeda, and there were faint streamers in Cassiopeia. At 1.17 traces were still visible passing through Cassiopeia, but were wholly gone at 1.25. There was a slight disturbance of the magnets, affecting almost wholly the horizontal force, and reaching its maximum about 7 a. m.

January 20, 1883, 2 *a. m. to* 1.17 *p. m.*—Arched traces began the aurora lying low in the NE. at 2 a. m. At 3 there was a broad, hazy, and indistinct zone (brightness 0 to 1), which was brightest in the NW. and on the eastern edge. The starting-points were near the horizon, ESE. in Leo, and NNW. in Aquila. The western edge ran through Leo, Lynx, Camelopardalis, Cassiopeia, Cepheus, Cygnus, and Vulpecula, and the eastern through Coma Berenices, Boötes, Corona Borealis, and Lyra. At 3.15 it had spread a little further west, hazy and indefinite. At 4 there was a rather narrow, regular arched band in the NE. from NNW. in Delphinus to the ESE. in Virgo, through Cygnus, Lyra (α Lyræ), Corona Borealis, Boötes (α Boötis), and Coma Berenices (brightness 1), with two or three incomplete bands below it. This had changed at 4.15 into two broader and more irregular bands, starting from the same points, but reaching a greater altitude, through Cygnus, Lyra, Draco, Boötes, Canes Venatici, and Coma Berenices (brightness 1 to 2). At 5 a quiet band (brightness 0 to 1) ran through Cygnus, Lyra, Draco, Corona Borealis, Boötes, Coma Berenices, and Leo. At 6.15 a similar band (brightness 1) ran through Cygnus, Lyra, Hercules, Boötes, and Virgo. At 7 there were merely traces on the northern horizon. At 8 a quiet double band (brightness 0 to 1) crossed from Ursa Major and Leo to Auriga and Perseus. At 9.15 there were faint traces near the zenith and in the ESE. and NW. At 10.15 a. m. a white, quiet arch (brightness 1) ran from the ESE. to the WNW., with its crown at an altitude of about 15°, while there were also long, quiet streamers in the E., passing through Corona Borealis, Draco, Hercules, and Lyra, with a luminous bar from Lyra through Cygnus, Cepheus, and Cassiopeia. At 11.15 there was a zone of broad bands (brightness 0 to 1), with its starting-points ESE. and NNW., reaching in breadth from Boötes to the zenith. At 2.15 there was a broad, quiet, white, and diffuse arch from ESE. to WNW. There were also streamers in the ESE., E., and ENE., in Sagitta, Lyra, Aquila, Delphinus, Vulpecula, Cygnus, Pegasus, and Lacerta. The last faint traces were seen in the E. near Aquila and near the zenith. The needles were slightly disturbed at 3 and 4 a. m. with high horizontal force, and from 8 a. m. to 3 p. m. there was a considerable disturbance, reaching its maximum at 11 a. m.

January 20 *and* 21, 1883, 11.15 *p. m. to* 11.15 *a. m.*—The aurora began at 11.15 p. m. as a faint streak in the NE. through Ursa Major, Lynx, and Gemini. At 12.15 a. m. there was a zone of two bands with its starting points W. by N. and E. by S., and passing, one through Canis Minor, Auriga, Cassiopeia, Cepheus, Lyra, and Hercules, the other through Canis Minor, Ursa Minor, Draco, and Hercules (brightness 1 to 2). It was brightest in the W. where the bands assumed the curtain form. At 1 a. m. there was a narrow, arched belt of three bands (brightness 1) from Hercules NNW., starting at an altitude of about 15° to near the horizon ESE. in Hydra, through Corona Borealis, Draco, Boötes, Ursa Major (λ), and Canes Venatici (above α), Leo Minor, Leo, and Cancer. At 1.15 it was a little brighter in the NNW., twisted and spreading into Lyra. At 2 a. m. there was a broad, hazy, indefinite zone (brightness 0 to 1). The starting-points were ESE. in Hydra and NNW. in Aquila, and it extended in breadth from ε Ursæ Majoris to Cassiopeia (near ε). At 2.15 it was brighter on the edges and spread farther west (into Perseus). At 3 there was a narrow zone (brightness 1) west of the zenith. The starting points were SE. in Hydra and NNW. in Aquila, stretching in breadth from close to Polaris to α Arietis. At 3.15 it was much brighter (brightness 1 to 2) and had drifted W., so that the eastern edge passed through Cassiopeia, and the western took in α Orionis and α Tauri. At 4, three or four bands, broad and sinuous (brightness 1 to 2), started from Pegasus in the NW., going straight up for about 15°, and then bending round through Cygnus, Lyra, Hercules, Draco, Corona Borealis, and Boötes (α Boötis). At 4.15 twisted streaks (brightness 2) forming a narrow zone from Pegasus NW., through Andromeda, Perseus, Auriga, Gemini, Cancer, and Canis Minor, ending in Hydra ESE., with considerable waving motion near the zenith. At 5.15 a band (brightness 1) ran through Andromeda, Lacerta, Cygnus, Lyra, and Hercules. At 6.15 a quiet band (brightness 0 to 1) stretched from Pegasus through Vulpecula and Hercules to Boötes. At 7.15 a zone (brightness 1 to 2) crossed the zenith with its starting-points NW. and SSE., in Aries, Andromeda, Leo, and Canes Venatici. It reached SW. to Gemini and Auriga, and NE. to Corona Borealis and Lyra, where it had a few bands of streamers in rapid, waving motion (brightness 1 to 2). At 8.15 a. m. there were faint traces in the N. Traces appeared again in the E. at 9.15 a. m. and at 11.15 in the SE. The magnets began to be agitated about 3 a. m. and were not quiet again till 2 p. m., the disturbance reaching its maximum about 7 a. m.

January 22, 1883, 6.15 *a. m. to* 11 *a. m.*—No aurora was seen till 6.15 a. m. (about 1 a. m. local time), when a band passed from Pegasus through Triangulum, Perseus, Cassiopeia, Cepheus, Draco, Ursa Minor, Ursa Major, Boötes, and Coma Berenices to Leo, and Leo Minor, with bright green and yellow streamers in Cassiopeia, Cepheus, and Draco, vibrating rapidly from SW. to NE., and pale streamers waving slowly in SE. (brightness 1 to 2). At 7.15 there was a quiet band (brightness 0 to 1) from Pegasus through Lyra, Hercules, and Corona Borealis to Boötes. Traces were observed remaining in the N. at 8.15, in the ESE. at 10.15, and in the E. at 11 a. m. The magnets were somewhat disturbed from 6 to 8 a. m., and there was a slight disturbance from 1 to 4 p. m.

January 24, 1883, 9.15 *a. m. to* 1.17 *p. m.*—Most of the night was cloudy, but at 9.15 a. m. and at 1.17 p. m. traces of aurora were observed among the clouds.

January 25, 3 *a. m. to* 1.50 *p. m.*—Early in the evening there were indefinite streaks in the

NE., which may have been auroral, but the brilliant moonlight rendered it impossible to be sure of this. At 3 a. m. a rather broad, striated, hazy band (brightness 1) crossed the zenith from near horizon ESE. in Hydra to Vulpecula NNW., at an altitude of about 15°, passing through Cancer, Lynx, Camelopardalis, Cassiopeia, Cepheus, Lacerta, and Cygnus (close to ϵ). This was in the same position at 3.15, but was narrower, paler, and very sinuous and twisted. At the next two hours there were no traces of aurora, but at 6.15 there were two bands of yellowish-green streamers, starting from Boötes, one going N. through Corona Borealis, Draco, and Cygnus, and the other S. through Coma Berenices, Leo Minor, and Gemini. The streamers vibrated rapidly from W. to E. (brightness 1 to 2). At 7.15 there were faint traces in the S. At 8.15 two quiet bands (brightness 0 to 1) ran through Boötes, Canes Venatici, Ursa Major, Auriga, and Perseus. The aurora then died away to mere traces, which were wholly gone at 11 a. m., reappearing at noon, and gradually developing, first into sinuous streaks across the zenith with streamers in the SE., and then into a corona (brightness 0 to 1) centering in Ursa Minor. This was replaced by a narrow sinuous band at 1.17 running through Cygnus, Ursa Major, and Leo Minor. Traces of this band were still visible at 1.50, when the daylight was quite bright. A magnetic disturbance commenced at 3 a. m. and was still going on at 3 p. m. (10 a. m. local time), with one maximum at 6 a. m. and one at 2 p. m., both with very high eastern declination and very low horizontal force.

January 25 and 26, 1883, 10.15 p. m. to 1.17 p. m.—As soon as it grew dark enough for an aurora to be visible a faint arch appeared in the NE. with its extremities NNW. and ESE., passing through Boötes, Canes Venatici, Ursa Major, Leo Minor, Lynx, and Gemini. The altitude of the crown was about 50°. At 11.15 this had developed into a zone, with its extremities NW. and SE. The northern edge ran through Hercules, Draco, Ursa Major, Lynx, Gemini, and Orion, and the southern edge through Orion, Auriga, Perseus, Cassiopeia, Cepheus, Lyra, and Hercules (brightness 1 to 2). At 12.15 a. m. waving bands of curtains ran through Serpens, Cygnus, Lacerta, Andromeda, Taurus, and Orion, and there was also a hazy patch in Orion, Gemini, Cancer, and Leo. At 1 a. m. a broad, hazy, sinuous band, festooned and breaking into streamers and irregular patches in the NNW., ran from the ESE. in Monoceros to the NNW. in Hercules, through Canis Minor, Gemini, Lynx, Auriga, Camelopardalis, Ursa Major, Ursa Minor, and Draco. There was also a luminous patch in Taurus continued by an imperfect band through Cassiopeia, and a band in the E. from Leo through Leo Minor and Canes Venatici into Boötes (brightness 1). At 1.15 this was broken and mostly faded, except the band in the E. and streamers in the NNW. There was nothing left at 2 a. m. except a few streamers in the N. and NNW. in Lyra and Hercules, which had developed at 2.15 into four slightly diverging, sinuous bands (brightness 0 to 1), all ending in the clouds in the SE. One passed through Draco and Ursa Major, one through Draco and Ursa Minor, one fading near α Cygni, through Cepheus, Cassiopeia, and Camelopardalis, and one through Lacerta and Cassiopeia. At 3 there were broken streamers in the N. and NW., and one pale band across the western horizon through Pegasus, Aries, Taurus, and Orion. This was replaced at 3.15 by three bands, narrow and rather hazy, starting between Vulpecula and Pegasus NNW. to NW., the upper through Cygnus, Cassiopeia, Camelopardalis, Auriga, and Gemini, growing very pale; the next through Pegasus, Andromeda, Perseus, β Aurigæ into Gemini, and the lowest through Pegasus, Triangulum, Aries, Taurus, and Orion, all fading in the moonlight in the SE. (brightness 0 to 1). At 4 a. m. there was a regular narrow arch (brightness 2) tinged with green and rose in the W., with an altitude of about 25°, running from the ESE. in Hydra (just below α) to the NW. just below γ Pegasi, through Monoceros, Orion (δ), the lower part of Taurus, Cetus (α), and Pisces. At 4.15 it was lower, passing through the nebula in Orion, and paler (1 to 2) with a band above it (brightness 1) through Canis Minor, Gemini (γ), Taurus, and Aries (α). The needles were agitated. At 5.15 a yellowish band, waving very slowly, ran from Cygnus through Draco, Ursa Minor, Ursa Major, Leo Minor, and Leo to Hydra, while a second band commenced from Cygnus through Lyra, Corona Borealis, Canes Venatici, Boötes, and Coma Berenices to Leo (brightness 1). At 6.15 a quiet band (brightness 0 to 1) extended from Cassiopeia through Cygnus, Hercules, and Serpens to Boötes. Nothing remained at 7.15 except traces in the SW. At 8.15 a faint, quiet band ran from Taurus through Auriga, Gemini, and Leo. At 9.17 there was a small patch in the SE. and a narrow, white, and quiet band running thence through Boötes, Coma Berenices, and Leo, and also a bright patch in the SW. in Gemini (brightness 1 to 2). At 10.15 a broad, irregular, white, quiet band (brightness 1 to 2) ran from the E. through Hercules, Corona Borealis, and Canes Venatici to Leo Minor, with a patch of the same character in the WNW. from Orion through Auriga. At 12.15 there were faint traces of aurora in the ESE. and S. At 1 p. m. traces of streamers appeared through Aquila, Lyra, Ursa Major, and Boötes. The last faint traces were seen at 1.17 p. m. A magnetic disturbance commenced at 5 a. m. and lasted till 5 p. m., being most violent at 5 a. m., 9 a. m., and 3 p. m.

January 26 and 27, 10.15 p. m. to 12.15 p. m.—At 10.15 p. m. there was a faint and narrow arch in the NE. through Canis Minor, Cancer, Leo Minor, Coma Berenices Canes Venatici, and Boötes. At 11.15 this was broken up into a hazy mass in Canis Minor, Cancer, and Leo, and streamers in Serpens and Boötes, and at 12.15 was reduced to a faint flush in the NE. At 1 a. m. there were two bands of short, ill-defined streamers in the NE., the upper from Hercules in the NNW. through Corona Borealis, Boötes, and Canes Venatici, and the lower through Leo (ρ and δ) and Coma Berenices, starting in Hydra and ending near α Boötes (brightness 0 to 1). These bands were essentially unchanged at 1.15, but a bunch of streamers had developed at the NNW. end reaching up into Draco. At 2 a. m. nothing remained but traces of the bands. These traces were better defined at 2.15, and there was a twisted streak (brightness 1) from close to α Vulpeculæ (NNW.) through Cygnus (β and δ). At 3 a narrow arched and somewhat sinuous band (brightness 1) extended from NNW. in Vulpecula to ESE. in Hydra, through Cygnus (β) α Lyræ, Draco, the top of Boötes, Canes Venatici (α), and Leo (δ and θ). At 3.15 this band was paler and formed an outlying band of a zone with the same starting points. The western edge of the zone ran through Leo, Gemini, Auriga, Perseus, Andromeda, and Pegasus, and the eastern through Leo, Leo Minor, Ursa Major, Camelopardalis, Ursa Minor, Cepheus, and Cygnus, while there was an arched band low in the E. from β Leonis to α Boötes. At 4 a. m. there was a hazy zone (brightness 0 to 1) with its starting points in the ESE. in Crater and NW. below ζ Pegasi. The western edge ran through Leo, Leo Minor, Lynx, Camelopardalis, Cassiopeia, and Andromeda, and the eastern through Leo, Cancer, Gemini, the top of Orion, Taurus (α), and Aries. At 4.15 the zone was in nearly the same place, but its eastern edge had moved four or five degrees W., while a twisted streak (brightness 2 to 3), very sinuous and tinged with green and rose, began to move up from the ESE., spreading out and beginning to wave, at first slowly and then rapidly, as it approached the zenith, passing up through Ursa Major and Cassiopeia (where it stopped) in 2 or 3 minutes, while the zone faded. It was brightest near the horizon. At 4.17 and 4.18 a second similar band was beginning to develop a little to the E. of this. At 5.15 a belt of quiet bands ran from Pegasus through Lacerta, Cygnus, Cepheus, Draco, Ursa Major, and Coma Berenices, while the lower edge passed through Cygnus, Lyra, Sagitta, Hercules, Corona Borealis, Serpens, and Boötes (brightness 1 to 2). Only traces remained at 6.15. At 7.15 there were two bands (brightness 0 to 1), one through Taurus, Perseus, Cassiopeia, Cepheus, Cygnus, and Corona Borealis, and the other through Cepheus, Draco, Ursa Major, and Coma Berenices. At 8.15 a quiet band (brightness 0 to 1) ran through Vulpecula, Hercules, Serpens, and Boötes. At 9.15 this was reduced to a streak, lying only in Hercules and Corona Borealis, with faint traces in the NW. At 10.15 a broad irregular mass of rays, converging towards the zenith (brightness 4), occupied Cassiopeia, Cepheus, Ursa Minor, Camelopardalis, Ursa Major, Draco, Canes Venatici, Coma Berenices, Boötes, and Serpens. This body of rays was slightly tinged with green and rose, and vibrated easterly, having also a slow but constant change of form and position. The western sky was filled with long, fine streamers from Canis Minor to Aries, and there was also a diffuse, white, quiet arch from the SE. to the NW., with its crown at an altitude of about 10° above the southern horizon (brightness 0 to 1). At 11.15 there was a broad striated band (brightness 0 to 1) running ESE. and WNW. through Hercules, Corona Borealis, Ursa Major, Ursa Minor, Lynx, Aquila, and Gemini, white and quiet. At 12.15 there were very faint traces of an arch running ESE. by WNW., passing a little south of the zenith. A magnetic disturbance commenced at 4 a. m. and continued about ten hours, being at no time very large, but reaching its maximum at 11 a. m.

January 27 and 28, 10.15 p. m. to 12.15 p. m.—The aurora began at 10.15 as a faint streak in the NE., which by 11 o'clock had developed into an arch of streamers through Canis Minor, Cancer, Leo, Coma Berenices, and Boötes (brightness 2), faintly tinged with green and rose, and in rapid vibration from E. to W. This had become quiet and faded to brightness 1 at 11.15. At

12.15 there were two parallel bands of curtains from the NW. to ESE., through Cancer, Leo, Leo Minor, Canes Venatici, Ursa Major, Boötes, Corona Borealis, and Hercules, moving but slightly (brightness 1 to 2). At 1 a. m. nearly the whole eastern sky was covered with aurora (brightness 2). A broad sinuous band ran from near α Hydræ in the ESE. to Cygnus in the NNW., through Leo, Leo Minor, Canes Venatici, Ursa Major, Draco, Hercules, and Lyra, while above this were three series of broad indistinct curtains radiating from the zenith and not reaching west of Gemini and Cassiopeia. At 1.15 the curtains were fading, leaving the bands which were slightly tinged with green and rose in the ESE. At 2 a. m. there was a broad, somewhat sinuous band (brightness 2) in the NE., from the NNW. in Hercules to the ESE in Hydra, through Corona Borealis, Canes Venatici, Ursa Major, and Leo (δ and θ), with traces of a streak through Cassiopeia and Gemini. At 2.15 there were also partial coronal streamers (brightness 1) occupying Leo, Leo Minor, Ursa Major, Ursa Minor, Draco, Cepheus, Cygnus, and Cassiopeia, centering towards Polaris, with pale bands branching off from the ESE. in Gemini. At 3 and 3.15 there was a narrow, rather regular arch (brightness 1 to 2) in the NE. from the ESE., low in Leo to the NNW. in Hercules, through Virgo, Coma Berenices, α Boötis, Corona Borealis, and Serpens, with a streak (brightness 0 to 1) E. by S. from Leo up into Gemini. There were only faint traces at 4, but at 4.15 these had developed into two bands (brightness 0 to 1) starting, respectively, NNW. and NW., one through Cygnus and the other through Pegasus, Andromeda, and Cassiopeia, faintly visible as far as Leo. At 5.15 a quiet band (brightness 1) ran from Hydra through Canis Minor, Orion, and Taurus to Cetus. Faint traces were observed at 6.15 and 7.15 a. m. No more was seen till 11.15 when a broad, diffuse, quiet arch (brightness 0 to 1) ran from the ESE. to the WNW., through Corona Borealis, Ursa Major, and Gemini. The last faint traces were seen in the ESE. at 12.15 p. m. The horizontal force was unusually high from about an hour before the beginning of the aurora, but returned to its ordinary reading at about 3 a. m., remaining undisturbed till 1 p. m., when there was a slight disturbance for a couple of hours, the horizontal force falling and the declination rising. The vertical intensity was rather high all day.

January 28 and 29, 1883, 10.15 p. m. to 12.15 p. m.—There was a faint streak in the NE. at 10.15 p. m., and faint traces were again visible in the ENE. at 11.10 and in the NW. again at 12 midnight. There were traces in the N. and E. at 1 a. m., which had developed at 1.15 into a slightly sinuous arched band (brightness 1) from the NNW. in Hercules to the ESE. in Hydra, through Corona Borealis (α), Boötes (ε), Coma Berenices, and Leo (β). At 2 a.m. the arch was in the same position, but had faded to brightness 0 to 1, and there was a second similar arch a little above it, passing through Canes Venatici and β Boötis. This had faded to traces at 2.15. At 3 there were two bands (brightness 0 to 1), beginning in nearly the same place in Hydra, but fading in Coma Berenices, with a trace also in the N. This developed at 3.15 into a somewhat sinuous band (brightness 1) from ESE. in Hydra to the NNW. in Vulpecula, through Leo (θ), Coma Berenices, Canes Venatici (α), Boötes, Draco (β and γ), and Cygnus close to δ. At 4 a. m. a festooned band (brightness 1 to 2) started from nearly the same point in the NNW., and passed through Cygnus, Draco, Boötes, Canes Venatici, Coma Berenices, and Leo, the ESE. in Virgo. This had become straighter at 4.15, and from the ESE. end came curved radiating streamers through Leo, Leo Minor, and Ursa Major, all slowly shifting. At 5.15 there were only traces in the NE., and no more was seen till 7.15, when there was a quiet, yellowish band (brightness 1) from Aries through Andromeda, Cassiopeia, Lacerta, Cygnus, and Lyra to Hercules. A fainter band (brightness 0 to 1) at 8.18 ran from Taurus through Orion, Gemini, Cancer, and Leo to Virgo. At 9.15 a broad, pale, quiet arch extended from the ESE. to WNW. with its crown at an altitude of about 18°, and above it a second similar arch from the same starting points, through Corona Borealis, Ursa Major, and Gemini. There was also an irregular arch of quiet streamers from the E. to NW. through Cygnus, Lacerta, Andromeda, Perseus, and the Pleiades. At 10.15 there was a broad, quiet arch (brightness 0 to 1) from the ESE. to the WNW., with its crown at an altitude of 20°, with a similar arch from Hercules through Corona Borealis, Canes Venatici, Leo Minor, Cancer, and Canis Minor. No more was observed till 12.15 p. m., when there was a broad, quiet white band (brightness 0 to 1) from the ESE. to the WNW. through the zenith, and from Polaris to the lower extremity of Ursa Major. The needles were unusually quiet all night though there was a slight disturbance at 9 a. m.

January 29 *and* 30, 1883, 11.15 *p. m. to* 1 *p. m.*—There was a faint streak along the horizon in the NE. at 11.15, which developed into an ill-defined arch of pale streamers, and had subsided to a faint glow at 12.15 a. m. At 1 and 2 faint traces only were visible, and absolutely no aurora was visible at 3. At 4, however, there was a well marked, rather narrow zone (brightness 1), with its starting points ESE. in Leo and NNW. in Pegasus, occupying part of Leo (ζ, δ, and θ), Coma Berenices, and Canes Venatici, Ursa Major, Ursa Minor, Cepheus, Draco, Lacerta, the top of Cygnus (not inclosing α), and Andromeda, with an outlying band through Cassiopeia. At 4.15 the starting points were nearly the same, but the aurora had drifted westward so as to occupy Pegasus, Andromeda, Perseus, Cassiopeia, Auriga, Camelopardalis, Lynx, Leo Minor, and Leo, where it was brighter (1 to 2) and much convoluted. This was essentially unchanged at 5.15. At 6.15 a quiet band (brightness 1 to 2) ran from Pegasus through Cygnus, Lyra, Hercules, Corona Borealis, and Boötes to Coma Berenices. At 7.15 a quiet band (brightness 1) ran from Cancer through Gemini, Auriga, Taurus, and Pisces. At 8.15 there were merely traces near the horizon in the N. At 9.10 bands (brightness 1) ran through Cassiopeia, Perseus, Cygnus, and α Lyræ. At 10.10 a band (brightness 2) ran through Ursa Minor, Ursa Major, Auriga, Boötes, Coma Berenices, Leo Minor, Gemini, Cepheus, Hercules, and Corona Borealis. At 11.15 a bright band (brightness 4) ran through Ursa Major, Boötes, Gemini, Auriga, Cassiopeia, Cygnus, Draco, and Lyra. At 12.10 p. m. there were traces in the NW. and N. at an altitude of 20° and 50°, and the last faint traces were seen in Lyra and in the S. at 1 p. m. The magnetic needles were unusually quiet all night.

January 31, 1883, 1 *a. m. to* 10.10 *a. m.*—Faint glimmers of aurora were observed in the NE. early in the evening, but there was no definite aurora till 1 a. m., when there were two broad bands of somewhat indefinite curtains (brightness 1) across the eastern sky, with slight waving motion running from Leo in the ESE. to Vulpecula (α) in the NNW., through Leo, Lynx, Ursa Major, Ursa Minor, Draco, Lyra, and Cygnus. These had changed at 1.15 into a broad band from the same starting points, running through Cancer, Gemini, Auriga, Camelopardalis, Cepheus, and Cygnus (brightness 1 to 2). It was brightest (brightness 2) in the NNW., and towards the ESE. was split longitudinally in two, and very sinuous near the horizon. At 2 a. m. a broad band (brightness 2 to 3), somewhat inclined to split lengthwise, and sinuous near the horizon, swept waving slightly from the NW. to the E. by S., occupying Pegasus, Andromeda, Lacerta, Cygnus, Cepheus, Draco, Lyra, Ursa Major, Leo Minor, and Leo. At 2.15 a broad band swept round from NW. to ENE., about 35° above the horizon, from Pegasus, through Andromeda, Perseus, Auriga, Gemini, Leo, Leo Minor, Ursa Major and Canes Venatici into Draco; there joining three spiral bands, making a sort of vortex between Draco and the zenith (brightness 2 to 3). The magnets were somewhat disturbed, especially the declination magnet, the eastern declination increasing about 1°. At 3 a. m. the SE. sky from near α Hydræ to near α Boötis was filled with exceedingly sinuous broad bands (brightness 1 to 2), reaching nearly to the zenith, the most southern being continued in the form of a narrow zone through Cancer, Gemini, Taurus, Aries, Triangulum, and Pegasus, ending in the NW. At 3.15 the bands were less sinuous and longer and the zone narrower and brighter (2 to 3). At 4 there was a very broad zone across the zenith (brightness 1 to 2). The starting points were between ESE. and E. by S. in Crater and Hydra, and NW. in Pegasus. The western edge ran through Virgo, Boötes (α), Corona Borealis, Lyra, and Cygnus, and the western through Hydra, Canis Minor, Orion, Taurus, Aries, and Pegasus. At 4.15 the zone was fading and breaking up, except the eastern edge, which had narrowed into a band (brightness 3) faintly tinged with rose on the lower edge, above which in the NE. was developing a row of imperfect curtains. At 5.15 four quiet yellowish bands started from Pegasus NW. (brightness 1 to 2), running as follows: The first, north of the zenith, through Lacerta, Cygnus, Draco, and Canes Venatici, ending in Virgo; the second, through Cassiopeia, Cepheus, Ursa Minor, Ursa Major to Virgo; the third, south of the zenith through Andromeda, Perseus, Auriga, and Lynx to Leo; and the fourth, through Aries, Taurus, Orion, and Canis Minor to Hydra. At 6.15 there was a zone running W. and E. (brightness 2 to 3), with the northern edge waving slowly. The starting points were in Aries and Boötes. The southern edge ran through Taurus, Gemini, Leo, and Coma Berenices, and the northern through Pisces, Andromeda, Cygnus, Lyra, and Corona Borealis. At 7.15 the zone had essentially the same position and form, but had faded (brightness 0 to 1). Faint traces continued to be visible at 8.15, 9.10, and 10.10, after which the weather became hazy. There was a magnetic disturbance at 5 to 6 a. m., greatest at 6 a. m.

February 1, 1883, 5.15 *a. m. to* 1.15 *p. m.*—Traces of small luminous patches appeared in the west at 5.15 a. m. At 6.15 a. m. one white and quiet band (brightness 2) ran from SE. to WNW. along the horizon, while there was an arch of short streamers of the same color and brightness, somewhat irregular, from the same starting points, about 10° higher than the first band, passing through Leo, Cancer, Gemini, Orion, and Taurus. At 7.15 there was a large corona (brightness 2 to 3), centering in Ursa Major south of the zenith; and a bright band of streamers, vibrating rapidly from W. to E., ran through Pegasus, Aries, Taurus, Auriga, Gemini, and Leo Minor. At 8.15 there was a broad arch from ESE. to WNW., with the crown about 15° from the southern horizon, with a second similar arch above it, from the same starting points through Boötes, Canes Venatici, Ursa Major, Lynx, Gemini, and Orion. From the western extremity came a third similar arch through Taurus, Camelopardalis, Ursa Minor, Draco, and Hercules, ending near the eastern horizon. At the same time a broad irregular broken band of short streamers, quivering slightly, extended from the ENE. through Lyra, Cygnus, Lacerta, Andromeda, Triangulum, Aries, and the Pleiades (brightness of all, 2). At 9.15 there were traces only in the S. At 10.15 there was a broad and quiet white arch from the ESE. to WNW., with its crown about 15° above the southern horizon, and long white motionless streamers in the E. and ENE., in Hercules, Sagitta, Cygnus, Lyra, and Draco. At 11.15 there was a broad waving band from E. to W. through Gemini, Ursa Major, Draco, Lyra, and Cygnus (brightness 1), and a long low arch in the S.; 12.15 p. m. there was a broad quiet band from the E. to W. from Leo through Coma Berenices, Boötis, and Aquila, with a corona in Ursa Major. At 1.15 a corona, with its streamers thickest in the E. and W., was barely discernible in the bright twilight. The needles were comparatively quiet up to nearly half past 12 p. m., when a violent disturbance began, which is still going on.

February 2, 1883, 1 *a. m. to* 12.15 *p. m.*—Early in the evening the haze and clouds were thick, but at 1 a. m. (8 p. m. local) traces of twisted bands, apparently bright and in motion, were visible through the clouds, crossing the zenith from NW. to SE. These were very faint at 1.15. The clouds were thicker at 2 a. m., and the traces consequently fainter. None were seen at 3 a. m. At 4 the haze grew thinner, allowing the central part of a broad zone to be visible. The starting points were invisible in the haze in NW. and SE., and the whole was much obscured by haze. In breadth it reached from Ursa Major to Taurus. The sky was much clearer for four or five hours, gradually becoming obscure again. At 5.15 an aurora was observed passing through Canis Minor, Orion, Taurus, and Cetus (brightness 0 to 1). At 6.15 there were two faint bands, one from Cancer through Orion, Taurus, and Aries, and the other through Gemini, Auriga, Perseus, and Andromeda (brightness 0 to 1). At 7.15 a short band crossed the zenith from Hercules through Ursa Major, Camelopardalis, and Gemini. Farther south of the zenith yellowish white bands ran from Ursa Major to Canes Venatici, Coma Berenices, and Leo Minor, and there was a band of streamers, in rapid waving motion, passing through Serpens, Boötes, Coma Berenices, Leo, Cancer, and Gemini (brightness 1 to 2). At 8.15 there were only faint traces along the horizon. At 9.15 a broad, white, quiet, irregular arch from the SW. horizon through Cancer, Leo Minor, Ursa Major, Canes Venatici, Corona Borealis, and Hercules, ending in Serpens. At 10.15 the haze and clouds were again becoming thicker, and traces of an arch were observed running from ESE. to W. about 10° south of the zenith. At 11.15 a broad zone (brightness 0 to 1) covered most of the southern sky, the bands running from ESE. to W. The first ran through Sagitta, Lyra, Draco, Ursa Major, and Leo Minor, and the second through Hercules, Corona Borealis, Coma Berenices, and Leo, while a broad irregular patch ran from the SSE. to SW. through Serpens, Boötes, and Leo, with a smaller luminous streak near the horizon in Virgo. The last faint traces were seen at 12.15 p. m. A magnetic disturbance began at 4 a. m. and continued all night.

February 3, 1883, 1 *a. m. to* 11.15 *a. m.*—The sky was cloudy early in the evening, but the clouds broke sufficiently at 1 a. m. (about 8 p. m. local) to show a regular, narrow arch in the SW. (brightness 2), from the SE. to NW., with its corona at an altitude of about 40°, partially obscured by clouds. The arch was partially broken and irregular at 1.15. At 2 the haze was thick again, but through it near the zenith in the SE. there were traces of an extensive and apparently bright aurora which was nearly obscured at 2.15. There was less haze again at 3 and a broad band considerably obscured from the SE. to NW. through Polaris could be seen. At 4 there were traces near the zenith, but at 4.15 the haze was nearly gone, displaying extensive bands forming a sort of vortex. One broad band (brightness 2) began in the top of Cygnus, in the NNE., as an irregular cloudy patch, and passed round through Lyra, Hercules, Boötes, Canes Venatici, Ursa Major, Lynx and Auriga, ending in Perseus, whence just below the edge of this a double band (brightness 1) ran back to Gemini. There was also a broad band (brightness 2) somewhat obscured by clouds on the SW. horizon through Orion. At 5.15 one band of streamers passed through Lyra, Hercules, Corona Borealis, Boötes, and Coma Berenices, and another from Pegasus through Aries, Taurus, Orion, and Gemini to Cancer, but vibrating slowly from E. to W. (brightness 2). At 6.15 a quiet band (brightness 0 to 1) ran from Pegasus through Cygnus, Vulpecula, and Serpens. At 7.15 a quiet yellowish zone (brightness 1 to 2) filled the southern half of the sky, and one outlying band from Ursa Major to Cygnus in rapid, waving motion. At 8.15 there were seen traces of a corona covering the whole sky from the horizon, centering a little south of the zenith. At 9.15 there were four broad bands (brightness 1) covering most of the sky, the first in the north from NW. to NE., with the crown at an altitude of about 12°, the second from E. to W. through Polaris, the other two starting together from the ESE., the west one passing through Hercules and Ursa Major, and the other through Corona Borealis, Canes Venatici, and Leo Minor, with also a broad band of luminous patches from the ESE. to W. about 15° above the southern horizon. At 10.15 there was a zone of three bands (brightness 0 to 1), with its starting points ESE. and NNW., one through Lyra, Draco, Ursa Major, Lynx, Gemini, and Canis Minor, the second through Corona Borealis, Canes Venatici, and Leo Minor, and the third through Serpens, Boötes, Coma Berenices, and Leo. At 11.15 there was a white, quiet arch from the NW. to E. through Auriga, Cassiopeia, and Lacerta (brightness 0 to 1), with streamers at the extremities, and also short curved streaks in the south in Boötes, Hercules, and Coma Berenices, and a broad broken band from the SE. to SW. about 10° above the southern horizon, all of the same brightness. The weather then became too thick for further observation. A violent disturbance, affecting all the magnetic elements, commenced about 2 a. m. and lasted about twelve or thirteen hours, being specially violent at 2 and 8 a. m. and 1 p. m.

February 4, 1883, 12.15 *a. m. to* 11.15 *a. m.*—The early part of the evening was very stormy, the wind reaching 54 miles an hour, with the drifting snow rendering accurate observation of the aurora impossible, though the sky frequently was almost clear of clouds. Hazy light was observed in the NE. at 12.15 a. m., and bright traces in the NE. at 1 a. m. At 2 a. m. there was a broad zone across the zenith from the NW. to SW. (brightness apparently 1). At the next two observations the sky was completely covered with clouds, and traces only were seen near the zenith at 3 a. m. and in the SE. at 4. At 5 the sky was clearer, showing a band (brightness 0 to 1) from Cancer through Canis Minor, Orion, and Taurus. At 6 a brighter band (brightness 1) ran from Leo, through Gemini, Auriga, and Taurus to Aries. At 7 there were two yellowish bands (brightness 1 to 2), the first from Leo, through Lynx, Camelopardalis and Cassiopeia, to Andromeda, and the second from Cygnus, through Draco to Ursa Major. At 8 there were merely traces round the southern horizon and a few patches in the W. At 9.15 there was a broad white band on the southern horizon, with streamers in Serpens and Boötes. There was besides a white arch from the SE. to NW. through Corona Borealis, Draco, Ursa Major, Auriga, and Orion, and a similar band from E. to N. through Sagitta, Vulpecula, Lacerta, and Andromeda, and streamers in Pleiades (brightness 1). At 10.15 a band ran along the northern horizon from the NW. to ENE., and a striated band from the SE. to NW. through Hercules, Draco, Ursa Major, Lynx, Cancer, Gemini, and Canis Minor. There was also a broad band near the southern horizon from SE. to SW. There were also streamers in the E. All were white and quiet (brightness 0 to 1). This was essentially unchanged at 11.15, after which the sky again became overcast. A violent disturbance began at 3 a. m. and lasted all night.

February 4, 1883, 10.45 *p. m. to* 11.15 *p. m.*—The sky, which had become overcast all the afternoon, became sufficiently clear at 10.45 p. m. (about half-past 4 local) to show an arch in the NE., with its extremities bearing ESE. and NNW., and its crown at an altitude of about 45°. The sky then became again overcast with snow, but auroral light was still visible at 11.15 p. m. through the clouds in the NE. A magnetic disturbance commenced about 5 a. m. and lasted all night (local), reaching its maximum about 12 m. (Washington time).

February 6, 1883, 12.15 *a. m. to* 12.15 *p. m.*—The early part of the evening was cloudy and stormy. However, at 12.15 a. m. traces were visible through the clouds in the NE. At 1 a. m. the clouds were broken away somewhat, and much bright light, obscured by broken clouds, was visible in the E. For the next six observations the clouds were thick and the weather stormy. At 8.15 a yellowish-green band, with short, motionless streamers (brightness 1 to 2), ran from Orion and Taurus, through Auriga, Perseus, Cassiopeia, Andromeda, Cygnus and Draco. At 9.15 there was an aurora of essentially the same character as at 8.15. At 10 an arch of diffused light (brightness 1 to 2) ran from the ESE. to WNW., with its crown at an altitude of about 15° above the southern horizon. At the same time a band of similar character ran from the E. to NW., through Cygnus, Ursa Minor, and Auriga. The latter had disappeared at 10.15, the former remaining unchanged. At 11.15 there was a broad band of quiet streamers, with its crown at an altitude of about 15° above the southern horizon, running from ESE. to WNW., and an elliptical corona continuing towards the zenith with its greatest diameter E. and W., the rays changing position rapidly at short intervals (brightness 2). There was still a corona of the same form at 12.15, but paler (0 to 1) and quiet, brightest in the W., and fading in the E., occupying Cancer, Lynx and Camelopardalis in the N. and Leo Minor, Canes Venatici and Hercules in the S. It was broad daylight at the next observation. A magnetic disturbance of considerable violence began about 5 a. m. and continued all night (local), reaching its maximum about 12 m. (Washington time).

February 7, 1883, 12.15 *a. m. to* 1 *a. m.*—The sky was hazy during the early part of the evening, but a faint arch was discernable at 12.15 a. m. in the NE. from ESE. to NNW., with its crown at an altitude of about 30°. There were also traces at 1 a. m., but after this the sky became overcast and the weather cloudy and no more aurora was seen. The magnetic needles were but little disturbed, although the intensity was very small.

February 8, 1883, 3 *a. m. to* 10.15 *a. m.*—Traces of a low arch were observed in the NE. at 3 a. m., somewhat obscured by haze, and at 3.15 this arch had risen so as to pass from WNW. to ESE. through Cygnus, Lyra (α), Corona Borealis, Boötes and Coma Berenices. At 4 a. m. a zone, not very broad and rather hazy (brightness 1), had its starting points ESE. and NW. in Virgo and Pegasus, with its western edge running through Leo, Minor, Ursa Major, Camelopardalis, Cassiopeia and Andromeda, and its western through Leo Cancer Gemini, Taurus, Aries and Triangulum. This was somewhat narrower and less hazy at 4.15. At 5.15 a broad, yellowish, quiet band (brightness 1) ran from NW. in Pegasus to ESE. in Coma Berenices and Boötes, the eastern edge through Cygnus, Lyra, Draco, Canes Venatici and Boötes, the western through Lacerta, Cassiopeia, Ursa Minor, and Ursa Major. At 6.15 the main band, waving slightly, ran through Pegasus, Andromeda, Cassiopeia, Camelopardalis, Ursa Major, Coma Berenices and Boötes, with a small secondary band from Lacerta through Cygnus, Draco, and Boötes (brightness of all, 1 to 2). At 7.15 there was only a faint band (brightness 0 to 1) through Virgo, Leo, Cancer, Gemini and Taurus, and at 8.15 merely traces around the southern horizon. At 9 a. m. a belt of streamers (brightness 2), about 20° long, white, and quiet, encircled the entire horizon, and at an average altitude of about 10°. At 9.15 there was an arch from the SE. to SW. with its crown at an altitude of about 40° above the southern horizon, and a broad striated band starting from the same point in the SE. and running to the NW., including Ursa Major in the S. and Cassiopeia in the N., with an arch of short rays, centering towards the zenith, starting from the NW. end of the band and running through the Pleiades, Aries, Andromeda, Cygnus and Sagitta. All were white and quiet (brightness 2). At 10.15 there was a white, quiet, diffused arch from the ESE. to WNW., with its crown at an altitude of about 15° above the southern horizon, with an arch of streamers from E. to NNW., through Cygnus, Ursa Minor, Camelopardalis and Taurus, slowly changing in form (brightness 2). The arch was in the same place at 11.15, but paler (brightness 0 to 1) and there were a few faint streamers in the E. and NW. The magnetic intensity still continued low, and there was a slight disturbance, lasting from 8 a. m. to about 1 p. m.

February 10, 1883, 8 *a. m. to* 11.15 *a. m.*—The violent storm having moderated about 8 a. m. (3 p. m. local), a quiet band was visible through the haze, passing through Leo, Cancer, Gemini and Taurus (brightness 0 to 1). At 9.15 traces were visible in the SW., and at 10.15 there were observed through the haze a few traces of auroral streamers, white and quiet. At 11.15 there was a definite band, white and quiet (brightness 1), running about E. and W. through Lyra, Draco and Ursa Major. Daylight began before the next observation. The magnetic needles were considerably agitated during the whole night, making large oscillations, but there was no regular disturbance.

February 11, 1883, 1 *a. m. to* 11.15 *a. m.*—At about 8 p. m. local time (1 to 1.15 a. m., Washington) there were faint traces in the E. in the form of a low, pale arch. At 2 a. m. there was a pale, vertical streak in the ESE. which developed at 2.15 into an irregular band (brightness 0 to 1) sinuous in the ESE., from ESE. in Leo to the NNW. in Cygnus, through Leo (β), Coma Berenices, Canes Venatici (α), Boötes (λ), Hercules and Lyra. This band was hardly changed at 3 a. m., having merely moved a trifle higher so as to pass through the tail of Ursa Major, and at 3.15 it was fading, leaving merely the part south of the magnetic meridian. At 4 a. m. a rather broad, sinuous band (brightness 1) crossed the zenith from the ESE. in Virgo to the NW. in Andromeda, through Leo, Coma Berenices, Ursa Major, Camelopardalis, Ursa Minor and Cassiopeia. At 4.15 this had become a narrow zone, broadest in the ESE., with the same starting points, but passing west of the zenith through Draco and Cepheus, waving slowly near the zenith and drifting westward. This developed into a very broad and bright zone between the observations, diminishing to a band at 5.15, and passing through Pegasus, Andromeda, Perseus, Auriga, Ursa Major and Leo Minor (brightness 1). At 6.15 a similar band ran through Pegasus, Lacerta, Cygnus, Draco, Corona Borealis and Boötes. At 7.15 a paler band (brightness 0 to 1) passed through Aries, Taurus, Orion, Gemini, Cancer and Leo, but at 8.15 there were merely traces over the southern horizon. At 9.15 there was a quiet white arch (brightness 1) from the SE. to NW., with its crown at an altitude of about 15° from the southern horizon, with streamers at the SE. end of the arch in Corona Borealis and in the NE. in Cygnus, Vulpecula and Lacerta. The arch had risen a little at 10.15, and reached to the NNW. At the same time the entire southern half of the sky was filled with a diffuse light (brightness 0 to 1) and pale streamers (brightness 0 to 1) forming a corona and occupying Taurus, Gemini, Camelopardalis, Perseus, Cassiopeia, Cepheus, Lacerta and Cygnus. At 11.15 the greater portion of the sky between the zenith and the southern horizon was filled with nearly parallel bands (brightness 0 to 1) running ESE. and WNW. from horizon to horizon. There was a slight magnetic disturbance from 10 to 11 a. m.

February 13, 1883, 9.15 *a. m. to* 10.15 *a. m.*—Though the early part of the evening was clear, it became cloudy by 2 a. m., local time, but the sky was partially clear at 9.15 and 10.15 (Washington). At the first observation faint traces, with slight motion, slowly shifting, were visible near the zenith and in the NW., and at the latter faint traces could be seen through the haze and clouds. The needles were but slightly disturbed.

February 14, 1883, 4.15 *a. m. to* 8.15 *a. m.*—It was cloudy and snowing up to about 11 p. m., local time (Washington, 4 to 4.15 a. m.), when it began to clear, remaining clear till 9 a. m. (Washton). At 4 to 4.15, while the stars were still mostly obscured, a zone, apparently very broad and rather bright, was seen crossing the zenith through the clouds and haze. At 5.15 a band with motionless streamers (brightness 0 to 1) ran through Pegasus, Cygnus, Cepheus, Draco, and Ursa Major. At 6.15 there was a short band (brightness 0 to 1) through Leo and Cancer and a few patches of light in Gemini, Auriga, and Pisces. At 7.15 and 8.15 a. m. there were merely faint traces in the S. There was a moderate magnetic disturbance at 9 and 10 a. m.

February 15, 1883, 8.15 *a. m. to* 10.15 *a. m.*—Most of the night was cloudy, but it was clear from 8 till daylight. Faint traces of aurora were seen at the zenith and in the NE. at 8.15 a. m., and at 10.15 a. m. there was a white and quiet arch (brightness 1), with rays centering towards the zenith, occupying Hercules, Ursa Minor, and Gemini. It was broad daylight at the next observation. There was no magnetic disturbance.

February 16, 1883, 2 *a. m. to* 11.15 *a. m.*—At 2 a. m. there was a pale arch in the E., starting low in Leo in the ESE., passing through β Leonis, Coma Berenices, the corner of Canes Venatici, Boötes (β), and Hercules, fading near α Lyræ, with a lower branch from the same starting point reaching α Boötes (brightness 0 to 1). This had become slightly irregular and not so high at 2.15, and remained in nearly the same place, but was faded to traces at 3 to 3.15. The sky was clouded at 4 a. m. with patches of fleecy cloud, which cleared away at 4.15, partly exposing a broad broken zone of many bands (brightness 0 to 1) apparently covering most of the sky. The sky was again partially cloudy at the next observation, and traces only were visible. At 6.15 one band with streamers in rapid vibration from W. to E. passed through Boötes, Canes Venatici, Ursa Major, Lynx, and Draco, while a second band, wholly of streamers in rapid motion, ran from Leo to Gemini, with a few patches in Virgo and Boötes (brightness 1 to 2). At 7.15 a quiet band (brightness 1) crossed the zenith from Hercules through Draco, Ursa Minor, Camelopardalis, Auriga, and Taurus. There were nothing but traces at 8.15, nor was any observed for two observations, though the sky was clear, but at the next two observations traces were observed near the zenith at 10.15 and in the SW. at 11.15. At the next hour it was daylight. There was a slight magnetic disturbance at 10 a. m.

February 17, 1883, 3 *a. m. to* 5 *a. m.*—The weather was cloudy till 9 a. m., local (3 a. m. Washington), when the clouds cleared away, leaving the sky covered with haze, through which a somewhat sinuous band was visible (brightness apparently 1), crossing the zenith from near the horizon NNW. and ESE. This had broadened into a zone at 3.15 with one bright streak (brightness 1 to 2) in the NW. Most of the stars were obscured. At 4 the sky was much clearer, and there was an arched band (brightness 1 to 2) from the NNW. in Pegasus to E. by S. in Virgo, through Cygnus (ϵ), Lyra (just below α), Hercules, Serpens, and Boötes. At 4.15 it was paler (brightness 1), and growing double from the eastern end. It began to cloud again at 5, so that traces only were visible. There was a considerable magnetic disturbance between 8 a. m. and 1 p. m., reaching its maximum at 11 to 12.

February 18, 1883, 11.15 *a. m. to* —— ?.—The weather was cloudy all night, but traces of aurora were visible through the clouds at 11.15 a. m. The magnetic needles were very quiet.

February 20, 1883, 8 *a. m. to* 9.15 *a. m.*—The weather was cloudy most of the night, but cleared away sufficiently at 8 to 8.15 and 9 to 9.15 a. m. (3 and 4 a. m. local) to allow aurora to be seen. This consisted of traces merely at the first observation, but at the second of two quiet bands (brightness 0 to 1), one from Auriga through Perseus to Cassiopeia, and the other from Andromeda through Pegasus to Delphinus. The magnetic needles were considerably disturbed from 4 to 11 a. m., the disturbance reaching its maximum at 7.

February 21 *and* 22, 1883, 11.45 *p. m. to* 11.15 *a. m.*—The twilight had not completely faded at 7.30 p. m. (11.45, Washington), when a twisted streak tinged with yellow was observed crossing the zenith from NW. to SE. (brightness 0 to 1). By 12.15 a. m. this was reduced to a bunch of streamers in Cygnus and Lyra, and a faint band through Lyra, Hercules, and Ursa Major, and had wholly disappeared at 1 a. m. At 1.15 shifting, twisted streaks and bands of streamers with considerable motion, (brightness 0 to 1), tinged with yellow and rose, appeared in the N., occupying Lyra, Cygnus, Cepheus, and Draco. At 2 a. m. a very pale band ran from Cygnus (α) in NNW. through Draco and Ursa Major (α), ending in the moonlight ESE., and was wholly gone at 2.15. At 3 a. m. there was a pale band west of the zenith, from the NW., in Pegasus, through Andromeda, Cassiopeia, Auriga, and Gemini. This was replaced at 3.15 by a similar band in nearly the same position as the one observed at 2 a. m. Traces merely were observed at 4 to 4.15. At 5 two bands ran from Boötes and Virgo through Coma Berenices, Leo, Leo Minor, Gemini, and Auriga to Taurus, with bunches of slowly vibrating streamers in Boötes and Virgo (brightness 0 to 1). Traces only were observed at 6 and 8. At 9.15 there was a quiet arch (brightness 0 to 1) in the S. from ESE. to WNW., with an altitude of about 15°, and a quiet, striated arch (brightness 0 to 1) through Hercules, Draco, and Gemini. At 10.17 a. m. the arch in the S. was unchanged, while a second similar arch about 10° to 15° in breadth ran from ESE. to SW., while a third arch ran from ENE. through Cygnus, Ursa Minor, and Lynx to Cancer, with streamers in the NE. and a luminous patch in Gemini (all brightness 0 to 1). At 11.15 there was a well-defined yellow corona (brightness 2), quivering rapidly, occupying Cygnus, Hercules, Corona Borealis, Boötes, Canes Venatici, Leo Minor, Ursa Major, and Ursa Minor, also Auriga and Perseus. The needles were considerably disturbed all night, the disturbance reaching its maximum between 10 a. m. and 12 m.

February 22, *and* 23, 1883, 1.55 *p. m. to* 8.15 *a. m.*—At 11.55 the aurora consisted of indistinct patches and streamers in the NE., which at 12.15 a. m. had developed into a faint corona, centering in Camelopardalis. It was made of shifting streamers, which were short, except in the NW. and SE. At 1 there was a broad, highly modified zone occupying large parts of the sky, made up of twisted streaks, angular curtains and streamers, with some motion (brightness mostly 1, reaching 2 in some places). Two bands were well defined, one on the eastern edge from Leo through Leo Minor, Ursa Major, Draco, Ursa Minor and Draco again to Lyra, and the other on the western edge through Cancer, Canis Minor, Gemini, β Tauri, Perseus, and Andromeda. The zone had moved toward the W. at 1.15 and was not so well defined, while a band of indistinct shifting curtains ran from Orion's belt to Canis Minor (α) and curving back to β Tauri. At 2 a. m. a broad band ran from the ESE. in Hydra through Leo, Leo Minor, Lynx and Ursa Major, Camelopardalis, Ursa Minor, Cassiopeia, and Andromeda to NW. in Pegasus. This was constantly changing its shape with rapid, twisting, whirling, and waving motion, shifting also from E. to W. and back again. It was tinged with shifting colors, pale green and rose (brightness 2 to 3). There were also quieter bands from the same starting points lying towards the SW., the lowest passing through the Hyades. The main aurora had faded to traces at 2.15, leaving large patches of luminous haze, while a narrow band (brightness 2) ran from Pegasus through Cygnus, Lyra (α), and Boötes (α). At 3 a. m. a narrow, twisted, shifting band, composed partly of streamers, passed close to the zenith from E., low in Boötes, through the tail of Ursa Major, Draco, Ursa Minor, Cepheus, Cassiopeia, and Andromeda to the NW. in Pegasus (brightness 1 to 2), with two pale arched bands in the SW., the lower from Pegasus, through Aries, Taurus (α), the head of Orion and Canis Minor (α), ending in the moonlight SE. It was much faded and broken at 3.16. At 4 a. m. there was a similar band, tinged with green and rose, starting high in the NW. in Perseus, passing through Auriga (δ) Lynx, Leo Minor, and Coma Berenices, ending in the ESE., shifting and waving. 4.15 found it broken and shifting, passing through (α) Aurigæ, with some ill-defined patches and bands in the SW. Traces only were observed in the SE. at 5, and no more was seen till 8.15, when a rapidly waving band ran from Taurus through Auriga, Camelopardalis, and Ursa Minor to Boötes (brightness 1 to 2). The needles were considerably disturbed from 11 p. m. to 10 a. m., the greatest disturbance being at 2 a. m.

February 23 *and* 24, 1883, 11.55 *p. m. to* 11.17 *a. m.*—When the aurora was first noticed, shortly before midnight, Washington time (6.40 local), it was in the form of two faint, slightly arched bands in the NE. about 30° above the horizon. At 12.15 it was an arch of fine streamers, with its extremities bearing NW. by N. and ESE., and its altitude about 30° (brightness 1). This band was essentially unchanged in character and position at 1 a. m., with an additional hazy band (brightness 1), from nearly the same starting points, passing through Leo, Leo Minor, Ursa Major, Draco, Ursa Minor, Cepheus, and Cygnus. This had disappeared at 1.15 to 1.20, leaving the first band, which had become more compact and brighter (brightness 1 to 2). At 2 a. m. there was a regular arch (brightness 1) from the ESE. in Virgo to the NNW. near β Cygni, through Coma Berenices, Boötes, Corona Borealis, Hercules, and Lyra (α). This was fading rapidly at 2.15 to 2.20. There was no aurora at 3 or 4, though faint and fugitive traces were noticed between the two hours. At 4.15 there were faint traces in E. and a band (brightness 0 to 1) from NW. in Pegasus through Andromeda, Perseus, and Auriga. From 5 to 5.20 a. m. there was a yellowish zone (brightness 1 to 2) with the bands in rapid waving motion from Orion to Boötes and Serpens through Gemini, Lynx, Ursa Major, and Canes Venatici. From 6 to 6.20 there was a band of streamers (brightness 0 to 1) vibrating rapidly from W. to E., running through Perseus, Cassiopeia, Cepheus, Cygnus, Lyra, and Hercules. At 7.20 and 8.20 traces only were observed, and also at 9.17, when they were in the SE., white and shifting. At 10.17 there were curtains from NNW. to ESE., with streamers in Leo Minor. All were white, with occasional tinges of green and yellow, and changing form and position very rapidly. At 11.17 there were faint traces near the zenith, with faint streamers in the W. The needles were more or less agitated all night, the disturbance being extreme at 8 a. m., 9 to 9.30 a. m., and 2 to 2.40 p. m.

February 25, 1883, 12.15 *a. m. to* 9.17 *a. m.*—The aurora began as a faint bunch of streamers in the SE. at 12.15, and at 1 a. m. had developed into four bands of ill-defined curtains, forming a sort of zone in the SW., with its starting points NW. in Pisces and ESE. in Hydra, the uppermost passing through Triangulum, Perseus, Auriga, Gemini, Cancer, and Leo, the lowest through Canis Minor, Orion, and Taurus, with slight waving motion (brightness 1). It had the same general character at 1.15 to 1.20, but was rather lower. From 2 to 2.15 it was nearly in the same position, but the curtains were shifting and turning into bands (brightness 2 to 3). The lowest band beginning as a patch of curtains just above Sirius, and finally formed an arch (2.20), made up of short, ill-defined streamers, quivering slightly (brightness 3), rather brightly colored, green, yellow, and rose, passing just above Sirius and through β Orionis. The curtains broke partially into streamers and moved up towards the zenith, having developed at 3 a. m. into an elongated corona (brightness 1), centering towards the zenith, with its longest diameter NE. and SE., nearly reaching the horizon at these points, the other streamers reaching as low as Arcturus in the NW. and Aldebaran in the SW. The streamers were uncolored and shifting. For the next half hour there was no definite arrangement of aurora, but the sky was covered with sinuous bands and scattered streamers all constantly changing position and brightness, the bands, as a rule, at right angles to the magnetic meridian, mostly E. of the zenith. At 4 a. m there were two or three broad shifting bands (brightness 1 to 2) from the SSE. in Virgo, spreading out through Leo and Ursa Major, forming an irregular corona at the zenith about 60° in width, with two paler bands from the same starting points along the SW. horizon through Canis Minor and Orion, ending in Taurus, NW. The corona had changed at 4.15 into a broad, shifting zone, ending in NW. in Taurus, with considerable waving motion in the NW. From 5 to 5.20 there was a broad band of waving curtains in the NE. from Pegasus through Lacerta, Cygnus, Lyra, Hercules, and Corona Borealis (brightness 1 to 2). From 6 to 6.20 there were two yellowish bands (brightness 1 to 2) in the SW. through Taurus, Orion, Auriga, Gemini, Cancer, Leo, and Coma Berenices. Traces only were observed at the next observation. At 8 to 8.20 a faint band (brightness 0 to 1) ran from Auriga through Lynx, Ursa Major, Canis Venatici, and Boötes, and the last faint traces were seen at 9.17 a. m. There was considerable disturbance all night.

February 25 *and* 26, 11.45 *p. m. to* 10.20 *a. m.*—At 11.15 p. m. there was a regular arch in the NE., with its extremities bearing ESE. and NW., with its crown about 40° in altitude (brightness 0 to 1), remaining in the same position at 12. At 12.15 it was rising in altitude and had become brighter (1 to 2) in the NW., where it was tinged with rose, and sent up rather long streamers. From 1 to 1.20 the arch was of the same character, but lower, passing through Hercules, Corona Borealis, and Boötes (above α), ending in Virgo, with streamers in Cygnus (brightness 2 to 3). The arch was shifting, and tinged with green, yellow, and rose. At 2 a. m. there was a rather broad zone (brightness 2), with the starting points NNW. in Pegasus and ESE. in Crater, occupying Leo, Leo Minor, Canes Venatici, Ursa Major, Camelopardalis, Ursa Minor, Cepheus, Cassiopeia, and Andromeda. This had drifted west at 2.15, leaving only a faint band in its original position, while the zone now passed through the square of Pegasus, the Pleiades, Perseus, Gemini, and Cancer. This began to grow twisted in the E. and developed into curtains which rapidly increased in brightness (brightness 3), showing some color beginning to whirl and spread toward the zenith and eastward. When this was reached the motion became very rapid, and the aurora formed a sort of spiral corona, made up of bands of curtains, centering round the zenith and covering nearly the whole sky. This moved last, and in fifteen minutes was reduced to large hazy patches, with bright streaks in the NE. At 3 a. m. there was a short arch (brightness 2 to 3) from the E. low in Boötes to NNW. in Cygnus, through ε and β Cygni, Hercules, and Corona Borealis. A second arch appeared above this at 3.15, when both were broken into fine streamers, which shifted and developed into homogeneous bands again before 3.20. At 4 a. m. there were bunches of streamers (brightness 2) in the place of the arch at the last observation, with traces of a very faint zone across the zenith. From 4.15 to 4.20 there were only traces in the E. and SE., with much diffused luminosity all over the sky. From 5 to 5.20 there were only traces again in the S. No more was seen till 7 a. m., when there was a belt of waving bands through Taurus, Orion, Gemini, Leo, Ursa Major, Canes Venatici, Coma Berenices, and Boötes, from NW. to SE., with a band of streamers (brightness 1 to 2) running N. to SE. through Cassiopeia, Cepheus, Cygnus, Lyra, Draco, Hercules, Corona Borealis, and Boötes, vibrating rapidly from W. to E. Traces alone were observed in the SE. from 8 to 8.20. At 10.20 there was a faint white arch across the zenith from the SE. to NW. There was no marked disturbance of the needle till 1 p. m., when it was violent, but of short duration.

February 27, 1883, 12.15 *a. m. to* 10.17 *p. m.*—The weather cleared between 12 and 1 a. m., disclosing an arch (brightness 1 to 2), partly obscured by clouds in the NE., passing through Arcturus and α Coronæ Borealis, with streamers beginning to develop at 1.20 m and above Cygnus. At 2

a. m. two or three broad sinuous bands were to be seen through the haze crossing the zenith from NW. to SE., one through Cassiopeia and one through Ursa Major. From 2.15 to 2.20 there was a zone of broad bands east of the zenith, partially obscured, especially near the horizon, coming up through Leo, with the upper band through Ursa Major and Boötes (α) (brightness apparently 1 to 2). At 3 a. m. there was a zone of broad bands with the starting points alone obscured in the NNW. and ESE., occupying Leo, Leo Minor, Ursa Major, Draco, Ursa Minor, Cygnus, and Lacerta (brightness 1 to 2). From 3.15 to 3.20 it was brighter (brightness 2) and west of the zenith, occupying Andromeda, Triangulum, Aries, Taurus, Perseus, Auriga, Gemini, and Aries. At 4 a. m. nearly the whole sky was covered with broad, shifting, sinuous, hazy bands running generally NW. and SE. (brightness 1), with some brighter streaks (brightness 2) in the E. This had all condensed at 4.15 to 4.20 into a broad arched band (brightness 2) in the NE. from Virgo to Pegasus, passing through Boötes, Serpens, Hercules, Lyra, and Cygnus, sending up streamers in the NW. and developing into a sort of zone. From 5 to 5.20 there was a quiet band (brightness 0 to 1) running through Taurus, Orion, Canis Minor, and Leo into Virgo. Traces only were seen at the next observation, but from 7 to 7.20 there was a quiet band (brightness 0 to 1) through Cassiopeia, Cepheus, Draco, Hercules, and Boötes. A slightly waving band at 8 to 8.20 ran through Orion, Gemini, Cancer, Lynx, Ursa Major, and Leo (brightness 1). At 9.17 a. m. there was a white, quiet arch over the southern horizon from SE. to WNW., with the crown at an altitude of about 15° and a broad, quiet, irregular band from the E. through Lacerta, Cepheus, Ursa Minor, Ursa Major, and Lynx to Cancer (brightness 1). At 10.17 there was a corona elongated from ESE. to WNW., occupying Sagitta, Hercules, Lyra, Draco, Ursa Major, Leo Minor, and Gemini in the E., S., and W. It underwent a slow, constant change of form and position (brightness 1). There were also long streamers in Lacerta, Andromeda, Triangulum, Perseus, and Arius, and a broad, luminous band near the horizon from the S. to SW. The magnetic needles were considerably disturbed all night.

February 28, 1883, 1.15 *a. m. to* 5.20 *a. m.*—The sky was covered all night with clouds, which at intervals broke away and became hazy enough to allow some of the stars to be seen. Between 1 and 2 a. m. bright bands in pretty active motion could be seen through the clouds, particularly in the SE. and NW., where there was a bright loop with its convexity towards the zenith. At 2 a. m. a band of bright curtains, waving rapidly, could be seen through the clouds in the NE., at an altitude of about 30°. From 2.15 to 2.20 there were twisted streaks and streamers from the NW. to SE., and partial coronas, bright and shifting, seen through the clouds. Bands could be seen through the clouds in the SW., which were less obscured from 4.15 to 4.20, so that the upper was observed to pass through α Leonis, α Orionis, and α Tauri. This faded rapidly, while a zone obscured by the haze developed from the SE. towards the zenith. The clouds then thickened up so that traces only were seen in the S. at 5 to 5.20. The needles were disturded violently all night.

February 28 *and March* 1, 1883, 11.30 *p. m. to* 10.40 *a. m.*—The sky cleared off while the twilight was still bright, and only the large stars were visible, and there appeared a bright aurora, probably a continuation of yesterday's, as when first seen it crossed the zenith. It was a yellowish, twisted band, which ran from the ESE. to WNW., and appeared shifting and agitated, developing gradually into a broad zone, while at 12.15, when the sky was dark enough for proper observation, occupied Cancer, Cassiopeia, Ursa Minor, Auriga, Andromeda, and Pegasus, and was in rapid motion (brightness 2). At 1.15 to 1.20 the zone was west of the zenith and somewhat obscured by clouds and haze, especially at the starting points. It was observed to pass through Gemini, Auriga, Perseus, and Andromeda (brightness 2), shifting and waving. At 3 to 3.15 it had subsided to quiet bands (brightness 1) from Leo through Canis Minor, Orion, Taurus, and Aries. At 4.17 there was a quiet arch over the southern horizon from SE. to NW., with its crown at an altitude of about 18° or 20°, and a zone of broad bands from the SE. to NW., occupying most of the sky between Cygnus and Lynx, and drifting slowly towards the W. (brightness of all 3). Traces only in the N. and W. were visible at the next hour. At 6.17 there was a zone of broad bands (brightness 3 to 4) from NW. to SE., stretching in width between Ursa Major and Cygnus, rapidly changing form and position, and bounded on the SW. edge by a broad curtain, passing through Serpens, Boötes, Corona Borealis, Leo Minor, and Gemini, vibrating rapidly in both directions, and showing brilliant pink, green, and yellow, with also a broad, quiet band from the Pleiades to Cygnus, near the northern horizon. At 7 to 7.20 there was a band of rapidly vibrating streamers (brightness 1 to 2) from Andromeda through Cassiopeia, Cygnus, Lyra, and Draco to Canes Venatici, and another waving band from Cygnus through Lyra, Hercules, Corona Borealis, and Boötes to Leo. This had subsided to traces in the E., S., and W. at the next hour. Waving bands (brightness 0 to 1) stretched through Aries, Taurus, Gemini, Auriga, Ursa Major, Leo Minor, Leo, and Cancer, at 9 to 9.20. At 10.17 there were faint traces near the southern horizon and pale streamers in the E., and the last traces were seen about 10.40 fading in the dawn. Yesterday's magnetic disturbance continued with uninterrupted violence.

March 1 *and* 2, 1883, 11.45 *p. m. to* 11.17 *a. m.*—The aurora appeared to be fully developed as soon as it grew dark, and was probably a continuation of yesterday's aurora. It first appeared as two streaming bands, starting near the horizon (southeast) and reaching nearly to the zenith. At 12 midnight two parallel bands of curtains crossed the zenith from SE. to NW. At 12.15 these were reduced to bunches of faint streamers in the SE. and NW., which soon rose and developed into curtains across the zenith. At 1 a. m. there was a narrow band of waving curtains (brightness 1), starting in Virgo, E. by S., running through the sickle of Leo and doubling back through Leo Minor, Ursa Major (α and β), Draco and Cygnus (α), with hazy bands spreading from Pegasus up through Cassiopeia to the zenith. At 1.15 to 1.20 these had developed into a broad shifting zone, edged with curtains (brightness 2 to 3), starting ESE. in Leo and NW. in Pegasus; in breadth extending from α Aurigæ to β Ursæ Majoris. At 2 a. m., rising from the same starting points, bands (brightness 1) and curtains (brightness 2) covered the whole sky from the eastern horizon to Auriga. The whole was constantly shifting, and brightest near the zenith, where it formed a sort of elliptical corona. At 2.20 this was reduced to one main band in the NE. from Pegasus NW. to Virgo ESE. through Cygnus (α), Lyra (α), Corona Borealis and Boötes (α), and indefinite (0 to 1) bands spreading up from each end towards the zenith. The band soon developed into three, the middle the brightest, and colored especially with a pink approaching salmon color. It was in rapid lateral motion from the NW. and all was changing rapidly. At 3 a. m. it was reduced to a few bands low in the NE. At 3.15 to 3.20 there was a band of curtains, making a loop in the NW., coming up from Pisces through Andromeda, Cygnus and Lyra, with other indistinct bands in the E. The loop rose and became a twisted band across the zenith, with tinges of the usual colors. At 4 a. m. most of the sky was covered with streaks (brightness 1 to 2) and broad hazy bands radiating from near the horizon in the NW. and SE. At 4.15 there was a diverging sheaf of bands in the NW. in Pisces, Triangulum and Taurus, and a broad band along the northern horizon to α Lyræ and then sweeping up almost in a circle through Draco, Ursa Minor, Leo Minor, and Leo to Virgo in the E. by S. and drifting rapidly westward (brightness 1 to 2). At 3 to 3.20 there were two bands (brightness 2 to 3), the upper quiet and the lower with streamers vibrating rapidly from W. to E., changing color from rose to yellow and green, running from Taurus through Orion, Canis Minor, Gemini, Cancer, Leo Minor, Leo, Coma Berenices and Boötes to Virgo, from NW. to SE. At 6 to 6.20 there were two quiet bands (brightness 0 to 1), one from Serpens through Boötes, Coma Berenices, Leo, Cancer, Auriga, Taurus, and Aries, and the other from Andromeda through Cygnus and Hercules, with detached patches in Canes Venatici, Ursa Major and Camelopardalis. Traces only were observed at the next two hours. At 9.17 there was an extensive zone (brightness 0 to 1), running E. and W., about 50° broad, drifting slowly southward, with an irregular band near the SW. horizon from W. to SSW., and quiet streamers (brightness 0 to 1) in Auriga, Perseus, Triangulum, Andromeda, Pegasus and Vulpecula. Traces only were seen at the next two observations in the SW. and N. at 10.17, and in the form of a shifting corona, fading in the dawn at 11.17. The magnetic disturbance still continued.

March 2 *and* 3, 1883, 11.45 *p. m. to* 10.17 *a. m.*—The twilight was so bright that only the largest stars were visible when the aurora was first seen. It began with streamers in the SE., which soon developed into a twisted band across the zenith. At 12.15 the waving band was in the same position (brightness 2 to 3), yellowish green in color and tinged with rose, and soon broke into four bands, extending 40° each side of the zenith. At 1 a. m. a moderately wide zone (brightness 1 to 2) crossed the zenith, starting ESE. in Leo and NW. in Pegasus, extending in width from α Aurigæ to α Ursæ Majoris, while two outlying bands from the same starting points (brightness 2) ran through Canes Venatici, Ursa Major (η), Corona Borealis, Boötes, Draco, Lyra, and Cygnus. The whole was narrower and fading at 1.15 to 1.20. It was brightest near the starting points and drifted eastward, much obscured by clouds. At 2 a. m. a zone about 60° broad, crossing the zenith from SE. to NW., was visible through the thin clouds (brightness apparently 1 to 2). At 2.15 to 2.20 the sky was clearer, though the starting points were still obscured. The shifting bands were all west of the zenith, the crown of the lowest passing through α Tauri. A hazy band was propagating rather rapidly from the SE., and the whole faded quickly and brightened up again. At 2.45 these bands in the W. were still pale, but somewhat convoluted. Suddenly the whole shot up to the zenith with lightning rapidity, burning very bright (3 to 4), and developing exceedingly rapid motion, both waving and whirling, with rapid changes of color and brightness. It passed the zenith in about two minutes, forming a semi-corona, first on the west side and then on the east. The motion was mostly from the NW., and the colors, though delicate, were exceedingly bright. They were apple-green, pale yellow, and rose-pink, in the usual order, the latter especially beautiful. In less than five minutes the motion subsided and the aurora faded, leaving the sky nearly covered with hazy, spiral, and sinuous bands (brightness mostly 1, some brightness 2), appearing to start from the SE. and NW., forming a sort of vortex round the zenith, circling and waving slowly, as it was seen at the 3 a. m. observation. At 3.15 to 3.20 there was in addition a bright loop in the NW., seen through the clouds, which gradually shifted and faded, breaking into luminous patches. At 4 a. m. all was gone except a bright glow in the NE. showing through the clouds, which at 4.15 to 4.20 could be seen to be an arched band. A shifting broad zone (brightness 0 to 1) covered most of the sky, and began to develop spirals in the N. At 5 to 5.20 a slowly-waving band (brightness 1 to 2) ran from Triangulum through Andromeda, Cassiopeia, Cepheus, Ursa Minor, Draco, and Boötes. Traces only were seen at the next observation. At 7 to 7.20 a belt of quiet bands (brightness 0 to 1) ran from Taurus through Auriga, Gemini, Lynx, Ursa Major, Leo Minor, Canes Venatici, and Coma Berenices to Virgo. Only traces were seen at 8. At 9.17 there was a broad arch from the NW. to SE., with its crown at an altitude of about 18°, and a broad, irregular, striated arch from the SE. to NNW. through Lyra, Draco, Ursa Major, Lynx, and Gemini (all brightness 0 to 1). This had faded to traces at 10.17. This aurora was probably a continuation of last night's, as it appeared highly developed at dark, and the magnetic disturbance still continued, though its violence was greatly abated.

March 4, 1883, 12.15 *a. m. to* 10.17 *a. m.*—Before the twilight was faded there was a faint arch in the NE., whose extremities bore ESE. and NW., with its crown at an altitude of about 20°. At 1 a. m. there was a regular arched band (brightness 1) in the NE. from ESE. in Leo through Coma Berenices, Boötes, Corona Borealis, Hercules, Lyra, and Cygnus, with streamers in Cygnus, which had developed at 1.15 into the upper band of a zone of three bands, passing through η Ursæ Majoris. At 2 a. m. there was an extensive zone (brightness 1 to 2) starting ESE. in Leo and NNW. in Pegasus, with its eastern bands in the position of the aurora last noted, and the main body of the zone crossing the zenith, going only 3° or 4° west of Polaris. Here it began to wave and circle, while the band through η Ursæ Majoris was now made up of short streamers, vibrating rapidly from E. to W., and slightly tinged with the usual colors. At 2.15 the main position still circling had reached α Aurigæ in the W., and the belt of streamers had become a broad sinuous band in rapid serpentine motion from the SE., again breaking into longer streamers, vibrating from NW. to SE. The western portion faded out in about five minutes, while the eastern subsided to quiet bands (brightness 1). At 3 a. m. nearly the whole sky was covered with hazy zone bands (brightness 0 to 1) from α Lyræ to Orion's belt, thinnest near the zenith and most numerous in the W. At 3.15 to 3.20 these were condensed to a broad shifting band (brightness 2) from Leo (β) in the ESE. to Pegasus in the NW. through γ and μ Leonis, Leo Minor, Lynx, Auriga, Perseus, and Andromeda. At 4 a. m. there were two well-defined arched bands (brightness 0 to 1) in the NE., the upper broad and the lower narrow, starting from Triangulum to Serpens through Pegasus, Cygnus (ε and β), and Hercules, with much diffused luminosity, reaching up to the zenith. At 4.15 to 4.20 the bands were twisted and broken, with a few pale streamers in the ESE., soon disappearing, and evanescent twisted streaks near the zenith. At 5 to 5.20 one band ran from Aries through Triangulum, Andromeda, Cassiopeia, Cygnus, Lyra, Draco, Hercules, and Serpens, and another short band from Taurus through Auriga and Ursa Major (brightness 0 to 1). At 6 to 6.20 there were traces only in the S. At 7 to 7.20 a slowly waving band (brightness 1 to 2) ran from Taurus through Orion, Gemini, Cancer, Leo, and Coma Berenices. At 8 to 8.20 there was a quiet band from Pegasus through (Orion, Gemini, Cancer, Leo) δ, Cygnus, Aquila, and Serpens (brightness 0 to 1). At 9.17 there was a diffused arch from the SE. to NNW., with its crown at an altitude of about 20°, with faint streamers in the NNW. At 10.17 there was a faint trace of an arch across the zenith from SE. to NW. Only slight magnetic disturbance was noticed.

March 5, 1883, 12.15 *a. m. to* 8.20 *a. m.*—At 12.15 (about 7 a. m. local) there was a faint arch in the NE., with its extremities bearing ESE. and NE., and the crown at an altitude of about 45°, with streamers in the NW. At 1 a. m. a broad twisted band (brightness 1 to 2), shifting and waving, crossed from ESE. in Leo to NNW. in Pegasus through Leo Minor, Ursa Major, Lynx, Ursa Minor, Cassiopeia, Cepheus, and Lacerta. It had drifted west to Auriga and Gemini at 1.15 to 1.20, and was brighter (brightness 2), and gradually spread towards the E., beginning to gyrate in the SE. in indistinct curtains. At 2 a. m. there was a rather narrow zone, with some of the bands approaching the curtain form from nearly the same starting points, broadest from ζ Ursæ Majoris nearly to α Aurigæ, with the bright portion mostly NE. of the zenith, and waving somewhat. It was broader at 2.15 to 2.20, and not so bright (brightness 1), and the bands were closer together, with less motion. At 3 there was a very broad zone (brightness 1 to 2) from nearly the same starting points, in width from α Lyræ and α Boötis to α Canis Minoris and α Tauri, brightest on the eastern edge and in the part west of the zenith, with a slight waving motion. At 3.15 to 3.20 the edges had faded and all was slowly fading except the extreme NE. bend. From 4 to 4.20 there were remains of the aurora (brightness 0 to 1) in essentially the same position, which had nearly all faded, except the western band, at 4.20. At 5 to 5.20 a quiet band (brightness 2) ran through Taurus, Gemini, Orion, Cancer, Leo, Coma Berenices, and Boötes. At 6 to 6.20 a corona (brightness 1) covered nearly the whole sky, centering in Ursa Major, and in rapid motion. Faint traces of this still remained at 7 to 7.20, and traces were again seen in the NW. and SW. at 8 to 8.20. After this the weather became cloudy. The magnets were comparatively quiet all night.

March 6, 1883, 3 *a. m. to* 9.17 *a. m.*—The aurora may have begun a little earlier, as there was a bank of hazy stratus clouds in the NE., but the first that could be recorded with certainty was at 3 to 3.20, when there were ill-defined luminous patches in the E., partly obscured by clouds, followed by exceedingly faint vertical streaks, first one and then three, streaming up from the SE. towards the zenith with a better defined streamer close to the horizon in the NNW. at 3.20. At about 3.40 these had developed into a band (brightness 1) from the clouds in the ESE., across the zenith to α Andromedæ in the NNW., which broadened into a zone, and at 4 to 4.15 was reduced to hazy traces about 30° in width near the zenith. These gradually became brighter in the SE., streaming up through Leo (β) to the zenith. At 5 to 5.20 only traces were observed, a little south of the zenith. At the next observation none was seen, but at 7 to 7.20 a quiet band (brightness 0 to 1), from Taurus through Orion, Gemini, and Leo. At 8 to 8.20 a. m. there were traces in NW. and SW. At 9.17 there was an arch from NW. to SE., with its crown about 20° above the southern horizon and traces in the NNW. No more was seen after this, though the sky was clear. There was a slight magnetic disturbance, beginning at 9 a m.

March 7, 1883, 12.15 *a. m. to* 10.17 *a. m.*—At 12.15 there were faint streamers in the E., which at 1 a. m. had developed into a twisted band of streamers (brightness 1), from ESE. in Hydra, through Leo, Lynx, Camelopardalis, and Cassiopeia, swinging round into Perseus somewhat in the form of a corona, with slight motion. The band was in the same position, with a well-defined semi-corona SW. of the zenith, reaching into Auriga and Gemini, with the band extending down into Andromeda NNW., the whole soon fading. At 2 to 2.20 there was an arch of shifting streamers (brightness 0 to 1) in the SW., much obscured by haze and clouds, especially near the horizon, reaching an altitude of about 30°, and passing through Leo, Cancer, Gemini, and Taurus. At 3 a. m. there was a somewhat irregular corona, connected with the horizon by narrow streaks ESE. and NNW., and made of curtains (brightness 1 to 2) running round through Leo Minor, Lynx, Gemini, Taurus, Aries, Andromeda, Cassiopeia, Cepheus, Draco, and Ursa Major, surrounding hazy curdled streaks (brightness 0 to 1) about the zenith, with slight motion. At 3.15 to 3.20 only the western portion remained, forming a sort of zone, combined with a semi-corona, and slowly shifting. At 4 there was merely an ill-defined arch of streamers in the SW., which at 4.15 had become three or four shifting bands of curtains, flickering from the extremities towards the center (brightness 2 to 3), tinged slightly with the usual colors. This soon rose towards the zenith, at length forming a complete corona of curtains (brightness 1), elongated towards the horizon, and brighter (brightness 2) in ESE. and NNW., with considerable motion at 4.20. At 5 to 5.20 a band of streamers, in slow motion from W. to E., ran through Taurus, Auriga, Gemini, Cancer, Leo, and Virgo, with short, broad, quiet bands from Virgo through Boötes, Serpens, Corona Borealis, Coma Berenices, Canes Venatici, Leo Minor, and Ursa Major (brightness 2 to 3). At 6 to 6.20 a band (brightness 1) ran through Perseus, Cassiopeia, and Cygnus. At 7 to 7.20 only traces near the zenith were seen. At 8 to 8.20 there were several parallel bands in the S., 15° to 50° above the horizon (brightness 0 to 1). At 9.17 there was an arch in the S. (brightness 0 to 1) from SE. to NW., with an altitude of about 20°, with faint curtains in the N. and NE. and a few faint streamers centering towards the zenith. At 10.17 traces of the arch still remained, and other traces in the W., N., and near the zenith. There was a magnetic disturbance from 4 a. m. to 1 p. m., reaching its maximum at about 12 m.

March 8, 1883, 12.15 *a. m. to* 9.17 *a. m.*—The aurora was first noticed at 12.15 (about 7 p. m. local), when the twilight was still bright, as a band crossing from SE. to NW., passing about 20° SW. of zenith. In the next three observations there was much haze and hazy clouds, obscuring the stars. At 1 a. m. a broad shifting zone crossed the zenith from WNW. to ESE., showing through the haze (brightness 1 to 2). At 1.15 to 1.20 it was narrower, and passed 15° to 20° SW. of the zenith. At 2 a. m. there showed through the hazy cloud in the SW. a regular arch (brightness 2), reaching an altitude of about 20°. This was gone at 2.15 to 2.20, and a hazy band crossed about 15° SW. of the zenith. At 3 a. m. there was a broad zone about 120° in width from SE. to NW. (brightness 1 to 3). It was brightest on the edges, especially in the W., where there was considerable motion and tinges of the usual colors, all obscured by the haze. At 3.15 to 3.20 it was mostly confined to the NW., where it formed bright shifting loops, with their convexity towards the zenith. At 4 a broad waving and shifting zone crossed the zenith (brightness 1 to 2) from a broad origin, NNW. to NW. by N., to ESE., the starting points in Virgo and Andromeda, Triangulum and Aries, the eastern edge passing through Coma Berenices, Canes Venatici, Ursa Major, Ursa Minor, and Cassiopeia, and the western through Leo Minor, Lynx, Auriga, and Perseus, with an arched yellow band (brightness 2 to 3) to the NE. through Cygnus (α), Lyra (α), Corona Borealis, and Virgo. At 4.15 to 4.20 it was in nearly the same position, but fading and shifting. The eastern edge of the zone appeared fimbriated. At 5 to 5.20 a slowly waving band (brightness 1 to 2) ran through Taurus, Auriga, Ursa Major, Canes Venatici, Coma Berenices, Boötes, Corona Borealis, and Draco. Traces only were observed at 6 to 6.20. At 7 to 7.20 bands and patches (brightness 0 to 1), without motion, covered the southern half of the sky. These had faded to mere traces near the southern horizon at 8 to 8.20. And traces only in the SW. and N. were seen at 9.17. None were seen at the next observation, but the sky then became cloudy, so that the end cannot be determined with certainty. A magnetic disturbance commenced about 3 a. m., and continued the rest of the night, reaching its greatest violence at about 9 a. m.

March 9, 1883, 1.15 *a. m. to* 6.20 *a. m.*—Very early in the evening, while the twilight was still bright, a patch of aurora appeared in the SE. near the horizon, but soon disappeared, and no definite aurora was seen till 1.15 to 1.20, when indistinct horizontal bands appeared in the NE., beginning gradually to develop in the ESE. At 2 a. m. a barely perceptible band crossed the zenith from ESE. to NNW., through Leo, Ursa Major, Camelopardalis, and Cassiopeia, and was in nearly the same place at 2.15 to 2.20, beginning to shift a little towards the W. At 3 a hazy band (brightness 1) ran from the ESE. in Virgo to the NNW. in Andromeda through Leo, Ursa Major (α and β), Camelopardalis and Cassiopeia, which at 3.15 to 3.20 was paler, and sent a band through Cancer, Taurus, and Aries. At 4 a. m. there were merely traces in nearly the same position, but at 4.15 to 4.20 there was a hazy band nearly 1 in brightness starting close to α Virginis in ESE. through δ, Leo (β and δ); Leo Minor, Lynx, Auriga, and Perseus, ending in a series of short, ill-defined streamers in Andromeda NNW. At 5 to 5.20 a quiet arch (brightness 1) ran from Taurus, through Orion, Gemini, Leo, and Boötes. At 6 to 6.20 there was a bright corona (2 to 3), centering in Ursa Major, on the edges vibrating rapidly from W. to E., and in the center whirling rapidly. Traces were seen at the next two observations. The magnets were quiet until about 12 m., when there was a violent disturbance, lasting only three hours, and reaching its maximum at 1 a. m.

March 10, 1883, 1.30 *a. m. to* 9.17 *a. m.*—Evanescent traces were noticed in the N. about 1.30 a. m., and again at 2 a. m. in Cygnus in the NW. At 2.15 to 2.20 there was a zone of three shifting bands (brightness 0 to 1) in the NE., through Cygnus, Lyra, Corona Borealis, and Boötes (α) into Virgo. At 3 to 3.20 there was a broad zone, shifting and changing in brightness from 0 to 1 to 1 to 2, crossing the zenith from ESE. in Virgo to NNW. in Pegasus, reaching in breadth from β and γ Draconis nearly to α Aurigæ. At 4 a. m. two bands (brightness 1 to 2) ran from the ESE. in Virgo to the NNW. in Andromeda, through Boötes, Corona Borealis, Draco (β and γ), and Hercules, with a bright patch growing hazy and fading out towards the zenith in the NW., occupying Andromeda, Perseus, and Cassiopeia. This had developed at 4.15 to 4.20 into a broad, shifting zone (brightness 1 to 2), starting from the same point in the NNW. and forming a much convoluted mass in the E. in Aquila and Boötes, while the western edge ran through Boötes, Ursa Major, Ursa Minor, Camelopardalis, and Cassiopeia. At 5 to 5.20 a. m. a quiet band (brightness 1) ran from Aries through Triangulum, Andromeda, Cygnus, Lyra, Hercules, and Corona Borealis. At 6 to 6.20 the band was in nearly the same position, but brighter (1 to 2), and had a few streamers in Corona Borealis. At 7 to 7.20 there were merely traces in the N. and NE. At 8 to 8.20 a broad band (brightness 0 to 1) crossed the zenith from Orion to Aquila, through Auriga, Lynx, Ursa Major, Draco, and Hercules. At 9.17 a. m. there was a broad diffused arch in the south from ESE. to WNW., reaching an altitude of about 20°, and a faint corona elongated from E. to W., occupying Cygnus, Ursa Minor, Lynx, Gemini, Lyra, Draco, and Ursa Major, and a short arch from E. to N., passing into Cassiopeia (brightness of all 0 to 1). There was a slight magnetic disturbance, lasting from 9 a. m. to 2 p. m.

March 11, 1883, 2 *a. m. to* 9.17 *a. m.*—Traces in the ESE. began to assume a definite form at 2 a. m., faint streaks streaming up to Virgo. At 3 a. m. the streak was very small, but at 3.15 to 3.20 better defined and longer, reaching into Boötes and Corona Borealis. At 4 a. m. a broad, hazy, striated band, almost a zone (brightness 1), ran from ESE. in Virgo to NNW. in Andromeda, through Coma Berenices, Canes Venatici, Ursa Major, Camelopardalis, and Perseus, and had drifted W. at 4.15 to 4.20 so as to pass through β and δ Leonis and Auriga. This had expanded into a broad zone at 4.45, but again contracted to a band at 5 to 5.20, crossing the zenith from Cancer through Gemini, Auriga, Lynx, Camelopardalis, Ursa Major, Draco, Lyra, and Hercules. At 6 to 6.20 there were merely traces in the S. At 7 to 7.20 a band of streamers (brightness 1 to 2), vibrating rapidly, passed from Taurus through Perseus, Cassiopeia, Cepheus, Cygnus, and Lyra. At 8 to 8.20 extensive traces crossed the southern sky. At 9.17 there was an arch in the S. from SE. to NW., reaching an altitude of about 20°, with a short streamer in the NW. and traces of an arch running from ESE. to WNW. through Lyra, Draco, Ursa Major, and Lynx (brightness 0 to 1). There was a magnetic disturbance between 7 and 11 a. m., reaching its maximum at about 8 a. m.

March 12, 1883, 3.40 *a. m. to* 9.17 *a. m.*—At about 3.40 a. m. (10.30 local time) there were three or four faint streamers in the N. in Andromeda and Cygnus, but at the regular observation at 4 a. m. the sky was too cloudy to allow any to be seen. At 4.15 traces of a pale zone or elongated corona could be seen through the clouds, but at 5 to 5.20 the sky was sufficiently clear to display a quiet band (brightness 0 to 1) from Boötes, through Canes Venatici, Ursa Major, and Lynx, to Auriga. Traces were seen in the S. at 6 to 6.20. The sky was partially cloudy at the next two observations, but clear enough at 9.17 to show an elongated corona (brightness 0 to 1), longest from SE. to N. W., where it reached the horizon, centering at the zenith, and made up of a long, slender ray, with slight motion, about 40° long on the sides of the corona. Increasing light and clouds prevented observation of the end of the aurora. The needles were slightly disturbed from 9 to 10 a. m.

March 13, 1883, 1.10 *a. m. to* 9.17 *a. m.*—The weather was cloudy early in the evening, but between 1 and 1.15 a. m. disclosing a brilliant display in the western sky still bright with the twilight in the form of an arch of short streamers vibrating from the extremities towards the crown. The ends bore NW. and S. about 20° above the horizon, while the crown reached an altitude of 35° close to α Tauri, while below the arch were irregular curtains, the whole tinged with the usual colors (brightness 2). The streamers suddenly fused together and the motion became rapid, bright colors—particularly rose—developed in the S. with rapid changes of color and brightness, becoming a broad zone of bands and curtains in very rapid motion (brightness 2), and in a few seconds reached the zenith and passed it, forming a semi-corona, and faded to hazy bands covering nearly all the sky. In about two minutes it began to develop again in the NW., reaching brightness 3, with bright colors and rapid motion in Cassiopeia, and some reached the zenith, forming an elongated corona of curtains in very rapid motion in several concentric rows rapidly fading. At 2 a. m. a band of short streamers ran from α Hydræ through Orion's belt to the clouds in the NW., while there was a broad hazy band just above this, and one long semi-corona the western half of which was a broad, sinuous band, the eastern a fan of streamers, the longest about 30°, near the zenith, centering about the middle of Camelopardalis and extending from Leo in the ESE. to Cassiopeia in the NW. The streamers were replaced by a hazy band at 2.15 to 2.20, with traces of the corona which were gradually growing more distinct (brightness of all 0 to 1). At 3 a. m. there were three hazy arched bands in the SW., and a narrow zone from the clouds in the ESE. to Cassiopeia NNW. in breadth, from λ Draconis to α Aurigæ, with a semi-corona E. of the zenith, mostly in Boötes, Canes Venatici and Ursa Major (brightness 1). At 3.15 to 3.20 there were only traces of the zone and corona, while the bands in the SW. were less distinct (brightness 0 to 1). At 4 a. m. there was a wavy broad zone (brightness 1 to 2) brightest on the eastern edge, with the starting points near α Virginis in the ESE. and α Arietis in the NW., with the western edge close to the horizon and the eastern through Corona Borealis, Draco, Cepheus, Cassiopeia and Andromeda, composed of bands and curtains, with some motion on the eastern edge. At 4.15 to 4.20 all was west of the zenith (brightness 1) and rapidly fading from above towards the horizon. At 5 to 5.15 a band of curtains and streamers rapidly vibrating and waving (brightness 1 to 2) ran from Andromeda through Lacerta, Cygnus, Lyra and Hercules. At 6.20 a band (brightness 0 to 1) ran from Gemini to Lynx and Ursa Major. At 7 to 7.20 there were traces only in the SW. At 8 to 8.20 the sky was nearly covered by a corona centering in Ursa Major and extending to a band about 15° to 20° above the horizon. There was no motion near the zenith, but a few bands of streamers in the N. and NW. (brightness 2 to 3), in Auriga and Cassiopeia, were vibrating very rapidly. The last faint traces were seen in the NW. at 9.17. The needles were disturbed from 1 to 8 a. m., the disturbance reaching its maximum at the last hour.

March 14, 1883, 1.15 *a. m. to* 9.17 *a. m.*—At about 1.15 a. m. there was noticed a faint, narrow, quiet arch in the NE. from ESE. to NNW. just below ε Cygni through Boötes (close to α), Corona Borealis (α), α Lyræ and Cygnus; at 1.20 rising and changing into streamers in the NNW. At 2 a. m. there was a narrow, indistinct, hazy zone from ESE. in Virgo to NNW. in Andromeda, stretching in breadth from δ Ursæ Majoris to α Persei. This at 2.15 to 2.20 was wholly W. of the zenith, occupying Andromeda, Perseus, Cassiopeia, the upper part of Taurus, Auriga, Gemini and Leo (brightness 0 to 1). At 3 a. m. there was a broad zone of two main bands, about 30° apart (brightness 2), starting in the ESE. in Virgo and the NNW. in Aries, and extending from the middle of Camelopardalis near the zenith to about 2° below α Canis Minoris and the SW., altitude about 25°, with a slight waving motion in the ESE. At 3.15 to 3.20 it was not so bright (brightness 1) and the western edge was unchanged, but the whole had spread E. so as to cover nearly the whole sky to within 10° of the horizon in the NE., and was very sinuous in the N. At 4 a. m. there was a hazy loop in the N. and NE. (brightness 1) from Aries near α through Triangulum, Andromeda, Cepheus (α) and Draco, bending back near θ Draconis through Hercules (ε), Lyra (β), Cygnus, and Andromeda. At 4.15 to 4.20 there were pale traces of the loop from Aries up through Cassiopeia towards the zenith, with a regular arch in the SW. from ESE. near α Virginis to the moonlight in the NW., with its crown near α Hydræ, and a belt of three or four bands in the NE., from N. to E., with its crown near β Cygni (brightness 0 to 1). At 5 to 5.20 a. m. a quiet band (brightness 0 to 1) ran from Taurus through Perseus, Andromeda, Cassiopeia, Cepheus, Cygnus, Lyra and Hercules. At 6 to 6.20 auroral bands covered nearly the whole sky. The brightest part was in the N. and NE. where it had a rapid motion. Round the zenith were only a few faint, quiet bands (brightness 1 to 2). There were extensive traces at 7 to 7.20, and slight traces in the S. at 8.20. Traces of an arch in the SW., from SE. to NW., reaching an altitude of about 18°, with a faint trace in the NNW., could be seen at 9.17. There was a magnetic disturbance from 3 to 9 a. m., reaching its maximum about 6 a. m.

March 15, 1883, 1.15 *a. m. to* 8.17 *a. m.*—There were traces of a faint arch in the ESE., while the twilight was still bright, coming up from near the horizon to α Boötis. The traces continued till 3.15 to 3.20, when there were bands of pale light from Pegasus through Cygnus, Lyra and Hercules. At 4.20 there was a brighter arch (brightness 1 to 2) from the E. to N. through Hercules, Draco, Cepheus, Cassiopeia and Andromeda, with traces in Perseus, Aries, Corona Borealis, Ursa Major and Lynx. At 5.15 to 5.20 a broad band, waving slowly, ran from Auriga through Camelopardalis, Ursa Minor, Cassiopeia, Cepheus, Lacerta, Cygnus, Lyra and Hercules (brightness 1 to 2). At 6.17 there was a broad curtain (brightness 2 to 3) from Sagitta in the E. through Cygnus and Cassiopeia, with streamers centering towards the zenith, and a broad band from the northern extremity of the curtain to Ursa Major, with a slight vibration. At 7.15 to 7.20 a quiet band (brightness 1) ran from Leo through Coma Berenices and Boötes. The last aurora seen was a quiet arch (brightness 0 to 1) at 8.17 in the SW., from SE. to NW., reaching an altitude of about 25°. There was a magnetic disturbance, affecting almost solely the horizontal force, between 5 and 6 a. m., reaching its maximum about 5.30.

March 16, 1883, 1 *a. m. to* 9.17 *a. m.*—At 1 a. m. there was an arch in the NE. (brightness 0 to 1) with one end near the horizon ESE. and the other in the twilight NNW., running just above α Boötis, Corona Borealis and Lyra (β). At 1.15 this was rising rapidly and soon formed a narrow zone across the zenith, again narrowing into a sinuous band (brightness 1) through Leo (α), Lynx, Camelopardalis, Cassiopeia and Andromeda. At 2 a. m. there was a broad zone with its starting points ESE. in Virgo and NNW. in Andromeda, extending in breadth from β Tauri in the SW., to η Ursæ Majoris in the NE. The western band was the brightest reaching brightness 2, while the rest was pale and hazy (brightness 0 to 1). At 2.15 to 2.20 the ESE. starting point had spun out over about 20° in azimuth, forming a broad patch of very sinuous and, as it were, curdled streamers, while the eastern edge passed through Boötes, Corona Borealis, Hercules, Lyra (β) and Cygnus (ε). The whole zone was rather broken and not so bright (brightness 1 to 2). At 3 a. m. it had all faded to traces except the easternmost band, which ran through Hercules, β Lyræ and ε Cygni, and was still paler at 3.15 to 3.20. At 4 a. m. there was no aurora, but at 4.40 faint traces appeared in the NW., developing into a very transitory band across the zenith from NW. to SE. No more was seen till 9.17 a. m. when there were faint traces in the NW. The needles were somewhat agitated at the time of the aurora without any larger disturbance.

March 17, 1883, 3.15 *a. m. to* 9.20 *a. m.*—At 3.15 to 3.20 there was a faint, arched streak from near the horizon ESE. in Virgo up through α Corona Borealis. This soon rose and formed a zone, which from 4 to 4.20 had a brightness 1 to 2, starting ESE. in Virgo, and NNW. in Andromeda, occupying Boötes, Canes Venatici, Ursa Major, Cameleopardalis, Auriga and Perseus. It was very sinuous in the ESE., shifting and changing form and brightness, and rather yellow in color. At 5.15 to 5.20 it had faded to a band (brightness 0 to 1) from Orion through Gemini, Lynx, Ursa Major; Canes Venatici and Boötes. At 6.15 to 6.20 a quiet zone (brightness 1) crossed the zenith from WNW. to ESE., from Taurus through Auriga, Gemini, Lynx, Camelopardalis, Ursa Minor, Draco and Hercules. There were traces only at 7.15 to 7.20 a little south of the zenith. No more was seen till 9.20 when there were traces of an arch from SE. to NW., through Corona Borealis, Ursa Major, Lynx and Auriga. The magnets were unusually quiet all night.

March 18, 1883, 4.40 *a. m. to* 9.17 *a. m.*—At 4.40 a. m. (11.30 p. m. local) a very faint, narrow band stretched across the zenith from ESE. to NW., through Ursa Major, Camelopardalis, Auriga, and Perseus indistinct towards the horizon. At 5 to 5.20 there was a rather indistinct short band in the ENE. from Hercules to Lyra. At 7 to 7.20 a slowly waving band (brightness 0 to 1) ran from Leo through Coma Berenices, Boötes, and Serpens. At 8 to 8.20 a band of streamers waving slowly like a curtain from E. to W. ran from Perseus through Cassiopeia, Andromeda, Lacerta, and Cygnus, and two quiet bands nearly parallel extended from Aquila through Hercules, Corona Borealis, Boötes, Canes Venatici, Ursa Major, and Leo (brightness of all 1 to 2). At 9.17 there were traces in the W. The magnets were slightly disturbed from 8 to 9 a. m.

March 19, 1883, 4.40 *a. m. to* 6.20 *a. m.*—At 4.40 a pale band (brightness 0 to 1) could be seen crossing the zenith with its extremities some distance from the horizon ESE. and NW., passing through Boötes, Canes Venatici, Ursa Major, Camelopardalis, and Perseus. At 5 to 5.20 a similar band passed west of the zenith from Serpens through Boötes, Coma Berenices, and Leo. At 6 to 6.20 a band of streamers in rapid vibration (brightness 1) ran from Orion through Taurus, Perseus, Andromeda, Cassiopeia, Lacerta, and Cygnus. The needles were slightly agitated at the time of the aurora

March 20, 1883, 4.40 *a. m. to* ———.—At 4.40 a. m. a faint streak was observed in the ESE. coming up from Virgo through Boötes towards the zenith. This soon faded and no more was observed. Clouds, however, interfered with observation later in the night. The magnets were very quiet.

March 21, 1883, 1.15 *a. m. to* 9.17 *a. m.*—The twilight was still very bright at 1.15 (8 p. m. local) showing only the larger stars, when bright, shifting streamers began to appear 8° or 10° above the horizon ESE., then shooting up as a band through Leo and Taurus, then forming several broad sinuous bands in Leo, which rose to the zenith and formed an elongated corona rendered indistinct by the twilight. At 2 a. m. there was a sinuous band (brightness 1 to 2) in the ESE., running up from Virgo into Boötes and Corona Borealis, and a broad hazy zone across the zenith from the twilight in the NNW. to the moonlight in the ESE., occupying Andromeda, Cassiopeia, Perseus, Auriga, Camelopardalis, Ursa Minor, Ursa Major, and Leo. At 2.15 to 2.20 the zone was in essentially the same position, but shifting and changing from a zone to a twisted band and back again, and moving slowly westward. At 3 a. m. an area of curtains (brightness 2) rapidly developed from the NW., consisting of three or four shifting rows from Andromeda to Hydra and from near the SW. horizon to Auriga, slightly tinged with the usual colors. At 3.15 to 3.20 there was a band of curtains from Libra through Hercules, α Lyræ, and α Cygni, waving from E. to N. and developing a large patch in Lyra and a few bands in the place of zone at 2 a. m., which quickly developed a small faint corona and all rapidly faded. At 4 a. m. there was a similar band of curtains in the NE., partly obscured by clouds. At 4.15 to 4.20 there appeared faint bands and streamers in the N. and NE. mixed with patches of cloud. Clouds interfered with observation at the next two hours, but it had cleared at 7.15 to 7.20, and showed a quiet band (brightness 0 to 1) from Aquila through Pegasus, Andromeda, and Perseus from E. to NNW. At 9.17 there was a corona of long slender rays centering towards the zenith, waving slightly. The needles began to be agitated at the first sign of the aurora, and the disturbance continued all night, reaching its maximum at 3 p. m.

March 23, 1883, 1 *a. m. to* 8.20 *a. m.*—At 1 a. m., while the daylight was still very bright, so that only the largest stars were visible, there was a white, sinuous, shifting streak in the E. near Arcturus. At 1.15 a. m. there was one arched band in the E. through Arcturus and Virgo, and a twisted, shifting band across the zenith from SE. to NW., soon fading, and extensive patches developing in the E. At 2 a. m. a rather narrow, shifting zone, waving slowly, crossed the zenith from the ESE. in Virgo to NW. in Andromeda through Boötes, Canes Venatici, Ursa Major, Ursa Minor, Cepheus, Cassiopeia, Perseus, and Andromeda, and two arched sinuous bands in the NE., the upper through Corona Borealis, Hercules, α Lyræ, and α Cygni, and the lower near the horizon. At 2.15 to 2.20 the zone had shifted W. nearly to α Aurigæ, fading gradually, while a new zone developed in the former place and bands in the E. shifted. Clouds interfered with the next three observations, and, though the sky then cleared, no more aurora was seen till 8.15 to 8.20, when a yellowish band (brightness 1), waving slowly, ran through Leo, Leo Minor, Ursa Major, Canes Venatici, Draco, and Cygnus, sending up a few rapidly vibrating streamers in Cygnus. The magnets were disturbed from 7 a. m. to 2 p. m., the maximum disturbance being at 8 a. m.

March 24, 1883, 1.45 *a. m. to* 3.15 *a. m.*—The twilight was still bright at 1.45, but a well-defined arch (brightness 1) was observed running through Boötes (just above α), Corona Borealis, Hercules, Draco, and α Cygni, and rising rapidly. At 2 a. m. a broad yellowish band (brightness 1 to 2), fringed on the upper edge, with ill-defined streamers, lay in the NE., passing through Canes Venatici, the tail of the Great Bear, Draco, and Cygnus to the twilight in the NW. This had risen at 2.15 a. m. to form a narrow zone (brightness 1) from the ESE. to NW. through Canes Venatici, Ursa Major, Ursa Minor, Draco, Cepheus and Cassiopeia to Andromeda. Three or four ill-defined rolling curtains developed quickly from the E. towards the N., with rapid, quivering motion propagated in the same direction through Boötes, Corona Borealis, Hercules and Lyra, reaching a brightness of 2 to 3 in Boötes in the E., with a bright display of green, yellow, and rose in the usual order, quickly quieting down and growing paler, while the zone widened in both directions to about twice its usual width and growing hazy, and then developing a waving motion on the western edge. At the next observation the clouds already so obscured the aurora that traces of an arch were alone visible in the E. The clouds prevented further observation entirely. The needles were quiet, with a high horizontal force.

March 26, 1883, 1.15 *a. m. to* 5.20 *a. m.*—It was still broad daylight at 1.15, but a perturbation of the magnets indicated an aurora, which was seen on leaving the observatory as a pale, shifting, sinuous band from near the horizon ESE. and passing up about 20° E. of the zenith. At 2 a. m. a narrow zone (brightness 1 to 2) ran from the ESE. in Virgo to the twilight in the NW., through the sickle of Leo, Gemini, Taurus, and Aries. At 2.15 to 2.20 this had spread eastward to within about 10° of the eastern horizon, broken up into sinuous bands and curtains, brightest in the E. and N., whirling curtains in the E. and a vertical loop in N., quickly developing into an arched band and again bearing a loop with rapid motion, both waving and vibrating, and showing rather bright colors—green, yellow, and rose—the green especially appearing against the twilight. At 3 a. m. there was a broad zone of four bands (brightness 2) with its starting points in Virgo ESE., and NW. in Aries, extending in breadth from Procyon to Polaris. It was in essentially the same place at 3.15 to 3.20, but there were more bands, shifting, broken, and hazy, some approaching the form of curtains, growing paler and then brighter again, especially in the ESE., where the bands were very sinuous. Clouds interfered with observation the next hour, but traces were seen in the W. At 5.15 to 5.20 a band (brightness 1) ran from Serpens through Boötes, Coma Berenices, Leo, Cancer, Gemini, and Orion, with a few quiet streamers in Serpens and Boötes. The magnets were disturbed all night.

March 27, 1883, 2.15 *a. m. to* 6.20 *a. m.*—The sky was covered with hazy clouds at 2 a. m., but these were sufficiently thin at 2.15 to 2.20 to show traces of a narrow band across the zenith from the NW. to SE. At 3 a. m. there were three or four bands, obscured by the hazy clouds lying low in the SW., passing through Virgo, the lower part of Leo, into Canis Minor and Taurus (brightness 1). The position of these bands was practically unchanged at 3.15 to 3.20, but the upper band was broadened and fringed out into ill-defined streamers, while the lowest was narrow and bright. All were shifting and changing in brightness (brightness 1 to 2) and bright streamers developed in the SE. At 3.15 there was a large, complete, and quiet regular corona (brightness 1), of about 40° radius, centering in Ursa Major, near the zenith, with a broad band on the western edge and twisted shifting streaks near the center. This had become a broad zone at 4 a. m., partly obscured by the clouds (brightness 1 to 2) from the NW. to SE., extending in breadth from the lower edge of Draco to Procyon, and at 4.15 to 4.20 had again become a corona, but more incomplete and elongated, running down towards the horizon in the E., with a bright (2 to 3) and quiet regular arch in the W., with an altitude of about 25°. All shifted rather rapidly, with a loop in the NW. (altitude about 35°), increasing in brightness 2 to 3, and finally all settling into a broad zone. At 5 to 5.20 quiet bands (brightness 0 to 1) were visible through the dense haze running through Coma Berenices, Canes Venatici, Ursa Major, Leo, Lynx, Cancer, and Gemini. At 6.15 to 6.20 there was a bright corona (brightness 2 to 3) centering in Ursa Major. The streamers were very short in the N., not reaching the zenith. The edge of the corona was in Serpens, Boötes, Orion, Gemini, Auriga, Lynx, Hydra, and Leo, all in rapid motion from E. to W. Clouds then interfered more or less with observation, rendering it impossible to determine the end of the aurora. A violent magnetic disturbance commenced about 3 a. m. and still continues.

March 28, 1883, 2 *a. m. to* 6.20 *a. m.*—At 2 a. m., partly obscured by the clouds, there were bands coming up from the ESE. At 2.15 to 2.20 there was a bright arched band (brightness 2 to 3) in the SW. from the ESE., in Crater through Hydra (α), Monoceros and Orion (γ), narrow and curling down in the NW. It was bright yellow, shading into rose on the lower edge, flickering slightly, and then developing rapid motion in the NW and rising at the same time to α Canis Minor is, broadening at the same time, while a second and then a third band above this and only about half as long developed from the ESE., and then growing paler and sinking. At 3 a. m. the whole sky was covered with broad hazy bands and curved patches running NW. and SE. At 3.15 to 3.20 there was a loop in the N. and NNE. from Aries, through Andromeda into Cygnus, shifting and rising, while a broad hazy band developed from the NW. to SE. across the zenith, and with the loop formed a semi-corona E. of the zenith, much elongated, and then becoming a band of streamers (brightness 2 to 3) from Aries through Andromeda, Cassiopeia, Cepheus, Draco, and Corona Borealis and then curving back through Lyra, vibrating rapidly from E. to N., rising towards the zenith, and splitting. At 4 a. m. there was a broad zone from ESE. to NW. (brightness 1) made up of coronal streamers east of the zenith, not reaching lower than Cepheus, while all the western sky was covered. At 4.15 to 4.20 there was a zone of four main bands (brightness 1 to 2) from the SW. horizon nearly to the zenith, with the same starting point, but curving back in the E. through Aquila. The upper band was edged with short streamers, and long streamers began to develop in the E. At 5 to 5.20 the whole sky was covered with quiet bands (brightness 0 to 1) running WNW. to SE. At 6.15 to 6.20 there were traces of a great corona covering the sky. No more was observed. Yesterday's magnetic disturbance continued.

March 29, 1883, 3.45 *a. m. to* 8.15 *a. m.*—The aurora was only observed at intervals of fair weather during the night. At 3.45 broad bands in the W. suddenly shot up to the zenith, with rapid vibration and play of colors, and formed a corona, apparently covering the whole sky. At 4 a. m. the corona still persisted, and surrounded by belts of curtains covered nearly all the sky (brightness 1 to 2). It was partly obscured by clouds and haze, but appeared to be in motion, shifting and waving with rapid vibration in the NE., and bright yellow patches showing through the clouds. It had partly faded at 4.15 to 4.20, and was much obscured by haze and clouds. Traces only were seen at the next hour. The sky was clear enough at 7.15 to 7.20 to show quiet bands (brightness 1), forming a zone, occupying Orion, Taurus, Gemini, Perseus, Andromeda, Lynx, Ursa Major, Cassiopeia, Cepheus, Boötes, Corona Borealis, Lacerta, Cygnus and Lyra. Traces were visible at 8.15. The needles were quiet up to 4 a. m., when a violent disturbance commenced and still continues.

March 30, 1883, 7.15 *a. m. to* 7.20 *a. m.*—The sky, which had been cloudy all night, cleared about 7.15 a. m., displaying a slowly waving band from Gemini through Lynx, Ursa Major, Canes Venatici and Boötes (brightness 0 to 1). The needles were somewhat disturbed from 4 a. m. to 1 p. m.

April 2, 1883, 2.15 *a. m. to* 7.20 *a. m.*—There were traces of a band in the ESE. at 2.15, which at 3 a. m. had developed into a broad hazy zone from the ESE., in Virgo, fading in the twilight in the NNW., reaching in breadth from θ Ursæ Majoris to β and γ Draconis. This had condensed at 3.15 to 3.20 to a broad band in the SW., through Virgo, Hydra, Leo, Gemini, Cancer, Canis Minor, the upper part of Orion and Taurus, and beginning to shift and break (brightness 1). At 4 a. m. there was a broad, ill-defined, sinuous band in the NE., from near α Serpentis, through Hercules, Lyra and Cygnus, into Pegasus, and a hazy band starting from the same place, running through Boötes, Canes Venatici, Ursa Major, Lynx, Auriga and Perseus (brightness 0 to 1), and all had faded to traces at 4.15 to 4.20 except the band in the E., and this even had become traces at 5 to 5.20. At 6.15 to 6.20 a belt of slowly waving bands, with a few patches of streamers in Aquila, ran from Taurus, through Auriga, Perseus, Andromeda and Cassiopeia, to Cygnus (brightness 1). At 7.15 to 7.20 there was a short band from Ursa Major to Boötes in slow motion from W. to E., and a rather motionless band from Perseus and Cassiopeia to Cepheus (brightness 0 to 1). A magnetic disturbance commenced at 3 a. m., and was not over when the aurora ended, reaching its maximum at 12 m.

April 3, 1883, 1.45 *a. m. to* 7.20 *a. m.*—A slight agitation of the needles indicated aurora, which appeared at 1.45 as very faint, evanescent white streamers in the ESE., while the daylight was still bright. There was none to be seen at 2 a. m., but at 2.15 there were traces of bands high in the SW. These had developed at 3 a. m. into a narrow hazy zone W. of the zenith from ESE., in Virgo, to the twilight NW., occupying Leo, Cancer, Gemini, Auriga and Taurus, which had risen at 3.15 to 3.20 to Ursa Major, while what had been sinuous bands in Serpentis in the E. began to develop into curtains (brightness 1), with waving motion. The whole sky was covered at 4 a. m. with a sort of elongated corona, approaching the horizon in the ESE. and NW., and extending from below Procyon, in the SW., to α Cygni and α Lyræ in the NE. (brightness 0 to 1). It was made up of rather sparsely scattered bands, rows, and curtains, which latter were best developed and brightest in the S. and SE., with some motion. It was broken and paler, reaching nearly to the SW. horizon, about 10° higher in the NE., where it consisted of long streamers. This was attended with considerable magnetic disturbance. At 5 to 5.20 there was a corona, curling in Ursa Major, with long streamers, reaching to the horizon in the E. and W. They were not so bright in the S., and only reached the zenith in the N. The whole was quiet (brightness 0 to 1), and continued unchanged at 6.15 to 6.20. At 7.15 to 7.20 there were only left traces of long streamers in the S., all running to Ursa Major. The magnetic disturbance still continued at 9 p. m.

April 4, 1883, 1.45 *a. m. to* 7.20 *a. m.*—At 1.45 the daylight was still bright, and an exceedingly faint band appeared in the ESE. extending towards the NW. about 10° west of the zenith. None was to be seen at 2 a. m., but at 2.15 to 2.20 there were traces in the ESE. gradually developing into very pale shifting curtains across the SW. beginning to wave rather rapidly in the S. At 3 a. m. there was a broad shifting hazy zone across the zenith from ESE. in Virgo to the NW. with its western edge in Hydra, Canis Minor and Orion, and its eastern in Boötes, Ursa Major, Draco, Cepheus, Cassiopeia and Perseus (brightness 0 to 1). This had faded to traces at 3.15 to 3.20, except some brighter bands in the E. through Serpens, Aquila, and the lower part of Cygnus, quickly rising to *α* Lyræ and instantly fading. At 4 a. m. traces of the zone were to be seen and a patch of ill-defined curtains (brightness 1 to 2) in Cygnus and Andromeda, NNE., with a bright long streamer or two. All had faded to traces at 4.15 to 4.20, but curtains were beginning to develop in the NNW. At 5.15 to 5.20 there was a band of slowly vibrating streamers (brightness 1) from Taurus through Auriga, Perseus, Cassiopeia and Cepheus. At 6.15 to 6.20 there was a quiet band (brightness 0 to 1) through Gemini, Lynx, Ursa Major and Boötes. Traces alone remained at 7.15 to 7.20. The magnetic disturbance continued all night.

April —, 1883, 4.15 *a. m. to* ——— —The sky was covered by clouds all night, but at 4.15 to 4.20, when the magnets were very much disturbed, auroral light appeared in the NE. showing strongly through the clouds, and quickly rose as a band across the zenith and disappeared in the W., while fresh patches of light developed in the E. The magnetic disturbance continued all night.

April 7, 1883, 4.15 *a. m. to* ———.—A very faint evanescent streak was observed curving up through Aquila close to the horizon bearing E. by S.; clouds interfered later in the night. The magnetic needles were uncommonly quiet, though there was a low horizontal force.

April 8, 1883, 3.45 *a. m. to* 6.20 *a. m.*—Sinuous traces appeared in the ESE. at 3.45 and had developed at 4 a. m. into definite pale sinuous bands in the E. coming up through Aquila into Lyra and Cygnus. At 4.15 to 4.20 these had developed into a broad belt of waving sinuous bands (brightness 1 to 2) in slow motion extending from Aquila near *α* through Lyra, Cygnus, Cassiopeia and Perseus, and gradually broadening and shifting and rising. These had faded to quiet bands (brightness 0 to 1) at 5 to 5.20, crossing high in the sky through Auriga, Gemini, Lynx, Camelopardalis, Ursa Major, Ursa Minor, Draco, Boötes and Hercules. Traces were still visible in the S. at 6 to 6.20.

April 9, 1883, 3.45 *a. m. to* 6.20 *a. m.*—A very faint band crossed the zenith through Boötes and Ursa Major, running SE. and NW. at 3.45 a. m. This had become sinuous and shifting at 4 a. m. and extended on through Cepheus and Perseus, with shifting sinuous bands on either side, one in Draco and the other in Auriga and Gemini. All had faded to traces at 4.15 to 4.20. At 5 to 5.20 a faint luminous band ran from Serpens through Boötes to Coma Berenices (brightness 0 to 1). Traces only were to be seen at 6 to 6.20. There was magnetic disturbance chiefly affecting the horizontal force at about 8 a. m.

April 13, 3.45 *a. m. to* 5.20 *a. m.*—At 3.45 the twilight was quite bright and the stars obscured by haze. A faint arched yellow band lay in the SW. from near the horizon ESE. to the light in the NW. reaching an altitude of about 40°. At 4 a. m. there were barely perceptible traces in the SW., but at 4.15, as indicated by the agitation of the needles, there was an extensive aurora in rapid waving and vibrating motion in the form of a zone about 30 or 40 degrees broad, and composed mostly of curtains and coronal streamers, crossing the zenith from ESE. to NW. The usual color appeared with the yellow very prominent (brightness 2 to 3) and the whole moved quickly toward the magnetic N. The stars were only faintly visible. When the north magnetic edge had reached *α* Lyræ the rest had faded, and all was soon reduced to sinuous traces occasionally brightening up again, but all was nearly faded at 4.20. These developed into a narrow band again at 4.45, but at 5 to 5.20 there was only a pale, quiet band (brightness 0 to 1) through Perseus, Andromeda, Cassiopeia, Lacerta and Cygnus. The needles continued more or less agitated till 2 p. m., being considerably disturbed at 1 p. m.

PART VI.

TERRESTRIAL MAGNETISM.

TERRESTRIAL MAGNETISM.

The magnetic records were placed in the hands of the United States Coast and Geodetic Survey for computation and discussion.

The following report is presented:

ACCOUNT AND RECORD OF THE MAGNETIC OBSERVATIONS WITH PARTIAL RESULTS DEDUCED BY C. A. SCHOTT, ASSISTANT, COAST AND GEODETIC SURVEY.

COMPUTING DIVISION, COAST AND GEODETIC SURVEY OFFICE,
May 6, 1884.

J. E. HILGARD,
Superintendent Coast and Geodetic Survey:

DEAR SIR: Towards the end of March, 1881, Mr. Carlile P. Patterson, then Superintendent of the United States Coast and Geodetic Survey, was invited to aid and co-operate in the researches proposed by the International Polar Commission, which held its second session at Bern, Switzerland, in August, 1880, H. Wild, president. General W. B. Hazen, Chief of the United States Signal Corps, United States Army, having notified the Commission that the United States would take part in the undertaking, caused two expeditions to be fitted out, one to proceed to Point Barrow, Alaska, the other to Lady Franklin Bay, Grinnell Land. The Coast and Geodetic Survey was to co-operate in the magnetic work which these parties were to execute by furnishing such magnetic and other instruments as were then available and by instructing three or four observers of the Signal Corps in their use; besides bearing a part of the expense of the first-named expedition, the second expedition having been provided for by special appropriation of Congress.

PART I.—INTRODUCTION.

It was not until near the close of April that these preliminary arrangements were concluded; and it was well understood, in consequence of the want of suitable magnetic instruments, and in particular of differential instruments, and owing to the fact that no trained scientific observers were at the time available, that the Coast and Geodetic Survey could not then follow the minute instructions which had been prepared for the guidance of the various expeditions which were to take part in the work of the Commission. In the words of the Superintendent, we were simply to do for terrestrial magnetism the best that was possible at the time. For the first year at Point Barrow, and during the entire absence of the other expedition, the assistance of the survey was more incidental than fully co-operative; but this condition was considerably improved in the second year at Point Barrow, when we were able to send a set of differential instruments with a newly instructed observer. In the summer of 1883 a special observer was sent in charge of pendulum work and particularly to verify the magnetic work, as well as to redetermine the geographical position and the true meridian or azimuth; but unfortunately he was unable to accomplish anything in consequence of the continued rain, fog, or cloudiness of the sky during the few days he could stay at the place, the state of the ice and the damaged condition of the vessel demanding a speedy embarkation of the whole party.

That under these circumstances the magnetic work should fall somewhat short of the accuracy which the committee had desired it should possess is not surprising; indeed, the Polar Conference found afterwards that so far as the first year's magnetic work was concerned it appeared to have been undertaken rather prematurely, inasmuch as it could not be supposed that differential instruments of a particular description were ready at hand, nor was there sufficient time to procure them. Disclaiming, therefore, such close co-operation as would have been desirable, but which was impossible under the circumstances, the records and results herewith presented are the outcome of faithful labor and are believed to be an acceptable contribution to our knowledge of magnetism in high latitudes, and it is thought that in the second year, at least, these records will prove to be a valuable part of the material accumulated by the several expeditions.

Later on, in full co-operation with the work undertaken by the International Polar Commission, the Coast and Geodetic Survey established at Los Angeles, Cal., a magnetic observatory and equipped it with a set of Adie's self-recording magnetometers of the Kew pattern. In the spring of 1882 the adobe building had been constructed by Assistant J. S. Lawson, and in July following the instruments were mounted and the photographic process was arranged by Mr. W. Suess, mechanician Coast and Geodetic Survey. The observatory was then permanently turned over to the charge of Mr. Marcus Baker, Coast and Geodetic Survey, under whose direction the absolute and differential measurements have been made uninterruptedly from about the end of September, 1882, to the present time, and it is the intention to continue the work for some years.

In May, 1881, Mr. J. B. Baylor, and in June following, Mr. M. Baker, of the Coast and Geodetic Survey, were detailed to instruct at Washington Sergeants E. Israel, J. Cassidy, J. Murdoch, and M. Smith, Signal Corps, U. S. Army, in the use of the sextant and the alt-azimuth for the determination of time, latitude, longitude, and azimuth, and in the requisite computations; they were likewise instructed in the use of those magnetic instruments which they were to take with them. Mr. A. C. Dark was instructed at San Francisco in astronomical observations by Subassistant J. F. Pratt, Coast and Geodetic Survey. With the exception of Sergeant Israel, who proceeded to Lady Franklin Bay, the above named observers formed part of the personnel of the Point Barrow party. These observers made the best use of the short time available for their instruction.

In May, 1882, J. Palmarts and Sergeant J. E. Maxfield, Signal Corps, U. S. A., received instructions from Mr. Baker in the use of the sextant and the theodolite, and in June they practiced under Assistant Eimbeck, Coast and Geodetic Survey, with the Brooke differential instruments, which left the office for Point Barrow June 14, 1882.

The following instructions to the parties were drawn up (June 9, 1881) by the writer under direction of Superintendent C. P. Patterson:

"*Instructions and notes for the guidance of the observers to be stationed at Point Barrow, Alaska, and at Lady Franklin Bay, north of Smith Sound, Arctic Ocean.*

"As soon as the quarters of the expedition have been fixed upon a magnetic house will be erected, in which the regular magnetic observations as described below will be made; other observations will be made when on boat or sledge trips.

"*Instruments.*—For the use of the magnetic observatory there will be provided a magnetometer, for absolute and differential declination and for horizontal magnetic intensity, to be permanently mounted on a stone pier. In connection with this instrument a meridian or azimuth mark will be established a short distance off the observatory and visible from it through an opening in its wall. The astronomical bearing of this mark will be carefully determined by means of an alt-azimuth instrument and solar observations. In the same house, but on a separate pier, will be mounted a Kew dip circle, and, in the case of Point Barrow, a third instrument, a bifilar magnetometer, will also be permanently mounted on its pier. At Point Barrow the magnetometer (or unifilar) and the bifilar instruments will be mounted in the magnetic meridian and at a distance apart of not less than twelve feet, and the dip circle will be mounted equidistant from these instruments, forming an equilateral triangle. At Lady Franklin Bay the two instruments will be mounted in the plane of the magnetic prime vertical and not less than 12 feet apart. No iron is to be used in the construction of these buildings and they should not be nearer than fifty yards to any other building or double that distance to any large mass of iron. Special reading lamps (of copper) must be provided for use with the instruments, and they must be tested to make sure that they do not affect the position of the magnets. The use of candles stuck in wooden blocks is preferable to lamps.

"When on boat or sledge journeys the party will carry a chronometer, a small alt-azimuth instrument with circles of about three inches diameter (as constructed by Fauth & Co., of Washington, or by Casella, of London), provided with a magnetic needle or compass mounted over its vertical axis, and a dip circle.

"*Observations at the permanent station.*—Hourly observations will be made for declination and diurnal variation with the magnetometer on three consecutive days about the middle of each month; besides these observations, extending over seventy-two hours, there will be made at any convenient intermediate time *each* day (of the three) one set of deflections, followed immediately by a set of oscillations for the determination of the horizontal intensity. At Point Barrow the bifilar will be read immediately after the unifilar. There will also be made at any intermediate time *each* day (of the three) a set of dip observations. In connection with the declination, the mark will be read once each day (unless the instrument should accidentally be disturbed), but it suffices to determine the magnetic axis of the declination magnet on one of three days. The instrumental constants of the magnetometer will be determined before leaving Washington, and the observer will use the Coast and Geodetic magnetic blank forms for their records, or, in case no special forms are provided, they will use small (octavo) note-books; they will also compute, as soon as the observations are completed each month, the magnetic mean declination, diurnal range, and turning hours; also the horizontal force in absolute measure (English units) and the dip, tabulating the results for each day.

"Extra observations on other than the three days about the middle of each month will be made during all occurrences of auroral displays, but as they are likely to be very numerous at Point Barrow observers there may confine their extra observations to the more conspicuous displays only. On these occasions the declinometer (and the bifilar) at Point Barrow will be read every 10 minutes or oftener, or less often, as the state of the needle may appear to demand, the object being to ascertain the relation and establish a connection between the appearance of the aurora and the motion of the magnetic needle.

"When landing on a boat journey or during a sledge journey, at suitable stations (not less than 10 or 15 miles apart), the time, latitude, and azimuth will be determined by the alt-azimuth instrument and the declination by the same instrument (the hour and minutes of the observation is to be noted in order that the diurnal variation may be allowed for); the dip will also be observed, and in case time is pressing, reversal of circle, reversal of face of needle, and reversal of polarity of needle may be dispensed with, but the needed corrections to the result from the single position of the instrument or needle must be ascertained at the permanent station. Observations of deflections with magnetic needle and with weights will be made with the dip circle as arranged for relative and absolute total force, the data for the latter to be supplied at the permanent station.

"It is highly desirable, especially in the case of the Lady Franklin Bay party, that all stations within reach and formerly occupied by other parties for magnetic purposes, be revisited in order to furnish material from which to deduce the secular change during the interval; besides all opportunities should be taken when landing on the way up, to secure observations for declination, dip, and intensity; the latter, best by oscillations of the intensity magnet. The winter quarters of the late English expedition should be connected magnetically with the present quarters.

"All magnetic observations will be made on Göttingen time, as provided for by the Hamburg Conference.*

"All magnetic work will be kept strictly in conformity with 'Notes on measurements of terrestrial magnetism,' United States Coast Survey, Washington, D. C., 1877,† and other records in connection therewith should be equally clear and complete, and all computations should be made by the observer in separate books. Duplicates of all records will be made, compared with the original, and the latter returned annually,‡ if practicable, to the Superintendent of the Coast and Geodetic Survey, Washington, D. C. The observers should also provide themselves with copies

* This sentence I find added to original report.—[Sch.]

† A new edition, the third, has since appeared in Appendix No. 8, Coast and Geodetic Survey Report for 1881.

‡ It was then supposed that the parties would remain out for three years.

of the Admiralty Manual of Scientific Inquiry, the Arctic Manual and Instructions, 1875, and Auroræ, their character and spectra, by J. R. Capron, 1880. Also, with Terrestrial and Cosmical Magnetism, by E. Walker, 1866, and any other work they may require for their information."

Besides the above paper, which is printed (pp. 12 to 14) in "Instructions No. 72, War Department, Office of the Chief Signal Officer, Washington, D. C., June 17, 1881," the parties received additional instructions headed (2) Obligatory observations in the domain of terrestrial magnetism, and (3) Elective observations—contained in the same order. Among these optional observations are mentioned observations of tides and of earth currents; for both of these phenomena returns were made.

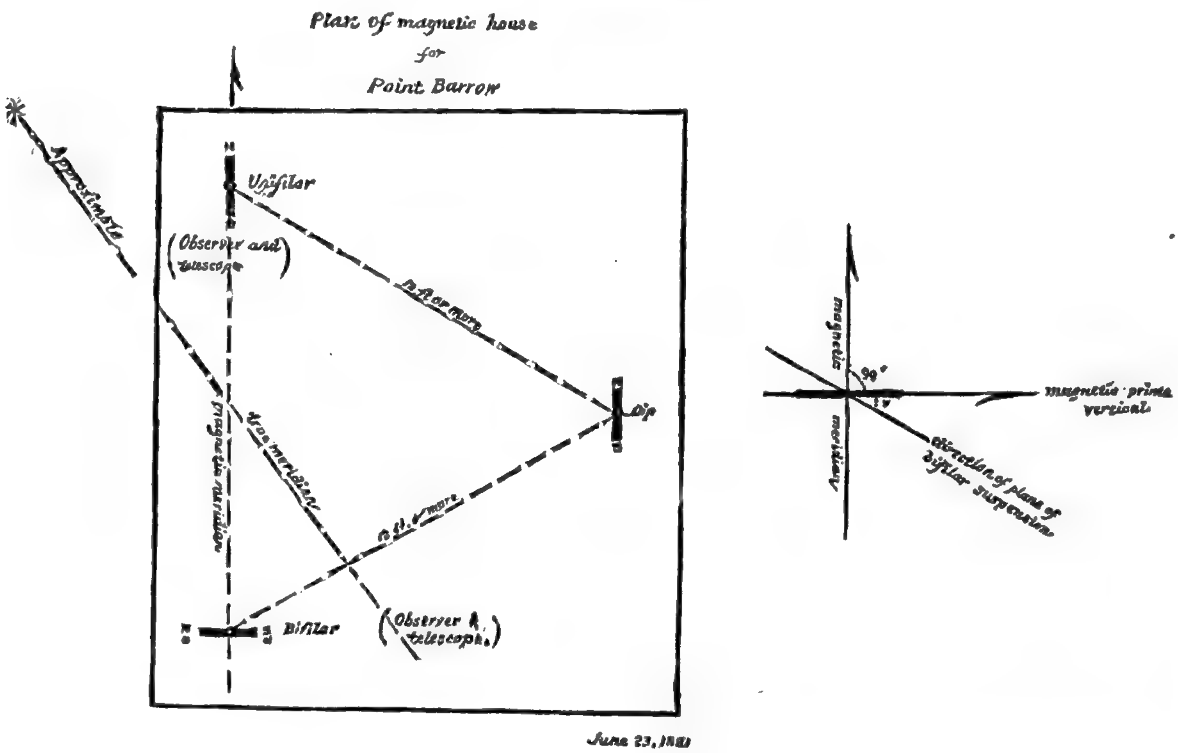
The Point Barrow party was also provided with a plan of the magnetic house, and received the following note respecting the adjustment of the bifilar magetometer, which had been hastily constructed from some remains of an older instrument:

"*The portable bifilar magnetometer.*—This instrument was reconstructed from such parts as could be found from an old instrument. A collimator magnet was provided, also a new bifilar suspension adjustable by means of a right and left handed screw in the place of a disk, as originally supplied; the projecting arms indicating that the instrument had been arranged for an induction inclinometer were removed.

"It is to be used differentially or for variations only of the horizontal component of the magnetic force. The instrument is to be adjusted with the axis of the collimator magnet in the magnetic prime-vertical, and the variations of the horizontal force observed by readings of the scale.

"If H= horizontal magnetic force, ΔH= variation of the same, v= angle of twist in the bifilar suspension (usually between 40° and 70°), Δv= variation of this angle (expressed in parts of radius) then

$$\frac{\Delta H}{H}=\cot v \Delta v$$



"If n_0= reading of the scale of any fixed part, say of the magnetic axis of the collimator, n= any reading at another time, a= value of one division of the scale in parts of radius (or angular value in minutes times .000291), then $\Delta v=(n-n_0)\,a$.

"To correct for changes in the value of $\frac{\Delta H}{H}$ for change of temperature of magnet let $q=$ change of magnetic moment of magnet corresponding to a change of 1° Fahr., we have the correction $q\ (t-t_0)$ where $t_0=$ normal temperature adopted and $t=$ any other temperature. The value of q may be found by a series of observations of oscillations at high and low temperatures, the magnet being suspended as in the unifilar magnetometer. Putting $k=a$ cot v we have

$$\frac{\Delta H}{H}=k\ (n-n_0)+q\ (t-t_0)$$

the value of k may be about .00025 and it should be so arranged, by varying the distance of the threads, that the least integer reading of the scale should indicate about $\frac{1}{1000}$ to $\frac{1}{10000}$ part of the horizontal force. The observed variation in the horizontal component of the magnetic force will be true only in case the magnetic moment of the suspended magnet remains unchanged during the time of observations, but as every magnet gradually loses magnetism a further correction for loss of magnetic moment is needed. This may be determined by comparing differences of values of horizontal force as determined by means of the unifilar magnetometer at certain times (and after long intervals) with a series of corresponding readings of the differential instrument. The magnet being an old one, it seems best to examine and readjust the bifilar at the end of each year or oftener in case of necessity.

"The north end of the magnet may be turned either to the right or left of the meridian, but it will be desirable to choose that side which will make *increasing* horizontal force correspond to *increasing* scale readings.

"The principal adjustments of the instrument may be summed up as follows:

"Level; suspend magnet as unifilar; focus telescope; place scale horizontal and adjust light for distinct vision; take torsion out of suspension; put plane of detorsion in magnetic meridian; determine axis of collimator; determine scale value or value of one division in minutes of arc; point on axis and note corresponding scale reading of magnetic meridian; take off unifilar and substitute bifilar tube; place plane of bifilar suspension in magnetic meridian, point on axis and read torsion circle; test this by turning telescope 180° in azimuth and bringing the magnet in the reversed position, north end to the south, and read torsion scale; if it reads as before, the plane of threads was truly in the magnetic meridian; repeat adjustment if necessary; turn telescope 90° or into the magnetic prime-vertical and turn in the *same direction* the torsion circle until the axis of the collimator appears pointed in telescope; read the torsion circle, it will be $90°+v$ from the meridian value; compute the value of k and alter the distance of threads by turning the screw until a satisfactory value for k is found.

"The observers will remember that at Point Barrow the horizontal force is about one-half of what it is at Washington. They may also consult Lloyd's Treatise on Magnetism (London, 1874)."

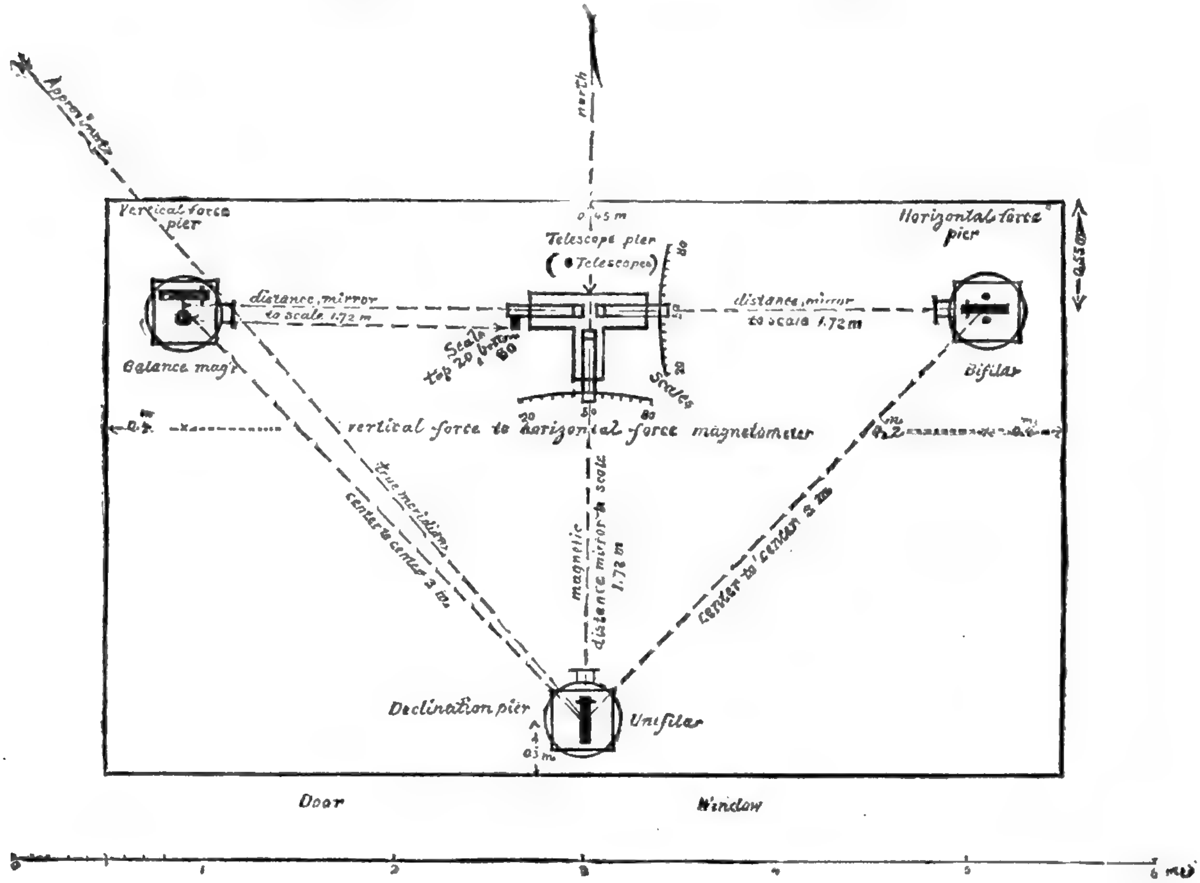
With reference to co-operation with the Polar Commission during the *second* year of occupation of the Point Barrow station, directions were given by you, May 23, 1882, to prepare the old Brooke magnetographs for immediate service. These instruments had been used for many years, first at Key West, Fla.,* and lately at Madison, Wis., and required thorough overhauling; moreover, photographic registration being out of the question in the Polar regions, they were changed and remounted according to a plan devised by me, for direct eye-observations. By extra exertion, with the assistance of Fauth & Co., instrument makers, and W. Suess, mechanician, this was expeditiously done, and the instruments left Washington June 14, 1882.

The following memorandum was handed to the relief party before starting for Point Barrow:

"MAY 26, 1882.

"The magnetic instruments intended for Point Barrow will be the modified Brooke Magnetometer, viz, declinometer, bifilar or horizontal force magnetometer, and Lloyd's balance or vertical

* For a description see Coast Survey Report for 1860, Appendix No. 26, or the original paper in Phil. Trans. Roy. Soc. 1847, part I, "On the automatic registration of magnetometers, &c., by photography. By Charles Brooke. June, 1846."



force magnetometer, to be relatively disposed of in a building as shown in the accompanying diagram. The size of the observatory was to be 3 by 5 meters, or about 10 feet by 16½ feet inside, and 6½ to 7½ feet high; size of the brick piers, 0.3 meter square and about 1 meter high; cross-section of telescope pier, 0.15 meter by 0.6 meter long, and of the same height as the instrument piers; the brass cylindrical vessels in the axis of which the magnets are suspended, except the knife-edge of the Lloyd balance which passes through the center, are each of 40 centimeters diameter. This new observatory should be distant from the older one at least 8 meters."

The following notes were prepared for the guidance of the party, May 31, 1882:

"Notes on the mounting, the adjustment, and the determination of instrumental constants of the Brooke differential magnetometers:

"1. THE DECLINOMETER OR UNIFILAR MAGNETOMETER.

"Take out the torsion of the suspension skein or wire suspending alternately magnet and weight until the telescope readings are the same; adjust fixed mirror to read 50 of scale (which is to be recorded as 500); adjust movable mirror to read the same for average position between daily extremes; note reading t of torsion circle. Measure torsion of suspension by turning off β degrees to right and to left and reading the scale (through telescope); turn torsion circle back to reading t.

"Let l = length of a division of scale, r = radius or distance from face of scale to surface of mirror (if of glass, silvered on back, ⅔ of the thickness of the glass must be added); then the angular value of one division of scale

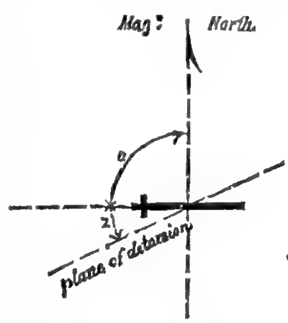
$$a = 3437.'75 \frac{l}{2r}$$

"For the magnetometers the value of l is uniformly 1 millimeter, and the angular value $a = 1'$. the radius r being = 1.719 meter, which has to be carefully measured off for each instrument.

"To determine the torsion coefficient $\frac{h}{f}$ let α = angle through which the magnet was deflected, and β = angle through which the torsion circle had been turned; then $\frac{h}{f}=\frac{\alpha}{\beta-\alpha}$; hence scale value $a\left(1+\frac{h}{f}\right)$ expressed in minutes of arc. Increasing numbers of scale should correspond to a motion of the *north* end of the magnet to the *east*. The scale is numbered from 20 to 80, which numbers are to be read 200 and 800, and thus has a range of 5° on either side of the normal position. Two spare scales, divided on white bristol board, about 15 centimeters long, giving additional extent of 2½°, should be made, and, in case of necessity, fastened to the ends of the reading scale. The vertical cross-thread of the telescope *is to be kept* on the 500 mark, as reflected from the fixed mirror,* a remark which applies to each of the instruments. The dividing line or narrow space between the fixed and movable mirrors is in the plane of the optical axis of the telescope. The instrument is placed under a zinc cover.

"2. THE HORIZONTAL FORCE OR BIFILAR MAGNETOMETER.

"Put plane of detorsion in the magnetic meridian, turn torsion circle with weight suspended approximately in plane of meridian, and read circle. Remove weight, suspend magnet, and again read circle, if the same as before the plane of detorsion is in the magnetic meridian; if not, repeat the process until the result is satisfactory. It is recommended to mark out in the observatory the directions of the magnetic meridian and of the magnetic prime vertical by threads or fine strings stretched from wall to wall. These threads would also aid in the setting of the piers. Let $m°$= reading of torsion circle for plane of detorsion in the meridian; suspend weight and turn torsion circle to $90°+m°$; turn movable mirror until the middle line or 50 of the scale is bisected, in which position of the telescope the fixed mirror will reflect division 50 (to be read and recorded as before 500). Suspend magnet in place of the weight, turn torsion to $m°_1$ until middle line of scale is again bisected, then $m°_1-(90°+m°)=z$. (See annexed diagram, where $u=90°$.) Let H = horizontal component of the earth's magnetic force, m=magnetic moment of magnet, W=weight of magnet and appendages (compensation bar, mirror, stirrup, and part of suspension), $2a$ and $2b$ the distances of the threads *above* and *below*, and l=length of suspension, then



$$\frac{Wab}{l}\sin z=Hm$$

now let H and z vary by δH and δz and the ratio, $\frac{\delta H}{H}$, or the variation of the horizontal force expressed in parts of the force, is given by the relation

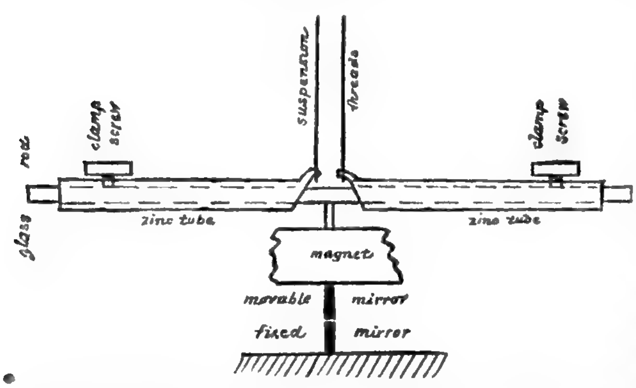
$$\frac{\delta H}{H}=\cot z\,\delta z$$

"Suppose the scale division to be 1 millimeter and the distance of the scale and mirror=r millimeter, then $\delta z=\frac{1}{2r}$. Now putting for δz its equivalent $a\,(n-n_0)$, where a=value of one division of scale in terms of radius and $n-n_0$= the difference of any two scale readings, and making $k=a\cot z$, the ratio, $\frac{\delta H}{H}$, becomes $k\,(n-n_0)$. A second method for determining the scale value is as follows: Let $w=\frac{W}{100}$, or let it be equal to any other convenient fraction of W, and add w to the

* An important addition to the Brooke instruments, as insuring the stability or fixity of the direction of the zero point of the scale; the idea was taken from the later Adie magnetograph. The circular windows of the three magnetometers were of French plate-glass. By trial on February 14, 1884, I find that the transmitted rays for the *extreme* scale-ends suffered but slight refraction by turning the glass in its own plane; the deviation changed from 0 to 5 divisions in maximo.

suspended magnet, then the difference of the two readings of the scale, that is, before and after the small weight was added, or for weight W and for weight $W+w$ will correspond to $\frac{1}{100}$ of the horizontal force. To give the instrument any desired sensitiveness compute the angle of deflection z corresponding to it, and set the torsion circle accordingly, then by means of the upper suspension screw, with its two sets of opposing screw-threads, the suspension threads are to be brought to that distance, which will bring the middle of the scale (50) on the vertical thread of the telescope. Using the second method a weight has to be provided corresponding to the desired sensitiveness, and the suspension threads must be regulated in order that the additional weight may produce a change of a certain number of divisions of scale when it is added and taken off.

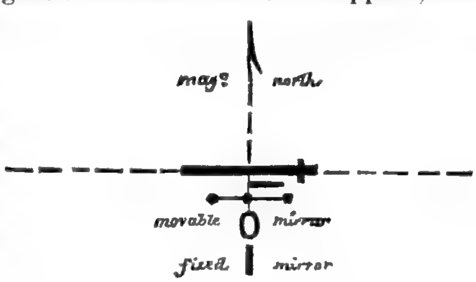
"The instrument is provided with a mechanical compensation for changes of temperature. In view of the extreme low temperatures which are likely to be experienced at Point Barrow, however, and under the present circumstances, it will be better to deduce the corrections for any outstanding amount, not compensated, differentially from the observations of the horizontal force themselves, than to attempt a complete mechanical compensation. The latter operates as follows:



Referring to accompanying figure, suppose the temperature increases, the effective force of the magnet will diminish, the differential expansion of glass and zinc (which materials form the compensation) will push the *zinc end in*, which brings the suspension threads closer together, and thus diminishes the torsion force balancing H in the same ratio that H itself diminishes. Increasing scale readings should correspond to increasing horizontal magnetic force, or correspond to a movement of the *north end* of the magnet toward the north. The narrow space dividing the fixed from the movable mirror is in the plane of the optical axis of the telescope. The instrument is placed under a zinc cover.

"3. THE VERTICAL FORCE OR BALANCE MAGNETOMETER.

"Put the knife-edge supporting the magnet in the magnetic meridian and level support; the magnet will then be free to oscillate in the magnetic prime vertical; balance the magnet and its appendages (mirror, knife-edge, balancing weights, compensation bar, &c.) horizontally by means of two weights on opposite sides of the knife-edge; next bring the center of gravity of the system to that particular position *close to* and *below* the knife-edge which corresponds to the desired sensitiveness; this is done by raising or lowering the central ball or weight. Set the mirror so that the middle of the scale (50) is reflected on the thread of the telescope when the magnet is level; at the same time this center division must remain bisected, as seen in the fixed mirror.



"Let V = the vertical component of the earth's force, d = the horizontal distance of center of gravity of the system from the plane of support passing through the knife-edge, W = the weight of magnet and appendages, m = the magnetic moment of the magnet, then $Vm = Wd$. Now, suppose the magnet inclined through the small angle ψ, and let h = distance of center of gravity of the system below plane of knife-edge; then—

$$\frac{\delta V}{V} = \frac{h}{d}\psi$$

"To determine the ratio $\frac{h}{d}$ we oscillate the magnet and appendages in its vertical plane and let T = time of an oscillation in that position. We then take the magnet off its support and suspend it (with its appendages) by a single thread (determining torsion and allowing for it), as in the case of a free declination magnet, observing that the sides which were vertical when on its bearings will now be horizontal. The moment of inertia will be the same as before. Let T_1 = the time of a horizontal oscillation, then—

$$\frac{\delta V}{V} = \frac{T_1^2}{T^2} \cot \text{dip.}\ \psi = \frac{T_1^2}{T^2} \psi \cot \theta$$

where θ = dip. For one linear unit of scale and r units of distance to mirror the value of $\psi = \frac{1}{2r}$. The dip is to be determined by means of the dip circle. For a particular scale value, T_1 having been determined, we alter the position of the center of gravity by the adjusting screw, until by trial the desired value of T is produced. The scale value may also be ascertained by means of deflections, the magnet being first in a horizontal, next in a vertical position. (See p. 65 of 2d part of Bulletin, St. Petersburg, 1882.) *

"The temperature compensation originally with the Brooke balancing magnetometer consisted of a glass thermometer tube filled with mercury. This has been removed, and a brass arm was substituted, as in the Adie instrument. The compensation operates as follows: Suppose the temperature is rising; the magnetic energy of the horizontal magnet will diminish, and gravity will consequently pull the south or unmarked end of the magnet down and thus elevate the marked end, but this is counteracted and the balance restored by the expansion of the brass arm which is directed to or on the same side as the marked end; the diminution of magnetic moment is thus counteracted by the increased leverage of the extended brass arm.

"Increasing scale readings should correspond to increasing vertical magnetic force or to a movement of the *north end* of the magnet *downward*. The instrument is placed under cover of thick plate-glass.

"Referring to the diagram of the magnetic observatory containing the modified Brooke differential or variation instruments, it will be seen that the north seeking or marked ends of the magnets turn all to the inside or toward the telescope-pier. The directions in which the scale-numbers increase are also there indicated.

"Time being wanting for an accurate mechanical compensation of the force magnetometers, it is the intention that only the greater part of the change should be so compensated and corrections applied for the remainder. For this purpose thermometers are inserted, which are to be read in connection with the scales. The data for outstanding temperature correction will be had from the ordinary hourly observations."

The Point Barrow party was also put in possession of the resolutions adopted at the third session of the International Polar Conference, held at St. Petersburg, August, 1881. From this publication the following notes were taken:

"The differential magnetic observations for changes of declination, horizontal and vertical components of the earth's magnetic force, are to be made *hourly* and continuously, commencing as soon as possible on or after August 1, 1882, and closing as late as practicable before or on September 1, 1883.

"These *hourly observations* may be made either with reference to *local* time or with reference to any other meridian. [The full hours of *local* mean time are recommended, and the instruments are to be read in the order, bifilar 1½ minutes before and after, unifilar 1 minute before and 1 minute after, and balance magnetometer ½ minute before and ½ minute after each full hour.]

"*Term-day observations.*—Term-days are the 1st and 15th of *each* month (excepting January 1, when January 2 will be taken). The differential instruments on term-days are observed every 5 minutes throughout the 24 hours, and strictly according to *Göttingen mean civil time*, beginning with $0^h\ 0^m$ (or midnight, Göttingen.) The three instruments will be read as rapidly as possible, one after another, in the order given above, the declinometer being read at the exact full fifth minute.

"*Additional observations* to be made on term-days during *one* hour are specified below. Declina-

* If ε = angle which the line joining the centers of gravity and of motion makes with the axis of the magnet, we have $\tan \varepsilon \tan \theta = \frac{T_1^2}{T^2}$; also $\frac{V}{H} = \tan \theta$, and since in our case $\varepsilon = 90°$, formula (3) of p. 63 changes to $\delta V = H \frac{T_1^2}{T^2} \psi$, hence, $\frac{\delta V}{V} = \frac{T_1^2}{T^2} \psi \cot \theta$, as above.

tion observations will be made every 20 seconds, beginning with the full hour and minute of Göttingen mean civil time.

Date.	Time of observation.	Date.	Time of observation.
1882		1883	
August 1	Noon to 1 p. m.	February 1	Midnight to 1 a. m.
August 15	1 p. m. to 2 p. m.	February 15	1 a. m. to 2 a. m.
September 1	2 p. m. to 3 p. m.	March 1	2 a. m. to 3 a. m.
September 15	3 p. m. to 4 p. m.	March 15	3 a. m. to 4 a. m.
October 1	4 p. m. to 5 p. m.	April 1	4 a. m. to 5 a. m.
October 15	5 p. m. to 6 p. m.	April 15	5 a. m. to 6 a. m.
November 1	6 p. m. to 7 p. m.	May 1	6 a. m. to 7 a. m.
November 15	7 p. m. to 8 p. m.	May 15	7 a. m. to 8 a. m.
December 1	8 p. m. to 9 p. m.	June 1	8 a. m. to 9 a. m.
December 15	9 p. m. to 10 p. m.	June 15	9 a. m. to 10 a. m.
		July 1	10 a. m. to 11 a. m.
1883		July 15	11 a. m. to noon.
January 2	10 p. m. to 11 p. m.	August 1	Noon to 1 p. m.
January 15	11 p. m. to midnight.	August 15	1 p. m. to 2 p. m.

"If three observers are available, all three instruments will be observed.

"*Absolute magnetic measures* of declination, dip, and intensity.—Observations are to be made as often as necessary to furnish the absolute values needed for the differential measures. [Unless some change is suspected in the latter, it will suffice to observe for absolute values the declination, the dip, and the horizontal intensity (oscillations and deflections) on the day *before each* term-day. Declination observations will then be made about 8 a. m. and 1 p. m., local time, and for these and the intermediate hours the corresponding readings of the scales of the differential and absolute instruments will be given. Observations for dip and intensity may be made at any convenient time of the day.—Sch.]

"Tests are to be made for possible local deflection before selecting the position for the absolute instruments.

"*Scale values of differential instruments.*—The unifilar or declinometer should have a sensitiveness such that 1 millimeter on the scale will correspond to a variation in declination (D) equal to 1′, hence $\delta D=1'$. For the bifilar or horizontal force magnetometer at a place where the dip is θ, 1 millimeter of its scale will be made to correspond to a variation of the horizontal component (H) of the magnetic force equal to 0.001 cos θ, hence $\delta H=.001 \cos \theta$ expressed in the metric units of the force *mm, mg, s.* For the vertical force or balance magnetometer, 1 millimeter of the scale will be made to correspond to a variation of the vertical component (V) of the force =0.001, hence $\delta V=.001$ in the same units as above."**

For absolute measures the Point Barrow party had Coast and Geodetic Survey magnetometer No. 11, and the Lady Franklin Bay party magnetometer No. 12, both new instruments, made by Fauth & Co., of Washington. Kew dip circle No. 23 was taken to the former place, and Kew dip circle No. 19 to the latter, both instruments the property of the Coast and Geodetic Survey. The magnetometers are described and figured (Plate No. 36) in Coast and Geodetic Report for 1881, Appendix No. 8. The Kew dip and intensity circles with needles 9 centimeters in length are well known.

GEOGRAPHICAL POSITION OF UGLAĀMIE STATION, ALASKA.

The two United States Polar expeditions which had been organized under the orders of W. B. Hazen, brigadier and brevet major general, U. S. A., and Chief Signal Officer, left for their respective destinations early in the summer of 1881, the one for Alaska in command of P. H. Ray, lieutenant, U. S. A., the other for Lady Franklin Bay in command of A. W. Greely, lieutenant, U. S. A.

** Supposing, for the sake of illustration, that at Point Barrow $H=0.95$ (in *mm, mg, s,* units) and $\theta=81\frac{1}{4}°$, then $\cos \theta=.1478$ and $\delta H=.0001478=\frac{1}{6766}$ nearly. From $\cot z=\frac{\delta H}{H \text{ arc } 1'}$ we have log cot z=9.72822, hence $z=61° 52'$ and the whole angle to be turned off would be $90°+z=151° 52'$. For the vertical force instrument we have from $V=H \tan \theta$, $V=6.3565$; also, total force $F=H \sec \theta=6.4272$ and for $\delta V=.001$ (metric units), $\frac{\delta V}{V}=.0001573$ The angular value of one division of each of the scales equals 1′.

Lieutenant Ray's party sailed from San Francisco in the Golden Fleece, July 18, and arrived off Uglaamie, near Point Barrow, September 8. The meteorological and magnetic station was established near the small Esquimaux settlement of that name,* about 17 kilometers or 10½ statute miles from Point Barrow and to the southward and westward of it, about 150 meters from the coast of the Arctic Ocean, and at an elevation of about 5 meters above its level.

The geographical position of the station, as derived from dead reckoning on board the Golden Fleece, is given by Lieutenant Ray † as follows: Latitude 71° 17′ 50″, longitude 156° 23′ 45″ west of Greenwich. The astronomical observations at Uglaamie for position and direction of meridian were made by A. C. Dark, and are contained in Appendix I to this report. Observations found defective or unreliable from whatever cause have been omitted in this appendix. The latitude here adopted results from two sets of observations, one of a series of double altitudes of the sun on April 28, 1882, the other of two sets of single altitudes of the sun about upper and at lower culmination on June 24, 1882. The first value from sextant observations has been given the weight 4, and the second value from theodolite observations the weight 1; the resulting latitude becomes $\varphi = 71° 17'.7$ with an estimated probable error of $\pm 0'.3$ According to British Admiralty Chart 2164 the position of Plover Point, where the English relief expedition under Commander R. Maguire, Royal Navy, was stationed in 1852, 1853 and 1854, is in latitude 71° 21′ 25″, and in longitude 156° 16′ 06″ west of Greenwich. Following the trend of the coast between the cemetery and summer camp down to Uglaamie and converting the linear measures of the chart into difference of latitude $\Delta\varphi$ and difference of longitude $\Delta\lambda$, we find the latitude of Uglaamie station $71° 21'.4 - 3'.5 = 71° 17'.9$ and for the longitude of the station $156° 16'.1 + 28'.4 = 156° 44'.5$ west of Greenwich. Since neither the first (nautical result) nor the last result (depending on estimated direction and distance) can compare in accuracy with the value deduced at the station, I shall adopt the value $\varphi = 71° 17'.7$

The longitude adopted results from a chronometric determination made by the supply expedition in the summer of 1882 in the Leo, under the command of Lieutenant Powell, Signal Corps, U. S. A. The result as worked out by Mr. W. Upton, computer in the office of the Chief Signal Officer, is given in his report appended to "Signal Service Notes, No. V., Work of the Signal Service in the Arctic Regions, prepared under the direction of General Hazen, Washington, 1883." It depends on four chronometers, the sea-rates of which could be established from observations at San Francisco before and after the voyage, and at Plover Bay, East Siberia, during the voyage, though neither at Plover Bay nor at Uglaamie did the weather prove favorable. Mr. Upton's result is $10^h\ 26^m\ 39^s \pm 10^s$, or $156° 39' 45'' \pm 2' 30''$; it will be seen that this result is intermediate between that derived from dead reckoning on board the Golden Fleece and from the English determination of their station in 1853 to the southward and eastward of Barrow Point and referred to our station. Moreover we have two sets of lunar distances from the sun July 7, 1882, with the resulting longitude $10^h\ 25^m\ 57^s$, and a set of lunar distances from Jupiter as observed at Point Barrow and referred to Uglaamie by the addition of $1^m\ 25^s$, giving the result $10^h\ 27^m\ 14^s$; the mean of these two astronomical determinations is $10^h\ 26^m\ 36^s$, which agrees so well with the above chronometric value, that I have adopted the latter, viz:

$$\lambda = 10^h\ 26^m\ 39^s \text{ or } 156° 39' 45'' \text{ west of Greenwich.}$$

For the magnetic work we need the difference of longitude between Uglaamie and Göttingen, Germany; taking the latter place to be $0^h\ 39^m\ 46^s.2$ east of Greenwich, we have the required difference $11^h\ 06^m\ 25^s \pm 10^s$, by which amount Göttingen is east of Uglaamie.

The magnetic work at Uglaamie, 1881, 1882, 1883.—The necessary buildings were erected without delay; October 3, 1881 the party was housed. October 17 the meteorological observations were commenced, the instruments were mounted in accordance with the plan furnished with the instructions, but it was not till the 1st of December that the magnetometers were adjusted and the regular hourly magnetic observations were recorded. Lieutenant Ray remarks: ‡

* Called Ootivakh on Ivan Petroff's map of Alaska, Tenth Census of the United States, Washington, 1882. The name of Kokmullit, given on this map, is that of an Esquimaux settlement at Point Barrow. It is called Noo-wook on the Admiralty Chart of 1853 (No. 2164.)

† Report of Chief Signal Officer of September 15, 1881.

‡ In his report to the Chief Signal Officer, dated at Uglaamie, Aug. 25, 1882.

"The three magnetic instruments were mounted on wooden piers, the season being too far advanced to place masonry. Posts 12 inches square were set into the frozen earth to a depth of 1 foot, and cemented into their place by pouring water around them and allowing it to freeze. The piers answered every purpose, were perfectly solid, and did not change their position in the slightest degree, and when the observatory was taken down this summer I found the ice around their base unmelted. As soon as the weather was warm enough, brick piers capped with stone were placed, and the instruments are now all in position on permanent piers." This operation occasioned an interruption in the hourly observations from July 22 to July 30, 1882. This first series closed with September 9, 1882; it includes term-day observations, also hourly observations of dipping needle deflected by a constant weight as a substitute for a vertical force measure; these latter observations of relative total force, while of small value as differential measure, may nevertheless supply means for computing changes in the intensity which otherwise would have been wanting.

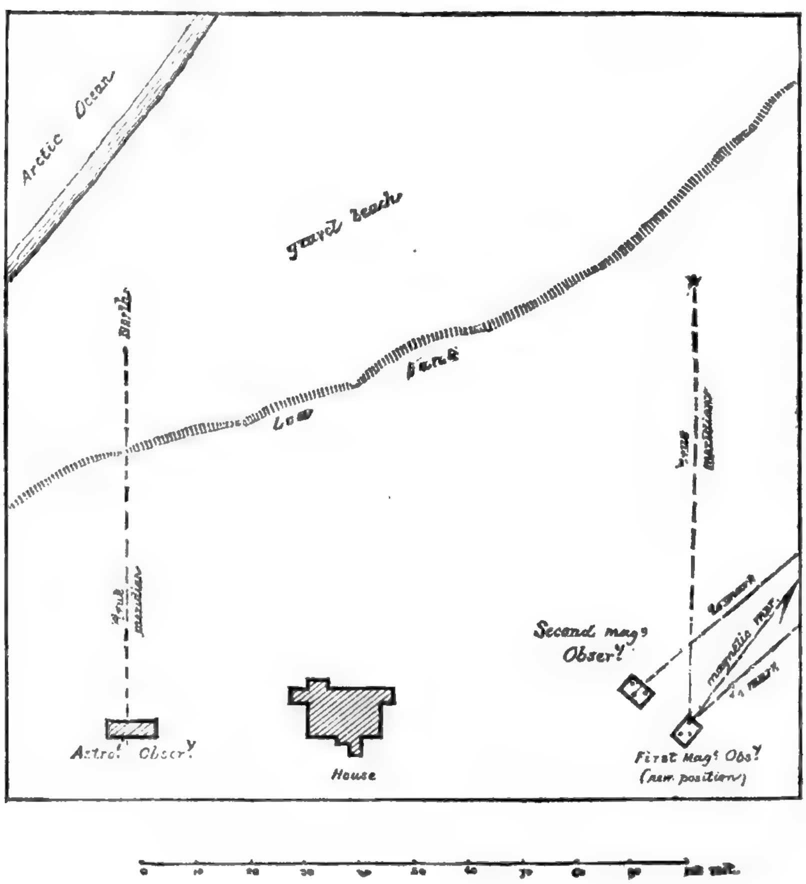
The supply party in the Leo arrived off Uglaamie August 20, 1882, with the Brooke magnetometers; they were mounted on brick piers, in a building especially erected for them, and their relative position was in strict conformity with the plan contained in the instructions. So long as thawing weather continued these piers lacked somewhat in stability, but the frost soon rendered them immovable. These instruments having been adjusted, the hourly series of observations commenced September 12, 1882, and were continued without interruption to August 27, 1883; the term-day observations and those for absolute measures were continued throughout the second year of the occupation of the place.

It has already been mentioned that in consequence of unfavorable conditions between August 22 and August 29, 1883 (when the station was abandoned), no verification of the magnetic works could be made by Mr. R. A. Marr, but on the return voyage some magnetic observations were secured at Unalashka, and after the return of the instruments to Washington some additional verification work was done by Sergeant Maxfield in January and February, 1884.

The accompanying sketch shows the location of the magnetic observations and the position of the instruments.

The first position of the magnetic observatory was a little to the westward of the new position shown on the sketch; the change was made in July, 1882.

U. S. Polar Station, Uglaamie, Alaska.



PART II.—ABSOLUTE MEASURES.

MONTHLY VALUES OF THE MAGNETIC DECLINATION, DIP, AND INTENSITY AT UGLAAMIE, DECEMBER, 1881, TO AUGUST, 1883.

The horizontal direction of the magnetic force at Uglaamie was determined by means of Fauth & Co.'s magnetometer, Coast and Geodetic Survey, No. 11, mounted on the northern pier of the magnetic observatory built soon after the arrival of the party. In July, 1882, it was shifted to a new position, where it remained to the close of the work. This instrument served both for the absolute as well as for the differential or variation measures; the latter observations, however, were discontinued on the arrival in the second year of the Brooke variation instruments. The instrument was not well adapted for differential work, as has been stated.

From returns brought home in the Leo, it was evident that the declinations were defective, for some reason not then apparent; also, that the magnet, which was a new one, had parted with much of its magnetism. It became desirable, therefore, practically to test the condition of the instrument for accurate work as soon as this could be done. It was returned to the office at Washington January 12, 1884, and after undergoing some trifling repairs, due to defective packing, Sergeant Maxfield was directed to determine the declination with it at the magnetic observatory in this city,* also to furnish some additional measures of the instrumental constants, those obtained by Sergeant Smith in June, 1881, not being deemed sufficient. These measures proved that the instrument was still in a satisfactory condition.

When the full returns came to hand it became evident that the discrepancies noticed in the monthly values of the declination were due to a want of attention to the suspension fiber. The plane of detorsion was apparently placed in the magnetic meridian in December, 1881, but no further test or adjustment was made till March, 1883. During this period the force of torsion had gradually increased (from unknown causes) and affected the declination to the amount of nearly 5½° in September, 1882. After this date this deflection remained perfectly steady, until removed in March, 1883.

For the first six months the monthly results refer to the mean declination of the day (from 24 hourly values), but after the arrival of the Brooke differential instruments the declinations were referred to the mean of the respective months through hourly corresponding readings of the Fauth & Co. magnetometer No. 11, and the Brooke declinometer. These corresponding readings generally extend over 6 hours on each day of observation.

The record and computation of the absolute measures are contained in accompanying Appendix No. 2. Placing little reliance on the determination in December, 1881, on account of a weak astronomical azimuth, and omitting for the present all results of 1882 and those for 1883, up to the middle of March, we have the following reliable values, which rest on a new astronomical azimuth, determined July 25, 1882, and which are roughly checked by a second measure, taken on the Brooke declination pier August 31, 1882, the same mark† being used and all distances being known. The observations of July 31 are rejected, there being apparently an error of about 4½°:

* The observations made February 5 and 7, 1884, gave for the declination 3° 57′.9 W. The same computed from annual observations made at Washington, D. C., since 1877, is 4° 00′.4 W.; difference, 2′.5 The measures for intensity were equally satisfactory.

† Distance magnetometer No. 11 to mark 900 feet, and to Brooke declinometer, 39.5 feet. First position of instrument November 21, 1881, azimuth of mark on house, 96° 13′ W. of N. from observation on Jupiter; second position of instrument, July 25, 1882, mark 46° 36′ E. of N. from observation of the sun.

Table of resulting magnetic declinations at Uglaamie station.

[Values reduced to mean of month by means of the differential observations.]

Date.	D.	Monthly mean values.		Corresponding mean of readings of Brooke declinometer.
1883.	° ′	1883.	° ′	*Divisions.*
March 31	35 33.3 E.	March	−35 33.3	484.7
April 14	35 31.7	April	29.0	482.1
April 30	35 26.4	May	28.6	476.0
May 14	35 30.8	June	11.8	475.7
May 31	35 26.3	July	47.8	474.0
June 14	35 25.2	August	30.1	473.5
June 30	34 58.3			
July 14	35 47.8	Mean D	−35 30.1	Mean 477.6 = r_0
August 14	35 30.1	Corresponding to the epoch June 1, 1883.		

The following results, except the first, are those mentioned as affected by torsion; some of these we propose to use differentially—they are all reduced to the mean of the month respectively:

1881.	° ′	1882.	° ′
December 11	35 15.7 E.	October 31	41 17.7 E.
		November 16	41 18.7
1882.		November 30	41 14.7
January 24	37 28.8	December 14	41 08.8
April 18	39 49.9		
May 24	39 06.1	1883.	
June 17, 18	39 47.4	January 1	41 15.1
July 19, 20	39 54.0	January 14	41 10.3
August 19 *	41 14.9	January 31	41 24.7
August 31	41 23.4	February 14	41 26.1
September 14	41 19.7	February 28 †	40 16.7
September 30	41 35.5	March 14 ‡	36 02.0
October 14	41 23.0		

* New position of instrument and a new azimuth used here.
† Torsion partly removed by observer.
‡ Observer attempted to take out the torsion. After this date the magnet was suspended on a single fiber; it had previously been suspended on two fibers.

Toward the middle of August, 1882, the deflecting force of torsion had become constant and remained so till the middle of February the following year. For this period we have the following means and the corresponding monthly means of the readings and of the Brooke differential magnetometer; the mean correction to the absolute results is then found as shown below:

Date.	D_1 observed declination.	Brooke declinometer, r	$\Delta r = r_0 - r$	$D + \Delta r$	Correction for torsion.	Corrected declination.
1882.	° ′		′	° ′	° ′	° ′
August 19, 31	−41 19.2	— —	— —	— —	— —	−35 44.6
September 14, 30	24.6	(498.0)	−20.4	−35 50.5	+ 5 34.1	50.0
October 14, 31	20.4	(495.6)	18.0	48.1	32.3	45.8
November 16, 30	16.7	489.8	12.2	42.3	34.4	42.1
December 14	08.8	489.9	12.3	42.4	26.4	34.2
1883.						
January 1, 14, 31	16.7	488.1	10.5	40.6	36.1	42.1
February 14	26.1	489.4	11.8	41.9	44.2	51.5
				Mean	+ 5 34.6	

The two values within parentheses in column headed r are interpolated: Mean reading of declinometer for the last 5 months, $476^d.2$, and for the preceding 5 months, $488^d.4$, hence difference for 5 months, $12^d.2$, or monthly change, $2^d.4$, and the first interpolated value becomes $4 \times 2.4 + 488.4 = 498.0$ The fifth column gives the computed declination corresponding to difference $r_0 - r$, or for the reading r, and the torsion correction is determined by the difference $D - D_1$. Our completed series, when compared with the preceding series (March to August, 1883), exhibits necessarily a trace of the comparatively rapid monthly decrease in the differential series between February, 1883 (mean 489.5) and May, 1883 (mean 476.1), but the magnitude of the errors of observation of the absolute measures forbids any attempt at correction of the differential series. Omitting the value for August, 1882, we finally have the table of absolute values, as follows:

Resulting monthly means of the magnetic declination at Uglaamie.

	°	′		°	′
1882.			1883.		
September	−35	50.0	March	−35	33.3
October		45.8	April		29.0
November		42.1	May		28.6
December		34.2	June		11.8
1883.			July		47.8
January		42.1	August		30.1
February		51.5			
			For the epoch March 1, 1883	−35	37.2

The value −35° 27′.2 for the epoch March 1, 1883, is preferred to the value deduced above for the epoch June 1, 1883. The corresponding value of the Brooke declinometer reading is 484.7

Respecting the annual change of the declination due to the secular variation, we know from the general discussion of the secular variation, Appendix No. 12, Coast and Geodetic Survey Report for 1882, that the eastern declination in Alaska is now diminishing. The expression for the secular variation at the two stations nearest to Point Barrow, viz, Port Clarence, in $\varphi = 65° 17'$ and $\lambda = 166° 19'$ west of Greenwich, and Chamisso Island, in $\varphi = 66° 13'.3$ and $\lambda = 161° 48'.7$ west of Greenwich, give for the annual change in 1880 and 1885 the values + 10′.3 and + 11′.3 for Port Clarence, and + 10′.7 and + 12′.0 for Chamisso Island, and we have to expect a greater value at Point Barrow. Captain Maguire determined the declination at that place in 1853, and found − 40° 21′, or, when reduced to Uglaamie, about − 40° 06′, which, compared with our value above, gives almost exactly a diminution of 4½° between 1853 and 1883. It is known, from the other stations, that this declination has not passed through a maximum within the last thirty years, but has diminished gradually, with an accelerating rate. For uniform speed, the annual change would be + 10′; it is, therefore, probably near + 15′. The absolute measures—September, 1882, to August, 1883—would give the value + 28′.4, which is known to be greatly in excess, and if we fall back on the differential series, we obtain a value but a trifle less, and undoubtedly affected by torsion in the suspension skein of the declinometer, which was never re-examined after the first adjustment had been made. Omitting the readings between March and April, when the torsion was most pronounced, a discussion of the 5 monthly means, November, 1882, to February, 1883, inclusive, give a monthly change $m = -0'.97$, and a discussion of the 4 monthly means for May, June, July, August, 1883, gives $m = -1'.15$, but if April be included $m = -1'.92$, mean $= -1'.53$; mean of first and last value − 1′.25, hence annual change + 15′.0, which is adopted as the most probable value.

ABSOLUTE MEASURES—RESULTS OF THE MAGNETIC DIP.

The observations were made with the Kew Dip Circle,* L. Casella (London), No. 4370, or Coast and Geodetic Survey, No. 23. It remained mounted on its pier in the small magnetic observatory during the stay at Uglaamie. The instrument left Washington June 23, 1881, and was returned January 12, 1884, only sustaining the breakage of one of the dipping needles. Test observations made by Sergeant Maxfield at Washington in January and February, 1884, on four days, gave very satisfactory results. (See results for intensity.)

Observations were generally made on three days each month. The series commences with November 30, 1881, and ends with August 14, 1883. It does not appear that there is any appreciable difference in the results by needles 1 and 2; they are therefore combined indiscriminately. The following monthly means are made up from the individual results contained in Appendix No. 2, and they are here arranged with a view of deducing, if practicable, from the monthly values, taken at an interval of a year, a value for the annual change of the dip, independent of any annual variation.

* Figured in Coast and Geodetic Survey Report for 1881, Appendix No. 8, Plate No. 37.

1. *Table of resulting dip at Uglaamie.*

Date of observations.	Observed dip θ_I.	Date of observations.	Observed dip θ_{II}.	Annual change. $\theta_{II}-\theta_I$.
1881.	° ′	1882.	° ′	′
December—1, 17, 18, 19	81 24.6	December 14	81 22.4	−2.2
1882.		1883.		
January 18, 19, 20	22.4	January 1, 14, 31	22.0	−0.4
February 16, 17, 18	27.1	February 14, 28	24.8	−2.3
March 17, 18, 19	27.6	March 14, 25	25.0	−2.6
April 17, 18, 19	24.3	April—1, 14, 30	24.5	+0.2
May 17, 18, 19	22.2	May 14, 23	22.6	+0.4
June 16, 18, 19	24.0	June—1, 14, 30	23.9	−0.1
July 17, 18, 19	21.5	July 14, ½ {31, 45}	19.2	−2.3
August 17, 18, 19	22.8			
September 1, 14, 30	22.2			
October 14, 31	22.6	Means	81 23.4	−1.2
November 16, 30	22.8			

Mean dip from twenty months of observation, 81° 23′.4, answering to the epoch October 1, 1882. Annual diminution of the dip, 1′.2

Applying the effect of the secular variation, or, more properly, of the annual change to the mean monthly values, *i. e.* to $\frac{1}{2}(\theta_I+\theta_{II})$ for the months from December to July, inclusive, and to θ_I the correction −0′.6 for the months of August, September, October, and November, we obtain the following table of monthly dip values, all reduced to the same epoch, and which, therefore, should indicate any annual variation that may exist, unless in consequence of the smallness of such variation it be hidden by the observing errors:

2. *Table of mean monthly dips reduced to the same epoch* (*December*, 1882).

Date, middle of month.	Mean dip.	Correction for annual change.	Dip referred to epoch.
	° ′	′	° ′
December, 1881 and 1882	81 23.5	−0.6	81 22.9
January, 1882 and 1883	22.2	−0.5	21.7
February, 1882 and 1883	25.9	−0.4	25.5
March, 1882 and 1883	26.3	−0.3	26.0
April, 1882 and 1883	24.4	−0.2	24.2
May, 1882 and 1883	22.4	−0.1	22.3
June, 1882 and 1883	23.9	+0.1	24.0
July, 1882 and 1883	20.4	+0.2	20.6
August, 1882 + 6 months	22.2	+0.3	22.5
September, 1882 + 6 months	21.6	+0.4	22.0
October, 1882 + 6 months	22.0	+0.5	22.5
November, 1882 + 6 months	22.2	+0.6	22.8

If the results exhibited in the last column of the table can be trusted for such small differences from the mean (81° 23′.1), they would indicate a slightly greater dip about the time of the vernal equinox and a slightly smaller dip about the time of the autumnal equinox.

The probable uncertainty of a monthly determination of the dip, *i. e.*, of any one of the values θ_I or θ_{II} is found to be $\frac{2'.5}{\sqrt{3}} = \pm 1'.4$ about.

Observations at Washington, D. C.; at Toronto, Canada; at Madison, Wis.; at Esquimault, British Columbia; at Sitka, Alaska, and at many intermediate places (see preface to "Diary of a magnetic survey of a portion of the Dominion of Canada," by General Sir J. H. Lefroy, London, 1883) show that the dip as well as the total intensity of the magnetic force are at the present time and have been for some years past slowly *decreasing*, and our result at Uglaamie is conformable with this general and extended action of the secular change. General Lefroy also states that at Fort Rae, Great Slave Lake, the present rate of the secular variation is −1′.7 per annum, determined from comparisons of observations by Capt. H. P. Dawson, with an earlier deduction. Both at Washington and Toronto the dip reached a maximum in 1859, at which time it is nearly certain that the total force had been declining for some years. In 1853, Captain Maguire, R. N., found the dip at Plover Point, about 2½ miles southeast of Barrow Point, 81° 36′ (Phil. Trans. Roy. Soc'y, 1857, vol. 147, Part II, London, 1858), indicating an apparent diminution of 13′ in 29 years, but it is highly probable that since Captain Maguire's occupation of this point the dip was on the increase for a few years before its present reversed motion commenced.

ABSOLUTE MEASURES: HORIZONTAL COMPONENT, VERTICAL COMPONENT AND TOTAL MAGNETIC FORCE.

The observations for horizontal force were made with magnetometer Coast and Geodetic Survey No. 11, mounted on its pier in the small magnetic observatory; on its return to Washington in January, 1884, the glass tube was found broken; it was replaced by a spare tube, and after repairing some trifling damages, additional observations were made here by Sergeant Maxfield for a better determination of the instrumental constants.* He also made the observations of deflections by gravity and by magnetism with the Lloyd needle of dip-circle No. 23, which were required to furnish the constant for converting relative total intensity into absolute measure.

Constants of magnetometer No. 11: Mass of ring 300.767 grains, outer diameter 3.779 cm., inner diameter 2.953 cm., thickness 0.529 cm., measured April 29, 1881, at 77° Fah., again from measures on April 30 at 73° Fah. outer diameter 1.4895 inches, inner diameter 1.160 inches, thickness 0.208 inches; the ring is of bronze. Moment of mass M_1 at any temperature t (Fah.) in units of feet and grains=0.93070 [1+.00002 (t−75°)]. From observations of oscillations of long or intensity magnet L_{11} with and without ring, by Sergeants Smith, in June, 1881, and Maxfield, in January, 1884, we have at the temperature of 62° Fah.:

Date.	M	w
1881.		
June 10	0.87898	1
11	0.87761	2
17	0.87723	7
1884.		
January 28	0.87515	3
Weighted mean	M=0.87694	

hence M for any temperature t (Fah.), M=0.87694 [1+.0000136 (t−62°)]; length of collimator magnet L_{11} 2.48 inches, diameter 0.33 inch about; length of shorter magnet S_{11} 2.04 inches, diamter 0.34 inch about. Scale of declination magnet L_{11}, 80 divisions; angular value of scale 3′.69 The temperature coefficient determined from the monthly observations of the intensity at Uglaamie was found to equal q=.00085, a value rather large and probably related to the rapid loss of magnetism of L_{11} when first magnetized; the magnetic momentum of this magnet changed from about 0.0693 (English units) in December, 1881, to 0.0671 in January, 1884.

From the monthly observations at Uglaamie the following results were deduced:

Table of resulting values for magnetic horizontal force (*H*) *at Uglaamie, as determined by magnetometer No.* 11 *from oscillations and deflections, and expressed in English units.*

Date of observations.	H	m at 62° F.	Date of observations.	H	m at 62° F.	Apparent annual change ΔH
1881, December 17, 18, 19	1.932	.0671?	1882, December 14	1.955	.0679	+0.023
1882, January† 18, 19, 20	1.916	.0693	1883, January 1, 14, 31	1.930	.0681	.014
February 16, 17, 18	1.930	.0690	February 14, 28	1.942	.0675	.012
March 17, 18, 19	1.912	.0696	March 14, 31	1.928	.0683	.016
April† 17, 18, 19	1.946	.0690	April 14, 30	1.956	.0669	.010
May 17, 18, 19	1.923	.0692	May 14, 31	1.954	.0676	.031
June 17, 18, 19	1.936	.0690	June 14, 30	1.955	.0662	.019
July 18, 19, 20	1.924	.0695	July 14, 31	1.930	.0670	.006
August 17, 18, 19	1.948	.0685	August 14	1.956	.0660	.008
September—1, 14, 30	1.939	.0685				
October 14, 31	1.936	.0686	Mean	1.939	.0681	+0.015
November 14, 30	1.972	.0682				

Mean horizontal component of magnetic intensity from 21 months of observation 1.939, (English units), for epoch October (middle), 1882. Annual apparent increase, +0.015

*The following results were deduced from Sergeant Maxfield's observations at Washington: January 28, 1884, H=4.375 (English units); dip January 30, 31, February 1, 2, 1884, θ=70° 37′.3, hence F=13.185 These results compare favorably with the values deduced (and referred to same time) from 18 years of annual determinations in the same place, viz, H=4.378, θ=70° 39.′4, F=13.218

† Oscillations alone on January 18, 19 and April 17.

From evidence similar to that given for the dip, but less conclusive, it is probable that H is on the increase, though the above amount appears far too large. In the discussion of Captain Maguire's observations at Barrow Point in 1852-'53-'54, Sir Edward Sabine assumes H for that epoch about 1.79 This value when compared with the above would indicate an annual increase of about +0.005

Second and independent determination of the horizontal force by means of the Kew Dip Circle, according to Doctor Lloyd's method* of deflections by gravity and by magnetism in conjunction with dip observations. This method has the great advantage of being independent of the temperature and of any loss of magnetism of the needle, and applies well for stations in high magnetic latitude.

The monthly observations for intensity with the Dip Circle at Uglaamie commence in June, 1882, and terminate with August, 1883. Washington, D. C., was selected as a base station, and the value of the constant $A=H_0 \sec \theta_0 \sqrt{\sin u_0 \sin u'_0 \sec \eta_0}$ became known from the observations of Sergeant Maxfield, in January and February, 1884. We have for the deflecting weight employed at Uglaamie previous to September, 1882, the values:

$\eta_0=41° 04'.4$ from 12 sets of observations, Lloyd's needle No. 4 weighted; February 15, 1884.

$\theta_0=70° 39'.4$ from annual observations for 18 years, 1867 to 1884, reduced to February, 1884.

$u_0=29° 35'.0$

$u'_0=37° 19'.1$ from 12 sets of observations, Lloyd's needle No. 4, deflecting No. 3, February 15, 1884.

Hence log $A=0.92055$, using $H_0=4.378$, as deduced from annual observations for 18 years, 1867 to 1884, reduced to February, 1884.

For the deflecting weight employed at Uglaamie after August 23, we have

$\eta_0=41° 34'.6$ from 7 sets of observations, Lloyd's needle No. 4 weighted; January 30, 31, February 1, 2, 1884.

$\theta_0=70° 37'.3$ from 10 sets of observations, dip circle No. 23.

$u_0=29° 02'.7$

$u'_0=37° 16'.0$ from 7 sets of observations, Lloyd's needle No. 4, deflecting No. 3; date as above.

Hence, log $A=0.91759$

The results at Uglaamie are then worked out by the formula

$$H=A \cos \theta \sqrt{\cos \eta \operatorname{cosec} u \operatorname{cosec} u'}$$

which were tabulated as follows:

Table of resulting values for magnetic horizontal force (H) at Uglaamie, as determined by Kew Dip Circle No. 23, from gravity and magnetic deflections:

Date of observations.	H.	Date of observations.	H.
1882.		1883.	
June 16, 18, 19	1.945	February 14, 28	1.922
July 17, 18, 19	1.958	March 14, 31	1.928
August 17, 18, 19	1.930	April 14, 30	1.918
September—1, 14, 30	1.934	May 14, 31	1.928
October 14, 31	1.958	June 14, 30	1.929
November 16, 30	1.930	July 14, 31	1.935
December 14	1.928	August 14	1.933
1883.		Mean	1.935
January 1, 14, 31	1.944		

Mean horizontal component of magnetic intensity from 15 months of observations, 1.935 (English units), for the epoch January (middle), 1883, with apparently an annual diminution.

* Directions for measurement of terrestrial magnetism, Coast and Geodetic Survey Report for 1881, Appendix No. 8, p. 145, Art. (16).

The mean values of H by the two instruments and methods agree well, and the monthly values may therefore advantageously be united as shown below:

Date.	H by magnetometer.	H by dip.	Mean adopted.	Date.	H by magnetometer.	H by dip.	Mean adopted.	Apparent annual change.
1881.				1882.				
December	1.932	— —	— —	December	1.955	1.928	1.941	+.009
1882.				1883.				
January	1.916	— —	— —	January	1.930	1.944	1.937	+.021
February	1.930	— —	— —	February	1.942	1.922	1.932	+.002
March	1.912	— —	— —	March	1.928	1.928	1.928	+.016
April	1.946	— —	— —	April	1.956	1.918	1.937	−.009
May	1.923	— —	— —	May	1.954	1.928	1.941	+.018
June	1.936	1.945	1.940	June	1.955	1.929	1.942	+.002
July	1.924	1.958	1.941	July	1.930	1.935	1.932	−.009
August	1.948	1.930	1.939	August	1.956	1.933	1.944	+.005
September	1.939	1.934	1.936					
October	1.936	1.958	1.947			Mean	1.936	+.006
November	1.972	1.930	1.951					

Mean H from 21 months of observation, 1.936, answering to the epoch October (middle), 1882. Annual increase approximately 0.006

The following table contains the resulting monthly values for the horizontal, the vertical and the total intensity, the last two quantities computed from the relations, $V = H \tan \theta$ and $F = H \sec \theta$;

In order to facilitate comparisons of similar quantities at other stations, using different units of measure, the values of H, V, F at Uglaamie are given in the table expressed in the three different systems of units at present in use, viz: the English system in foot, grain and second units; the Gaussian system in millimeter, milligramme, second units; and the British Association or the C. G. S. system in centimeter, gramme, second units, or dynes.

Resulting horizontal, vertical and total magnetic force at Uglaamie.

Date.	Dip θ.	Horizontal force H.			Vertical force V.			Total force F.		
		English units.	Gaussian units.	C. G. S.; dynes.	English units.	Gaussian units.	C. G. S.; dynes.	English units.	Gaussian units.	C. G. S.; dynes.
1881.	° ′									
December	81 24.6	1.932	0.8908	.08908	12.790	5.897	.5897	12.935	5.964	.5964
1882.										
January	22.4	1.916	0.8834	.08834	12.629	5.823	.5823	12.774	5.890	.5890
February	27.1	1.930	0.8899	.08899	12.840	5.920	.5920	12.984	5.987	.5987
March	27.6	1.912	0.8816	.08816	12.733	5.871	.5871	12.875	5.936	.5936
April	24.3	1.946	0.8973	.08973	12.875	5.936	.5936	13.021	6.004	.6004
May	22.2	1.923	0.8867	.08867	12.670	5.842	.5842	12.816	5.909	.5909
June	24.0	1.940	0.8945	.08945	12.828	5.915	.5915	12.974	5.982	.5982
July	21.5	1.941	0.8950	.08950	12.772	5.889	.5889	12.918	5.956	.5956
August	22.8	1.939	6.8940	.08940	12.791	5.898	.5898	12.937	5.965	.5965
September	22.2	1.936	0.8927	.08927	12.756	5.882	.5882	12.902	5.949	.5949
October	22.6	1.947	0.8977	.08977	12.839	5.920	.5920	12.986	5.988	.5988
November	22.8	1.951	0.8996	.08996	12,870	5.934	.5934	13.017	6.002	.6002
December	22.4	1.941	0.8950	.08950	12.794	5.899	.5899	12.941	5.967	.5967
1883.										
January	22.0	1.937	0.8931	.08931	12.758	5.882	.5882	12.904	5.950	.5950
February	24.8	1.932	0.8908	.08908	12.795	5.900	.5900	12.940	5.966	.5966
March	25.0	1.928	0.8890	.08890	12.774	5.890	.5890	12.918	5.956	.5956
April	24.5	1.937	0.8931	.08931	12.820	5.911	.5911	12.966	5.978	.5978
May	22.6	1.941	0.8950	.08950	12.799	5.901	.5901	12.946	5.969	.5969
June	23.9	1.942	0.8954	.08654	12.838	5.919	.5919	12.984	5.987	.5987
July	19.2	1.932	0.8908	.08908	12.655	5.835	.5835	12.802	5.903	.5903
August	81 (22.2)	1.944	0.8963	.08963	12.809	5.906	.5906	12.956	5.974	.5974
Mean, October, 1882.	81 23.4	1.936	0.8927	.08927	12.786	5.895	.5895	12.932	5.963	.5963

To an annual change of $\delta\theta$ in the dip θ and an annual change δH in the horizontal component of the force H there correspond annual changes of δV and δF in the vertical component V and in the total force F, respectively, viz:

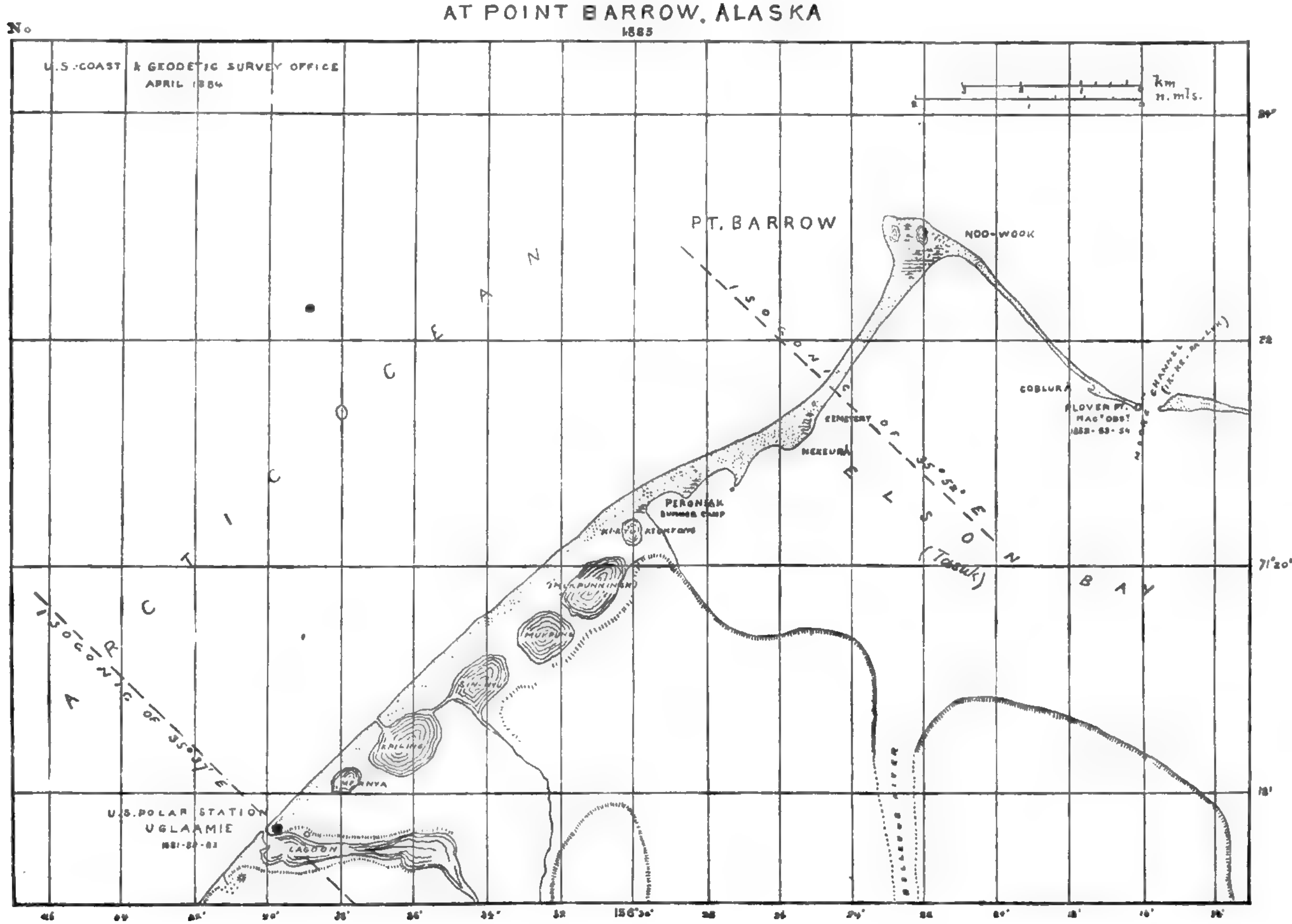
$$\delta V = \tan \theta \delta H + H \sec^2 \theta d\theta \qquad \delta F = \sec \theta \delta H + H \sin \theta \sec^2 \theta d\theta$$

hence for $\delta\theta = -1'.2$ and $\delta H = +0.006$, we find $\delta V = +0.010$ and $\delta F = +0.010$ in English units, and in dynes with $\delta H = +.00028$, $\delta V = .00046$ and $\delta F = .00046$

The topography of the accompanying map is compiled from surveys of 1853 (by Captain Maguire, R. N.), of 1881–'83 (by Lieutenant Ray, U. S. A.); for the positions and names of the small lakes northwest of Uglaamie I am indebted to Sergeant Murdoch; the two astronomical stations are laid down by their observed latitude and longitude. The distribution of the magnetic declination for 1883 is shown by two isogonic lines, the direction and distance of which are taken from my paper on the distribution of magnetism in the United States (Coast and Geodetic Survey Report for 1882, Appendix No. 13). The isoclinic and isodynamic (horizontal force) lines incline about 50° W. of N., or about 5° more than the isogonic lines, but no precise data are available.

DISTRIBUTION OF MAGNETIC DECLINATION AT POINT BARROW, ALASKA

1883



PART III.—DIFFERENTIAL MEASURES.

HOURLY VARIATIONS OF THE DECLINATION, HORIZONTAL AND VERTICAL INTENSITIES, WITH BI-MONTHLY TERM-DAY READINGS, AT UGLAAMIE, DECEMBER, 1881, TO AUGUST, 1883.

I. The observations of the first year of occupation consist of hourly readings of the Fauth & Co. magnetometer, Coast and Geodetic Survey No. 11; of the bifilar magnetometer, Coast and Geodetic Survey No. 2; and of Dip Circle, Coast and Geodetic Survey No. 23, comprising *variations* in the magnetic declination in the horizontal and in the total intensities between December, 1881, and September, 1882, together with term-day readings at the beginning and middle of each month, as agreed upon for the Polar stations. There were four observers, viz: Sergt. James Cassidy, Sergt. John Murdoch, Sergt. Middleton Smith, and A. C. Dark. They took regular turns, each observing four hours at a time. Fifteen readings were taken each hour, five for each instrument, viz, 6 minutes and 3 minutes before and after and at the full hour, commencing with the declinometer and immediately followed by readings of the bifilar and dip instruments. The temperature was noted. The presence of an aurora is indicated by an asterisk.

The instrumental outfit of the second year of occupation being far more complete than that of the first year, only so much of the record and discussion of the first year's work will be given here as seems desirable; further consideration will be given to this year's record after the presentation of the second year's work.

II. The observations of the second year of occupation consist of hourly readings of the Brooke magnetometers, comprising *variations* in the magnetic declination, in the horizontal intensity, and in the vertical intensity, between September, 1882, and August, 1883, together with term-day readings on the 1st and 15th of each month, as agreed upon for the Polar stations. The observations were made by six observers, viz: Sergeants Murdoch and Smith and Mr. Dark, as in the previous year, and Sergt. J. E. Maxfield, with Privates C. Ancor and J. Guzman. They took watches of four hours each in regular rotation. Six readings were taken every hour, viz: The horizontal force magnetometer was read $1\frac{1}{2}$ minutes before and again $1\frac{1}{2}$ minutes after the full hour, the declinometer was read 1 minute before and 1 minute after, and the vertical force magnetometer $\frac{1}{2}$ minute before and $\frac{1}{2}$ minute after the full hour. The temperature was noted by two thermometers suspended inside the cases or zinc covers of the horizontal force magnetometer and of the declinometer. Suitable centigrade thermometers had been ordered, but they were not received in time, and none was placed inside the case of the vertical force magnetometer. The temperature of this magnet can be inferred from the mean of the readings of the thermometers of the other instruments, which rarely deviated more than half a degree. The presence of an aurora is indicated by an asterisk.

ADJUSTMENT OF THE BROOKE DIFFERENTIAL MAGNETOMETERS.

The unifilar magnetometer.—The length of 1 division of the scale is 1 millimeter; the radius, mirror to scale, is 1.719 meter; hence the angular value of 1 division of the scale$=1'$.

(1) Observations for torsion coefficient, September 9, 1882, 1^h p. m. When in the magnetic

meridian the plane of detorsion read 164° 30′, and by turning the torsion circle 90° first backward,* next forward, and again to the first position, we have the readings:

Torsion circle.	Scale readings.		Mean.	Differences.
	Left.	Right.		
	d	d	d	d
164° 30′	530	519	524.5	88.5 for 90°
74 30	456	416	436.0	155.5 for 180
254 30	684	499	591.5	88.5 for 90
164 30	770	236	503.0	

Mean deflection $\alpha = 83'.1$ for $\beta = 90°$; hence $\frac{h}{f} = \frac{83.1}{5316.9} = 0.01563$, and the scale value $a = 1'.016$

The fixed mirror was set to show scale division 50 bisected, and at $0^h\ 08^m$ (September 10) a. m., Göttingen mean time, the magnetometer (movable mirror) was set to read 524.

(2) On November 1, $4^h\ 52^m$ p. m., Göttingen time, both mirrors set to read 500.

(3) The instrument was readjusted November 3, $6^h\ 10^m$ p. m. At $3^h\ 47^m$ p. m. the plane of detorsion was found to read 51° 52′, when the following observations were made:

Torsion circle.	Scale readings.	Differences.
	d	
51° 52′	486	106ᵈ for 90°
141 52	592	208 for 180
321 52	384	103 for 90
51 52	487	

Mean deflection $\alpha = 104'.3$ for $\beta = 90°$; hence $\frac{h}{f} = \frac{104.3}{5295.7} = 0.01970$, and the new scale value $a = 1'.020$

Fixed mirror reads 500, and the magnetometer (movable mirror) was set to 493 at $5^h\ 16^m$ a. m., November 4, Göttingen time. Increasing scale divisions denote increasing easterly declination.

* The circle is graduated from left to right.

DIFFERENTIAL MAGNETIC OBSERVATIONS AT UGLAAMIE.

HOURLY READINGS OF THE BROOKE DECLINOMETER FROM SEPTEMBER 12, 1882, TO AUGUST 27, 1883.

[Increasing scale numbers denote increasing easterly declination. Value of one division of scale between September 12, 1882, and November 3, last observation, $a = 1'.016$; from November 4 to close of series, $a = 1.028$. The average scale reading, 484.7, corresponds approximately to 35° 37'.2 E. declination. The presence of an aurora is indicated by letters, thus: (*a*) a trace just visible, (*b*) a feeble display, (*c*) a moderate display, (*d*) a bright appearance, (*e*) a brilliant display. The two readings of the declinometer are given for each hour, as well as their mean. The two readings are placed opposite the brace in the first column, and their mean directly below. The extreme scale divisions are 200 and 800.]

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, September, 1882.

[Göttingen time.]

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Sept. 12*.	.....	515	520	510	520	522	544	525	506	498	523	517	511	522	508	525	531	524	545	562	510	490	502	519
	.....	514	521	515	518	550	521	526	515	501	520	514	506	520	512	535	534	528	549	558	519	496	515	520
Mean....	.....	514	520	512	519	536	532	526	510	500	522*b*	516	508	521	510	530	532	526	547	560	514	493	508	520
Sept. 13..	512	520	544	481	512	524	504	498	590	490	519	511	525	530	550	530	569	443	581	592	530	529	526	513
	507	521	544	509	514	525	505	498	565	494	520	513	522	534	540	535	570	444	559	584	545	522	528	518
Mean....	510	520	544	495	513	524	504	498	578	492	520	512	524	532	545	532	570	444	570	588	538	526	527	516
Sept. 14..	515	514	510	504	498	519	510	524	527	504	397	523	525	533	521	531	562	552	528	523	528	556	516	518
	514	515	515	502	509	528	506	523	522	504	403	522	518	534	523	544	564	544	529	524	530	559	514	520
Mean....	514	514	512	503	504	524	508	524	524	504	400	522	522	534	522	538	563	548	528	524	529	558	515	519
Sept. 15..	522	525	519	526	521	517	522	537	563	578	510	538	531	529	547	550	551	541	542	541	541	547	543	532
	525	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean....	524	525	519	526	521	517	522	537	563	578*c*	510	538	531*a*	529*a*	547	550	551	541	542	541	541	547	543	532
Sept. 16.	535	529	532	534	529	521	518	520	519	522	527	527	525	522	510	528	523	534	536	531	533	531	542	522
	.....	532	532	532	532	526	526	517	518	521	522	524	524	523	528	525	524	535	537	527	535	530	543	520
Mean....	535	530	532	533	530	524	522	518	518	522	524	526	524	522	519	526	524	534	536	529	534	530	542	521
Sept. 17†.	518	515	518	533	510	515	519	528	528	529	524	522	525	527	534	534	535	532	547	542	532	529	531	534
	516	520	517	533	521	510	515	526	537	527	526	527	526	526	531	532	534	535	554	544	531	529	532	532
Mean...	517	518	518	533	520	512	517	527	532	528	525	524	526	526	532	533	534	534	550	543	532	529	532	533
Sept. 18..	531	504	540	530	524	521	519	526	515	522	513	518	523	524	521	519	532	569	587	540	567	500	507	507
	518	503	539	535	527	521	522	525	516	523	514	516	523	524	522	523	530	564	578	539	552	510	514	509
Mean....	524	504	540	532	526	521	520	526	516	522	514	517	523	524	522	521	531	566	582	540	560	510	510	508
Sept. 19..	507	515	518	528	518	522	523	517	514	503	518	519	517	521	515	524	527	541	546	544	556	523	524	505
	505	514	519	524	520	521	520	517	517	508	521	516	515	520	514	529	524	542	539	537	549	526	529	504
Mean....	506	514	518	526	519	522	522	517	516	506	520	518	516	520	514	526	526	542	542	540	552	524	526	504
Sept. 20..	504	507	515	519	508	512	517	517	524	508	486	512	503	515	515	522	520	531	519	529	539	540	525	534
	506	512	513	520	504	515	516	513	519	508	494	516	507	516	515	523	520	531	536	528	536	539	524	539
Mean....	505	510	514	520	506	514	516	515	522	508	490	514	505	516	515	522	520	531	528	528	538	540	524	536
Sept. 21‡.	493	516	516	524	517	521	514	518	514	505	495	478	531	527	530	523	524	532	534	530	526	525	526	517
	490	517	510	523	514	523	518	517	510	508	496	469	529	528	529	524	527	531	536	531	524	525	523	518
Mean....	492	516	513	524	516	522	516	518	512	506	496	474	530	528	530	524	526	532	535	530	525	525	524	518
Sept. 22..	520	518	522	522	520	519	517	518	523	517	508	515	525	527	535	525	532	526	532	539	528	520	521	521
	522	519	523	522	520	517	516	517	518	518	522	512	524	528	518	524	532	526	533	540	525	519	522	525
Mean....	521	518	522	522	520	518	516	518	520	518	515	514	524	528	526	524	532	526	532	540	526	520	522	523
Sept. 23..	522	525	519	520	512	514	511	522	520	519	518	524	516	522	542	549	529	544	578	541	542	522	519	516
	521	522	519	520	514	515	512	521	519	519	521	518	517	520	528	530	529	537	572	546	544	520	518	515
Mean...	522	524	519	520	513	514	512	522	520	519	520	521	516	521	535	540	529	540	575	544	543	521	518	516
Sept. 24..	520	525	522	520	519	523	522	521	519	521	525	523	524	518	524	531	522	537	532	535	527	533	524	524
	521	523	522	520	523	523	522	520	520	521	524	521	525	520	521	531	521	533	534	535	528	535	522	527
Mean....	520	524	522	520	521	523	522	520	520	521	524	522	524	519	522	531	522	538	533	535	528	534	523	526
Sept. 25..	515	514	514	511	510	496	483	527	502	503	499	485	503	515	533	585	556	555	544	520	519	544	513	495
	518	514	505	502	506	507	497	523	504	504	487	468	520	517	538	611	566	554	526	524	515	513	509	493
Mean....	516	514	510	506	508	502	490	525	503*c*	504*b*	493*d*	476	512	516	536	598	561	554	535	522	517	544	511	494
Sept. 26§.	502	512	522	520	512	513	516	522	504	442	424	515	480	534	509	521	527	526	530	524	527	532	529	499
	507	517	519	520	513	522	516	522	507	458	455	518	510	519	507	523	525	526	531	529	528	533	534	498
Mean....	504	514	520	520	512	518	516	526	506	450*d*	440*d*	516*a*	495*c*	526	508	522	526	526	530	526	528	532	532	498
Sept. 27..	527	515	515	509	514	498	505	515	494	530	484	528	509	544	530	526	524	521	530	527	520	526	525	517
	525	516	516	511	515	485	511	527	475	520	448	530	503	547	522	531	525	520	530	526	518	524	523	517
Mean....	526	516	516	510	514	492	508	521	484	525	466	529	506	546	526	528	524	520	530	526	519	525	524	517
Sept. 28..	514	511	518	512	515	514	516	518	511	502	516	517	515	502	526	520	521	529	539	528	520	511	510	514
	513	513	515	512	514	516	518	518	516	506	516	511	512	502	525	520	522	530	545	529	522	512	514	517
Mean...	514	512	516	512	514	515	517	518	514	504	516	514	514	502	526	520	522	530	542	528	521	512	512	516
Sept. 29..	518	517	517	513	512	514	511	517	522	498	520	482	528	520	502	516	512	531	536	525	522	516	512	513
	518	517	516	514	512	514	509	518	519	502	505	480	488	527	518	514	511	531	537	527	519	514	510	512
Mean....	518	517	516	514	512	514	510	518	520	500	512	481	508	524	510	515	512	531	536	526	520	515	511	512
Sept. 30‖.	518	511	513	513	514	511	508	512	504	505	465	585	500	518	513	518	529	528	536	529	518	519	516	517
	519	510	512	513	515	511	508	509	504	505	478	592	498	516	515	515	530	529	531	524	519	520	516	513
Mean....	518	510	512	513	514	511	508	510*b*	504*b*	505*b*	472*b*	588	499	517	514	516	530	528	534	526	518	520	516	515
Means...	515.9	516.5	520.1	518.0	515.9	517.0	514.6	520.2	520.1	511.2	498.9	517.0	516.2	523.7	524.2	531.4	533.4	531.1	542.5	536.6	530.7	526.6	522.1	517.1

* Correction to reduce to a uniform system, −26.2

† Correction to reduce to a uniform system, −25.1

‡ Correction to reduce to a uniform system, −24.2

§ Correction to reduce to a uniform system, −23.1

‖ Correction to reduce to a uniform system, −22.2

Monthly mean, 521.7; correction, −24.2; corrected mean, 497.5

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, October, 1882.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Oct. 1*	508	516	520	519	522	519	518	522b	522	521	519	514	523	531	526	523	546	543	522	529	532	524	524	527
	509	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mean	508	516	520	519	522	519	518	522	522	521	519	514	523	531	526	523	546	543	522	529	532	524	524	527
Oct. 2	521	513	515	508	520	509	512	496	516	507	499	330	292	465	536	535	576	570	648	655	522	437	509	493
	....	513	515	508	520	508	512	500	514	508	495	325	285	490	517	548	588	534	617	666	450	469	470	472
Mean	521	513	515	508	520	508	512	498	515	508	497	328	288	478	526	542	582	552	632	660	486	453	490	482
Oct. 3	432	522	500	500	518	470	490	522	507	513	496	483	500	492	500	500	503	491	489	508	511	504	498	502
	455	500	510	497	521	476	489	521	499	517	500	488	506	503	504	506	516	479	494	506	507	503	500	500
Mean	444	511	505	498	520	473	490	522	503	515	498	486	503	498	502	503	510	485	492	507	509	504	499	501
Oct. 4	510	502	500	499	510	494	492	516	500	515	454	443	335	521	498	502	535	560	537	630	475	509	501	492
	513	504	500	497	508	489	490	514	498	538	451	449	431	527	500	504	534	545	512	599	505	502	495	485
Mean	512	503	500	498	509	492	491	515	499	526	452	446	383	524	499	503	534	552	524	614	490	506	498	488
Oct. 5	503	503	501	515	521	497	494	504	484	514	480	502	507	514	520	497	535	551	517	555	722	570	499	374
	504	504	505	512	513	499	504	508	490	515	479	509	510	516	517	498	546	549	518	570	665	568	513	434
Mean	504	504	503	514	517	498	499	506	487	514	480	506	508	515	518	498	540	550	518	562	694	569	506	404
Oct. 6	475	500	505	470	490	404	510	485	461	452	380	452	585	490	760	493	532	520	487	492	510	495	492	503
	472	495	506	465	492	404	507	480	431	435	398	471	616	493	734	507	531	521	492	489	507	500	496	501
Mean	474	498	506	468	491	404	508	482	446	444	389	462	600	492	747	500	532	520	490	490	508	498	494	502
Oct. 7	502	510	509	500	503	524	502	505	505	505	506	505	507	510	509	515	528	503	520	519	509	531	519	518
	501	508	511	498	505	506	506	504	500	502	504	498	503	517	514	518	526	508	518	517	511	535	522	515
Mean	502	509	510	499	504	515	504	504	502	504	505	502	505	514	512	516	527	506	519	518	510	533	520	516
Oct. 8	507	503	504	508	504	512	512	512	509	499	505	498	501	508	506	510	506	516	510	509	528	521	490	515
	505	504	506	509	504	509	513	511	501	503	507	500	509	506	502	511	507	518	512	516	530	519	501	512
Mean	506	504	505	508	504	510	512	512	505	502	506	499	505a	507a	504a	510	506	517	511	512	529	520	502	514
Oct. 9	515	496	520	509	506	510	507	501	496	504	502	500	491	508	510	502	530	527	520	515	550	580	519	502
	515	500	505	512	511	506	500	503	498	502	502	494	492	502	516	511	524	524	518	512	547	573	520	495
Mean	515	498	512	510	508	508	504	502	497	503	502	497	492	505	513	506	527	526	519	514	548	576	520	498
Oct. 10	515	500	513	500	511	491	510	509	505	487	504	474	309	500	526	509	511	537	550	555	610	515	482	490
	507	502	507	505	513	504	501	512	501	488	502	470	321	504	529	513	516	538	556	582	619	480	470	500
Mean	511	501	510	502	512	499	506	510	503b	488	503d	472a	315a	502	528	511	514	538	553	568	614	498	476	495
Oct. 11	525	506	502	474	480	509	508	527	505	501	489	500	508	513	550	526	517	508	521	682	519	502	492	510
	523	504	509	500	462	517	508	519	508	493	487	502	500	515	542	535	516	489	535	643	504	497	499	512
Mean	524	505	506	487	471	513	508	523	506	497b	488b	501	504	514	546	530	516	498	528	662	512	500	496	511
Oct. 12	560	512	507	508	504	509	502	542	521	509	498	480	501	515	517	510	523	521	508	523	500	514	515	505
	562	518	508	503	523	510	499	550	521	515	501	470	506	514	512	511	520	520	505	520	502	510	511	506
Mean	561	515	508	506	514	510	500c	546e	521b	512b	500b	475b	504b	514b	514	510b	522	520	506	522	501	512	518	506
Oct. 13	512	511	511	509	508	514	512	505	499	512	512	508	511	509	508	525	524	509	529	514	512	510	509	507
	512	510	510	510	511	514	510	509	501	517	509	510	512	506	510	521	530	508	523	519	511	513	512	508
Mean	512	510	510	510	510	514	511	507	500c	514b	510a	509	512	508	509	523c	527c	508	526	516	512	512	510	508
Oct. 14	520	513	512	505	514	513	509	509	511	502	508	508	505	498	513	525	521	558	577	530	527	500	500	518
	515	515	510	506	512	513	513	510	514	510	503	510	510	507	510	556	522	561	580	555	542	503	512	520
Mean	518	514	511	506	513	513	511	510	512	506b	506c	509c	508b	502b	512b	540b	522	560	578	542	534	502	510	519
Oct. 15††	515	509	510	506	500	512	528	495	580	532	469	500	518	550	529	425	523	534	500	522	500	506	500	518
	510	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mean	512	509	510	506	500	512	528b	495e	580c	532c	469c	500d	518c	556b	529b	425b	523b	534	500	522	500	506	500	518
Oct. 16	507	510	507	510	509	514	504	511	506	497	523	495	550	511	512	520	533	527	517	590	525	501	538	507
	....	512	500	513	511	508	500	510	510	493	560	507	558	510	515	517	532	524	547	576	537	505	543	509
Mean	507	511	504	512	510	511	502	510b	508c	495b	542a	501	554	510	514	518	532	526	547	583	531	503	540	508
Oct. 17	526	483	552	510	516	499	515	500	515	538	517	492	521	530	552	510	529	520	513	540	531	500	526	510
	525	500	554	514	523	508	519	550	522	541	516	502	515	537	556	513	527	504	497	534	540	507	503	508
Mean	526	492	553	512	520	504	517c	525c	518c	540e	516c	497c	518b	534b	551b	512	528a	512	505	537	536	504	514	509
Oct. 18	512	512	500	499	523	525	509	500	511	519	491	500	500	525	536	528	522	520	519	529	521	535	522	513
	515	510	500	500	524	522	512	505	508	530	488	502	510	528	534	526	521	522	521	531	519	528	529	510
Mean	514	511	500	500	524	524	510	502	510	524	490	501	505	526	535	527	522	521	520	530	520	532	526	512
Oct. 19	510	508	508	509	514	517	515	512	518	526	512	518	515	522	528	523	525	561	518	510	526	520	519	518
	512	510	508	510	514	518	516	512	516	523	516	516	513	521	527	522	526	556	520	521	522	518	517	520
Mean	511	509	508	510	514	518	516	512	517	524	514	517	514	522	528	522	526	558	519	520	524	519	518	519
Oct. 20	517	508	515	516	518	518	517	519	519	519	515	516	520	523	516	537	527	527	528	529	526	523	517	518
	516	509	518	517	516	517	518	519	518	519	517	513	518	521	520	544	525	527	527	531	522	520	519	519
Mean	516	508	516	516	517	518	518	519	518	519	516	514	519	522	518	540	526	527	528	530	524	522	518	518
Oct. 21	516	517	516	516	519	518	517	518	520	518	518	518	521	515	535	525	521	532	529	528	522	520	519	518
	515	517	516	516	519	518	519	517	519	515	515	510	519	520	515	522	521	533	532	531	525	523	521	519
Mean	516	517	516	516	519	518	518	518	520	516	516	514	520	518b	525b	524b	521	532	530	530	524	522	520	518
Oct. 22	520	520	518	516	520	517	521	508	510	535	513	519	525	523	533	531	561	521	538	570	600	555	542	465
	519	517	519	514	520	517	522	511	515	532	519	515	523	520	535	536	561	517	533	582	566	562	510	467
Mean	520	518	518	515	520	517	522	510	512	534	516	517	524	522	534	534	561	519	536	576	583	558	526	466
Oct. 23	520	521	524	518	516	504	512	496	530	525	555	485	510	508	523	521	514	532	529	522	529	518	520	511
	522	522	500	515	509	509	508	500	535	520	518	476	505	504	525	524	515	534	529	525	524	521	519	512
Mean	521	522	512	516	512	506b	510b	498c	532c	522c	536d	480b	508b	506	524b	522a	514a	533	529	524	526	520	520	512
Oct. 24	510	515	516	517	514	500	474	483	475	478	505	523	487	440	550	530	513	508	525	533	522	518	512	518
	512	518	517	517	501	493	466	561	480	490	497	530	475	461	583	531	510	542	528	539	528	515	514	520
Mean	511	516	516	517	508	496	470	522	478	484	501	526	481	450	566	530	512	510	526	536	525	516	513	519
Oct. 25	517	510	521	516	518	520	488	478	448	408	518	522	471	542	538	527	540	531	516	544	529	526	530	516
	515	500	517	509	516	525	492	473	450	390	525	509	484	545	533	520	534	528	503	539	535	532	522	516
Mean	516	505	519	512	517	522	490	476	449	399	522	516	478	544	536	524	537	530	510	542	532	529	526	516
Oct. 26	500	510	525	526	518	519	528	540	524	525	527	522	519	513	538	533	542	523	562	535	532	520	517	495
	504	512	533	530	524	521	531	531	521	524	527	520	520	529	536	538	539	527	547	528	530	530	512	500
Mean	502	511	529	528	521	520	530	536	522	524	527	521	520	521	537	536	540	525	554	532	531	525	514	498
Oct. 27	510	514	518	517	519	523	520	501	521	457	511	508	426	539	530	544	518	524	549	542	520	525	500	483
	510	513	514	517	525	523	520	503	523	464	514	500	448	533	528	541	512	522	540	550	523	512	509	475
Mean	510	514	516	517	522	523	520	502b	522c	460c	512	504	437	536	529	542	515	523	544	546	522	518	504	479
Oct. 28	502	510	535	512	515	512	507	472	446	525	518	522	510	518	495	548	546	532	537	555	525	620	540	560
	495	515	550	514	509	513	499	481	450	520	520	517	512	498	490	553	527	530	544	512	570	602	519	540
Mean	498	512	542	513	512	512b	503b	476b	448	522	519	520	511	508	492	550	536	531	540	534	548	611	530	550
Oct. 29	515	520	530	508	517	502	517	502	530	486	408	492	470	515	545	530	508	553	564	625	520	500	495	520
	505	515	518	507	514	513	514	515	530	500	432	511	467	512	540	527	512	560	568	588	516	512	492	506
Mean	510	518	524	508	516	508	516	508	530a	493b	420	502b	468	514	542	528b	510b	556b	566	606	518	506	494	513
Oct. 30	521	500	515	514	514	524	519	530	519	518	578	490	562	537	520	534	519	527	520	542	522	519	512	510
	522	505	515	489	509	523	517	531	524	518	553	495	531	535	542	535	522	533	518	555	527	516	515	508
Mean	522	502	515	502	512	524	518	530	522	518	566	492	546	536	531	534	520	530	519	548	524	518	514	509
Oct. 31‡‡	521	517	515	502	523	524	525	525	525	520	520	515	539	510	525	527	528	524	530	525	529	512	520	518
	520	520	520	508	524	525	522	528	523	521	520	518	528	500	528	528	522	523	529	523	532	519	526	512
Mean	520	518	518	505	524	524	524	526	524	520	520	514	534	510	526	528	525	524	530	524	530	516	523	515
Means	511.1	509.5	514.1	507.7	512.4	507.5	509.2	510.5	507.4	505.8	501.8	494.9	493.7	514.0	531.5	519.7	527.5	527.9	529.7	546.3	531.5	520.4	511.5	504.8

*Correction to reduce to uniform system, —22.0 †Correction to reduce to uniform system, —19.0 ‡Correction to reduce to uniform system, —10.1
Monthly mean, 514.6; correction, —19.0; corrected mean, 495.6

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, November, 1882.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Nov. 1	502	517	524	525	518	524	522	530	525	519	559	475	518	532	537	534	591	511*	523	535	531	500	502	498
	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean	501	517	524	525	518	524	522	530	525	519	559	475	518	532	537	534	591	511	523	535	531	500	502	498
Nov. 2	500	523	510	505	509	510	510	497	512	522	516	485	552	519	511	518	520	525	520	514	519	520	509	511
	.....	515	500	506	508	511	512	510	511	517	522	482	515	520	506	522	519	518	527	519	508	522	513	510
Mean	500	519	505	506	508	510	511	504	512	520b	519a	484	534	520	508	520	520	522	524	516	514	521	511	510
Nov. 3	502	511	495	514	508	515	520	511	511	518	510	515	520	510	537	512	505	518	518	524	519	520	523	†
	496	510	493	519	527	512	526	508	517	516	511	510	518	514	542	501	503	514	519	530	525	515	510	.....
Mean	499	510	494	516	518	514	523	510b	514b	517b	510c	512b	519	512c	540b	506	504	516	518	527	522	518	516	.....
Nov. 4	.....	.....	.....	.....	.....	(†)	487	495	486	486	488	495	486	497	490	485	501	497	491	498	493	491	490	484
	.....	.....	.....	.....	.....	.....	494	491	485	487	482b	491	488	489	489	487	500	498	490	492	496	495	488	482
Mean	.....	.....	.....	.....	.....	.....	490	493	486	486	485	493	487	493	490	486	500	498	490	495	494	493	489	483
Nov. 5	486	484	480	482	484	485	486	488	475	487	492	489	480	485	490	492	491	483	488	495	508	470	486	486
	484	485	480	485	485	485	484	489	478	488	486	487	481	482	488	495	493	487	487	490	511	466	479	476
Mean	485	484	480	484	484	485	485	488	476b	488	489	488	480b	484	489	494	492	485	488	492	510	468	482	481
Nov. 6	476	466	480	462	469	481	483	481	496	481	485	485	491	486	495	490	489	510	514	509	480	484	485	500
	479	473	481	473	466	482	482	484	492	483	485	479	492	480	492	487	490	508	515	517	488	480	478	493
Mean	478	470	480	468	468	482	482	482	494	482	485	482	492	483b	494	488	490	509	514	513	484	482	482	496
Nov. 7	490	500	482	496	484	474	486	494	470	508	475	435	480	456	490	500	489	495	507	552	500	492	470	485
	487	500	482	490	485	473	485	490	480	498	478	441	478	455	492	492	490	508	518	540	493	480	485	474
Mean	488	500	482	493	484	474	486	492	475	503	476c	438	479	456	491	496	490	502c	512	546	496	486	478	480
Nov. 8	484	480	500	484	485	480	482	518	481	483	509	474	482	500	438	503	500	496	511	506	500	503	482	470
	500	483	501	485	482	488	485	525	483	483	489	468	486	496	472	495	499	493	518	509	502	499	48[illegible]	473
Mean	492	482	500	484	484	484	484	522	482	483	499b	471	484	498	455	499a	500b	494	514	508	501	501	484	472
Nov. 9	470	478	472	492	476	470	475	485	488	487	476	496	483	501	509	533	548	525	620	550	575	535	470	474
	470	479	475	491	470	467	474	487	495	475	481	499	455	504	470	510	536	525	578	692	550	521	483	478
Mean	470	478	474	492	473	468	474	486c	492c	481d	478d	498c	469b	502b	490	522	542	525	599	621	562	530	476	476
Nov. 10	457	471	480	470	485	498	486	485	483	482	480	478	485	481	506	481	486	488	491	490	485	483	475	470
	461	475	478	477	484	476	485	484	483	482	479	475	486	480	509	483	487	485	492	488	482	484	482	479
Mean	459	473	479	474	484	487	486	484	483	482	480	476b	486	480	508b	482a	486	486	492	489	484	484	481	474
Nov. 11	470	474	478	481	480	487	483	480	475	487	479	472	486	482	487	496	496	495	513	492	490	499	502	468
	473	475	481	482	481	480	481	485	475	475	483	480	491	480	484	490	501	497	511	502	494	501	515	470
Mean	472	474	480	482	480	484	482	482	475	481	480	476	488	481	486	493	498	496	512	497	492	500	508	469
Nov. 12	530	482	465	476	461	482	464	498	411	462	456	513	498	520	511	492	557	622	581	500	463	466	472	462
	500	485	468	461	480	485	468	498	400	467	446	528	490	505	515	533	545	517	573	514	450	444	462	465
Mean	515	484	486	468	470	484	466	498	406	464c	451d	520c	494b	512b	513b	512b	551b	570b	577a	507	456	455	467	464
Nov. 13	457	463	452	430	448	459	470	418	463	360	481	428	480	484	410	542	520	526	700	585	460	540	545	545
	451	470	467	443	439	454	474	440	455	310	543	400	465	478	402	571	555c	525	810	540	469	507	510	552
Mean	454	466	460	436	444c	456c	472b	429d	459d	335e	512d	414c	472d	481a	406	556d	538	526c	755c	562	464	524	528	548
Nov. 14	482	475	500	501	486	495	507	495	458	456	464	514	427	494	520	583	473	515	572	500	565	492	452	456
	472	470	485	497	475	494	516	483	473	462	466	505	450	491	515	608	462	498	580	492	589	443	492	553
Mean	477	472	492	499	480c	494c	512b	489b	466d	459c	462b	510c	438b	492a	518a	596b	468b	506b	576a	496	577	468	472	504
Nov. 15	489	478	462	520	473	497	446	480	444	490	412	503	438	556	493b	502	485	476	492	523	500	493	482	489
	517	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean	503	478	462	520	473	497c	446	480c	444	490d	412b	503a	438c	556b	493b	502	485a	476a	492b	523	500	493	482	489
Nov. 16	452	461	479	473	483	493	478	491	455	522	432	375	419	510	440	510	518	508	502	493	499	493	492	443
	.....	485	479	474	488	487	472	490	455	520	441	362	405	512	457	510	519	500	510	500	489	499	510	446
Mean	452	473	479	474	486	490	475a	490b	455b	521d	436d	368b	412d	511b	448c	510b	518b	504a	506	496	494	496	501	444
Nov. 17	473	449	496	502	494	495	494	470	488	452	454	362	320	332	411	500	640	603	693	510	563	755	390	450
	503	443	500	499	498	504	494	568	498	476	468	324	310	336	335	472	650	514	680	492	644	630	523	443
Mean	488	446	498	500	496	500	494b	519b	493a	464b	461b	343b	315b	334	373	486a	645a	561a	686c	501	604	692	456	446
Nov. 18	550	462	495	460	419	426	361	419	467	371	639	380	725	522	520	479	500	515	490	574	572	432	570	567
	660	645	478	468	445	414	332	448	461	382	530	342	710	488	523	522	523	493	523	562	634	402	582	566
Mean	605	554	486	464	432	420	346	434	464	376	584	361	718	505c	522a	500a	512a	504	506b	568	603	417	576	566
Nov. 19	470	500	521	454	517	461	723	502	462	457	486	478	358	540	123	300	443	481	540	484	502	500	479	470
	460	605	470	437	499	456	697	500	463	462	504	480	371	545	204	354	526	574	497	508	499	503	484	503
Mean	465	552	496	446b	508b	458b	710a	501	462	460a	495	479	364	542	164a	277a	484	528	518	496	500	502	482	486
Nov. 20	481	505	560	569	447	381	362	424	416	190	761	250	512	645	373	408	605	421	503	514	566	483	468	486
	471	445	563	575	458	379	389	442	409	180 —?	800	215	423	478	369	472	613	430	352	519	574	475	449	493
Mean	476	475	562	572	452	380	376	433b	412b	180— ?d	780c	232c	468c	562a	371c	440c	609c	426a	428	516	570	479	458	490
Nov. 21	493	496	478	442	466	494	497	490	465	486	487	491	485	482	410	481	521	390	820+?	610	646	508	455	500
	478	486	468	472	471	492	499	497	476	493	491	493	484	479	451	487	526	399	820+?	505	717	499	460	490
Mean	486	491	473	457	468	493	498	494	470	490	489a	492	484	480	430	484	524	394a	820+?e	558	682	504	458	495
Nov. 22	450	433	483	468	497	482	481	489	404	492	494	444	470	500	489	492	500	497	493	490	484	501	480	465
	486	463	488	492	500	487	488	488	478	494	488	447	466	498	488	494	499	494	497	495	476	499	483	463
Mean	468	448	486	480	498	484	484	488	486	493	491	446	468	499	438	493	500	496	495	492	480	500	482	464
Nov. 23	480	484	479	486	481	491	481	527	500	493	432	450	453	500	497	522	450	518	510	531	473	484	470	468
	474	477	481	490	478	491	477	495	490	477	428	476	425	486	495	562	451	518	530	522	467	489	472	465
Mean	477	480	480	488	480	491	479	511	495	485	430	463	439	493	496	542	450	518	535	526	470	486	471	466
Nov. 24	486	488	470	491	487	476	490	490	476	474	504	435	461	492	480	505	492	551	522	504	492	484	496	464
	477	489	478	493	485	474	496	486	485	475	520	437	461	490	469	494	499	554	529	509	501	480	504	460
Mean	482	488	474	492	486	475	493	488	480	474	512	436	461	491	474	500	496	552	526	506	496	482	500	462
Nov. 25	504	490	473	485	484	489	488	491	469	430	492	482	442	500	491	519	590	542	537	572	490	522	450	468
	500	498	463	489	490	492	484	491	475	464	486	465	438	529	496	527	586	508	542	553	519	534	461	450
Mean	502	494	468	487	487	490	486	491	472b	447c	489b	474	440c	514c	494a	523	586	525	540b	562	504	528	456	459
Nov. 26	504	460	440	509	479	496	501	466	328	495	475	490	489	498	512	415	537	537	540	502	500	490	508	483
	487	448	453	502	480	502	505	470	388	512	480	497	485	495	515	423	532	519	491	496	511	499	450	480
Mean	496	454	446	506	480	499	503	468b	358c	504b	478a	494	487	496	514	419	534	528	516	499	506	494	479	482
Nov. 27	480	469	484	478	484	460	493	483	465	457	478	441	445	516	495	498	536	519	506	487	462	465	476	475
	481	470	480	480	484	465	493	473	466	478	478	429	442	517	496	493	528	522	510	519	468	488	479	478
Mean	480	470	482	479	484	462	493	478	466	468a	478b	435b	444b	516	496	496	532	520	508	503	465	492	478	476
Nov. 28	483	480	478	487	490	490	478	482	477	513	468	428	474	467	490	487	497	508	495	499	500	480	479	483
	485	483	480	488	492	488	481	483	480c	509	413	406	482c	473	487	491	496	508	499	501	493	482	478	484
Mean	484	482	479	488b	491	489	480	482b	478	511d	440a	417b	478	470a	488	489a	496a	508a	497a	500	496	481	478	484
Nov. 29	472	484	483	478	474	472	486	487	491	491	489	468	487	486	495	502	490	490	489	485	486	487	486	486
	475	486	483	478	477	479	488	484	492	487	491	473	483	490	498	498	491	490	489	488	490	489	485	487
Mean	474	485	483	478	476b	476b	487b	486b	492	489	490	470b	484c	488a	496b	500	490a	490	489	486	488	488	486	486
Nov. 30	480	480	483	484	485	486	478	483	491	452	473	505	490	493	467	481	519	466	511	493	500	488	508	446
	480	481	483	485	485	488	479	483	489	456	463	496	493	490	469	483	511	464	511	501	502	485	490	465
Mean	480	480	483	484	485	487	478b	483d	490d	454d	468b	500d	492b	492d	468a	482a	515a	465b	511	497	501	486	499	456
Means	485.8	484.8	484.7	487.0	481.3	479.9	486.1	486.5	471.4	466.2	493.4	454.3	474.2	495.1	470.6	493.5	517.6	504.0	538.9	517.8	514.9	498.3	487.4	483.0

* Both scales made to read 500 at 4h 52m p. m. by readjustment of instrument. Correction to each reading November 1, 0h to 17h, inclusive, —16.0 † Readjusting instrument, new determination of scale value. N. B.—November 20 at 9h magnet off scale below 180 divisions; again November 21 at 18h off scale above 820, the intended extensions to the scale not having been made. Monthly mean, 489.8

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, December, 1882.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Dec. 1	475	469	484	482	483	487	474	476	490	488	483	486	481	510	487	492	455	474	490	514	500	495	498	502
	483																							
Mean	479	469	484	482b	483c	487a	474e	476c	490a	488a	483	486	481	510d	487c	492b	455a	474	490	514	500	495	498	502
Dec. 2	507	456	487	498	481	491	480	497	476	486	474	485	480	485	482	491	499	516	482	512	490	472	484	492
	...	467	485	492	485	485	489	497	493	487	380	493	474	484	486	495	497	519	497	508	495	480	486	489
Mean	507	462	486	495b	483	488	484b	497b	484b	486b	477c	489a	477b	484c	484c	493b	498b	518	490	510	492	476	485	490
Dec. 3	493	481	483	481	486	488	488	495	491	468	486	487	484	486	488	505	495	497	511	520	515	499	472	479
	488	483	480	477	486	485	487	496	490	466	482	490	483	487	486	515	498	497	516	540	492	509	479	473
Mean	490	482	482	479	486	486	488	496	490	467	484a	488b	484c	486b	487b	510b	496b	497b	514a	534	504	504	476	476
Dec. 4	474	453	485	485	492	433	484	481	485	418	478	505	525	444	485	500	572	493	512	480	570	533	502	463
	472	494	487	486	490	496	488	480	485	415	482	441	542	452	487	499	574	491	503	489	565	549	500	470
Mean	473	494	486	486b	491b	494b	486b	480b	485c	432d	480d	473e	534c	448a	486b	500a	573	492b	508a	484c	568	541	501	466
Dec. 5	483	483	487	486	489	487	489	484	494	495	488	483	477	504	458	437	492	491	493	497	491	489	487	472
	482	481	482	480	489	486	487	477	496	497	487	481	475	506	453	487	493	487	491	494	492	488	486	483
Mean	482	482	484	483	489	486	488	480a	495b	496b	488b	482a	476b	505b	456c	487a	492	489	492	496a	492	488	486	478
Dec. 6	492	478	483	486	489	487	490	892	492	500	514	484	482	487	500	491	495	492	501	500	522	489	480	484
	490	480	484	887	486	486	489	490	486	491	508	485	484	486	492	493	493	493	498	495	503	488	476	483
Mean	491	479	484	486	488	486	490	491b	489b	496c	511b	484b	483b	486c	496a	492	494	492	500	498	512	488	478	484
Dec. 7	484	485	490	487	882	484	491	487	487	492	488	486	486	492	491	499	492	515	515	504	484	502	484	480
	483	480	481	483	484	485	492	488	489	488	489	489	485	490	492	495	495	514	515	508	487	509	479	486
Mean	484	482	486	485	483	484	492	488	488	490	488	488b	486	491c	492c	497b	494a	514b	515b	506a	483	506	482	483
Dec. 8	483	486	484	487	487	483	488	487	484	481	478	483	485	470	505	494	491	489	489	490	491	489	490	489
	480	487	478	496	487	485	482	487	485	491	486	482	485	474	507	493	491	489	489	492	490	489	490	493
Mean	482	486	481	492	487	484	485	487	484	486a	482c	482b	485c	472c	506b	494c	491a	489	489	491	490	489	490	491
Dec. 9	483	488	486	486	489	482	487	430	483	502	490	490	489	480	499	506	500	535	500	518	485	489	509	473
	486	487	486	484	488	482	486	389	486	500	493	485	484	473	500	505	505	541	499	486	488	472	499	479
Mean	484	488	486	485	488	482	486c	410d	484c	501a	492b	488a	486b	476c	500b	506	502a	538	500a	502b	486a	480	504	476
Dec. 10	461	475	488	490	478	484	481	489	483	486	490	493	486	494	487	490	488	493	491	490	492	491	488	493
	467	467	481	484	483	483	484	491	487	486	487	496	488	497	492	493	489	497	491	490	489	490	489	491
Mean	464	471	484	487b	480b	484a	481b	490b	485c	486b	488b	494b	487a	496d	490c	492b	488b	495a	491	490	490	490	488	492
Dec. 11	493	486	483	490	484	482	491	472	498	478	594	500	491	498	494	495	501	515	552	450	553	522	472	480
	483	483	482	486	484	487	487	471	492	479	610	508	484	479	495	492	503	516	566	490	528	450	497	476
Mean	488	484	482	488	484	484	489	472	495c	478c	602d	504	488	488	494	494	502a	516	559	470b	540a	486	484	478
Dec. 12	478	485	495	487	477	489	494	500	496	489	488	481	369	528	487	493	512	548	535	485	467	482	515	486
	496	487	500	491	482	490	496	494	493	482	487	478	283	532	490	494	515	542	522	492	470	484	470	488
Mean	487	486	498	489c	480c	490b	495b	497c	494c	486b	488b	480d	326b	530b	488c	494	514b	545b	528b	488a	468	483	492	487
Dec. 13	480	490	481	484	487	488	486	493	484	492	484	485	459	435	503	509	488	491	509	500	493	480	492	482
	483	485	481	485	488	484	482	493	481	492	483	491	466	487	509	508	487	490	511	497	496	488	490	483
Mean	482	488	481	484	488	486	884	493	482	492	484	488	462b	461	506a	508a	488b	490	510	498a	494	484	491	482
Dec. 14	482	480	485	490	488	488	489	487	489	469	491	484	467	442	492	504	486	490	490	496	494	489	494	490
	490	482	485	490	488	488	488	491	488	492	490	480	491	460	492	515	486	487	490	494	495	483	499	486
Mean	486	481	485	490	488	488	488	489	488b	490b	490c	482b	489c	451c	492b	510b	486b	488a	490a	496	494	486	496	488
Dec. 15	494	483	484	500	485	488	488	486	484	487	483	479	468	489	493	499	493	497	504	500	510	519	495	468
	483																							
Mean	488	483	484	500	485	488	488	486a	484	487b	483c	479a	468a	489	493	499	493b	497a	504a	500a	510	519	495	468
Dec. 16	485	476	556	474	493	472	476	458	500	400	374	543	517	538	430	447	492	492	539	498	518	527	475	466
	.....	490	549	482	496	475	512	446	480	410	337	485	528	533	425	453	496	491	539	495	532	520	425	498
Mean	485	483	552	478b	494b	474b	494b	452c	490d	405c	356d	514c	522c	536d	428b	450c	494c	492b	539b	496b	525a	524	450	482
Dec. 17	491	473	476	475	488	486	483	481	491	491	483	483	491	500	487	494	497	494	492	490	493	496	490	491
	497	475	473	483	486	488	479	490	485	491	490	477	491	506	490	492	497	495	492	487	490	496	492	496
Mean	494	474	474	479	487	487	481	486	488	491b	486b	480a	491	503	488b	493a	497a	494a	492	488	492	496	491	494
Dec. 18	490	475	484	484	481	484	478	493	492	495	495	492	486	494	486	493	490	486	492	484	489	500	498	493
	491	475	488	482	481	479	484	496	490	489	486	490	485	490	486	489	491	487	494	488	493	499	511	510
Mean	490	475	486	483	481	482b	481b	494	491a	492	490	491	486	492a	486	491	490	486	493	486	491	500	504	502
Dec. 19	492	476	467	486	481	471	479	596	450	330	482	477	508	503	497	494	498	493	487	510	490	494	500	487
	500	472	472	476	484	467	479	600	458	292	502	478	505	505	495	496	496	480	484	506	492	500	498	490
Mean	496	474	470	481	482c	469a	479	598e	454b	311c	492c	478a	506	504	496	495	497a	491	486	508	491b	497	499	488
Dec. 20	492	484	489	485	481	481	489	475	473	481	485	478	482	494	595	575	481	610	461	580	562	402	510	485
	482	485	486	485	483	482	486	473	476	574	486	481	484	500	814	621	470	661	462	570	545	420	505	485
Mean	487	484	488	485	482	482b	488	474b	474b	528d	486c	480b	483a	497	704a	598a	476a	636	462	575b	554a	411a	508	485
Dec. 21	510	500	486	476	451	479	472	478	465	630	446	504	530	475	522	507	452	501	513	599	552	472	469	499
	514	483	484	471	457	477	484	479	490	659	435	531	506	480	513	510	458	500	515	585	633	503	450	485
Mean	512	492	485	474	454	478	478	478c	478d	644b	440a	518c	518b	478	518a	508a	455	500	514a	588b	592b	488a	460	492
Dec. 22	485	473	482	487	486	478	476	500	495	482	485	220	507	550	451	501	507	502	508	530	493	512	466	481
	484	470	486	486	481	480	475	490	498	530	488	254	508	549	453	508	505	490	520	502	472	529	460	486
Mean	484	472	484	486	484	479a	476a	495b	496c	506c	486b	237a	508b	550b	452a	504	506	496a	514a	516	482	520	463	484
Dec. 23	495	490	478	490	487	495	482	479	568	491	454	477	305	502	490	495	510	539	496	508	476	490	462	494
	492	490	877	486	486	493	483	476	562	495	474	461	258	500	501	495	504	539	493	504	482	484	470	485
Mean	494	490	478	488	486	494	482	478	565c	493c	464b	469a	282	501	496	495	507a	539	491a	506b	479a	487	466	490
Dec. 24	485	489	489	487	485	490	487	489	496	483	565	411	540	490	519	480	541	441	471	502	480	499	483	493
	482	490	489	488	486	491	483	491	495	476	538	392	541	486	520	483	498	435	468	500	474	503	490	488
Mean	484	490	489	488	486	490	485	490b	490b	480b	552b	402b	540	488	520a	482	520	438a	470	501	477	504	486	490
Dec. 25	483	482	486	488	485	468	485	482	498	469	510	520	442	585	482	492	507	503	502	496	485	480	482	485
	482	483	486	488	481	475	489	480	486	471	516	525	451	586	480	492	508	500	500	501	480	483	480	481
Mean	482	482	486	488	483	472	487	481	492c	470	513	522	446	586	481	492	508	502	501	498	482	482	481	483
Dec. 26	485	489	486	487	487	487	495	488	489	488	484	465	490	489	484	508	520	525	490	492	491	489	476	478
	488	490	486	489	486	487	489	487	489	488	495	475	496	491	482	512	522	532	492	492	495	480	478	480
Mean	486	490	486	488	486	487	492	488	489	488	490	470	493	490	483	510	521	528	491	492	493	484	477	479
Dec. 27	506	483	474	482	486	483	480	480	463	501	493	482	493	490	497	497	492	492	489	490	491	480	476	489
	463	483	472	482	482	485	479	486	470	505	488	487	489	487	495	497	490	490	487	484	490	481	479	484
Mean	494	483	473	482	484a	484a	480a	483b	466c	503d	490d	484b	491b	488a	496a	497a	491	491	488	487	490	480	478	486
Dec. 28	480	480	472	477	486	465	477	452	475	516	500	491	475	515	520	502	489	488	487	490	481	486	482	487
	478	468	463	477	484	474	485	461	455	512	500	488	478	486	508	493	490	489	486	488	483	489	486	490
Mean	479	474	468	477	485b	470b	481b	456b	465c	514b	500a	490a	476b	500b	514a	498a	490a	488	486	489	482	488	484	488
Dec. 29	488	480	482	472	478	464	474	471	466	504	466	489	341	495	610	471	560	516	556	570	534	480	482	465
	485	486	482	471	482	473	465	480	471	506	473	490	343	497	635	517	550	521	547	559	541	478	485	478
Mean	486	483	482	472	480	468	470	476	468c	505c	470b	490	342	496b	622c	494b	555b	518b	552b	561b	538a	479	484	472
Dec. 30	498	485	457	479	480	483	479	488	493	490	490	470	525	456	410	500	480	511	432	523	580	478	466	470
	565	488	478	472	485	482	491	484	498	486	489	467	545	459	450	497	484	510	433	522	532	492	469	490
Mean	532	486	468	476	482b	482c	485b	486c	496b	488b	490b	468c	535c	458b	430d	498c	482a	510	432	522b	556b	485a	468	480
Dec. 31	478	468	460	485	474	484	492	492	496	479	482	485	487	557	524	497	493	493	505	552	496	502	477	475
	485	489	470	484	482	483	491	489	494	474	479	492	489	574	503	494	492	495	504	539	500	509	480	493
Mean	482	278	465	484	478a	484a	492a	490b	495c	476c	480b	488b	488b	560a	514a	496	492a	494	501a	546b	498a	506	478	484
Means	487.9	481.5	484.1	484.5	483.8	483.2	484.0	485.1	487.7	485.6	487.3	476.4	474.8	497.0	490.5	490.0	498.3	504.4	499.9	507.7	504.8	491.8	481.6	484.5

Monthly mean, 489.9

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, January, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Jan. 1	490	461	481	476	475	480	492	481	467	491	487	402	423	516	486	474	528	509	494	492	503	490	476	487
	452	468	480	477	475	484	491	482	476	495	486	405	448	510	479	493	514	499	482	488	515	481	471	474
Mean	471	464	480	476	475a	482a	492	482a	472b	493c	486c	404c	436b	513b	482c	484c	421a	504a	488a	490	509	486	474	480
Jan. 2	476	482	481	480	488	485	489	488	486	485	480	464	485	446	402	526	515	484	512	513	536	519	485	468
	480	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean	478	482	481	480	488b	485b	489	488b	486	485	481b	484b	485	446a	402	526	515	484	512	513	536	519	485	468
Jan. 3	476	485	483	487	484	481	485	485	480	470	460	491	488	472	491	528	482	487	492	490	486	482	493	485
	.....	485	482	485	486	482	486	485	488	476	461	495	487	462	486	524	482	485	491	488	486	488	491	485
Mean	476	485	482	486	485	482	486	485	484	473b	460b	493b	488a	467c	488	526	482	486a	492	489	486	485	492	485
Jan. 4	489	489	484	485	486	487	486	484	490	489	484	473	486	495	481	486	489	488	498	484	491	489	490	482
	482	485	482	485	487	487	485	485	483	490	487	476	486	506	486	485	488	487	496	486	489	490	487	482
Mean	486	487	483	485	486	487	486	484	486	490b	486a	474b	486b	500a	484a	486	488	488	497	485	490	490	488	482
Jan. 5	484	495	481	481	475	478	475	481	487	460	503	493	492	480	485	484	492	490	493	490	500	530	497	476
	483	496	481	481	473	480	478	471	492	459	498	485	493	483	488	480	490	489	492	492	493	523	486	475
Mean	484	496	481	481	474	479	476a	476b	490b	460b	500b	489a	492	482	486	482	491	490	492	491	496	526	492	476
Jan. 6	489	480	402	435	472	489	484	484	469	470	429	188	492	476	543	498	565	487	525	526	572	520	480	470
	480	483	461	429	470	492	486	484	472	457	436	215	496	479	522	435	560	497	532	517	559	490	477	466
Mean	484	482	462	432	471b	490	485	484	470a	464c	432	202	494	478	532b	466b	562b	492a	528b	522b	566a	505	478	468
Jan. 7	476	485	480	481	481	480	487	477	457	494	487	508	352	442	510	560	533	680	550	482	582	586	467	494
	469	487	489	484	479	481	474	483	458	491	484	495	347	448	512	506	524	673	558	478	575	572	482	478
Mean	472	486	484	482	480	480	480b	480c	458d	492b	486b	502c	350a	445	511a	503	528b	676b	554	480	578	579	474	486
Jan. 8	482	478	482	480	480	482	473	485	478	492	488	506	480	454	528	495	473	508	503	532	480	470	453	470
	467	478	481	478	478	480	454	497	478	483	490	510	482	466	524	498	472	510	506	520	507	450	470	464
Mean	474	478	482	479	479b	481	464c	491c	478c	488b	489a	508b	481a	460a	526	496	472	509	504	526	494	460	462	467
Jan. 9	474	475	481	481	484	481	475	487	493	478	491	465	479	405	502	515	490	499	498	562	477	469	483	486
	480	480	481	481	480	489	473	491	494	478	485	470	474	414	501	516	494	500	501	553	490	468	481	485
Mean	477	478	481	481	482a	485	474a	488b	494b	478a	488a	468	476a	410	502b	516c	492b	500b	500b	558b	484a	468	482	486
Jan. 10	483	489	492	482	483	483	488	482	488	488	500	490	482	485	486	487	486	500	490	489	492	492	482	480
	482	492	494	480	484	485	490	480	490	486	500	487	484	487	487	487	488	500	491	490	491	494	484	478
Mean	482	490	493	481	484	484a	489	481a	489b	487	500	488	483b	486b	486	487	487	500	490a	490a	492	493	483	479
Jan. 11	460	467	480	472	479	477	490	491	485	482	483	485	486	488	488	487	488	488	490	486	486	487	490	482
	466	466	480	468	473	483	491	491	484	483	481	487	485	487	486	488	488	487	490	486	488	489	483	486
Mean	463	466	480	470	476a	480b	490a	491a	484a	482a	482a	486b	486a	488b	487	488	488	488	490	486	487	488	486	484
Jan. 12	486	488	484	488	485	486	489	487	488	493	484	485	494	457	492	488	487	495	504	510	490	483	479	484
	486	488	487	488	484	485	485	482	491	489	488	486	489	453	492	487	490	496	506	512	492	484	478	479
Mean	486	488	486	488	484	486	487	484b	490b	491a	486a	486	492b	455b	492a	488	488a	496a	505b	511b	491	484	478	482
Jan. 13	479	485	483	485	484	484	485	486	491	485	492	488	489	492	487	514	529	500	500	483	484	489	488	487
	479	485	483	484	484	483	485	484	495	489	494	484	488	488	489	517	511	498	504	485	483	488	487	486
Mean	479	485	483	484	484	484	485	485	493	487	493	486	488	490	488b	516b	520c	499b	502b	484	484	488	488	486
Jan. 14	485	480	476	483	486	485	486	487	479	487	484	483	485	491	492	485	498	497	504	513	502	499	493	471
	485	480	478	481	486	485	486	487	482	484	483	480	484	490	490	503	498	496	505	519	498	497	490	472
Mean	485	480	477	482	486	485	486	487	480b	486c	484c	482b	484b	490b	491a	494b	498b	496a	504b	516b	500	498	492	472
Jan. 15	476	482	480	482	480	484	481	490	487	486	484	486	480	495	646	490	499	523	490	512	501	484	488	470
	476	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean	476	482	480	482	480	484	481	490	487	486	484	486b	480b	495c	646b	490a	499b	523a	490b	512	501	484	488	470
Jan. 16	484	474	483	477	488	485	492	491	492	492	487	489	488	492	502	487	503	506	474	491	493	480	487	490
	.....	482	478	478	493	481	485	496	482	484	491	485	490	494	495	485	498	507	478	490	491	480	489	488
Mean	484	478	480	478	490	483	488	494	487a	488c	489	487b	489a	493b	498a	486a	500	506	476	490	492	480	488	489
Jan. 17	483	481	471	485	480	481	484	487	469	485	422	456	498	502	514	494	525	569	478	482	488	510	476	478
	485	482	473	485	476	482	483	487	474	497	395	490	520	504	511	490	527	608	473	484	479	493	480	479
Mean	484	482	472	485	478	482	484	487	472	491	408	473	509	503	512	492c	526a	588a	476a	483	484	502	478	478
Jan. 18	472	475	478	490	482	481	474	488	481	410	475	490	481	500	516	492	496	493	495	534	555	478	476	490
	460	476	472	489	481	477	475	489	487	431	464	513	457	501	518	492	494	495	506	535	515	483	474	490
Mean	466	476	475	490	482	479	474b	488b	484b	420d	470a	502b	469b	500a	517	492a	495a	494b	500b	534a	535	480	475	490
Jan. 19	465	472	481	481	487	486	488	487	483	481	496	481	485	505	490	494	503	507	507	478	489	491	494	490
	471	483	478	482	485	488	486	487	486	484	491	490	486	494	482	493	502	510	510	476	490	490	491	492
Mean	468	478	480	482	486	487	487	487	484	482c	494a	486	486	500b	486a	494a	502a	508b	508b	477b	490	400	492	491
Jan. 20	493	490	493	492	489	483	486	493	491	474	482	543	305	438	502	501	537	577	506	565	490	486	478	475
	494	491	492	490	487	485	486	492	500	460	476	485	387	440	500	502	551	568	490	507	498	490	476	478
Mean	494	490	492	491	488	484	486	492	496a	467b	479c	514b	346b	439a	501b	502a	544b	582b	498b	506a	494	488	477	476
Jan. 21	477	478	475	472	484	478	480	486	485	474	489	504	495	448	457	506	510	523	499	505	466	465	486	471
	478	477	477	481	487	481	486	480	482	475	506	520	485	459	464	492	511	524	503	519	470	461	475	466
Mean	478	478	476	476	486	480a	483c	483b	484b	474c	498c	512b	490b	454c	460a	499a	510	524a	501	512	468	463	480	468
Jan. 22	468	476	477	484	481	483	484	483	485	484	483	480	523	387	500	483	485	490	491	488	491	480	490	474
	476	475	480	483	486	485	484	483	484	484	484	478	572	380	510	481	482	491	491	490	492	481	488	472
Mean	472	476	478	484	484	484	484	483	484	484	484	479	548c	384b	505a	482	484a	490	491	489	492	480	489	473
Jan. 23	469	473	479	481	482	482	482	485	483	483	482	485	458	504	528	486	499	503	481	482	483	492	498	484
	470	475	478	484	483	483	482	485	481	483	483	483	470	487	530	400	498	504	484	484	482	493	497	500
Mean	470	474	478	482	482	482	482	485	482	483	482	484	464	496	529	486	498	504	482	483	482	492	498	492
Jan. 24	482	480	488	483	484	486	484	485	483	484	482	490	485	489	495	497	501	534	515	540	530	473	493	465
	488	481	480	483	484	484	485	487	484	485	483	485	486	492	494	491	491	534	518	550	480	462	510	450
Mean	485	480	484	483	484	485	484	480	484	484	482	488	486	490	494	494a	496	534	516	545a	505	468	502	458
Jan. 25	474	494	482	472	490	476	489	484	485	498	489	480	635	480	501	499	548	521	486	575	680	430	519	456
	469	492	476	480	492	474	487	482	487	493	487	472	670	486	494	511	525	517	483	562	749	500	534	462
Mean	472	493	479	476	491	475	488	483	486	496b	488	476	652c	483a	498b	505a	536a	519	484a	568b	714	465	526	459
Jan. 26	461	476	472	485	478	464	472	491	474	474	466	530	455	494	482	490	507	486	526	504	514	660	432	450
	454	462	471	480	472	446	470	492	478	481	469	537	460	498	505	527	495	481	541	510	526	575	489	448
Mean	458	469	472	482	475a	455c	471c	492b	476b	478b	468c	534b	458b	496a	494b	508c	501c	484	534a	507a	520	618	460	449
Jan. 27	445	464	472	476	481	490	491	487	496	482	500	484	404	492	485	494	516	558	468	527	502	493	490	478
	435	461	466	474	482	487	492	486	481	484	495	482	397	498	491	491	443	561	474	516	510	500	482	490
Mean	440	462	469	475	482a	488b	492a	486b	488b	483b	498d	483c	400a	495b	488b	492b	480e	560b	471a	522	506	496	486	484
Jan. 28	431	478	478	470	487	482	467	470	490	495	491	491	489	492	490	487	486	491	494	529	526	484	472	486
	450	483	400	482	491	480	463	480	495	496	484	484	486	493	487	489	484	493	491	523	522	493	476	472
Mean	440	480	469	476	489a	481b	465c	475c	492c	496c	488b	490b	488a	492a	488	488	485	492b	492a	526	524	458	474	479
Jan. 29	475	479	477	471	477	493	489	484	486	494	500	488	485	481	491	500	506	500	500	507	504	488	482	475
	472	469	479	473	478	492	489	490	492	400	492	494	486	483	491	514	507	498	500	499	507	493	486	475
Mean	474	474	478	472	478a	492	489	487b	489b	492b	496c	491a	486	482b	491b	507b	506b	499	500b	503	506	490	481	475
Jan. 30	474	480	475	481	481	481	488	485	490	483	484	505	467	485	495	498	489	518	473	490	497	493	486	486
	475	476	480	481	481	481	486	486	483	487	485	510	470	486	499	494	489	516	478	488	495	496	489	482
Mean	474	478	478	481	481	481a	487a	486a	486a	485	484c	508c	468c	486b	497a	496b	489c	517e	476a	489a	496	494	488	494
Jan. 31	466	464	476	490	479	479	481	475	587	493	433	482	550	506	498	496	498	528	516	502	550	492	491	472
	468	470	480	489	479	480	483	483	568	495	413	485	614	500	501	495	496	530	520	511	543	489	496	473
Mean	467	469	478	490	479	480	482	470c	578d	494d	423d	484c	582d	503b	500a	496a	497a	529	518	506	546	490	494	472
Means	474.2	479.6	479.1	479.7	482.2	482.3	483.1	485.5	486.9	481.9	470.6	478.4	481.4	477.1	498.7	495.7	502.6	514.9	499.1	500.2	511.1	494.7	484.9	477.0

Monthly mean, 488.1

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, February, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Feb. 1	488	475	474	488	479	470	488	485	483	486	483	482	470	470	486	483	499	498	534	795	459	589	652	699
	485																							
Mean	486	475	474	488	479	470	488	485	483	486	483	48 a	470c	470d	486c	483a	499b	498b	534b	795b	459	589	652	699
Feb. 2	468	438	491	487	448	494	472	493	491	461	490	532	475	270	494	531	489	512	525	519	464	489	419	453
	.	462	479	520	442	431	463	492	483	463	481	418	477	295	489	544	486	517	515	513	496	490	593	468
Mean	468	450	485	524	445	462	468	492a	487a	462	486c	475b	476b	282c	492a	538c	488a	514b	520a	516	480	490	506	460
Feb. 3	464	495	478	483	486	466	476	452	526	500	470	538	527	438	725	466	476	514	533	622	495	500	463	415
	460	498	479	487	482	494	467	448	515	484	466	540	542	432	604	481	471	519	520	444	602	449	450	436
Mean	462	496	478	485	484	480	472	450c	520c	492a	468c	539c	534b	435c	664a	474b	474b	516b	526	533	548	474	456	433
Feb. 4	476	481	493	471	477	477	483	479	464	490	541	438	444	500	440	572	506	460	556	602	425	488	473	470
	473	492	482	460	481	475	484	480	466	447	545	452	438	420	452	487	507	454	553	591	450	472	449	467
Mean	474	486	488	466	479	476	484a	480a	465b	468a	528a	445b	441b	460c	446a	530b	506b	457b	554	596	438	480	446	463
Feb. 5	479	482	488	470	485	485	500	458	486	476	465	450	462	498	495	494	509	506	540	476	486	487	488	475
	482	467	479	466	482	483	500	474	482	475	473	414	455	502	493	495	509	507	535	493	489	485	493	476
Mean	480	474	484	468	484	484a	500	466	484	476	469	432	458	500	494	494	509	506	538	484	488	486	496	476
Feb. 6	474	469	480	481	463	479	491	472	489	489	483	494	484	402	494	482	494	566	662	509	463	642	463	480
	486	469	486	480	477	476	490	478	482	486	482	495	485	405	503	483	493	571	692	494	460	552	459	489
Mean	480	469	483	480	470	478	490c	475c	486	488	482	494	484	404	498c	482c	494c	508c	677b	502	462	597	461	484
Feb. 7	480	490	476	483	478	481	485	480	489	491	478	485	488	495	484	490	484	485	489	492	506	499	481	485
	480	476	480	481	475	485	485	481	493	485	484	487	488	494	484	488	485	486	489	494	507	500	483	486
Mean	480	483	478	482	476	483	485a	480	491	488	481	486	488	494	484	489	484	486	489	493	506	500	482	486
Feb. 8	476	467	482	481	479	479	479	486	487	489	480	575	472	487	492	500	491	486	508	496	498	500	484	481
	478	467	480	481	479	480	478	487	482	481	478	570	469	483	491	500	492	487	507	495	499	496	485	479
Mean	477	467	481	481	479	480	478	486	484	485b	479b	572b	470c	485b	492a	500c	492c	486b	508	496	498	498	484	480
Feb. 9	478	480	481	476	484	485	477	481	484	491	484	482	483	478	484	484	484	493	493	509	536	533	498	474
	478	481	478	479	482	485	478	482	485	490	484	482	487	476	484	487	483	493	495	510	539	520	490	470
Mean	478	480	480	478	483	485	478	482	484	490	484	482	485	477	484	486	484	493	494	510	538	526	494	472
Feb. 10	477	472	478	466	486	485	489	482	481	487	479	471	486	480	490	492	503	488	491	499	496	490	492	484
	478	472	478	474	474	471	493	479	480	480	479	472	484	485	493	496	510	491	492	495	493	485	490	478
Mean	478	472	478	470	480	478	491	480	480	484	479	472	486	482	492b	494a	506a	490b	492	497	494	488	491	481
Feb. 11	493	490	485	486	482	483	483	483	490	488	487	460	465	489	487	493	530	497	506	487	483	488	486	461
	485	491	486	486	483	483	483	483	485	483	486	459	442	491	487	496	523	498	505	483	471	490	485	462
Mean	489	490	486	486	482	483	483	483a	488b	486b	486b	460b	454b	490b	487a	494b	526b	498b	506	485	477	489	486	482
Feb. 12	482	482	483	485	483	484	483	485	493	482	481	479	438	501	488	522	499	486	491	491	489	484	482	483
	482	484	482	485	482	483	483	484	485	483	482	479	442	498	492	517	505	486	491	491	489	483	482	487
Mean	482	483	482	485	482	484	483	484	489	482	482	479	440	500	490	520	502	486	491	491	489	484	482	485
Feb. 13	481	482	483	483	483	483	483	483	483	483	485	485	482	485	487	485	498	497	494	492	493	485	498	487
	480	482	484	483	483	483	483	481	483	484	484	488	483	486	486	485	500	497	497	490	492	486	494	482
Mean	480	482	484	483	483	483	483	482	483	484	484	486	482	486	486	485a	499a	497	496	491	492	486	496	484
Feb. 14	478	479	480	482	481	479	481	486	457	462	481	496	475	491	518	525	535	507	489	501	452	480	500	495
	478	481	481	481	481	483	482	485	459	466	464	495	479	488	513	488	545	493	488	485	473	512	490	491
Mean	478	480	480	482	481	481	482	486	458	464	472c	496b	477b	490a	516a	506	540	500	488	493	462	500	495	493
Feb. 15	475	482	483	480	495	487	486	484	479	482	484	479	482	490	490	487	487	485	489	488	489	485	483	478
	470																							
Mean	472	482	483	480	495	487	486	484	479	482	484	479	482	490	490a	487	487	485	489	488	489	485	483	478
Feb. 16	487	479	481	479	472	486	487	484	478	488	485	485	532	487	484	495	531	486	469	499	485	467	482	483
	....	485	482	483	471	486	488	483	485	486	491	479	510	482	482	500	533	483	472	493	491	484	487	483
Mean	487	482	482	481	472	486	488	484	482b	487a	488b	482a	521c	484b	482a	498	532a	484a	470	496	488	486	484	483
Feb. 17	478	482	482	483	482	483	482	480	469	464	489	498	485	484	541	473	487	570	540	496	484	501	486	478
	478	482	482	482	482	484	483	480	473	463	493	501	489	485	540	476	489	573	515	486	487	504	472	476
Mean	478	482	482	482	482	484	482	480	471	464c	491c	500a	487	484	540	474	488	572	542	491	486	502	479	477
Feb. 18	462	472	478	496	481	484	481	485	486	486	481	478	482	486	485	485	489	503	477	490	489	517	477	470
	461	475	478	496	481	482	479	481	485	481	478	484	482	483	485	485	489	503	479	488	490	516	479	475
Mean	462	474	478	496	481	483	480	483	486	481	480	481	482	484	485	485	489	503a	478	489	490	514	478	472
Feb. 19	470	480	478	475	473	478	472	487	489	486	487	486	481	485	486	486	489	486	486	489	488	489	488	486
	467	481	479	475	471	470	472	484	489	487	485	485	482	483	487	487	489	485	485	488	486	489	487	489
Mean	468	480	478	475	472	474	472	486	489	486	486	486	482	484	486	486	489	486	486	488	487	489	488	488
Feb. 20	488	484	481	478	480	480	475	483	473	467	461	464	495	684	546	450	490	515	489	490	486	488	495	482
	486	483	481	476	480	481	476	483	475	468	459	472	491	712	554	456	490	516	489	494	489	485	500	485
Mean	487	484	481	477	480	480	476	483	474	468	460	468	493	698	550a	453b	490	516	489	492	488	486	498	484
Feb. 21	481	483	482	484	483	484	484	484	487	481	474	478	483	485	529	494	503	497	484	494	490	506	493	494
	483	480	480	483	483	483	484	483	484	484	480	482	486	483	538	491	515	495	484	497	492	511	488	500
Mean	482	482	481	484	483	484	484	484	486	482	477	480	484	484	534	492	509	496	484	[illegible]	491	508	490	497
Feb. 22	499	462	450	494	472	454	485	468	499	490	469	650	453	486	555	529	661	800	430	462	503	485	490	507
	495	453	439	498	470	450	476	471	479	478	470	503	437	489	550	518	581	710	547	479	477	512	500	503
Mean	497	458	444	496	471	452	480a	470b	489b	484b	470a	576b	445a	488	552a	524b	621b	755c	488	470	490	498	495	505
Feb. 23	453	486	471	462	508	480	484	403	614	567	610	414	494	491	544	472	509	517	531	470	511	518	478	488
	453	498	456	468	504	480	476	441	547	601	408	418	491	487	535	461	507	508	515	475	510	515	485	486
Mean	453	492	464	465	506	480	480a	422c	580d	584c	509c	416a	492	489	540c	466	508	512	523	472	510	516	482	487
Feb. 24	468	740	483	470	473	475	476	513	485	494	478	560	505	487	494	482	557	445	515	463	585	582	573	446
	468	474	482	474	476	471	485	503	481	482	475	582	518	483	495	495	498	428	479	469	530	578	530	550
Mean	468	472	482	472	474	473	480b	508c	483b	488	476b	571c	512b	485a	494a	488a	528e	436a	497	466	558	580	552	498
Feb. 25	465	468	458	440	484	462	474	472	490	360	490	353	472	476	436	494	483	490	507	486	475	492	484	481
	462	467	501	446	475	460	480	467	483	368	499	372	451	459	414	494	482	493	487	482	493	468	489	482
Mean	464	468	480	443	480	461	477a	470b	486d	364b	494c	364c	462c	468a	425b	494a	482	492	497	484	484	490	486	482
Feb. 26	472	472	477	477	479	478	484	471	473	474	500	490	489	476	564	465	509	498	541	602	522	509	480	474
	471	471	483	477	472	485	481	475	470	484	497	492	489	470	575	460	502	494	534	582	539	517	482	477
Mean	472	472	480	477	476	482	482c	473d	472d	479d	498a	491a	489	473c	570a	462	506	496	538	592	530	513	481	476
Feb. 27	467	470	488	478	476	479	479	467	500	460	452	485	375	470	494	486	507	523	610	570	584	519	460	478
	470	490	492	469	478	476	476	485	490	470	439	482	391	482	492	486	[illegible]	515	629	533	515	530	465	485
Mean	468	480	490	474	477	478	478	476a	495c	465c	446c	484b	383a	476b	493b	486b	526b	519	620	552	550	524	462	482
Feb. 28	485	431	485	495	467	471	473	472	543	434	564	468	479	410	556	499	559	622	442	520	459	493	443	468
	482	433	463	493	479	473	464	478	541	428	566	463	482	398	568	494	566	648	491	537	480	450	491	456
Mean	484	432	474	494	473	472	468	475	542d	431	565c	466a	480	404	562	496	562	635	466	528	474	472	467	462
Means	476.2	476.0	479.3	479.8	478.9	479.0	481.4	478.2	489.1	478.0	485.6	483.7	476.4	476.6	507.7	491.6	507.9	513.6	513.6	513.8	494.5	505.4	491.1	487.[illegible]

Monthly mean, 489.4

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, March, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Mar. 1	470	490	480	468	465	473	457	467	477	491	581	445	448	250	479	513	506	589	480	546	652	505	492	490
	475																							
Mean	472	490	480	468	465	473	457a	467c	477	491b	581d	445a	448e	250c	479a	513b	506a	589	480	546	652	505	492	490
Mar. 2	447	484	472	506	464	477	459	497	491	482	461	525	570	514	472	430	436	568	519	515	480	520	488	528
	.....	487	463	524	465	483	479	498	486	499	338	521	462	496	408	432	451	572	525	506	472	479	602	486
Mean	447	486	468	515	464	480	469b	498d	488d	490d	400c	523d	516b	505a	440a	431b	454a	570a	522	510	476	500	545	507
Mar. 3	476	480	485	464	476	481	509	495	450	515	446	496	479	478	500	529	496	514	453	510	489	499	483	509
	465	488	486	460	480	466	541	491	456	430	452	504	481	477	502	525	497	514	506	528	483	509	480	498
Mean	470	484	486	462	478	474	525d	493c	453c	472c	449c	500c	480a	478b	501a	527b	496a	514	480	519	486	504	482	504
Mar. 4	468	486	463	476	492	473	489	380	475	473	487	456	487	422	494	496	503	495	509	511	499	500	499	474
	474	489	480	474	494	478	492	496	474	474	492	481	485	432	500	496	508	489	505	503	501	500	497	473
Mean	471	488	472	475	493	476	490a	438b	474c	474c	490c	468b	486a	427c	497b	496b	506a	492	507	507	500	500	498	474
Mar. 5	476	476	482	468	473	458	471	478	482	449	491	491	460	479	479	476	522	492	512	488	479	482	481	485
	478	477	482	464	473	461	474	476	476	468	490	498	374	490	480	475	516	490	509	484	482	487	486	484
Mean	477	476	482	466	473	461	472a	477c	479b	458c	490b	494c	417b	484a	480a	476	519	491	510	486	480	484	484	484
Mar. 6	480	475	479	483	473	479	484	478	477	477	482	490	483	518	468	497	515	527	489	522	542	532	470	483
	480	479	484	482	476	477	484	478	482	484	486	484	502	435	465	496	522	530	491	511	530	550	462	480
Mean	480	477	482	482	474	478	484	478	480	480a	484b	487a	492	476b	466a	496b	518	528	490	516	536	541	466	482
Mar. 7	490	472	470	471	486	479	462	476	474	453	487	486	455	471	492	508	463	503	574	489	470	481	488	462
	493	475	466	469	488	480	464	481	472	457	497	494	465	472	500	510	453	504	554	484	473	476	486	460
Mean	492	474	468	470	487	480	463a	478b	473b	455c	492d	490d	460b	472a	496b	509b	458a	504	564	486	472	478	487	461
Mar. 8	482	477	491	465	484	468	469	483	473	461	455	500	487	465	481	570	501	506	487	506	540	547	515	459
	485	476	490	469	482	466	465	478	484	330	451	485	490	483	478	573	515	512	485	501	530	520	511	460
Mean	484	476	490	467	483	467	467b	480c	478b	396d	453d	492c	488a	474b	480a	572a	508	509	486	504	535	534	513	470
Mar. 9	460	473	475	433	462	496	496	483	490	495	474	464	468	455	485	481	497	509	502	562	499	471	473	482
	464	472	476	423	453	498	494	485	489	491	486	468	463	452	486	487	493	503	519	602	493	476	475	483
Mean	462	472	476	428	458	497	495	484a	490b	492b	480b	466b	466d	454a	486a	484	495	506	510	582	496	474	474	482
Mar. 10	487	474	483	475	474	476	474	484	482	479	498	479	410	472	498	507	496	504	510	464	511	490	491	480
	484	475	482	477	476	476	474	483	470	478	503	475	393	475	496	508	492	504	510	459	516	485	496	479
Mean	486	474	482	476	475	476	474	484	476b	478b	500c	477b	402c	474a	497b	508b	494	504	510	462	514	488	494	480
Mar. 11	479	468	479	476	480	481	485	481	491	487	481	492	486	520	521	494	498	500	495	493	490	491	496	495
	476	468	478	476	480	481	485	486	495	491	479	488	482	517	508	495	499	503	493	495	488	490	499	496
Mean	478	468	478	476	480	481	485	484	493a	489a	480b	490b	484a	518c	514a	494b	498	506	494	494	489	490	498	496
Mar. 12	485	480	480	481	476	480	483	483	483	481	482	487	485	488	494	533	525	474	478	521	492	490	482	467
	493	481	481	481	476	480	483	484	480	473	478	490	487	487	495	534	547	465	482	530	490	500	471	468
Mean	489	480	480	481	476	480	483	484	482	477	480	488b	486a	488	494	534b	536	470	480	526	491	495	476	468
Mar. 13	485	475	484	477	471	462	429	386	427	434	467	432	475	498	490	471	496	495	487	491	486	485	484	487
	500	476	484	479	475	464	436	365	436	432	459	386	480	495	463	470	487	495	483	494	490	488	480	486
Mean	492	476	484	478	473	463	432	376d	432b	433b	462b	409c	478b	496a	476d	470a	492	495	485	492	488	486	482	486
Mar. 14	487	486	485	482	480	480	470	482	464	651	464	485	643	458	479	500	489	495	504	514	479	486	478	472
	482	492	482	482	482	479	471	478	453	558	475	479	691	437	477	497	489	492	500	509	471	483	482	472
Mean	484	489	484	482	481	480	470	480	462b	604b	470b	482b	667c	448a	478a	498a	489	494	502	512	475	484	480	472
Mar. 15	474	480	479	481	482	477	481	480	473	466	480	527	470	495	492	491	510	500	492	496	490	491	484	484
	477																							
Mean	476	480	479	481	482	477	481	480	473	466	480	527c	470d	495b	492b	491	510	500	492	496	490	491	484	484
Mar. 16	486	485	481	483	481	482	481	470	509	483	495	485	483	488	484	491	492	502	497	499	490	485	486	487
	.....	485	482	482	483	482	479	472	514	484	494	484	482	488	485	490	495	500	491	494	486	482	485	489
Mean	486	485	482	482	482	482	480	471b	512c	484b	494	484	482	488	484	490a	494	501	494	496	488	481	486	488
Mar. 17	481	480	479	479	475	481	484	474	489	490	491	472	494	490	495	490	486	487	500	494	495	500	515	476
	479	481	470	479	473	483	483	476	483	486	479	481	493	488	496	486	485	487	502	498	490	496	510	475
Mean	480	479	479	479	474	482	484	475	486	488a	485c	476b	494b	489a	496	485a	486	487	501	496	492	479	512	476
Mar. 18	477	484	474	476	483	479	483	482	478	489	492	481	487	480	530	507	486	493	482	497	494	500	486	481
	475	482	474	478	482	479	481	483	485	488	477	483	485	485	526	500	485	494	490	494	492	499	480	480
Mean	476	483	474	477	482	479	482	482	482	488	484	482a	486	482b	528c	504a	486	494	486	496	493	500	483	480
Mar. 19	478	480	481	483	482	481	482	485	473	491	486	488	483	490	490	484	495	483	503	499	491	485	489	490
	479	479	480	483	482	481	482	482	478	481	486	487	481	491	488	484	490	488	504	494	495	490	490	488
Mean	478	480	480	483	482	481	482	484	476	486	486	488b	482b	490	489	484	492	488	504	496	493	488	490	489
Mar. 20	479	479	478	481	469	484	484	484	486	485	481	485	486	489	485	488	491	494	492	493	496	494	490	484
	480	479	480	481	472	483	486	484	487	487	490	496	485	492	489	490	490	492	494	495	495	495	491	482
Mean	480	479	479	481	470	484	485	484	486	486	486	490	486	490	487	489	490	493	493	494	496	494	490	483
Mar. 21	486	476	480	472	474	475	465	401	447	470	467	465	502	440	485	507	502	525	502	530	602	520	502	493
	486	474	480	473	474	470	468	407	440	445	441	470	500	445	486	517	504	540	505	523	570	511	523	485
Mean	486	475	480	472	474	472	466	404b	444b	458c	454b	468	501	442b	486	512b	503	532	504	526	586	516	512	489
Mar. 22	474	456	486	458	475	478	490	484	435	393	448	414	510	426	486	511	503	503	514	550	533	499	467	459
	481	461	499	464	465	474	488	483	431	434	441	427	515	422	480	516	506	498	490	554	511	493	474	459
Mean	478	458	492	461	470	476	489	484	433	414	444	420	512	424	483	514	504	500	502	552	522	496	470	459
Mar. 23	491	464	469	484	474	470	456	495	497	471	498	482	478	482	467	470	485	477	527	511	499	491	476	452
	489	469	468	486	472	471	455	526	503	474	507	484	479	482	500	473	487	483	526	522	504	495	480	457
Mean	490	466	468	485	473	470	456	510b	500c	472	502	483	478	482	484b	472	486	480	526	516	502	493	478	454
Mar. 24	482	475	475	462	470	474	466	475	499	485	494	488	485	486	481	480	491	487	498	495	493	495	490	494
	478	475	478	464	469	466	472	477	490	485	497	485	486	485	482	479	489	496	501	499	488	491	493	493
Mean	480	475	476	463	470	470	469	476	494c	485b	[illegible]	486	486	486	482	480	490	492	500	497	490	493	492	494
Mar. 25	480	464	470	472	465	480	472	467	481	476	486	490	479	484	480	486	511	505	527	526	505	496	503	480
	478	465	472	469	462	481	477	458	481	478	485	488	479	483	477	481	510	507	528	522	511	493	498	479
Mean	479	464	471	470	464	480	474	462	481	477	486	489	479	484	478	484	510	506	528	524	508	494	500	480
Mar. 26	479	480	475	473	465	466	480	465	480	461	461	459	432	473	475	522	483	486	513	495	544	505	560	486
	480	480	475	474	465	468	480	466	527	457	456	452	427	470	481	530	486	486	515	490	549	500	602	485
Mean	480	480	475	474	465	467	480	466b	504d	459c	458a	456b	430	472	478	526	484	486	514	492	546	502	581	486
Mar. 27	492	509	479	452	475	454	464	475	432	434	564	422	394	490	524	467	487	533	547	650	560	505	532	458
	500	503	476	456	470	478	482	477	440	429	553	408	416	487	528	463	485	510	551	644	591	517	519	459
Mean	496	506	478	454	472	466	473	476	436a	432c	558c	415b	405d	488	526	465	486	522	549	647	576	511	526	458
Mar. 28	532	450	468	466	423	474	444	453	450	358	460	446	267	462	461	500	550	478	529	510	485	475	512	458
	455	442	470	470	439	462	446	443	460	373	489	455	318	465	496	511	541	488	533	480	493	483	503	450
Mean	494	446	469	468	431	468	445	448	455d	366c	474c	450b	292a	464	478	506	546	483	531	495	489	479	508	454
Mar. 29	449	478	480	464	447	448	466	465	478	463	499	490	532	468	480	546	488	543	554	548	461	465	462	463
	462	480	478	471	451	463	471	458	484	463	534	493	521	525	483	560	481	544	539	533	468	502	452	475
Mean	456	479	479	468	449	456	468	462	481	463	516c	492a	526	496b	482a	553	484	544	546	540	464	484	457	469
Mar. 30	473	481	488	452	470	481	481	480	474	483	519	490	493	438	488	480	492	495	486	488	480	492	480	477
	463	476	490	458	469	481	482	480	478	487	515	498	500	412	484	491	489	510	482	482	478	495	478	476
Mean	468	478	489	455	470	481	482	480	476	485	517	494	496	425b	486	486	490	502	484	485	479	494	479	476
Mar. 31	472	473	472	467	464	485	480	474	478	466	465	492	410	455	494	492	502	537	510	519	492	485	483	468
	475	471	473	467	462	480	474	472	478	460	465	489	448	451	485	495	491	527	508	519	494	483	485	470
Mean	474	472	472	467	463	482	477	473	478	466	465	490	429	453	490	494	496	532	509	519	493	484	484	469
Means	478.7	477.3	478.5	472.5	472.0	475.5	475.5	471.5	475.3	469.8	483.8	477.5	474.3	467.5	487.5	498.3	497.0	506.8	505.9	513.2	506.4	495.6	493.6	478.8

Monthly mean, 484.7

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, April, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Apr. 1	466	467	439	465	459	460	470	470	478	460	482	473	478	482	476	485	481	495	515	501	483	500	465	475
	462																							
Mean	464	467	439	465	459	460	470	470	478	460	482	473	478	482	476	485	481	495	515	501	483	500	465	475
Apr. 2	470	473	471	477	466	479	482	488	480	462	474	485	485	446	500	480	495	509	613	483	488	191	493	474
	....	475	474	476	464	483	484	477	468	465	468	492	490	471	507	491	497	507	598	485	489	484	495	478
Mean	470	474	472	476	465	481	483	482	474*a*	464*b*	471*b*	488*a*	488*b*	458*b*	504	486	496	508	606	484	488	488	494	476
Apr. 3	477	473	468	472	474	475	468	465	450	466	345	470	423	650	595	437	531	539	512	505	400	485	504	520
	472	470	469	471	473	475	469	463	450	447	297	452	432	691	470	445	520	625	498	506	442	480	500	524
Mean	474	472	468	472	474	475	468	464	450*a*	456*b*	321*b*	461*b*	428*b*	670*a*	488	441	526	582	505	506	451	482	502	522
Apr. 4	525	452	513	469	472	456	476	476	418	474	445	475	482	435	508	510	526	528	483	552	483	480	465	405
	544	430	509	461	464	457	478	472	432	448	425	476	498	424	562	504	501	523	498	604	519	519	469	403
Mean	534	441	511	465	468	456	477	474	425*a*	461*b*	435*b*	460*b*	490*b*	430*a*	505	507	514	526	400	578	501	500	467	479
Apr. 5	450	477	472	474	470	472	478	476	480	459	498	448	489	485	514	512	486	186	496	483	533	514	480	462
	447	487	470	475	465	481	483	481	485	460	423	457	486	485	479	508	482	488	494	492	534	494	486	459
Mean	448	482	471	474	468	476	480	478	482	460	460*b*	452	488	485	496	510	484	487	495	488	534	504	483	460
Apr. 6	470	467	464	464	465	457	468	471	480	489	563	490	485	472	482	495	486	493	500	500	498	492	479	479
	467	463	466	460	461	452	475	474	472	490	529	485	484	468	487	483	489	495	504	506	495	491	479	479
Mean	468	465	465	462	463	454	472	472	476	490	546	488	484	470	484	489	488	494	502	503	496	492	479	479
Apr. 7	476	473	469	472	475	476	481	484	483	482	483	482	473	486	483	490	490	489	490	490	493	488	486	484
	474	471	470	471	472	477	479	479	490	480	478	489	488	481	487	484	484	488	490	492	493	491	487	486
Mean	475	472	470	472	474	476	480	482	486	486	480	486	480	484	485	487	487	488	490	491	493	490	486	485
Apr. 8	490	478	468	464	465	463	468	478	476	484	478	475	479	495	485	488	544	492	527	520	511	490	482	485
	492	481	468	464	465	466	472	472	482	482	478	462	476	500	488	491	540	486	548	525	512	492	479	484
Mean	491	480	468	464	465	464	470	475	479	483	478*c*	468*b*	478*a*	498	486	490	512	489	538	522	512	491	480	484
Apr. 9	466	465	470	466	474	473	475	474	478	477	458	485	502	489	533	485	480	500	493	499	480	489	492	476
	466	464	469	466	473	474	474	475	481	478	455	470	496	493	515	486	479	501	496	496	484	490	491	476
Mean	466	464	470	466	474	474	474	474	480	478	456*b*	478*b*	499*a*	491	524	486	480	500	494	498	482	490	492	476
Apr. 10	478	474	471	471	469	475	475	476	479	477	479	482	481	434	477	486	492	481	496	493	488	493	487	476
	478	474	475	471	469	474	474	475	479	478	479	481	479	428	474	486	494	479	496	492	488	491	495	468
Mean	478	474	473	471	469	474	474	476	479	478	479	482	480	431	476	486	493	480	496	492	488	492	491	472
Apr. 11	473	471	465	461	478	466	454	480	477	455	470	504	488	486	480	476	489	493	501	496	502	488	486	484
	474	471	465	460	474	465	455	479	492	471	463	507	482	483	476	482	488	491	500	499	500	489	485	483
Mean	474	471	465	460	476	466	454	480	484	463	466	506	485	484	478	479	488	492	500	498	501	488	486	484
Apr. 12	482	476	472	475	470	479	476	480	483	477	472	458	405	455	495	507	484	494	519	522	491	490	482	470
	481	474	472	474	470	478	475	481	487	479	482	465	384	481	490	499	484	494	520	521	493	489	490	470
Mean	482	475	472	474	470	478	476	480	485	478	477	462	394	468	492	503	484	494	520	522	492	490	486	470
Apr. 13	480	472	472	472	473	474	476	475	467	475	468	464	465	472	504	509	497	496	491	570	487	473	482	478
	478	471	471	473	472	474	476	475	467	476	469	470	475	479	495	516	494	496	491	592	472	471	486	478
Mean	479	472	472	472	472	474	476	475	467	476	468*d*	467*b*	470	476	500	512	496	496	491	581	480	472	484	478
Apr. 14	468	466	469	463	470	470	472	478	476	484	471	472	477	476	479	488	485	496	493	490	489	486	482	481
	470	467	468	461	470	470	472	477	481	480	472	469	478	488	481	482	487	496	493	488	487	484	486	481
Mean	469	466	468	462	470	470	472	478	478	482	472	470	478	482	480	485	486	496	493	489	488	485	484	481
Apr. 15	473	473	472	473	474	473	472	479	478	474	471	470	497	478	472	496	495	524	492	490	482	486	478	489
	475																							
Mean	474	473	472	473	474	473	472	479	478	474	471	470	497	478	472	496	495	524	492	490	482	486	478	489
Apr. 16	480	475	471	461	461	462	474	471	467	466	479	468	541	485	496	501	499	499	492	496	504	499	471	472
	.....	473	470	460	460	463	473	478	475	473	478	462	545	484	475	498	494	501	494	490	511	501	475	472
Mean	480	474	470	460	460	462	474	474	471	470	478	465	543	484	486	500	496	500	493	493	508	500	473	472
Apr. 17	474	474	474	477	462	461	470	473	468	481	481	478	476	475	492	493	487	498	495	499	496	492	484	481
	472	474	474	478	461	461	468	473	470	489	490	472	473	484	486	477	491	498	494	497	490	488	487	484
Mean	473	474	474	478	462	461	469	473	469	485	486	475	474	480	489	485	489	498	494	498	493	490	486	482
Apr. 18	475	470	469	468	471	475	474	475	488	467	471	467	470	471	467	503	507	541	522	526	489	492	498	493
	475	470	469	469	469	475	474	473	479	465	454	469	463	475	456	497	522	528	522	529	483	491	500	504
Mean	475	470	469	468	470	475	474	474	484	466	462	468	466	473	462	500	514	534	522	528	486	492	499	498
Apr. 19	460	472	472	454	441	474	467	415	424	438	457	455	518	438	481	476	478	494	484	577	542	541	547	494
	468	470	468	454	443	474	463	410	426	435	456	462	503	431	488	478	491	489	488	576	537	567	622	492
Mean	464	471	470	454	442	474	465	412	425	436	456	458	510	434	484	477	484	492	486	576	540	554	584	493
Apr. 20	492	498	450	452	468	470	451	459	455	448	516	485	485	492	538	409	504	531	589	528	450	498	460	459
	498	490	457	476	470	459	462	454	462	450	488	465	484	495	529	467	510	540	560	580	443	504	463	459
Mean	495	494	454	464	469	464	456	456	458	449	502	475	484	494	534	408	507	536	574	554	446	501	462	459
Apr. 21	478	483	474	472	470	471	477	474	476	479	470	480	482	464	478	484	488	486	477	488	490	489	480	481
	476	483	475	471	471	470	478	474	477	476	472	485	479	471	476	483	486	487	491	486	491	487	482	481
Mean	477	483	474	472	470	470	478	474	476	478	471	482	480	468	477	484	487	486	484	487	490	488	481	481
Apr. 22	480	465	480	471	478	479	476	479	474	481	476	476	475	481	482	486	481	477	508	492	487	498	499	479
	480	466	470	470	478	479	476	478	479	477	486	480	476	478	483	478	482	474	501	490	488	496	498	479
Mean	480	466	475	470	478	479	476	478	476	479	481	478	476	478	482	482	482	476	504	491	488	497	498	479
Apr. 23	475	484	468	472*	467	470	474	476	475	481	478	478	473	474	478	488	502	486	493	487	488	511	484	484
	477	484	468	472	469	470	474	475	464	481	478	470	465	483	482	492	501	489	493	488	486	509	483	487
Mean	476	484	468	472	468	470	474	476	480	481	478	474	469	478	480	490	502	488	493	488	487	510	484	486
Apr. 24	474	473	471	469	468	469	471	472	474	476	473	476	478	470	475	481	492	577	449	550	601	563	650	490
	474	474	471	469	468	469	471	473	476	474	483	483	476	492	471	475	495	570	427	561	580	530	655	476
Mean	474	474	471	469	468	469	471	472	475	475	478	480	477	481	473	478	494	574	438	556	590	546	652	483
Apr. 25	434	485	496	440	482	444	418	488	456	467	457	438	409	402	458	467	479	471	522	462	480	484	513	493
	515	481	500	428	481	454	424	481	450	472	458	444	406	435	491	467	483	473	522	511	492	478	482	491
Mean	474	483	498	434	482	449	421	484	453	470	458	441	408	418	474	467	481	472	522	486	486	481	498	492
Apr. 26	435	464	470	462	454	454	525	463	471	497	498	479	483	467	490	472	497	492	517	553	562	478	470	478
	450	463	467	462	418	446	503	463	476	428	477	481	470	474	477	481	496	496	523	502	523	476	461	482
Mean	442	464	468	462	451	450	514	463	474	462	488	480	476	470	484	476	436	494	520	528	542	477	466	480
Apr. 27	460	478	460	459	458	450	483	486	490	486	483	465	510	495	497	506	493	487	522	515	492	527	507	492
	468	503	458	463	460	456	479	477	498	498	498	469	443	498	502	489	479	489	532	509	491	486	506	490
Mean	464	490	459	466	459	453	481	482	494	492	490	467	476	496	500	498	486	488	527	512	492	506	506	491
Apr. 28	483	482	482	469	460	468	459	542	503	475	480	465	485	481	488	495	501	509	509	519	505	477	472	474
	476	490	490	471	459	467	461	531	496	476	484	470	492	476	494	493	498	509	511	517	507	474	473	476
Mean	480	486	486	470	460	468	460	536	500	476	482	468	488	478	491	494	500	509	510	518	506	476	473	475
Apr. 29	479	471	470	469	469	472	473	475	469	466	471	489	487	471	486	463	503	516	504	504	531	482	468	472
	480	470	470	466	470	471	473	473	470	460	468	472	474	469	493	470	493	512	510	507	533	483	466	473
Mean	480	470	470	468	470	472	473	474	470	463	470	480	480	470	490	466	498	514	507	506	532	482	467	472
Apr. 30	464	461	476	485	402	460	466	460	476	476	468	463	472	501	480	470	481	498	501	554	539	534	486	418
	465	465	474	479	460	463	469	462	480	479	471	456	477	471	476	462	485	513	506	582	585	508	498	418
Mean	464	463	475	482	401	462	468	461	478	478	470	460	474	486	478	466	484	506	504	568	562	521	492	418
Means	474.8	473.1	471.2	467.2	467.0	467.6	471.7	474.3	472.8	471.6	470.4	472.3	476.6	479.2	487.7	485.8	494.7	503.9	506.8	514.4	509.6	495.7	492.6	479.0

Monthly mean, 482.1

* Observation taken 9m late.

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, May, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
May 1 ...	456	466	470	464	452	465	452	452	442	482	453	475	459	459	475	480	477	492	558	521	523	488	492	472
	458																							
Mean	457	466	470	464	452	465	452	452	442	482	453	475	459	459	475	480	477	492	558	521	523	488	492	472
May 2 ...	463	464	475	460	442	463	476	461	467	440	440	446	457	442	476	523	470	495	503	491	528	520	482	468
	.....	467	470	461	468	469	469	468	462	430	432	448	449	397	502	503	472	498	506	493	539	518	478	460
Mean	463	466	472	460	455	466	472	464	464	435	436	447	453	420	489	513	471	456	504	492	534	519	480	464
May 3 ...	475	474	472	467	468	462	468	473	479	471	471	452	468	529	465	487	488	494	500	500	501	491	484	478
	476	468	471	466	468	467	469	470	482	463	466	464	471	507	480	480	490	493	504	501	486	492	481	479
Mean	476	471	472	466	468	464	468	472	480	467	468	458	480	518	472	484	489	494	502	500	494	492	482	478
May 4 ...	476	466	470	470	460	468	470	477	480	464	475	438	467	460	495	487	491	498	509	514	508	482	479	468
	475	465	471	471	454	469	472	478	483	470	471	450	465	468	480	484	491	500	509	516	509	480	478	466
Mean	476	466	470	470	457	468	471	478	482	467	473	444	466	464	488	486	491	499	509	515	508	481	478	467
May 5 ...	468	474	467	471	458	469	473	459	483	480	478	479	475	476	484	505	491	496	531	513	502	474	469	464
	471	474	466	469	459	467	472	460	483	479	478	478	475	474	485	498	497	496	531	501	567	471	475	463
Mean	470	474	466	470	458	468	472	460	483	480	478	478	475	475	484	502	494	496	531	507	564	472	472	464
May 6 ...	460	465	468	470	462	451	456	472	480	454	474	472	460	465	474	479	495	489	493	512	486	472	486	446
	450	461	466	470	463	450	457	470	474	453	478	468	457	463	496	472	498	487	499	513	489	476	493	446
Mean	455	463	467	470	462	450	456	471	477	454	476	470	458	464	485	476	496	488	496	512	488	474	490	446
May 7 ...	460	453	456	463	468	453	470	473	412	470	475	441	482	499	468	474	474	493	484	525	490	491	464	461
	458	451	458	469	466	455	469	475	414	473	483	438	491	454	473	473	475	483	483	522	487	490	468	462
Mean	459	452	457	466	467	454	470	474	413	472	479	440	486	476	470	474	474	488	484	524	488	490	466	462
May 8 ...	466	461	458	466	467	470	472	463	472	471	469	469	443	481	466	485	496	493	476	482	500	497	490	478
	463	462	460	466	466	470	474	464	472	473	465	472	430	478	469	482	495	489	476	486	503	499	483	477
Mean	464	462	459	466	466	470	473	464	472	472	467	470	416	480	468	484	496	491	476	484	502	498	486	478
May 9 ...	446	455	468	464	464	465	469	470	470	472	467	465	444	475	470	480	494	480	507	506	493	474	467	475
	437	453	460	460	465	465	467	470	470	475	468	468	442	467	468	479	497	481	509	500	490	472	459	474
Mean	442	454	464	462	464	465	468	470	470	474	468	466	443	471	469	480	496	480	508	503	492	473	468	474
May 10 ..	470	466	468	467	460	473	468	472	472	470	473	466	470	474	480	478	483	489	499	500	500	487	462	474
	475	470	469	467	459	470	466	473	476	473	473	468	465	472	477	477	484	487	500	499	498	478	460	475
Mean	472	468	468	467	460	472	467	472	474	472	473	467	468	473	478	478	484	488	500	500	499	482	461	474
May 11 ..	461	457	471	467	458	462	467	468	468	471	470	455	457	453	475	470	483	496	487	480	482	479	480	473
	460	460	471	470	460	462	468	468	470	481	472	456	461	465	470	472	481	496	489	478	482	480	479	474
Mean	460	458	471	468	459	462	468	468	469	476	471	456	459	459	472	471	482	496	488	479	482	480	480	474
May 12 ..	474	454	462	456	459	465	467	452	467	469	475	458	470	474	470	478	480	496	496	486	476	479	481	462
	474	460	461	455	461	461	465	455	468	470	472	456	467	474	474	482	481	495	495	486	475	480	480	464
Mean	474	457	462	456	460	463	466	454	468	470	474	457	468	474	472	480	480	496	496	486	476	480	480	463
May 13 ..	464	461	468	464	470	463	470	469	470	477	464	474	472	478	465	466	478	504	522	499	482	488	476	467
	461	468	469	466	470	466	470	468	467	478	465	470	475	480	459	460	480	503	540	497	484	491	477	468
Mean	462	464	468	465	470	464	470	468	468	478	464	472	474	479	462	463	479	504	531	498	483	490	476	468
May 14 ..	466	460	473	456	451	443	443	461	475	477	455	441	480	481	490	483	493	490	496	486	470	476	470	463
	466	462	474	458	451	446	432	484	480	473	456	455	481	475	494	487	492	490	497	485	468	478	469	465
Mean	466	461	474	457	451	444	438	472	478	475	456	448	480	478	492	485	492	490	496	486	469	477	470	464
May 15 ..	462	463	463	466	466	465	470	467	467	483	465	451	459	482	481	481	498	495	514	509	488	461	466	470
	461																							
Mean	462	463	463	466	466	465	470	467	467	483	465	451	459	482	481	481	498	495	514	509	488	461	466	470
May 16 ..	467	468	467	470	459	467	466	455	435	475	418	465	478	550	450	495	516	514	503	491	470	466	472	468
	.....	466	465	471	467	464	465	451	432	474	420	468	482	565	451	500	502	517	494	498	471	468	470	468
Mean	467	467	466	470	463	466	466	453	434	474	419	466	480	558	450	498	509	516	498	494	470	467	471	468
May 17 ..	470	469	468	474	470	469	470	474	468	452	459	461	476	490	485	496	480	529	490	510	514	451	467	465
	470	472	465	474	471	468	470	476	470	453	458	472	471	488	491	490	476	531	495	514	515	457	468	465
Mean	470	470	466	474	470	468	470	475	469	452	458	466	474	489	488	493	478	530	492	512	514	454	468	465
May 18 ..	480	491	456	461	469	472	475	465	472	472	476	465	462	418	462	472	476	502	497	484	478	478	477	467
	481	490	452	467	468	475	477	462	474	472	471	464	464	455	464	470	479	502	494	480	479	476	475	464
Mean	480	490	454	464	463	474	476	464	473	472	474	464	463	452	463	471	478	502	496	482	478	477	476	466
May 19 ..	472	493	466	468	472	473	458	461	486	480	473	450	454	486	495	476	468	491	516	529	470	459	473	484
	472	496	467	469	472	474	460	486	486	483	460	442	469	472	499	472	474	493	525	518	463	457	471	488
Mean	472	494	466	468	472	474	459	474	486	482	466	446	462	479	497	474	471	492	520	524	466	458	472	486
May 20 ..	472	483	469	462	469	476	471	484	475	477	477	480	467	466	488	482	487	516	516	590	650	518	476	458
	472	478	470	462	473	476	474	484	478	464	476	473	471	459	500	485	489	516	516	542	675	525	480	455
Mean	472	480	470	462	471	476	472	484	476	470	476	476	469	462	494	484	488	516	516	566	662	522	478	456
May 21 ..	478	507	500	451	444	495	415	416	378	525	438	450	381	465	483	480	596	557	530	494	507	552	579	460
	481	507	511	453	435	491	412	433	395	494	414	443	430	469	478	491	610	524	517	499	500	533	616	457
Mean	480	507	506	452	440	493	414	424	386	510	426	446	406	467	480	486	603	540	524	496	504	542	598	458
May 22 ..	467	540	463	467	465	410	486	454	466	422	485	450	475	462	551	489	488	506	523	532	471	501	470	493
	479	554	458	468	464	424	492	436	472	435	486	402	463	454	546	494	500	503	519	527	475	497	468	494
Mean	473	547	460	468	464	417	489	445	469	428	486	426	469	458	548	492	494	504	521	530	473	499	469	494
May 23 ..	455	492	453	472	472	451	456	441	445	453	417	472	483	495	469	478	490	522	485	479	483	482	471	475
	455	498	439	462	471	448	458	451	450	471	410	467	485	496	473	474	485	520	489	480	481	483	472	475
Mean	455	495	446	467	472	450	457	446	448	462	414	470	484	496	471	476	488	521	487	480	482	482	472	475
May 24 ..	483	460	461	465	466	468	475	472	468	465	468	459	450	465	475	484	497	506	556	542	497	482	468	464
	481	464	462	465	466	467	475	470	476	471	474	458	455	472	504	490	507	499	527	534	499	486	470	463
Mean	482	466	462	465	466	468	475	471	472	468	471	458	452	468	490	487	502	502	542	538	498	484	469	464
May 25 ..	461	457	452	455	460	466	468	477	482	480	472	481	462	466	483	499	500	490	495	502	504	479	482	474
	461	459	454	455	459	467	471	465	490	473	472	453	460	467	481	497	494	490	494	501	502	478	484	470
Mean	461	458	453	455	460	466	470	471	486	476	472	467	461	466	482	498	497	490	494	502	503	478	483	472
May 26 ..	456	452	478	454	450	438	473	474	450	478	462	459	464	439	486	506	516	528	514	536	544	459	464	470
	460	452	481	454	451	451	472	478	444	473	456	463	448	446	484	500	511	532	510	552	547	464	465	472
Mean	458	452	480	454	450	456	472	476	447	476	459	461	456	442	485	503	514	530	512	544	546	462	464	471
May 27 ..	454	464	477	467	463	468	458	480	475	467	487	432	471	443	496	475	484	491	491	481	488	508	501	460
	453	462	479	470	464	466	456	477	485	448	417	453	478	435	480	480	482	491	490	484	490	502	498	465
Mean	454	463	478	468	464	467	457	478	480	458	452	442	474	439	488	478	483	491	490	482	489	505	500	462
May 28 ..	468	460	466	459	461	460	470	469	456	476	463	458	455	474	467	481	469	640	567	470	479	468	490	472
	463	451	462	458	461	458	470	473	453	460	460	463	487	482	475	481	471	566	570	473	478	463	487	468
Mean	466	456	464	458	461	459	470	471	454	468	462	460	471	478	471	481	470	603	568	472	478	467	488	470
May 29 ..	448	461	471	459	470	480	462	463	468	460	391	475	470	463	454	481	496	493	487	496	483	481	490	480
	448	462	470	460	464	483	462	454	466	465	476	478	473	459	467	486	510	494	488	493	484	482	491	480
Mean	448	463	470	460	467	482	462	458	467	462	434	476	472	461	460	484	503	494	488	494	483	482	490	480
May 30 ..	466	468	468	466	472	462	478	481	473	465	479	461	478	446	475	490	493	512	514	500	485	482	489	465
	466	470	468	466	470	460	477	480	473	466	483	462	481	453	479	493	488	501	516	506	487	483	486	459
Mean	466	469	468	466	471	461	478	480	473	466	481	462	480	450	477	492	490	506	515	503	486	482	488	462
May 31 ..	453	472	461	463	462	467	441	467	486	477	478	466	384	462	462	498	503	515	527	499	504	476	469	469
	453	472	460	463	462	468	430	473	480	475	476	461	410	455	465	498	507	569	527	500	502	474	473	468
Mean	453	472	460	463	462	468	436	470	483	476	477	464	397	458	464	498	505	512	527	500	503	475	471	468
Means	465.0	470.7	466.8	464.1	462.5	464.0	464.6	466.0	461.8	469.6	462.2	459.6	462.7	470.8	479.5	484.9	492.6	504.6	509.1	504.4	500.8	483.6	480.8	468.9

Monthly mean, 476.0

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, June, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
June 1	466	460	465	459	459	459	473	485	485	474	464	447	446	462	483	476	517	519	499	527	555	525	473	465
	468																							
Mean	467	460	465	459	459	459	473	485	485	474	464	447	446	462	483	476	517	519	499	527	555	525	473	465
June 2	459	461	461	460	460	443	454	458	472	398	497	423	455	436	469	437	432	513	546	561	589	460	546	519
	....	462	457	461	465	445	446	466	483	408	498	441	454	442	482	430	433	500	547	564	580	437	554	513
Mean	459	462	459	460	462	444	450	462	478	403	498	432	454	439	476	434	432	506	546	562	584	448	550	516
June 3	487	439	469	455	450	466	461	473	413	428	424	472	482	461	473	482	467	552	510	487	492	488	505	437
	507	458	470	460	449	467	461	475	411	422	405	467	475	466	479	481	465	547	501	483	503	490	492	442
Mean	497	448	470	458	450	466	461	474	412	425	414	470	478	464	476	482	466	550	506	485	498	489	498	440
June 4	458	468	465	457	474	459	470	474	474	470	469	465	471	454	450	481	503	495	480	491	498	494	473	473
	466	470	465	460	469	461	470	472	489	479	475	462	467	469	453	481	507	497	481	488	499	488	471	474
Mean	462	469	465	458	472	460	470	473	482	474	472	464	469	462	452	481	505	496	480	490	498	491	472	474
June 5	463	464	463	470	463	470	471	470	474	470	481	488	462	472	471	484	483	485	493	486	485	486	468	463
	465	465	463	472	466	473	471	480	474	474	473	476	468	466	480	486	483	485	493	487	484	485	466	468
Mean	464	464	463	471	464	472	471	475	474	472	477	482	465	469	476	485	483	485	493	486	484	486	467	466
June 6	462	460	460	456	451	474	464	476	456	462	312	479	411	433	450	470	543	490	593	536	584	578	464	458
	460	467	463	454	458	475	470	481	461	467	270	473	417	437	456	488	529	497	615	539	572	512	469	470
Mean	461	464	462	455	454	474	467	478	458	464	291	476	414	435	453	479	536	494	604	538	578	515	466	464
June 7	463	474	470	468	464	452	460	475	418	476	485	488	464	482	470	467	487	495	516	498	512	476	479	472
	459	478	465	466	465	448	462	463	466	478	468	475	467	476	477	464	489	496	528	499	508	474	480	471
Mean	461	476	468	467	464	450	461	469	442	477	476	482	466	479	474	466	488	496	517	498	510	475	480	472
June 8	460	451	471	457	460	467	454	462	462	474	461	456	449	488	490	489	509	557	536	543	508	488	457	468
	462	454	469	458	460	465	458	470	474	470	460	458	453	517	484	486	514	563	531	539	496	486	459	471
Mean	461	452	470	458	460	466	456	466	468	472	460	457	451	502	487	488	512	560	534	541	502	487	458	470
June 9	464	468	448	453	463	443	462	460	457	423	411	454	447	462	480	456	493	506	529	530	519	482	488	465
	461	468	449	455	466	440	468	460	462	424	417	451	452	467	524	478	495	501	524	522	521	483	489	465
Mean	462	468	448	454	464	442	465	460	460	424	414	452	450	464	502	467	494	504	526	526	520	482	488	465
June 10	447	475	462	461	468	467	470	476	473	474	469	466	482	471	454	484	473	513	517	504	488	492	485	491
	445	473	464	461	468	468	470	481	471	470	466	463	481	466	459	475	470	514	525	502	481	488	482	490
Mean	446	474	463	461	468	468	470	478	472	472	468	464	482	468	456	480	472	514	521	503	484	490	484	490
June 11	441	458	459	456	458	457	456	468	492	465	454	483	468	482	486	475	491	517	505	484	477	474	472	473
	460	463	460	456	459	458	453	469	483	460	457	492	464	487	482	471	490	519	501	481	478	472	470	470
Mean	450	460	460	456	458	458	454	468	488	462	456	488	466	484	484	473	490	518	503	482	478	473	471	472
June 12	476	467	460	463	463	468	473	462	475	478	459	474	472	450	443	492	494	511	474	478	492	483	482	460
	476	466	460	465	462	468	478	461	475	477	455	475	481	446	435	492	494	511	474	479	490	484	481	459
Mean	476	466	460	464	462	468	476	462	475	478	457	474	476	448	439	492	494	511	474	478	491	484	482	460
June 13	461	460	465	467	473	468	455	450	493	481	471	472	467	479	466	479	481	478	490	484	488	489	459	465
	461	461	465	468	473	468	457	453	495	483	477	469	468	482	465	479	481	476	486	483	487	492	462	465
Mean	461	460	465	468	473	468	456	452	494	482	474	470	468	480	466	479	481	477	488	484	488	490	460	465
June 14	492	472	466	468	468	472	472	477	450	448	486	475	468	477	471	456	489	503	485	499	501	482	466	471
	489	477	467	471	465	467	471	473	446	445	487	476	466	492	473	456	489	496	487	496	505	480	466	472
Mean	490	474	466	470	466	470	472	475	448	446	486	476	467	484	472	456	489	500	486	498	503	481	466	472
June 15	466	458	472	471	472	468	470	476	474	477	474	475	475	476	474	483	483	485	494	510	516	495	471	470
	470																							
Mean	468	458	472	471	472	468	470	476	474	477	474	475	475	476	474	483	483	485	494	510	516	495	471	470
June 16	471	478	466	465	462	470	472	479	476	481	469	475	476	474	468	474	483	484	488	516	528	482	478	479
	....	480	465	465	467	468	470	486	475	475	477	473	468	472	466	475	484	485	492	512	523	484	482	476
Mean	471	479	466	465	464	469	471	482	476	478	473	474	472	473	467	474	484	484	490	514	526	483	480	478
June 17	453	468	509	471	476	465	473	416	442	438	463	444	410	491	489	478	503	529	530	498	501	499	478	442
	452	467	501	473	470	459	476	370	432	437	463	443	394	496	491	478	506	528	531	495	493	484	482	438
Mean	452	468	505	472	473	462	474	393	437	438	463	444	402	494	490	478	504	528	530	496	497	492	480	440
June 18	510	533	426	495	407	464	448	504	417	412	326	513	482	429	497	491	457	495	579	468	501	522	471	453
	511	464	441	501	420	465	440	497	417	410	336	493	458	448	499	486	476	503	571	476	509	516	467	469
Mean	510	498	434	498	414	464	444	500	417	411	331	503	470	438	498	488	466	499	575	472	505	519	469	461
June 19	437	471	470	459	479	461	448	455	465	472	490	668	434	477	496	499	468	517	497	502	496	488	491	478
	441	472	468	465	473	467	449	462	463	470	489	612	420	483	498	493	470	526	498	499	492	493	489	482
Mean	439	472	469	462	476	464	448	458	464	471	490	640	427	480	497	496	469	522	498	500	494	490	490	480
June 20	462	468	465	449	472	472	480	509	504	478	470	432	465	467	467	480	488	499	562	499	494	492	498	476
	463	467	469	450	474	470	485	497	506	479	467	436	472	471	474	482	496	499	559	482	490	484	492	475
Mean	462	468	467	450	473	471	482	503	505	478	468	434	468	469	470	481	492	499	560	490	492	488	495	476
June 21	471	469	470	448	460	463	459	466	472	469	471	460	464	466	474	481	485	492	497	499	493	496	471	468
	470	468	472	446	460	462	476	453	471	469	470	474	473	468	467	482	485	492	498	500	494	488	468	468
Mean	470	468	471	447	460	462	468	460	472	469	470	467	468	467	470	482	485	492	498	500	494	492	470	468
June 22	464	460	461	464	467	469	471	470	482	474	470	455	472	471	485	491	481	514	556	533	496	414	471	488
	470	460	460	465	467	464	474	463	477	472	471	462	460	466	488	488	492	533	528	490	503	421	511	473
Mean	467	460	460	464	467	469	472	466	480	473	470	458	466	468	486	490	486	524	542	512	500	418	491	480
June 23	505	550	439	430	472	482	467	504	500	490	441	354	446	487	490	476	464	519	507	501	529	544	488	459
	488	473	437	462	476	481	445	502	478	483	436	379	468	542	488	486	475	520	513	500	523	533	486	450
Mean	496	512	438	446	474	482	456	503	489	486	438	366	457	514	489	481	470	520	510	505	526	538	487	454
June 24	469	476	461	454	459	464	464	452	481	470	467	456	452	464	464	476	505	485	515	496	510	485	492	456
	469	472	464	454	456	464	465	447	480	473	469	463	445	464	461	474	497	485	519	494	514	484	493	456
Mean	469	474	462	454	458	462	464	450	480	472	468	460	448	464	462	476	501	485	517	495	512	484	492	456
June 25	464	464	457	445	474	466	464	478	472	474	472	465	471	453	460	481	475	531	530	516	546	482	489	462
	463	465	456	446	472	467	462	478	472	470	470	467	470	458	463	481	473	532	521	486	557	479	492	461
Mean	464	464	456	446	473	466	463	478	472	472	471	466	470	456	462	481	474	532	526	501	552	480	490	462
June 26	487	465	459	457	457	465	468	468	460	420	446	467	400	469	486	470	470	548	521	502	509	505	470	452
	492	469	457	455	458	465	469	470	457	461	450	463	405	482	489	477	473	579	573	499	503	503	478	451
Mean	490	467	458	456	458	465	468	469	458	440	448	465	402	476	488	474	472	564	547	500	506	504	474	452
June 27	435	458	460	461	464	467	441	489	444	428	622	401	473	466	472	456	514	501	498	509	572	583	510	460
	457	460	463	450	463	462	438	488	442	433	513	390	418	473	480	457	530	492	497	506	593	610	504	460
Mean	446	459	462	460	464	464	440	488	443	430	568	396	446	470	476	456	522	496	498	508	582	596	507	460
June 28	469	503	485	470	462	438	481	492	479	459	477	447	422	467	441	474	487	473	514	498	502	501	484	479
	458	502	482	469	451	470	480	489	481	461	484	454	428	464	453	476	492	476	510	495	504	493	485	477
Mean	464	502	484	470	456	454	480	490	480	460	480	450	425	466	447	475	490	474	512	496	503	497	484	478
June 29	474	408	469	467	463	456	475	472	464	454	454	408	473	472	474	466	465	497	510	504	525	507	480	459
	477	473	469	472	464	452	476	474	467	464	456	426	473	476	472	466	478	494	511	507	523	502	477	459
Mean	476	470	469	470	464	454	476	473	466	459	455	417	472	474	473	466	476	496	510	506	524	504	478	459
June 30	455	484	465	461	463	468	440	461	421	461	474	399	473	397	434	506	495	515	558	453	483	508	518	489
	456	486	461	460	463	470	443	484	426	411	458	402	494	393	428	509	494	503	561	463	476	490	487	506
Mean	456	485	463	460	463	469	442	472	424	436	466	400	484	395	431	508	494	509	560	458	480	499	502	498
Means	467.2	470.0	464.0	461.7	462.8	463.7	464.0	471.3	465.8	459.2	458.0	461.0	456.8	467.3	472.5	478.7	487.6	508.0	518.1	502.0	512.7	493.2	482.5	468.8

Monthly mean, 475.7

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, July, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
July 1	482	483	481	476	469	474	449	469	386	437	473	436	493	432	454	443	494	463	583	531	576	509	473	492
	480																							
Mean	481	483	481	476	469	474	449	469	386	437	473	436	493	432	454	443	494	463	583	531	576	509	473	492
July 2	543	481	476	439	449	446	424	472	470	499	483	456	507	465	472	479	486	489	497	486	509	482	478	464
	.....	469	469	413	449	408	422	466	455	500	476	458	534	467	471	479	491	490	496	490	508	483	478	467
Mean	543	475	472	426	449	427	423	469	462	500	480	457	520	466	472	479	488	490	496	488	508	482	478	466
July 3	463	462	466	472	460	460	468	474	472	453	448	446	435	436	469	530	481	506	520	538	490	493	468	453
	466	464	461	476	465	461	467	478	472	456	450	442	439	432	468	535	477	505	523	532	487	496	471	456
Mean	464	463	464	474	462	460	468	476	472	454	449	444	437	434	468	532	479	506	522	535	488	494	470	454
July 4	462	454	459	447	463	479	445	464	474	477	455	471	449	423	477	480	488	509	507	495	486	473	454	486
	462	455	460	442	458	479	454	466	482	469	460	467	448	441	466	478	492	509	507	490	488	477	458	486
Mean	462	454	460	444	460	479	450	465	478	473	458	469	448	432	472	479	490	509	507	492	487	475	456	486
July 5	461	468	465	449	470	471	441	469	440	425	491	474	461	460	440	444	483	490	550	549	566	476	482	453
	459	467	464	448	471	473	440	474	447	423	489	463	462	463	438	453	485	494	528	546	554	473	480	457
Mean	460	468	464	448	470	472	440	472	444	424	490	468	462	462	439	448	484	492	539	548	560	474	481	455
July 6	463	466	469	450	454	452	457	470	472	471	472	464	478	473	475	475	490	490	486	503	503	487	473	461
	468	466	469	455	451	466	450	478	461	472	464	459	480	472	477	476	492	490	487	504	503	486	472	464
Mean	466	466	469	452	452	459	454	474	466	472	468	462	479	472	476	476	491	490	486	504	503	486	472	464
July 7	458	479	469	461	470	431	463	449	445	489	455	468	456	479	490	484	473	479	514	550	607	472	469	459
	457	478	458	464	469	437	462	455	449	488	464	471	460	483	495	484	471	481	468	563	622	468	470	453
Mean	458	478	464	462	470	434	462	452	447	488	460	470	458	481	492	484	472	480	491	556	614	470	470	456
July 8	461	462	449	462	462	466	443	398	401	412	473	456	465	534	388	455	381	610	509	483	474	557	452	482
	459	455	453	463	460	466	443	390	410	416	461	465	468	563	405	465	440	626	505	497	457	546	458	474
Mean	460	458	451	462	461	466	443	394	406	414	467	460	466	548	396	460	410	618	507	490	466	552	455	478
July 9	461	447	481	456	460	468	465	470	470	474	472	454	467	468	477	480	495	487	492	493	489	488	468	474
	463	443	476	456	461	467	463	468	471	467	465	450	463	469	477	479	492	491	495	496	487	490	463	469
Mean	462	445	478	456	460	468	464	469	470	470	468	452	465	468	477	480	494	489	494	494	488	489	466	472
July 10	463	447	483	445	444	467	464	448	390	438	459	470	503	488	453	486	472	478	512	494	500	454	463	465
	463	450	485	469	460	460	470	451	389	483	467	487	496	487	451	485	475	478	521	491	488	452	458	467
Mean	463	448	484	457	452	464	467	450	390	460	463	478	500	488	452	486	474	478	516	492	494	453	460	466
July 11	480	485	490	444	448	459	470	464	466	439	436	493	468	469	485	485	470	492	499	486	512	473	458	460
	476	485	493	448	450	456	469	461	467	444	433	480	467	462	486	484	474	488	505	481	499	475	459	469
Mean	478	485	492	446	449	458	470	462	466	442	434	486	468	466	486	484	472	490	502	484	506	474	458	464
July 12	578	532	473	464	438	432	508	453	453	473	480	487	464	477	442	461	483	485	485	478	476	475	478	467
	570	509	464	465	434	429	511	468	463	464	477	490	458	475	440	461	482	486	485	477	475	477	479	463
Mean	574	520	478	464	436	430	510	460	458	468	478	488	461	476	441	461	482	486	485	478	476	476	478	465
July 13	458	464	469	469	476	472	475	469	442	427	470	438	462	471	470	481	466	511	533	510	501	488	476	485
	455	463	469	470	468	468	474	463	443	421	499	447	454	473	477	489	457	509	525	513	496	490	477	488
Mean	456	464	469	470	472	470	474	466	442	424	484	442	458	472	474	485	462	510	529	512	498	489	476	486
July 14	472	478	500	461	467	470	467	471	472	468	438	461	452	492	488	485	606	542	509	493	468	486	465	464
	472	478	485	467	467	469	467	473	473	472	429	410	444	503	458	462	584	546	498	487	471	488	463	466
Mean	472	478	492	464	467	470	467	472	472	470	434	436	448	498	473	474	595	544	504	490	470	487	464	465
July 15	[illegible]	465	467	470	469	469	469	475	466	483	475	475	473	474	478	465	451	509	433	560	478	496	468	527
	467																							
Mean	466	465	467	470	469	469	469	475	466	483	475	475	473	474	478	465	451	509	433	560	478	496	468	527
July 16	452	436	457	464	470	407	460	485	480	473	476	460	431	460	468	480	530	520	493	652	529	472	468	471
	....	435	455	458	468	415	472	475	472	478	474	465	410	459	472	479	521	519	505	657	567	463	473	479
Mean	452	436	456	461	469	411	466	480	476	476	475	462	420	460	470	480	526	520	499	654	548	468	470	475
July 17	457	461	472	449	455	477	464	487	451	470	469	484	427	477	476	478	503	489	490	490	482	478	477	467
	455	461	473	453	454	475	468	493	457	475	460	476	432	475	475	486	499	489	492	488	481	480	476	466
Mean	456	461	472	451	454	476	466	490	454	472	464	480	430	476	476	482	501	489	491	489	482	479	476	466
July 18	456	473	466	459	461	463	475	471	457	463	472	394	434	412	480	510	483	512	508	549	682	470	465	441
	449	468	465	461	460	462	473	472	454	466	471	402	446	415	468	509	483	511	513	552	619	463	448	440
Mean	452	470	466	460	460	462	474	472	456	464	472	398	440	414	474	510	483	512	510	550	650	466	456	440
July 19	448	441	452	535	489	473	471	469	466	473	440	449	420	495	438	480	493	501	499	529	498	502	498	488
	459	449	460	529	482	481	470	472	475	471	444	456	424	476	442	478	496	496	502	532	499	509	491	483
Mean	454	445	456	532	486	477	470	470	470	472	442	452	422	486	440	479	494	498	500	530	498	506	496	486
July 20	496	452	460	462	450	460	465	473	475	473	490	476	461	472	474	481	495	495	502	493	496	488	478	498
	480	454	463	460	446	455	466	474	475	469	490	471	466	468	477	478	499	497	502	495	498	489	480	483
Mean	488	453	462	461	448	458	466	474	475	471	490	474	464	470	476	480	497	496	502	494	497	488	479	486
July 21	469	455	462	457	464	472	470	469	460	466	470	475	472	471	472	480	488	491	491	493	498	484	472	463
	471	452	462	460	465	469	469	473	458	464	470	475	473	472	473	481	489	491	491	492	496	483	473	466
Mean	470	454	462	458	464	470	470	471	459	465	470	475	472	472	472	480	488	491	491	492	497	484	472	464
July 22	459	462	461	461	460	474	470	470	472	470	467	469	476	476	482	477	483	486	491	494	488	489	476	476
	460	463	460	462	462	470	467	471	471	467	469	469	477	477	482	478	484	487	491	496	490	488	478	471
Mean	460	462	460	462	461	472	468	470	472	468	468	469	476	476	482	478	484	486	491	495	489	488	477	478
July 23	468	459	454	458	458	461	465	477	469	475	470	468	457	477	473	477	482	488	493	498	502	483	480	467
	460	460	456	459	457	463	464	475	470	475	467	472	460	476	474	477	482	488	493	499	500	484	479	480
Mean	464	460	455	458	458	462	464	476	470	475	468	470	458	476	474	477	482	488	493	498	501	484	480	474
July 24	469	459	454	462	450	446	448	447	470	449	441	439	455	468	463	491	505	459	602	530	488	467	466	481
	465	454	450	460	449	446	451	435	468	449	441	428	460	475	466	479	514	468	621	518	485	470	469	479
Mean	467	456	452	461	450	446	450	441	469	449	441	434	458	472	464	485	510	464	642	524	486	468	468	480
July 25	471	455	454	462	453	457	471	476	478	491	464	474	458	442	479	470	494	504	507	486	475	478	476	466
	464	461	447	468	447	458	468	476	480	483	464	466	445	460	485	467	495	504	506	489	473	480	474	471
Mean	468	458	450	465	450	458	470	476	479	487	464	470	458	451	482	468	494	504	506	488	474	479	475	468
July 26	467	471	461	461	461	459	466	457	489	473	476	467	463	450	479	481	515	568	553	548	554	468	426	454
	465	472	463	462	461	460	466	459	491	480	472	469	456	452	463	471	518	545	534	575	552	477	433	456
Mean	466	472	462	462	461	460	466	458	490	476	474	468	460	451	471	476	516	556	544	562	553	472	430	455
July 27	485	459	454	452	467	460	437	452	453	460	492	464	464	469	454	470	463	508	506	509	478	477	471	468
	481	461	454	453	463	457	438	454	464	454	510	455	473	471	450	473	448	521	509	507	477	478	471	468
Mean	483	460	454	452	465	458	438	453	458	457	501	460	468	470	452	472	456	514	508	508	478	478	471	468
July 28	466	462	464	466	467	471	471	475	474	470	473	479	466	468	473	480	480	502	490	486	478	473	470	469
	465	461	463	466	467	470	472	472	473	478	477	471	472	472	471	478	481	502	491	485	477	475	469	468
Mean	466	462	464	466	467	470	472	474	474	474	475	475	469	470	472	479	480	502	490	486	478	474	470	468
July 29	468	468	470	468	473	473	469	469	469	471	467	481	476	474	478	478	494	486	493	490	496	491	462	463
	468	468	471	468	473	471	469	469	468	472	470	470	476	475	480	480	493	489	494	494	496	490	458	456
Mean	468	468	470	468	473	472	474	469	468	472	468	476	476	474	479	479	494	488	494	492	496	490	460	460
July 30	465	452	458	484	434	464	403	344	250	483	515	462	470	491	332	481	457	519	511	545	652	523	498	485
	465	450	462	497	414	464	399	358	257	479	515	458	489	445	351	512	473	520	492	536	659	509	494	484
Mean	465	451	460	490	424	464	401	351	254	481	515	460	480	468	342	496	475	520	502	540	656	516	496	484
July 31	448	401	525	490	442	422	411	472	443	412	422	445	447	397	479	460	451	552	534	612	562	470	450	497
	464	480	512	495	435	414	434	467	404	435	404	450	433	424	482	455	465	575	487	603	544	463	448	506
Mean	456	490	518	492	438	418	422	470	424	424	413	448	440	410	480	458	458	564	510	608	553	466	449	502
Means	471.0	464.8	467.9	463.5	458.9	459.2	459.6	461.9	450.7	463.3	467.1	461.1	462.2	466.6	463.1	477.9	486.0	504.7	508.6	518.2	514.5	484.3	469.4	472.5

Monthly mean, 471.0

Hourly readings of the Brooke declinometer, Uglaamie, Alaska, August, 1883.

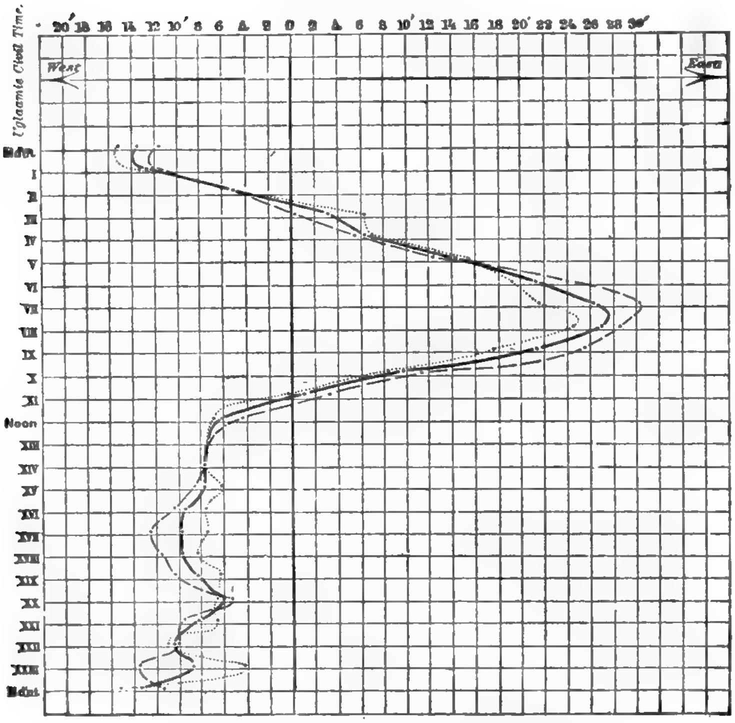
Date.	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	Noon.	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ
Aug. 1	506	472	470	466	440	441	420	509	498	406	411	484	384	450	444	478	473	518	532	546	463	532	502	428
	492	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mean	499	472	470	466	440	441	420	509	498	406	411	484	384	450	444	478	473	518	532	546	463	532	502	428
Aug. 2	471	448	431	473	444	474	454	590	442	475	434	470	432	449	408	477	467	494	494	482	486	488	464	461
	....	465	432	464	453	459	441	628	426	479	449	463	442	425	487	473	477	495	492	472	488	486	463	461
Mean	471	456	432	468	448	456	448	609	434	477	442	466	437	437	492	475	462	494	493	477	487	487	464	461
Aug. 3	453	465	465	459	483	465	464	475	475	466	467	454	467	472	474	484	486	504	498	492	486	491	482	473
	454	468	466	459	479	465	465	473	478	478	471	455	469	467	472	502	491	502	499	491	487	484	482	473
Mean	454	466	466	459	481	465	464	474	476	472	469	454	468	470	473	493	488	503	498	492	486	488	482	473
Aug. 4	458	449	462	465	464	472	473	467	470	482	464	473	461	462	468	480	492	487	483	484	491	492	467	478
	458	449	464	464	464	471	474	476	468	476	467	470	463	466	476	476	490	488	483	487	490	488	468	482
Mean	458	449	463	464	464	472	474	472	469	479	466	472	462	464	472	478	491	488	483	486	490	490	468	480
Aug. 5	463	471	466	465	469	468	466	472	472	464	472	472	481	463	469	478	488	469	504	514	544	502	461	475
	464	468	468	465	469	468	467	472	470	465	465	475	487	460	474	474	483	474	495	498	543	485	460	476
Mean	464	470	467	465	469	468	466	472	470	464	468	474	484	462	472	476	486	472	500	506	544	494	460	476
Aug. 6	458	460	456	457	446	447	439	473	403	425	457	389	445	462	484	523	496	507	516	550	717	541	534	495
	489	460	456	464	451	438	433	472	414	438	451	386	436	471	480	517	504	532	532	542	623	524	549	472
Mean	474	460	456	460	448	442	436	472	408	432	454	388	440	466	482	520	500	520	524	546	670	532	542	484
Aug. 7	402	431	462	463	453	462	445	474	479	468	470	470	472	464	469	474	476	487	511	499	473	495	469	467
	405	431	465	465	455	459	442	472	479	465	472	469	473	465	470	473	481	490	504	498	473	495	468	456
Mean	404	431	464	464	454	460	444	473	479	466	471	470	472	464	470	474	478	488	508	498	473	495	468	462
Aug. 8	471	464	477	447	467	459	445	462	487	464	474	469	480	480	481	428	474	497	478	489	482	468	460	470
	467	465	473	464	467	459	444	457	489	458	473	469	480	481	482	433	474	491	478	493	481	467	460	469
Mean	469	464	475	456	467	459	444	460	488	461	474	469	480	480	482	430	474	494	478	491	482	468	460	470
Aug. 9	469	461	463	461	468	473	472	470	471	463	469	475	466	473	465	473	486	492	485	482	477	473	471	476
	464	462	464	464	470	474	471	471	482	470	470	475	468	470	476	481	485	491	485	480	477	474	471	477
Mean	466	462	464	462	469	474	472	470	476	466	470	475	467	472	470	477	486	492	485	481	477	474	471	476
Aug. 10	471	470	464	466	471	467	468	468	470	464	472	463	471	482	486	484	478	489	484	497	482	480	470	459
	468	470	464	466	471	468	465	470	462	465	476	470	479	472	484	482	482	481	486	496	482	480	469	460
Mean	470	470	464	466	471	468	466	469	466	464	474	466	475	477	485	483	480	485	485	496	482	480	470	460
Aug. 11	465	480	476	473	467	444	448	423	506	492	480	481	362	435	466	481	509	492	516	490	466	474	465	464
	462	475	479	471	464	445	442	422	562	489	474	485	391	445	464	480	502	488	517	496	464	474	462	471
Mean	464	478	478	472	466	444	445	422	534	490	477	483	376	440	465	480	506	490	516	493	465	474	464	468
Aug. 12	470	455	455	464	459	465	474	474	476	472	469	466	471	486	469	477	476	508	513	542	499	478	470	462
	469	456	461	463	458	465	471	474	476	473	468	466	474	467	468	476	477	511	514	515	499	468	470	463
Mean	470	456	458	464	458	465	472	474	476	472	468	466	472	466	468	476	476	510	514	528	499	473	470	462
Aug. 13	470	472	465	465	463	468	467	470	471	479	474	470	466	478	477	483	502	508	518	504	499	490	469	485
	468	473	462	464	466	466	468	470	470	476	470	474	470	465	480	483	496	509	518	507	505	492	461	484
Mean	469	472	464	464	464	467	468	470	470	478	472	472	468	482	478	483	499	508	518	506	502	491	465	484
Aug. 14	464	465	465	469	468	455	471	456	451	452	442	469	467	487	478	475	488	504	516	488	488	493	465	428
	446	465	464	469	469	452	472	460	466	459	440	468	460	482	477	476	483	504	518	489	493	488	462	420
Mean	455	465	464	469	468	454	472	458	458	456	441	468	466	484	478	476	486	504	517	488	490	490	464	424
Aug. 15	500	477	464	463	464	462	468	470	468	462	465	477	475	470	483	486	491	497	491	480	472	466	465	466
	510	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mean	505	477	464	463	464	462	468	470	468	462	465	477	475	470	483	486	491	497	491	480	472	466	465	466
Aug. 16	468	470	470	467	469	465	470	473	474	479	465	473	474	469	479	484	485	485	485	480	479	481	471	470
	....	469	471	469	469	465	472	473	474	474	474	476	475	485	479	482	485	490	484	475	479	479	469	472
Mean	468	470	470	468	469	465	471	473	474	476	470	474	474	477	479	483	485	488	484	478	479	480	470	471
Aug. 17	463	461	465	461	468	467	473	474	476	474	475	473	474	474	474	477	483	497	502	497	491	480	472	467
	462	461	466	464	468	468	473	474	478	476	475	472	474	472	477	485	486	496	500	499	491	480	474	461
Mean	462	461	466	462	468	468	473	474	477	475	475	472	474	473	476	481	484	496	501	498	491	480	473	464
Aug. 18	464	468	463	461	464	466	479	469	453	432	448	400	495	465	467	441	495	492	512	525	556	510	486	475
	462	468	463	464	465	465	476	472	458	446	440	418	476	455	470	442	502	545	516	521	601	512	484	479
Mean	463	468	463	462	464	466	478	470	456	439	444	409	486	460	468	442	498	518	514	523	578	511	485	477
Aug. 19	467	459	453	473	459	450	489	475	467	470	475	474	464	458	476	484	482	482	479	482	483	478	481	465
	468	461	460	472	460	447	486	473	465	466	476	474	465	459	476	485	480	482	480	482	482	477	487	472
Mean	468	460	456	472	460	448	488	474	466	468	476	474	464	458	476	484	481	482	480	482	482	478	484	468
Aug. 20	465	454	464	460	465	481	472	470	467	476	441	460	482	470	479	486	488	488	483	477	490	485	472	477
	462	462	466	462	463	475	473	469	465	477	428	459	495	469	482	490	487	487	481	475	492	485	472	475
Mean	464	458	465	461	464	478	472	470	466	476	434	460	488	470	480	480	488	488	482	476	491	485	472	476
Aug. 21	468	459	463	472	469	465	473	473	475	467	477	448	469	472	464	477	494	490	504	505	479	493	472	475
	468	462	465	470	469	464	472	471	474	469	470	457	472	474	465	479	497	488	505	501	479	494	474	475
Mean	468	460	464	471	469	464	472	472	474	468	474	452	470	473	464	478	496	489	504	503	479	494	473	475
Aug. 22	478	455	447	464	465	467	475	473	465	468	456	492	434	471	528	491	484	489	521	499	480	491	488	487
	478	455	449	466	464	468	474	474	465	469	455	494	443	456	522	492	481	489	514	496	478	496	488	494
Mean	478	455	448	465	464	468	474	474	465	468	456	493	438	464	525	492	482	489	518	498	479	494	488	490
Aug. 23	443	469	460	454	453	465	463	495	486	478	466	459	374	470	483	470	478	483	510	538	507	494	494	450
	435	472	460	462	455	466	461	500	481	476	463	459	328	474	482	466	485	481	512	531	501	500	492	454
Mean	439	470	460	458	454	466	462	498	484	477	464	459	351	472	482	468	482	482	511	534	504	497	493	452
Aug. 24	451	464	443	451	452	456	466	481	471	475	474	318	443	432	473	470	504	489	487	499	486	481	464	468
	452	464	442	452	452	459	465	483	469	476	487	445	451	429	469	470	500	488	481	498	487	482	464	470
Mean	452	464	442	452	452	458	466	482	470	476	480	382	447	430	471	470	502	488	484	498	486	482	464	469
Aug. 25	450	469	464	463	471	464	467	463	467	476	467	479	460	457	480	476	469	502	494	489	482	483	470	466
	448	469	465	463	471	462	464	457	468	471	465	472	461	461	475	477	470	502	490	488	482	481	470	468
Mean	449	469	464	463	471	463	466	460	468	474	466	476	460	459	478	476	470	502	492	488	482	482	470	467
Aug. 26	464	466	466	468	470	469	467	469	471	472	462	454	473	474	490	479	481	493	492	486	476	476	472	469
	464	466	466	468	470	469	467	470	466	468	461	456	473	476	490	476	480	492	493	484	476	476	472	469
Mean	464	466	466	468	470	469	467	470	468	470	462	455	473	475	490	478	480	492	492	485	476	476	472	469
Aug. 27	466	465	467	468	466	470	471	473	473	472	469	472	472	474	472	469	477	488	496	497	481	479	481	.....
	466	466	467	468	469	470	471	473	472	474	476	472	470	476	470	467	476	489	490	497	481	480	479	.....
Mean	466	466	467	468	468	470	471	473	472	473	472	472	471	475	471	468	476	488	490	497	481	480	480	.....
Means	464.2	463.5	462.2	464.2	463.1	462.2	463.7	476.4	470.7	466.1	462.8	461.6	456.4	465.0	476.8	477.6	485.9	495.0	500.0	499.0	495.9	487.9	475.5	467.4

Monthly mean, 473.5

SOLAR-DIURNAL VARIATIONS OF THE DECLINATION

Observed at Uglaamie, Alaska.

(Disturbances included.)



Full curve — mean of the year, Sept. 1882 to Aug. 1883.

Broken — mean of 6 months, sun in north declination.

Dotted — mean of 6 months, sun in south declination.

Recapitulation of monthly mean values (inclusive of disturbances) of hourly readings of the Brooke declinometer at Uglaamie, Alaska, 1882–'83.

Göttingen civil time	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Uglaamie civil time	12h 53.6m Noon+53.6m	13h 53.6m	14h 53.6m	15h 53.6m	16h 53.6m	17h 53.6m	18h 53.6m	19h 53.6m	20h 53.6m	21h 53.6m	22h 53.6m	23h 53.6m
1882.												
Sept'r epoch, the (21st)	491.7	492.3	495.9	493.8	491.7	492.8	490.4	496.0	495.9	487.0	474.7	492.8
October	492.1	490.5	495.1	488.7	493.4	488.5	490.2	491.5	488.4	486.8	482.8	475.2
November	485.8	484.8	484.7	487.0	481.3	479.9	486.1	486.5	471.4	466.2	493.4	454.3
December	487.9	481.5	484.1	484.5	483.8	483.2	484.9	485.1	487.7	485.6	487.3	476.4
1883.												
January	474.2	479.6	479.1	479.7	482.2	482.3	483.1	485.5	486.9	481.9	479.6	478.4
February	476.2	476.0	479.3	479.8	478.9	479.0	481.4	478.2	489.1	478.0	485.6	483.7
March	478.7	477.3	478.5	472.5	472.0	475.5	475.5	471.5	475.3	469.8	483.8	477.5
April	474.8	473.1	471.2	467.2	467.0	467.6	471.7	474.3	472.8	471.6	470.4	472.3
May	465.0	470.7	466.8	464.1	462.5	464.0	464.6	466.0	464.8	469.6	462.2	459.6
June	467.2	470.0	464.0	461.7	462.8	463.7	464.0	471.3	465.8	459.2	458.0	461.6
July	471.0	464.8	467.9	463.5	458.9	459.2	459.6	461.9	450.7	463.3	467.1	461.1
August epoch, the (14th)	464.2	463.5	462.2	464.2	463.1	462.2	463.7	476.4	470.7	466.1	462.8	461.6
April to Sept., inclusive.	472.3	472.4	471.3	469.1	467.7	468.2	469.0	474.3	470.1	469.5	465.9	468.2
Oct. to March, inclusive.	482.5	481.6	483.5	482.0	481.9	481.4	483.5	483.1	483.1	478.1	485.4	474.4
Year	477.4	477.0	477.4	475.6	474.8	474.8	476.3	478.7	476.6	473.8	475.6	471.3

Göttingen civil time	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Mean.
Uglaamie civil time	0h 53.6m	1h 53.6m	2h 53.6m	3h 53.6m	4h 53.6m	5h 53.6m	6h 53.6m	7h 53.6m	8h 53.6m	9h 53.6m	10h 53.6m	11h 53.6m	
1882.													
September	492.0	499.5	500.0	507.2	509.2	506.9	518.3	512.4	506.5	502.4	497.9	492.9	497.5
October	474.7	495.0	512.5	500.7	508.5	508.9	510.7	527.3	512.5	501.4	492.5	485.8	495.6
November	474.2	495.1	470.6	493.5	517.6	504.0	538.9	517.8	514.9	498.3	487.4	483.0	489.8
December	474.8	497.0	499.5	499.0	498.3	504.4	499.9	507.7	504.8	491.8	484.6	484.5	489.9
1883.													
January	481.4	477.1	498.7	495.7	502.6	514.9	499.1	506.2	511.1	494.7	484.9	477.0	488.1
February	476.4	476.6	507.7	491.6	507.9	513.6	513.6	513.8	494.5	505.4	491.1	487.6	489.4
March	474.3	467.5	487.5	498.3	497.0	506.8	505.9	513.2	506.4	495.6	493.6	478.8	484.7
April	476.6	479.2	487.7	485.8	494.7	503.9	506.8	514.4	500.6	495.7	492.6	479.0	482.1
May	462.7	470.8	479.5	484.9	492.6	504.6	509.1	504.4	500.8	483.6	480.8	468.9	476.0
June	456.8	467.3	472.5	478.7	487.6	508.0	518.1	502.0	512.7	493.2	482.5	468.8	475.7
July	462.2	466.6	463.1	477.9	486.0	504.7	508.6	518.2	514.5	484.3	469.4	472.5	474.0
August	456.4	465.6	476.8	477.6	485.9	495.0	500.0	499.0	495.9	487.9	475.5	467.4	473.5
Apr. to Sept., inclusive	467.8	474.8	479.9	485.4	492.7	503.8	510.2	508.4	505.2	491.2	483.1	474.9	479.8
Oct. to Mar., inclusive	476.0	484.7	496.1	496.5	505.3	508.8	511.4	514.3	507.4	497.9	489.0	482.8	489.6
Year	471.9	479.8	488.0	490.9	499.0	506.3	510.8	511.4	506.3	494.6	486.1	478.8	484.7

SOLAR DIURNAL VARIATION OF THE DECLINATION, INCLUSIVE OF DISTURBANCES.

The daily variation of the magnetic declination is found by subtracting each hourly mean from the respective daily mean, and is given in the following table for the whole year, as well as for the half years, *i. e.*, with sun in north declination and sun in south declination:

Göttingen civil time.	Uglaamie civil time.		April to September, ⊙ north declination.	October to March, ⊙ south declination.	Year.
		m	′	′	′
0h	Noon	+ 53.6	+ 7.5	+ 7.1	+ 7.3
1	13	53.6	+ 7.4	+ 8.0	+ 7.7
2	14	53.6	+ 8.5	+ 6.1	+ 7.3
3	15	53.6	+10.7	+ 7.6	+ 9.1
4	16	53.6	+12.1	+ 7.7	+ 9.9
5	17	53.6	+11.6	+ 8.2	+ 9.9
6	18	53.6	+10.8	+ 6.1	+ 8.4
7	19	53.6	+ 5.5	+ 6.5	+ 6.0
8	20	53.6	+ 9.7	+ 6.5	+ 8.1
9	21	53.6	+10.3	+11.5	+10.9
10	22	53.6	+13.9	+ 4.2	+ 9.1
11h	23	53.6	+11.6	+15.2	+13.4

Göttingen civil time.	Uglaamie civil time.		April to September, ⊙ north declination.	October to March, ⊙ south declination.	Year.
		m	′	′	′
Noon.	Midnight	+ 53.6	+12.0	+13.6	+12.8
13	1	53.6	+ 5.0	+ 4.9	+ 4.9
14	2	53.6	− 0.1	− 6.5	− 3.3
15	3	53.6	− 5.6	− 6.9	− 6.2
16	4	53.6	−12.9	−15.7	−14.3
17	5	53.6	−24.0	−19.2	−21.6
18	6	53.6	−30.4	−21.8	−26.1
19	7	53.6	−28.6	−24.7	−26.7
20	8	53.6	−25.4	−17.8	−21.6
21	9	53.6	−11.4	− 8.3	− 9.9
22	10	53.6	− 3.3	+ 0.6	− 1.4
23h	11	53.6	+ 4.9	+ 6.8	+ 5.9

Apparent diurnal range, 6 months, sun north of equator, 44′.3
Apparent diurnal range, 6 months, sun south of equator, 39′.9
Apparent diurnal range, year, 40′.1

The most pronounced feature of the diurnal variation is the morning extreme easterly deflection between 7 and 8 a. m. This is in perfect accord with the times of eastern elongation at stations in lower latitudes: thus at Sitka,* 8^h a. m.; at Madison, Wis., 8¼; at Toronto, 7¾; at Philadelphia, 7¾; and at Key West, 8¼. The afternoon westerly deflection, however, appears to be delayed when compared with stations to the south of Uglaamie. We have a maximum about 5 p. m., and a second and greater maximum about midnight, undoubtedly produced by disturbances, as shown in the accompanying diagram. At Sitka the westerly elongation occurs about 3½ p. m.; at Madison, 1½; at Toronto, 0¾ p. m.; at Philadelphia, 1¼; and at Key West, 1¾. At Sitka there is no trace of the irregular western deflections recorded at Uglaamie between 8^h p. m. and about 2^h a. m., as shown by the table in the foot-note. If we now refer to the observations made at Point Barrow during 1852, 1853, and 1854 (Phil. Trans., vol. 147, 1857), we find 8 a. m. to be distinctly the hour of the maximum of the easterly disturbances, which thus re-enforce the regular solar-diurnal variation about this time and produce the great easterly deviation exhibited by the diagram. On the other hand, the westerly disturbances reach their maximum between the hours 11 p. m. midnight and 1 a. m., when they obliterate the regular solar-diurnal variation. Retaining the disturbances, the eastern maximum deflection is recorded between 7 and 8 a. m.; excluding the larger ones, it occurs near 7 a. m; the western maximum, disturbances included, is recorded at 5 p. m. (with a second maximum between 10 and 11 p. m.), but excluding the larger ones, the elongation reverts to 1 p. m.

It is also a noteworthy fact that the diurnal variations seem to depend little on the season, the deviations from the annual course for the half year with sun north of the equator, and for the half year with sun south of the equator, being small.

SEPARATION OF THE LARGER MAGNETIC VARIATIONS, OR SO-CALLED DISTURBANCES, AND THEIR DISCUSSION.

In the present state of our knowledge there appears to be no other means of recognizing so-called disturbances in a series of observations except by their magnitude; that is, for any one observation or reading taken at random it is impossible to say how much of the measured quantity is due to the regular daily variation, and how much to other variations following different laws. Having formed preliminarily for any one month hourly average or normal values, and compared each observation at any hour with the normal value at that hour, the series of differences so obtained will disclose the amount of the so-called disturbances; and a certain limiting value requires to be found which shall separate the apparently regular values from the supposed disturbed values; *i. e.*, those following different laws from the others.

In the discussion of that large body of magnetic material which had accumulated mainly through the support of the British Government about the middle of the present century, General Sir Edward Sabine was guided in his selection of a limiting value simply by practical considerations or by experience, and the eminent success which he had fully justified his method; yet when a

*It is much to be regretted that the magnetic observations taken at Sitka, Alaska, between 1848 and 1864, have never been fully discussed. As it appeared to me highly desirable to compare the diurnal variation of the declination at Uglaamie with that of Sitka, I have made a combination of the hourly readings from the broken and irregular series extending from 1848 to 1862. (The material for this combination had been collected by Mr. M. Baker, of the Coast and Geodetic Survey, in March, 1882.)

Diurnal variation (inclusive of disturbances) of the declination observed at Sitka, Alaska, from ten years of observations.

[A + sign indicates deflection of north end of needle to the west; a — sign the opposite direction.]

h	′	h	′	h	′	h	′	h	′
Midnight.	+ 0.6	5	— 2.9	10	— 3.0	15	+ 4.6	20	+ 1.4
1	— 0.2	6	— 4.2	11	— 0.6	16	+ 4.6	21	+ 0.8
2	— 1.0	7	— 5.8	Noon.	+ 2.1	17	+ 3.8	22	+ 0.4
3	— 1.4	8	— 6.0	13	+ 3.2	18	+ 3.2	23	+ 0.6
4	— 2.0	9	— 5.8	14	+ 4.2	19	+ 2.4	Midnight.	+ 0.6

number of simultaneous observations made at different stations, as in the case of the present polar researches, require strict intercomparability of results, a more definite proceeding appears desirable.

I had made use of Peirce's criterion for the rejection of doubtful observations,* or, here more appropriately expressed, for the separation of observations deviating largely in amount by reason of their following different laws from those to which the ordinary observations are subject; and in using the criterion in such a case it was put forward only with a view of securing some definite rule uniformly applicable.

The criterion was first employed by me in the discussion of Dr. Kane's magnetic observations of 1853, 1854, 1855, at Van Rensselaer Harbor, North Greenland;† afterwards for Dr. Bache's magnetic observations of 1840 to 1845 at Philadelphia,‡ and for the United States Coast Survey magnetic series of 1860 to 1866 at Key West, Florida.§ In these applications, where no great precision is required, its method of application may be much simplified. Thus the mean deviation or the mean difference of any hourly value from its hourly normal may be found, without the trouble of forming squares, by the simple expression of $\varepsilon = 1.25 \frac{[\Delta]}{N-1}$, and the limiting value given by the criterion will be $= \varkappa\,\varepsilon$, the value of $\varkappa$ being a tabular value for the case $\mu = 1$, is readily had from Chauvenet's Table X. The limit so found will be the widest one that may be employed, but in special applications it may require contraction, for the reason that the number of the largest disturbances is found to be insufficient for their successful discussion. Instead of using Peirce's criterion, we can, however, arrive at an equally satisfactory fixation of a limit by means of the expressions of either the probable or the mean error of an observation. ‖ We may define the widest limit as that deviation or difference from the mean which exceeds 3.5 times the probable variability or probable deviation of an observation. This limit corresponds to $\frac{3.5}{1.483}$, or to 2.36 times the mean deviation (as already used in connection with the criterion). Thus $2\frac{1}{3}$ times the mean deviation would be a superior limit, whereas Dr. Lloyd (1874) adopts for the discussion of the disturbances a limit of $1\frac{1}{2}$ times the average departure of a reading from its normal. By taking this lower limit we necessarily include a number of disturbances of lesser magnitude; but should the limit be drawn still closer there is danger of confusing the results with values following different laws from those which govern the larger disturbances. It would be most desirable to investigate the disturbances by a series of *graduated* limits and falling between these extremes. A limit somewhere between 2 and $1\frac{1}{2}$ times the mean deviation will probably be found most satisfactory. To find the mean deviation $\varepsilon = 1.25 \frac{\Sigma \Delta}{n-1}$ say from an hourly series of observations extending over one year, the diurnal as well as the annual variations of the disturbances must be taken into account; and it will suffice to deduce 24 numerical values for ε, using for the first month the hours 0 and 12, for the second month the hours 1 and 13, for the third the hours 2 and 14, etc., and finally to take the average (ε) from the 24 individual values so obtained.

Discussing the hourly variations of the declination recorded in the second year at Uglaamie, where the horizontal component H = 1.936 English units (=0.8927 Gaussian units, or 0.08927 dynes) for October, 1882, the value of ε equals 18′.4 nearly; hence limit by Peirce's criterion = 44′, and the same limit for $2\frac{1}{3}$ times ε; for twice ε the limit is 37′, and for $1\frac{1}{2}\ \varepsilon$ it is 28′, which limits separate, respectively, 1 disturbed observation in 17 observations, 1 in 12, and 1 in 8. General Sabine's limit in the discussion of Captain Maguire's observations of 1852, 1853, and 1854 was 22′.87, and the number

* United States Coast Survey Report for 1854, pp. 131 to 138; Gould's Astronomical Journal, No. 83, Cambridge, Mass., April 24, 1855. It is now most readily accessible in Chauvenet's Manual of Spherical and Practical Astronomy, Vol. II (first edition, Philadelphia, 1863).

† Smithsonian Contributions to Knowledge, Vol. X, 1858.

‡ United States Coast Survey Report for 1859, Appendix No. 22.

§ United States Coast Survey Report for 1874, Appendix No. 9.

‖ Here, of course, the differences of the tabular hourly readings from their respective hourly normals do not, in any sense, represent errors, every one being as correct as any other; they are variations governed by unknown laws, probably of much complexity. The application of the formulæ of the method of least squares to such phenomena is more or less precarious; the pure observing error may be regarded as insignificant.

of disturbances separated was between $\frac{1}{6}$ and $\frac{1}{8}$ of the whole number; but it should be remarked here that at that time we were approaching an epoch of a sun-spot minimum, whereas at present we have just passed through a sun-spot maximum, during which the disturbances are greater.

It has been noticed that a limit adopted for a station in low magnetic latitude will not serve to deduce a limit for a station in high magnetic latitude when having regard only to the supposition that the limits are inversely proportional to the magnitude of the horizontal components of their respective magnetic intensities; the disturbances appear to increase in greater ratio as we approach the magnetic polar regions.*

The further discussion of the differential observations must be deferred until a decision has been reached by the fourth international polar conference (which is to meet shortly at Vienna) respecting the limit of recognition of disturbances. [April 5, 1884.]

THE BIFILAR MAGNETOMETER.

The length of 1 division of the scale is 1 millimeter, the radius mirror to scale is 1.719 meter, hence angular value of 1 division of scale = 1′.

(1) Adjustment and determination of scale value, September 11, 1882, 1^h p. m.

With plane of detorsion in the magnetic meridian the torsion circle read 54° 42′. It was then turned with the suspended weight 90°, and read 324° 42′, in which position the fixed as well as the movable mirrors were made to read 500 on the scale. The torsion weight was then removed and the magnet inserted and the torsion circle turned to read 248° 35′. The movable mirror was next brought to read 500, by means of the screw regulating the distance between the two suspension threads. The angle z=324° 42′−248° 35′ = 76° 07′ was calculated to answer the desired value of one division of the scale to represent a variation of the horizontal force of .001 cos. θ, expressed in metric units (millimeter, milligramme, s). By inadvertence a mistake was made by the observers in their calculation (in the value of H), so that the scale value neither for the horizontal nor for the vertical force corresponds to the value proposed by the President of the Polar Commission. This was not discovered by them until near the close of the observations, when they judged it best to adhere to the old value. The magnetometers were thus given a sensitiveness fully double of what was intended they should have. The consequence was that many of the largest disturbances in the horizontal and vertical components failed to be registered, the deflections falling beyond the range of the instruments.

We have the scale value k in parts of the horizontal force=cot. z times 1′=. 00007190, and multiplying by H, or 1.939, the scale value becomes .0001394 English units.

(2) *September* 18, 1882, 2^h a. m. to 3^h15^m a. m., Göttingen time, readjusted bifilar instrument.

Plane of detorsion read 60° 41′; turned torsion circle to 330° 41′, and movable mirror made to read 50; magnet inserted and torsion circle turned to 254° 34′; movable mirror brought to read 50 by means of the adjusting screw. The angle z equals 76° 07′; hence k, or the scale value, remains as above. The apparent change in the plane of the detorsion of 5° 59′ is due to shifting of the instrument.

(3) *November* 6, 1882, 10^h p. m., to *November* 7, 2^h 31^m a. m. Göttingen time; readjusted instrument.

With plane of detorsion in meridian torsion circle reads 52° 46′; adjusted movable mirror to 50, when torsion circle reads 322° 46′; suspended magnet and made torsion circle read 247° 12′; brought movable mirror to 50 by means of adjusting screw, z = 75° 34′; hence k=. 00007487 parts of the horizontal force, and multiplying by H the scale value becomes .0001452 English units.

(4) *February* 27, 1883, 3^h 05^m a. m. to 6^h 55^m a. m. Göttingen time, readjusted instrument.

Plane of detorsion in magnetic meridian, torsion circle reads 52° 35′; movable and fixed mirrors adjusted to 50, with torsion circle 322° 35′; suspended magnet and turned circle to 247° 14′ and brought movable mirror again to 50 by means of the adjusting screw, z = 75° 21′; hence k=.00007604 parts of the horizontal force, and the scale value .0001474 English units.

* Thus with the Key West (H = 6.74) limit of 2′.6 the Uglaamie limit would be 9′ about. With the Philadelphia (H = 4.17) limit of 3.6 the Uglaamie limit would be 8′, about. With the Toronto (H = 3.53) limit of 5.0 the Uglaamie limit would be 9′, about.

(5) ***February*** **28, 1883, 1^h 13^m a. m. to 3^h 37^m a. m. Göttingen time, readjusted instrument.**

Plane of detorsion in magnetic meridian 40° 22′; turned to 310° 22′, with fixed and movable mirrors at 50; suspended magnet and turned to 235° 01′, with movable mirror at 50, by means of the screw, z=75° 21′; hence scale value as in preceding case.

(6) At 6 p. m., *March* 23, Göttingen time, the suspended mirror touched fixed mirror owing to stretching of threads; raised suspension at 6^h 45^m p. m.

(7) At 6^h 45^m a. m., *March* 25, Göttingen time, suspension further shortened; again at 7^h 10^m p. m., same day.

(8) At 3^h a. m., *April* 21, Göttingen time, fixed mirror read 486; changed to 500 before taking the 3 a. m. observations.

Increasing scale readings denote increase of horizontal force.

HOURLY READINGS OF THE BROOKE BIFILAR MAGNETOMETER, AT UGLAAMIE, ALASKA, TOGETHER

[Uncorrected for temperature. The hourly readings are placed opposite a trace in first column and the corresponding temperature immedi passed off the scale at the negative end it is indicated by (—40—?), when beyond the positive end by (1040+?). In taking the monthly outside the scale. A parallel dash (‖) in the table indicates time of readjustment of instrument or change in value of one division. 18 2ʰ. It is found as follows: mean of 6 days less 1 hour September 12 to 18, inclusive, 827.6; mean of 6 days less 4 hours September 18 to

Value of one division of scale
Between September 11, 1882, and November 6, 1882...............
Between November 7, 1882, and February 27, 1883 ....
Between February 27, 1883, to close of series ....
The average scale reading 419 corresponds approximately to horizontal intensity..

Hourly readings of the Brooke bifilar magnet

[One division of scale=.0000719

Date.	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ
Sept. 12	....	662	731	752	752	752	850	(800+?)	(800+?)	(800+?)	(800+?)
	....	621	754	752	752	751	850	803	(800+?)	(800+?)	(800+?)
Temperature	....	46	46.5	45	44	42	41	40	37.5	36.5	36
Sept. 13	(800+?)	794	754	781	(800+?)	809	816	(800+?)	525	(800+?)	747
	(800+?)	(800+?)	762	(800+?)	(800+?)	820	838	(800+?)	526	815	776
Temperature	38	38	39	39	40	39	38.5	36.5	37	36	36
Sept. 14	(800+?)	(800+?)	(800+?)	(800+?)	926	838	870	830	818	903	835
	(800+?)	(800+?)	(800+?)	(800+?)	940	818	885	833	844	905	751
Temperature	36	36	36	36	37	36	36	36	36	36	35.5
Sept. 15	834	807	812	838	818	853	892	844	670	763	930
	827	....	....	....	....	....	....	....	....	....	....
Temperature	40	39	39	38	38.5	36.5	39.5	42	42	48.5	44
Sept. 16	868	888	885	900	895	920	900	932	910	931	964
	....	885	870	885	893	950	925	930	933	938	952
Temperature	51	48	47	46	45	42	41	39	38	37	36
Sept. 17	894	938	928	933	980	(1040+?	(1040+?)	(1040+?)	965	(1040+?)	(1040+?)
	910	935	928	920	990	(1040+?)	(1040+?)	(1040+?)	948	(1040+?)	(1040+?)
Temperature	40	40.5	40	40	40	39	36	35	34.5	34	33
Sept. 18	895	940	‖	....	509	516	510	542	544	549	554
	963	945	‖	....	510	530	540	541	545	550	552
Temperature	36.5	37	‖	....	45	40	39	38	37	36	35.5
Sept. 19	422	434	489	480	515	494	490	467	452	480	469
	423	428	492	483	518	501	492	476	477	476	477
Temperature	38.5	37.5	39	41	40	39	38	37	36	35	35
Sept. 20	503	516	532	506	539	508	514	545	543	518	482
	502	515	528	499	560	520	518	544	533	503	455
Temperature	35	35	35.5	35	35	35	34	34	34	33.5	33
Sept. 21	562	573	542	546	526	520	508	526	558	503	420
	558	574	547	548	546	529	526	516	546	527	430
Temperature	32.5	33	33	33	33	32.5	32	32	31	31	31
Sept. 22	522	527	522	532	524	513	528	508	535	556	501
	523	524	524	514	518	525	526	638	542	561	486
Temperature	32.5	32.5	32.5	32.5	32	31	31	30	30	30	30
Sept. 23	541	542	557	542	552	532	566	503	544	561	564
	539	542	558	544	535	540	564	533	547	535	533
Temperature	31.5	32	32.5	33	33	32	32	30	29	29	28.5
Sept. 24	510	504	512	560	572	544	555	553	555	550	557
	503	504	508	565	550	556	556	564	545	568	559
Temperature	33.5	34.5	34.5	34	33	33	32	31	31	30.5	30
Sept. 25	551	563	581	561	698	696	651	436	405	524	378
	551	565	602	591	702	687	625	480	467	516	381
Temperature	31.5	31.5	31.5	32	31	31	30	30	29.5	29	29
Sept. 26	592	618	585	569	625	596	622	430	542	292	325
	590	613	588	568	626	590	626	442	561	205	278
Temperature	32.5	33.5	33.5	33	35	33	33	33	31.5	31	30
Sept. 27	565	565	630	650	680	662	524	576	558	538	404
	568	563	622	648	670	637	481	568	577	556	401
Temperature	34	34.5	35	36	35.5	35	35	34	33	33	32.5
Sept. 28	583	587	570	583	589	585	582	604	598	558	565
	582	574	570	587	588	581	579	603	593	544	574
Temperature	37	37.5	38	38	38	38.5	39	38	37	37	36
Sept. 29	551	556	560	558	572	565	568	571	594	548	394
	558	555	559	559	570	564	559	568	571	567	411
Temperature	38.5	39	39	39	40	39	38	38.5	37.5	37	36
Sept. 30	550	549	550	554	561	556	570	575	598	596	540
	550	548	552	556	538	556	570	508	591	574	567
Temperature	37.5	37.5	37.5	38	38.5	38	38	38	37	36	35
Mean temperature	36.4	37.0	37.2	37.1	37.6	36.4	35.9	35.4	34.7	34.5	33.8
Mean readings	537.1	532.0	536.1	542.0	563.5	558.8	563.0	538.0	518.8	529.5	501.8

WITH THE CORRESPONDING TEMPERATURE (FAHR.), FROM SEPTEMBER 12, 1882, TO AUGUST 27, 1883.

ately below them. Increasing scale numbers denote increasing horizontal force. Extreme scale divisions, —40 and 1040; when the magnet means of the hourly readings, disturbances included, the respective extreme values were substituted in the place of the unknown position To reduce readings of bifilar to an approximately uniform series subtract 318 divisions from each reading from September 12 to September 23, inclusive, 509.6; difference, 318 divisions. The bottom line of means of readings includes the correction of —318 divisions.]

English units.	Gaussian units.	British Association units or dynes.
.000139 .000145 .000147	.0000643 .0000669 .0000680	.00000643 .00000669 .00000680
1.939	0.8940	0.08940

ometer at Uglaamie, Alaska, September, 1882.

part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	820	(800+?)	721	720	715	12
(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	(800+?)	818	(800+?)	....	714	718	
35	35	34.8	34.5	34	34	33.5	33.3	33.5	34	36.5	36.5	37	
732	810	815	720	735	673	703	475	476	484	755	769	(800+?)	13
805	792	753	732	752	574	701	476	475	486	752	774	(800+?)	
36	37	37	36.3	36	36.1	35.6	35.2	35.5	36	36	36	36	
818	792	750	832	765	745	535	776	848	756	645	517	834	14
835	594	773	845	732	721	544	774	825	755	660	519	829	
35.4	35.5	35.5	35.5	35.5	35.8	35.9	36	36	36.5	37.5	38.5	40	
846	716	700	745	713	768	790	832	792	850	834	824	860	15
....	....	....	....	....	....	....	....	....	....	....	....	....	
45	46	45.2	45.1	45	45	41	43.5	42	45	46	48	47	
959	945	955	963	954	930	930	928	910	922	943	909	924	16
910	944	970	968	950	925	934	931	905	930	945	906	922	
35.5	36	36	36	35.3	35.2	35	35	36	36.5	36.5	38	39	
965	950	972	845	888	953	923	822	858	962	955	941	915	17
978	960	958	854	868	960	917	791	861	955	953	940	930	
33.2	34	34	34	34	34	35	35	35.5	35.5	35.5	36	36	
556	553	554	554	555	555	555	557	558	711	397	405	413	18
553	553	553	553	555	555	555	558	559	717	402	386	410	
35.5	36	36.2	36.2	36	36	36	36	35.5	37	39	38.5	38.5	
502	498	590	486	444	498	461	444	428	491	472	467	498	19
485	486	489	488	465	505	467	450	436	409	492	464	497	
35	35	35.2	35	34	35	36	35	35	35.5	35.5	35.5	35.5	
549	496	472	509	501	507	494	535	514	476	475	472	467	20
510	525	479	510	492	493	492	477	515	488	470	473	454	
33	32.8	32.5	32.2	32	32	32	32	32.5	32	32	32	32	
478	540	528	522	526	509	518	504	517	509	515	518	528	21
546	538	525	527	519	504	522	500	516	512	517	516	524	
31.2	31.5	31.5	32	32	32	32	32	32	32	32	32	32.5	
538	530	534	455	530	485	531	518	503	509	522	549	538	22
545	527	532	480	525	487	512	517	505	514	520	539	543	
30.2	30.5	31	31	31	31	30	30	30.5	30.5	30.5	30.5	31	
528	553	539	390	325	435	453	399	422	462	529	525	560	23
541	551	552	436	395	386	481	396	419	459	518	523	567	
29	29.5	29.5	29.8	29	30	30	30	30.5	30.5	30.5	30.5	31.5	
565	562	506	535	585	561	527	558	555	552	544	541	543	24
544	568	570	565	541	570	518	555	556	518	545	544	535	
30	30	30.2	30.1	30	30	30	30	30	30.5	30.5	30	31	
432	465	575	570	321	522	278	378	509	516	465	522	568	25
438	446	585	564	293	505	295	417	501	514	433	508	570	
29.2	30	30	30	30	30	30	30	30	30	30.5	30.5	31.5	
475	450	492	536	518	535	543	541	559	550	539	542	564	26
464	485	495	527	496	537	541	544	532	551	535	541	570	
29.8	29	28.8	29	28	29	30	30	29	29.5	31	32	33.5	
605	514	352	382	500	513	570	530	541	559	539	551	565	27
655	528	297	417	501	518	563	525	542	570	542	557	568	
32.6	33	33	33	33	33	33	33	33	34.5	34.5	35.5	36	
543	542	470	514	526	501	481	466	496	530	549	557	563	28
561	540	467	509	531	495	478	465	502	529	546	556	562	
36.2	36	36	36	36	36	36	36	36.5	36.5	36.5	37.5	38.5	
485	279	505	453	485	530	461	499	521	548	551	559	551	29
498	425	484	430	500	527	452	496	523	546	550	555	541	
36	36	36	36	36	36	37	37	37	37	37	37	37	
475	498	535	526	515	460	479	508	544	551	564	562	555	30
470	512	547	519	528	462	478	515	542	552	570	560	563	
35	34.8	34.5	34.5	34	34	34	35	35	35	35.5	36.5	36	
33.8	34.1	34.0	34.0	33.7	33.9	33.8	33.9	33.9	34.4	34.9	35.3	35.8	
526.6	504.4	508.4	500.4	487.4	498.9	480.4	481.1	496.0	513.6	509.5	500.9	529.1	

Monthly means: Temperature, 35°.1; readings 519.1

Hourly readings of the Brooke bifilar magnet

[One division of scale = .0000719

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Oct. 1	553	578	594	601	592	565	600	602	605	606	615
	557										
Temperature	36	38	40	39.5	40.5	38	39.5	40	41.5	41	42
Oct. 2	595	584	587	598	573	578	620	580	559	587	549
		582	588	597	574	567	626	578	542	626	575
Temperature	46.5	45	45.5	45	45	43	44	43	41	40.5	40
Oct. 3	551	482	572	568	668	551	554	452	480	484	497
	512	526	583	564	665	573	573	494	498	490	500
Temperature	41.5	42	43	43	45	43	41	39	38	37	36
Oct. 4	556	497	493	510	475	578	588	555	554	475	396
	563	521	507	500	498	598	603	559	525	452	428
Temperature	34.5	34	33	32.5	33	32	32	32	31	30	30
Oct. 5	542	515	529	560	561	572	614	555	513	536	564
	534	512	550	554	538	588	592	565	470	577	503
Temperature	31.5	31	31	32	34	32	31.5	30.5	30	28.5	28
Oct. 6	582	550	583	709	475	358	404	397	347	230	250
	578	572	601	718	451	339	898	409	327	305	227
Temperature	30	30	30	30	30	29.5	29	29	28	27	27
Oct. 7	555	535	528	514	526	560	505	530	497	503	534
	547	532	535	512	533	531	539	526	523	530	522
Temperature	28	28	28.5	28	28	28	28	27.5	26.5	26	25.5
Oct. 8	537	524	531	533	526	544	552	533	496	538	537
	518	520	531	535	532	510	557	534	535	515	514
Temperature	27	27.5	27.5	28	28	28	30	28.5	26.5	25.5	25
Oct. 9	520	540	585	551	528	519	539	495	490	487	508
	522	586	564	550	536	529	526	506	460	476	449
Temperature	26	27.5	27	29	28	27.5	26.5	25.5	24	23	23
Oct. 10	532	527	522	564	526	560	528	531	495	532	502
	515	530	522	557	541	516	545	555	525	512	497
Temperature	24.5	24.5	26	25.5	25.5	25	25	24	22.5	21.5	21
Oct. 11	570	532	515	555	567	486	556	466	480	442	485
	581	510	500	571	554	505	548	477	494	495	518
Temperature	25	25	24	24	23	22	23	21	20	19	18
Oct. 12	495	550	522	532	531	546	476	309	518	501	477
	485	546	520	537	533	548	480	827	482	488	432
Temperature	19.5	19.5	19.5	20	21	21	20	19	17	16	15
Oct. 13	488	492	502	470	463	436	452	459	495	485	505
	489	488	507	475	458	430	476	460	530	478	518
Temperature	18.5	20.5	21	22.5	21	20	18.5	17	16	15	14
Oct. 14	472	450	455	475	455	455	423	455	412	465	428
	470	460	455	467	449	503	434	440	457	472	430
Temperature	16	17	19.5	19	18	18	17	15.5	14.5	13	12.5
Oct. 15	468	493	533	542	544	544	489	456	628	320	283
	472										
Temperature	17	20.5	23	24	26	25.5	26	25.5	28	26	26
Oct. 16	498	462	456	422	375	450	530	449	500	530	260
		458	490	435	452	364	468	465	455	413	215
Temperature	27.5	26	25	24	22	20	17.5	17	14.5	13	12
Oct. 17	422	592	483	486	523	546	452	418	468	90	363
	453	600	500	475	562	524	454	415	440	89	407
Temperature	16	17.5	18.5	18	20	19.5	19	18	15	14	12.5
Oct. 18	474	492	482	480	465	474	479	522	465	398	449
	463	498	400	486	455	451	486	530	475	486	438
Temperature	11	17.5	17.5	13	13.5	14	13.5	13.5	12	11.5	11
Oct. 19	458	472	463	400	473	465	474	476	511	485	473
	464	474	463	403	470	464	480	485	407	472	488
Temperature	15	15	15	15	15	15	15	14.5	14	13.5	13
Oct. 20	470	492	493	496	504	500	488	482	474	484	461
	472	494	493	496	506	499	490	481	472	464	468
Temperature	14	14.5	15.5	15.5	15.5	15	15	15.5	14	13	18
Oct. 21	484	488	485	482	490	484	475	480	500	442	486
	483	487	485	482	491	486	480	480	450	482	481
Temperature	15	16	16	16	16.5	16	15.5	15	14	13	12.5
Oct. 22	487	490	488	481	489	504	504	550	508	535	508
	488	488	490	484	488	504	510	538	532	517	512
Temperature	13	14	14.5	14	15	14	14	13.5	13	12.5	12
Oct. 23	532	551	422	500	540	490	454	390	385	420	180
	530	550	443	518	526	506	489	440	418	380	(—40—?)
Temperature	11.5	12	12	10	10	10	9	8.5	5.5	4	3.5
Oct. 24	431	427	430	416	510	376	385	80	390	303	201
	429	425	427	414	492	372	403	102	378	310	243
Temperature	8	8.5	9.5	9	9.5	9	9	9.5	9	8.5	8
Oct. 25	425	424	428	415	426	429	420	83	309	(—40—?)	(—40—?)
	422	419	419	424	445	444	394	63	367	318	(—40—?)
Temperature	10.5	10.5	11	11	12	12	11	10.5	10	9.5	9.5
Oct. 26	424	418	402	367	457	439	456	382	307	428	417
	430	419	364	364	501	462	492	368	429	450	440
Temperature	12	12.5	13	13	13.5	12.5	12	11.5	11	10.5	10
Oct. 27	438	436	440	436	456	447	484	348	354	291	338
	436	444	461	434	400	452	471	392	311	380	410
Temperature	8	8.5	9.5	9.5	9.5	10	9	8	6.5	5.5	4.5
Oct. 28	444	442	380	445	536	374	353	220	430	413	372
	440	438	367	422	542	402	372	240	451	309	380
Temperature	3	4	4	4	2	1	0	—1	—2	—2.5	—2.5
Oct. 29	392	372	438	415	436	450	396	400	460	297	(—40—?)
	442	432	420	424	439	441	398	401	460	320	(—40—?)
Temperature	6.5	7	7.5	8	7.5	7	7	5.5	4.5	3.5	2.5
Oct. 30	400	411	385	396	424	379	428	395	402	381	302
	394	410	387	433	416	361	422	409	391	359	267
Temperature	0.5	1	2	3	4	4	4	5	4	4	5
Oct. 31	372	410	432	449	432	423	416	410	400	420	410
	375	405	427	442	436	428	424	415	428	422	400
Temperature	15.5	18	18.5	19	19.5	19.5	19.5	20	19.5	19.5	19
Mean temperature	19.6	20.4	20.9	20.8	21.0	20.3	20.0	19.4	18.3	17.5	17.0
Mean readings	489.2	494.0	490.0	498.5	504.0	485.8	489.0	438.4	468.6	424.6	390.9

ometer at Uglaamie, Alaska, October, 1882.

part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
551	621	602	610	615	515	580	600	618	619	625	600	617	1
42	43	43	44	45	45	44	45	40	47	46.5	46.5	48	
235	243	754	545	812	460	549	204	322	310	500	615	354	2
185	357	780	550	298	440	546	237	382	410	472	461	402	
40	41	41	41	40	41	40.5	40	40	40	40.5	41	41.5	
495	461	469	534	430	410	338	498	409	485	495	501	503	3
470	487	448	527	450	412	351	515	522	508	486	490	505	
36	35.5	35	35	34	35	35	34	32	32.5	32.5	33	33	
551	320	443	470	470	501	278	262	(—40—?)	352	455	482	500	4
498	182	421	462	439	504	221	282	(—40—?)	374	449	500	570	
30	30	30	30	30	30	31	32	30.5	30.5	30.5	30.5	30.5	
548	530	475	482	540	500	395	545	300	142	315	372	725	5
563	510	481	465	511	491	383	550	289	157	332	379	750	
28	27	27.5	27.5	27	27	28	28	28	28.5	29	29.5	29.5	
385	190	510	(—40—?)	422	485	480	400	542	509	600	572	563	6
440	203	475	(—40—?)	455	502	424	415	553	535	570	564	555	
27	27.5	27.5	27.5	27	28	29	29	28.5	28.5	28	28	28	
492	512	495	471	445	473	518	468	475	510	485	516	507	7
518	526	510	483	471	476	482	454	463	518	479	504	496	
25.5	26	26	26	26	26	26	27	26.5	26.5	26.5	27	27	
520	515	506	496	450	485	473	468	489	430	442	512	520	8
523	485	487	490	479	489	469	475	493	405	437	517	518	
25	24.5	24	24	23	24	24	24	23.5	23.5	24	24	25	
486	460	474	490	465	425	459	504	511	445	339	310	503	9
495	473	485	497	481	440	457	505	516	419	400	302	535	
23	23	23	22.5	22	22	23	23	23	23	23	24	24	
450	210	470	482	440	491	430	388	250	62	183	470	511	10
460	173	490	468	490	480	450	340	182	53	344	467	530	
20.5	21	21	20.5	20	21	21	20	19.5	19	19	20	21	
435	442	434	428	412	311	509	403	95	352	426	488	500	11
460	485	450	452	387	315	530	384	120	401	432	492	500	
18	18	18	17	17	18	18	18	17.5	17.5	18.5	19	19.5	
435	510	486	468	465	418	391	400	402	479	462	480	478	12
405	518	490	495	475	427	382	496	458	445	471	477	476	
15	15	15	15	15	15.5	15	15	14	14	14	15	16	
472	478	480	475	400	422	370	427	439	465	462	474	484	13
485	481	469	462	456	408	371	422	450	469	472	468	478	
14	14	14	14	13.5	14	13.5	13.5	13	12.5	12	12	14.5	
489	250	845	435	301	390	261	80	135	150	480	479	480	14
465	265	853	442	315	379	239	73	125	1	482	470	468	
12	12	12	11.5	11	11	11	11.5	13	12.5	13	14	17	
350	267	255	359	401	363	260	419	458	404	483	479	471	15
26	25.5	26	26	25	26.5	27	26.5	26	24.5	25	26	27.5	
240	375	493	490	460	410	411	392	190	320	470	399	415	16
225	325	479	498	476	411	440	381	263	310	452	364	420	
12	12	13	14	14.5	14.5	14	14.5	14.5	13.5	13.5	14	15	
430	485	522	405	379	404	471	482	410	415	430	422	462	17
463	472	518	400	380	413	522	458	412	420	419	453	465	
12	11.5	11	11	11	11.5	11.5	11.5	11.5	11	11	10	11	
85	467	468	425	407	451	464	471	452	459	428	450	462	18
185	465	460	428	413	460	465	460	450	456	445	443	462	
11.5	12	12	12.5	12.5	13	13.5	14	14	14.5	14	14.5	15	
450	482	465	400	453	439	330	432	470	463	469	467	473	19
475	487	468	367	442	437	334	450	475	480	472	471	467	
13	13	13.5	13	13	13.5	14	14.5	14	14	14	13.5	14	
482	483	480	460	460	459	471	468	466	459	472	479	478	20
465	485	483	472	422	465	460	472	465	461	482	480	480	
13	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14	14	14.5	14	14	
465	480	450	402	465	478	434	460	452	467	480	482	481	21
460	484	485	440	448	464	421	460	469	485	479	480	480	
12.5	12.5	12	11.5	11	10.5	10	10.5	11	11	11	11	11	
462	325	465	481	481	458	241	350	304	120	185	312	372	22
473	215	482	479	484	440	250	405	289	182	169	270	375	
11.5	12	12.5	12.5	12.5	12.5	12.5	12	12	12	11.5	11.5	11.5	
290	400	382	428	386	391	301	411	439	422	420	421	431	23
382	426	390	433	377	411	363	403	433	415	429	425	430	
3.5	3.5	4.5	5	5.5	5	5.5	5.5	6	6.5	6.5	7	7	
410	458	260	75	92	405	401	420	365	389	415	409	425	24
440	392	249	122	93	448	403	408	360	395	419	412	430	
8	9	9	9	9	10	11.5	12	11.5	12	12	12	10.5	
305	455	448	450	409	378	362	410	349	362	380	392	440	25
332	463	440	472	416	386	365	428	372	370	400	409	442	
9.5	9.5	10	10	10	10.5	10.5	11.5	11.5	11	11	11	11	
430	425	302	435	382	278	359	240	305	340	372	382	432	26
385	410	255	405	345	295	350	226	345	369	380	393	428	
10	9.5	9	8.5	8.5	8.5	8	8.5	8.5	7.5	7.5	7.5	7.5	
420	405	378	410	355	430	436	235	320	401	384	345	435	27
372	427	398	400	366	432	439	239	339	399	395	350	440	
4.5	4	4	4	3.5	3.5	3.5	3	3.5	3	2.5	2	2.5	
380	384	310	25	190	269	329	285	82	202	63	350	364	28
372	386	349	54	222	193	349	253	120	110	89	302	367	
—2	—0.5	0	1	2	2.5	3	3	5	5	5	5	5.5	
(—40—?)	250	448	382	334	382	960	185	82	301	385	390	386	29
(—40—?)	240	427	278	374	400	247	86	95	349	355	335	394	
2.5	1.5	0.5	—0.5	—1.5	—1.5	—1.5	—1.5	—1.5	—2	—2.5	—2	—1	
350	55	235	272	286	343	280	362	292	372	390	383	399	30
363	284	218	243	278	328	318	370	254	375	400	372	400	
5.5	7	8	9	9	8.5	7	7.5	6	6.5	7.5	9	12	
405	458	435	371	360	410	402	377	259	326	400	410	405	31
432	480	375	355	398	404	400	380	384	392	391	399	414	
19	19	20	20	19.5	19	18.5	19	19	19.5	20.5	20.5	20.5	
17.0	17.2	17.8	17.3	17.1	17.4	17.5	17.6	17.5	17.4	17.5	17.7	18.4	
404.9	401.1	442.1	405.9	406.1	420.3	396.4	390.5	354.4	377.5	419.5	441.5	474.8	

Monthly means: Temperature, 18°.4; readings, 437.8

Hourly readings of the Brooke bifilar magnet

[One division of scale = .0000719 to November 6, after this date

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Nov. 1	395	408	429	432	475	430	452	438	460	469	290
	400										
Temperature	20.5	24	25	26	26	27	27.5	27	28.5	29.5	29.5
Nov. 2	398	398	503	441	387	361	378	385	390	360	408
	...	430	526	342	405	378	376	365	375	398	360
Temperature	22.5	18.5	16	14	15	15	14.5	13	11	10	9.5
Nov. 3	381	360	392	401	422	401	430	400	397	355	360
	377	393	384	389	378	397	446	428	399	383	387
Temperature	7.5	7.5	7.5	6.5	7	6.5	6	5	4	3.5	3
Nov. 4	395	374	384	392	408	450	423	368	354	409	370
	402	364	370	395	407	407	419	398	389	358	428
Temperature	10	11.5	14	15	15.5	15.5	14	12	10	8.5	7
Nov. 5	394	395	403	382	396	394	402	415	421	420	385
	395	398	406	384	403	397	391	380	415	400	421
Temperature	5	5	5.5	4.5	6	5.5	5.5	4.5	3.5	3	2.5
Nov. 6	392	354	407	431	466	425	412	398	391	355	411
	382	358	405	439	425	431	407	418	402	418	385
Temperature	5	5	[illegible]	4.5	4.5	4.5	5	4	3.5	3	2.5
Nov. 7	...	...	...	523	492	480	487	470	526	456	415
	...	...	...	445	497	510	495	494	528	472	410
Temperature	...	...	...	11	10	[illegible]	8.5	7	5.5	5	4.5
Nov. 8	540	573	482	525	539	530	561	433	492	521	308
	483	509	500	533	540	528	564	426	479	502	285
Temperature	3.5	3.5	3.5	3	5	4.5	4	3	1.5	1	1
Nov. 9	540	493	525	524	558	542	526	551	450	589	457
	520	483	525	524	564	558	530	546	452	527	472
Temperature	7.5	8	8.5	8.5	10	9.5	9.5	8.5	7	6.5	6
Nov. 10	548	453	486	561	499	564	498	493	478	478	474
	554	468	500	542	494	495	496	479	476	476	474
Temperature	17.5	18	19	20	21	22	23	23.5	24	24	24.5
Nov. 11	473	469	465	470	485	460	488	492	522	526	504
	470	470	470	473	497	481	502	488	488	512	528
Temperature	24	23.5	23	22	22	20.5	20	18.5	16.5	15.5	14.5
Nov. 12	585	656	660	659	652	690	763	603	590	450	580
	768	587	673	672	670	662	737	593	740	492	640
Temperature	9.5	8.5	8.5	8	7	5.5	4.5	3	2	1	0
Nov. 13	620	628	583	609	642	430	347	298	463	(—40—?)	85
	619	620	590	594	661	443	356	363	467	350	(—40—?)
Temperature	—5	—4	—[illegible]	—5	—[illegible]	—6.5	—6	—7.5	—9.5	—10.5	—11.5
Nov. 14	579	550	570	573	693	571	584	598	557	472	451
	603	548	568	576	700	575	608	604	416	540	479
Temperature	—10.5	—10.5	—10	—10	—11	—10.5	—10.5	—12	—13	—14	—14.5
Nov. 15	388	600	633	740	782	990	818	640	460	(1040+?)	663
	322										
Temperature	—10.5	—10	—7.5	—9.5	—7	—7.5	—5.5	—6.5	—5.5	—9	—7
Nov. 16	539	418	476	491	526	526	476	525	610	501	698
	...	550	466	503	548	553	551	528	582	561	688
Temperature	0.5	—2	—3.5	—4	—4.5	—5	—6	—7	—8.5	—9	—9.5
Nov. 17	571	473	593	521	555	498	476	507	564	550	541
	530	507	600	566	550	546	576	528	541	540	476
Temperature	—7.5	—6.5	—5.5	—4.5	—4	—4	—3.5	—4.5	—5.5	—6	—6
Nov. 18	(—40—?)	358	98	104	148	(—40—?)	348	401	362	269	(—40—?)
	(—40—?)	226	114	82	192	156	415	250	264	153	(—40—?)
Temperature	0	0	0.5	1	1	1	1.5	0.5	0	—0.5	—1
Nov. 19	382	795	563	683	589	523	(—40—?)	495	342	15	420
	183	538	584	749	574	397	(—40—?)	515	363	247	314
Temperature	1.5	1.5	1.5	1.5	1.5	1.5	2	0.5	—0.5	—1	—2
Nov. 20	426	268	(—40—?)	02	289	300	(—40—?)	(—40—?)	(—40—?)	35	(—40—?)
	426	367	(—40—?)	(—40—?)	293	322	(—40—?)	(—40—?)	10	(—40—?)	(—40—?)
Temperature	0	0.5	0.5	0.5	1	1	2.5	2	0.5	0	—1
Nov. 21	344	488	523	548	539	449	455	405	544	444	462
	384	495	540	469	515	459	456	421	526	429	442
Temperature	5.5	6	6.5	6.5	7.5	6	5	4.5	2.5	2.5	1.5
Nov. 22	442	472	437	554	473	448	463	373	344	315	340
	478	510	470	450	477	449	480	345	392	314	306
Temperature	6.5	6.5	7	7	7	7	8	7.5	7	7	8
Nov. 23	447	463	457	461	465	410	449	348	466	280	472
	450	519	443	470	470	403	451	423	476	312	463
Temperature	11.5	11	10	10	11	11	10	9	8	7.5	7
Nov. 24	462	463	496	435	463	506	503	482	513	446	394
	484	467	503	436	468	519	539	518	492	458	322
Temperature	3.5	4	4	3	3	1.5	1	0	—0.5	—1	—1
Nov. 25	503	483	592	536	541	569	576	524	484	536	555
	498	488	663	478	569	588	583	478	470	538	555
Temperature	—3.5	—4	—4.5	—5	—5	—4	—1.5	—1	—1	—1.5	—2
Nov. 26	588	558	555	541	621	535	531	493	599	541	485
	563	573	710	525	580	503	540	506	485	488	476
Temperature	—3	—2.5	—2.5	—3	—3	—3	—2.5	—3.5	—4.5	—6	—7
Nov. 27	561	532	483	577	579	573	498	549	458	505	372
	621	550	485	567	546	581	491	526	451	501	436
Temperature	—6.5	—5.5	—5	—5	—4.5	—4	—4	—5	—5	—5	—5
Nov. 28	503	535	537	508	522	508	544	526	468	136	551
	500	528	540	510	525	503	535	536	477	135	488
Temperature	—2.5	—1.5	—1.5	—1	—0.5	—1	—1	—2.5	—3.5	—4.5	—5
Nov. 29	493	482	485	498	535	572	537	517	456	539	470
	493	486	480	503	536	561	528	537	487	528	483
Temperature	—1.5	—1	—1	—0.5	—0.5	1	1	—0.5	—1.5	—2.5	—3
Nov. 30	494	493	480	489	496	591	523	521	499	461	477
	488	489	476	481	495	499	533	529	573	480	473
Temperature	—1.5	—0.5	0	0.5	1.5	1.5	2	1	0	—0.5	—0.5
Mean temperature	3.8	3.9	4.1	4.2	4.6	4.3	4.5	3.5	2.5	1.9	1.5
Mean readings	459.1	418.8	477.0	480.1	508.0	485.3	467.8	455.5	452.0	418.3	402.2

ometer at Uglaamie, Alaska, November, 1882.

.000749; average for month .0000743 part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
479	440	405	411	10	120	392	376	292	320	406	398	399	1
29.5	29.5	29	28	26	25.5	30	28.5	29	27.5	26	25	23.5	
350	95	363	400	375	368	345	388	402	352	365	399	400	2
328	110	360	412	373	366	373	369	399	390	350	355	395	
9.5	10	10	10.5	11	11	11.5	12	11.5	[illegible]	8.5	7	7	
398	405	390	360	180	397	386	399	335	390	382	369	400	3
366	395	355	371	185	415	398	399	365	425	401	392	385	
3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3	2.5	2	7	
425	386	368	362	370	365	366	394	309	388	392	389	389	4
382	380	343	378	368	384	367	382	395	390	384	393	387	
7	6.5	6.5	6	5.5	5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
432	418	351	380	369	368	386	399	394	362	244	250	356	5
380	415	404	389	369	379	387	397	309	354	223	272	373	
2.5	2	2	2	2	2	2	2.5	3	3.5	4.5	4.5	4.5	
415	390	410	400	416	398	340	315	299	402	382	410	......	6
382	394	375	394	370	382	349	293	255	409	400	395	......	
2.5	2	1.5	1.5	1.5	2	1.5	2	2.5	2	1.5	1.5	......	
365	506	544	501	268	423	(—40—?)	430	315	462	514	522	430	7
347	509	554	498	249	399	185	358	370	520	440	465	470	
4	4.5	4.5	4.5	4	4	4	4	[illegible]	4	3.5	3.0	3.5	
356	415	441	75	369	447	413	371	382	445	405	470	509	8
382	416	449	123	371	450	408	354	378	440	412	476	503	
0.5	1.5	2	2.5	3.5	4	4.5	5	6.5	6.5	6.5	6.5	7.5	
400	408	425	220	120	323	250	(—40—?)	10	42	273	500	510	9
395	372	408	278	241	320	237	50	(—40—?)	110	305	488	515	
5.5	6	6.5	7	7.5	8.5	10	10.5	12	13.5	15.5	16	17.5	
432	474	470	396	489	432	452	440	470	477	474	467	449	10
439	473	465	392	481	420	454	445	459	475	473	472	444	
24.5	25.5	26	26	26.5	26.5	26.5	27	27	26.5	26	25.5	24.5	
587	539	550	558	561	481	519	425	508	512	521	353	554	11
574	530	556	567	559	475	512	405	499	530	508	382	559	
14.5	14	14	14	13.5	13	12.5	12	11.5	11.5	11	10.5	10	
305	563	591	314	404	340	65	35	544	360	620	669	673	12
332	528	635	376	395	505	(—40—?)	231	623	402	639	703	646	
—1	—2	—3	—4	—4.5	—5	—6	—5	—5.5	—6	—5.5	—5.5	—5	
350	326	212	105	258	250	455	(—40—?)	40	280	502	280	139	13
495	355	237	156	110	120	440	(—40—?)	120	232	520	140	108	
—12	—12	—12.5	—12	—11.5	—12.5	—12.5	—11	—12	—12	—12	—11	—11	
74	418	465	479	240	160	382	300	178	30	92	310	430	14
(—40—?)	345	413	478	115	175	405	298	199	(—40—?)	99	235	500	
—16	—15	—15.5	—16	—16.5	—16.5	—16.5	—16	—16	—15.5	—15	—12.5	—11.5	
476	490	321	453	426	482	443	270	296	421	473	483	510	15
—7	—5.5	—6.5	—6	—5.5	—5	—4	—3.5	—2.5	—2	—1	—0.5	0	
485	568	622	418	409	507	415	482	472	463	480	479	530	16
537	590	626	435	408	505	461	463	487	492	495	452	552	
—11	—10.5	—9.5	—9	—9	—9	—9	—7	—9	—9	—9	—8.5	—7.5	
488	225	310	229	110	(—40—?)	100	(—40—?)	74	202	(—40—?)	682	450	17
275	65	283	492	165	......	120	(—40—?)	288	10	5	119	493	
—6.5	4.5	—4.5	—4	—3.5	—4	—4	—2	—3	—2.5	—1.5	—1	—0.5	
55	(—40—?)	350	390	353	398	438	283	29	63	522	365	139	18
14	(—40—?)	334	399	190	340	518	200	(—40—?)	03	468	192	135	
—1	0.5	0	—1	—1	—0.5	0	1	1	0	0	0.5	0.5	
315	390	15	(—40—?)	170	391	571	422	402	444	525	578	600	19
276	425	03	(—40—?)	240	220	293	433	360	410	489	623	275	
—2	—2	—2	—2	—2	—2	—2	—1	0	0.5	0.5	0.5	0.5	
(—40—?)	(—40—?)	(—40—?)	35	508	395	720	(—40—?)	192	120	152	413	382	20
(—40—?)	65	(—40—?)	(—40—?)	538	281	704	05	210	202	110	442	356	
—0.5	—1	—1	—1.5	—1	—1	—1	0	1	2	3	4	4.5	
465	450	351	313	424	248	(—40—?)	(—40—?)	40	(—40—?)	372	532	256	21
446	452	379	232	416	241	(—49—?)	(—40—?)	120	(—40—?)	388	519	380	
1	1.5	1	1.5	1.5	2	2.5	3	4	5	5.5	6	6	
491	442	412	418	393	355	356	398	366	432	332	429	470	22
498	447	411	418	392	373	379	407	397	438	339	417	437	
9	10.5	11.5	11.5	11.5	12	12	12.5	12	12	12	11.5	11.5	
(—40—?)	295	174	98	20	253	268	220	202	425	312	442	470	23
(—40—?)	352	253	218	(—40—?)	283	284	222	220	447	320	444	450	
6	6.5	6.5	6.5	6	6	5.5	5.5	5.5	5.5	5.5	5	4.5	
538	483	365	230	354	402	241	324	402	386	445	426	437	24
502	488	368	152	378	359	259	324	415	375	419	352	450	
—0.5	0.5	0.5	1	1	0.5	0.5	0	—1	—1.5	—1.5	—1.5	—3	
570	414	65	350	314	(—40—?)	253	80	342	234	300	482	492	25
556	422	(—40—?)	288	318	110	432	80	373	250	265	532	513	
—2.5	—3	—3.5	—4	—4	—4	—4	—3	—4	—4	—3.5	—3	—3.5	
462	539	470	458	502	272	291	220	472	412	359	382	590	26
410	520	504	394	484	307	329	393	440	408	409	342	612	
—7.5	—7.5	—8	—8	—8	—8	—8	—8	—8.5	—8	—8	—7	—6.5	
214	567	428	467	467	304	264	339	311	512	410	515	505	27
405	612	429	464	480	301	268	350	282	516	446	535	449	
—5	—5	—4.5	—4.5	—3.5	—4	—4.5	—3.5	—4	—4	—3.5	—3	—3	
485	357	408	390	459	4[illegible]9	422	460	429	458	492	499	490	28
459	398	396	384	438	490	420	443	434	470	501	490	490	
—5	—5	—5	—4.5	—5	—4.5	—4.5	—3.5	—3	—2.5	—2	—2	—1.5	
505	485	446	490	457	481	501	490	496	498	484	480	474	29
520	510	451	482	465	481	502	499	493	492	486	482	477	
—3	—3.5	—3.5	—4	—4	—3.5	—3.5	—2.5	—2.5	—2.5	—2	—2	—1.5	
502	502	452	438	470	450	545	445	462	465	470	440	435	30
545	497	459	436	456	458	553	433	439	442	488	469	380	
—0.5	—0.5	—0.5	—0.5	—0.5	0	0	1	1	1.5	3	2.5	2	
1.3	1.6	1.5	1.5	1.5	1.5	1.7	2.3	2.3	2.3	2.5	2.6	2.9	
372.7	396.3	368.7	340.7	335.9	335.5	349.4	284.6	322.7	342.4	388.3	431.2	439.7	

Monthly means: Temperature, 2°.7; readings, 408.1

Hourly readings of the Brooke bifilar magnet

[One division of scale = .0000749

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Dec. 1	566	500	482	521	485	503	486	518	483	450	471
	552										
Temperature	2	4.5	6.5	6.5	0	7	8.5	8	9.5	9	10
Dec. 2	320	446	463	475	460	458	465	500	481	455	504
		400	530	449	439	464	454	468	480	418	508
Temperature	14	11.5	10.5	9.5	8.5	7.5	6	5	3	2	1
Dec. 3	482	492	492	470	495	511	523	518	485	519	488
	484	489	510	476	491	519	520	508	485	518	488
Temperature	0	0	0.5	1	2	2.5	2.5	2	1.5	1.5	1.5
Dec. 4	501	480	508	584	502	537	537	545	571	418	349
	503	480	514	567	526	524	555	562	518	510	472
Temperature	-1	-1.5	-1.5	-1	-1	-2	-3	-3.5	-4	-4	-5.5
Dec. 5	465	541	506	523	511	523	505	488	518	528	525
	518	523	505	537	514	519	512	538	536	530	546
Temperature	-4	-4	-3.5	-4	-4	-3	-3	-4	-5	-6	-7
Dec. 6	528	530	548	524	515	517	511	530	531	478	570
	538	523	540	519	516	516	514	501	555	483	553
Temperature	-5.5	-5.5	-5.5	-5	-4.5	-4.5	-5	-6	-7	-7.5	-7.5
Dec. 7	502	485	487	490	521	504	491	470	468	463	498
	498	491	495	495	524	502	486	468	475	480	478
Temperature	0.5	1.5	3	3.5	3.5	3.5	3.5	3	2	1	0.5
Dec. 8	520	520	563	514	524	485	490	520	540	480	499
	511	493	540	502	525	512	529	524	536	544	537
Temperature	-3.5	-5	-6	-6.5	-5.5	-6.5	-7.5	-8	-8.5	-9	-9.5
Dec. 9	508	504	501	509	520	530	544	500	680	545	513
	507	500	500	507	509	530	559	505	696	540	524
Temperature	-5	-5	-5	-4.5	-3	-3	-4	-4.5	-6	-7	-8
Dec. 10	524	573	522	526	553	541	547	546	585	560	562
	520	640	543	538	554	549	561	540	586	571	558
Temperature	-9.5	-9.5	-9.5	-9.5	-9	-9	-9.5	-9.5	-11	-11.5	-12
Dec. 11	527	534	530	537	531	552	535	584	561	529	100
	523	532	532	531	531	553	523	564	571	522	125
Temperature	-9.5	-8.5	-8.5	-8	-7	-7	-7	-7	-7	-7	-7
Dec. 12	535	567	595	534	569	587	562	501	576	569	568
	546	600	628	552	590	568	556	539	602	589	542
Temperature	-6	-7	-7.5	-8	-7.5	-8	-8	-9	-10	-11	-12
Dec. 13	520	523	548	531	529	534	541	525	552	520	539
	507	532	539	525	522	536	530	522	534	517	538
Temperature	-12.5	-13	-13	-12.5	-12	-12	-12.5	-11.5	-12.5	-12.5	-12
Dec. 14	496	493	494	502	502	492	491	404	468	480	518
	487	491	490	506	500	486	498	487	480	525	521
Temperature	-6.5	-6	-6	-6	-5	-6	-6.5	-6.5	-7.5	-8.5	-9.5
Dec. 15	503	507	503	504	510	449	490	496	502	482	480
	508										
Temperature	-9.5	-4	-1	0	0.5	1.5	3	2	4	3.5	3.5
Dec. 16	426	400	570	659	848	709	784	635	400	474	333
		403	540	738	819	721	748	660	514	500	374
Temperature	3.5	0	-1.5	-2.5	-4	-5	-6.5	-7.5	-9	-10	-10
Dec. 17	478	507	548	524	543	530	530	538	512	518	482
	498	523	542	525	554	524	571	547	530	504	500
Temperature	-9.5	-9.5	-8.5	-8	-7.5	-7	-7.5	-7.5	-8.5	-9.5	-10
Dec. 18	492	527	523	503	531	533	530	496	500	485	485
	494	530	515	499	538	542	518	491	500	499	490
Temperature	-9.5	-9.5	-9	-8	-7	-7.5	-8	-8.5	-10	-11	-12
Dec. 19	486	596	548	595	544	406	476	314	434	452	394
	490	583	591	602	531	492	474	435	410	528	458
Temperature	-14	-14	-14	-14.5	-14	-14	-14	-14	-14.5	-15.5	-16
Dec. 20	511	503	507	531	554	553	582	570	520	445	504
	525	504	505	534	558	554	584	580	530	(-40-?)	500
Temperature	-15.5	-15.5	-15.5	-15.5	-15.5	-14.5	-15	-15	-16	-16.5	-17
Dec. 21	433	396	438	450	554	409	371	454	(-40-?)	(-40-?)	358
	490	425	440	447	552	408	379	435	(-40-?)	(-40-?)	358
Temperature	-15	-12.5	-12.5	-12	-10	-10	-10	-10	-11	-12	-12.5
Dec. 22	531	542	538	530	511	536	565	551	380	135	175
	534	548	523	524	523	538	539	557	361	165	255
Temperature	-11	-10.5	-10.5	-10.5	-10.5	-11.5	-12	-13	-14.5	-15.5	-16
Dec. 23	520	510	564	521	536	551	536	454	374	509	559
	500	500	570	528	522	542	512	560	498	543	572
Temperature	-14.5	-14.5	-13.5	-13	-13	-13	-13	-12.5	-14	-15	-15.5
Dec. 24	528	523	503	532	519	553	510	549	503	530	277
	523	522	500	533	517	524	529	538	529	523	345
Temperature	-16.5	-16.5	-16	-16	-15	-15	-15.5	-16	-18	-18	-19.5
Dec. 25	490	492	468	501	498	486	492	514	499	512	448
	493	495	483	496	499	496	500	520	487	498	353
Temperature	-20.5	-21	-21	-21.5	-20.5	-21.5	-21.5	-21	-22	-22	-22
Dec. 26	483	463	460	451	454	453	468	460	430	454	428
	456	456	458	448	450	452	434	439	425	450	428
Temperature	-11	-10	-9.5	-9.5	-8.5	-8	-6.5	-6.5	-8.5	-9	-9.5
Dec. 27	389	448	462	449	464	463	493	480	501	480	460
	460	415	465	451	471	459	497	463	498	458	482
Temperature	-7	-7	-6	-6	-5.5	-5.5	-5.5	-5.5	-7.5	-8.5	-9
Dec. 28	462	510	481	504	500	572	554	596	530	525	508
	453	498	514	511	504	569	550	529	609	485	485
Temperature	-12.5	-11.5	-11	-11.5	-11.5	-11	-9.5	-8.0	-9	-10	-10.5
Dec. 29	413	457	461	436	488	572	549	530	414	356	498
	452	448	453	449	483	596	561	523	413	360	483
Temperature	-9.5	-8	-5	-3	0	1.5	3.5	5	4	5	5
Dec. 30	443	450	523	488	475	510	475	500	514	565	457
	452	410	535	502	504	512	528	495	500	530	493
Temperature	-8.5	-8.5	-8.5	-9	-9	-9.5	-11.5	-12	-14	-15.5	-16.5
Dec. 31	453	540	520	498	529	489	482	462	467	477	508
	413	520	490	490	516	486	476	490	487	490	401
Temperature	-14.5	-13.5	-13	-13	-11.5	-11	-10.5	-10	-11.5	-12	-12
Mean temperature	-7.8	-7.5	-7.1	-7.0	-6.4	-6.5	-6.6	-6.8	-7.9	-8.5	-8.9
Mean readings	487.9	500.7	513.3	514.8	525.1	522.2	520.9	515.0	500.8	477.7	459.1

ometer at Uglaamie, Alaska, December, 1882.

part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date
452	418	260	310	386	270	465	455	339	368	390	364	356	1
10.5	11	10	11.5	12.5	13.5	14	14.5	14	14	16	15.5	14.5	
585	470	473	447	457	417	307	510	434	467	479	492	483	2
471	500	494	456	482	450	323	453	445	450	485	500	480	
1	0.5	0	0	—0.5	—1	—1.5	0.5	0	—0.5	—0.5	0	0.5	
420	428	467	470	474	435	425	342	350	410	450	579	493	3
441	437	465	482	343	428	440	312	330	501	438	555	492	
1.5	2	2	1	0.5	0.5	0	0	0	—0.5	—0.5	—0.5	—1	
5	328	437	418	340	175	418	64	503	210	252	334	690	4
(—40—?)	274	445	459	388	114	415	3	509	265	282	350	550	
—6	—6	—6.5	—6.5	—6	—6	—6	—5	—5.5	—5.5	—5.5	—5.5	—5	
520	496	458	517	504	502	498	501	500	492	512	507	505	5
545	495	490	528	505	525	512	506	502	488	504	515	510	
—7	—7	—7	—6.5	—6.5	—7	—6.5	—5.5	—6.5	—6.5	—6	—6	—5.5	
565	533	492	509	475	498	500	451	462	403	508	515	503	6
559	533	495	504	479	497	498	467	475	417	476	519	502	
—7.5	—7	—6.5	—6.5	—6.5	—5.5	—4.5	—2	—1.5	—2	—1	0	0.5	
480	494	521	478	451	430	380	227	320	499	450	480	496	7
484	493	519	470	443	434	389	217	372	483	448	492	521	
0.5	0	—0.5	—0.5	—1	—1.5	—1.5	—1	—1.5	—2	—2.5	—3	—3.5	
538	521	472	485	516	511	523	520	508	511	512	511	508	8
520	517	470	464	516	512	522	520	512	510	512	510	490	
—9.5	—10	—10	—9.5	—9.5	—8.5	—8.5	—7	—7	—6.5	—5.5	—5.5	—5.5	
525	532	472	502	448	455	362	430	110	496	480	410	503	9
514	528	487	496	469	454	325	438	345	479	500	450	563	
—8.5	—8.5	—9	—9	—9.5	—9.5	—9	—7	—8.5	—8.5	—8.5	—9	—9	
542	538	540	510	492	525	512	520	519	512	521	525	508	10
554	539	532	531	486	527	527	518	519	518	520	523	523	
—12	—12	—12	—12	—11.5	—11	—11	—10	—10	—10	—10	—10	—9.5	
470	519	335	516	512	491	430	225	535	260	250	400	524	11
489	521	382	515	520	481	432	165	454	282	420	429	552	
—6.5	—6	—6	—5	—4	—3.5	—4	—3	—3	—3	—3.5	—4	—5	
525	484	400	510	517	455	243	175	482	521	502	473	505	12
408	367	418	514	504	453	310	200	494	520	519	517	509	
—12	—12	—12.5	—12.5	—12.5	—12.5	—12.5	—12	—12.5	—12.5	—12.5	—12.5	—12.5	
515	453	538	412	388	473	491	419	467	472	499	494	500	13
512	537	450	395	411	482	500	422	465	477	495	499	497	
—12	—11.5	—10.5	—10	—10	—9.5	—9	—7	—7.5	—7	—7	—7	—6.5	
488	493	428	480	307	498	521	507	488	489	501	482	491	14
536	472	393	490	279	502	526	508	490	499	503	479	494	
—10	—10	—10	—10	—10.5	—10.5	—10.5	—9.5	—10	—10	—9.5	—9.5	—9.5	
450	499	440	468	445	473	441	412	360	344	306	180	398	15
3.5	4	4.5	5	4	5	4.5	5	4.5	4.5	4	5	4	
262	289	388	554	499	500	503	376	500	462	309	458	544	16
326	262	410	567	532	481	520	373	508	342	315	109	463	
—10	—11	—11	—11.5	—11.5	—11	—11	—9	—9.5	—9	—9.5	—9.5	—9.5	
484	485	505	415	481	490	491	480	482	488	499	514	486	17
489	479	496	430	490	477	490	480	493	494	494	490	507	
—10.5	—10.5	—10.5	—10.5	—10	—10	—9.5	—8	—9	—9	—9.5	—9.5	—9.5	
496	521	476	502	502	517	520	499	510	522	500	466	458	18
534	520	498	514	520	511	512	496	512	493	501	482	450	
—12.5	—12	—12.5	—12.5	—12.5	—12.5	—12.5	—11.5	—12	—12	—12.5	—13	—12.5	
528	479	482	501	505	479	495	511	460	503	490	496	522	19
533	476	483	516	497	481	511	519	482	479	496	489	490	
—16	—16.5	—16	—16	—15.5	—15	—15	—12	—13	—13.5	—14	—14	—15.5	
503	508	307	(—40—?)	(—40—?)	291	20	570	322	10	552	550	400	20
458	506	293	(—40—?)	(—40—?)	362	(—40—?)	575	350	(—40—?)	495	592	350	
—17	—16.5	—16	—16	—16	—16	—16	—14.5	—14.5	—14.5	—14.5	—14.5	—15	
396	293	488	250	145	514	481	390	210	372	22	480	495	21
315	299	502	317	160	504	479	412	190	50	340	522	546	
—12.5	—12.5	—13	—13	—13.5	—13	—13	—11	—11	—11	—11.5	—11.5	—12	
467	445	369	372	450	459	413	362	379	422	403	470	484	22
258	437	360	391	497	470	450	340	409	508	339	462	503	
—16.5	—16	—16.5	—16	—16.5	—16.5	—16	—15	—15	—15	—14.5	—14.5	—14.5	
445	371	362	454	490	457	205	394	400	532	444	550	500	23
512	414	379	462	473	473	206	387	412	509	472	544	520	
—16	—16	—16	—16.5	—16	—15.5	—15.5	—15	—15	—15.5	—16	—17	—16.5	
504	395	476	350	123	(—40—?)	250	430	403	482	412	480	482	24
475	393	454	334	110	10	359	447	420	492	450	440	484	
—20	—20	—20.5	—20.5	—20.5	—21	—20.5	—20	—20	—20	—20	—20.5	—20.5	
453	528	25	432	478	409	348	410	412	440	434	452	470	25
437	452	37	438	480	400	357	415	421	437	435	453	468	
—21.5	—20.5	—19.5	—19	—18	—16.5	—15.5	—13.5	—12.5	—12.5	—12.5	—12	—12	
478	447	423	358	200	278	258	435	429	430	409	433	453	26
494	409	428	371	190	268	272	439	408	399	388	422	430	
—9	—8.5	—8.5	—8.5	—8.5	—8	—7	—5	—5.5	—6	—6	—6.5	—6	
450	465	464	434	420	436	445	457	445	459	465	468	451	27
476	448	453	446	426	451	454	461	443	480	449	470	434	
—9.5	—9.5	—10	—10.5	—11	—12	—12	—11.5	—13	—13.5	—14	—14	—13.5	
400	390	(—40—?)	349	410	425	432	480	431	465	452	453	452	28
404	397	(—40—?)	365	441	439	446	467	447	462	446	446	449	
—10.5	—11	—11.5	—12	—13	—13.5	—14	—13	—14	—14	—14	—14	—11.5	
349	220	322	(—40—?)	215	200	140	220	45	192	300	510	411	29
346	245	320	(—40—?)	112	250	88	228	110	172	339	474	385	
6	7	5	3.5	2	0	—1	—1.5	—3.5	—5	—6.5	—7	—8	
495	432	475	240	140	491	400	291	344	50	234	508	538	30
483	440	431	72	220	469	401	289	299	110	255	488	487	
—17	—17.5	—18	—18.5	—18	—18	—17	—16	—16	—15.5	—15.5	—15.5	—15.5	
431	420	85	289	381	383	446	375	180	266	339	365	383	31
450	414	42	342	371	414	437	362	210	280	322	340	356	
—12	—11.5	—11.5	-11	—11	—10	—9.5	—8	—7	—7.5	—7.5	—7.5	—8	
—9.0	—8.9	—9.0	—9.0	—9.0	—8.8	—8.7	—7.5	—7.9	—8.0	—8.1	—8.1	—8.2	
407.6	416.5	397.2	493.5	389.5	417.9	402.7	398.8	427.0	398.5	422.6	459.8	479.8	

Monthly means: Temperature, —8°.0; readings, 460.4

Hourly readings of the Brooke bifilar magnet

[One division of scale=.0000749

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Jan. 1	360	408	456	451	476	503	452	459	484	462	398
	400	411	461	491	488	491	443	458	500	474	394
Temperature	—8	—7	—6.5	—6	—5	—5	—5	—5	—5	—6.5	—7
Jan. 2	440	438	429	422	439	461	416	415	428	415	441
	435										
Temperature	—3.5	—0.5	2.5	2	2.5	2.5	3	4	2.5	5	7.5
Jan. 3	377	368	369	349	386	377	350	375	377	356	376
		356	366	369	382	384	368	374	349	368	386
Temperature	14	13.5	12	10	[illegible]	[illegible]	8	8	6.5	5	4.5
Jan. 4	398	386	388	3·6	389	387	389	388	360	388	375
	409	388	388	379	389	387	384	388	368	376	377
Temperature	4.5	5	5	5	6	5	5	5	4	2.5	2
Jan. 5	384	395	398	392	408	426	443	475	517	494	357
	390	394	388	389	407	422	451	488	494	507	434
Temperature	5	5	5.5	5.5	5	4.5	4.5	5	3	2	1
Jan. 6	418	399	423	621	464	428	422	468	445	462	349
	420	394	425	704	482	433	428	458	437	401	336
Temperature	1.0	1.5	2.5	3	3.5	3.5	3	2.5	1	0.5	0
Jan. 7	478	434	443	426	443	471	506	505	506	514	420
	481	440	438	449	458	463	503	458	534	545	416
Temperature	—4	—4	—4	—3	—4	—3.5	—3.5	—3	—4.5	—5	—6
Jan. 8	478	426	470	440	478	477	385	411	414	521	445
	480	403	438	459	464	473	551	430	374	537	412
Temperature	—4	—3.5	—2.5	—2.5	—1.5	—1.5	—2	—2.5	—4	—5	—6.5
Jan. 9	440	438	428	417	452	453	490	484	476	498	406
	426	432	427	428	450	454	496	471	478	477	396
Temperature	—2.5	—1.5	—1	—1.5	—2.5	—2	—2.5	—3	—4.5	—5.5	—6
Jan. 10	428	440	442	456	454	460	454	457	451	424	447
	432	444	453	454	458	450	447	461	444	462	452
Temperature	—6.5	—7	—8	—8.5	—8	—8	—8	—7	—8.5	—9.5	—9.5
Jan. 11	432	449	500	491	496	501	452	421	446	447	455
	437	436	473	485	508	482	456	422	444	457	465
Temperature	—6	—6	—6	—6.5	—6.5	—6.5	—6.5	—6.5	—8	—8.5	—9
Jan. 12	445	449	457	453	458	463	463	465	472	433	463
	470	454	453	457	457	462	469	479	472	462	488
Temperature	—10	—11	—11	—11.5	—10.5	—10.5	—11	—13	—12.5	—14	—14.5
Jan. 13	472	460	467	470	469	475	472	466	450	467	459
	468	464	466	470	466	473	472	472	465	440	459
Temperature	—15	—15.5	—15.5	—15.5	—15	—15	—15.5	—15.5	—17	—18	—18.5
Jan. 14	465	465	461	480	484	472	475	463	470	444	438
	465	464	463	478	483	475	474	460	476	458	443
Temperature	—16.5	—16	—16	—15	—15	—14.5	—14.5	—15	—16.5	—17.5	—17.5
Jan. 15	470	467	470	462	465	464	456	428	454	460	461
	465										
Temperature	—12.5	—9.5	—6	—8	—7.5	—7	—6	—7.5	—6	—6	—7.5
Jan. 16	441	447	484	448	450	449	475	450	443	400	485
		423	488	468	452	452	431	452	488	499	465
Temperature	—7	—9.5	—10.5	—13	—13.5	—14	—15.5	—15.5	—17	—18	—18.5
Jan. 17	449	447	439	439	463	448	488	508	520	458	218
	448	440	437	434	446	452	491	508	522	440	253
Temperature	—3.5	—2	0	2	2.5	2.5	2.5	3.5	2	1.5	1
Jan. 18	404	453	395	404	419	451	465	402	447	345	431
	405	443	396	418	444	443	468	413	433	320	420
Temperature	6	6.5	6.5	7	7	6	5	4.5	3	1.5	0.5
Jan. 19	488	448	450	438	426	432	437	438	455	423	420
	490	417	447	438	424	428	441	434	427	404	399
Temperature	—2.5	—2.5	—1.5	—2	—2.5	—2.5	—3	—2.5	—4.5	—5.5	—6
Jan. 20	432	440	443	446	452	456	446	447	460	552	5 5
	432	442	444	451	460	456	444	450	435	565	545
Temperature	—9.5	—9.5	—9.5	—10	—10	—10	—10	—10	—11	—12	12.5
Jan. 21	432	423	446	509	479	502	440	499	500	375	376
	425	425	450	502	490	503	431	510	503	396	343
Temperature	—10	—9	—7.5	—8.5	—8.5	—7.5	—6.5	—6	—8	—9	—9.5
Jan. 22	432	443	454	432	434	440	430	417	426	418	426
	442	449	436	446	412	434	427	420	422	423	425
Temperature	—4	—4	—4	—4	—3.5	—3	—2	—2	—3	—3.5	—4
Jan. 23	424	418	409	416	413	426	431	421	419	423	409
	401	407	399	414	417	429	430	425	421	425	408
Temperature	2.5	3	3	2.5	4	4.5	5	5.5	4	4	3.5
Jan. 24	417	420	411	420	423	428	429	423	438	428	421
	410	421	401	421	427	410	431	426	429	424	431
Temperature	8	10	10	11.5	12.5	13.5	14.5	16	14.5	14	13.5
Jan. 25	403	400	400	405	430	469	428	430	433	459	438
	410	380	420	454	448	455	427	438	408	440	439
Temperature	3	2.5	2	—0.5	0	0	0.5	0.5	—1	—2	—2
Jan. 26	460	460	480	475	520	543	468	466	425	476	374
	453	500	479	401	498	571	476	456	408	457	413
Temperature	—6	—6	—6	—6.5	—6.5	—6.5	—6.5	—6.5	—8	—9	—9.5
Jan. 27	473	401	473	478	518	512	468	467	407	426	241
	450	385	465	504	502	504	470	478	412	470	285
Temperature	—10.5	—10.5	—10.5	—11	—10.5	—11	—11	—11.5	—13	—13.5	—14.5
Jan. 28	500	453	486	582	560	525	561	600	536	463	445
	443	452	510	530	552	511	569	570	536	474	453
Temperature	—15	—14.5	—14	—13.5	—13	—13	—13.5	—13.5	—15	—15.5	—16
Jan. 29	455	449	440	511	520	466	456	458	439	423	424
	480	449	451	511	534	472	458	456	460	447	416
Temperature	—15	—14.5	—14	—14.5	—13.5	—13	—12.5	—14	—15	—15.5	—16.5
Jan. 30	454	448	462	467	487	471	458	462	464	420	422
	458	460	448	464	497	476	462	468	463	461	439
Temperature	—15	—14.5	—14.5	—15	—15	—15	—15.5	—15.5	—17	—18	—18.5
Jan. 31	440	453	460	403	498	496	497	536	302	508	459
	448	447	457	410	506	503	497	516	431	499	526
Temperature	—18.5	—18	—18.5	—19	—18	—17.5	—17	—17	—18	—18.5	—18.5
Mean temperature	—5.3	—4.8	—4.5	—4.7	—4.5	—4.4	—4.4	—4.4	—5.7	—6.4	—6.9
Mean readings	438.1	431.5	441.6	455.0	461.1	461.4	454.4	454.6	449.5	449.4	417.7

ometer at Uglaamie, Alaska, January 1883.

part of the horizontal force.]

11h	Noon.	13h	14h	12h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
254	540	409	(—40—?)	327	301	407	408	423	335	382	450	455	1
245	516	415	(—40—?)	322	380	417	442	429	304	393	419	474	
—7	—6.5	—7	—7	—7.5	—6	—5.5	—4	—3.5	—4	—4	—3.5	—3.5	
430	409	337	359	151	203	301	272	131	77	218	398	384	2
8	[illegible]	9	9.5	9	10	11	11.5	12	12	12	12.5	16.5	
415	370	334	213	53	364	363	381	372	369	363	378	384	3
392	377	302	234	89	365	377	382	375	372	370	382	389	
4	4	4	4	4	4.5	4.5	5.5	5	5	5	5	4.5	
412	368	222	386	394	387	390	355	394	393	390	388	394	4
371	367	178	370	396	396	380	359	392	394	396	386	393	
2	2.5	3	3.5	3	3.5	3.5	5	5	5	5	4.5	4.5	
450	412	384	410	411	402	391	385	402	382	299	358	361	5
436	417	414	421	411	404	394	388	405	401	309	352	369	
—0.5	—0.5	—0.5	—0.5	—1	—0.5	—0.5	0	0	—0.5	0	0	0.5	
275	289	325	78	(—40—?)	120	336	325	334	100	325	344	470	6
114	386	304	13	(—40—?)	138	329	316	355	209	379	395	484	
—0.5	—0.5	—1	—1	—1	—1	—1.5	—1.5	—1.5	—2.5	—3	—4	—4	
34	185	424	381	375	65	(—40—?)	241	262	(—40—?)	80	462	403	7
120	229	455	362	375	122	(—40—?)	193	315	(—40—?)	(—40—?)	404	442	
—6.7	—7.5	—8	—7.5	—7.5	—7	—6.5	—5.5	—5.5	—5.5	—5	—4.5	—4	
285	232	348	165	309	456	338	366	290	400	440	466	441	8
283	239	320	137	305	461	348	352	275	272	399	413	433	
—6.5	—6.5	—6.5	—6	—6	—5	—5	—3.5	—3.5	—3.5	—3.5	—3	—2.5	
464	516	475	389	424	366	333	300	7	368	442	440	424	9
450	518	505	400	416	361	334	319	(—40—?)	382	448	441	430	
—6.5	—6.5	—6	—5.5	—5.5	—5.5	—6	—5	—6	—6.5	—6.5	—7	—7	
416	450	436	439	423	431	374	415	412	398	402	383	376	10
430	453	438	440	426	426	381	417	410	403	405	375	380	
—9.5	—9	—9	—8.5	—8	—7.5	—6.5	—5	—5.5	—5.5	—5.5	—6	—6	
426	450	442	446	444	442	438	432	442	439	448	427	448	11
468	450	446	452	438	442	440	433	443	430	443	439	446	
—9.5	—10	—10	—10	—10	—9.5	—9	—8	—8.5	—9	—9.5	—10	—10	
470	467	495	470	472	462	433	384	216	375	432	473	476	12
472	445	454	463	471	465	431	380	222	382	440	475	446	
—15	—14.5	—14.5	—14	—14	—14	—14	12.5	—13	—13.5	—14	—14.5	—15.5	
447	473	470	472	434	300	299	435	478	479	470	469	466	13
440	472	472	473	419	335	319	415	476	478	473	467	465	
—19	—18.5	—18.5	—18	—18.5	—18	—18	—16	—16.5	—16.5	—16.5	—16.5	—16.5	
516	465	470	464	453	429	431	424	296	269	385	442	469	14
509	468	472	470	403	426	430	414	274	288	392	450	462	
—17.5	—17.5	—17.5	—17	—17	—16.5	—16.5	—15.5	—15	—15	—14.5	—14.5	—14	
459	540	232	61	450	400	367	203	299	375	424	431	465	15
—7	—7	—6.5	—6	—7	—6.5	—6.5	—5.5	—7	—7	—7	—7	—7.5	
483	434	335	232	405	368	355	450	430	440	454	452	448	16
474	431	370	259	395	394	359	444	441	448	461	450	455	
—18.5	—18	—17.5	—16.5	—16.5	—15	—14.5	—12	—11.5	—10	—8.5	—7.5	—5.5	
52	454	302	268	260	250	(—40—?)	393	439	400	362	417	385	17
10	417	314	323	248	258	(—40—?)	411	423	445	383	394	386	
1	3	5	6.5	7	7	8	8.5	7.5	7.5	6.5	6	6	
332	311	385	360	318	378	378	388	170	229	427	413	459	18
245	379	380	358	313	384	372	311	165	293	402	420	441	
0	—1	—1	—1.5	—2	—2	—2	—1.5	—2	—2	—2	—2.5	—2.5	
373	395	160	270	320	308	260	235	421	419	427	414	419	19
408	388	267	322	332	307	254	220	432	431	438	419	427	
—7	—7	—7.5	—8	—8.5	—8.5	—8.5	—8	—8	—8.5	—8.5	—9	—9.5	
472	468	492	351	353	210	104	190	271	228	391	474	448	20
518	449	500	362	364	214	(—40—?)	226	280	243	400	459	456	
—14	—13.5	—13.5	—13	—13	—13	—13	—12	—11.5	—11.5	—11.5	—11.5	—10.5	
465	382	23	260	215	200	290	314	298	484	439	443	438	21
480	251	127	334	210	179	265	316	329	477	448	455	440	
—9.5	—9.5	—9.5	—9	—8.5	—8	—7.5	—5.5	—5.5	—5	—5	—4.5	—3.5	
409	142	346	241	445	433	416	408	392	387	362	300	391	22
427	78	304	251	441	440	404	391	374	384	376	289	396	
—4	—3.5	—3	—2.5	—2	—1.5	—1.5	0	—1	—0.5	—0.5	0	1	
381	344	290	269	315	352	297	390	429	416	405	399	408	23
376	335	340	280	314	345	266	396	422	418	409	400	401	
3.5	4.5	5	5.5	5.5	5.5	6	8	7.5	7.5	8	8	8	
432	406	357	381	409	330	243	205	180	5	352	242	322	24
380	402	350	380	392	364	261	213	139	122	367	263	335	
13.5	12.5	11	9.5	9	8	7.5	7.5	7	6.5	5	4	3.5	
385	(—40—?)	288	370	425	108	168	353	132	(—40—?)	250	142	450	25
410	(—40—?)	320	388	400	225	173	380	210	(—40—?)	179	110	319	
—3	—3.5	—4	—4	—4.5	—5	—4.5	—5	—5.5	—6	—6	—6	—6	
15	363	352	359	80	387	454	280	395	233	(—40—?)	260	315	26
112	352	364	390	0	430	471	237	339	209	3	310	320	
—9.5	—10	—10.5	—11	—11.5	—10.5	—10	—9.5	—9.5	—9.5	—10	—10.5	—10	
370	564	467	471	238	205	145	501	302	383	403	396	475	27
526	558	441	460	237	70	160	483	323	355	395	409	503	
—15	—15	—15.5	—15.5	—16	—15.5	—15.5	—15	—15	—15.5	—15.5	—15.5	—15	
416	459	440	435	457	462	461	422	267	250	432	443	443	28
477	464	439	438	463	465	445	436	295	279	442	450	453	
—16.5	—16.5	—16	—16	—16	—15.5	—15.5	—15	—14.5	—15.5	—15.5	—16	—16	
428	465	419	450	280	386	419	416	418	403	388	445	456	29
440	462	430	452	266	370	413	411	425	421	392	449	478	
—16.5	—16	—16	—15.5	—16	15.5	—15	—14.5	—14.5	—14.5	—14.5	—15	—15	
410	524	484	456	450	460	500	493	483	468	466	462	451	30
[illegible]	522	481	407	446	459	498	492	493	474	461	465	454	
—18.5	—19	—19	—19.5	—19	—19.5	—19.5	—18.5	—19.5	—19	—19	—18.5	—18.5	
312	65	430	461	443	427	339	345	380	348	399	419	475	31
260	112	451	458	438	436	338	345	375	309	469	420	471	
—18.5	—18.5	—18.5	—18.5	—18.5	—17.5	—16.5	—15.5	—15.5	—15	—14	—12.5	—10.5	
—7.3	—7.1	—7.1	—6.9	—7.0	—6.6	—6.4	—5.4	—5.6	—5.7	—5.7	—5.8	—5.4	
372.1	383.3	370.8	336.4	335.1	339.8	319.8	356.9	328.5	319.0	365.7	400.4	435.7	

Monthly means: Temperature, —5°.8; readings, 398.7

Hourly readings of the Brooke bifilar magnet

[One division of scale .0000749 to February 27, 1h; for

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Feb. 1	475	477	436	447	473	502	442	428	434	422	445
	478	....	....	....	....	....	....	....	....	....	....
Temperature	—9.5	—1	1	1	3.5	3.5	3	5	6.5	9	8.5
Feb. 2	482	500	437	504	548	439	515	397	411	410	127
	....	488	446	515	554	471	509	436	452	411	236
Temperature	6	4	4	2.5	3	2.5	2	1	—0.5	—1	—1
Feb. 3	373	508	475	456	439	420	508	376	—10	339	377
	334	493	473	434	447	538	494	376	65	351	303
Temperature	0.5	0.5	0.5	2	4	6	6.5	8	7	6	6.5
Feb. 4	508	528	410	535	485	494	456	480	430	(—40—?)	405
	525	523	467	479	493	496	468	478	475	207	325
Temperature	13	14	14.5	15	15	17.5	18	19	17	15.5	15.5
Feb. 5	344	432	433	470	456	462	446	416	469	433	420
	367	417	479	452	462	468	438	436	474	413	395
Temperature	13	13	13.5	13	14	15	16	17	15.5	15.5	15.5
Feb. 6	444	404	406	396	406	467	436	496	427	409	417
	423	416	396	388	504	473	438	483	436	424	418
Temperature	21	22	22.5	23	24	26	26.5	27	26	25.5	25
Feb. 7	283	315	333	339	331	351	376	302	357	363	325
	320	320	328	349	357	364	382	367	357	331	335
Temperature	12.5	12	11.5	12	11	10.5	10	10	9	8	7
Feb. 8	353	387	350	362	390	382	369	347	324	332	287
	346	379	354	361	398	384	373	344	300	330	300
Temperature	19	19	18.5	19	19.5	19.5	18.5	17.5	14.5	12.5	11
Feb. 9	358	353	358	366	373	390	395	409	372	372	372
	358	356	362	370	373	378	393	403	376	376	373
Temperature	10	10	10	10.5	12	12.5	13	13.5	12	12	12.5
Feb. 10	407	411	404	390	397	358	462	484	384	399	409
	407	413	404	372	359	370	438	471	320	399	384
Temperature	27.5	27	25	22	20.5	18	16.5	16	13	11	9
Feb. 11	414	420	445	420	429	428	429	439	430	427	454
	430	419	444	430	427	428	429	437	432	450	473
Temperature	—2.5	—2.5	—3	—3	—2	—2	—1.5	—2	—3	—4	—5
Feb. 12	433	4:9	428	429	432	432	433	436	400	432	448
	432	428	424	431	434	432	433	432	368	442	446
Temperature	—4	—3.5	—4	—4	—4	—4	—4	—3	—5	—5	—5
Feb. 13	413	411	407	404	406	407	404	388	388	377	369
	415	409	406	402	407	409	404	394	387	373	372
Temperature	5	6	8	8.5	10	12	12.5	13	11.5	11	9.5
Feb. 14	407	407	406	400	405	412	424	402	423	329	387
	405	399	403	406	405	416	425	409	423	354	364
Temperature	3.5	3.5	4	5	3.5	3.5	4.5	4.5	3.5	2.5	2
Feb. 15	407	426	443	432	418	419	433	407	430	404	403
	420	....	....	....	....	....	....	....	....	....	....
Temperature	2	4	9.5	6.5	8	8.5	11	9	13	13.5	15
Feb. 16	364	356	446	408	449	485	459	423	488	412	515
	....	368	408	398	435	489	445	446	493	454	505
Temperature	9	8	8	6	6	6	5	4	2	0.5	—1
Feb. 17	495	491	486	488	487	488	491	495	517	573	530
	492	489	488	488	487	487	489	498	519	586	524
Temperature	—3.5	—2.5	—2.5	—2.5	—2	—1	—1	0	—1	—1	—1.5
Feb. 18	438	484	502	472	488	489	487	474	472	463	490
	445	477	492	476	488	481	491	483	484	477	484
Temperature	2.0	2.5	2.5	2.5	3	3	2	2	0.5	0	—0.5
Feb. 19	474	464	464	470	504	578	549	468	452	440	453
	477	460	462	471	506	583	534	470	453	441	427
Temperature	8	10	11.5	11.5	12.5	13	12	11.5	11	11	10
Feb. 20	453	456	453	454	448	456	338	435	510	392	210
	457	452	443	456	448	450	557	423	489	397	129
Temperature	12	13	14.5	15	14	15	15	13	12	11	10
Feb. 21	475	472	470	471	478	470	474	471	508	494	480
	482	480	478	473	479	472	475	472	483	480	500
Temperature	2.5	3	3	3	3	3	3.5	3	2	1	0
Feb. 22	340	410	522	426	543	620	574	558	540	467	451
	304	415	535	462	534	606	572	572	542	441	469
Temperature	1	1.5	2	2	3	3.5	3.5	3	1.5	0.5	0
Feb. 23	605	428	498	540	474	533	594	530	45	225	387
	592	388	515	512	408	521	610	519	96	146	357
Temperature	—5.5	—5	—5	—5	—4.5	—5	—6	—6	—8	—9.5	—11
Feb. 24	503	500	472	560	502	546	554	501	540	500	488
	499	508	480	564	556	556	550	514	554	499	554
Temperature	—7.5	—7.5	—7.5	—6.5	—6	—6	—6	—6.5	—8	—9.5	—10.5
Feb. 25	570	500	608	450	326	486	414	315	368	379	123
	506	638	700	424	307	477	414	363	388	3'1	65
Temperature	—10.5	—9.5	—8.5	—9	—8	—9	—9.5	—9.5	—11.5	—12.5	—13.5
Feb. 26	528	538	530	534	533	532	565	626	490	522	548
	529	532	514	534	541	540	577	611	468	572	487
Temperature	—11	—9.5	—9.5	—9	—8.5	—8.5	—8.5	—0.5	—11.5	—13	—14
Feb. 27	536	....	....	....	....	....	....	....	455	487	(—40—?)
	549	....	....	....	....	....	....	....	585	422	(—40—?)
Temperature	—13.5	....	....	....	....	....	....	....	—2	—4	—6
Feb. 28	....	....	....	....	582	660	700	432	(—40—?)	530	333
	....	....	....	....	585	624	724	417	(—40—?)	544	362
Temperature	....	....	....	....	3.5	1	1	0.5	—1	—2	—2.5
Mean temperature	3.7	5.1	5.5	5.4	5.9	6.1	6.1	6.0	4.5	3.7	3.1
Mean readings	441.0	443.6	434.5	445.2	459.0	473.0	475.3	446.0	397.4	399.3	375.0

ometer at Uglaamie, Alaska, February, 1883.

remainder of the month .0000760 part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
420	411	312	308	431	357	373	233	(—40—?)	352	(—40—?)	(—40—?)	(—40—?)	1
9.5	9	8.5	8	8	7.5	7	7	6.5	7	7	7	7	
23	238	4	243	60	378	392	282	349	310	229	352	340	2
69	245	108	221	20	414	379	311	278	192	211	(—40—?)	412	
—1.5	—1.5	—2	—2	—2	—2	—2	—0.5	—1	—1	—0.5	—0.5	0.5	
320	200	172	(—40—?)	295	389	404	112	(—40—?)	203	252	424	542	3
318	295	304	(—40—?)	278	387	389	178	183	—25	453	402	490	
6.0	6.5	6.5	6.5	6	6.5	6	7	6.5	7	9	11	12	
359	355	369	350	15	75	447	29	(—40—?)	75	233	411	383	4
324	468	461	268	210	10	480	124	(—40—?)	119	255	399	375	
14.5	15	15	15	15	14	14	14	13.5	13.5	13.5	13	13.5	
258	455	347	402	368	264	209	(—40—?)	302	423	407	332	308	5
386	439	355	403	367	271	304	(—40—?)	193	399	417	359	340	
15	15.5	16	16.5	17	17.5	17.5	19	19	19	20	20.5	21	
382	372	240	286	369	320	(—40—?)	(—40—?)	42	309	—30	410	365	6
375	366	393	278	369	311	(—40—?)	(—40—?)	29	352	119	392	268	
25	25	25	25	25	23.5	22.5	21	19	17.5	16	14.5	14	
332	355	324	377	350	363	357	338	320	228	298	333	344	7
336	323	341	376	351	361	356	336	314	215	290	329	351	
7	7.5	8	8.5	9	10	10.5	12	13	14.5	17	18	19.5	
162	403	315	258	190	292	305	200	269	304	316	348	364	8
97	394	351	280	152	296	317	212	253	312	317	350	360	
10	9.5	9	9	8.5	8.5	9	9	8	8	8.5	9	10	
374	334	386	361	395	393	362	364	287	182	240	352	408	9
370	304	385	372	391	392	364	359	283	171	262	357	411	
12.5	14	16.5	18	19	21	22	23	24	25	26.5	27	27.5	
400	397	304	330	397	350	418	392	352	404	442	433	430	10
422	379	315	390	354	363	418	390	344	414	410	450	460	
7	6.5	5	3.5	3	2	0.5	1	—0.5	—1	—1.5	—2	—2.5	
515	430	414	436	408	187	297	350	406	442	433	426	420	11
468	443	420	438	411	184	308	352	412	433	436	432	428	
—5.5	—5	—5.5	—5	—4.5	—4	—4	—3	—3	—4	—4	—4.5	—4	
430	393	365	382	290	245	389	373	409	421	419	418	411	12
422	408	396	382	287	243	392	383	414	419	419	417	403	
—5	—4	—4	—3	—3	—2	—1	0.5	1.5	1.5	3	4	4	
380	385	380	379	378	296	333	365	389	388	399	379	395	13
400	386	379	379	375	291	328	355	393	389	399	382	394	
8.5	8	7.5	6.5	6	5.5	5.5	6	5	5.5	5	5	4	
395	403	406	368	60	170	365	422	266	479	350	372	399	14
360	382	409	362	140	140	408	424	280	442	368	400	492	
2	2	0.5	0	—1	—1	—1	0	—0.5	0	1	1.5	2	
382	331	370	321	365	308	360	356	375	362	379	388	376	15
14	13	13	13	12	12	11	9.5	9.5	9	9.5	10	10	
502	300	328	463	426	140	440	518	489	483	478	501	498	16
495	330	380	449	443	183	456	510	480	495	483	489	496	
—1.5	—1.5	—2	—2	—3	—3	—3	—2.5	—3.5	—4.5	—4.5	—4	—3.5	
525	500	483	152	494	474	(—40—?)	(—40—?)	377	478	409	429	411	17
508	498	486	110	492	469	(—40—?)	(—40—?)	372	473	401	412	384	
—2	—2	—1.5	—1	—0.5	1	1.5	3	2	2	1.5	1.5	1.5	
474	491	494	490	495	492	431	487	478	481	382	475	493	18
465	490	498	490	486	479	411	482	473	479	388	470	488	
—1	—0.5	—0.5	0	0.5	1.5	2	4	4	5	6	7	8	
446	432	435	439	437	430	420	442	447	449	446	433	447	19
447	428	434	440	434	427	428	444	448	452	447	444	446	
10	9.5	9	8.5	8	8	9	10	10	9.5	10	10	11	
400	394	(—40—?)	76	387	396	385	445	455	488	459	455	474	20
420	366	(—40—?)	12	375	407	377	447	450	431	489	440	465	
9	8.5	8	6.5	6	5	4.5	5	4	3	2.5	2.5	2.5	
470	465	480	300	442	353	400	506	473	486	400	278	393	21
462	475	490	312	430	346	405	504	473	482	392	260	297	
—1	—2	—2.5	—2.5	—2.5	—2.5	—2.5	—1	—1.5	—1	—1	—1	0	
64	468	479	245	273	(—40—?)	(—40—?)	100	530	90	223	333	374	22
235	466	440	229	296	50	65	(—40—?)	551	102	200	357	411	
—2	—2	—2.5	—3.5	—4.5	—4.5	—5.5	—5	—6	—7	—7	—7	—6.5	
554	501	478	430	235	377	417	414	540	467	432	516	502	23
510	504	494	441	254	338	452	456	537	473	416	506	497	
—11.5	—11.5	—11.5	—12	—12	—11.5	—11.5	—9.5	—10	—10	—9.5	—9.5	—8.5	
(—40—?)	462	545	432	418	282	108	358	542	211	190	(—40—?)	400	24
(—40—?)	499	540	475	407	100	105	437	514	329	211	—23	370	
—11	—11.5	—11.5	—12	—12.5	—12.5	—12	—12	—12	—11.5	—11.5	—12	—11.5	
235	248	402	495	519	542	519	485	530	536	500	422	522	25
321	334	426	448	520	543	504	530	527	490	518	509	521	
—13.5	—14	—14.5	—14.5	—14.5	—14	—14	—12.5	—12.5	—12.5	—13	—12.5	—11.5	
551	528	483	356	490	407	469	370	(—40—?)	342	430	502	511	26
515	530	250	135	508	430	476	409	30	313	400	500	517	
—14.5	—14.5	—15	—15.5	—16	—16	—16	—15.5	—16	—17	—17	—17	—15.5	
(—40—?)	(—40—?)	(—40—?)	429	(—40—?)	(—40—?)	(—40—?)	(—40—?)	(—40—?)	(—40—?)	(—40—?)	....	....	27
(—40—?)	(—40—?)	(—40—?)	406	(—40—?)	(—40—?)	(—40—?)	(—40—?)	(—40—?)	(—40—?)	(—40—?)	....	....	
—6.5	—7	—8	—8.5	—9	—9	—9.5	—9	—9.5	—9.5	—9.5	....	....	
405	500	(—40—?)	(—40—?)	313	255	(—40—?)	386	450	445	442	440	409	28
504	494	(—40—?)	(—40—?)	366	210	(—40—?)	220	443	442	440	441	500	
—3.5	—3	—2.5	—2	—1.5	—0.5	0	2	2	2	2	2.5	4	
2.5	2.5	2.3	2.2	2.0	2.2	2.2	3.0	2.6	2.5	2.8	3.5	4.0	
365.9	388.2	337.0	318.9	349.8	209.3	305.4	289.8	312.7	344.1	330.6	362.6	401.9	

Monthly means: Temperature, 3°.7; readings, 383.1

Hourly readings of the Brooke bifilar magnet-

[One division of scale = .0000760

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Mar. 1	573	483	515	626	619	616	528	486	480	380	395
	583										
Temperature	5.5	5	9	12	14	8	10	6	7	8.5	9.5
Mar. 2	642	528	648	540	767	468	510	469	40	465	444
		540	750	694	652	543	571	361	170	509	420
Temperature	4	3	2.5	2.5	2.5	1.5	0	−1.5	−3	−4	−5
Mar. 3	483	518	558	578	579	640	352	625	334	224	430
	557	583	554	585	554	658	174	622	369	245	527
Temperature	−8.5	−8	−8	−7.5	−6	−6	−6.5	−6.5	−8	−8.5	−9.5
Mar. 4	508	600	601	542	470	578	590	599	623	413	390
	513	598	559	556	472	584	612	624	502	447	389
Temperature	−6.5	−5	−4	−3.5	−1	−1	−1.5	−1	1	2	−1
Mar. 5	514	493	525	572	568	624	616	458	464	575	488
	516	476	506	591	582	614	622	536	468	662	539
Temperature	−5	−4	−3	−2.5	−0.5	−1	−1.5	−1.5	−3	−4.5	−5
Mar. 6	470	493	483	474	454	489	485	490	439	518	504
	470	513	504	492	500	501	485	484	441	520	492
Temperature	2	3	3	1.5	2.5	2	2	2	0	−1.5	−2.5
Mar. 7	437	453	480	528	480	508	497	575	468	458	375
	428	450	520	528	462	484	497	517	449	408	303
Temperature	−5.5	−4	−3	−3	−2	−3	−3.5	−4.5	−6	−7.5	−8.5
Mar. 8	485	500	485	534	474	566	470	594	410	30	384
	480	498	473	522	478	538	564	580	388	236	90
Temperature	−7.5	−6	−5.5	−5	−4	−3.5	−4.5	−5	−7	−8	−9
Mar. 9	380	452	543	760	618	434	669	558	448	498	461
	423	462	562	848	632	429	678	563	442	463	425
Temperature	−11	−11	−11.5	−11.5	−10.5	−10.5	−11	−11.5	−13.5	−15	−16
Mar. 10	468	475	468	478	504	517	506	474	480	468	485
	468	473	469	488	512	516	508	474	487	515	550
Temperature	−15.5	−13.5	−12.5	−13	−11	−11	−11.5	−12.5	−14	−15.5	−17
Mar. 11	490	465	475	477	454	463	464	454	485	491	476
	500	472	473	473	450	458	468	458	466	487	452
Temperature	−18.5	−15.5	−12.5	−11	−8.5	−9	−10	−12	−14	−15	−16
Mar. 12	458	459	445	446	472	461	464	466	467	470	468
	457	457	446	446	468	467	464	464	467	465	476
Temperature	−13	−10.5	−9.5	−9	−6.5	−7	−8	−9	−8	−8	−8.5
Mar. 13	454	435	435	458	499	526	440	355	315	383	398
	462	452	445	448	481	541	442	306	390	372	369
Temperature	−3	−1	−0.5	−0.5	0.5	0.0	−1	−1.5	−4	−5	−6.5
Mar. 14	473	465	436	433	460	437	508	498	515	388	514
	475	463	433	435	438	441	504	471	481	304	491
Temperature	−5	−3.5	−2.5	−2.5	0	−1	−2	−3	−5.5	−7	−8.5
Mar. 15	472	435	451	450	461	453	480	484	430	521	484
	457										
Temperature	−5.5	−4	−1	3	8	5	3	2	2	1.5	1
Mar. 16	435	422	430	430	436	451	467	520	525	618	468
		418	431	431	430	437	454	536	365	575	494
Temperature	2	−2	−0.5	−1.5	0	0	−1	−1.5	−3.5	−4.5	−5
Mar. 17	433	429	427	442	480	456	446	524	482	460	395
	435	429	424	448	472	458	455	503	467	485	410
Temperature	−0.5	0	0.5	0.5	2	2	1	1	−1	−1.5	−3
Mar. 18	428	429	425	460	422	472	460	451	450	432	438
	432	432	431	450	430	474	458	451	458	460	434
Temperature	0.5	1	1	2	4.5	3.5	2.5	1.5	0	−1	−2.5
Mar. 19	439	449	435	427	436	439	454	459	437	466	446
	446	445	437	427	436	439	456	460	453	457	489
Temperature	1	1	2	2.5	5	5	4	3	1	−1	−2.5
Mar. 20	453	440	437	438	477	445	461	462	439	402	518
	447	440	437	440	471	446	469	473	434	490	468
Temperature	−1.5	1	2	2	4	2.5	−0.5	−0.5	−2.5	−4	−5
Mar. 21	438	445	451	453	458	478	527	427	420	352	450
	443	445	448	461	476	490	553	437	452	340	486
Temperature	−0.5	1	2	2	2.5	3.5	2.5	1.5	−0.5	−2	−3
Mar. 22	440	442	588	506	667	551	412	409	391	254	436
	440	440	508	602	651	623	402	407	370	307	413
Temperature	0.5	2	2	2	4	4	4	4	3.5	3	2
Mar. 23	500	456	444	490	554	504	565	413	460	589	510
	488	446	445	489	522	538	544	500	472	598	530
Temperature	6	6	7	7.5	8	9.5	9	8	8	7	7
Mar. 24	521	492	493	564	520	616	635	570	324	600	504
	509	496	486	554	521	592	643	577	308	648	503
Temperature	6.5	7.5	8	8.5	8.5	9	9	8	8	7	7
Mar. 25	500	511	564	613	640	649	667	494	482	491	446
	503	523	568	614	651	653	671	555	481	504	444
Temperature	15	15.5	16.5	16.5	18.5	19.5	19	18.5	19.5	19.5	19.5
Mar. 26	325	336	361	376	396	448	415	534	45	295	355
	327	334	361	374	386	442	417	516	180	170	389
Temperature	26.5	27	26.5	28	27.5	25	24.5	23	20	18	16
Mar. 27	250	354	442	503	556	587	447	404	486	334	(−40−?)
	214	380	445	449	433	559	403	405	476	332	(−40−?)
Temperature	23	23	22.5	24	24	25.5	25	25	25	25	25
Mar. 28	450	398	454	488	590	528	389	373	268	464	360
	510	438	526	558	548	570	323	385	220	506	151
Temperature	27.5	26.5	26.5	25	24.5	23	21	20	18	17	15
Mar. 29	502	465	442	592	581	430	543	468	525	414	(−40−?)
	494	462	460	614	569	301	537	466	542	408	(−40−?)
Temperature	16	18	19	18.5	18.5	20	20	20	20.5	21	20.5
Mar. 30	405	403	522	401	489	426	324	392	432	440	260
	438	419	494	519	495	430	367	406	415	456	190
Temperature	28	29.5	29.5	29.5	29	29	29	28	26	24.5	23
Mar. 31	418	425	426	388	446	454	396	443	414	471	431
	409	432	426	403	472	465	380	445	416	474	433
Temperature	23.5	25	25	25.5	24.5	24	22.5	21.5	20.5	20.5	20
Mean temperature	2.6	3.5	4.2	4.6	5.9	5.4	4.7	3.9	2.8	2.0	1.0
Mean readings	462.5	458.3	481.8	510.7	512.1	510.8	489.7	4·1.9	419.1	439.1	410.2

ometer at Uglaamie, Alaska, March, 1883.

part of the ho izontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
440	441	332	80	422	104	40	500	116	(—40—?)	120	516	578	1
									(—40—?)				
10.5	10	10	8.5	8.5	7.5	7	6	5	4.5	4	3.5	4	
230	(—40—?)	318	(—40—?)	250	276	(—40—?)	377	333	367	290	499	356	2
212	325	291	(—40—?)	245	316	(—40—?)	358	310	520	503	439	465	
—5.5	—6.5	—8	—9.5	—10.5	—10.5	—11	—10.5	—11	—10.5	—10.5	—10.5	—9.5	
557	520	475	480	337	399	318	110	336	412	389	506	525	3
525	509	482	503	346	418	367	70	186	417	360	520	447	
—10	10	—10	—10.5	—10	—10	—10	—9	—9.5	—10	—10	—9	—7.5	
470	384	423	385	415	420	240	325	319	352	410	469	487	4
452	437	515	378	396	388	260	343	337	350	429	482	503	
—2	—2.5	—3.5	—4.5	—5	—5	—5	—5	—6	—6.5	—7	—6.5	—5.5	
430	352	438	458	409	324	441	413	489	538	487	490	473	5
394	563	405	456	426	355	447	445	492	530	492	463	476	
—5.5	—5.5	—5.5	—6	—6	—6	—5	—3.5	—2	—1.5	0	1	1.5	
518	474	410	463	385	259	297	395	359	223	160	461	491	6
476	479	344	409	390	389	270	418	419	260	132	475	493	
—3	—3.5	—4.5	—5	—6	—6.5	—6.5	—6.5	—7.5	—8.5	—8.5	—8	—7	
350	503	534	368	234	360	347	(—40—?)	90	528	517	483	[illegible]	7
302	528	490	394	195	341	338	(—40—?)	170	523	533	485	507	
—9.5	—9.5	—10	—10	—11	—11	—11	—10.5	—11	—11	—11	—10	—8.5	
235	434	258	479	(—40—?)	205	275	455	442	357	85	120	370	8
124	444	207	500	(—40—?)	160	290	469	446	300	152	143	410	
—10	—10	—10	—10.5	—10.5	—10.5	—10.5	—10	—10.5	—11	—11	—11	—11	
450	472	410	455	520	474	342	25	(—40—?)	290	482	501	481	9
396	479	400	510	509	486	366	12	(—40—?)	300	473	[illegible]	478	
—16.5	—17	—17.5	—18	—18	—18	—18.5	—17	—17.5	—17.5	—17.5	—17.5	—16.5	
562	485	471	370	241	378	351	350	202	262	410	442	480	10
535	540	503	398	244	392	339	350	173	267	406	450	485	
—18	—18.5	—19	—19	—19	—18.5	—19	—18	—18.5	—18.5	—18.5	—18.5	—18.5	
503	452	200	82	378	336	328	434	462	479	482	475	465	11
442	465	224	156	377	331	329	445	464	480	484	480	463	
—17	—17.5	—17.5	—18	—18.5	—18	—18	—17.5	—17.5	—17.5	—17	—16	—16	
464	465	468	459	290	226	458	470	350	490	400	406	523	12
415	469	471	468	264	196	509	441	280	478	362	429	514	
—9	—9.5	—10	—10	—10	—9.5	—9	—8	—8	—7.5	—7	—6	—4	
125	265	417	(—40—?)	420	434	315	433	472	485	480	477	470	13
243	302	442	(—40—?)	455	492	309	438	455	471	483	484	476	
—7.5	7.5	—7.5	—8	—8.5	—9	—8.5	—8	—8.5	—8.5	—8	—7.5	—6	
357	(—40—?)	10	270	383	454	414	361	349	483	463	507	494	14
379	(—40—?)	42	264	400	460	449	382	369	514	490	510	484	
—9.5	—10	—10	—10	—10.5	—11	—11	—10.5	—11	—10.5	—10	—9.5	—6.5	
249	388	412	434	455	377	381	427	412	430	453	451	438	15
—0.5	—1	—2	—2.5	—3	—3	—4	—3.5	—3	—3	—2	—1.5	0	
451	466	457	462	465	338	333	227	382	484	464	435	428	16
438	465	459	470	440	332	332	193	415	490	460	462	427	
—5.5	—6	—6	—6.5	—6	—6	—5.5	—5	—5	—4.5	—3.5	—3	—0.5	
468	429	400	417	440	455	422	379	408	453	426	386	453	17
425	430	435	418	388	462	418	372	402	467	438	412	449	
—3.5	—4	—4	—4	—4.5	—4	—4	—2.5	—3	—2.5	—2.5	—1	0	
490	442	475	135	305	438	439	496	441	432	399	459	450	18
439	470	479	54	328	454	437	457	442	437	402	453	449	
—3.5	—4.5	—4.5	—5.5	—6	—6	—6.5	—6	—6	—5.5	—5	—3	—1	
500	336	430	357	461	450	469	370	410	450	470	472	446	19
465	339	455	368	454	454	468	352	414	448	464	475	450	
—3.5	—4	—5	—5.5	—6	—6	—6.5	—6	—6	—5.5	—5	—4	—2.5	
373	475	455	462	467	471	456	478	474	460	467	459	453	20
455	471	469	466	470	476	466	470	471	462	469	467	456	
—6	—6.5	—7	—7	—7	—7	—7.5	—7	—7	—6.5	—5	—4	—2	
460	458	379	459	323	270	248	455	322	—20	(—40—?)	264	314	21
503	456	387	462	232	256	187	455	340	00	(—40—?)	240	312	
—4	—4.5	—4.5	—4.5	—4.5	—4	—4	—2.5	—2.5	—2.5	0	—0.5	1	
162	356	320	375	400	384	267	206	222	104	263	452	538	22
218	375	339	403	373	360	253	378	227	203	294	457	540	
1.5	1.5	1.5	2	2	2	2.5	3.5	3	3	3.5	4.5	5.5	
552	515	343	(—40—?)	230	240	240	240	243	338	472	470	502	23
514	514	343	(—40—?)	230	240	240	240	256	376	438	452	456	
7	6.5	6	5.5	5.5	5	4	4.5	6	5.5	5	5	5.5	
510	502	502	521	513	400	424	416	462	516	507	499	482	24
552	502	501	519	511	406	373	406	460	523	511	495	481	
6	6	6	6	6	5.5	6	6.5	8	10	11	13	14.5	
434	422	428	349	405	446	449	451	452	202	196	292	319	25
422	410	435	361	430	446	449	451	452	196	182	299	319	
19.5	20	20	21	21.5	22	22	21	21	23	24	21.5	27	
325	376	412	451	445	416	393	311	374	195	152	(—40—?)	140	26
315	337	385	436	270	403	395	288	308	210	161	(—40—?)	120	
15	14.5	14.5	14.5	14.5	14	14	15	15	17	18.5	19.5	21	
(—40—?)	246	378	135	254	148	274	265	(—40—?)	20	52	188	293	27
(—40—?)	254	383	206	284	200	263	225	(—40—?)	(—40—?)	15	145	250	
24.5	24.5	24	23.5	23	23	22	22.5	23	24	25	26.5	27	
270	71	255	268	374	160	395	180	290	105	382	305	504	28
322	(—40—?)	372	382	224	88	327	155	260	92	369	350	402	
13.5	12	10	9.5	8	7	6.5	7.5	8	9	10	12.5	14.5	
219	178	375	300	12	300	173	105	55	382	470	450	402	29
264	245	147	286	59	328	181	47	95	359	230	552	456	
19.5	20	20	19.5	19	19	19	20	21	21	22	24	26	
200	258	425	221	445	376	175	382	390	461	388	383	419	30
336	262	434	293	378	391	236	392	394	442	374	395	432	
21.5	20.5	20	19	17.5	16.5	15	15	15	15.5	17	19	20.5	
321	216	264	356	334	229	20	180	282	362	422	482	411	31
315	443	296	372	375	190	78	200	283	360	400	399	402	
20	19.5	19	18	17	16	16	16.5	16.5	17.5	19.5	20.5	21	
0.3	—0.1	—0.5	—0.9	—1.2	—1.4	—1.6	—0.9	—0.3	—0.6	0.0	0.9	2.1	
375.2	372.4	383.2	326.7	346.9	341.0	313.5	329.2	318.0	345.4	357.4	411.3	441.4	

Monthly means: Temperature, 1°.5; readings, 409.5

Hourly readings of the Brooke bifilar magnet

[One division of scale=.0006760

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Apr. 1	422 418	398	428	406	474	482	437	518	590	579	447
Temperature	21.5	20	20	20.5	22	20.5	22	20.5	19.5	17	16.5
Apr. 2	399	396 387	379 377	390 370	423 423	402 399	445 454	501 428	505 529	320 350	580 464
Temperature	13.5	13.5	13.5	12.5	13.5	13	12	11	8	6	5
Apr. 3	400 376	382 391	390 399	375 373	379 378	370 386	475 476	518 555	394 456	330 394	100 155
Temperature	9	10	11.5	11.5	9.5	9.5	9	7	5	3.5	2
Apr. 4	(—40 ?) (—40 ?)	198 211	442 423	409 443	460 488	419 481	468 484	416 408	279 349	110 160	444 441
Temperature	6.5	8	9.5	9.5	10	9	7	6	4	3	0
Apr. 5	392 397	432 419	346 359	402 398	416 460	397 387	393 405	402 388	426 480	381 378	65 60
Temperature	6.5	6.5	8	9	10	9	8	7	5.5	5	4
Apr. 6	358 369	408 421	351 353	464 444	457 465	533 553	462 419	445 436	422 443	418 408	348 341
Temperature	13.5	15.5	16.5	16	16.5	15	13.5	12	11	10	9
Apr. 7	356 358	360 356	352 348	380 367	352 348	370 366	360 376	379 390	344 368	373 407	374 367
Temperature	9.5	10	12	12	13	11.5	10	7	5	3.5	2
Apr 8	361 352	359 352	375 373	376 384	379 384	421 421	405 386	420 381	366 379	423 414	348 392
Temperature	7	8.5	8.5	9	9.5	9	7.5	5	3.5	1.5	0
Apr. 9	356 364	356 356	369 369	353 368	350 340	356 352	370 374	391 392	384 384	424 420	337 366
Temperature	5.5	5.5	5.5	8	9.5	9.5	8.5	7	5.5	4	1.5
Apr. 10	345 344	346 352	352 345	343 343	392 390	374 372	364 366	371 378	367 367	373 377	376 380
Temperature	5.5	6	7.5	7.5	9	9	8.5	8	7.5	7	6.5
Apr. 11	344 344	349 350	395 393	451 454	383 391	391 389	400 483	416 417	439 402	359 363	276 180
Temperature	9.5	11	12	11.5	13	12	12	11	9.5	8	7
Apr. 12	320 322	315 318	315 313	327 337	359 360	361 361	374 392	448 447	409 388	411 416	363 392
Temperature	11	12.5	13.5	13.5	14.5	15	13.5	13	11.5	10	8.5
Apr. 13	376 376	338 336	356 355	354 352	367 367	374 372	374 369	390 411	486 461	403 397	350 319
Temperature	16	17.5	17.5	18	18.5	18.5	17.5	16.5	15	14	13
Apr. 14	365 367	373 374	399 389	405 419	393 396	404 402	381 381	390 398	362 364	370 383	419 410
Temperature	19	20.5	21.5	22	23.5	22.5	21	20	17.5	15.5	14
Apr. 15	367 369	356	354	347	354	368	382	364	381	415	418
Temperature	18	20	22.5	21	22.5	20.5	23	20	19.5	19.5	19.5
Apr. 16	342	351 348	418 417	452 400	444 426	450 442	407 407	360 372	354 412	412 389	474 406
Temperature	24.5	24	23	21.5	21	20.5	19.5	18.5	16	14	12
Apr. 17	358 349	333 334	346 344	342 348	402 412	429 447	484 490	418 422	452 473	408 396	373 372
Temperature	8	10	8	8	9.5	9.5	8.5	7.5	6	4	2
Apr. 18	352 353	351 352	353 352	360 348	356 350	361 360	381 383	376 395	358 360	442 443	400 346
Temperature	9.5	10	11.5	11	12	11.5	11.5	10	7	5	8
Apr. 19	365 369	373 375	393 403	510 522	613 614	393 397	362 384	407 423	483 450	363 345	145 198
Temperature	6.5	7	8.5	8.5	10.5	10.5	10	9.5	8	7	6
Apr. 20	343 351	248 253	353 363	725 735	667 645	321 375	576 570	576 551	378 385	407 364	110 25
Temperature	11	12.5	14	14.5	16.5	17	16.5	16	15.5	15	14.5
Apr. 21	354 359	318 321	374 372	361 379	431 430	401 393	428 410	413 413	394 404	360 370	374 357
Temperature	21.5	22	22.5	23.5	25	25	26	25.5	24.5	24	23
Apr. 22	328 325	354 353	342 346	348 344	346 350	373 373	358 361	369 370	372 356	391 432	368 381
Temperature	20	21	20	19.5	19.5	19	18.5	18	16.5	15	14
Apr. 23	346 351	320 321	338 340		357 353	356 360	362 362	349 345	336 340	382 330	356 379
Temperature	21.5	21	21.5	20.5	21.5	21.5	20.5	19	17	15	13
Apr. 24	348 347	335 336	328 330	344 343	350 351	357 358	365 365	381 381	384 381	403 392	397 413
Temperature	17	18	19	18.5	19	18.5	18.5	18	17	15.5	14.5
Apr. 25	370 354	250 193	100 183	829 897	516 508	527 471	421 411	399 414	331 337	222 258	268 283
Temperature	20.5	20.5	21.5	22.5	23	24	24.5	22	22	21	20
Apr. 26	510 476	423 442	420 258	409 401	452 570	556 559	406 298	520 508	405 385	100 (—40 ?)	319 340
Temperature	27	28	28	28	29	29	28	27.5	26	25	24
Apr. 27	418 432	471 446	500 500	446 478	499 557	528 529	488 524	514 502	483 435	420 370	391 369
Temperature	24	25.5	28.5	28	30	30	30	28.5	26	24	22.5
Apr. 28	382 396	363 363	382 353	389 411	443 448	410 416	466 469	415 412	429 455	428 439	372 418
Temperature	28	29	31	31	32.5	32.5	32.5	21.5	29.5	27	24
Apr. 29	365 364	362 355	374 379	379 390	345 338	348 349	365 365	378 387	460 456	427 470	400 442
Temperature	28	29	30	28.5	30.5	30.5	30	27.5	26	24.5	23
Apr. 30	374 375	394 396	368 375	414 336	404 416	439 438	434 420	477 466	448 462	474 447	425 414
Temperature	25	27	27	26.5	27	26	24.5	24	22.5	21	20
Mean temperature	15.5	16.3	17.2	17.0	18.0	17.6	17.1	15.8	14.2	12.8	11.5
Mean readings	355.5	353.0	364.9	418.7	422.5	410.4	416.9	423.6	411.1	374.8	344.8

ometer at Uglaamie, Alaska, April, 1883.

part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
346	324	93	328	398	359	330	226	367	429	371	439	391	1
15.5	14.5	14	18	12	11	10	9.5	9	9.5	9.5	11	11	
345	504	427	261	310	269	224	(—40?)	333	390	362	341	354	2
378	402	240	200	247	293	270	(—40?)	336	399	368	339	368	
4	2.5	1	0	—1	—1.5	—2	1.5	0	0.5	3.5	5	7	
85	320	(—40?)	273	504	419	(—40?)	438	(—40?)	350	351	352	313	3
122	274	(—40?)	382	432	493	(—40?)	476	(—40?)	396	340	399	256	
0	—1.5	—2	—3	—4	—5	—5	—4	—3	—1.5	—0.0	2.5	4.5	
320	361	237	301	260	190	185	120	(—40?)	180	218	369	310	4
352	264	264	289	240	210	244	122	(—40?)	132	135	362	352	
—1	—2	—3	—4	—4.5	—5.5	—5.5	—5	—4	—3	—1.5	0	3.5	
120	350	376	205	(—40?)	242	320	336	356	121	202	263	316	5
149	321	379	304	(—40?)	236	319	343	298	108	270	250	319	
3	2.5	2.5	2	2	1.5	2	3	3.5	5	6.5	9	10.5	
198	365	321	349	132	190	258	266	313	350	334	366	347	6
220	375	375	332	153	218	260	280	298	363	334	370	349	
8	6.5	0	5.5	5	4.5	4.5	5	5	5	6	7.5	9	
380	389	390	359	335	303	379	386	381	382	380	372	367	7
428	312	357	354	408	354	382	380	384	381	383	370	362	
—0.5	—1	—1.5	—2	—2	—2.5	—2	—1	0	1	2	3.5	4.5	
385	342	225	345	238	20	160	108	202	316	330	363	326	8
354	374	257	336	257	60	190	60	193	302	327	372	328	
—2	—3.5	—4.5	—5.5	—6	—6	—6	—5	—3.5	—3	—1	1	3.5	
334	298	421	(—40?)	308	373	330	326	329	386	352	331	374	9
362	304	377	(—40?)	327	387	327	315	335	367	350	338	374	
1	0.5	—0.5	—1.5	—2.5	—2.5	—2.5	—1.5	0	3	3.5	4.5	5.5	
428	389	145	360	290	353	426	350	370	381	354	322	360	10
392	400	217	395	325	332	426	349	366	386	360	334	364	
5	5	5	4.5	3.5	4	4	4	5	6	6.5	7.5	9.5	
125	363	336	338	346	341	356	284	352	281	311	331	324	11
134	352	348	349	354	346	371	290	350	292	324	333	336	
6	5	4.5	4.5	4	4.5	4.5	5	5.5	6.5	7	9	10.5	
347	374	95	232	102	357	344	290	182	316	394	368	360	12
438	344	226	244	217	347	333	282	190	309	388	350	358	
7	5.5	4.5	4	3.5	4	5	6	7	9.5	11	13.5	15	
383	367	302	280	295	253	319	274	(—40?)	262	388	383	369	13
309	330	263	371	235	253	320	277	(—40?)	267	384	389	367	
11.5	9.5	8.5	7.5	6.5	8	6.5	7.5	8	10	12	14.5	17.5	
378	402	362	395	388	318	359	378	376	388	392	381	364	14
403	386	392	410	382	365	340	382	386	385	390	378	365	
12.5	10.5	10	8.5	8	8	8	8.5	10	11.5	13	15.5	17	
392	359	377	373	334	280	(—40?)	350	377	412	387	382	345	15
18	18	18	18	17	17	17	16.5	17.5	19	21	22	23	
402	89	434	332	297	306	338	389	390	315	321	377	358	16
383	185	447	376	340	272	410	400	415	313	325	373	367	
9.5	9	7	5.5	4	3	2.5	3.5	4	4	5	6	6	
365	301	227	350	331	357	350	382	363	377	320	383	360	17
357	475	198	361	328	330	368	360	364	373	326	375	364	
1	—1	—2.5	—3.5	—4	—4	—4	—2	—1	0	2	4.5	7	
347	332	428	316	290	347	170	179	210	329	336	318	343	18
278	284	416	382	358	253	150	140	200	332	331	321	345	
1	—1.5	—3	—4	—5	—5.5	—5.5	—4.5	—3.5	—3.5	0	3	5.5	
320	7	206	304	371	122	243	296	(—40?)	118	(—40?)	(—40?)	192	19
335	38	272	288	362	89	263	280	(—40?)	150	(—40?)	(—40?)	195	
4.5	4	3.5	2.5	3	3	3	4.5	4.5	6	8	9	11	
250	285	380	67	335	400	259	309	(—40?)	364	305	450	409	20
294	272	369	95	242	413	238	380	(—40?)	369	299	435	399	
14	13	13	12	12	12.5	13	14	15	17	18	20	21.5	
345	138	300	341	321	373	391	372	387	370	365	353	353	21
370	260	254	347	328	378	388	366	392	366	366	360	354	
21	20.5	20	20	19.5	19	19	19	18.5	18.5	18.5	19	20	
381	327	390	342	384	390	292	235	384	416	363	334	352	22
325	337	398	339	373	388	280	250	392	414	368	331	356	
12.5	11	11	10	10	10.5	11	12	13.5	15	18.5	19.5	21	
430	360	418	404	401	268	367	374	394	388	337	360	360	23
408	394	378	367	332	274	368	375	395	394	333	367	360	
11	10	9.5	8	7.5	7.5	7.5	9	10.5	12	13.5	15	17	
370	395	441	445	442	470	220	460	402	(—40?)	—25	(—40?)	—10	24
389	386	400	410	459	505	244	548	359	0	102	(—40?)	(—40?)	
12	11.5	11	10	10	10.5	11	12.5	14	16	18	18	20.5	
331	195	78	120	292	360	335	270	372	340	457	270	261	25
348	154	208	13	272	353	327	259	201	369	450	370	269	
18	17	17	17	17	17	18	19.5	20	21.5	23	25	27	
358	378	295	304	405	355	240	40	(—40?)	(—40?)	292	331	394	26
370	329	312	341	381	363	239	(—40?)	150	—30	320	416	489	
28	21.5	20.5	20	19.5	19.5	19	20	20	21	22	23	24	
376	(—40?)	266	124	90	158	297	245	260	340	219	318	427	27
264	35	223	169	170	271	289	209	252	344	332	319	417	
21.5	20	19	18	17.5	17.5	18	19	19	21	22	27	28	
375	267	286	319	283	278	285	242	269	301	386	303	378	28
382	256	362	258	210	251	286	245	278	300	388	395	377	
23.5	22	21	20	19.5	19	19	20.5	22	23.5	25	26.5	28	
411	463	338	215	270	237	292	270	299	144	327	392	372	29
418	380	332	257	283	245	308	274	297	159	325	395	370	
21.5	20	19	18	17.5	17.5	17	18	18	19	22	24	25	
432	390	140	295	205	215	227	117	72	—35	3	176	375	30
428	402	45	369	237	247	153	105	12	(—40?)	66	189	380	
18.5	17.5	16	15	15	14.5	14	15	15	15.5	16.5	19	19	
10.0	8.9	8.2	7.3	6.8	6.0	6.7	7.6	8.0	9.5	11.0	12.8	14.5	
336.8	311.0	290.8	291.9	299.4	303.9	276.1	274.6	245.1	289.0	310.3	329.4	339.9	

Monthly means: Temperature, 12°.1; readings, 341.5

Hourly readings of the Brooke bifilar magnet

[One division of scale=.0000760

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
May 1	394	340	325	356	433	474	577	488	420	500	437
	392										
Temperature	19	20	20	19.5	20	19	19.5	18.5	17	16	16
May 2	355	446	623	581	554	476	355	452	540	289	444
		446	594	563	534	480	365	422	438	276	488
Temperature	25	24	24	20.5	20	20	18	16	14.5	13	11
May 3	383	408	428	397	377	442	424	453	406	419	358
	383	408	428	393	386	433	415	402	430	473	306
Temperature	16	16.5	17	17	17.5	17	16.5	16	15.5	14	13
May 4	352	348	354	399	502	462	400	372	335	403	433
	370	350	353	386	510	454	401	373	332	407	402
Temperature	22	20.5	20.5	20	20	20	19	18	17	15.5	14
May 5	343	352	320	361	444	404	394	438	404	397	390
	336	353	334	363	441	412	404	447	412	398	392
Temperature	21	21.5	22.5	22	23.5	22.5	23	22	21.5	21	20.5
May 6	378	334	352	412	351	430	474	565	552	513	413
	382	340	350	424	349	449	469	555	554	529	411
Temperature	36	37.5	39	39	38.5	38	38.5	37	36	34.5	38
May 7	351	381	367	402	465	546	496	472	598	483	415
	364	379	367	406	462	547	468	433	580	447	413
Temperature	31.5	30.5	30	29	30	29	26.5	25	24.5	23.5	23
May 8	362	362	378	365	391	414	397	438	396	411	450
	362	366	374	373	387	420	381	435	391	410	436
Temperature	29.5	31	32.5	33.5	33.5	34	34	33	32	31	30
May 9	353	356	377	358	380	380	406	377	444	466	435
	386	364	363	374	396	392	400	387	418	420	379
Temperature	38	39.5	39.5	38	39	37	34.5	34.5	33	32	30
May 10	359	369	357	358	421	362	382	423	390	388	396
	352	360	354	356	428	382	395	402	386	415	405
Temperature	35	37.5	39	38.5	39.5	37	35	36	34	32.5	31.5
May 11	360	356	400	410	340	406	390	416	419	395	451
	355	352	417	403	404	397	384	401	414	391	443
Temperature	40	40.5	41.5	40	39.5	40	37.5	35	33.5	33	32.5
May 12	385	398	387	427	467	458	479	528	479	472	458
	385	394	383	418	466	471	478	536	449	462	444
Temperature	37	37.5	38.5	37.5	36	36	36	34	33	32	31
May 13	372	371	382	386	372	412	424	414	456	420	494
	372	372	384	390	387	388	418	408	443	447	492
Temperature	37	37	37	35.5	35.5	36.5	35	35	33	32	31
May 14	364	379	389	486	580	683	740	617	493	504	445
	368	378	390	494	592	661	722	601	474	474	458
Temperature	33.5	34	34	34	34	33	32	33	32	31	30
May 15	377	368	361	364	361	400	449	432	407	350	470
	375										
Temperature	43	40.5	47.5	42	45.5	46.5	48	47	47	44	41.5
May 16	358	380	368	384	470	417	443	551	566	368	490
		377	370	382	474	413	449	560	565	371	520
Temperature	42	41.5	40	39	39	39.5	38	38	36	35	34
May 17	496	400	386	381	369	400	398	400	428	540	488
	494	403	369	381	375	407	390	393	413	521	429
Temperature	44	43	43.5	42.5	42	41.5	40	39	37.5	36	35
May 18	413	364	556	478	362	510	422	478	432	454	419
	410	366	548	446	371	506	415	491	420	443	440
Temperature	35.5	34.5	35	35	35	34	33	33	32	31	30.5
May 19	384	354	389	390	396	424	628	689	529	435	487
	385	354	391	389	400	422	640	687	474	394	462
Temperature	37	38	38.5	38	38	36	35	34	33	31.5	29.5
May 20	400	381	408	389	381	384	610	408	434	446	426
	409	408	412	391	378	390	598	411	380	411	400
Temperature	39	38	37.5	37	37	36.5	37	36	34	33	31.5
May 21	389	408	370	564	481	144	309	467	368	(—40—?)	470
	376	398	362	578	507	150	311	449	212	50	419
Temperature	42	43.5	45	44	44	46	45	42	41	37	34
May 22	501	463	456	460	554	482	420	540	370	457	325
	620	468	478	462	552	704	418	575	335	352	429
Temperature	42.5	44	45	43.5	43	42	39	36.5	35	33	32
May 23	500	466	519	418	632	699	486	610	555	365	345
	482	486	522	429	634	631	474	590	590	340	435
Temperature	36	37	37	36.5	36.5	37	36	35	32	32	31.5
May 24	404	419	381	393	433	462	470	475	492	590	480
	410	420	378	392	421	461	472	486	466	510	538
Temperature	39	40	41	41	41	41	39.5	38.5	36	34.5	33.5
May 25	382	458	423	438	443	430	447	550	437	439	439
	390	486	423	428	446	427	440	525	422	449	450
Temperature	48	43	44	44.5	44	43.5	42.5	41	40	39	38
May 26	389	382	324	420	488	490	453	403	563	468	404
	365	324	320	392	510	520	451	431	515	500	401
Temperature	50	51	51	50	48.5	49	48.5	46	44	43	41
May 27	392	382	414	420	455	466	610	429	399	440	600
	403	376	433	362	431	470	596	419	437	469	200
Temperature	49	50	50	49	48	47	46	44	41.5	39.5	38.5
May 28	487	520	626	429	440	536	436	430	536	555	502
	462	558	618	465	464	542	434	449	580	521	503
Temperature	48	49	50	48.5	45	46	44.5	43	42	41	39
May 29	452	384	403	446	447	420	458	521	547	536	180
	458	382	400	426	459	412	476	512	576	461	163
Temperature	53	54	54.5	53	51.5	50.5	49	46	44	42.5	41
May 30	396	350	352	449	496	503	428	384	412	503	521
	394	352	403	457	510	517	430	384	408	496	465
Temperature	41	41	40.5	39.5	40	40	40	39	39	38	38
May 31	405	453	456	412	513	557	786	485	460	538	477
	410	451	453	424	530	543	768	474	459	498	446
Temperature	41	42	43	41.5	41	40.5	39	38.5	37	37.5	36.5
Mean temperature	37.0	37.3	38.0	37.0	37.0	36.6	35.6	34.5	33.1	31.9	30.7
Mean readings	396.8	391.3	408.0	416.4	448.3	457.4	469.0	472.9	452.8	429.1	429.3

ometer at Uglaamie, Alaska, May, 1883.

part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
362	252	280	332	328	305	283	(—40—?)	83	192	216	237	218	1
15	14	13	12	10	11	12.5	14	15.5	18	20	22.5	24	
364	255	(—40—?)	5	20	308	300	223	317	231	219	326	366	2
379	203	(—40—?)	(—40—?)	180	320	289	226	302	223	199	339	361	
9.5	7.5	6.5	5.5	5.5	5.5	6	8	9	10.5	12.5	14	16	
210	364	(—40—?)	369	352	346	359	318	350	322	340	376	343	3
125	318	(—40—?)	289	340	341	357	310	348	331	337	373	360	
11.5	10	8.5	8	7	7.5	9	11	12	13	14	17.5	22	
253	371	396	287	337	312	341	263	232	248	319	347	350	4
124	392	360	314	340	311	335	249	224	222	322	340	376	
13	11.5	11	10	10.5	11	12	13.5	14.5	16.5	17.5	19.5	21	
374	380	350	225	131	246	223	198	176	(—40—?)	230	300	310	5
375	379	332	231	157	215	212	181	172	(—40—?)	236	293	312	
20	20	20	20	20	20.5	21	23	25	27	28.5	32	35	
359	343	402	79	268	364	379	334	294	358	374	296	403	6
344	365	408	(—40—?)	297	363	384	303	286	352	380	294	400	
32	31	31	31	32	32	32	32.5	32	31.5	31.5	32	32.5	
428	205	304	427	374	377	469	333	260	402	403	388	377	7
445	236	207	445	356	380	488	328	272	405	409	392	378	
22	22	21	21	21	21.5	22.5	23.5	24	25	26.5	28	29.5	
338	375	359	340	354	382	404	345	421	342	362	247	340	8
342	355	341	326	385	387	401	334	417	337	348	364	343	
29	27.5	27	26.5	26	26	26	27	27	29.5	31.5	34	36.5	
423	400	338	370	345	320	378	268	287	313	382	386	361	9
435	412	395	362	358	320	379	260	303	318	390	393	358	
28.5	28.5	28	27.5	28	28	28	28	28	29	30	32	34	
391	403	354	385	352	359	373	241	259	287	327	375	339	10
380	415	381	397	345	368	374	240	262	296	343	380	340	
30	29	28	28	28	28.5	29	30	31.5	34	36.5	39	40	
486	355	368	260	368	362	378	430	421	308	382	361	380	11
512	349	340	296	379	365	377	428	429	396	381	364	378	
32	31.5	31	30.5	31	31	32	32.5	33.5	35	36	36.5	38	
427	385	402	400	384	387	378	378	396	416	357	355	381	12
433	410	406	377	374	390	374	380	395	411	354	353	380	
30	29.5	29.5	29.5	29	29	30	29.5	31	33	34.5	36	37	
442	430	435	387	322	384	253	160	290	409	376	368	367	13
494	409	408	374	370	388	240	124	293	406	370	365	362	
30	29	28.5	27.5	27.5	28	28	29.5	30	30.5	32	33.5	33.5	
369	332	430	426	295	332	431	444	447	458	412	411	393	14
376	349	418	447	313	358	430	446	443	450	406	413	388	
29	2.9	28.5	28	28.5	29	30	31	33	35	37	39	42	
363	365	332	357	389	273	303	140	286	348	446	400	373	15
40	38.5	37.5	37	36	36.5	37	37	37.5	39	40.5	42	43.5	
426	316	372	538	446	402	246	294	438	486	420	419	408	16
442	284	165	552	456	378	276	311	405	482	422	421	413	
33	33	33	32.5	33	33.5	34	35	37	39	41	42.5	44.5	
402	428	394	400	425	457	297	342	278	280	432	430	413	17
378	393	400	426	422	441	306	302	238	209	421	419	408	
33.5	33	33	32	32	32.5	32.5	32.5	32.5	32.5	33	34	36	
472	459	378	365	397	368	338	409	450	448	427	392	405	18
453	446	331	377	401	364	325	419	472	446	430	373	410	
29	29	28.5	28	28.5	29	30	31	31.5	33.5	34	36	38	
545	531	385	185	235	275	278	200	52	510	504	468	404	19
526	495	424	73	250	257	289	170	68	520	511	460	393	
28	26	25	24	25	26.5	27.5	30	31.5	32.5	35	36.5	38	
439	434	430	345	458	364	320	295	—20	(—40—?)	142	293	399	20
420	412	453	386	437	337	323	300	5	(—40—?)	110	307	396	
30	28	27	26	26	28	29.5	31.5	32.5	35	36	38	40	
414	125	142	418	(—40—?)	20	228	278	277	357	116	(—40—?)	346	21
386	(—40—?)	220	508	(—40—?)	(—40—?)	274	325	179	370	156	(—40—?)	480	
31.5	31	29.5	28	28.5	29	30	32	34	36	37	39	42	
250	303	244	315	310	345	330	270	265	436	334	462	382	22
64	291	265	378	366	315	324	241	273	462	372	451	358	
30.5	30	29.5	29	29	29.5	30	30.5	31.5	32	33	34	35	
350	379	374	412	250	337	186	343	477	461	412	413	408	23
378	392	375	389	301	349	200	357	476	464	414	416	408	
31	30	30	29.5	30	30	31	32.5	34	34.5	35	37	38	
392	400	341	424	318	254	187	110	211	312	332	500	403	24
465	374	295	246	260	208	220	146	219	366	335	482	408	
32.5	31.5	31.5	30.5	31	31.5	32	33	35	36.5	38	40	42	
495	478	423	369	300	150	279	350	329	288	409	348	321	25
510	469	440	385	312	125	285	358	349	290	391	341	315	
37	36.5	36	36	37	37	38.5	38.5	40.5	41.5	43.5	46	48	
366	147	88	290	360	256	70	212	199	66	432	432	458	26
330	225	84	315	321	252	70	234	170	49	428	427	450	
40	39.5	39	39	39	39.5	40	40.5	43	43.5	45.5	47	48	
285	398	316	73	323	430	425	427	382	367	275	269	420	27
308	414	192	15	334	455	430	430	368	377	264	277	424	
38	37	36	35	35.5	37	37	37.5	39	40	42	44.5	46	
388	395	157	296	313	178	(—40—?)	10	414	424	457	320	403	28
445	216	205	259	323	130	(—40—?)	60	426	428	452	324	467	
38	37.5	37	36	36.5	36.5	39	36.5	41.5	44	47	48.5	51	
454	375	405	302	281	210	155	341	372	428	404	358	384	29
470	398	426	275	301	178	158	354	388	423	402	356	386	
39	38	37.5	37	37.5	37.5	38	38.5	39	39	40	40.5	41	
449	367	392	443	353	314	110	209	352	430	391	339	370	30
450	342	428	449	284	327	120	198	348	436	386	350	378	
37.5	37	36.5	36	36	37	37.5	38	39	38.5	39	39	41	
409	260	412	348	358	325	245	224	378	332	438	419	414	31
445	121	424	332	348	313	243	231	374	336	432	418	425	
36	36	35	35	35	35.5	36	37	38	39.5	41.5	42	44.5	
29.5	28.8	28.2	27.6	27.7	28.2	29.0	29.8	31.1	32.4	33.8	35.5	37.3	
388.8	341.8	315.0	319.9	317.6	308.9	289.3	269.2	300.7	332.8	357.0	356.0	379.5	

Monthly means: Temperature, 32°.8; readings, 377.0

Hourly readings of the Brooke bifilar magnet

[One division of scale =.0000760

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
June 1	407	376	383	425	490	431	430	415	339	379	430
	400										
Temperature	45	44	49	51	51.5	56.5	52	48	45.5	48	48
June 2	486	348	432	448	500	522	616	535	629	592	278
		348	433	456	528	542	658	514	656	620	330
Temperature	55	53.5	52	50.5	48	48	47	45	43.5	42	41
June 3	372	523	408	461	524	432	464	521	602	428	255
	368	566	478	458	515	416	452	386	557	449	421
Temperature	44.5	47.5	49	48	48	47.5	47	44.5	42.5	41.5	40
June 4	392	395	411	430	390	474	511	486	525	570	542
	274	403	418	410	373	478	484	514	462	544	499
Temperature	44	43	43	42	40.5	40.5	40	39	37.5	36.5	35
June 5	373	366	374	356	381	389	396	397	396	410	413
	382	373	378	356	395	363	386	374	399	413	419
Temperature	44.5	46	47	47.5	48	47	46	44	44	42	39
June 6	386	352	349	376	394	434	473	550	566	470	240
	384	343	345	468	446	426	472	569	527	490	312
Temperature	45.5	46	48	49	48	48.5	47	45	44.5	43	41.5
June 7	327	362	378	388	436	445	462	595	610	549	419
	328	367	378	390	450	443	476	546	575	541	419
Temperature	52.5	52	53	53	52.5	53	51.5	49	48	46	44
June 8	360	364	412	502	451	408	569	588	480	437	474
	353	363	439	484	468	470	565	582	511	431	478
Temperature	50	49	48.5	47.5	46	45.5	44.5	42.5	42	41	40
June 9	382	400	352	404	443	619	643	625	633	343	459
	393	408	356	410	445	651	632	562	580	396	498
Temperature	46	46	46	46.5	44.5	44	42.5	41	40.5	39.5	38
June 10	414	400	432	396	389	396	397	399	416	443	460
	417	402	418	396	375	398	409	389	415	417	448
Temperature	43	43.5	44	44.5	44.5	44	43	42	41	40	39
June 11	336	288	300	439	509	516	591	582	572	518	406
	332	291	303	443	510	520	587	558	510	522	435
Temperature	53	54	53.5	53.5	58.5	53	51.5	49	46.5	44	42.5
June 12	361	368	385	368	379	388	460	388	412	445	509
	358	368	386	364	377	398	421	416	421	456	444
Temperature	48.5	49	49	49.5	49	48	46	44	43	42.5	41.5
June 13	403	419	388	374	373	465	642	671	470	390	406
	405	417	390	375	361	473	700	639	457	402	481
Temperature	45.5	46	46.5	46.5	46.5	46	44.5	42.5	42.5	42	41.5
June 14	332	370	334	481	474	461	437	584	569	545	501
	330	363	375	470	440	445	441	581	556	574	484
Temperature	48	46.5	49	46.5	44.5	44.5	44	43	42.5	41	40
June 15	366	353	319	335	367	333	332	341	372	334	406
	376										
Temperature	45	47.5	51	51.5	52.5	52	52	51	51	49	49
June 16	320	334	347	336	380	384	412	387	401	386	370
		338	346	346	368	388	431	401	403	309	409
Temperature	53	52	51	49.5	48	47.5	46	44.5	44.5	43	42.5
June 17	323	364	354	440	890	704	688	800	519	447	313
	332	363	360	435	856	740	712	824	449	380	341
Temperature	51	51	50	49.5	49	48.5	47.5	46	44	43	42
June 18	312	500	313	561	571	400	620	613	346	375	87
	327	553	328	558	531	888	613	510	413	360	240
Temperature	50	52	52.5	53	53.5	52.5	52	50	48	46.5	46
June 19	368	400	406	442	702	442	614	607	591	515	408
	322	400	402	480	660	445	550	511	580	518	509
Temperature	46.5	48	48	47	47	46.5	45.5	44	42	41	40
June 20	402	419	411	413	460	531	590	567	580	475	490
	400	421	414	416	426	553	578	652	536	543	497
Temperature	49	49.5	50.5	49.5	49	47.5	46.5	44	44	42	41
June 21	372	324	587	460	414	390	573	491	449	410	429
	373	335	590	449	412	394	539	490	459	391	446
Temperature	50	53	53	51.5	51	50	48.5	46.5	45	43.5	42
June 22	350	382	371	354	371	387	377	389	374	458	461
	348	385	364	368	375	379	429	409	357	446	455
Temperature	48.5	49.5	50.5	50	49	48.5	46.5	45	42.5	41.5	41
June 23	411	486	484	696	744	618	601	286	515	489	438
	437	480	530	740	702	692	571	210	610	470	421
Temperature	45	45	46	46	44.5	43.5	42.5	41	40	39	38.5
June 24	411	460	503	608	452	518	569	672	514	426	488
	400	453	506	616	458	509	568	668	507	477	492
Temperature	42	42.5	42	42	42	42	42	41	41	40.5	40
June 25	402	392	385	460	403	462	448	404	412	442	440
	398	390	400	436	373	458	459	439	413	439	428
Temperature	44	44.5	45.5	45.5	45.5	45.5	44.5	43	42	41.5	40.5
June 26	388	484	441	447	406	432	397	449	580	408	586
	378	453	453	439	405	416	398	444	590	523	532
Temperature	41.5	41	42.5	44	44	44	43.5	42.5	41.5	41.5	41
June 27	395	418	418	438	429	430	690	502	620	488	(—40?)
	392	412	407	426	419	422	714	504	629	482	(—40?)
Temperature	42	42	42	41.5	41.5	41	41.5	40	41	41	40
June 28	450	467	535	596	549	678	543	410	468	469	422
	456	472	587	618	563	716	521	458	506	487	442
Temperature	46.5	46	46.5	46	46	45	44	43	43	42	41.5
June 29	287	321	362	342	380	475	413	402	514	563	400
	300	326	360	354	374	453	409	403	513	568	387
Temperature	58.5	58.5	58.5	58.5	57.5	58	56.5	55	54.5	52	50.5
June 30	328	436	446	470	446	439	652	724	480	519	544
	331	438	462	468	442	428	624	710	496	518	408
Temperature	55.5	54.5	54	54	54.5	54	53	50.5	50	49	48
Mean temperature	47.8	48.1	48.7	48.5	48.0	47.6	46.6	44.8	43.9	42.8	41.8
Mean readings	372.1	397.2	405.8	444.3	467.3	470.6	518.5	503.7	496.4	465.7	410.0

ometer at Uglaamie, Alaska, June, 1883.

part of the horizontal force.]

11ʰ	Noon.	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Date.
470	333	387	386	359	277	228	145	27	(—40?)	89	223	233	1
45	45	45	45	44	45	46.5	47.5	50	51	53	54	55	
378	500	482	(—40?)	417	437	171	178	298	—20	403	158	248	2
359	440	447	(—40?)	390	398	242	234	255	5	482	130	282	
40	39	38	37	36.5	36.5	37	37.5	38	39	40	41.5	43	
438	439	414	432	400	416	274	246	428	366	387	302	500	3
440	392	423	366	423	420	271	271	452	330	381	355	478	
39	38	37	36.5	36.5	37	38.5	38.5	39.5	40.5	41	42	43	
390	382	328	341	354	276	435	462	419	339	370	391	386	4
404	432	261	365	355	282	418	459	412	341	400	392	386	
33	32.5	32	32	32	32	32	34	35.5	37	39	41	42.5	
424	414	402	415	378	400	427	409	440	439	423	492	438	5
439	425	417	400	374	386	421	411	443	442	426	495	418	
37	36.5	36	35.5	35.5	35	35.5	36.5	39	40	41.5	43	45	
(—40?)	488	424	395	320	20	210	(—40?)	80	—25	239	327	332	6
(—40?)	452	510	416	5	95	212	(—40?)	42	—17	242	320	327	
39.5	39	38	38.5	38.5	40.5	41.5	44	45.5	46	47.5	49	51	
501	467	372	345	178	268	282	300	340	294	358	363	358	7
446	474	359	330	180	284	287	282	334	297	342	372	354	
43	42.5	42	41.5	41.5	41	41	41.5	42.5	43.5	45	46.5	51	
418	447	175	191	209	185	92	167	132	163	326	399	368	8
430	422	79	264	234	157	79	205	140	203	317	390	378	
39	38.5	38	37.5	38	38	38.5	39.5	40.5	41.5	43	44	47	
405	437	398	(—40?)	206	300	280	169	55	132	417	430	403	9
436	428	409	(—40?)	248	300	294	145	62	120	401	422	404	
37.5	37	36.5	36	35.5	35.5	35.5	36	36.5	37	39	40.5	42.5	
430	400	422	360	288	270	264	264	249	388	328	309	262	10
452	398	414	380	318	264	258	251	253	389	332	317	264	
38	37.5	37.5	37.5	38	38.5	39.5	40.5	42	44	46	48	51	
354	402	414	395	477	457	379	358	452	463	438	402	400	11
375	460	418	414	479	460	362	309	454	460	439	399	398	
42	41	40	39.5	39.5	39.5	40.5	42.5	43.5	44.5	45	46.5	48	
431	474	498	165	270	303	362	494	473	418	412	388	442	12
452	445	482	80	305	319	365	484	468	426	410	390	416	
41	40.5	39.5	39.5	39.5	39.5	39.5	40	41	41.5	42	43	43.5	
364	370	372	455	427	371	436	295	452	420	349	410	413	13
368	340	371	480	416	371	441	318	448	427	343	406	400	
41	40.5	40	40	40	40	40.5	41.5	43	44	45	46	48	
461	466	417	388	371	283	275	408	279	335	375	382	388	14
458	465	362	394	361	286	276	385	326	361	378	382	388	
40	40	40	40	39.5	39.5	39.5	39.5	40.5	40.5	42	43.5	44	
412	389	398	401	380	370	410	395	337	238	366	353	327	15
48	46.5	46.5	46.5	46	46.5	46	46.5	47.5	48	49.5	51	52.5	
398	451	415	403	409	396	418	368	192	200	388	352	370	16
394	428	412	409	409	398	416	356	203	211	383	340	320	
41.5	41	41	40	40.5	40.5	40.5	41	42.5	43.5	45.5	48	50	
470	175	345	398	487	469	60	10	305	357	330	242	388	17
459	(—40?)	253	372	479	468	38	70	312	410	362	253	407	
41	39.5	38	38	38	38	39	39.5	41	43	45	46	47.5	
365	234	421	270	392	365	170	(—40?)	210	357	352	494	342	18
331	316	375	247	393	348	184	(—40?)	262	403	363	476	325	
43.5	42.5	42	41	40.5	40	40.5	41	41.5	43	44	45	46	
(—40?)	418	413	454	219	364	(—40?)	38	362	417	419	352	378	19
(—40?)	375	391	425	253	366	(—40?)	35	384	450	415	357	366	
39.5	39	38.5	38	37.5	37.5	37.5	38	39	41	43	45.5	47.5	
418	576	421	372	394	350	265	(—40?)	323	220	282	236	351	20
401	525	442	421	410	347	260	(—40?)	350	242	307	244	317	
40	39	38	38	37.5	38.5	39.0	40.5	41.5	43	44	47.5	49	
465	462	405	430	392	407	350	368	334	364	352	396	382	21
445	421	452	453	425	390	350	367	328	362	357	392	385	
40	40	39.5	39	38.5	38	38	38.5	39	41	42.5	44.5	47.5	
467	463	418	392	333	355	140	136	—20	399	502	342	372	22
481	478	402	410	345	340	145	157	67	382	494	210	404	
40	39	38	38	37.5	37.5	37.5	38.5	39.5	41	42.5	44.5	45	
23	442	333	312	350	232	316	419	344	299	202	398	438	23
95	234	137	334	340	240	310	439	322	324	230	392	477	
38	38	38.5	39	38.5	38	38	38.5	39	39	49	40	41	
454	462	450	394	346	318	317	280	402	298	452	412	429	24
454	512	441	404	376	308	326	251	412	319	455	396	429	
40	39	38.5	38	38	37.5	37.5	38	39	40	42	42.5	42.5	
485	444	426	402	380	379	276	332	102	174	433	412	446	25
463	458	417	394	403	391	258	334	96	102	444	401	446	
40.5	40	39.5	39	39	38.5	38	38.5	39	40	40.5	41	41	
430	488	361	390	390	393	93	75	420	422	355	404	397	26
450	498	332	403	371	370	(—40?)	40	428	393	342	387	401	
41	40	40	40	39.5	39	39	39.5	39.5	40.5	41	41	41.5	
265	316	397	(—40?)	293	243	465	357	388	10	(—40?)	208	481	27
372	410	407	(—40?)	309	195	497	358	405	—22	(—40?)	319	439	
40	40.5	41	41	41	41	41.5	42.5	42.5	43	43.5	44.5	45	
402	256	240	409	345	272	186	203	321	290	282	299	273	28
417	245	269	418	344	257	184	209	324	287	332	292	280	
41.5	41.5	42	42	42.5	43	44	47.5	49	51.5	53.5	55	57	
477	455	424	364	397	333	124	300	398	252	335	352	368	29
498	449	431	378	398	291	170	301	392	259	350	357	372	
49.5	49.5	49	48	48	47.5	47	46.5	47	48	49.5	51	53.5	
385	468	286	330	(—40?)	333	158	520	324	442	352	319	332	30
361	403	278	283	(—40?)	330	188	500	350	482	398	412	330	
47	46.5	46	45	45.5	45	45	44.5	44	45	45	47	48.5	
40.9	40.3	39.8	39.6	39.4	39.4	39.8	40.6	41.6	42.7	44.0	45.4	47.0	
381.5	406.3	380.6	329.7	337.6	325.9	258.2	253.8	299.2	284.3	348.3	353.6	374.5	

Monthly means: Temperature, 43°.7; readings, 387 1

Hourly readings of the Brooke bifilar magnet-

[One division of scale = .0000760

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
July 1	476	432	690	638	453	696	621	449	611	409	160
	487										
Temperature	50	55	57	58	57.5	57	57.5	54	56	54.5	53.5
July 2	307	497	374	439	410	494	504	537	240	435	395
		422	400	401	500	540	456	502	295	465	419
Temperature	58.5	55.5	53	50	48	47	46	45	45	45	44
July 3	416	400	403	430	446	440	540	497	449	556	446
	409	357	405	442	407	466	516	520	451	544	446
Temperature	43	44	43.5	45	44.5	44.5	43.5	43	43.5	43	42
July 4	321	372	450	571	502	420	578	519	605	550	508
	317	377	442	585	512	419	582	529	588	510	491
Temperature	54.5	55	55	55	54.5	53	51.5	49	48	48	46.5
July 5	369	335	374	630	474	396	564	603	564	452	346
	350	342	368	567	452	376	574	591	602	527	333
Temperature	50	52	53	51.5	50	49	48	46.5	46	45	44
July 6	358	340	433	724	576	603	599	684	536	560	479
	360	343	440	696	595	596	621	632	561	551	496
Temperature	48.5	49	48	48	47	46.5	45	43.5	43.5	43	42.5
July 7	417	404	450	396	334	492	366	487	500	391	441
	419	419	455	397	330	498	392	475	529	412	454
Temperature	46	47.5	48.5	49.5	50.5	51	50	49	46.5	47.5	46.5
July 8	411	388	405	376	381	383	614	657	456	474	220
	413	394	408	372	379	386	594	623	420	450	191
Temperature	53	52	52	53	53.5	53.5	54	53	53.5	53	52
July 9	431	444	491	409	375	380	412	391	424	440	417
	419	450	472	411	373	394	426	413	420	404	463
Temperature	46	46.5	46.5	47	46.5	46.5	46.5	45	45	44	43
July 10	356	386	348	498	576	890	473	525	434	306	385
	349	385	350	482	556	932	514	515	464	65	356
Temperature	51.5	51.5	51	48.5	47.5	46.5	45	43	42.5	41.5	40
July 11	352	374	401	614	445	412	366	337	464	520	449
	349	365	368	608	453	415	374	368	480	493	447
Temperature	45	46.5	47.5	46.5	47	47	47	45.5	45	47.5	44
July 12	214	458	522	488	740	478	437	561	424	473	507
	201	500	518	497	672	483	427	608	360	473	516
Temperature	50	51.5	51.5	50.5	50.5	50	49	47	46	45	44
July 13	376	372	376	369	337	363	379	431	550	419	460
	373	373	364	369	346	[illegible]	385	446	544	401	481
Temperature	45.5	45	45	45.5	45.5	46	45.5	44	44	44	43
July 14	400	427	382	424	380	350	405	445	473	511	608
	395	436	393	380	399	332	398	[illegible]	478	490	551
Temperature	46	47	50	50.5	50.5	50.5	49.5	48	47.5	46	45
July 15	359	352	325	343	310	392	363	415	458	440	391
	353										
Temperature	53	53	55	54.5	59	54	56.5	51.5	55	53.5	53
July 16	378	448	480	438	484	851	484	522	530	498	460
		412	469	423	529	843	489	549	482	507	515
Temperature	57.5	56	53	53.5	51	50	49	47	46.5	45.5	43
July 17	463	455	498	507	573	513	571	564	570	522	478
	447	454	507	496	576	513	563	509	545	502	522
Temperature	46	46.5	47.5	48	47.5	47	46.5	45	44.5	43.5	42
July 18	385	386	410	408	444	540	506	398	488	568	582
	392	381	408	405	461	551	502	407	517	526	525
Temperature	51.5	51.5	51.5	51	50.5	50	49	48	46.5	45.5	45
July 19	446	450	493	346	591	437	512	417	458	415	439
	427	433	446	365	571	485	492	469	464	436	415
Temperature	57	57	58	59	60	60	59.5	57.5	56	54.5	53
July 20	496	558	544	528	642	539	522	491	424	436	398
	538	564	535	590	631	530	538	475	444	491	451
Temperature	51	50	52	49.5	48.5	47.5	47	46.5	46	45	44
July 21	428	448	448	453	410	437	436	432	497	535	486
	430	436	455	448	404	433	467	427	517	552	497
Temperature	43	43	43	43.5	44	43.5	42.5	42	41.5	41.5	40
July 22	380	392	403	421	449	431	461	472	446	453	445
	381	400	403	427	444	434	468	406	451	445	466
Temperature	44.5	44	44	43.5	43	42	41.5	41	40.5	39.5	39
July 23	389	392	432	440	433	454	435	510	558	535	518
	385	395	468	432	410	448	456	533	546	536	538
Temperature	44	44.5	44.5	45	44.5	44	43	42	42	41.5	41
July 24	344	356	386	429	510	632	671	697	595	687	604
	341	357	387	427	532	630	680	680	545	671	596
Temperature	50	51	52	51.5	49.5	49	48.5	46	43	41	41
July 25	359	493	441	565	643	609	523	578	532	445	490
	374	466	431	586	706	608	523	[illegible]	519	458	[illegible]
Temperature	50	51	51.5	51	51	51	51	48.5	48	47.5	46
July 26	387	378	393	458	397	420	421	517	545	427	462
	386	383	378	462	389	446	415	570	524	580	471
Temperature	53.5	54	56	54	54	53.5	52.5	50.5	48	46	45
July 27	307	490	439	411	446	637	651	585	662	640	498
	316	492	427	410	451	642	648	597	620	503	482
Temperature	52	52	52.5	51	50.5	51	50.5	48	47.5	46	45
July 28	417	418	419	421	427	420	439	444	399	418	459
	421	420	419	421	427	422	439	450	456	465	476
Temperature	49	49	49	48.5	48.5	48	47.5	46	44	43	42
July 29	391	400	401	411	439	443	518	514	506	568	[illegible]
	384	400	397	422	436	452	506	560	581	615	495
Temperature	49	49	50	49	47.5	46.5	44	43	41.5	40.5	39.5
July 30	426	465	458	692	583	570	804	535	405	510	447
	428	400	443	632	607	521	817	553	428	479	508
Temperature	42	42	42.5	41.5	41.5	41.5	41	40	39	39	38
July 31	528	718	801	451	567	461	685	418	190	410	160
	465	683	873	446	579	478	605	431	289	393	175
Temperature	42.5	44	46	46.5	46.5	45.5	44	43.5	42	41.5	40
Mean temperature	49.1	49.5	50.0	49.6	49.4	48.8	48.1	46.5	46.0	45.1	44.1
Mean readings	388.3	425.7	447.0	473.3	478.9	505.7	511.8	505.8	488.7	482.6	445.1

ometer at Uglaamie, Alaska, July, 1883.

part of the horizontal force.]

11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Date.
376	35	279	463	389	(—40—?)	140	(—40—?)	(—40—?)	(—40—?)	44	241	291	1
53	52.5	51	50.5	50	50.5	52	53	55	56	57.5	58.5	59	
461	265	372	403	439	404	416	410	398	328	443	457	400	2
469	158	364	412	455	377	426	414	400	342	453	450	460	
43	43	42.5	42.5	42.5	42	41.5	41.5	41.5	42	43.5	43	44	
447	359	461	403	190	248	190	226	238	337	288	287	360	3
454	445	452	411	118	251	178	231	249	322	292	280	328	
42	42	42	42	42.5	42	42.5	44	45.5	48	50	52	54	
490	454	352	374	364	336	328	326	399	410	382	410	362	4
488	459	405	385	362	334	323	323	405	406	386	406	358	
46	45.5	44.5	44	44.5	44.5	44.5	45.5	45	46.5	47.5	48	49	
485	466	357	372	297	336	330	345	262	103	282	259	342	5
498	475	300	427	279	358	344	312	264	122	274	263	346	
43	43	43	42.5	42.5	42	42.5	43	44	45	47.5	50	49	
415	403	392	440	427	456	481	404	352	351	426	453	431	6
428	340	387	441	435	458	472	307	353	354	424	457	430	
42	41.5	41	41	41	41	40.5	41	42.5	42.5	43	44.5	46	
435	440	412	431	504	450	355	(—40—?)	—15	(—40—?)	304	409	419	7
463	438	408	417	508	450	334	(—40—?)	—37	(—40—?)	309	403	445	
46	45.5	45	45	45.5	45.5	46	47.5	48	49.5	50.5	52.5	53.5	
334	470	418	304	542	229	524	461	371	344	162	478	468	8
400	458	382	399	470	(—40—?)	414	556	405	352	244	463	482	
51	50.5	50	48	46	45	43.5	44	43.5	43	43.5	44	45	
429	450	423	422	435	387	429	404	397	386	367	383	354	9
406	454	425	404	438	396	422	404	382	390	365	392	332	
42.5	43	42	42	43.5	44.5	45.5	46	47.5	48	49	49.5	51.5	
(—40—?)	404	399	560	433	469	478	403	432	423	435	402	362	10
(—40—?)	417	389	564	473	461	476	375	440	460	429	414	370	
39.5	39	39	39	38.5	38.5	38.5	39.5	39.5	40	41	42	43.5	
463	404	395	368	416	474	417	381	370	343	413	376	303	11
422	412	426	366	416	449	423	348	379	408	373	364	268	
43	43	43	43	43.5	43.5	44	45	46	46.5	47	48	50	
446	460	394	251	396	420	400	438	453	438	408	373	360	12
428	467	400	309	309	384	395	429	455	437	410	368	388	
43	43	42.5	42	41.5	41	41	41.5	41.5	42	43	44	45.5	
511	450	439	315	300	324	231	181	290	330	344	322	378	13
406	472	430	344	286	321	233	196	273	352	355	323	308	
42.5	42.5	42.5	42	42.5	42	42.5	42	42.5	43	44.5	45	45.5	
(—40—?)	408	322	590	436	(—40—?)	50	304	416	492	358	370	352	14
195	392	374	412	507	130	10	391	380	475	367	362	352	
43.5	42.5	42	42	44	43.5	43.5	44.5	45	47	49	51.5	52.5	
414	411	415	397	410	430	122	(—40—?)	(—40—?)	309	395	362	[illegible]	15
51	53	52.5	52	52	52	52	51.5	53	53.5	54.5	56	56.5	
294	172	420	406	413	309	59	175	(—40—?)	(—40—?)	435	466	495	16
238	307	448	420	421	308	55	119	(—40—?)	(—40—?)	492	452	503	
44	43.5	43	42.5	42.5	42	41.5	41.5	41.5	42.5	42.5	43	45	
533	440	442	434	417	254	340	398	385	342	354	350	356	17
484	378	445	438	403	241	326	364	396	344	350	349	354	
41	41	40	39.5	40	40	40	41	43	46	47.5	49.5	51.5	
519	562	518	168	139	237	426	289	36	(—40—?)	5	362	403	18
354	520	432	(—40—?)	216	268	460	259	29	(—40—?)	42	365	375	
44	44	44	44.5	45.5	46.5	47.5	50	51.5	53.5	53.5	53.5	56	
432	294	382	435	410	400	348	413	324	358	348	280	345	19
423	305	314	307	389	387	327	417	318	366	337	275	353	
51	50	49	48	48	47.5	47.5	48.5	49.5	50.5	51	52	52	
462	465	383	329	345	292	299	266	390	413	309	419	384	20
467	490	350	346	360	308	314	313	387	416	403	414	388	
43	43	42.5	42.5	42.5	42	41.5	41.5	41.5	42	42	42.5	43	
481	475	460	431	436	420	443	443	412	382	382	364	372	21
474	477	459	427	435	431	444	446	410	383	376	369	372	
40	40	40	40	40.5	40	40.5	41	41.5	43	43.5	44	44.5	
458	452	451	450	464	454	455	436	428	404	392	393	382	22
450	456	453	453	463	458	448	438	432	400	393	390	384	
39	39	39	39	39.5	39	39.5	39.5	40	41	41.5	42.5	42.5	
504	492	446	401	465	467	463	443	402	375	382	359	368	23
527	464	454	464	468	467	462	443	399	379	380	362	357	
39.5	39	39	38.5	38.5	39	39.5	41.5	42	44	45	47	47	
547	428	439	512	484	508	210	(—40—?)	63	402	508	429	370	24
519	376	433	510	496	508	237	(—40—?)	15	419	488	423	378	
40.5	40	39.5	39	39.5	39	38.5	39.5	40.5	41.5	44	46.5	48	
470	304	145	393	436	400	287	267	432	468	415	385	363	25
487	232	94	343	446	397	262	268	444	472	404	373	370	
45	44	43.5	43	43.5	43.5	45	46.5	47	47	49	51.5	52	
524	485	514	324	341	195	109	197	69	183	393	501	371	26
565	542	459	281	351	185	162	283	52	170	400	482	352	
43	42.5	42	41	40.5	40.5	41	42.5	43.5	46	47.5	49.5	51	
495	482	438	530	330	397	220	414	424	486	438	427	415	27
496	515	471	524	332	388	222	394	429	487	438	424	416	
43.5	43	42.5	42	42.5	42.5	43	44.5	45	46	47	49	49	
455	457	482	481	486	451	322	410	434	449	428	409	404	28
490	465	503	490	481	456	330	412	439	448	426	411	402	
41	41	40	40	40	41	42	43	43.5	44	46	46.5	47.5	
525	479	481	446	430	427	413	430	342	358	390	470	419	29
538	486	477	455	440	436	394	433	308	356	403	482	431	
39	38.5	38	38	37.5	37.5	37.5	38.5	38	39	40	40.5	42	
550	296	(—40—?)	343	244	432	560	103	170	232	374	399	500	30
564	187	172	248	226	503	541	223	257	262	395	332	504	
37	37	37.5	37.5	37.5	37	36.5	37	37	38	39	40	42	
260	192	380	302	480	350	195	30	(—40—?)	103	398	452	400	31
218	135	241	334	508	264	120	40	(—40—?)	236	402	433	386	
39	38	38	37	36.5	36	36.5	37	37	38	40	42	43.5	
43.2	43	42.6	42.2	42.4	42.3	42.5	43.3	43.0	45.0	46.1	47.4	48.4	
421.6	395.7	387.0	390.4	398.1	341.7	320.3	289.1	274.3	308.0	360.5	386.0	379.8	

Monthly means: Temperature, 45°.8; readings, 408.8

Hourly readings of the Brooke bifilar magnet …

[To reduce readings approximately to a uniform series subtract 187.0 divisions from all readings after August 7, 23 hours; this correction …
One division of scale = .0000760

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Aug. 1	372	356	323	420	446	601	664	435	386	573	347
	380										
Temperature	45	48	49.5	49	51	50	51	50	50.5	49	48.5
Aug. 2	448	448	485	541	759	776	612	(—40—?)	565	462	466
		412	492	546	769	806	613	295	632	527	411
Temperature	51.5	49	48	48	47.5	47	46.5	44.5	44	43	42
Aug. 3	400	413	442	541	589	489	471	435	510	544	455
	400	407	439	545	550	495	469	470	487	570	486
Temperature	52	54	54	53	53	52	51	49.5	48	46	45
Aug. 4	461	493	495	492	593	490	494	542	503	541	515
	452	492	487	501	600	494	503	559	504	514	512
Temperature	47	47.5	47.5	47.5	48	48	47	45.5	44	43	43
Aug. 5	465	479	475	486	474	479	516	497	554	565	583
	463	476	477	483	475	481	515	508	562	570	595
Temperature	45.5	45.5	46	45	44.5	45	45	45	44	43	42
Aug. 6	538	510	561	637	716	631	692	625	586	662	555
	520	509	560	621	708	676	710	640	598	675	537
Temperature	43	43	44	43	43	43.5	43.5	43.5	42.5	42	41
Aug. 7	534	570	527	495	521	565	667	616	601	587	560
	554	528	520	517	558	547	670	614	604	612	503
Temperature	42.5	42.5	42	43	43	43	43	43	42	41	41
Aug. 8	486	492	618	840	727	562	642	689	632	710	632
	511	500	584	910	719	562	640	701	654	692	612
Temperature	45	45.5	48	48.5	50.5	52	52	51	50	49	49
Aug. 9	580	563	554	640	619	617	629	691	650	620	638
	594	560	550	620	593	609	641	686	678	652	657
Temperature	60.5	63.5	62	62	62.5	63.5	63	62	60	58	57
Aug. 10	644	643	664	656	644	646	637	710	652	667	633
	660	643	664	656	640	643	652	658	648	650	621
Temperature	63	64	61.5	63.5	63	63	61.5	58.5	56.5	54.5	53
Aug. 11	660	642	640	749	737	870	892	811	557	794	716
	659	650	644	735	726	876	870	867	581	805	703
Temperature	56	54.5	54	53	53	52.5	51	50	50	49	48
Aug. 12	720	700	695	696	770	731	694	680	682	717	707
	718	697	693	697	715	730	686	680	683	712	700
Temperature	55	55	56	55.5	54	53.5	53	54	53	53	53
Aug. 13	685	754	682	695	686	683	686	708	700	718	727
	690	753	670	703	700	686	686	695	698	712	740
Temperature	57.5	57	55.5	54.5	53	52.5	52	50	50	50	49
Aug. 14	653	700	693	680	703	780	701	722	698	720	717
	695	715	702	679	702	776	710	770	731	738	695
Temperature	49.5	49.5	51	52	52.5	51	50.5	48.5	46.5	45	44.5
Aug. 15	714	746	770	741	701	770	700	686	722	717	715
	708										
Temperature	49	52	54.5	53	56.5	52.5	55.5	55.5	54	52	53
Aug. 16	698	703	705	701	702	709	707	705	725	724	742
		700	703	707	702	700	701	704	729	693	745
Temperature	62.5	61.5	60	60.5	59.5	59.5	57.5	58	56.5	54.5	54
Aug. 17	720	712	700	715	694	709	707	700	722	726	730
	716	713	704	713	705	712	709	714	720	741	733
Temperature	47.5	48	48.5	48	47.5	47.5	47	46	45	44.5	41
Aug. 18	710	703	697	685	728	751	727	724	804	645	702
	712	703	700	695	736	748	739	736	802	610	765
Temperature	48.5	50	51.5	52	52	51.5	50.5	49.5	48.5	47	46
Aug. 19	811	763	794	882	800	961	742	715	752	755	745
	819	758	780	886	796	971	746	713	756	750	728
Temperature	43	43	43	42.5	41.5	42	41	40.5	40	39	38
Aug. 20	684	704	713	748	766	635	710	800	787	780	794
	690	689	709	750	748	730	708	797	790	789	752
Temperature	43	44.5	46	46	47.5	47.5	46.5	45.5	44	42	41
Aug. 21	726	733	678	729	742	769	758	747	766	778	661
	725	735	675	728	742	766	758	743	760	787	680
Temperature	36	37	36.5	36.5	36	36.5	36	36.5	36.5	36.5	36
Aug. 22	719	730	768	718	709	736	731	735	792	802	755
	720	730	760	717	713	724	736	731	735	805	751
Temperature	37	38	38	37.5	38.5	40	40	40	39	38	37
Aug. 23	723	743	828	790	784	742	850	849	822	760	787
	752	740	836	709	768	741	853	901	823	761	797
Temperature	40	40.5	40.5	42	42	41	41	40.5	40	40	39.5
Aug. 24	694	748	737	786	803	816	817	782	780	783	630
	763	749	737	780	800	826	821	786	782	785	625
Temperature	44	45	46	46	46	45	45	44	44	44	43
Aug. 25	754	735	768	743	745	770	787	823	823	759	805
	756	740	761	739	741	771	782	830	816	745	812
Temperature	41	40	40	40.5	40	40.5	40.5	40	39.5	39	38
Aug. 26	731	731	734	738	735	730	749	743	752	774	782
	736	728	734	735	733	729	744	740	759	771	780
Temperature	39.5	41	41	41	42	43	43	43	43	44.5	45
Aug. 27	762	760	755	759	745	764	778	756	759	754	800
	761	757	752	761	764	764	779	755	761	758	806
Temperature	44.5	44	44	43.5	43	43	43	41	40	39.5	39
Mean temperature	47.7	48.3	48.6	48.4	48.5	48.4	48.0	47.2	46.3	45.4	44.8
Mean readings	498.5	500.2	508.2	540.5	550.2	560.8	557.1	528.1	541.9	553.1	524.3

ometer at Uglaamie, Alaska, August, 1883.

was found as follows: Mean of 7 days, August 1 to 7, inclusive, 466 9; mean, August 8 to 14, inclusive, 653 9; difference 187 0.]
part of the horizontal force.]

11h	Noon.	13h	14h	15h •	16h	17h	18h	19h	20h	21h	22h	23h	Date.
25	570	330	494	376	513	330	249	260	502	190	159	404	1
48	48	47	48	47	47.5	47	47.5	47	47.5	48.5	49.5	51	
408	537	551	392	382	317	440	430	458	392	344	359	365	2
415	526	504	370	407	377	441	434	452	396	342	370	373	
41.5	41	41	41	41	41	41.5	41.5	42.5	44	46	48	50.5	
567	506	480	371	468	470	463	465	463	437	423	419	436	3
575	489	465	392	458	474	474	470	461	435	442	417	437	
44	43.5	42.5	42	42	41	41	41.5	42	43.5	45	45.5	46	
521	539	541	485	470	495	508	521	482	451	412	445	446	4
533	548	537	472	482	491	507	512	478	450	406	468	442	
42	42	41.5	41	41	41	41	41.5	42	42.5	43	44	45.5	
525	537	542	508	512	491	572	484	285	214	286	448	443	5
578	534	566	491	537	501	569	501	300	234	345	447	448	
41	40.5	40	39.5	40	40	40	40	40	40.5	41	42	43	
448	383	549	594	430	409	210	332	219	(—40—?)	175	314	451	6
465	420	518	585	435	397	120	258	188	(—40—?)	208	318	470	
41	40.5	40	40	40.5	40	40	40	40	40	40.5	41.5	41.5	
525	550	568	583	160	366	430	360	461	550	426	470	506	7
530	559	556	574	125	388	401	364	461	550	415	457	533	
40	40	40	40	40	39.5	40	40	40.5	43	43.5	44	44	
620	567	579	611	352	517	519	552	554	575	563	596	590	8
610	564	582	609	338	523	538	550	550	587	569	595	582	
49	40	49	49	49.5	49.5	49.5	50.5	52	53.5	54.5	60	59	
563	694	626	612	613	545	571	612	611	611	615	632	628	9
590	628	614	625	575	562	577	610	607	613	609	630	634	
55	53	52	51	50.5	51.5	52	53.5	55	56.5	58.5	61	62	
728	685	684	693	675	680	684	647	577	632	635	658	665	10
675	706	653	687	676	690	695	621	580	630	635	662	664	
52	50.5	49	48.5	48.5	48	47.5	49.5	51	52	53	55	56	
677	724	705	624	661	572	652	589	618	733	698	720	734	11
650	672	701	615	665	617	634	590	601	738	702	723	728	
47.5	48	47.5	47	47	46.5	46.5	47.5	47.5	48	49	50	53	
725	718	712	691	645	668	562	347	510	601	615	610	645	12
727	723	710	695	641	673	517	407	530	601	622	611	672	
52.5	52	51.5	51	50.5	49.5	49.5	49	49	50	52	54.5	56.5	
740	725	675	700	701	638	598	509	605	595	574	576	547	13
734	727	688	693	690	637	603	523	617	581	548	583	560	
48.5	48	47.5	47	47	46.5	47	47	47	47	47.5	48	49.5	
685	702	718	703	703	678	605	620	685	642	596	673	703	14
709	710	724	707	715	691	611	594	674	625	598	674	700	
44.5	44.5	44	44	43.5	43	42.5	43	43.5	44	47	47	47.5	
769	749	750	731	738	725	707	699	703	688	700	702	689	15
53	53	50	50.5	49.5	50	50	[illegible]	54	56.5	58	58.5	60	
753	726	721	737	720	718	737	719	720	713	698	714	720	16
725	715	715	722	725	713	723	727	720	712	703	718	716	
53	52	51	51	50.5	50.5	49.5	49.5	49.5	49	49	49	48	
739	735	740	735	730	738	722	746	737	720	701	724	708	17
748	739	736	742	695	750	721	732	733	720	701	719	715	
44	44	44	43.5	43	42	41.5	40.5	40	41	42	45	47	
695	612	628	670	721	735	557	615	674	400	442	471	600	18
761	700	697	704	730	712	406	654	707	395	429	460	670	
45	45	44.5	44	44	42.5	42.5	42.5	42	42.5	43	43	43	
758	744	743	728	685	749	754	751	723	717	702	807	722	19
751	752	745	731	717	758	751	750	727	724	700	806	711	
38	38	37.5	37	37	36.5	36.5	37	37	39	40.5	41.5	42	
740	703	751	715	731	705	722	752	765	723	678	742	711	20
760	720	755	705	730	720	745	763	764	709	675	744	718	
40	39.5	39	38.5	38	38	36.5	36.5	36	35.5	36	36	36	
750	755	747	762	735	699	719	635	680	775	735	743	703	21
785	762	753	752	739	693	731	637	608	775	740	743	705	
36	36	35	35.5	35	34.5	34.5	34.5	34	34	34.5	35	37	
710	738	736	504	710	747	742	478	651	715	738	694	674	22
715	747	775	538	721	760	754	461	651	726	732	700	667	
36	35.5	34.5	34	34	34	34	34.5	35	35.5	36.5	38	39	
775	483	665	729	777	525	738	635	502	440	623	667	742	23
758	615	670	720	784	519	745	620	496	444	600	673	740	
39	39	39	39	39	39	39	40	40	41	41	42	43	
538	700	705	687	715	576	690	765	726	731	734	748	740	24
662	683	691	692	701	582	682	772	735	732	728	750	724	
43	43	42.5	43	43	43	42.5	42	41.5	41	41	41	41.5	
742	765	736	642	670	720	656	696	704	734	690	727	738	25
787	768	730	651	681	721	643	703	723	728	693	734	734	
37.5	37	36	36	35.5	35.5	35.5	35.5	35.5	35.5	36.5	37.5	38	
760	727	703	704	710	680	676	719	736	770	759	750	750	26
757	782	698	692	691	709	681	723	746	775	758	748	750	
46	47	46.5	46.5	45.5	45	44	41.5	41.5	41	41.5	42.5	41	
764	780	742	739	722	726	728	725	733	742	730	730	....	27
785	768	741	742	731	726	726	726	734	741	730	731	....	
39	39	38.5	37.5	37.5	37	37	37.5	38	38.5	39.5	41	....	
44.3	44.0	43.3	43.1	42.9	42.7	42.5	42.8	43.1	43.8	44.7	45.9	41.1	
506.9	519.5	513.9	496.2	472.8	473.4	461.2	441.2	450.4	445.5	435.6	466.0	484.5	

Monthly means: Temperature, 45°.5; readings, 501.2

The monthly means of the bifilar readings appear quite irregular, produced by large disturbances and by change in adjustment. The latter became necessary in consequence of the effect of temperature and moisture on the suspension. During the winter the observatory became thickly coated with ice on its sides and roof, which during thawing weather kept the interior atmosphere in a state of extreme moisture. The observed variations in the length of the suspension fibers and in the torsion of the two declination instruments may be thus accounted for, and the greater or less stiffness of the fibers was probably occasioned by moisture deposited upon it freezing and thawing alternately. The effects on the readings of changes of temperature and gradual loss of magnetism* of the magnet or of such secular change are small compared with the above irregularities from other causes. It would seem desirable to use metallic suspension in the place of silk.

The September mean (619.5) was corrected to 519.1 by application of a rough correction of −318 divisions to the readings of the first six days, found by comparison with the mean of the succeeding six days.

In August, 1883, the mean reading was higher (639.7) than at any other time, and it was evident that the adjustment of the instrument had from some unknown cause been disturbed. One of the observers (Mr. Maxfield) states that when he took down the instrument on the 27th he found that the adjusting screw which holds the thread and determines the distance between the threads worked rather loosely in its bearings, whereas it was very tight when the instrument was first set up. It is difficult to fix upon a particular time when the rapid increase in the readings commenced, but it was most probably between August 7 and 8, and lasted for two or three days before the instrument settled again to a fixed condition. A slow, progressive motion is apparent from the last two days of July. For our present purpose the matter is of little importance, since we shall deal strictly in a differential way, only aiming at roughly comparable absolute readings. In order to reduce the monthly readings during August roughly to a uniform scale a correction of −187.0 divisions was applied.

Recapitulation of monthly mean values (inclusive of disturbances and uncorrected for changes of temperature and variations in scale values) of the hourly readings of the Brooke bifilar magnetometer at Uglaamie, Alaska, 1882–'83.

Göttingen civil time	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Uglaamie civil time	Noon+53m.6	13h 53m.6	14h 53m.6	15h 53m.6	16h 53m.6	17h 53m.6	18h 53m.6	19h 53m.6	20h 53m.6	21h 53m.6	22h 53m.6	23h 53m.6
1882.												
September 12 to 30	537.1	532.0	536.1	542.0	563.5	558.8	563.0	538.9	518.8	529.5	501.8	526.6
October	489.2	494.0	490.0	498.5	504.0	485.8	489.0	438.4	468.6	424.6	390.9	404.9
November	459.1	481.8	477.0	480.1	508.0	485.3	467.8	455.5	452.0	418.3	402.2	372.7
December	487.9	500.7	513.3	514.8	525.1	522.2	520.9	515.0	500.8	477.7	459.1	467.6
1883.												
January	438.1	431.5	441.6	455.0	461.1	461.4	454.4	454.6	449.5	449.4	417.7	372.1
February	441.0	443.6	434.5	445.2	459.0	473.0	475.3	446.0	397.4	399.3	375.0	365.9
March	462.5	458.3	481.8	510.7	512.1	510.3	489.7	481.9	419.1	439.1	400.2	375.2
April	355.5	353.0	364.9	418.7	422.5	410.4	416.9	423.6	411.1	374.8	344.3	336.3
May	396.8	391.3	408.0	416.4	448.3	457.4	469.0	472.9	452.8	429.1	429.3	388.8
June	372.1	397.2	405.8	444.3	467.3	470.6	518.5	508.7	496.4	465.7	410.0	381.5
July	388.3	425.7	447.0	473.3	478.9	505.7	511.8	505.8	488.7	482.6	445.1	421.6
August 1 to 27, inclusive	498.5	500.2	508.2	540.5	550.2	560.8	557.1	528.1	541.9	553.1	524.3	506.9

Göttingen civil time	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Mean.
Uglaamie civil time	0h 53m.6	1h 53m.6	2h 53m.6	3h 53m.6	4h 53m.6	5h 53m.6	6h 53m.6	7h 53m.6	8h 53m.6	9h 53m.6	10h 53m.6	11h 53m.6	
1882.													
September	504.4	508.4	500.4	487.4	498.9	480.4	481.1	496.9	513.6	509.5	500.9	529.1	519.1
October	401.1	442.1	405.9	406.1	420.3	396.4	390.5	354.4	377.5	419.5	441.5	474.8	437.8
November	396.3	368.7	340.7	335.9	335.5	249.4	284.6	322.7	342.4	388.3	431.2	439.7	408.1
December	446.5	397.2	403.5	389.5	417.9	402.7	398.8	427.0	398.5	422.6	459.8	479.8	460.4
1883.													
January	383.3	370.8	336.4	335.1	339.8	310.8	356.9	328.5	319.0	365.7	400.4	425.7	398.7
February	388.2	337.0	318.9	349.8	299.3	305.4	289.8	312.7	344.1	330.6	362.6	401.9	383.1
March	372.4	383.2	326.7	346.9	341.0	313.5	329.2	318.0	345.4	357.4	411.3	441.4	409.5
April	311.0	290.8	294.9	299.4	303.9	276.1	274.6	245.1	289.0	319.3	329.4	339.9	341.5
May	341.8	315.0	319.9	317.6	308.9	289.3	209.2	300.7	332.8	357.0	356.0	379.5	377.0
June	406.3	380.6	329.7	337.6	325.9	258.2	253.8	299.2	284.3	348.3	353.6	374.5	387.1
July	395.7	387.0	396.4	398.1	341.7	320.3	280.1	274.3	398.0	360.5	386.0	379.8	408.8
August	519.5	513.9	496.2	472.8	473.4	461.2	441.2	450.4	445.5	435.6	466.0	484.8	501.2
													419.4

* The Brooke magnets are now over thirty years old. They were used at Washington in 1853.

Solar-diurnal variation of the horizontal force (inclusive of disturbances), expressed in scale divisions and uncorrected for changes in temperature.

Göttingen civil time.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h
Uglaamie civil time.	Noon+53^m.6	13^h+53^m.6	14^h+53^m.6	15^h+53^m.6	16^h+53^m.6	17^h+53^m.6	18^h+53^m.6	19^h+53^m.6
1882.								
September	+18.0	+12.9	+17.0	+ 22.9	+ 44.4	+ 39.7	+ 43.9	+ 19.8
October	+51.0	+56.2	+52.2	+ 60.7	+ 66.2	+ 48.0	+ 51.2	+ 0.6
November	+51.0	+73.7	+68.9	+ 72.0	+ 99.9	+ 77.2	+ 59.7	+ 47.4
December	+27.5	+40.3	+52.9	+ 54.4	+ 64.7	+ 61.8	+ 60.5	+ 54.6
1883.								
January	+39.4	+32.8	+42.9	+ 56.3	+ 62.4	+ 62.7	+ 55.7	+ 55.9
February	+57.9	+60.5	+51.4	+ 62.1	+ 75.9	+ 89.9	+ 92.2	+ 62.9
March	+53.0	+48.8	+72.3	+101.2	+102.6	+100.8	+ 80.2	+ 72.4
April	+14.0	+11.5	+23.4	+ 77.2	+ 81.0	+ 68.9	+ 75.4	+ 82.1
May	+19.8	+14.3	+31.0	+ 39.4	+ 71.3	+ 80.4	+ 92.0	+ 95.9
June	−15.0	+10.1	+18.7	+ 57.2	+ 80.2	+ 83.5	+131.4	+121.6
July	−20.5	+16.9	+38.2	+ 64.5	+ 70.1	+ 96.9	+103.0	+ 97.0
August	− 2.7	− 1.0	+ 7.0	+ 39.3	+ 49.0	+ 59.6	+ 55.9	+ 26.9
April to September, inclusive	+ 2.3	+10.8	+22.6	+ 50.1	+ 66.0	+ 71.5	+ 83.6	+ 73.9
October to March, inclusive	+46.7	+52.1	+56.8	+ 67.8	+78.6	+ 73.4	+ 66.6	+ 49.0
Year	+24.5	+31.4	+39.7	+ 58.9	+ 72.3	+ 72.5	+ 75.1	+ 61.4

Göttingen civil time.	8^h	9^h	10^h	11^h	Noon.	13^h	14^h	15^h
Uglaamie civil time.	20^h+53^m.6	21^h+53^m.6	22^h+53^m.6	23^h+53^m.6	0^h+53^m.6	1^h+52^m.6	2^h+53^m.6	9^h+53^m.6
1882.								
September	− 0.3	+10.4	−17.3	+ 7.5	−14.7	−10.7	−18.7	−31.7
October	+ 30.8	−13.2	−46.9	−32.9	−36.7	+ 4.3	−31.9	−31.7
November	+ 43.9	+10.2	− 5.9	−35.4	−11.8	−39.4	−67.4	−72.2
December	+ 40.4	+17.3	− 1.3	+ 7.2	−13.9	−63.2	−56.9	−70.9
1883.								
January	+ 50.8	+50.7	+19.0	−26.6	−15.4	−27.9	−62.3	−63 6
February	+ 14.3	+16.2	− 8.1	−17.2	+ 5.1	−46.1	−64.2	−33.3
March	+ 9.6	+29.6	− 9.3	−34.3	−37.1	−26.3	−82.8	−62.6
April	+ 69.6	+33.3	+ 2.8	− 5.2	−30.5	−50.7	−46.6	−42.1
May	+ 75.8	+52.1	+52.3	+11.8	−35.2	−62.0	−57.1	−59.4
June	+109.3	+78.6	+22.9	− 5.6	+19.2	− 6.5	−57.4	−49.5
July	+ 79.9	+73.8	+36.3	+12.8	−13.1	−21.8	−12.4	−10.7
August	+ 40.7	+51.9	+23.1	+ 5.7	+18.3	+12.7	− 5.0	−28.4
April to September, inclusive	+ 62.5	+50.0	+20.0	+ 4.5	− 9.3	−23.2	−32.9	−37.0
October to March, inclusive	+ 31.6	+18.5	− 8.8	−23.2	−18.3	−33.1	−60.9	−55.7
Year	+ 47.1	+34.2	+ 5.6	− 9.4	−13.8	−28.1	−40.9	−46 3

Göttingen civil time.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	k. Scale value in parts of force, 0.0000
Uglaamie civil time.	4^h+53^m.6	5^h+53^m.6	6^h+53^m.6	7^h+53^m.6	8^h+53^m.6	9^h+53^m.6	10^h+53^m.6	11^h+53^m.6	
1882.									
September	−20.2	− 38.7	− 38.0	− 22.2	− 5.5	− 9.6	−18.2	+10.0	719
October	−17.5	− 41.4	− 47.3	− 83.4	− 60.3	−18.3	+ 3.7	+37.0	719
November	−72.6	− 58.7	−123.5	− 85.4	− 65.7	−19.8	+23.1	+31.6	743
December	−42.5	− 57.7	− 61.6	− 33.4	− 61.9	−37.8	− 0.6	+19.4	749
1883.									
January	−58.9	− 78.9	− 41.8	− 70.2	− 79.7	−33.0	+ 1.7	+27.0	749
February	−83.8	− 77.7	− 93.3	− 70.4	− 39.0	−52.5	−26.5	+18.2	749
March	−68.5	− 96.0	− 80.3	− 91.5	− 64.1	−52.1	+ 1.8	+31.9	760
April	−37.6	− 65.4	− 66.9	− 96.4	− 52.5	−31.2	−12.1	− 1.6	760
May	−68.1	− 87.7	−107.8	− 76.3	− 44.2	−20.0	−21.0	+ 2.5	760
June	−61.2	−128.9	−133.3	− 87.9	−102.8	−38.8	−33.5	−12.6	760
July	−67.1	− 88.5	−119.7	−134.5	−100.8	−48.3	−22.8	−29.0	760
August	−27.8	− 40.0	− 60.0	− 50.8	− 55.7	−65.6	−35.2	−16.7	760
April to September, inclusive	−47.0	− 74.9	− 87.6	− 78.0	− 60.2	−35.6	−23.8	− 7.9	753
October to March, inclusive	−57.3	− 68.4	− 74.6	− 72.4	− 61.8	−35.6	+ 1.5	+27.5	746
Year	−52.2	− 71.6	− 81.1	− 75.2	− 61.0	−35.6	−11.1	+ 9.8	750

Monthly mean values of the hourly readings of the thermometer attached to the Bifilar magnetometer and expressed in degrees of Fahrenheit's scale.

Göttingen civil time	0h	1h	2h	3h	4h	5h	6h	7h
Uglaamie civil time	Noon+53m.6.	13h+53m.6.	14h+53m.6.	15h+53m.6.	16h+53m.6.	17h+53m.6.	18h+53m.6.	19h+53m.6.
1882.								
September	36.4	37.0	37.2	37.1	37.6	36.4	35.9	35.4
October	19.6	20.4	20.9	20.8	21.0	20.3	20.0	19.4
November	3.8	3.9	4.1	4.2	4.6	4.3	4.5	3.5
December	−7.8	−7.5	−7.1	−7.0	−6.4	−6.5	−6.6	−6.8
1883.								
January	−5.3	−4.8	−4.5	−4.7	−4.5	−4.4	−4.4	[illegible]
February	3.7	5.1	5.5	5.4	5.9	6.1	6.1	6.0
March	2.6	3.5	4.2	4.6	5.9	5.4	4.7	2.9
April	15.5	16.3	17.2	17.0	18.0	17.6	17.1	15.8
May	37.0	37.3	38.0	37.0	37.0	36.6	35.6	34.5
June	47.8	48.1	48.7	48.5	48.0	47.6	46.6	44.8
July	49.1	49.5	50.0	49.6	49.4	48.8	48.1	46.5
August	47.7	48.3	48.6	48.4	48.5	48.4	48.0	47.2
April to September, inclusive	38.9	39.4	40.0	39.6	39.8	39.2	38.6	37.4
October to March, inclusive	2.8	3.4	3.8	3.9	4.4	4.2	4.0	3.6
Year	20.8	21.4	21.9	21.8	22.1	21.7	21.3	20.5

Göttingen civil time	8h	9h	10h	11h	Noon.	13h	14h	15h
Uglaamie civil time	20h+53m.6.	21h+53m.6.	22h+53m.6.	23h+53m.6.	0h+53m.6.	1h+53m.6.	2h+53m.6.	3h+53m.6.
1882.								
September	34.7	34.5	33.8	33.8	34.1	34.0	34.0	33.7
October	18.3	17.5	17.0	17.0	17.2	17.3	17.3	17.1
November	2.5	1.9	1.5	1.3	1.6	1.5	1.5	1.5
December	−7.9	−8.5	−8.9	−9.0	−8.9	−9.0	−9.0	−9.0
1883.								
January	−5.7	−6.4	−6.9	−7.3	−7.1	−7.1	−6.9	−7.0
February	4.5	3.7	3.1	2.5	2.5	2.3	2.2	2.0
March	2.8	2.0	1.0	0.3	−0.1	−0.5	−0.9	−1.2
April	14.2	12.8	11.5	10.0	8.9	8.2	7.3	6.8
May	33.1	31.9	30.7	29.5	28.8	28.2	27.6	27.7
June	43.9	42.8	41.8	40.9	40.3	39.8	39.6	39.4
July	46.0	45.1	44.1	43.2	43.0	42.6	42.2	42.4
August	46.3	45.4	44.8	44.3	44.0	43.3	43.1	42.9
April to September, inclusive	36.4	35.4	34.4	33.6	33.2	32.7	32.3	32.2
October to March, inclusive	2.4	1.7	1.1	0.8	0.9	0.8	0.7	0.6
Year	19.4	18.6	17.8	17.2	17.0	16.7	16.5	16.4

Göttingen civil time	16h	17h	18h	19h	20h	21h	22h	23h	Monthly mean.
Uglaamie civil time	4h+53m.6.	5h+53m.6.	6h+53m.6.	7h+53m.6.	8h+53m.6.	9h+53m.6.	10h+53m.6.	11h+53m.6.	
1882.									
September	33.9	33.8	33.9	33.9	34.4	34.9	35.3	35.8	+35.°1
October	17.4	17.5	17.6	17.5	17.4	17.5	17.7	18.4	+18.4
November	1.5	1.7	2.3	2.3	2.3	2.5	2.6	2.9	+2.7
December	−8.8	−8.7	−7.5	−7.9	−8.0	−8.1	−8.1	−8.2	−8.0
1883.									
January	−6.6	−6.4	−5.4	−5.6	−5.7	−5.7	−5.8	−5.4	−5.8
February	2.2	2.2	3.0	2.6	2.5	2.8	3.5	4.0	+3.7
March	−1.4	−1.5	−0.9	−0.9	−0.6	0.0	0.9	2.1	+1.5
April	6.6	6.7	7.6	8.0	9.5	11.0	12.8	14.5	+12.1
May	28.2	29.0	29.8	31.1	32.4	33.8	35.5	37.3	+32.8
June	39.4	39.8	40.6	41.6	42.7	44.0	45.4	47.0	+43.7
July	42.3	42.5	43.3	43.9	45.0	46.1	47.4	48.4	+45.8
August	42.7	42.5	42.8	43.1	43.8	44.7	45.9	47.1	+45.5
April to September, inclusive	32.2	32.4	33.0	33.6	34.6	35.8	37.0	38.4	+35.8
October to March, inclusive	0.7	0.8	1.5	1.3	1.3	1.5	1.8	2.3	+2.1
Year	16.4	16.6	17.3	17.5	18.0	18.6	19.4	20.3	+19.0

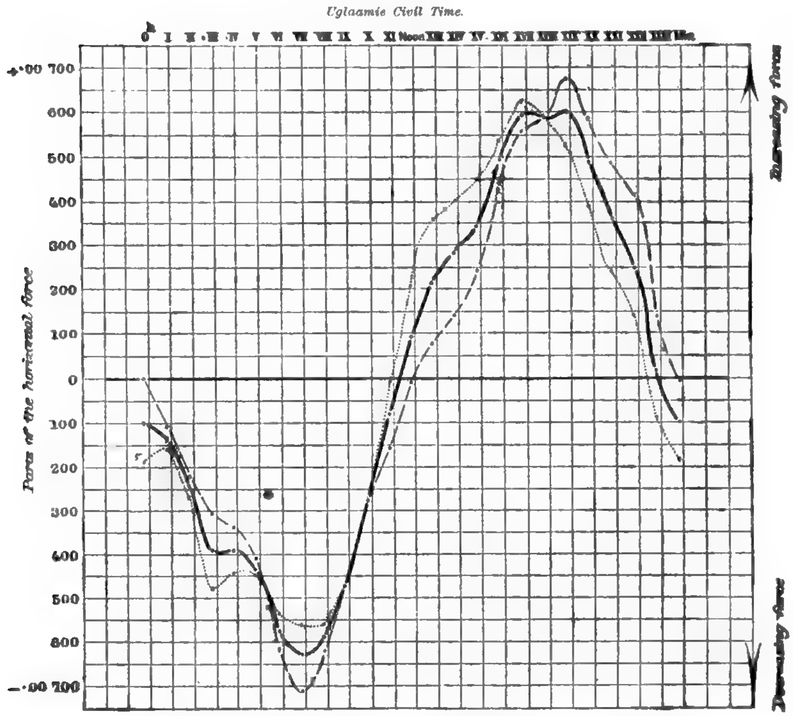
TEMPERATURE COEFFICIENT.

There were no special observations made to ascertain the effect of changes of temperature on the magnetic moment of the bifilar magnet; the instrument was mechanically compensated as near as could be judged; we have, therefore, to determine the outstanding effect by means of the

SOLAR-DIURNAL VARIATIONS OF THE MAGNETIC HORIZONTAL FORCE

Observed at Uglaamie, Alaska.

(*Disturbances included.*)



Full curve ——— *mean of the year, Sept. 1882, to Aug. 1883, incl.*
Broken " —·—·— *mean of 6 months, sun in north declination.*
Dotted " ········ *mean of 6 months, sun in south declination.*

ordinary hourly readings. During 1882, one lamp was continually burning in the observatory, but early next year three lamps were kept burning, the supply of oil in store being greater than was at first supposed. The annual average temperature in the observatory, as shown by a Fahrenheit thermometer inside the zinc cover of the bifilar, was $+19^{\circ}.0$ or $-7^{\circ}.22$ C.

In consequence of the irregularities in the state of the instrument as shown by the monthly mean readings, the only available method for deducing the temperature coefficient q appeared to be that of selecting a number of consecutive and undisturbed days at times when the temperature was rapidly changing, and find for each case the apparent change of the daily means in scale divisions corresponding to a change of 1° in temperature. The following values were thus found:

Date.	Change of the daily means.	Corresponding change in temperature.	Change for 1° Fahrenheit.
1882.	d	°	d
October 30, 31	+55	+13.4	+4.1
November 10, 11	+26	− 8.0	−3.3
December 1, 2	+27	− 7.3	−3.7
December 14, 15	−39	+11.0	−3.5
December 15, 16	+44	−10.3	−4.3
1883.			
February 9. 10	+40	− 7.4	−5.3
March 11, 12	+16	+ 6.8	+2.4
July 19, 20	+37	− 8.3	−4.5

It is proposed to adopt provisionally the mean value -2.2 ± 0.8 which is equivalent to a *decrease* of 0.000165 part of the horizontal force for an *increase* of temperature of 1° Fah. or $q = 0.000165$

In the following table the values in columns 3, 4, 5 are uncorrected for changes of temperature, the next three columns show the temperature differences for which corrections were required, and the last three columns give the diurnal variations thus corrected. The values are laid down on the accompanying diagram.

Solar-diurnal variation of the horizontal force, inclusive of disturbances, and expressed in parts of the force, at Uglaamie, 1882–'83.

Göttingen civil time.	Uglaamie civil time.		Six months, sun north of equator.	Six months, sun south of equator.	Whole year.	Temperature difference.			Solar-diurnal variation.		
						$t-35^{\circ}.8$ ⊙ N.	$t-2^{\circ}.1$ ⊙ S.	$t-19^{\circ}.0$ year.	Half year, sun north of equator.	Half year, sun south of equator.	Whole year.
		°				°	°	°			
0h	Noon	+53.6	+.00017	+.00348	+.00184	+3.1	+0.7	+1.8	+.00069	+.00360	+.00214
1	13	+53.0	.00081	.00389	.00236	+3.6	+1.3	+2.4	.00140	.00410	.00276
2	14	+53.6	.00170	.00424	.00298	+4.2	+1.7	+2.9	.00239	.00452	.00346
3	15	+53.6	.00377	.00506	.00442	+3.8	+1.8	+2.8	.00440	.00536	.00488
4	16	+53.6	.00497	.00586	.00542	+4.0	+2.3	+3.1	.00563	00624	.00593
5	17	+53.6	.00538	.00548	.00544	+3.4	+2.1	+2.7	.00594	.00583	.00589
6	18	+53.6	.00630	.00497	.00563	+2.8	+1.9	+2.3	.00076	.00528	.00601
7	19	+53.6	.00556	.00366	.00461	+1.6	+1.5	+1.5	.00582	.00391	.00486
8	20	+53.6	.00471	.00236	.00353	+0.6	+0.3	+0.4	.00481	.00241	.00360
9	21	+53.6	.00376	+.00138	.00257	−0.4	−0.4	−0.4	.00369	+.00131	.00250
10	22	+53.6	.00151	−.00065	+.00042	−1.4	−1.0	−1.2	+.00128	−.00081	+.00022
11	23	+53.6	+.00034	.00173	−.00071	−2.2	−1.3	−1.8	−.00002	.00194	−.00101
Noon.	0h	+53.6	−.00070	.00136	.00103	−2.6	−1.2	−2.0	.00113	.00156	.00136
13	1	+53.6	.00175	.00247	.00211	−3.1	−1.3	−2.3	.00226	.00268	.00249
14	2	+53.6	.00248	.00454	.00352	−3.5	−1.4	−2.5	.00306	.00477	.00393
15	3	+53.6	.00279	.00416	.00347	−3.6	−1.5	−2.6	.00338	.00441	.00390
16	4	+53.6	.00354	.00427	.00391	−3.6	−1.4	−2.6	.00413	.00150	.00434
17	5	+53.6	.00564	.00510	.00537	−3.4	−1.3	−2.4	.00620	.00531	.00577
18	6	+53.6	.00660	.00557	.00608	−2.8	−0.6	−1.7	.00706	.00567	.00636
19	7	+53.6	.00587	.00540	.00564	−2.2	−0.8	−1.5	.00623	.00553	.00589
20	8	+53.6	.00458	.00461	.00458	−1.2	−0.8	−1.0	.00473	.00474	.00474
21	9	+53.6	.00268	−.00266	.00267	0.0	−0.6	−0.4	.00268	−.00276	.00274
22	10	+53.6	.00179	+.00011	−.00083	+1.2	−0.3	+0.4	.00159	+.00006	−.00076
23	11	+53.6	−.00059	+.00205	+.00073	+2.6	+0.2	+1.3	−.00016	+.00208	+.00094

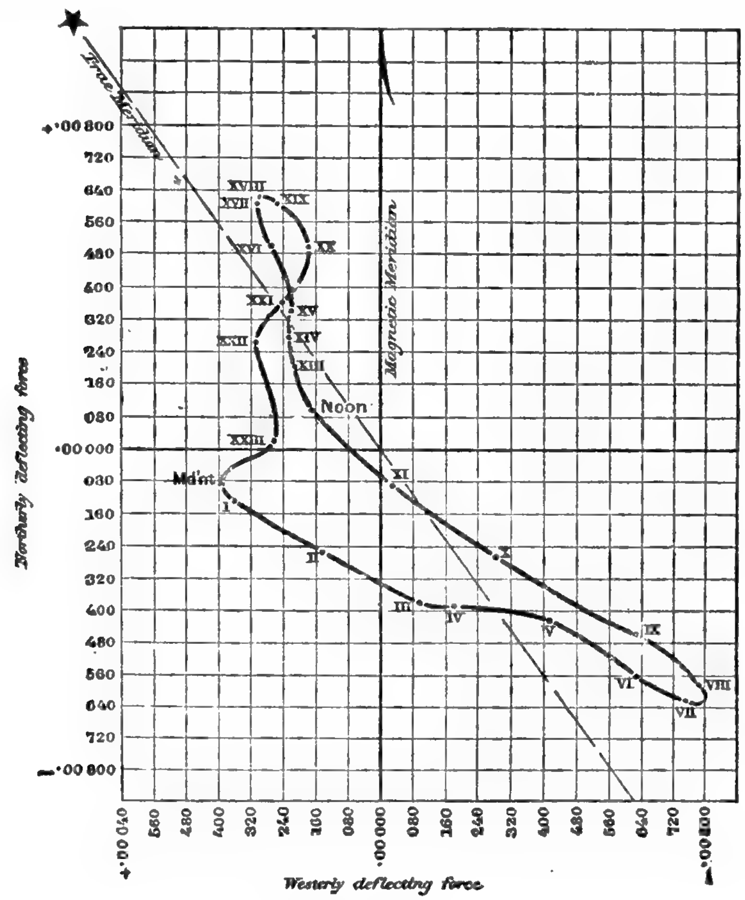
At Uglaamie the daily maximum value of the horizontal force occurs between the hours 5 and 7 p. m., and the daily minimum about 7 a. m.; there is also a very slight indication of a secondary disturbance in the regular progression between 3 and 5 a. m. corresponding to a secondary maximum about 6 a. m. as exhibited at Toronto, and more strongly at Philadelphia at $5\frac{3}{4}$ a. m. where it constitutes the principal maximum, the secondary occurring at 4 p. m. The maximum at Toronto takes place between 4 and 5 p. m. and the minimum about 10 a. m.

The diurnal inequality in the whole deflecting force acting in the horizontal plane may be exhibited graphically both in direction and magnitude as in the annexed diagram.

The origin of the co-ordinates represents the normal declination and horizontal force, and any line drawn from it to any part of the curve will represent in direction and magnitude (according to scale of diagram) the deflecting force acting at the time as marked against that point. If for any time the angle ψ equals the westerly deflection of the horizontal needle the deflecting force producing the same is $H \sin \psi$, and when expressed in parts of the horizontal force simply $\sin \psi$. A deflection of ψ minutes corresponds to $\frac{\psi}{3437.7}$ or $0.000291\ \psi$, parts nearly. The table of the solar-diurnal variation of the declination contains the values of ψ for every hour of the day, and the corresponding change in the force at right angles thereto is contained in the preceding table of the variations of the horizontal force; these two components, the westerly and northerly, appear combined in the diagram. It will be seen that the disturbing forces act more energetically in a plane approaching closer to the true than to the magnetic meridian, and that the usual character of the representation is changed by their action, that half of the curve containing the hours 21 (9 p. m.) to $2\frac{1}{2}$ a. m. being thrown far to the westward, forming a loop, and beyond the branch containing noon; on the other hand, the great extension of the deflecting force between 7 and 8 a. m. is wholly due to the great activity of the *easterly* disturbances about these hours. This will become clear when the disturbances have been separated from the normal deflecting forces, and a diagram for the latter alone is presented.

DIURNAL VARIATION IN THE WHOLE DEFLECTING FORCE ACTING IN THE HORIZONTAL PLANE.

[The intensity of the total horizontal deflecting force is expressed in parts of H and all its disturbances are included.]



THE VERTICAL MAGNETOMETER.

The length of 1 division of the scale is 1^{mm}, the radius, mirror to scale, is 1.719^{m}, hence angular value of 1 division of scale = 1′. In consequence of the great sensitiveness given to the instrument, which was nearly double what it was intended it should have a few of the largest disturbances were beyond the range of the instrument during November, and thus failed to be recorded.

(1) Adjustment and determination of scale value September 9, 1882, noon. The knife-edge was brought into the magnetic meridian on the leveled agate supports; the magnet was balanced at 11^{h} 22^{m} p. m., Göttingen time; the fixed and movable mirrors were made to read 500.

Observations for time of one oscillation of magnet and appendages.

Magnet supported on knife-edge.	Magnet suspended by threads.
10 oscillations were performed* in 2^{m} 18^{s}.0 16 oscillations were performed in 3 25.5 16 oscillations were performed in 3 28.0 16 oscillations were performed in 3 33.5 58 oscillations were performed in 12 45.0	8 oscillations were performed* in 2^{m} 21^{s}.5 10 oscillations were performed in 2 56.9 10 oscillations were performed in 2 56.2 28 oscillations were performed in 8 14.6 Hence T_1=17^{s}.664 (uncorrected for torsion).
Hence T=13^{s}.190; and value of one division of the scale in parts of the vertical force (for log ψ = log 1′)	Observations for torsion of thread.

$$\frac{T_1^2\left(1+\frac{h}{f}\right)}{T_1^2}\cot\theta\psi = 0.00008028$$

and multiplying by V=12.786, value of one division of scale=0.001026 English units.

Observations for torsion of thread:

Torsion circle.	Scale extremes.		Mean.	Diff.
15°	488^{d} and	711^{d}	600^{d}	
285	708	323	516	84^{d}
105	625	754	690	174
15	480	714	597	93
				351

Value of one division = 1′; 351 ÷ 4 = 87′.8, hence corrected time

$$T_1 = 17^{s}.664\sqrt{1+\frac{h}{f}} = 17^{s}.807$$

* By Chronometer Bond 188.

(2) Readjustment November 3, 10½^{h} p. m. (Göttingen time), to November 4, 4½^{h} a. m. (Göttingen time). Instrument releveled, fixed mirror made to read 500; also movable mirror adjusted to division 50, 5^{h} 20^{m} p. m. (local time).

Magnet supported on knife-edge.	Magnet suspended by threads.
The center of gravity was raised until time of one oscillation was found to be T=13^{s}.698 After a few minutes the operation was repeated with the following result: 10 oscillations were performed* in 2^{m} 07^{s}.5 8 oscillations were performed in 1 42.0 18 oscillations were performed in 3 49.5	10 oscillations were performed* in 2^{m} 57^{s}.8 10 oscillations were performed in 2 59.0 20 oscillations were performed in 5 56.8 Hence T_1=17.840 (uncorrected for torsion).
Hence T=12.750, mean T=13.224; and value of one division of the scale in parts of the vertical force = 0.00008163, which is equal to 0.001044 English units.	Observations for torsion of thread.

Torsion circle.	Scale extremes.		Mean.	Diff.
164°	596^{d} and	693^{d}	644^{d}	
74	523	596	560	84^{d}
254	755	773	764	204
164	613	699	656	108
				396

396 ÷ 4 = 99′.0; hence T_1=18^{s}.002

* By Chronometer Bond 188.

(3) Balance magnetometer adjusted November 14, 1882 (7 p. m. Göttingen time), so as to oscillate in 9^{s}.060 and to read 500 at 10^{h} 05^{m} p. m. (Göttingen time). This value for T was derived from 20 oscillations; no particulars are recorded. No observations of oscillations with magnet suspended. With T_1 = 18^{s}.002 and T = 9^{s}.060 we have scale value in parts of the vertical force 0.0001739, which is equal to 0.002223 English unit.

(4) Readjustment of balance magnetometer March 4, 1883. Instrument leveled, with supporting

edge in magnetic prime vertical (7 a. m. Göttingen time); magnet balanced by means of weights, and both mirrors brought to scale 50 (8 a. m. Göttingen time); magnet brought to oscillate in $11^s.850$ by means of adjusting weight on upright stem ($8\frac{1}{2}$ a. m. Göttingen time).

	m.	s.
10 oscillations were performed* in	1	58.5
10 oscillations were performed in	1	58.5
20 oscillations were performed in	3	57.0

Hence $T=11^s.850$ With $T_1=18^s.002$ and $T=11^s.850$ we have value of one division of scale in parts of the vertical force 0.0001017, which equals 0.001300 English unit.

* By Chronometer Bond 188.

(5) March 29, 1883, about 4 a. m. (Göttingen time) magnet removed, cleaned of slight frost that had collected on it, and replaced between 4 and 5 p. m.

(6) April 15, 1883, magnet raised from support and lowered between $6^h\ 55^m$ and $7^h\ 00^m$ p. m. (Göttingen time).

(7) Readjustment of the balance magnetometer April 27, 1883. Instrument leveled. Supporting edge in magnetic meridian for oscillations in horizontal plane $2^h\ 12^m$ a. m. (Göttingen time). Between $4^h\ 10^m$ and $5^h\ 40^m$ a. m. adjusted fixed and movable mirrors to scale division 50.

No. of oscillations.	Time by Bond 188.	No. of oscillations.	Time by Bond 188.
	h. m. s.		h. m. s.
0	1 16 55.0	0	2 27 03.5
6	17 42.5	6	28 52.0
13	18 37.0	13	30 59.5
19	19 23.5	19	32 47.5

Time of one oscillation $=7^s.816$ Time of one oscillation $=18^s.105$

No. of oscillations.	Time by Bond 188.	Torsion circle.	Scale extremes.	Mean.	Diff.
	h. m. s.				
0	6 38 29.0	Change 90°	250^d and 690^d	470^d	95^d
6	39 15.0	Change 180	15 735	375	220
13	40 02.5	Change 90	460 730	595	140
19	40 41.5		235 675	455	
					455

Time of one oscillation $=6^s.974$ $455\div4=113'.8$; hence $T_1=18^s.295$

Hence scale value for the time preceding April 27, using $T=7^s.816$, one division $=0.0002413$ part of the vertical force, or 0.003086 English unit, and after April 27 using $T=6^s.974$, one division $=0.0003031$ part of the force, or 0.003876 English unit.

(8) May 3, 1883, magnet of balance magnetometer raised on support and lowered between 11 and 12 p. m. (Göttingen time). Found time of one oscillation in the vertical plane $=8^s.750$; hence with $T_1=18^s.295$, one division of the scale $=0.0001926$ part of the vertical force, or 0.002462 English unit.

(9) May 21, 1883. At 3 a. m. Göttingen time magnet fell off support; replaced and time of one oscillation determined $8^s.700$; hence one division of scale $=0.0001948$ part of the vertical force, or 0.002490 English unit.

Increasing scale readings denote increasing vertical force.

HOURLY READINGS OF THE BROOKE BALANCE MAGNETOMETER, TOGETHER WITH THE CORRESPONDING TEMPERATURE (FAH.), FROM SEPTEMBER 12, 1882, TO AUGUST 27, 1883.

Value of one division of scale.	English units.	Gaussian units.	B. A. units, or dynes.
Between September 9, 1882, and November 3, 1882	.00103	.000473	.000047
Between November 3, 1882, and November 14, 1882	.00104	.000481	.000048
Between November 14, 1882, and March 4, 1883	.00222	.00102	.000102
Between March 4, 1883, and April 15, 1883	.00130	.00060	.000060
Between April 15, 1883, and April 27, 1883	.00309	.00142	.000142
Between April 27, 1883, and May 3, 1883	.00388	.00179	.000179
Between May 3, 1883, and May 21, 1883	.00246	.00114	.000114
Between May 21, 1883, and close of series	.00249	.00115	.000115
The average scale reading 523 corresponds approximately to vertical intensity	12.792	5.898	0.5898

[Tabular values uncorrected for changes of temperature. A parallel sign || indicates that the instrument was readjusted. Extreme scale divisions, 0 and 800; when the magnet passed off the zero end it is indicated by (0—?); when off the opposite end by (800 + ?); the extremes are included in the monthly mean hourly values, Göttingen time. Increasing scale numbers denote increasing vertical force.]

Hourly readings of the Brooke balance magnetometer, at Uglaamie, Alaska, September, 1882.

(Göttingen time.)

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Sept. 12	.....	384	388	388	362	362	386	388	395	392	397	398	400	399	401	403	402	402	401	411	398	399	397	394
	.....	384	388	389	366	364	385	388	396	393	396	397	399	399	402	404	403	403	402	412	398	398	395	394
Temp	.....	46	46	45.5	44.5	42.5	41	40	38	37	36	35	35	35	35	34	34	33.5	33.5	34	34	36.5	36.5	37
Sept. 13	392	396	397	397	394	391	394	393	371	385	397	392	400	406	407	404	419	411	420	409	394	395	395	395
	393	397	397	396	393	391	394	393	370	385	397	392	399	407	407	405	419	410	421	408	395	394	395	394
Temp	38	38	39	39	40	39	38.5	37	37	36	36	36	37	37	36	36	36	36	35.5	35.5	36	36	36	36
Sept. 14	399	401	407	406	404	400	402	401	403	405	400	396	404	404	408	409	414	424	410	408	406	405	407	407
	398	398	404	405	405	400	403	401	404	403	398	397	405	404	409	410	414	424	410	409	406	406	407	407
Temp	36	36	36	36	37	36	36	36	36	36	35.5	35.5	35.5	35.5	35.5	35.5	36	36	36	36	36.5	37	39	40
Sept. 15	405	405	407	407	407	407	409	400	398	388	391	393	401	398	407	406	406	403	404	404	404	402	401	399
	404																							
Temp	40	39.5	39	38.5	39	37	39.5	42	42	48.5	44	45	46	45	45	45	45	41	43.5	41.5	45	46	48	47
Sept. 16	399	399	399	400	401	402	403	405	407	407	409	409	410	410	410	411	413	411	411	411	412	410	409	409
	.....	399	399	400	401	402	403	405	406	407	409	409	410	411	410	411	413	412	411	411	411	410	409	410
Temp	51	48	47.5	46.5	45	42	41	39	38	37	36	35.5	36	36	36	35.5	35	35	35	36	36	36.5	38	39
Sept. 17	409	409	409	408	409	411	411	411	407	410	413	412	414	416	414	416	414	414	415	411	412	412	412	411
	409	409	409	408	410	411	411	411	407	410	413	414	414	415	414	416	414	414	415	411	412	412	412	411
Temp	40	40.5	40	40	40	39	36	35	34	34	33	33	34	34	34	34	34	35	35	35	35	35.5	36	36
Sept. 18	412	412	411	408	406	407	408	409	410	411	411	412	412	412	411	412	416	418	413	411	412	409	407	408
	412	412	411	408	406	408	408	409	410	411	411	412	412	412	412	413	416	418	413	411	412	408	407	407
Temp	36.5	37	41.5	46	44.5	40	39	38	37	36	35	35.5	36	36	36	36	36	36	36	36	37	39	38.5	38.5
Sept. 19	409	410	410	410	410	411	411	411	411	412	412	412	412	413	413	418	415	414	412	411	410	409	410	413
	409	410	410	410	410	411	411	411	411	412	412	412	412	413	413	418	415	414	412	411	409	409	411	414
Temp	38	38	39	41	40	39	38	37	36	35	[illegible]	35	35	35	35	34	35	36	35	35	35.5	35.5	35.5	35.5
Sept. 20	414	414	413	414	415	414	415	410	411	410	407	410	414	414	415	416	417	416	416	417	416	417	417	418
	414	414	413	414	415	414	414	411	410	411	407	410	414	414	414	416	417	416	416	417	416	417	417	419
Temp	35	35	35.5	35	35	35	34	34	34	33.5	33	33	33	32.5	32	32	32	32	32	32	32	32	32	32
Sept. 21	423	418	418	418	417	417	417	417	418	417	406	401	410	415	417	416	418	417	417	416	416	416	415	416
	422	419	418	418	417	417	418	417	418	417	407	401	410	415	417	417	418	417	417	416	416	416	416	416
Temp	32.5	33	33	33	33	32.5	32	32	31	31	31	31	31.5	31.5	32	32	32	32	32	32	32	32	32	33
Sept. 22	417	417	417	417	417	418	418	418	419	416	416	412	416	419	422	420	420	419	418	418	417	418	418	418
	418	417	418	417	417	418	418	418	419	416	416	412	416	420	421	420	420	419	418	418	417	418	418	418
Temp	33	32.5	32.5	32.5	32	31	31	30	30	30	30	30	30.5	31	31	31	31	30	30	30.5	30.5	30.5	30.5	31
Sept. 23	418	418	418	418	418	418	419	419	420	420	421	421	420	420	420	424	435	427	420	419	413	412	414	415
	418	418	418	418	418	418	419	419	420	421	420	421	420	421	420	425	434	427	420	419	413	412	414	415
Temp	32	32	33	33	33	32	32	30	29	29	28.5	29	29.5	29.5	30	29	30	30	30	30.5	30.5	30.5	30.5	32
Sept. 24	415	415	416	417	418	419	418	419	419	419	419	418	419	419	419	419	419	419	417	417	416	415	415	416
	416	415	417	418	418	419	418	419	419	419	419	418	419	419	419	419	419	419	417	416	416	415	415	515
Temp	33.5	35	35	34	33	33	32	31	31	30.5	30	30	30	30	30	30	30	30	30	30	31	30.5	30	31
Sept. 25	416	416	418	421	416	405	398	402	396	400	420	428	426	426	420	431	438	463	451	428	422	417	415	418
	416	417	418	422	415	405	398	402	396	400	420	429	426	426	420	430	438	463	450	427	422	417	415	417
Temp	31.5	31.5	31.5	32	31	31	30	30	29.5	29	29	29	30	30	30	30	30	30	30	30	30	30.5	31	32
Sept. 26	418	418	417	420	420	421	419	411	416	300	398	417	434	427	423	422	421	420	421	421	422	420	419	419
	418	418	416	420	420	421	419	411	416	403	401	417	433	427	423	421	421	420	421	421	422	419	419	419
Temp	33	34	34	33	35	33	33	33	31.5	31	30	30	29	29	29	28	29	30	30	29	30	31	32	33.5
Sept. 27	418	418	418	416	414	407	409	400	405	409	404	417	414	432	427	424	424	419	418	419	419	418	417	418
	418	418	418	415	414	407	409	400	405	409	404	416	415	432	427	424	424	419	418	419	419	418	417	417
Temp	34	35	35	36	36	35	35	34	33	33	32.5	32.5	33	33	33	33	33	33	33	33	34.5	35	35.5	36
Sept. 28	419	418	418	417	416	416	415	415	412	408	411	412	413	416	418	419	419	418	415	414	412	413	413	413
	419	418	418	417	416	416	415	415	413	409	411	411	413	416	418	419	419	418	415	415	412	413	413	413
Temp	37	38	38	38	38	38.5	39	38	37	37	36	36	36	36	36	[illegible]	36	36	36	36.5	37	37	38	38.5
Sept. 29	413	414	414	413	413	413	413	414	415	412	416	419	422	418	419	416	415	415	414	413	413	412	413	413
	413	414	414	413	413	413	413	414	415	412	416	419	422	417	419	416	415	415	414	413	413	412	413	413
Temp	38.5	39	39	39	40	39	38	38.5	37.5	37	36	36	36	36	36	36	36	37	37	37	37	37	37	37
Sept. 30	414	414	414	414	414	414	414	414	413	411	410	407	419	420	423	424	423	421	416	414	416	415	414	415
	414	414	414	414	414	414	414	414	413	410	410	407	419	420	423	424	423	421	416	414	416	415	414	414
Temp	37.5	38	38	38	38.5	38	38	38	37	[illegible]	35	35	35	34.5	34.5	34	34	34	35	35	35	35.5	36	36
Magnet'r	411.6	410.3	410.9	411.1	409.2	408.2	409.4	408.7	407.6	406.6	408.3	409.8	413.7	415.0	415.5	416.4	418.3	418.5	416.3	414.3	412.1	411.2	410.9	411.3
Reduced	517.3	516.0	516.6	516.8	514.9	513.9	515.1	514.4	513.3	512.3	514.0	515.5	519.4	520.7	521.2	522.1	524.0	524.2	522.0	520.0	517.8	516.9	516.6	517.0
Temp	36.4	37.0	37.2	37.1	37.6	36.4	35.9	35.4	34.7	34.5	33.8	33.8	34.1	34.0	34.0	33.7	33.9	33.8	33.9	33.9	34.4	34.9	35.3	35.8

To reduce readings to an approximately uniform series increase each reading by 40.7 + 65.0 = 105.7 divisions; it is found as follows: Mean of 10 days, September 24 to October 3, inclusive, 414.1; mean of 10 days, October 4 to 13, inclusive, 454.8; difference, 40.7 For origin of number 65.0 see note to next month. One division of scale = .0000803 part of the vertical force. Monthly means: Temperature, 35° 1; magnetometer, 411.9; reduced mean, 517.6

Hourly readings of the Brooke balance magnetometer at Uglaamie, Alaska, October, 1882.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	N	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Oct. 1	413	414	413	412	412	412	413	411	410	409	408	401	404	405	406	407	413	405	403	403	403	402	402	401
	413	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Temp	36	38	40	40	41	38	39.5	40	41.5	41	42	42	43	43	44	45	45	44	45	46	47	46.5	46.5	48
Oct. 2	401	402	402	402	401	401	403	395	395	395	399	418	403	411	411	425	429	423	427	424	440	430	411	389
		402	402	402	401	402	403	396	395	396	399	420	403	411	411	426	429	422	427	434	429	428	404	390
Temp	46.5	45	46	45	45	43	44	43	41	40.5	40	40	41	41	41	40	41	40.5	40	40	40	40.5	41	42
Oct. 3	400	388	400	400	389	391	392	399	402	405	405	406	408	408	407	413	416	418	411	409	410	412	412	.....
	398	395	400	400	389	391	392	398	402	405	405	406	408	408	407	413	417	418	412	409	410	412	412	.....
Temp	42	42	43	43	45	43	41	39	38	37	36	36	35.5	35	35	34	35	35	34	32	33	33	33	33
Oct. 4	437	436	435	435	434	441	426	430	430	421	443	436	467	456	445	446	453	466	457	442	443	441	436	442
	437	436	435	435	434	441	426	430	430	422	444	436	467	455	445	446	453	466	456	440	443	441	436	443
Temp	34.5	34	33	32.5	33	32	32	32	31	30	30	30	30	30	30	30	30	31	32	30.5	30.5	30.5	30.5	30.5
Oct. 5	440	439	440	441	429	440	436	434	433	427	434	436	438	443	444	447	444	462	460	456	492	473	470	452
	440	439	440	441	439	440	436	433	433	429	435	436	439	443	444	447	444	462	460	456	491	473	469	457
Temp	31.5	31	31	32	34	32	31.5	30.5	30	28.5	28	28	27	27.5	27.5	27	27	28	28	28	28.5	29	29.5	30
Oct. 6	452	448	447	448	435	442	431	435	443	465	475	467	506	497	508	521	496	500	490	469	452	450	450	450
	474	450	447	448	435	442	430	435	442	465	476	467	505	497	506	521	496	500	490	460	451	450	450	450
Temp	30	30	30	30	30	29.5	29	29	28	27	27	27	27.5	27.5	27.5	27	28	29	29	28	28	28	28	28
Oct. 7	451	451	450	449	450	452	450	450	450	451	451	451	451	451	453	454	453	452	451	451	451	450	450	449
	451	451	450	449	450	451	450	450	450	451	450	451	451	451	454	454	453	452	451	451	451	450	449	470
Temp	28	28	28.5	28	28	28	28	27.5	27	26	26	25.5	26	26	26	26	26	26	27	26.5	26.5	27	27	27
Oct. 8	448	450	450	450	450	450	450	449	450	451	452	453	454	455	455	455	456	457	455	455	453	453	452	450
	448	450	450	450	450	450	450	450	470	452	452	453	454	455	455	455	456	457	455	455	453	452	452	450
Temp	27	28	28	28	28	28	30	28.5	27	26	25	25	25	24	24	23	24	24	24	24	24	24	24	25
Oct. 9	450	452	452	448	450	450	451	452	453	455	456	456	456	457	457	458	468	459	458	476	453	452	447	447
	450	452	452	448	450	450	451	452	453	455	456	456	457	457	457	459	468	459	458	476	453	452	445	417
Temp	26	28	27	29.5	28.5	28	26.5	25.5	24	23	23	23	23	23	22.5	22	22	23	23	23	23	23	24	24
Oct. 10	448	452	451	455	452	452	452	452	450	451	451	474	513	482	466	461	462	463	463	483	514	459	453	454
	448	452	451	455	452	452	452	452	450	451	451	474	518	482	466	461	462	462	462	483	513	462	452	455
Temp	25	25	26	26	25.5	25	25	24	23	22	21	20.5	21	21	20.5	20	21	21	20	19.5	19	19	20	21
Oct. 11	456	453	453	455	453	453	450	446	454	455	456	459	450	452	459	472	481	469	458	470	464	454	453	457
	456	453	453	457	452	453	450	447	454	454	496	459	450	452	459	472	481	469	478	469	464	453	453	460
Temp	25	25	24	24	23	22	23	21	20	19	18	18	18	18	17	17	18	18	18	17.5	18	19	19	19.5
Oct. 12	459	458	460	459	456	455	450	449	455	458	462	446	452	458	459	461	469	465	462	459	459	459	459	458
	460	460	460	458	456	455	451	450	456	458	461	446	452	458	459	461	469	465	463	459	459	459	458	458
Temp	19.5	20	20	20	21	21	20	19	17	16	15	15	15	15	15	15	16	15	15	14	14	14	15	16.5
Oct. 13	458	458	454	454	452	454	453	455	455	446	455	458	459	459	460	464	468	469	460	459	459	459	458	460
	458	458	455	454	453	454	453	455	455	446	456	458	459	459	460	465	468	469	461	459	459	459	458	460
Temp	19	21	21.5	23	21	20	18.5	17.5	16	15	14	14	14.5	14.5	14	14	14	14	14	13	12.5	12	12	15
Oct. 14	460	455	454	454	454	454	454	457	457	456	458	459	459	461	465	467	472	475	468	461	459	458	458	458
	458	455	454	454	454	454	454	457	457	456	458	459	459	461	466	467	471	476	468	460	459	458	458	453
Temp	16.5	17.5	20	19	18.5	18	17	16	15	13.5	13	12	12.5	12.5	12	11	11.5	11.5	12	13	13	13.5	14.5	17
Oct. 15	456	457	455	450	444	443	444	440	430	437	434	454	454	445	464	465	469	465	456	444	445	444	443	444
	454	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Temp	17.5	21	23.5	24.5	26	26	26.5	26	26.5	26.5	26.5	26.5	26	26.5	25	26	27	27	27	26.5	25	25.5	26.5	28
Oct. 16	444	444	445	445	447	449	451	452	450	449	453	451	463	455	455	453	458	456	463	473	465	455	452	451
	.....	444	445	445	447	449	451	451	450	448	451	451	464	455	455	454	458	457	463	471	465	454	451	452
Temp	28	26.5	25.5	24.5	22.5	20	18	17	14.5	13	12	12	12	13	14	15	15	14.5	15	15	14	14	14.5	15
Oct. 17	450	451	454	451	451	439	433	435	440	458	455	453	465	470	472	473	463	460	458	455	456	455	455	457
	450	453	454	451	451	437	433	435	441	459	456	453	465	470	472	473	463	460	458	454	456	455	454	456
Temp	16.5	18	19	18.5	20.5	20	19	18	15	14	13	12	12	11.5	11.5	11	12	12	12	12	11	11	11	11.5
Oct. 18	458	457	458	460	456	455	455	454	448	453	451	468	451	460	464	459	455	454	454	453	452	452	452	453
	458	457	458	460	456	455	455	454	448	453	451	470	452	460	464	459	455	454	454	453	452	452	452	454
Temp	12	18	18	13	13	14	14	13.5	12	12	11	12	12	12.5	13	13	13	14	14	14.5	15	14	15	15
Oct. 19	452	453	452	452	452	452	452	453	454	453	452	453	455	457	461	455	457	462	458	454	454	454	454	454
	452	453	452	452	452	452	452	453	454	453	452	453	455	457	460	455	457	462	458	454	454	454	454	454
Temp	15	15	15	15	15	15	15	15	14	14	13	13	13	14	13.5	13	14	14	15	14	14	14	14	14
Oct. 20	454	452	453	452	452	452	452	452	452	453	454	455	455	454	454	457	456	454	454	453	453	453	452	452
	452	453	453	452	452	452	452	452	453	453	454	455	455	451	454	457	456	454	454	453	453	452	452	452
Temp	14	15	16	16	16	15	15	15.5	14	13	13	13	14	14	14	14	14	14	14	14	14	14.5	14	14
Oct. 21	453	452	452	452	451	451	451	451	452	453	454	455	456	458	460	460	460	458	459	458	478	458	458	458
	453	453	452	452	451	451	451	452	452	453	455	454	456	458	460	460	459	458	459	458	458	458	458	458
Temp	15	16	16	16	17	16	16	15	14	13	13	13	13	12	12	11	11	10	11	11	11	11	11	11
Oct. 22	457	456	456	455	455	455	455	454	446	448	450	455	451	469	476	468	477	501	468	469	483	472	478	471
	457	456	456	455	455	455	455	454	447	448	450	455	451	469	476	468	477	501	468	469	482	471	479	472
Temp	13	14	14.5	14	15	14	14	14	13	13	12	12	12	13	13	13	13	13	12	12	12	12	12	12
Oct. 23	452	457	460	457	458	449	448	453	454	450	480	468	458	461	473	481	471	468	463	460	462	461	462	463
	458	458	461	457	457	448	449	454	454	451	475	469	458	461	473	482	470	468	462	470	462	461	462	464
Temp	12	12	12	10	10	10	9	8.5	6	4	4	4	4	5	5	6	5	6	6	6.5	7	7	7	7
Oct. 24	460	460	459	459	461	443	450	413	433	450	447	451	468	524	501	482	462	460	460	456	452	451	451	453
	460	460	459	459	460	443	450	413	433	451	447	451	468	519	502	485	463	460	460	456	452	451	451	453
Temp	8	9	10	9	10	9	9	10	9	8.5	8	8	9	9	9	9	10	12	12	12	12	12	12	11
Oct. 25	453	451	453	473	454	453	449	422	447	441	469	475	481	471	467	461	462	463	458	457	455	454	453	452
	453	451	453	453	454	453	449	423	447	447	468	474	482	471	467	461	462	463	457	457	455	454	453	453
Temp	11	11	11	11	12	12	11	11	10.5	10	10	10	10	10	10	10	11	11	12	12	11	11	11	11.5
Oct. 26	450	451	454	452	453	451	448	438	443	448	451	453	456	462	460	464	478	469	470	462	457	455	455	460
	450	452	456	454	454	451	448	437	443	449	451	453	457	463	460	464	478	469	469	462	457	455	455	460
Temp	12	13	13	13	14	13	12	12	11	11	10	10	10	9	9	9	9	8	9	9	8	8	8	8
Oct. 27	460	460	461	459	458	455	454	449	450	440	443	462	461	465	469	473	472	471	479	463	461	459	459	462
	460	460	461	459	458	455	454	450	450	444	445	462	464	465	470	472	472	471	479	463	461	459	460	462
Temp	8	9	10	10	10	10	9	8	7	6	5	5	4.5	4.5	4	4	4	4	3.5	4	3	3	2.5	3
Oct. 28	465	464	470	459	461	452	455	436	444	451	459	461	462	489	520	503	506	496	475	457	477	462	467	467
	463	464	472	459	461	452	455	436	444	451	460	461	463	488	524	503	506	496	475	477	481	461	467	465
Temp	3	4	4.5	4	2.5	1	0	−0.5	−2	−2	−2	−2	0	0.5	1.5	2.5	3	3.5	3.5	5	5	5	5	6
Oct. 29	468	460	450	451	452	446	448	450	447	442	456	429	458	458	467	468	472	472	473	479	461	463	470	470
	464	457	448	451	452	446	448	450	447	442	454	432	459	458	467	467	472	472	475	473	464	463	471	469
Temp	7	7.5	8	8	8	7	7	6	5	4	3	3	2	1	0	−1	−1	−1	−1	−1	−2	−2	−2	−0.5
Oct. 30	465	462	463	459	458	458	451	453	455	452	444	442	451	464	466	456	458	451	451	452	452	452	451	449
	464	463	462	458	458	458	451	453	455	452	443	442	451	464	465	456	458	451	451	452	452	452	451	448
Temp	1	1.5	2	3	4.5	4.5	4.5	5	4.5	4.5	5	6	7	8	9	9	9	7	8	6	7	8	9	12
Oct. 31	445	443	441	440	440	439	438	438	437	437	436	435	435	440	433	436	437	437	436	436	437	436	435	435
	445	443	441	440	440	439	438	438	437	437	436	435	435	440	432	436	437	437	436	436	437	436	435	435
Temp	16	18	19	19	20	20	20	20	19.5	19.5	19	19	19	20	20	19.5	19	19	19	19	19.5	20.5	21	21
Magnet'r	448.8	448.2	448.3	447.4	446.4	448.8	443.4	440.7	442.5	444.1	448.8	449.7	455.1	457.9	460.0	460.3	461.0	460.6	456.7	453.9	455.8	451.1	450.1	450.8
Reduced	517.7	517.1	517.2	516.3	515.3	513.7	512.3	509.6	511.4	513.0	517.7	518.6	524.0	526.8	528.9	529.2	529.9	529.5	525.6	522.8	524.7	520.0	519.0	518.5
Temp	19.6	20.4	20.9	20.8	21.0	20.3	20.0	19.4	18.3	17.5	17.0	17.0	17.2	17.3	17.3	17.1	17.4	17.5	17.6	17.5	17.4	17.5	17.7	18.4

To reduce readings to an approximately uniform series increase each reading of the 1st, 2d, and 3d by 105.7, and all remaining readings by 65.0 divisions. We have mean of 8 days, October 27 to November 3, inclusive, 451.5, and mean of 8 days, November 5 to 12, inclusive, 516.5; difference 65.0. One division of scale = .0000803 part of the vertical force. Monthly means: Temperature, 18°.4; magnetometer, 451.1; reduced mean 520.0.

Hourly readings of the Brooke balance magnetometer, Uglaamie, Alaska, November, 1882.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Nov. 1..	436	435	431	431	430	431	430	431	430	426	424	422	422	430	433	433	446	436	429	418	418	423	426	432
	435	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp....	21	24	25	26	26	27	28	27.5	28.5	30	30	30	29.5	29	28	26	25.5	30	29	29.5	28	26	25	24
Nov. 2..	432	435	438	440	442	442	442	443	444	444	445	448	453	450	446	448	447	445	445	445	445	446	447	450
	....	435	438	440	442	442	442	443	444	444	445	448	451	450	446	448	447	445	445	445	445	446	447	450
Temp....	23	19	16	14	15	15	15	13	11	10	10	10	10	10	11	11	11	12	12	12	9	9	7	7
Nov. 3..	452	451	453	451	452	450	449	452	451	452	452	453	454	449	461	491	467	457	457	456	456	457	458	....
	453	451	454	451	451	450	449	452	452	452	452	453	454	448	461	492	467	457	457	456	457	457	458	....
Temp....	8	8	8	7	7	7	6	5	4	4	3	3	4	4	4	4	4	4	4	4	3	3	2	....
Nov. 4..	....	....	....	....	....	490	486	489	491	495	496	501	504	496	502	505	504	506	508	510	509	509	509	511
	....	....	....	....	....	491	486	489	491	495	496	501	504	496	503	505	504	506	508	509	509	509	508	509
Temp....	....	....	....	....	....	15.5	14	12	10	8.5	7	7	7	7	6	6	5	5	5	5	5	5	5	5
Nov. 5..	508	509	509	508	508	507	507	506	508	509	511	511	514	513	515	514	515	511	511	511	509	504	495	504
	509	510	509	508	509	507	507	507	509	509	510	511	514	513	515	514	515	511	512	511	509	504	494	506
Temp....	5	5.5	6	5	6	6	6	5	4	3	3	3	2	2	2	2	2	2	3	3	4	5	5	5
Nov. 6..	506	510	510	511	509	506	507	508	509	508	510	512	513	512	514	515	517	517	523	527	516	507	514	510
	506	511	510	511	509	505	506	508	509	509	509	512	513	513	514	516	517	517	523	527	515	507	514	508
Temp....	5	5	5.5	5	5	5	5	4	4	3	3	3	2	2	2	2	2.5	2	2	3	2.5	2	2	8
Nov. 7..	499	494	493	488	490	494	496	494	493	494	506	474	495	506	515	520	536	550	529	529	514	505	508	508
	498	495	493	488	490	494	496	494	494	494	506	474	495	507	515	519	536	550	527	529	514	505	509	509
Temp....	10	10	12	11	10	8	9	7	6	5	5	4	5	5	5	4.5	4.5	4.5	4	4.5	4	4	3	4
Nov. 8..	511	516	511	512	510	508	509	499	499	499	500	514	525	517	527	525	522	513	504	504	499	495	498	500
	510	515	512	512	509	508	509	500	499	498	499	514	525	518	530	524	521	512	504	503	499	494	498	500
Temp....	4	4	4	3	5	5	4.5	3	2	1	1	1	2	2	3	4	4	5	5	7	7	7	7	8
Nov. 9..	500	500	500	498	494	490	489	489	482	482	485	516	490	522	550	530	514	514	507	492	477	466	466	463
	500	498	499	498	494	490	489	489	482	481	486	514	489	523	547	531	514	514	506	490	477	465	466	465
Temp....	8	8	9	9	10	10	10	9	7	7	6	6	6	7	7	8	9	10	10.5	12	14	16	16.5	18
Nov. 10..	458	458	455	453	453	458	457	458	457	457	457	459	459	463	465	469	475	468	466	466	466	466	465	468
	459	457	454	453	453	456	457	457	457	457	457	459	459	463	466	469	475	468	466	466	466	466	465	467
Temp....	18	18	19	20	21	22	23	23.5	24	24	24.5	24.5	25.5	26	26	26.5	26.5	26.5	27	27	26.5	26	25.5	25
Nov. 11..	467	468	470	470	469	469	472	472	474	478	480	483	484	485	484	485	486	486	489	486	487	485	479	485
	468	468	469	470	469	470	472	472	474	477	480	483	484	484	485	486	486	486	489	486	487	484	479	485
Temp....	24	24	23	22	22	20.5	20	19	17	16	15	14.5	14	14	14	14	13	13	12	12	12	11	11	10
Nov. 12..	498	502	500	491	491	494	491	495	509	483	502	525	559	585	655	(?)	585	(?)	572	573	642	623	713	525
	500	502	501	491	493	495	491	496	509	484	504	522	561	583	659	(?)	585	(?)	574	575	780	602	757	526
Temp....	10	9	9	8	7	6	5	3.5	2.5	1.5	0	-1	-2	-3	-3.5	-4	-5	-6	-5	-5.5	-6	-5	-5	-5
Nov. 13..	511	507	504	497	478	497	505	520	531	(?)	(?)	(?)	693	694	(?)	(?)	(?)	(?)	(?)	630	609	635	562	578
	510	506	504	497	479	495	507	521	532	(?)	690	(?)	691	694	(?)	(?)	750	(?)	(?)	625	599	630	560	577
Temp....	-5	-4	-4	-5	-6	-6	-6	-7.5	-9	-10	-11	-12	-12	-12	-12	-11	-12.5	-12	-11	-12	-12	-12	-11	-11
Nov. 14..	536	532	531	531	535	517	508	519	517	513	515	555	568	534	545	557	(?)	(?)	(?)	(?)	(?)	583	(?)	504
	537	532	530	531	534	518	508	520	516	511	515	552	570	535	544	559	(?)	(?)	(?)	(?)	(?)	582	( )	503
Temp....	-10	-10	-10	-10	-10.5	-10	-10	-11.5	-13	-14	-14	-15.5	-15	-15	-15.5	-16	-16	-16	-15.5	-16	-15	-15	-12	-11
Nov. 15..	510	519	520	516	498	503	486	480	476	484	459	486	505	526	538	525	521	523	515	503	501	501	500	503
	511	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp....	-11	-10	-7	-9	-7	-7	-5	-6	-5	-8.5	-7	-6.5	-5	-6	-5.5	-5	-4.5	-4	-3	-2	-1.5	-1	0	0
Nov. 16..	500	503	507	508	509	511	511	515	512	510	514	501	533	524	525	526	528	528	527	526	526	526	526	530
	....	504	507	509	509	511	511	515	512	510	514	501	534	523	526	526	528	528	527	526	526	526	526	529
Temp....	1	-2	-3	-3.5	-4	-5	-6	-7	-8	-9	-9	-10.5	-10	-9	-9	-9	-8.5	-9	-7	-9	-9	-9	-8	-7
Nov. 17..	529	528	529	528	524	522	519	517	518	518	518	515	518	525	538	518	579	564	557	568	556	554	550	520
	529	528	530	527	524	522	519	516	518	517	518	514	519	525	538	518	586	564	559	567	555	557	549	522
Temp....	-7	-6	-5	-4	-4	-4	-3	-4	-5	-6	-6	-6	-4	-4	-4	-4	-4	-4	-2	-3	-2	-1	-1	0
Nov. 18..	518	515	521	513	509	507	527	480	494	514	531	506	517	524	535	541	548	531	535	548	534	528	526	547
	520	516	521	514	509	509	526	486	492	517	534	505	517	524	535	540	548	533	536	547	530	528	526	542
Temp....	0	0	1	1	1	1	2	1	0	0	-0.5	-1	0	0	-0.5	-1	0	0	1.5	1.5	0	0	1	1
Nov. 19..	548	524	523	502	509	502	510	506	514	507	508	549	556	525	561	572	558	539	545	534	526	526	527	528
	546	523	519	496	507	498	506	506	514	510	507	548	556	524	568	574	560	539	543	534	526	526	528	527
Temp....	2	2	2	2	2	2	2	1	0	-1	-1.5	-2	-2	-2	-2	-2	-1.5	-1.5	-1	0	1	1	1	1
Nov. 20..	525	529	518	531	527	524	544	513	521	536	521	574	575	581	598	565	567	568	565	586	578	560	531	527
	526	531	518	530	527	524	547	514	521	546	514	575	577	582	599	564	567	569	566	585	577	558	529	527
Temp....	0	1	1	1	1	1	3	2	1	0	-1	-0.5	-1	-1	-1	-1	-1	-0.5	0	1	2	3	4	5
Nov. 21..	520	529	514	509	511	513	516	516	517	523	526	531	532	536	538	535	537	599	514	562	563	568	549	548
	520	528	514	509	511	513	516	517	517	523	526	531	532	537	538	534	537	588	514	560	566	567	548	548
Temp....	6	6	7	7	7.5	6.5	5.5	5	3	2	2	1	2	1	2	2	2	3	3	4	5	6	6	6
Nov. 22..	520	528	525	527	526	526	527	516	507	526	520	522	528	529	522	518	517	516	514	514	515	516	518	520
	520	529	525	527	526	526	527	517	507	526	520	523	528	529	522	518	517	516	514	514	515	516	518	520
Temp....	7	7	7	7	7	7	8	8	7	7	8	9	11	11.5	12	12	12	12	12.5	12	12	12	11.5	12
Nov. 23..	522	526	528	529	527	527	526	521	526	515	512	494	506	523	547	552	552	534	525	516	516	517	517	528
	523	526	528	529	527	527	526	521	526	514	512	495	508	523	548	553	551	534	526	516	516	517	517	526
Temp....	12	11	10	10	11	11	10	9	8	7.5	7	6	7	7	7	6	6	6	6	6	6	6	5	5
Nov. 24..	518	517	518	516	515	515	506	507	506	510	505	498	506	510	532	522	526	522	522	517	516	515	516	515
	517	518	518	516	515	515	506	508	507	510	506	498	507	511	534	522	524	522	521	518	516	515	516	518
Temp....	4	4	4	3	3	2	1	0	0	-1	-1	0	1	1	1	1	1	0.5	0	-1	-1	-1	-1	-3
Nov. 25..	520	522	522	520	520	519	514	509	511	505	504	510	515	522	518	537	552	546	562	549	560	531	522	524
	519	522	524	520	521	520	514	510	511	505	504	509	515	521	517	537	552	546	564	548	560	530	524	524
Temp....	-3	-4	-4	-5	-5	-4	-1.5	-1	-1	-1	-2	-2	-3	-3	-4	-4	-4	-4	-3	-4	-4	-3	-3	-3
Nov. 26..	529	524	521	519	517	516	515	514	501	509	516	524	527	526	540	538	538	540	528	524	525	524	521	527
	530	525	526	518	517	516	515	513	502	510	516	523	527	526	539	537	538	540	528	523	525	524	520	526
Temp....	-3	-2	-2	-2.5	-2.5	-2.5	-2	-3	-4	-6	-7	-7	-7	-8	-8	-8	-8	-8	-7.5	-8	-8	-8	-7	-6
Nov. 27..	525	528	526	524	523	519	521	521	514	514	512	541	527	523	522	524	529	528	522	513	515	514	518	522
	525	522	525	523	523	520	521	521	515	514	513	541	526	523	522	524	529	528	521	514	515	514	519	520
Temp....	-6	-5	-5	-5	-4	-4	-4	-4.5	-5	-5	-5	-5	-5	-4	-4	-4	-4	-4	-3	-4	-4	-3	-3	-3
Nov. 28..	522	522	521	519	518	517	517	517	511	510	513	511	522	526	532	529	520	520	520	519	517	516	517	520
	522	523	522	519	518	517	517	517	511	511	510	510	524	526	531	528	519	520	519	519	516	516	517	520
Temp....	-2	-1	-1	-1	0	-0.5	-1	-2	-3	-4	-5	-5	-5	-5	-4	-5	-4	-4	-3	-2.5	-2	-2	-2	-1
Nov. 29..	520	520	520	519	517	518	517	518	517	518	517	515	518	522	522	518	519	519	517	517	517	516	516	518
	520	520	520	519	517	519	517	518	517	518	517	516	518	522	522	518	519	518	517	517	517	516	516	518
Temp....	-1	-1	-1	0	1	1	1	0	-1	-2	-3	-3	-3	-3	-4	-4	-3	-3	-2	-2	-2	-2	-2	-1
Nov. 30..	518	517	518	515	515	516	517	510	511	507	506	512	512	516	521	517	514	517	515	512	511	510	509	515
	518	517	517	515	515	516	518	511	511	507	501	511	513	516	520	517	513	517	515	512	510	510	509	515
Temp....	-1	0	0	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	1	1	2	3	3	2
Magnet'r	505.5	505.8	504.8	502.5	500.9	500.3	500.7	498.1	498.4	508.4	508.7	515.2	517.8	519.7	533.6	538.2	540.7	546.4	534.2	528.4	529.5	517.0	524.0	511.3
Reduced.	512.2	512.5	511.5	509.2	507.6	506.8	507.2	504.6	504.9	514.9	515.2	521.7	524.3	526.2	540.1	544.7	547.2	552.9	540.7	534.9	536.0	523.5	530.5	515.8
Temp....	3.8	3.9	4.1	4.2	4.6	4.3	4.5	3.5	2.5	1.9	1.5	1.3	1.6	1.5	1.5	1.5	1.5	1.7	2.3	2.3	2.3	2.5	2.6	2.9

To reduce readings to an approximately uniform system increase the readings of November 1, 2, and 3 by 65.0 divisions as explained in note to preceding month. Scale value for the first 3 days .0000803, for the next 11 days to November 14, 20h .0000816, for remainder of month .0001739; average for month .0001307 part of the vertical force. Monthly means: Temperature, 2°.7; magnetometer, 516.2; reduced mean, 522.7

Hourly readings of the Brooke balance magnetometer, Uglaamie, Alaska, December, 1882.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Dec. 1	513	511	514	514	515	512	513	511	516	519	518	521	524	526	523	533	541	532	530	532	531	532	531	532
	512	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp	2	5	7	7	9	7	9	8	10	9	10	11	11.5	10	12	13	14	14	15	14	14	16	16	15
Dec. 2	532	529	522	509	509	505	503	502	502	504	506	509	512	511	515	514	516	517	514	512	512	511	511	513
	....	528	521	509	508	505	503	502	502	504	507	510	512	512	516	514	516	517	514	512	512	511	511	513
Temp	14	12	11	10	9	8	6	5	3	2	1	1	1	0	0	-0.5	-1	-1	0.5	0	0	0	0	0
Dec. 3	513	514	513	513	512	513	512	512	511	511	508	511	513	513	513	517	514	514	513	512	511	510	510	512
	513	514	514	513	512	513	512	512	511	511	508	512	513	513	513	517	514	514	513	512	511	510	511	512
Temp	0	0	1	1	2	3	3	2	2	2	2	2	2	2	1	1	1	0	0	0	0	0	0	-1
Dec. 4	513	514	514	516	514	513	513	514	512	505	502	524	518	528	526	544	521	540	538	525	513	512	514	513
	513	514	515	516	514	513	513	514	511	507	501	519	517	529	527	544	520	539	540	524	513	512	514	520
Temp	-1	-1	-1	-1	-1	-1.5	-2.5	-3	-4	-4	-5	-6	-6	-6	-6	-6	-6	-6	-5	-5	-5	-5	-5	-5
Dec. 5	520	519	520	519	519	518	518	517	516	515	517	520	521	522	525	522	522	522	521	520	519	520	519	520
	520	519	520	519	519	518	518	517	516	515	517	521	521	522	526	522	522	522	521	520	519	520	519	522
Temp	-4	-4	-3	-4	-4	-3	-3	-4	-5	-6	-7	-7	-7	-7	-6	-6	-7	-6	-5	-6	-6	-6	-6	-5
Dec. 6	523	521	522	521	520	520	520	519	518	509	511	515	520	521	522	523	522	520	520	519	518	517	516	519
	523	521	522	521	520	520	520	519	518	508	511	516	520	522	522	523	522	520	520	519	518	517	516	519
Temp	-5	-5	-5	-5	-4	-4	-5	-6	-7	-7	-7	-7	-7	-6	-6	-6	-5	-4	-2	-1	-2	-1	0	1
Dec. 7	519	521	521	521	523	522	523	523	514	525	526	528	527	522	525	530	532	532	525	520	517	515	515	518
	519	520	522	521	523	523	523	523	514	525	526	528	527	522	525	531	532	532	525	520	517	515	515	518
Temp	1	2	3	4	4	4	3.5	3	2	1	1	1	0	0	0	-1	-1	-1	-1	-1	-2	-2	-3	-3
Dec. 8	518	518	519	519	520	520	520	520	520	522	521	523	524	517	522	524	524	523	523	522	521	521	520	521
	518	518	520	519	520	520	521	520	521	522	521	524	524	518	522	524	524	523	523	522	521	521	520	522
Temp	-3	-5	-6	-6	-5	-6	-7	-8	-8	-9	-9	-9	-10	-10	-9	-9	-8	-8	-7	-7	-6	-5	-5	-5
Dec. 9	520	522	522	521	521	521	520	503	502	514	520	521	523	523	525	526	527	532	534	520	524	522	515	522
	522	522	522	521	521	521	520	503	501	515	519	522	523	523	525	526	527	532	534	519	524	522	515	521
Temp	-5	-5	-5	-4	-3	-3	-4	-4	-6	-7	-8	-8	-8	-9	-9	-9	-9	-9	-7.5	-8	-8	-8	-9	-9
Dec. 10	522	525	525	524	525	524	524	523	523	522	523	526	527	532	532	528	528	526	526	525	524	524	525	525
	522	525	525	524	525	524	524	523	523	522	524	526	528	532	532	528	528	526	526	525	524	524	525	525
Temp	-9	-9	-9	-9	-9	-9	-9	-9	-10.5	-11	-12	-12	-11.5	-12	-12	-11	-11	-11	-10	-10	-10	-10	-10	-9
Dec. 11	525	525	524	524	524	526	523	519	513	515	513	503	511	521	521	521	524	530	538	524	510	514	514	518
	525	526	524	524	524	526	523	519	514	515	507	504	511	521	522	521	524	530	538	524	510	514	514	517
Temp	-9	-8	-8	-8	-7	-7	-7	-7	-7	-7	-7	-6	-6	-6	-5	-4	-3	-4	-3	-3	-3	-3	-4	-5
Dec. 12	520	522	520	519	521	522	521	518	518	519	520	527	522	521	525	527	532	530	539	532	530	528	525	528
	520	522	521	519	521	522	521	518	518	519	520	527	522	521	526	527	532	533	538	532	529	528	524	528
Temp	-6	-7	-7	-8	-7	-8	-8	-9	-10	-11	-12	-12	-12	-12	-12	-12	-12.5	-12	-12	-12	-12	-12	-12	-12
Dec. 13	529	530	531	530	530	529	529	527	524	523	524	527	522	513	532	530	527	526	524	524	523	523	524	525
	529	530	531	530	530	529	529	526	524	523	525	527	522	516	533	530	527	526	524	524	523	523	524	525
Temp	-12	-13	-13	-12	-12	-12	-12	-11	-12	-12	-12	-12	-11	-10	-10	-9.5	-9	-9	-7	-7	-7	-7	-7	-6
Dec. 14	525	525	525	525	525	525	524	522	521	521	520	521	524	528	534	538	529	526	526	525	524	525	524	524
	525	525	525	525	525	524	524	522	522	521	522	521	524	529	534	537	529	526	526	525	524	525	524	524
Temp	-6	-6	-6	-6	-5	-6	-6	-6	-7	-8	-9	-10	-10	-10	-10	-10	-10	-10	-9	-10	-10	-9	-9	-9
Dec. 15	524	523	526	528	531	534	538	538	541	543	543	544	542	543	544	543	542	540	541	535	531	522	516	514
	524	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp	-9	-3.5	-1	0	1	2	3.5	2	4	4	4	4	4.5	5	5	4	5	5	5	5	5	4	5	4
Dec. 16	514	508	513	509	484	497	505	505	497	497	522	503	522	530	534	536	531	536	539	532	523	537	532	522
	....	508	513	511	484	498	506	505	496	496	521	500	523	529	533	537	531	536	540	532	523	537	528	524
Temp	4	0	-1	-2	-3.5	-5	-6	-7	-9	-10	-10	-10	-10.5	-11	-11	-11	-11	-11	-9	-9.5	-9	-9	-9	-9
Dec. 17	524	523	524	522	523	522	521	523	521	522	522	524	528	531	531	526	525	525	524	523	523	523	523	523
	523	523	524	522	522	523	522	523	521	522	523	524	528	531	530	526	525	525	524	523	523	528	523	524
Temp	-9	-9	-8	-8	-7	-7	-7	-7	-8	-9	-10	-10	-10	-10	-10	-10	-9.5	-9	-8	-9	-9	-9	-9	-9
Dec. 18	524	525	525	524	525	525	523	523	524	525	526	528	527	528	528	528	528	528	528	527	527	527	526	526
	524	525	525	524	525	525	524	523	524	525	527	528	528	528	528	528	528	528	528	527	527	527	526	526
Temp	-9	-9	-9	-8	-7	-7	-8	-8	-10	-11	-12	-12	-12	-12	-12	-12	-12	-12	-11	-12	-12	-12	-13	-12
Dec. 19	526	530	528	531	523	522	523	500	508	509	510	515	523	530	532	532	533	531	530	529	528	526	528	528
	526	531	530	530	523	522	523	500	508	510	512	515	533	530	532	532	533	531	530	529	528	528	528	529
Temp	-14	-14	-14	-14	-14	-14	-14	-14	-14	-15	-16	-16	-16	-16	-16	-15	-15	-14.5	-12	-13	-13	-14	-14	-15
Dec. 20	530	531	532	532	533	532	532	532	527	531	527	520	537	551	552	559	571	558	557	550	559	546	538	525
	530	531	532	532	533	532	531	532	527	529	527	519	537	552	545	556	570	557	557	551	560	545	538	528
Temp	-15	-15	-15	-15	-15	-14	-15	-15	-16	-16	-17	-17	-16	-16	-16	-15.5	-15.5	-15.5	-14	-14	-14	-14	-14	-15
Dec. 21	528	525	523	521	512	516	520	520	450	498	527	548	541	539	542	550	543	537	531	545	537	532	523	524
	528	525	523	520	512	516	521	520	451	497	526	549	538	539	542	550	543	537	531	547	534	535	521	524
Temp	-15	-12	-12	-12	-10	-10	-9.5	-10	-11	-12	-12	-12	-12	-13	-13	-13	-18	-13	-11	-11	-11	-11	-11	-12
Dec. 22	524	526	528	526	526	525	524	526	522	518	552	518	522	546	557	550	545	538	534	527	526	527	527	530
	524	527	528	525	526	525	523	525	522	521	552	520	521	545	558	550	544	538	533	526	529	527	527	531
Temp	-11	-10	-10	-10	-10	-11	-12	-13	-14	-15	-16	-16	-16	-16	-16	-16	-16	-16	-15	-14.5	-14.5	-14	-14	-14
Dec. 23	530	532	533	531	531	528	530	530	526	520	521	521	550	543	535	537	538	561	538	535	533	530	531	532
	531	532	533	531	531	528	530	530	527	520	522	521	548	548	535	537	539	550	537	535	533	531	531	532
Temp	-14	-14	-13	-13	-12.5	-13	-12.5	-12	-14	-15	-15	-16	-16	-16	-16	-16	-15	-15	-15	-15	-15	-16	-17	-16
Dec. 24	532	534	534	533	532	533	532	531	529	528	534	505	524	528	537	556	535	553	545	535	534	534	533	534
	532	534	533	534	532	532	532	531	529	529	535	503	525	528	537	555	537	553	546	535	534	534	533	534
Temp	-16	-16	-16	-15.5	-14.5	-15	-15	-16	-18	-18	-19	-20	-20	-20	-20	-20	-20.5	-20	-19.5	-20	-20	-20	-20	-20
Dec. 25	534	534	534	534	535	534	534	534	530	521	517	522	534	539	539	532	534	530	525	524	523	522	522	525
	534	534	534	534	535	534	534	534	530	522	516	522	533	539	538	533	534	530	525	524	523	522	522	526
Temp	-20	-21	-21	-21	-20	-21	-21	-21	-22	-22	-22	-21	-20	-19	-19	-18	-16	-15	-13	-12	-12	-12	-12	-12
Dec. 26	525	527	527	527	527	527	528	528	528	526	523	520	521	530	533	533	533	532	534	524	524	523	522	524
	527	528	527	527	527	527	527	528	527	526	523	521	521	530	533	534	533	532	534	524	523	523	522	524
Temp	-11	-10	-9	-9	-8.5	-8	-6.5	-6	-8	-9	-9	-9	-8	-8	-8	-8	-8	-7	-5	-5	-6	-6	-6	-6
Dec. 27	526	524	525	524	524	524	525	523	520	513	515	514	516	516	519	521	520	520	520	520	521	522	522	522
	524	524	524	524	524	524	525	523	521	513	515	513	516	517	518	521	520	520	520	520	521	522	522	521
Temp	-7	-7	-6	-6	-5	-5	-5	-5	-7	-8	-9	-9	-9	-10	-10	-10.5	-11.5	-11.5	-11	-13	-13	-14	-14	-13
Dec. 28	521	524	524	522	521	515	516	510	508	506	509	514	520	503	526	523	523	522	523	521	522	522	522	522
	521	524	524	522	521	516	516	510	509	506	509	514	520	502	526	523	523	522	523	521	522	522	522	522
Temp	-12	-11	-11	-11	-11	-11	-9	-8	-9	-10	-10	-10	-11	-11	-12	-13	-13	-14	-13	-14	-14	-14	-14	-11
Dec. 29	522	520	521	522	523	516	524	528	521	520	510	515	536	520	508	477	501	511	510	511	504	509	508	508
	521	520	520	522	523	517	524	528	521	520	510	515	536	519	508	478	501	511	511	510	505	508	508	508
Temp	-9	-8	-5	-3	0	2	4	5	4	5	5	6	7	5	4	2	0	-1	-1.5	-3	-5	-6	-7	-8
Dec. 30	513	513	516	515	516	517	518	516	520	519	521	524	525	521	533	540	528	528	535	542	526	522	521	523
	512	512	518	514	517	516	518	517	520	519	520	524	525	521	531	541	528	528	536	542	525	523	522	523
Temp	-8	-8	-8	-8.5	-9	-9.5	-11	-12	-14	-15	-16.5	-17	-17	-18	-18	-18	-18	-17	-15.5	-16	-15	-15	-15	-15
Dec. 31	524	527	514	522	523	521	521	520	519	519	517	519	527	551	533	527	525	523	521	520	521	514	515	509
	524	526	514	522	524	521	521	521	519	519	517	519	526	552	532	527	525	523	521	520	521	513	514	509
Temp	-14	-13	-13	-13	-11	-10.5	-10	-10	-11	-12	-12	-12	-11	-11	-11	-11	-10	-9	-8	-7	-7	-7	-7	-8
Magnet'r	523.0	523.2	523.3	522.5	521.5	521.2	521.9	519.9	516.2	517.5	520.1	520.4	525.2	527.6	529.6	530.6	520.4	530.4	529.3	526.1	523.9	523.1	521.5	522.3
Temp	-7.8	-7.5	-7.1	-7.0	-6.4	-6.5	-6.6	-6.8	-7.9	-8.5	-8.9	-9.0	-8.9	-9.0	-9.0	-9.0	-8.8	-8.7	-7.5	-7.9	-8.0	-8.1	-8.1	-8.2

One division of scale = .0001739 part of vertical force. **Monthly means: Temperature, -8°.0; magnetometer, 523.7**

Hourly readings of the Brooke balance magnetometer, at Uglaamie, Alaska, January, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Jan. 1	512	512	513	515	515	515	513	512	515	509	509	495	498	506	522	532	516	513	513	512	509	510	508	511
	510	512	513	516	515	515	512	512	515	509	509	495	499	505	522	532	516	513	513	512	509	510	508	511
Temp	-8	-7	-6	-6	-5	-5	-5	-5	-5	-6	-7	-7	-6	-7	-7	-7	-6	-5	-4	-3	-4	-4	-3	-3
Jan. 2	511	511	510	510	509	507	505	504	504	501	500	497	497	490	493	499	499	495	494	497	488	481	486	488
	511																							
Temp	-3	-1	3	2.5	3	4	3	4	3	5	8	8	9	9	10	9	10	11	12	12	12	12	13	17
Jan. 3	486	487	490	490	492	494	494	494	495	493	493	493	498	498	506	512	502	499	499	498	498	499	499	500
	....	487	491	490	492	494	494	494	495	493	493	493	498	498	506	512	502	499	499	498	498	499	499	501
Temp	14	14	12	10	8	9	8	8	7	5	5	4	4	4	4	4	5	5	6	5	5	5	5	5
Jan. 4	501	500	500	500	499	499	499	499	499	500	500	496	503	509	502	500	501	501	499	499	499	498	498	498
	501	500	500	500	499	499	499	499	499	500	500	497	503	509	501	500	501	501	499	499	499	498	498	499
Temp	5	5	5	5	6	5	5	5	4	3	2	2	3	3	4	3	4	4	5	5	5	5	5	5
Jan. 5	500	500	501	500	501	501	500	500	495	492	491	498	503	503	504	504	506	505	505	504	503	500	499	492
	500	500	501	500	501	501	501	500	495	491	490	498	503	503	504	504	506	505	505	504	503	501	499	493
Temp	5	5	6	6	5	5	5	5	3	2	1	-0.5	-0.5	0	0	-1	0	0	0	0	0	0	0	1
Jan. 6	495	501	503	507	498	500	500	500	500	494	502	489	506	502	517	541	518	512	518	509	502	499	504	505
	497	502	505	507	498	500	501	500	500	491	501	489	508	501	517	539	518	512	518	508	502	497	505	505
Temp	1	2	3	3	4	4	3	3	1	1	0	0	0	-1	-1	-1	-1	-1	-1	-1	-2	-3	-4	-4
Jan. 7	509	511	511	511	510	512	510	500	501	502	505	492	474	507	510	511	540	525	536	534	520	502	510	509
	508	511	511	511	510	511	510	500	501	503	505	494	478	508	510	512	541	525	536	537	522	501	510	509
Temp	-4	-4	-4	-3	-3.5	-3	-3	-3	-4	-5	-6	-6	-7	-8	-7	-7	-7	-6	-5	-5	-5	-5	-4	-4
Jan. 8	508	510	511	511	509	510	505	501	502	502	504	504	517	505	519	519	516	515	513	513	509	506	507	507
	507	509	511	512	509	509	506	501	502	502	504	504	517	504	520	519	516	515	513	512	509	505	507	507
Temp	-4	-3	-2	-2	-1	-1	-2	-2	-4	-5	-6	-6	-6	-6	-6	-6	-5	-5	-3	-3	-3	-3	-3	-2
Jan. 9	508	510	509	509	510	510	510	511	507	505	511	505	507	513	511	519	526	523	517	519	514	514	514	514
	508	510	509	509	510	510	510	511	507	505	511	505	507	514	511	519	526	523	517	518	515	514	514	514
Temp	-2	-1	-1	-1	-2	-2	-2	-3	-4	-5	-6	-6	-6	-6	-5	-5	-5	-6	-5	-6	-6	-6	-7	-7
Jan. 10	514	516	517	517	517	518	517	516	517	517	518	518	517	517	517	517	517	516	515	513	513	513	511	509
	514	516	518	517	517	518	517	516	517	517	518	518	517	517	517	517	517	516	515	512	513	513	511	509
Temp	-6	-7	-8	-8	-8	-8	-8	-7	-8	-9	-9.5	-9	-9	-9	-8	-8	-7	-6	-5	-5	-5	-5	-6	-6
Jan. 11	510	514	518	517	517	516	514	514	513	515	516	517	518	518	518	518	518	518	517	517	517	517	518	518
	511	513	518	517	517	516	515	514	514	515	516	517	518	518	518	518	518	518	517	517	517	517	518	519
Temp	-6	-6	-6	-6	-6	-6	-6	-6	-8	-8.5	-9	-9	-10	-10	-10	-10	-9	-9	-8	-8	-9	-9	-10	-10
Jan. 12	519	519	520	520	520	520	520	521	521	522	522	522	521	523	522	522	523	523	523	524	521	520	521	521
	519	519	519	520	520	520	520	521	521	522	521	522	521	521	522	522	523	522	524	524	521	520	521	522
Temp	-10	-10.5	-11	-11	-10	-10	-11	-13	-12	-14	-14	-15	-14	-14	-14	-14	-14	-14	-12	-13	-13	-14	-14	-15
Jan. 13	523	523	524	524	524	524	524	524	525	525	526	527	527	527	527	528	534	533	527	526	526	526	526	526
	523	523	524	524	524	524	524	524	524	525	526	527	527	527	527	528	534	533	527	526	526	526	526	526
Temp	-15	-15	-15	-15	-15	-15	-15	-15	-17	-18	-18.5	-19	-18	-18	-18	-18	-18	-18	-16	-16	-16	-16	-16	-16
Jan. 14	526	526	526	526	525	524	524	525	525	524	523	522	524	524	526	529	527	526	526	526	526	525	520	522
	526	526	526	526	525	525	524	525	525	524	523	523	525	524	526	530	527	526	526	526	526	524	520	522
Temp	-16	-16	-16	-15	-15	-14	-14	-14.5	-16	-17	-17.5	-17	-17	-17	-17	-17	-16	-16	-15	-15	-15	-14	-14	-14
Jan. 15	522	521	520	518	518	518	517	515	516	515	515	515	510	513	519	518	518	518	525	517	514	507	504	508
	522																							
Temp	-12	-9	-6	-8	-7	-7	-6	-7	-6	-6	-7	-7	-7	-6	-6	-7	-6	-6	-5	-6.5	-6.5	-6.5	-7	-7
Jan. 16	511	515	518	520	521	521	523	523	524	523	525	525	527	528	534	531	529	526	525	522	520	519	518	516
	....	515	518	520	522	521	522	523	524	523	525	525	527	529	534	531	529	526	525	522	520	519	518	516
Temp	-7	-9	-10	-13	-13	-14	-15	-15	-17	-18	-18	-18	-18	-17	-16	-16	-15	-14	-12	-11	-10	-8	-7	-5
Jan. 17	515	513	513	510	508	507	508	505	498	494	480	494	502	503	516	509	511	520	516	501	498	499	498	498
	515	513	513	510	508	508	508	504	497	494	480	495	502	503	516	509	511	530	516	500	498	499	498	498
Temp	-3	-2	0	2	3	3	3	3.5	2	2	1	1	[illegible]	5	7	7	7	8	9	8	8	7	6	6
Jan. 18	501	502	502	501	501	503	497	497	499	502	496	497	496	506	511	519	510	511	512	510	508	507	506	510
	501	502	502	501	502	502	497	498	499	507	498	496	496	506	511	519	510	511	513	510	507	507	506	510
Temp	[illegible]	7	7	7	7	6	5	5	3	1.5	0.5	0	-1	-1	-1	-2	-2	-2	-1	-2	-2	-2	-2	-2
Jan. 19	512	511	511	512	510	511	511	510	511	511	512	513	513	510	515	516	516	518	519	514	515	516	517	518
	512	511	511	512	510	511	511	510	511	511	512	513	513	510	516	516	515	517	518	514	515	516	517	518
Temp	-2	-2	-1	-2	-2	-2	-3	-2.5	-4	-5	-6	-7	-7	-7	-8	-8	-8	-8	-8	-8	-8	-8	-9	-9
Jan. 20	518	519	519	519	519	520	519	519	519	515	512	510	507	523	522	523	534	536	532	526	525	521	518	518
	518	519	519	519	519	519	519	519	520	515	512	508	512	523	522	523	534	534	533	526	525	521	517	519
Temp	-9	-9	-9	-10	-10	-10	-10	-10	-11	-12	-12.5	-14	-13	-13	-13	-13	-13	-13	-12	-11	-11	-11	-11	-10
Jan. 21	519	519	520	519	516	514	511	510	509	512	492	510	506	521	524	523	520	521	519	512	510	508	509	512
	519	519	520	519	516	514	511	510	508	512	492	509	504	522	525	523	520	521	518	513	510	508	509	512
Temp	-10	-9	-7	-8	-8	-7	-6	-6	-8	-9	-9	-9	-9	-9	-9	-8	-8	-7	-5	-5	-5	-5	-4	-3
Jan. 22	512	513	514	513	512	512	512	511	511	510	510	511	508	505	516	512	509	509	508	507	506	506	502	501
	512	513	513	513	513	512	511	511	511	510	510	511	510	505	517	512	509	509	508	507	506	506	506	502
Temp	-4	-4	-4	-4	-3	-3	-2	-2	-3	-3	-4	-4	-3	-3	-2	-2	-1	-1	0	-1	0	0	0	1
Jan. 23	503	504	504	505	504	504	504	503	502	503	501	502	498	503	510	514	510	507	499	498	498	498	498	498
	503	503	504	506	504	504	503	503	502	503	501	502	499	503	510	514	509	507	499	498	498	498	498	498
Temp	3	3	3	2.5	4	5	5	6	4	4	4	4	5	5	6	6	6	6	8	7.5	8	8	8	8
Jan. 24	498	498	497	497	496	495	493	492	491	491	490	491	491	493	494	496	499	502	511	510	511	500	493	495
	498	498	497	497	496	494	493	492	491	491	490	491	492	494	494	496	499	502	511	509	513	500	494	495
Temp	8	10	10	11.5	13	14	15	16	15	14	13.5	14	13	11	10	9	8	7.5	8	7	7	5	4	4
Jan. 25	495	501	504	506	505	505	506	506	506	504	505	507	518	522	520	512	520	527	516	528	530	516	508	507
	496	502	504	506	505	505	506	506	506	504	505	507	516	522	520	512	520	527	517	529	527	518	505	506
Temp	3	3	2	0	0	0	0.5	1	-1	-2	-2	-3	-3	-4	-4	-4	-5	-4	-5	-5	-6	-6	-6	-6
Jan. 26	511	513	515	516	516	511	505	510	513	512	515	515	523	516	530	539	532	526	536	533	535	530	512	510
	511	513	515	516	516	510	504	510	513	512	516	517	528	516	531	539	531	526	536	533	535	527	514	510
Temp	-6	-6	-6	-6	-6	-6	-6	-6	-8	-9	-9	-9	-10	-10	-11	-11	-10	-9.5	-9	-9	-9	-10	-10	-10
Jan. 27	518	519	517	520	520	523	520	5'1	521	521	523	505	506	519	520	528	543	535	531	526	526	524	522	522
	518	519	518	520	520	522	520	521	521	520	523	505	506	519	520	527	542	535	530	527	527	524	522	523
Temp	-10	-10	-10	-10.5	-10	-11	-11	-11	-12.5	-13	-14	-15	-15	-15	-15	-16	-15	-15	-15	-15	-15	-15	-15	-15
Jan. 28	521	524	529	527	526	522	523	520	521	522	525	525	527	529	529	527	526	527	525	527	526	525	523	525
	522	525	529	526	526	522	523	520	521	522	525	526	527	529	529	527	526	527	525	527	526	525	523	524
Temp	-15	-14	-14	-13	-13	-13	-13	-13	-15	-15	-16	-16	-16	-16	-16	-16	-15	-15	-14.5	-14	-15	-15	-15.5	-16
Jan. 29	526	526	526	528	526	525	525	525	525	525	525	526	526	522	528	526	528	528	526	524	522	521	520	521
	526	526	526	528	526	525	526	525	525	526	525	526	527	522	528	526	528	528	526	523	522	521	520	522
Temp	-15	-14	-14	-14	-13	-13	-12	-13.5	-15	-15	-16	-16	-16	-15.5	-15	-16	-15	-15	-14	-14	-14	-14	-15	-15
Jan. 30	523	525	524	525	5.6	527	527	527	527	527	526	525	526	523	527	520	520	523	520	529	530	529	528	527
	523	525	525	525	527	527	527	527	527	528	525	525	526	523	527	520	521	523	520	529	530	529	528	528
Temp	-14.5	-14	-14	-15	-15	-15	-15	-15	-17	-18	-18	-18	-19	-19	-19	-19	-19	-19	-18	-19	-19	-19	-18	-18
Jan. 31	527	529	527	528	529	529	529	526	517	514	510	516	519	523	527	532	532	536	536	529	528	523	519	520
	527	528	530	529	529	529	529	5.6	517	514	510	517	520	523	528	532	532	536	537	529	528	523	510	520
Temp	-18	-18	-18	-19	-18	-17	-17	-16.5	-18	-18	-18	-18	-18	-18	-18	-18	-17	-16	-15	-15	-15	-14	-12	-10
Magnet'r.	511.5	512.7	513.5	513.6	512.9	512.7	511.7	511.0	510.6	509.8	509.1	508.5	510.3	513.0	517.4	519.9	519.3	518.5	517.9	516.2	514.4	511.5	510.2	510.6
Temp	-5.3	-4.8	-4.5	-4.7	-4.5	-4.4	-4.[illegible]	-4.4	-5.7	-6.4	-6.9	-7.3	-7.1	-7.1	-6.9	-7.0	-6.6	-6.4	-5.4	-5.6	-5.7	-5.7	-5.8	-5.4

One division of scale = .0001759 part of the vertical force. Monthly means: Temperature, −5°.8; magnetometer, 513.2

Hourly readings of the Brooke balance magnetometer, at Uglaamie, Alaska, February, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Feb. 1...	522	520	516	512	511	512	508	506	506	504	501	500	501	499	500	499	502	501	509	522	513	508	530	494
	522	...																						
Temp....	-9	-0.5	1	1.5	4	3	3	5	7	9	9	9	9	9	8	8	8	7	7	7	7	7	7	7
Feb. 2...	495	506	499	488	497	501	504	497	499	502	503	501	502	519	528	531	529	523	529	529	517	498	506	509
	.....	505	500	489	496	501	504	497	499	502	503	501	502	521	528	530	529	523	529	528	517	498	508	510
Temp....	6	4	4	3	3	3	2	1	0	-1	-1	-1	-1	-2	-2	-2	-2	-2	0	-1	-1	0	0	1
Feb. 3...	511	511	508	507	507	506	505	497	484	487	492	505	534	496	512	521	522	511	531	515	520	491	495	495
	512	511	508	508	508	509	504	497	485	487	492	505	533	493	514	522	522	511	532	512	507	496	497	496
Temp....	1	1	1	2	4	6	7	8	7	6	7	6	7	7	7	6	7	6	7	6.5	7	9	11	12
Feb. 4...	498	495	492	496	495	491	488	488	478	459	479	472	476	504	505	509	510	504	506	508	507	488	487	485
	498	495	494	495	496	491	489	488	478	466	478	473	478	502	505	509	510	504	506	509	507	487	487	486
Temp....	13	14	15	15	15.5	18	18	19	17	10	15.5	15	15	15	15	15	14	14	14	13.5	13.5	18.5	13	13
Feb. 5...	489	489	496	493	495	491	483	481	483	484	482	463	480	478	487	490	495	497	501	496	487	485	483	480
	489	489	496	493	495	491	482	482	483	485	482	465	479	478	487	490	495	497	502	495	486	485	483	481
Temp....	13	13	14	13	14	15	16	17	16	15.5	15.5	15	15.5	16	16.5	17	17.5	17.5	19	19	19	20	20.5	21
Feb. 6...	482	482	480	481	482	479	478	474	472	473	475	476	476	478	476	477	480	500	499	501	486	478	486	480
	482	482	480	481	482	478	478	475	471	473	475	476	476	478	476	478	480	501	498	502	485	477	480	480
Temp....	21	22	23	23	24	26	26.5	27	26	25.5	25	25	25	25	25	25	23.5	22.5	21	19	17.5	16	14.5	14
Feb. 7...	489	491	492	493	493	495	496	495	495	496	496	496	496	494	497	497	497	496	494	493	489	486	484	483
	489	490	493	493	494	495	496	495	495	496	496	496	496	494	497	497	497	496	494	493	489	486	484	483
Temp....	13	12	12	12	11	11	10	10	9	8	7	7	8	8	9	9	10	11	12	13	14.5	17	18	20
Feb. 8...	482	484	485	485	486	485	484	485	487	489	488	481	488	495	503	501	501	500	500	497	495	493	493	494
	482	484	485	485	486	485	484	485	487	489	488	481	488	496	503	501	501	500	500	497	495	493	493	493
Temp....	19	19	18.5	19	20	20	19	18	14.5	12.5	11	10	9.5	9	9	8.5	9	9	9	8	8	8.5	9	10
Feb. 9...	495	496	497	497	496	495	494	494	493	492	492	491	488	483	488	487	485	483	481	479	479	478	472	470
	495	496	497	498	496	494	494	494	494	492	492	491	488	483	488	487	485	483	481	479	479	476	472	471.5
Temp....	10	10	10	10.5	12	13	13	14	12	12	12.5	13	14	17	18	19	21	22	23	24	25	26.5	27	27
Feb. 10...	471	473	475	477	481	482	486	484	486	488	490	491	493	498	502	504	507	506	505	504	504	506	506	508
	471	473	475	477	481	482	486	484	486	489	489	491	493	498	503	501	507	506	506	504	505	506	507	508
Temp....	27.5	27	25	22	20.5	18	17	16	13	11	9	7	6.5	5	3.5	3	2	0.5	1	-0.5	-1	-1	-2	-2
Feb. 11...	509	510	510	510	510	510	509	510	510	509	509	506	503	512	513	514	516	517	509	509	509	511	512	512
	509	510	510	510	510	510	510	510	510	509	510	506	502	512	512	515	516	517	509	509	509	511	512	512
Temp....	-2	-2	-3	-3	-2	-2	-1	-2	-3	-4	-5	-5.5	-5	-5	-5	-4.5	-4	-4	-3	-3	-4	-4	-4.5	-4
Feb. 12...	512	512	512	512	512	512	512	512	512	512	513	512	500	510	512	511	512	509	507	507	506	506	505	503
	512	512	512	512	512	512	512	512	512	512	513	512	500	511	512	511	512	509	507	507	506	506	505	503
Temp....	-4	-3	-4	-4	-4	-4	-4	-3	-5	-5	-5	-5	-4	-4	-3	-3	-2	-1	1	2	2	3	4	4
Feb. 13...	503	502	501	499	498	496	494	493	493	493	494	495	496	497	[illegible]	502	503	502	500	499	493	500	500	500
	502	502	500	499	498	496	495	493	493	493	494	495	496	407	498	502	503	502	500	499	499	500	500	501
Temp....	5	6	8	8.5	10	12	13	13	12	11	10	9	8	7.5	6.5	6	6	6	6	5	5.5	5	5	4
Feb. 14...	501	501	502	502	502	503	502	502	500	499	489	498	504	507	509	518	523	520	517	517	506	503	501	502
	501	501	502	502	502	503	502	502	500	499	488	498	504	508	500	519	523	520	517	517	507	504	501	501
Temp....	4	4	4	5	4	4	4.5	4.5	3.5	2.5	2	2	2	1	0	-1	-1	-1	0	0	0	1	2	2
Feb. 15...	503	505	503	502	503	500	500	497	493	490	490	490	492	490	490	491	492	492	493	494	495	495	495	495
	503																							
Temp....	2	4	10	7	8	9	11	0	13	14	15	14	13	13	13	12	12	11	9.5	9.5	9	9.5	10	10
Feb. 16...	494	494	498	499	500	500	499	500	500	500	502	504	509	510	505	511	521	514	511	510	509	510	510	511
	.....	495	498	498	500	500	499	500	500	501	502	504	509	511	506	511	521	513	511	510	509	510	510	511
Temp....	9	8	8	6	6	6	5	4	2	0.5	-1	-1.5	-1.5	-2	-2	-3	-3	-3	-2.5	-3	-4	-4	-4	-3
Feb. 17...	512	512	511	511	510	510	509	509	506	491	497	503	506	510	524	513	512	512	508	507	501	500	502	507
	512	512	511	511	510	510	509	509	506	490	497	503	506	510	523	513	512	512	508	507	501	500	501	507
Temp....	-3	-2	-2	-2	-2	-1	-1	0	-1	-1	-1	-2	-2	-1	-1	0	1	2	3	2	2	2	2	2
Feb. 18...	508	507	504	506	504	504	504	505	505	505	506	506	507	508	507	507	508	510	507	503	501	500	499	496
	508	507	505	506	504	503	504	505	505	505	506	506	507	508	507	507	508	509	507	503	501	500	499	496
Temp....	2	3	3	3	3	3	2	2	1	0	-0.5	-1	0	0	0	1	2	2	4	4	5	6	7	8
Feb. 19...	497	497	496	495	496	490	487	493	494	493	493	494	493	495	496	496	407	497	496	495	495	496	495	495
	497	497	496	495	496	490	487	493	494	493	493	494	493	495	496	496	497	497	496	495	495	496	495	495
Temp....	8	10	11.5	12	13	13	12	11.5	11	11	10	10	10	9	9	8	8	9	10	10	9.5	10	10	11
Feb. 20...	494	493	492	491	491	490	485	490	491	490	482	483	495	511	516	520	513	507	506	499	500	501	502	503
	494	493	491	491	491	490	490	490	491	490	481	483	495	510	517	520	513	507	506	499	501	501	502	503
Temp....	12	13	15	15	14	15	15	13	12	11	10	9	9	8	7	6	5	5	5	4	3	3	2.5	2.5
Feb. 21...	504	504	503	503	504	503	503	503	504	504	504	505	505	506	517	512	515	514	509	508	508	504	503	510
	504	504	504	504	504	503	503	503	504	504	504	505	504	507	516	512	517	514	509	508	508	504	502	511
Temp....	3	3	3	3	3.5	3	3.5	3.5	2	1	0	-1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	0
Feb. 22...	505	511	502	510	507	501	493	502	500	497	504	510	512	523	526	529	537	541	541	518	536	537	527	526
	505	512	502	511	507	500	493	503	400	497	504	506	512	524	526	529	537	542	537	547	538	536	527	526
Temp....	1	2	2	2	3	3.5	3.5	3	1.5	0.5	0	-2	-2	-2	-3	-4	-4	-5	-5	-6	-7	-7	-7	-6
Feb. 23...	515	509	508	511	508	514	513	500	492	514	522	509	513	521	532	546	536	539	537	526	519	516	518	517
	515	508	508	511	509	514	512	502	491	514	522	510	513	521	532	546	536	538	537	526	518	516	518	516
Temp....	-5	-5	-5	-5	-4	-5	-6	-6	-8	-9	-11	-11	-11	-11	-12	-12	-11	-11	-9	-10	-10	-9	-9	-8
Feb. 24...	516	518	516	517	518	517	517	512	516	518	517	506	507	515	519	530	580	555	547	537	521	543	546	528
	516	518	516	517	518	517	517	512	517	518	518	504	507	516	520	530	579	555	547	538	520	545	547	528
Temp....	-7	-7	-7	-6	-6	-6	-6	-6	-8	-9	-10	-11	-11	-11	-12	-12	-12	-12	-12	-12	-11	-11	-12	-11
Feb. 25...	527	526	527	505	511	497	503	513	514	522	522	520	530	532	530	529	525	525	524	524	524	524	524	524
	527	526	530	505	511	498	508	513	514	522	522	521	531	531	529	528	525	525	525	524	524	524	524	524
Temp....	-10	-9	-8	-8.5	-8	-9	-9	-9	-11	-12	-13	-13	-14	-14	-14	-14	-14	-18.5	-12	-12	-13	-13	-12	-11
Feb. 26...	523	520	520	519	518	517	516	513	513	511	518	520	522	526	538	530	529	525	534	536	531	524	520	519
	521	520	519	519	518	518	515	513	514	511	518	520	522	525	538	531	529	526	534	536	530	524	520	520
Temp....	-11	-9	-9	-9	-8	-8	-8	-9	-11	-13	-14	-14	-14	-15	-15	-16	-16	-16	-15	-16	-17	-17	-17	-15
Feb. 27...	521	522	521	518	514	511	512	510	507	507	498	508	506	511	515	528	533	538	539	554	545	532	524	506
	521	523	520	516	513	510	512	510	507	508	499	509	505	511	515	522	533	533	539	552	549	533	522	508
Temp....	-13	-9	-4	-3	-0.5	-1	-0	-0.5	-2	-4	-6	-6	-7	-8	-8	-9	-9	-9	-9	-9	-9	-9	-8.5	-7
Feb. 28...	502	522	510	514	504	499	484	488	479	500	493	508	513	536	518	530	522	551	538	529	512	505	409	502
	523	521	510	500	505	498	483	488	477	500	493	508	513	534	518	530	521	551	539	527	511	504	502	502
Temp....	-1.5	1	2.5	4	4	1	1	1	-1	-2	-2	-3	-3	-2	-2	-1	0	0	2.5	2	2	2	3	4
Magnet'r.	503.2	504.0	502.8	501.7	502.0	500.4	498.9	498.4	496.9	497.6	498.2	498.3	501.6	505.9	509.4	511.7	514.4	513.8	513.5	512.3	507.4	504.3	504.5	502.8
Temp....	3.7	5.1	5.5	5.4	5.9	6.1	6.1	6.0	4.5	3.7	3.1	2.5	2.5	2.8	2.2	2.0	2.2	2.2	3.0	2.6	2.5	2.8	3.5	4.0

One division of scale = .0001739 part of the vertical force. Monthly means: Temperature, 3°.7; magnetometer, 504.3

Hourly readings of the Brooke balance magnetometer at Uglaamie, Alaska, March, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Mar. 1	502	502	501	500	498	497	487	483	496	494	495	484	494	523	509	512	530	520	515	522	522	499	495	501
	502	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp	6	5	9	12	14.5	8	10	6	7	9	10	11	10	10	9	9	8	7	6	5	5	1	4	4
Mar. 2	503	507	506	509	505	493	493	494	467	474	484	507	534	534	546	551	543	550	548	538	526	518	522	518
	.....	508	507	510	504	493	494	493	473	473	480	507	533	534	545	551	543	549	547	538	526	518	524	516
Temp	4	3.5	3	3	3	2	0	-1	-2.5	-4	-4.5	-5	-6	-8	-9	-10	-10	-11	-10	-11	-10.5	-10.5	-10	-9
Mar. 3	520	520	522	521	514	511	504	506	504	512	517	506	514	519	524	528	536	540	537	534	520	516	514	517
	519	521	522	521	513	511	505	506	507	511	517	506	514	519	524	528	536	540	537	529	529	516	514	515
Temp	-8	-8	-8	-7	-5.5	-5.5	-6	-6	-8	-8	-9	-10	-10	-10	-10	-10	-10	-10	-9	-9	-10	-10	-9	-7
Mar. 4	516	517	515	513	626	626	626	.....	(†)	516	509	518	534	546	518	544	547	550	542	538	536	538	540	542
	516	517	515	513	626	627	626	....	...	516	509	518	534	548	548	544	547	550	541	537	536	539	540	543
Temp	-6	-5	-4	-3	-1	-0.5	-1	.....		2.5	-1	-2	-2	-3	-4	-5	-5	-5	-4.5	-5.5	-6	-7	-6	-5
Mar. 5	543	543	540	537	528	523	517	510	509	513	520	534	551	547	550	550	548	546	544	536	529	521	517	511
	543	543	540	537	528	523	517	510	510	513	520	534	549	547	551	550	548	546	544	536	529	519	517	511
Temp	-5	-4	-3	-2	0	-0.5	-1	-1	-3	-4	-5	-5	-5	-5	-6	-6	-6	-5	-3	-2	-1	0	1	2
Mar. 6	507	506	506	506	506	508	510	511	515	522	526	529	535	534	535	544	547	542	541	539	539	533	538	510
	507	505	506	507	507	508	510	511	515	522	526	529	534	528	535	544	547	542	549	540	538	532	538	510
Temp	2	3	3	2	3	2	2	2	0	-1	-2	-3	-3	-4	-5	-6	-6	-6	-6	-7	-8	-8	-8	-7
Mar. 7	539	540	542	538	536	535	534	517	526	525	532	535	531	535	551	549	550	550	547	559	552	550	550	548
	539	540	542	538	536	535	534	517	526	526	532	536	532	535	552	549	550	550	546	559	551	550	550	548
Temp	-5	-4	-3	-3	-2	-3	-3	-4	-6	-7	-8	-9	-9	-10	-10	-11	-11	-11	-10	-11	-11	-11	-10	-8
Mar. 8	548	549	548	546	545	540	523	514	517	515	525	538	550	562	561	569	577	572	555	547	544	550	557	551
	548	548	548	546	545	539	523	514	518	514	520	537	550	564	560	569	576	572	555	547	544	550	556	552
Temp	-7	-6	-5	-5	-4	-3	-4	-5	-7	-8	-9	-10	-10	-10	-10	-10	-10	-10	-10	-10	-11	-11	-11	-11
Mar. 9	552	550	551	547	545	533	540	548	549	549	552	555	559	584	561	559	560	566	579	572	558	561	559	560
	552	550	551	548	544	532	540	548	559	550	552	556	559	584	561	559	560	566	579	569	557	561	559	560
Temp	-11	-11	-11	-11	-10	-10	-11	-11	-13	-15	-16	-16	-17	-17	-18	-18	-18	-18	-17	-17	-17.5	-17	-17	-16
Mar. 10	560	550	560	559	557	554	552	553	554	551	549	548	548	556	556	560	568	571	570	564	560	556	557	559
	560	566	569	559	557	554	553	553	554	551	549	548	551	556	556	560	569	571	570	564	559	556	557	559
Temp	-15	-13	-12	-12.5	-10.5	-10.5	-11	-12	-14	-15	-17	-18	-18	-19	-19	-19	-18	-18.5	-18	-18	-18	-18	-18	-18
Mar. 11	559	559	559	556	553	550	549	550	551	552	552	551	556	576	575	572	571	567	565	559	559	559	559	559
	559	559	559	556	553	549	549	549	551	552	553	551	557	576	575	572	571	567	565	559	559	559	559	559
Temp	-18	-15	-12	-10.5	-8	-8.5	-9.5	-11.5	-13.5	-15	-16	-17	-17	-17	-18	-18	-18	-18	-17	-17	-17	-17	-16	-16
Mar. 12	558	558	555	552	549	545	544	544	545	546	545	545	548	548	550	559	562	556	552	544	545	544	544	545
	558	556	555	552	548	545	544	544	545	546	546	545	548	548	550	559	562	557	552	544	545	544	542	545
Temp	13	-10	-9	-8.5	-6	-6.5	-7.5	-8.5	-8	-8	-8	-9	-9	-10	-10	-10	-9	-9	-8	-8	-7	-7	-6	-4
Mar. 13	544	543	543	542	540	539	529	533	523	528	527	539	553	556	563	576	565	560	555	550	549	548	548	548
	545	543	543	542	540	539	529	534	523	528	527	540	554	557	562	575	564	560	555	549	549	548	548	547
Temp	-3	-1	0	0	1	0	-1	-1	-4	-5	-6	-7	-7	-7	-8	-8.5	-9	-9	-8	-8	-8	-8	-7	-5.5
Mar. 14	547	548	547	547	547	545	544	543	538	538	527	536	550	551	572	561	555	554	554	555	553	551	549	549
	547	548	547	547	547	545	544	543	538	537	527	536	548	550	570	561	555	554	554	555	553	551	549	549
Temp	-5	-3	-2	-2	0.5	-0.5	-2	-2.5	-5	-7	-8	-9	-10	-10	-10	-10	-11	-11	-10	-11	-10	-10	-9.5	-6
Mar. 15	548	549	547	542	524	514	519	526	525	521	524	520	537	542	544	540	539	541	538	537	537	537	538	528
	548	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp	-5	-3.5	-1	3	8.5	6	3.5	2.5	2.5	2	0.5	0	-1	-2	-2	-2.5	-3	-3.5	-3	-3	-3	-1.5	-1	0.5
Mar. 16	537	537	536	536	537	536	536	535	529	528	535	535	536	539	539	543	547	548	552	540	538	538	538	537
	.....	537	536	536	537	536	536	536	529	528	535	535	537	539	539	542	547	548	552	539	538	538	538	537
Temp	2	2.5	0	-1	0.5	0	-0.5	-1	-3	-4	-5	-5	-6	-6	-6	-6	-6	-5	-5	-5	-4	-3	-3	0
Mar. 17	536	537	537	536	537	535	533	533	532	532	528	525	534	532	544	541	537	537	537	534	534	534	531	534
	536	537	537	536	536	535	533	533	532	532	528	526	534	533	544	541	537	537	537	534	534	534	534	534
Temp	0	0.5	1	1	3	2.5	1.5	1	-1	-1.5	-3	-3	-4	-4	-4	-4	-4	-4	-2	-3	-2	-2	-1	0
Mar. 18	534	534	534	535	531	530	530	528	528	529	529	531	533	535	547	545	541	538	539	537	536	525	526	536
	534	534	535	535	531	530	529	528	528	529	529	531	533	535	547	544	540	538	539	537	536	535	536	536
Temp	1	1.5	1.5	2.5	5	4	3	2	0	-1	-2	-3	-4	-4	-5	-5.5	-6	-6	-6	-6	-5	-5	-3	-1
Mar. 19	535	534	533	532	529	525	525	525	527	527	528	530	523	537	536	537	537	537	537	536	536	526	537	537
	535	534	533	531	529	525	524	525	527	527	528	529	523	537	536	536	537	537	537	536	536	526	537	537
Temp	1.5	1.5	2.5	3	6	5.5	4.5	3.5	1	-1	-2	-3	-4	-5	-5	-6	-6	-6	-6	-6	-5	-5	-4	-2
Mar. 20	537	536	535	534	533	531	530	530	530	531	533	534	537	537	538	539	539	539	540	540	540	540	539	539
	537	536	535	533	533	530	530	530	530	531	533	534	536	537	538	539	539	539	540	540	540	540	539	539
Temp	0	1.5	2.5	2.5	4	3	1	0	-2	-4	-5	-6	-6	-7	-7	-7	-7	-7	-7	-7	-6	-5	-4	-2
Mar. 21	538	537	535	533	531	530	530	519	509	509	513	524	533	542	542	542	547	548	543	538	540	531	526	524
	538	537	535	533	531	530	530	520	509	508	512	524	533	542	542	542	547	548	543	538	539	532	525	524
Temp	0	1.5	2.5	3	3	4	3	2	0	-2	-3	-4	-4	-4	-4	-4	-4	-4	-2	2	2	0	0	1.5
Mar. 22	530	529	530	516	513	507	510	512	513	507	514	538	539	548	540	538	540	548	549	547	528	516	519	521
	529	529	530	516	512	509	510	512	513	508	514	538	539	549	540	538	540	518	549	547	528	516	519	521
Temp	1	2	2	2	4.5	4	4	4	4	3	2	2	2	2	2	2	2	3	4	3	3	4	5	6
Mar. 23	521	520	520	522	518	514	498	484	479	496	504	507	507	516	536	534	531	530	528	520	518	517	518	521
	520	521	520	522	518	515	499	487	480	496	504	507	507	516	536	535	531	531	528	519	518	517	518	521
Temp	6.5	6.5	7.5	8	8	10	9	9	8	7	7	7	7	6	6	6	5	4	5	6	5.5	5	5	6
Mar. 24	520	520	519	517	514	513	513	512	499	505	509	510	512	514	514	515	523	520	518	514	512	508	506	501
	520	520	519	517	513	512	513	512	498	505	509	510	512	513	514	515	523	520	517	514	511	508	506	501
Temp	7	8	8.5	9	9	9	9	8	8	7	7	6	6	6	6	6	6	6	7	8	10	11	13	15
Mar. 25	501	498	498	496	495	489	483	486	482	475	474	471	475	476	477	475	490	478	470	464	462	455	454	457
	501	499	498	496	495	489	483	486	482	475	474	471	475	476	477	475	490	478	470	464	462	455	454	457
Temp	15	16	17	16.5	19	19.5	19	20	20	20	20	20	20	20	21	21.5	22	22	21	21	23	24	24.5	27
Mar. 26	456	455	454	445	445	445	444	440	432	438	441	446	459	467	463	468	469	469	468	467	459	459	454	442
	456	455	453	415	445	445	444	440	432	438	441	446	460	467	463	468	473	469	468	467	459	459	451	441
Temp	26.5	27	26.5	28	27.5	25	25	23	20	18	16	15	15	15	15	14.5	14	14	15	15	17	18.5	19.5	21
Mar. 27	436	427	429	427	412	418	427	431	429	429	432	443	447	460	459	466	464	472	474	474	453	449	458	452
	435	426	429	427	413	421	428	430	429	429	432	442	448	459	459	466	465	471	474	474	452	448	459	445
Temp	23	23	22.5	24	24	25.5	25	25	25	25	25	24.5	24.5	24	23.5	23	23.5	22	23	23	24	25	26.5	27
Mar. 28	430	429	434	434	438	435	430	438	439	447	441	446	482	475	477	488	516	511	512	506	482	478	469	463
	425	430	436	435	437	434	430	438	439	447	445	446	485	475	479	488	516	510	512	506	483	478	468	462
Temp	27.5	27	26.5	25	24.5	23	21	20	18	17	15	13.5	12	10	9.5	8	7	7	8	8	9	10	12.5	11.5
Mar. 29	456	433	420	405	392	425	431	432	436	438	449	455	459	453	463	469	468	460	467	451	449	435	434	433
	456	433	421	405	392	426	431	432	437	438	448	455	461	452	463	470	468	460	467	449	449	434	432	433
Temp	16	18	19	18.5	19	20	20	20	21	21	21	19.5	20	20	19.5	19	19	19	20	21	21	22	24	26
Mar. 30	432	431	431	430	430	428	430	432	433	436	433	436	442	454	454	451	451	453	451	450	449	447	445	444
	432	431	430	430	430	428	432	432	434	436	433	436	443	454	454	451	451	453	452	450	449	447	445	414
Temp	28	29.5	29.5	20.5	29	29	29	28	26	24	23	21.5	20.5	20	19	17.5	16.5	15	15	15	15.5	17	19	21
Mar. 31	442	439	439	439	439	438	439	442	443	444	442	447	449	447	448	450	456	462	458	456	450	447	441	443
	442	439	439	439	439	438	439	442	443	444	442	447	452	447	448	450	458	462	458	455	450	447	444	443
Temp	24	25	25.5	26	25	25	22.5	22	20.5	21	20	20	20	19	18	17	16	16	16.5	16.5	17.5	20	20.5	21
Magnet'r	515.6	514.4	513.7	511.4	511.7	510.1	508.5	503.8	502.4	504.1	506.0	510.5	518.3	523.9	526.5	528.2	530.8	530.4	528.5	524.6	519.5	516.2	516.0	515.0
Reduced	519.5	518.3	517.6	515.3	515.6	514.0	512.4	507.8	506.4	508.0	509.9	514.4	522.2	527.8	530.4	532.1	534.7	534.3	532.4	528.5	523.4	520.1	519.9	518.9
Temp	2.6	3.5	4.2	4.6	5.9	5.4	4.7	3.9	2.8	2.0	1.0	0.3	-0.1	0.5	0.9	-1.2	-1.4	1.5	0.9	0.9	0.6	0.0	0.9	2.1

To reduce readings to an approximately uniform series increase each reading between March 29, 4h, and close of the month by 40.0 divisions. It is found as follows: Mean of 10 days, March 19 to 28, inclusive, 499.4; mean 10 days, March 30 to April 8, inclusive, 459.4, **difference, 40.0 Monthly means:** Temperature, 1°.5; magnetometer, 516.3; reduced mean, 520.2

* March 29, about 4 a. m. Gott. time, magnets cleaned of slight frost that had collected.

† Scale value up to March 4, 8h, .0001739; after that date .0001017; average for month .0001087 part of the vert. force.

Hourly readings of the Brooke balance magnetometer at Uglaamie, Alaska, April, 1883.

Date	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Cor'n +
Ap. 1	444	446	448	448	443	443	443	445	440	435	440	445	456	468	462	459	461	460	459	457	458	457	457	457	40.0
	444	....	....																						
Tem.	22	20	20	21	22	21	22	21	19.5	17	16.5	15.5	14.5	14	13	12	11	10	9.5	9	9.5	9.5	11	11	
Ap. 2	456	455	454	455	455	455	457	457	456	456	454	460	460	461	472	475	476	477	481	473	468	466	464	462	40.9
	.....	455	454	455	455	455	457	457	456	456	454	460	460	461	472	475	476	477	481	472	468	466	464	462	
Tem	14	14	14	13	14	13.5	12	11	8.5	6	5	4	3	1	0	−1	−1	−2	−1	0	0.5	3.5	5	7	
Ap. 3	461	460	459	457	457	457	458	458	455	456	450	456	467	481	482	489	486	498	495	500	490	478	478	477	41.8
	461	460	459	457	457	458	458	458	455	456	450	456	468	481	482	489	486	500	495	499	489	478	478	477	
Tem..	9	10	12	12	10	10	9.5	7	5.5	4	2	0	−1	−2	−3	−4	−5	−5	−4	−3	−1.5	0	2.5	5	
Ap. 4	468	462	454	458	459	459	457	454	458	454	458	458	462	465	468	477	482	486	485	490	482	478	477	475	42.7
	467	462	454	458	459	459	457	454	458	454	458	458	462	465	468	477	482	486	486	490	482	478	477	475	
Tem .	7	8.5	10	10	10.5	10	7.5	6	4.5	3.5	0.5	−1	−2	−3	−4	−4	−5	−5	−5	−4	−3	−1.5	0	4	
Ap. 5	473	471	468	467	465	463	463	462	463	462	463	463	464	467	475	481	483	478	474	470	467	464	463	463	43.5
	473	470	468	467	465	463	463	462	463	462	467	463	464	467	475	481	483	478	474	470	467	464	463	463	
Tem.	7	7	9	9.5	11	9.5	9	7	6	5	4	3	3	3	2	2	2	2	3	4	5	7	9	11	
Ap. 6	459	456	453	454	453	453	452	454	453	453	453	454	458	459	461	465	466	464	463	462	462	462	461	461	44.4
	458	456	453	453	453	453	452	454	453	453	453	454	458	459	461	465	466	464	463	462	462	462	461	461	
Tem	14	16	16.5	16	16.5	15	14	12	11	10	9	8	6.5	6	6	5	5	5	5	5	5	6	8	9	
Ap. 7	460	460	460	459	459	458	459	459	460	461	462	464	464	465	466	466	467	467	467	467	467	466	466	465	45.3
	460	460	460	459	459	458	459	459	461	462	463	463	464	465	466	466	467	467	467	467	467	466	466	465	
Tem..	9.5	10	12	12	13	11.5	10	7	5	3.5	2	0	−1	−1	−2	−2	−2	−2	−0.5	0	1	2	4	5	
Ap. 8	465	464	463	463	463	462	462	463	464	464	464	464	467	469	470	471	471	472	472	471	470	469	469	469	46.2
	465	464	463	463	463	462	462	463	464	464	464	464	467	469	470	472	471	472	472	471	470	469	469	469	
Tem	7	9	9	9.5	10	9.5	8	5.5	4	2	0	−2	−3	−4	−5	−6	−6	−6	−5	−3	−3	−1	1	4	
Ap. 9	469	469	469	468	468	467	467	467	467	468	468	468	468	469	470	470	470	470	470	469	469	469	469	468	47.1
	469	469	469	468	468	467	467	467	467	468	468	468	468	469	470	470	470	470	470	469	469	469	469	468	
Tem..	6	6	6	9	10	10	9	7.5	6	4	2	1	1	0	−1	−2	−2	−2	−1	0	3	4	5	6	
Ap.10	468	469	468	468	465	464	463	462	462	463	463	464	464	465	465	467	468	467	466	466	466	465	464	465	48.0
	468	469	468	468	465	464	463	462	462	463	463	464	464	465	465	467	468	467	466	466	466	465	464	462	
Tem..	6	6.5	8	8	9	9.5	9	8	8	7	7	5	5	5	5	4	4	4	4	5	6	6.5	7.5	10	
Ap.11	462	462	463	462	461	460	460	454	455	450	459	464	464	465	466	466	467	466	465	465	464	462	461	460	48.8
	462	462	463	462	461	460	460	454	455	450	459	464	464	465	466	466	467	466	465	465	464	462	461	459	
Tem .	10	11.5	12.5	11	12	13	12.5	11	10	8	7	6	5	5	5	4	5	5	5	6	7	7	9.5	11	
Ap.12	459	459	458	458	457	456	456	455	455	455	455	456	457	462	466	466	466	464	464	463	462	460	459	457	49.7
	459	459	458	458	457	456	456	455	455	455	455	456	458	462	466	466	466	464	464	463	462	460	459	457	
Tem	11.5	13	14	14	15	15	14	13	12	10	9	7	[illegible]	5	4	4	4	5	6	7	10	11	14	15.5	
Ap.13	456	455	454	453	452	451	451	451	450	450	451	450	451	453	457	458	461	460	460	462	459	458	456	455	50.6
	456	454	454	453	452	451	451	451	450	450	451	450	451	453	457	458	461	460	460	462	459	458	456	455	
Tem	16.5	18	18	18	18.5	18.5	18	17	15	14	13	12	10	9	8	7	6.5	7	8	8	10	12	14.5	18	
Ap.14	453	452	451	449	448	447	447	448	448	449	450	450	451	452	452	453	454	454	454	454	453	453	452	452	51.5
	453	452	451	449	448	447	447	448	448	449	450	450	451	452	452	453	454	454	454	454	453	453	452	452	
Tem.	19.5	21	22	22	24	23	21	20	18	15.5	14	13	11	10	9	8	8	8	9	10	11.5	13	16	17.5	
Ap.15	452	451	452	450	449	449	449	448	448	449	448	448	448	448	448	449	452	453	452	451	450	446	442	439	52.3
	452																								
Tem..	18.5	20	23	21	23	20.5	23.5	20	20	20	20	18	18	18	18	17	17	17	17	18	19	21	22	25	
Ap.16	437	449	443	444	444	445	446	447	448	451	452	455	450	463	471	470	472	471	471	472	469	469	469	468	53.2
	.....	449	443	444	444	446	446	447	449	451	452	455	450	463	471	470	472	471	472	471	469	469	468	468	
Tem .	25	24.5	23.5	21.5	21.5	21	20	19	16	14	12	10	9	7	6	4	3	3	3.5	[illegible]	4	5	6	6	
Ap.17	468	469	469	469	469	467	467	463	465	466	468	471	473	476	479	480	480	480	481	479	479	477	475	474	54.1
	468	469	469	469	469	468	466	463	465	466	468	472	473	476	479	480	480	480	481	479	479	477	475	474	
Tem	8.5	10.5	8.5	8.5	10	10	9	8	6.5	4.5	2.5	1	−1	−2	−3	−4	−4	−4	−2	−1	0	2	4.5	7.5	
Ap.18	471	469	468	466	465	464	464	463	464	465	466	471	473	479	483	490	487	487	484	484	480	479	478	475	55.0
	471	469	468	466	465	464	464	463	464	465	466	471	473	479	483	489	487	487	484	484	480	479	478	475	
Tem	10	10.5	12	12	13	12	12	10.5	7.5	5	3	1	−1	−3	−4	−5	−5	−5	−4	−3	−3	0	3	6	
Ap.19	475	473	473	469	466	455	454	450	451	458	470	468	473	470	471	475	482	486	484	485	476	471	473	463	55.9
	475	473	474	469	465	455	454	450	451	458	470	468	473	470	471	475	482	486	484	485	477	471	473	466	
Tem.	7	7.5	9	9	11	11	10	10	8	7.5	6	5	4	4	3	3	3	3	5	5	6	8	9	11.5	
Ap.20	462	463	461	460	456	447	450	450	450	451	459	457	459	460	462	463	464	465	466	465	463	459	458	460	56.8
	467	463	460	461	456	446	450	450	450	452	459	457	459	460	462	463	464	465	466	465	463	459	458	456	
Tem .	11	13	14.5	15	17	17.5	17	16	16	15	15	14	13	13	12	12	13	13	14.5	15	17.5	18	20	21	
Ap.21	455	455	455	454	454	453	453	453	453	453	452	453	454	454	454	454	454	454	455	455	435	455	455	455	57.6
	456	455	455	454	454	453	453	458	453	453	452	453	454	454	454	454	454	454	455	455	435	455	455	455	
Tem	22	22	23	24	25	25	26	25.5	25	24	28	21	20.5	20	20	19.5	19	19	19	18.5	18.5	18.5	19	20.5	
Ap 22	455	455	455	455	453	453	453	453	454	454	453	454	458	462	462	463	464	467	466	463	461	459	456	456	58.5
	455	455	455	454	453	453	453	453	454	454	453	454	458	462	462	463	465	467	466	462	461	459	459	454	
Tem	20.5	21.5	20.5	20	20	19	19	18	16.5	15	14	13	11	11	10	10	11	11	12	14	15	18.5	20	21.5	
Ap.23	454	453	453	453	453	452	451	451	451	452	455	457	458	462	463	466	468	467	467	466	465	463	461	459	59.4
	454	453	453	453	453	452	451	451	451	452	455	457	458	462	463	466	468	467	467	466	464	463	461	459	
Tem .	22	21.5	22	21	22	22	21	19.5	17	15	13.5	11	10	10	8	8	8	8	9	10.5	12	14	15	17	
Ap.24	459	459	459	457	456	454	454	454	455	455	456	457	459	460	460	462	462	473	471	479	476	481	465	448	60.3
	459	459	459	457	456	454	454	455	455	455	456	457	459	460	460	462	462	473	472	478	476	481	464	447	
Tem.	17	18	19	19	19.5	19	19	18	17	16	15	12	12	11	10	10	11	11	13	14	16	18	18.5	21	
Ap.25	448	438	442	428	429	440	432	436	438	440	445	449	456	454	468	465	462	462	462	457	455	452	450	449	61.2
	446	438	445	424	429	441	432	436	439	440	446	449	456	454	469	465	463	462	462	456	[illegible]	451	449	449	
Tem..	21	21	22	23	23	24.5	25	22	22	21	20	18	17	17	17	17	17	18	20	20.5	22	23	25	27	
Ap.26	453	449	449	445	443	442	436	434	435	436	436	441	446	453	452	451	450	453	462	457	448	448	449	450	62.1
	452	449	449	445	443	442	434	434	435	438	436	441	446	453	452	451	450	453	462	456	447	448	449	450	
Tem	27	28	28	28	29	29	28	27	26	25	24	23	21.5	20.5	20	19.5	19.5	19	20	20	21	22	23	24.5	
Ap.27	449	....	....	....	....	....	....	504	511	516	518	521	526	521	526	512	517	520	525	523	523	520	522	515	
	449	....	....	....	....	....	....	505	511	516	518	521	526	521	527	510	517	522	525	523	523	520	521	515	
Tem.	24.5	....	....	....	....	....	....	28.5	26	24	22.5	21.5	20	19	18	17.5	17.5	18	19	19	21	22	27	28	
Ap.28	514	512	518	519	520	519	520	517	518	519	520	522	530	530	529	531	531	530	529	529	528	527	528	528	
	514	512	518	518	520	518	520	517	518	519	520	522	530	529	529	531	531	530	529	529	528	527	528	528	
Tem .	28.5	29	31	31	32.5	33	32.5	31	29	27	24	23.5	22	21	20	19.5	19	19	21	22	23.5	25	26.5	28	
Ap.29	528	528	528	528	524	523	523	523	525	524	525	525	526	526	529	532	532	531	530	529	528	528	529	528	
	528	528	528	528	524	523	523	524	525	524	525	525	526	526	529	532	532	531	530	529	528	528	529	528	
Tem	28	29	30	29	31	31	30.5	28	26	25	23	21.5	20	19	18	17.5	18	17	18	18	19	22	24	25	
Ap.30	528	529	527	528	527	528	528	529	528	529	529	528	529	530	535	535	535	536	536	532	532	528	528	531	
	529	529	527	527	527	528	528	529	528	529	529	528	529	530	535	535	535	536	536	531	532	528	528	531	
Tem .	25	27	27	27	27	26	25	24	23	21	20	19	18	16	15	15	15	14	15	15	16	17	19	19.5	
Magn'r	465.4	465.2	464.7	463.4	462.5	461.6	461.1	462.2	462.7	463.2	464.8	466.5	469.1	471.6	474.1	475.4	476.3	477.4	477.3	476.4	474.1	472.3	471.1	469.3	
Redu'd	509.6	509.4	508.9	507.6	506.7	505.8	505.3	506.4	506.9	507.4	509.0	510.7	513.3	515.8	518.3	519.6	520.5	521.6	521.5	520.6	518.3	516.5	515.3	513.5	
Tem	15.5	16.3	17.2	17.0	18.0	17.6	17.1	15.8	14.2	12.8	11.5	10.0	8.9	8.2	7.3	6.8	6.6	6.7	7.6	8.0	9.5	11.0	12.8	14.5	

Scale value of one division up to April 15, .0001017; between April 15 and 27, .0002413; after April 27, 6h, .0003031; average for month, .0001844 part of the vert. force. To reduce readings to an approximate uniform series apply the corrections indicated in last column. We have means of 10 days April 17 to 26, inclusive, 460.1; mean of 10 days, April 28 to May 7, inclusive, 522.2; difference, 62.1. Monthly means: Temperature, 12.1°; magnetometer, 468.7; reduced mean, 512.9

Hourly readings of the Brooke balance magnetometer, Uglaamie, Alaska, May, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
May 1	530	530	530	531	531	531	531	527	524	529	529	531	533	530	532	534	536	537	537	536	531	529	528	528
	530	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Temp	19.5	20	20.5	20	20.5	19.5	20	19	17	16.5	16	15.5	14.5	13	12	10	11	13	14	16	18	20	23	24
May 2	528	530	530	528	530	530	531	532	530	521	529	529	533	535	542	542	542	542	540	538	536	535	535	534
	.....	530	530	528	531	530	531	532	530	521	529	530	533	535	542	542	542	542	540	538	536	535	535	534
Temp	25.5	24.5	24.5	21	20.5	20.5	18.5	16.5	15	13.5	11.5	10	8	7	6	6	6	6.5	8	9	11	13	14	16.5
May 3	535	534	534	534	533	534	533	534	531	531	531	537	536	537	537	536	537	537	536	536	535	534	533	533
	535	534	534	534	534	534	533	534	531	531	531	537	536	537	537	536	537	537	536	536	535	534	533	533
Temp	16.5	17	17.5	17.5	18	18	17	16	16	14	13	12	10	9	8	7	8	9	11	12	13	14	18	22
May 4	545	548	550	551	563	520	523	524	524	524	524	527	530	528	529	530	530	530	529	528	522	522	522	522
	545	548	550	551	563	520	523	524	523	525	524	528	530	528	529	530	530	530	529	528	522	522	522	522
Temp	22	21	21	20.5	20.5	20.5	19.5	18.5	17	16	14	13	12	11	10	11	11	12	14	14.5	16.5	17.5	19.5	21
May 5	522	522	522	521	520	520	520	520	518	519	519	520	521	524	525	530	528	526	522	523	514	508	494	494
	522	522	522	521	520	520	520	521	518	519	519	520	521	524	525	529	528	526	522	522	514	508	493	494
Temp	21	22	23	23	24	23	23	22.5	22	21	21	20	20	20	20	20	21	21	23	25	27	28.5	32	35
May 6	496	493	490	487	485	486	485	476	476	481	482	485	489	495	514	514	509	501	506	500	489	489	488	486
	496	493	490	487	485	486	485	476	476	482	483	484	489	495	515	514	509	502	506	500	488	489	488	486
Temp	36	38	39	39.5	39	38	38.5	37	36	34.5	33	32	31	31	31	32	32	32	32.5	32	31.5	31.5	32	33
May 7	490	492	493	493	496	497	498	491	483	487	495	501	509	511	507	509	515	515	510	503	501	501	500	498
	490	492	493	494	496	498	497	491	483	488	495	501	509	510	507	509	515	515	510	503	501	501	500	498
Temp	32	31	30	29	30	29	27	25	25	24	23	22	22	21	21	21	22	22.5	24	24	25	27	28	30
May 8	499	497	502	495	495	495	495	494	494	494	494	496	502	504	504	502	505	504	503	500	496	494	498	498
	499	497	502	495	495	496	495	494	494	494	494	496	502	504	504	502	505	504	503	500	496	494	500	498
Temp	30	31	33	34	34	34	34	33	32	31	30	29	27.5	27	26.5	26	26	26	27	27	29	31	34	37
May 9	500	497	497	498	489	491	492	492	494	493	495	496	494	499	500	501	502	502	505	502	499	497	497	496
	501	497	496	492	489	491	492	493	491	493	495	496	494	499	500	501	502	502	505	502	499	497	497	496
Temp	38	40	40	39	39.5	37.5	35	35	33	32	30	28.5	28.5	28	27.5	28	28	28	28	28	29	30	32	34
May 10	495	493	492	491	492	493	494	495	497	498	499	499	500	501	501	502	502	502	500	498	495	493	492	492
	494	493	492	491	491	494	494	495	497	498	499	499	500	501	501	503	502	502	500	498	495	493	492	492
Temp	35	38	39	39	39.5	37	35	36	34	32.5	31.5	30	29	28	28	28	29	29.5	30	31.5	34	36.5	39	40
May 11	493	493	494	494	493	492	492	494	496	496	492	491	501	502	500	500	499	498	498	497	496	497	496	495
	493	493	494	491	494	492	492	494	496	495	492	491	501	502	500	500	499	498	498	497	497	497	496	495
Temp	40	40.5	41.5	41	40	40.5	38	35.5	34	33	32.5	32	31.5	31	30.5	31	31	32	32.5	33.5	35	36	36.5	38
May 12	496	497	497	494	495	495	496	495	494	496	497	498	498	500	500	501	501	500	500	498	497	496	495	495
	496	497	497	493	495	494	496	496	494	496	497	496	498	500	500	501	501	500	500	498	497	496	495	495
Temp	37	38	39	38	36	36	36	34	33	32	31	30	29.5	29.5	29.5	29	29	30	29.5	31	33	34.5	36	37
May 13	495	495	495	495	495	495	497	492	493	493	493	492	492	498	503	505	503	508	503	496	495	494	497	497
	495	495	495	495	495	496	498	492	493	493	493	492	492	498	503	505	503	508	503	496	495	494	497	497
Temp	37	37	37	36	36	37	35	35	33	32	31	30	29	28.5	27.5	28	28	28	30	30	30.5	32	34	34
May 14	497	498	499	502	500	498	492	494	500	499	498	499	500	503	505	511	507	503	501	501	499	498	496	493
	497	498	499	502	500	498	491	495	500	499	498	499	500	503	505	511	597	503	501	501	499	498	495	493
Temp	34	34.5	34.5	34	34	33	32	33	32	31	30	29	29	28.5	28	28.5	29	30	31	33	35	37	39	42
May 15	492	486	485	487	479	479	479	472	467	456	457	456	466	481	482	487	493	497	489	488	483	478	476	470
	492	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Temp	43	41	47.5	42.5	46	47	48	47	47	44	42	40	39	37.5	37	36	36.5	37	37	37.5	39	40.5	42	43.5
May 16	472	475	479	480	481	481	483	480	473	470	470	476	484	494	501	494	499	501	499	487	482	478	476	472
	.....	475	478	480	481	481	483	480	473	470	471	476	483	494	501	494	499	501	499	487	482	478	476	473
Temp	42	42	40	39	30	39.5	38	38	36	35	34	33	33	33	32.5	33	33.5	34	35	37	39	41	42.5	44.5
May 17	473	471	471	471	472	473	475	476	478	479	478	479	482	483	486	486	487	492	490	487	485	486	486	486
	473	471	471	471	472	473	475	476	478	479	478	479	482	483	486	486	487	492	490	487	485	486	486	486
Temp	44	43	43.5	42.5	42	41.5	40	39	37.5	36	35	33.5	33	33	32	32	32.5	32.5	32.5	32.5	32.5	33	34	36
May 18	486	491	489	494	494	493	494	494	494	494	495	495	496	496	500	498	501	499	497	496	494	493	491	489
	486	491	490	492	493	493	494	494	494	495	495	495	496	499	500	497	501	499	497	496	494	493	491	489
Temp	35.5	34.5	35	35	35	34	33	33	32	31	30.5	29	29	28.5	28	28.5	29	30	31	31.5	33.5	34	36	38
May 19	490	489	491	485	486	489	491	482	481	491	492	491	501	507	508	512	506	506	503	504	494	491	489	487
	490	489	491	487	486	489	491	481	481	491	492	491	502	507	508	512	506	505	503	504	493	491	489	488
Temp	37	38	38.5	38	38	36	35	34	33	31	29.5	28	26	25	24	25	26.5	28	30	31.5	32.5	35	36.5	38
May 20	487	493	489	489	489	490	490	486	488	489	490	491	494	494	496	498	498	499	496	492	497	482	479	479
	488	493	490	489	489	489	487	486	488	489	489	491	494	494	496	498	498	499	495	492	497	483	479	479
Temp	39	38	37.5	37	37	36	37	36	34	33	31	30	28	27	26	26	27.5	29	31.5	32.5	35	35.5	38	40
May 21	480	479	471	...	510	512	514	515	517	521	528	533	548	550	547	600	593	567	566	560	552	548	549	548
	479	479	471	...	509	512	514	514	516	519	528	533	548	550	547	600	592	567	566	560	552	548	550	548
Temp	42	43.5	45	...	45	46.5	46	42.5	40.5	37	34	31.5	31	29.5	28	28.5	29	30	32	34	35.5	36.5	39	42
May 22	545	543	537	529	534	536	540	544	541	550	546	551	563	550	559	567	561	559	555	553	553	552	552	551
	547	543	535	529	535	538	540	545	541	550	546	532	563	550	559	567	561	558	555	553	553	552	552	551
Temp	42.5	44	45	44	43	42.5	39.5	37	35	33	32	30.5	30	29.5	29	29	30	30	31	32	32	33	34	35
May 23	553	551	553	550	550	549	545	550	544	546	550	547	550	560	560	562	560	565	559	554	552	552	551	550
	553	551	553	550	550	548	545	550	544	546	550	547	550	560	560	562	559	565	559	554	552	552	551	550
Temp	36	37	37	37	37	37	36	35	32	32	31.5	31	30	30	29.5	30	30	31	33	34	34.5	35	37	38
May 24	550	549	550	549	549	549	550	550	551	550	549	547	548	553	556	558	557	558	555	549	547	544	549	548
	550	549	550	549	549	549	550	550	551	550	549	547	548	553	557	558	557	558	555	549	547	547	550	548
Temp	39	40	41	41	41	41	39.5	38	36	34	33.5	32.5	31.5	31.5	30.5	31	31.5	32	33	35	36.5	38	40	42
May 25	548	548	549	548	547	547	548	548	547	548	549	547	548	553	553	555	555	552	549	547	546	545	544	543
	548	548	549	548	547	547	548	548	547	548	549	547	548	553	553	555	555	552	549	547	546	545	544	543
Temp	43	43	44	44.5	44	43.5	42.5	41	40	39	38	37	36.5	36	36	37	37	38.5	38.5	40.5	41.5	43.5	46	48
May 26	543	541	541	542	543	541	540	541	539	537	537	540	546	543	548	548	549	556	549	544	542	541	541	541
	543	541	541	542	543	541	540	541	539	537	536	540	545	543	548	548	549	556	549	543	542	541	541	541
Temp	50	51	51	50	48.5	49	48.5	46	44	43	41	40	39.5	39	39	39	39.5	40	40.5	43	43.5	45.5	47	48
May 27	541	541	541	542	543	543	543	543	545	543	540	542	545	552	552	552	548	548	548	547	546	543	540	541
	541	541	541	542	543	543	543	543	545	543	537	543	545	551	552	552	548	548	548	547	546	543	510	541
Temp	49	50	50	49	48	47	46	44	41.5	39.5	38.5	38	37	36	35	35.5	37	37	37.5	39	40	42	44.5	46
May 28	543	542	541	541	543	543	542	541	544	539	539	542	546	553	552	551	550	547	555	548	544	544	543	543
	543	542	541	541	544	543	542	541	544	539	540	542	546	553	551	551	550	546	555	548	544	544	543	542
Temp	48	49	50	49	45.5	46	45	43	42	41	39	38	37.5	37	36	36.5	36.5	39	36.5	42	44	47	48.5	51
May 29	541	540	541	540	532	534	534	533	533	535	541	539	541	542	546	543	547	549	545	543	544	543	543	543
	541	540	541	540	532	534	535	533	533	535	543	539	541	542	546	543	547	549	545	543	544	543	543	543
Temp	53	54	54.5	54	52	51	49.5	[illegible]	[illegible]	43	41	39	[illegible]	37.5	37	37.5	37.5	38	38.5	39	39	40	40.5	41
May 30	[illegible]	543	543	545	545	541	541	542	541	542	539	540	540	538	546	550	548	550	544	540	540	539	538	541
	543	543	544	545	545	541	541	542	541	542	539	540	540	538	546	549	548	550	544	540	540	539	538	540
Temp	41	41	40.5	40	40	40	40	39	39	38	38	37.5	37	36.5	36	36	37	37.5	38	39	38.5	39	39	41
May 31	540	539	539	540	540	540	533	532	531	531	531	540	543	543	543	547	549	546	545	542	538	537	537	536
	540	539	539	540	540	540	533	532	531	531	537	540	543	543	543	547	549	546	545	542	538	537	537	536
Temp	41	42	43	42	41	41	39.5	39	37	38	37	36	36	35	35	35	35.5	36	37	38	39.5	41.5	42	44.5
Magnet'r	514.5	514.2	514.0	514.8	514.7	513.5	513.5	512.5	511.8	512.4	513.2	514.8	518.7	521.3	523.7	526.6	526.3	525.6	523.7	520.5	517.5	515.6	514.8	513.8
Temp	37.0	37.3	38.0	37.0	37.0	36.6	35.6	34.5	33.1	31.9	30.7	29.5	28.8	28.2	27.3	27.7	28.2	20.0	29.8	31.1	32.4	33.8	35.5	37.3

One division of scale up to May 3, 23h, .0003031; between May 4 and 21, .0001926; and after May 21, 3h, .0001948 Average for month, .0002031 part of the vertical force. Monthly means: Temperature, 32°.8; magnetometer, 517 2

Hourly readings of the Brooke balance magnetometer, Uglaamie, Alaska, June, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
June 1	536	537	534	533	533	530	530	532	535	532	531	534	534	537	532	534	538	543	540	542	531	517	518	517
	536	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp.	45	44	49	51	52	52	52	48	45.5	48.5	48	45	45	45	45	44	45	46.5	47.5	50	51	53	54	55
June 2	519	523	525	529	531	530	529	515	520	522	529	531	539	538	546	551	550	562	562	559	558	544	536	537
	....	523	525	529	531	531	529	515	521	523	528	531	539	538	547	551	550	562	561	559	558	544	536	537
Temp.	55	53.5	52	50.5	48	48	47	45	43	42	41	40	39	38	37	36.5	36.5	37	37.5	38	39	40	41.5	43
June 3	538	538	537	537	534	533	534	535	533	536	550	535	537	541	540	541	543	543	551	542	530	537	537	537
	538	538	537	537	534	533	534	535	533	536	550	535	537	541	540	541	543	543	551	542	539	537	538	537
Temp.	44.5	47.5	49	48	48	47.5	47	44	42.5	41.5	40	39	38	37	36.5	36.5	37	38	38	39.5	40	41	42	43
June 4	537	538	538	538	539	539	539	539	539	539	539	542	542	547	547	546	546	545	544	543	541	540	538	537
	537	538	538	538	539	539	538	540	539	539	539	542	542	547	547	546	546	545	544	543	541	539	538	537
Temp.	44	43	43	42	40.5	40.5	40	39	37	36.5	35	33	32.5	32	32	32	32	32	34	35.5	37	39	41	42.5
June 5	536	535	535	535	533	534	534	535	535	536	537	537	538	539	540	541	541	541	540	539	538	537	535	534
	536	536	535	534	533	534	534	535	535	536	537	537	538	539	540	541	541	541	540	539	538	537	535	534
Temp.	44.5	46	47	47.5	48	47	46	44	44	42	39	37	36.5	36	35.5	35.5	35	35.5	36.5	39	40	41.5	43	45
June 6	533	532	532	530	531	532	533	534	530	531	538	544	547	539	539	541	541	541	535	539	531	530	529	527
	533	532	532	531	531	532	533	534	529	531	538	544	547	540	539	540	541	540	535	539	531	530	529	527
Temp.	45.5	46	48	49	48	48.5	47	45	44	43	41	39.5	39	38	38	38.5	40	41	43	45	45	47	48.5	51
June 7	527	526	527	526	527	524	527	524	520	523	526	528	530	533	534	538	536	534	532	530	528	528	527	527
	527	526	527	526	527	524	527	524	521	523	526	528	530	533	535	538	536	534	532	530	528	528	527	527
Temp.	52	52	53	53	53	53.5	52	49	48	46	44	43	42.5	42	41.5	41.5	41	41	41.5	42.5	43.5	45	46.5	50
June 8	528	527	527	529	531	532	532	532	532	533	532	532	532	531	536	540	542	538	540	543	527	527	528	528
	528	527	527	529	531	532	532	532	533	533	532	532	532	530	536	540	542	538	541	533	527	527	528	528
Temp.	50	49	49	48	46	46	45	43	42	41	40	39	38.5	38	37.5	38	38	39	40	40.5	41.5	43	44	47
June 9	528	529	529	529	530	532	527	530	529	528	525	530	530	534	543	544	543	543	544	545	537	530	531	531
	528	529	529	529	530	532	527	530	529	529	526	530	530	534	544	514	543	543	544	545	537	530	531	531
Temp.	46	46	46	46	45	44	43	41	41	40	38	37.5	37	36.5	36	36	36	36	36	37	37	39	40.5	43
June 10	532	531	532	533	532	531	530	531	531	532	532	532	532	534	534	533	535	533	531	530	527	526	525	523
	532	531	532	533	532	531	531	531	531	532	532	532	532	534	535	534	535	533	531	530	527	526	525	522
Temp.	43	44	44.5	45	45	44.5	43.5	42.5	41.5	40.5	39	38	37.5	37.5	37.5	38	39	40	41	42	44	46	48	51
June 11	522	522	522	524	523	523	520	517	516	518	518	521	522	528	529	533	535	535	534	529	528	527	526	525
	522	522	522	524	523	523	520	517	516	518	518	521	522	528	520	533	535	535	533	529	528	527	526	525
Temp.	53	54	54	54	54	53.5	52	49.5	47	44	42.5	42	41	40	39.5	39.5	39.5	40.5	42	43.5	44.5	45	46.5	48
June 12	525	524	525	525	525	526	527	528	529	529	529	529	531	533	534	537	535	533	532	532	531	530	528	528
	525	524	525	525	525	526	527	528	529	529	529	529	531	533	534	537	535	533	532	532	531	530	528	528
Temp.	49	49.5	49.5	50	49.5	48.5	46	44	43	43	42	41	40.5	39.5	39.5	40	40	40	40	41	41.5	42	43	44
June 13	528	528	527	526	526	528	531	528	528	530	531	530	530	530	532	533	534	535	533	529	528	527	526	525
	528	528	527	526	526	528	531	528	528	531	531	530	530	530	532	533	534	535	533	529	528	527	526	526
Temp.	46	46	47	47	47	46	45	42.5	43	42	42	41	40.5	40	40	40	40	41	42	43	44	45	46	48
June 14	525	527	527	529	532	530	529	529	528	523	529	530	532	534	535	533	536	543	537	534	532	530	530	530
	525	527	527	529	532	529	529	529	529	523	529	530	532	534	535	533	537	543	537	534	532	530	530	530
Temp.	48	47	49	47	45	45	44	43	42.5	41	40	40	40	40	40	40	40	39.5	40	40.5	40.5	42	41	44.5
June 15	530	528	526	526	525	525	524	524	524	524	524	524	525	525	526	527	527	530	529	528	527	525	525	523
	530	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Temp.	45	48	51.5	52	53	52	52.5	51.5	51.5	49	49	48	47	47	47	46	47	46	46.5	48	48	50	51	53
June 16	523	523	525	526	527	527	527	528	529	530	530	531	532	533	534	534	534	534	534	530	526	528	527	525
	.....	523	525	526	528	528	527	528	529	530	530	531	532	533	534	534	534	534	534	530	526	528	527	525
Temp.	53	52.5	51.5	50	48	47.5	46	44.5	45	43	42.5	41.5	41	41	40	40.5	40.5	41	41	42.5	43.5	45.5	48	50.5
June 17	526	527	526	529	520	520	510	515	515	517	521	526	532	534	535	535	537	542	546	535	531	529	525	523
	526	527	526	529	519	520	510	514	515	517	521	526	532	534	535	535	538	542	546	535	531	527	525	523
Temp.	51	51	50.5	50	49	49	47.5	46	44	43	42	41	39.5	38	38	38	38	39	39.5	41	43	45	46	48
June 18	523	515	524	520	516	521	517	496	502	514	536	533	547	533	533	538	548	546	544	539	530	526	528	527
	523	513	523	519	516	521	516	495	503	514	539	533	546	533	533	538	548	547	544	539	530	525	528	527
Temp.	50	52	53	53	54	53	52	50	48	46.5	46	43.5	42.5	42	41	40.5	40	40.5	41	41.5	43	44	45	46
June 19	528	530	529	529	527	528	529	518	519	526	530	530	526	533	535	546	542	544	543	535	534	531	530	531
	529	530	529	529	526	527	529	517	519	526	530	528	526	534	535	546	542	544	543	535	535	532	530	531
Temp.	47	48	48	47.5	47	47	46	44	42	41	40	39.5	39	38.5	38	38	38	38	38	39	41	43	46	48
June 20	530	528	529	527	529	529	529	528	521	529	531	531	534	533	535	537	538	543	546	534	527	526	526	527
	530	528	529	527	529	529	528	528	521	529	531	531	534	533	535	538	538	543	547	535	527	524	526	527
Temp.	49	50	51	50	49.5	48	47	44.5	44	42	41	40	39	38	38	38	38.5	39	40.5	41.5	43	44	48	49.5
June 21	527	528	528	525	526	527	529	524	528	530	531	532	532	534	535	536	536	536	535	533	532	530	530	529
	527	528	528	525	526	527	529	525	528	530	531	532	532	534	535	536	536	535	535	533	532	530	530	529
Temp.	50.5	53.5	53	52	52	50.5	49	47	45.5	44	42	40	40	40	39	39	38	38	39	39	41	43	45	48
June 22	530	529	528	528	527	527	528	529	530	531	530	531	532	533	534	534	537	541	534	533	530	529	527	529
	530	529	528	528	527	527	528	529	530	531	530	531	532	533	534	534	538	541	534	539	530	529	527	529
Temp.	49	50	51	51	49.5	49	47	45	43	42	41	40	39	38	38	38	38	38	39	39.5	31	43	45	45.5
June 23	529	531	530	528	513	513	518	511	515	522	528	535	531	536	542	543	539	535	533	531	532	531	531	532
	529	531	530	528	513	514	518	510	515	522	528	536	530	536	542	543	540	535	534	532	532	531	531	532
Temp.	45.5	45.5	46.5	46	45	44	43	41	40	39	30	38	38	38.5	39	39	38	38	39	39	39	40	40	41
June 24	531	530	532	530	530	532	529	531	529	531	532	531	529	533	533	533	537	540	536	534	531	530	531	531
	531	530	532	530	530	532	529	531	529	531	532	531	529	533	533	533	537	540	536	534	531	530	531	531
Temp.	42	43	42	42	42	42	42	41	41	41	40	40	39	39	38	38	38	38	38	39	40	42	43	43
June 25	530	531	531	531	529	530	530	531	530	531	531	531	531	531	532	533	539	542	546	543	537	535	532	532
	530	531	531	531	528	530	530	531	530	531	531	531	531	531	532	534	539	542	546	545	536	534	532	532
Temp.	44.5	45	46	46	46	46	45	43	42.5	42	41	40.5	40	40	39	39	38.5	38	39	39	40	41	41	41
June 26	532	533	534	531	531	532	532	532	533	530	530	527	530	532	536	535	539	543	541	533	530	529	531	531
	532	533	534	531	531	532	532	532	533	530	529	527	530	532	536	535	539	544	540	533	530	529	531	531
Temp.	42	41.5	43	44.5	44.5	44.5	44	43	42	42	41	41	40	40	40	40	39	39	39.5	40	41	41	41	42
June 27	532	532	532	533	533	532	530	517	527	526	521	533	540	540	547	545	545	538	541	533	539	538	532	530
	532	532	532	533	533	531	530	517	527	526	522	534	539	540	548	545	545	538	541	533	538	538	531	531
Temp.	42	42	42	42	41.5	41	41.5	40	41	41	40	40	41	41	41	41	41	42	43	43	43	44	45	45
June 28	531	529	528	521	522	525	522	526	528	530	529	531	542	537	531	534	535	536	528	524	523	523	521	520
	529	528	528	521	522	525	522	526	528	530	529	531	543	537	531	534	535	536	527	524	523	523	521	520
Temp.	46.5	46	47	46.5	46.5	45	44	43	43	42	42	41.5	42	42	42	43	43	44	47.5	49	51.5	53.5	55	57
June 29	519	520	520	518	517	517	517	516	517	517	513	514	516	520	523	525	529	532	526	524	521	520	518	517
	520	520	520	518	517	517	517	516	517	517	513	514	518	520	523	525	529	532	525	524	521	520	518	516
Temp.	59	59	59	59	58	58.5	57	55.5	55	52	50.5	50	49.5	49	48	48	47.5	47	46.5	47	48	49.5	51	54
June 30	517	520	520	519	520	521	522	512	513	512	526	522	530	535	537	546	543	544	543	548	533	529	528	526
	517	520	520	519	520	522	522	512	513	512	524	523	530	535	537	546	543	544	543	546	533	529	526	528
Temp.	56	55	54	54	54.5	54	53	50	50	49	48	47	46.5	46	45	45.5	45	45	44.5	44	45	45	47	49
Magnet'r	528.4	528.3	528.6	528.1	527.3	527.8	527.1	524.9	525.5	527.1	529.7	530.6	532.8	534.0	535.7	537.6	538.8	539.8	538.7	535.6	531.9	529.6	528.5	528.0
Temp.	47.8	48.1	48.7	48.5	48.0	47.6	46.6	44.8	43.9	42.8	41.8	40.9	40.3	39.8	39.6	39.4	39.4	39.8	40.6	41.6	42.7	44.0	45.4	47.0

One division of scale .0001948 part of the vertical force. Monthly means: Temperature, 43°.7; magnetometer, 531.0

Hourly readings of the Brooke balance magnetometer, Uglaamiè, Alaska, July, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	18h	20h	21h	22h	23h
July 1	525	519	490	500	511	515	502	518	517	512	509	520	538	536	538	545	547	557	558	563	554	543	534	534
	525																							
Temp	50	55	57.5	58	58	57	58	54	56	55	53.5	53	53	51	51	50	51	52	53	55	56	58	59	59
July 2	529	518	519	519	515	516	525	527	528	532	539	541	544	541	542	541	545	545	545	546	545	548	547	545
	.....	518	516	519	515	518	526	527	527	532	541	541	544	541	542	541	545	545	545	546	548	548	549	545
Temp	59	56	53	50	48	47	46	45	45	45	41	43	43	42.5	43	42.5	42	41.5	42	41.5	42	43.5	43	44.5
July 3	546	548	548	548	548	549	548	548	548	549	546	542	543	544	548	552	553	550	548	543	542	540	539	540
	547	547	548	548	548	549	548	518	550	549	546	543	543	544	548	553	553	550	547	543	541	540	539	541
Temp	43.5	44	41	45	44.5	44.5	44	43	44	43	42	42	42	42	42	42.5	42	42.5	44	45.5	48	50	52	54
July 4	541	542	543	540	538	539	540	539	539	539	540	540	543	543	548	550	551	552	550	548	546	546	546	543
	541	542	543	539	539	539	540	539	539	539	540	540	543	544	548	550	551	552	550	548	546	546	546	543
Temp	54.5	55	55	55	55	53	51.5	49	48	48	46.5	46	45.5	44.5	44	41.5	44.5	44.5	45.5	45	46.5	47.5	46	49
July 5	542	542	546	544	543	544	546	544	540	541	541	542	546	548	553	556	555	560	561	562	559	548	543	544
	542	542	546	544	543	544	546	544	540	542	541	542	546	548	553	556	555	560	561	562	559	548	543	544
Temp	50	52	53	51.5	50	49	48	46	46	45	44	43	43	43	42.5	42.5	42	42.5	43	44	45	47.5	50	49
July 6	546	548	548	541	544	546	547	542	547	545	546	548	553	556	553	555	556	556	553	551	549	548	549	549
	545	548	548	541	543	546	547	543	547	545	546	549	553	556	553	555	556	555	553	551	549	548	549	549
Temp	48.5	49	48	48	47	46.5	45	43.5	43.5	43	42.5	42	41.5	41	41	41	41	40.5	41	42.5	42.5	43	45	46
July 7	549	547	547	544	543	542	542	543	543	542	543	544	545	546	547	546	546	550	555	550	550	545	541	541
	549	547	547	544	544	542	542	543	543	542	543	544	545	546	547	546	546	550	555	550	549	544	541	541
Temp	46	48	49	50	51	51	50	49	49	48	47	46	45.5	45	45	45.5	45.5	46	48	48	49.5	50.5	53	54
July 8	542	541	540	541	540	540	542	536	532	529	535	533	539	545	553	554	568	559	558	553	552	553	550	548
	542	541	540	541	540	540	542	534	532	529	535	534	540	545	554	554	570	559	558	553	552	553	550	548
Temp	53	52	52	53	53.5	53.5	54	53	53.5	53	52	51	50.5	50	48	46	45	43.5	44	43.5	43	43.5	41	45
July 9	549	550	550	549	548	547	547	547	548	548	549	548	549	551	552	552	552	550	550	550	549	547	547	546
	549	550	550	549	549	547	547	547	548	548	549	548	549	551	552	552	551	550	550	550	549	547	547	545
Temp	46	46.5	46.5	47	46.5	46.5	46.5	45	45	44	43	42.5	43	42	42	43	44	45	46	47	48	49	49.5	51.5
July 10	544	543	544	550	550	547	546	548	541	535	541	553	552	553	553	554	555	555	556	554	554	553	552	551
	544	543	544	546	550	546	546	548	542	533	542	553	552	553	553	555	555	555	556	554	554	553	552	551
Temp	51.5	51.5	51	49	48	47	45.5	43	43	42	40	39.5	39	39	39	39	38.5	38.5	39.5	39.5	40	41	42	44
July 11	549	550	544	540	544	546	547	547	549	548	548	549	547	548	548	550	549	549	549	549	548	549	546	545
	550	550	544	540	544	545	547	548	549	548	548	548	547	548	548	550	549	549	549	549	549	549	546	545
Temp	45.5	47	48	47	47.5	47.5	47.5	46	45.5	45	44	43	43	43	43	43.5	43.5	44	45	45.5	46	47	48	50
July 12	547	547	537	545	543	531	538	544	540	542	542	546	548	550	550	551	551	552	552	553	553	552	551	550
	547	547	538	545	543	531	538	545	540	542	542	546	548	550	550	551	551	552	552	553	553	552	551	550
Temp	50.5	52	52	51	51	50.5	49.5	47	46	45	44	43	43	42.5	42	42	41	41	41.5	41.5	42	43	44	46
July 13	550	550	550	549	549	549	550	551	551	547	549	551	553	553	558	558	560	562	558	556	554	552	548	548
	550	550	550	550	549	549	550	551	550	546	548	550	553	553	558	558	561	563	558	555	554	549	550	548
Temp	46	45	45	45.5	46	46	45.5	44	44	44	43	42.5	42.5	42.5	42	42.5	42	42.5	42	42.5	43	44.5	45	46
July 14	548	548	545	546	544	545	547	549	548	548	547	554	552	557	558	559	562	562	560	552	548	548	547	546
	548	548	544	545	544	546	547	549	548	548	546	554	550	557	557	559	562	562	561	552	548	548	547	546
Temp	46	47	50	51	51	51	50	48	47.5	46	45	43.5	42.5	42	42	44	43.5	43.5	44.5	45	47	49	51.5	53
July 15	545	546	544	543	539	544	542	545	544	542	543	545	543	542	543	544	546	556	563	549	543	539	539	535
	545																							
Temp	53	53	55	55	59.5	54	57	52	55.5	54	53	51	53	53	52	52	52	52	52	53	54	55	56	56.5
July 16	545	544	543	542	543	541	531	536	540	543	542	547	551	555	553	553	555	563	563	556	561	550	549	550
	.....	544	542	542	543	540	532	536	540	543	542	547	552	555	553	553	556	563	564	555	563	550	549	550
Temp	58	56	53	53.5	51	50	49	47	46.5	45.5	45	44	43.5	43	42.5	42.5	42	42	42	41.5	42.5	42.5	43	45
July 17	530	530	550	550	547	546	549	548	549	518	550	550	554	554	558	556	559	557	554	552	550	550	549	548
	550	530	550	550	546	546	549	548	550	548	551	550	554	554	556	556	560	557	554	552	550	550	548	548
Temp	46	46.5	47.5	48	47.5	47	46.5	45	44.5	43.5	42	41	41	40	40	40	40	40	41	43	46	47.5	49.5	52
July 18	545	546	546	545	545	547	545	545	548	547	542	543	548	550	553	553	555	552	552	556	568	555	543	543
	545	546	546	545	545	517	546	546	548	547	542	543	548	550	553	553	555	552	551	556	564	554	544	543
Temp	52	52	52	51.5	51	50.5	49.5	48.5	47	46	45	41	44	41	44.5	45	46.5	47	49.5	51	53.5	53.5	53.5	56
July 19	543	542	540	521	518	533	531	535	536	537	536	546	546	539	546	545	548	548	547	544	543	542	540	540
	542	543	540	521	517	535	532	536	536	537	536	546	547	540	546	545	547	548	548	544	543	543	540	541
Temp	57	57	58	59.5	61	61	60	58	56.5	55	53	51	50	49	48	48	47.5	47.5	48	49	50	51	52	52
July 20	541	544	543	545	544	545	547	544	546	547	546	547	550	552	557	554	556	555	553	552	552	552	553	552
	543	544	543	545	544	545	547	546	546	548	546	547	550	552	556	554	556	555	553	552	552	552	553	552
Temp	51	50	52	50	48.5	48	47	47	46	45	44	43	43	42.5	42.5	42.5	42	41.5	41.5	41.5	42	42	42.5	43
July 21	553	554	555	553	552	552	552	552	552	552	553	553	553	553	553	555	556	556	555	555	554	552	552	550
	554	554	555	552	552	552	553	552	552	553	553	553	553	553	553	556	556	556	556	555	553	552	552	550
Temp	43	43	43	43.5	44	43.5	43	42	41.5	41.5	40	40	40	40	40	40	41	40	40.5	41	41.5	43	43.5	44	45
July 22	551	552	553	554	554	554	555	554	553	554	555	555	555	555	555	556	556	557	558	555	554	554	553	553	553
	552	552	553	554	554	555	556	554	553	555	555	555	555	555	555	556	556	557	557	555	554	554	553	553	553
Temp	45	44	44	43.5	43	42	41.5	41	40.5	39.5	39	39	39	39	39	39.5	39	39.5	40	40	41	42	43	43
July 23	552	552	552	552	552	552	552	553	553	552	552	553	553	554	555	555	555	555	555	554	552	551	551	549
	552	552	552	553	552	552	552	553	553	552	552	553	553	554	555	535	555	555	555	554	552	551	551	549
Temp	44	45	45	45.5	45	44.5	43	42	42	41.5	41	39.5	39	39	38.5	38.5	39	39.5	41	42	43.5	45	47	47.5
July 24	549	549	548	546	548	548	545	545	540	542	543	547	550	552	554	557	560	568	570	567	558	552	549	547
	548	548	547	546	548	547	546	545	540	542	543	547	550	552	551	557	560	569	571	567	558	552	548	547
Temp	50.5	51.5	52.5	52	50	49.5	49	46	43	41	41	40.5	40	40	39	40	39	39	40	40.5	41.5	44	46.5	48
July 25	548	549	547	546	540	544	543	544	543	544	545	546	548	546	552	554	556	556	552	549	550	549	548	548
	548	545	547	546	540	544	543	544	543	545	545	546	548	546	551	554	556	556	552	550	550	549	547	547
Temp	50	51.5	52	52	52	51.5	51.5	49	48.5	48	46	45	44	43.5	43	43.5	43.5	45	46	46.5	47	49	51.5	52.5
July 26	548	546	544	544	544	544	544	544	544	546	548	549	550	553	556	554	558	569	572	564	557	552	550	547
	548	546	544	544	544	544	544	544	544	546	548	549	550	553	556	554	558	570	572	564	557	552	549	547
Temp	53.5	54	56	55	34.5	54	53	51	48	46	45	43	42.5	42	41	41	40.5	41	42.5	43.5	46	47.5	49.5	51
July 27	547	550	549	548	548	549	548	541	539	535	544	547	552	553	553	558	554	558	559	554	553	551	549	548
	547	550	549	549	549	549	547	541	538	535	544	548	552	553	553	558	554	558	558	554	553	550	548	548
Temp	52.5	52.5	53	52	51	51.5	51	48.5	48	46	45	43.5	43	42.5	42	42	42.5	43	44	45	46	47	49	49
July 28	549	549	549	547	548	547	547	548	549	550	551	551	552	553	554	555	558	556	554	553	552	551	550	550
	549	546	549	547	548	547	547	548	549	550	551	551	552	553	554	555	558	556	554	552	552	551	550	550
Temp	49	49.5	49.5	49	49	48.5	48	46	44	43	42	41	41	40	40	40	41	42	43	43.5	44	46	46	48
July 29	550	548	548	548	548	549	551	551	553	553	551	554	554	555	556	556	557	556	555	555	553	552	553	554
	549	548	547	547	548	549	551	551	553	553	552	554	554	555	556	557	557	556	555	555	553	552	553	554
Temp	49	49.5	50.5	49.5	48	47	44	43	41.5	40.5	39.5	39	38.5	38	38	37.5	37.5	37.5	38	38	39	40	40.5	42
July 30	553	554	554	545	533	534	532	534	543	542	548	554	562	570	575	573	570	570	569	582	573	580	571	567
	553	554	554	544	533	534	532	534	543	542	548	554	563	571	575	572	571	570	569	583	572	582	573	565
Temp	42	42	43	42	42	41.5	41	40	39	39	38	37	37	38	38	37.5	37	37	37	37	38	39	40	42
July 31	562	560	546	541	539	540	543	543	535	536	537	547	557	557	561	560	565	568	576	579	564	558	554	552
	562	560	544	541	539	540	543	543	535	535	538	547	557	558	561	561	567	568	574	581	566	557	554	553
Temp	41	44.5	46.5	47	47	46	44.5	44	42.5	41.5	40	39	38	38	37	37	36	36.5	37	37	38	40	42	44
Magnet'r.	546.5	545.9	544.1	542.6	542.0	542.8	542.9	543.5	543.2	542.8	544.0	546.6	549.5	550.5	552.7	553.7	555.5	556.8	556.7	555.0	552.9	550.2	548.2	547.1
Temp	49.1	49.5	50.0	49.6	49.4	48.8	48.1	46.5	46.0	45.1	44.1	43.2	43.0	42.6	42.2	42.4	42.3	42.5	43.3	43.9	45.0	46.1	47.4	48.4

One division of scale = .001918 part of the vertical force. Monthly means: Temperature, 45°.8; magnetometer, 548.2

Hourly readings of the Brooke balance magnetometer, at Uglaamie, Alaska, August, 1883.

Date.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Aug. 1	550	536	530	536	534	528	530	542	548	547	546	555	551	549	549	558	557	560	560	559	553	545	546	549
	550																							
Temp	45	48.5	50	49.5	51.5	50.5	51.5	50.5	51	49	49	48	48	49	48	47	47.5	47	48	47	48	49	50	51
Aug. 2	548	547	548	548	546	544	535	524	534	546	550	551	546	550	548	553	555	553	552	553	550	549	549	547
	.....	547	548	547	546	544	534	528	536	546	551	551	548	549	548	554	555	552	553	553	550	549	549	547
Temp	52	49	48	48	48	47	47	44.5	44	43	42	41.5	41	41	41	41	41	41.5	41.5	42.5	44	46	48	51
Aug. 3	545	545	544	546	546	544	545	545	547	548	548	547	546	549	557	554	553	554	554	558	552	552	551	552
	546	544	544	546	544	544	545	546	548	548	549	547	546	549	557	554	554	554	554	553	552	552	551	550
Temp	52	54	54.5	53.5	53.5	52.5	51.5	50	48	46	45	44	43.5	42.5	42	42	41	41	41.5	42	43.5	45	46	46.5
Aug. 4	550	550	549	549	551	549	549	551	550	552	551	552	552	552	553	552	553	553	554	553	553	553	552	551
	550	550	549	549	550	549	549	551	551	552	551	552	552	553	553	552	553	553	554	553	553	553	552	551
Temp	47	48	48	48	48	48	47.5	46	44	43	43	42	42	41.5	41	41	41	41	42	42	42.5	43	44.5	45.5
Aug. 5	551	551	551	551	550	552	552	551	551	551	550	549	550	551	555	555	561	563	562	560	551	547	549	551
	551	551	551	551	550	551	552	551	552	552	549	549	550	551	554	557	561	563	562	560	551	547	549	550
Temp	45.5	45.5	46	45	45	45	45	45	44	43	42	41	40.5	40	39.5	40	40	40	40	40	40.5	41	42	43
Aug. 6	558	552	552	553	551	550	549	546	544	545	547	555	558	559	558	564	561	566	567	566	562	554	556	558
	553	552	553	553	552	551	549	546	544	545	548	555	558	559	558	563	561	566	567	566	561	554	556	558
Temp	43	43	44	43	43	43.5	43.5	43.5	42.5	42	41	41	40.5	40	40	40.5	40	40	40	40	40	41	42	42
Aug. 7	557	556	556	555	553	553	554	551	552	553	554	554	553	557	558	560	562	559	557	556	554	553	553	554
	556	556	556	555	553	553	553	551	553	554	554	554	553	557	558	560	564	559	558	556	554	553	553	554
Temp	43	43	42	43	43	43	43	43	42	41	41	40	40	40	40	40	40	40	40	41	43	44	44	44
Aug. 8	553	553	551	549	548	547	548	546	545	546	548	548	550	549	551	554	553	549	549	547	546	544	541	541
	553	553	551	549	548	547	548	546	545	546	548	548	550	549	551	555	553	550	548	547	546	544	541	542
Temp	45	45.5	48	48.5	51	52	52	51	50	49	49	49	49	49	49	49.5	49.5	49.5	50.5	52	53.5	54.5	60	59
Aug. 9	540	539	540	539	538	538	536	537	536	537	538	539	542	545	548	548	546	546	548	543	542	542	539	537
	540	538	540	539	538	537	535	537	537	537	538	539	542	545	547	548	545	547	544	543	543	542	538	537
Temp	60.5	63.5	62	62.5	63	64	63.5	62.5	60	58	57	55	53	52	51	50.5	51.5	52	54	55	56.5	59	61	62.5
Aug. 10	537	535	535	536	536	536	535	538	539	540	542	544	544	547	547	548	548	548	547	546	546	544	543	543
	537	535	536	535	536	535	536	537	539	540	542	544	544	547	547	548	547	548	547	546	546	544	543	542
Temp	63.5	64.5	65	64	63.5	63.5	62	59	57	55	53	52	50.5	49	48.5	48.5	48	47.5	49	51	52	53	55	56
Aug. 11	542	543	544	547	547	550	547	538	531	540	544	548	547	550	551	553	554	555	555	553	551	550	547	547
	542	543	544	546	545	548	547	538	532	540	544	549	547	550	551	553	554	555	556	552	550	550	547	545
Temp	56	54.5	54	53	53	52.5	51	50	50	49	48	47.5	48	47.5	47	47	46.5	46.5	47.5	47.5	48	49.5	50	53.5
Aug. 12	543	545	545	544	544	546	544	543	544	545	545	545	544	545	546	549	549	553	552	549	543	543	543	542
	542	543	544	544	543	545	544	544	544	545	545	545	544	545	546	549	549	553	553	549	542	543	543	542
Temp	55.5	55.5	56.5	56	54	53.5	53	54	53	53	53	52.5	52	51.5	51	50.5	49.5	49.5	49	49	50	52	54.5	57
Aug. 13	543	543	543	543	544	545	545	545	547	547	547	547	548	548	549	551	554	551	549	549	547	545	546	548
	543	543	543	543	545	544	545	547	547	547	547	547	548	548	549	551	554	552	549	548	547	545	546	546
Temp	57.5	57	56.5	54.5	53	52.5	52	50	50	50	49	48.5	48	47.5	47	47	46.5	47	47	47	47	47.5	48	49.5
Aug. 14	549	549	546	547	547	548	548	548	545	546	543	545	548	553	553	555	557	556	553	552	550	549	547	549
	549	549	547	546	547	548	548	549	545	546	543	545	548	553	553	555	557	556	552	552	550	548	547	546
Temp	49.5	49.5	51	52	52.5	51	51	49	46.5	45	44.5	45	44.5	44	44	44	43	43	43	44	44	47	47	47.5
Aug. 15	548	546	545	544	544	546	545	544	545	546	545	545	545	549	547	549	549	548	547	543	543	542	541	539
	547																							
Temp	49	52.5	55	53.5	56.5	53	56	56	54	52	53	53	53	50	51	49.5	50	50	52	54	57	58	59	60
Aug. 16	537	537	536	538	539	538	540	539	540	542	543	544	544	545	546	547	548	548	548	548	548	549	549	550
	....	536	536	538	539	538	540	540	540	542	543	544	544	545	546	547	548	549	549	548	548	549	549	550
Temp	62.5	61.5	60	60.5	60	60	58	58	57	54.5	54	53	52	51	51	50.5	50.5	49.5	49.5	49.5	49	49	49	48
Aug. 17	550	551	552	550	550	549	549	550	550	551	552	551	553	553	554	555	556	554	554	555	556	555	553	552
	550	551	552	550	550	549	549	549	551	551	552	551	553	552	554	556	555	554	554	555	556	556	553	552
Temp	48	48	48.5	48	47.5	47.5	47	46	45	44.5	44	44	44	44	43.5	43	42	41	40.5	40	41	42	45	47
Aug. 18	552	552	550	548	547	547	547	547	548	531	544	543	550	560	564	564	562	561	571	569	564	560	556	556
	552	552	550	547	548	547	547	547	548	531	544	544	550	560	564	564	562	562	571	569	564	560	557	556
Temp	49	50	52	53	52.5	52	51	50	48.5	47	46	45	45	44.5	44	44	42.5	42.5	42.5	42	42.5	43	43	43
Aug. 19	555	555	552	549	549	555	556	556	555	557	557	558	559	559	559	560	560	560	560	558	559	558	557	556
	555	555	552	549	549	555	556	556	555	557	557	558	559	559	559	561	560	560	561	558	559	558	557	556
Temp	43	43	43	42.5	41.5	42	41	40.5	40	39	38	38	38	37.5	37	37	36.5	36.5	37	37	39	40.5	42	42
Aug. 20	554	553	552	553	552	550	551	553	553	552	550	556	557	559	559	559	561	560	560	560	559	559	560	560
	554	553	552	553	552	552	551	553	553	552	549	556	557	559	559	559	561	560	560	560	560	560	561	560
Temp	43.5	45	46.5	46.5	48	48	47	46	44	42	41	40	39.5	39	38.5	38	38	36	36.5	36	35.5	36	36	36
Aug. 21	561	560	561	561	560	560	561	560	560	559	556	557	560	561	563	565	566	564	563	562	561	560	560	561
	561	559	561	560	560	560	561	560	560	559	556	557	560	561	563	565	566	564	563	563	562	560	560	561
Temp	36	37	36.5	36.5	36	36.5	36	36.5	36.5	36.5	36	36	36	35	35.5	35	34.5	34.5	34.5	34	34	34.5	35	37
Aug. 22	560	560	561	561	559	558	557	558	558	558	556	556	555	560	564	563	563	566	566	562	560	560	560	560
	560	560	561	561	559	557	557	557	558	558	556	555	555	560	564	563	563	566	566	562	560	560	560	560
Temp	37	38	38	37.5	39	40	40	40	39	38	37	36	35.5	34.5	34	34	34	34	35	35	35.5	37	38	39
Aug. 23	560	562	562	559	558	558	558	554	556	559	557	557	559	562	560	562	566	561	557	562	558	558	555	557
	560	562	562	559	559	558	558	554	556	559	557	558	560	562	560	561	567	560	557	562	558	557	556	557
Temp	40	40.5	41	42	42	41	41	40.5	40	40	39	39	39	39	39	39	39	39	40	40	41	41	42	43
Aug. 24	557	554	554	555	554	554	537	539	538	536	527	533	537	538	537	542	545	543	542	540	540	539	541	541
	557	554	554	555	554	554	538	539	538	536	528	538	536	538	537	543	546	543	542	541	540	539	542	541
Temp	44	45	46	46	46	45	45	44	44	44	43	43	43	42.5	43	43	43	42.5	42	41.5	41	41	41	41.5
Aug. 25	542	543	543	544	543	544	544	544	543	541	542	540	543	547	548	548	548	548	548	547	546	546	546	545
	542	543	543	544	543	545	545	544	543	541	542	540	543	547	548	548	548	548	548	547	546	546	546	545
Temp	41	40	40	40.5	40	40.5	40.5	40	39.5	39	38	37.5	37	36	36	36	35.5	35.5	35.5	35.5	35.5	37	37.5	38
Aug. 26	545	545	545	545	544	543	544	543	544	542	541	537	538	541	540	541	542	540	540	541	543	542	542	542
	546	545	545	545	544	543	544	544	544	543	541	537	538	540	541	541	542	540	540	541	543	541	543	543
Temp	40	41	41	41	42	43	43	43	43	44.5	45	46	47	46.5	46.5	45.5	45	44	41.5	41.5	41	41.5	42.5	44
Aug. 27	542	542	541	543	543	543	543	545	546	546	546	545	545	547	547	547	547	548	547	546	546	547	544	.....
	542	541	542	543	543	543	544	544	546	546	546	545	545	547	547	547	548	548	547	546	547	547	544	.....
Temp	44.5	44	44	43.5	43	43	43	41	40	39.5	39	39	39	38.5	37.5	37.5	37	37	38	38	38.5	39.5	41	.....
Magnet'r	549.0	548.1	547.7	547.8	547.3	547.2	546.3	546.0	546.4	546.9	547.1	548.4	549.1	551.2	552.2	554.0	554.8	554.4	554.0	553.0	551.2	549.9	549.1	549.3
Temp	47.7	48.3	48.6	48.4	48.5	48.4	48.0	47.2	46.3	45.4	44.8	44.3	44.0	43.8	43.1	42.9	42.7	42.5	42.8	43.1	43.8	44.7	45.9	47.1

One division of scale = .0001948 part of the vertical force. Monthly means: Temperature, 45°.5; magnetometer, 549.6

***Recapitulation of monthly mean values (inclusive of disturbances and uncorrected for changes of temperature and variations in scale value) of the hourly readings of the balance magnetometer, at Uglaamie, Alaska,* 1882-'83.**

Göttingen civil time	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h
Uglaamie civil time	Noon $+53^m.6$.	$13^h+53^m.6$.	$14^h+53^m.6$.	$15^h+53^m.6$.	$16^h+53^m.6$.	$17^h+53^m.6$.	$18^h+54^m.6$.	$19^h+53^m.6$.
1882.								
September 12 to 30	517.3	516.0	516.6	516.8	514.9	513.9	515.1	514.4
October	517.7	517.1	517.2	516.3	515.3	513.7	512.3	509.6
November	512.2	512.5	511.5	509.2	507.6	506.8	507.2	594.6
December	523.0	523.2	523.3	522.5	521.5	521.2	521.9	519.9
1883.								
January	511.5	512.7	513.5	513.6	512.9	512.7	511.7	511.0
February	503.2	504.0	502.8	501.7	502.0	500.4	498.9	498.4
March	519.5	518.3	517.6	515.3	515.6	514.0	512.4	507.8
April	509.6	509.4	508.9	507.6	506.7	505.8	505.3	506.4
May	514.5	514.2	514.0	514.8	514.7	513.5	513.5	512.5
June	528.4	528.3	528.6	528.1	527.3	527.8	527.1	524.9
July	546.5	545.9	544.1	542.6	542.0	542.8	542.9	543.5
August 1 to 27, inclusive	549.0	548.1	547.7	547.8	547.3	547.2	546.3	546.0

Göttingen civil time	8^h	9^h	10^h	11^h	Noon.	13^h	14^h	15^h
Uglaamie civil time	$20^h+53^m.6$.	$21^h+53^m.6$.	$22^h+53^m.6$.	$23^h+53^m.6$.	$0^h+53^m.6$.	$1^h+53^m.6$.	$2^h+53^m.6$.	$3^h+53^m.6$.
1882.								
September 12 to 30	513.3	512.3	514.0	515.5	519.4	520.7	521.2	522.1
October	511.4	513.0	517.7	518.6	524.0	526.8	528.9	529.2
November	504.9	514.9	515.2	521.7	524.3	526.2	540.1	544.7
December	516.2	517.5	520.1	520.4	525.2	527.6	529.6	530.6
1883.								
January	510.6	509.8	509.1	508.5	510.3	513.0	517.4	519.9
February	496.9	407.6	498.2	498.3	501.6	505.9	509.4	511.7
March	506.4	508.0	509.9	514.4	522.2	527.8	530.4	532.1
April	506.9	507.4	509.0	510.7	513.3	515.8	518.3	519.6
May	511.8	512.4	513.2	514.8	518.7	521.3	523.7	526.6
June	525.5	527.1	529.7	530.6	532.8	534.0	535.7	537.6
July	543.2	542.8	544.0	546.6	549.5	550.5	552.7	553.7
August 1 to 27, inclusive	546.4	546.9	547.1	548.4	549.1	551.2	552.2	554.0

Göttingen civil time	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Mean.
Uglaamie civil time	$4^h+53^m.6$.	$5^h+53^m.6$.	$6^h+53^m.6$.	$7^h+53^m.6$.	$8^h+53^m.6$.	$9^h+53^m.6$.	$10^h+53^m.6$.	$11^h+53^m.6$.	
1882.									*d.*
September 12 to 30	524.0	524.2	522.0	520.0	517.8	516.9	516.6	517.0	517.6
October	529.9	529.5	525.6	522.8	524.7	520.0	519.0	518.5	520.0
November	547.2	552.9	540.7	534.9	536.0	523.5	530.5	515.8	522.7
December	529.4	530.4	529.3	526.1	523.9	523.1	521.5	522.3	523.7
1883.									
January	519.3	518.5	517.9	516.2	514.4	511.5	510.2	510.6	513.2
February	514.4	513.8	513.5	512.3	507.4	504.3	504.5	502.3	501.3
March	534.7	534.3	532.4	528.5	523.4	520.1	519.9	518.9	520.2
April	520.5	521.6	521.5	520.6	518.3	516.5	515.3	513.5	512.9
May	526.3	525.6	523.7	520.5	517.5	515.6	514.8	513.8	517.2
June	538.8	539.8	538.7	535.6	531.9	529.6	528.5	528.0	531.0
July	555.5	556.8	556.7	555.0	552.9	550.2	548.2	547.1	548.2
August 1 to 27, inclusive	554.8	554.4	554.0	553.0	551.2	549.9	549.1	549.3	549.6

Solar diurnal variation of the vertical force (inclusive of disturbances). Expressed in scale divisions and uncorrected for changes of temperature, 1882–'83.

Göttingen civil time	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h
Uglaamie civil time	Noon $+53^m.6$.	$13^h+53^m.6$.	$14^h+53^m.6$.	$15^h+53^m.6$.	$16^h+53^m.6$.	$17^h+53^m.6$.	$18^h+53^m.6$.	$19^h+53^m.6$.
1882.								
September	− 0.3	− 1.6	− 1.0	− 0.8	− 2.7	− 3.7	− 2.5	− 3.2
October	− 2.3	− 2.9	− 2.8	− 3.7	− 4.7	− 6.3	− 7.7	−10.4
November	−10.5	−10.2	−11.2	−13.5	−15.1	−15.9	−15.5	−18.1
December	− 0.7	− 0.5	− 0.4	− 1.2	− 2.2	− 2.5	− 1.8	− 3.8
1883.								
January	− 1.7	− 0.5	+ 0.3	+ 0.4	− 0.3	− 0.5	− 1.5	− 2.2
February	− 1.1	− 0.3	− 1.5	− 2.6	− 2.3	− 3.9	− 5.4	− 5.9
March	− 0.7	− 1.9	− 2.6	− 4.9	− 4.6	− 6.2	− 7.8	−12.4
April	− 3.3	− 3.5	− 4.0	− 5.3	− 6.2	− 7.1	− 7.6	− 6.5
May	− 2.7	− 3.0	− 3.2	− 2.4	− 2.5	− 3.7	− 3.7	− 4.7
June	− 3.4	− 3.3	− 2.4	− 2.9	− 3.7	− 3.2	− 3.9	− 6.1
July	− 1.7	− 2.3	− 4.1	− 5.6	− 6.2	− 5.4	− 5.3	− 4.7
August	− 0.6	− 1.5	− 1.9	− 1.8	− 2.6	− 2.4	− 3.3	− 3.6
April to September, inclusive	− 2.0	− 2.5	− 2.8	− 3.1	− 4.0	− 4.2	− 4.4	− 4.8
October to March, inclusive	− 2.8	− 2.7	− 3.0	− 4.2	− 4.9	− 5.9	− 6.6	− 8.8
Year	− 2.4	− 2.6	− 2.9	− 3.7	− 4.4	− 5.1	− 5.5	− 6.8

Göttingen civil time	8^h	9^h	10^h	11^h	Noon.	13	14^h	15^h
Uglaamie civil time	$20^h+53^m.6$.	$21^h+53^m.6$.	$22^h+53^m.6$.	$23^h+53^m.6$.	$0^h+53^m.6$.	$1^h+53^m.6$.	$2^h+53^m.6$.	$3^h+53^m.6$.
1882.								
September	− 4.3	− 5.3	− 3.6	− 2.1	+ 1.8	+ 3.1	+ 3.6	+ 4.5
October	− 8.6	− 7.0	− 2.3	− 1.4	+ 4.0	+ 6.8	+ 8.9	+ 9.2
November	−17.8	− 7.8	− 7.5	− 1.0	+ 1.6	+ 3.5	+17.4	+22.0
December	− 7.5	− 6.2	− 3.6	− 3.3	+ 1.5	+ 3.9	+ 5.9	+ 6.9
1883.								
January	− 2.6	− 3.4	− 4.1	− 4.7	− 2.9	− 0.2	+ 4.2	+ 6.7
February	− 7.4	− 6.7	− 6.1	− 6.0	− 2.7	+ 1.6	+ 5.1	+ 7.4
March	−13.8	−12.2	−10.3	− 5.8	+ 2.0	+ 7.6	+10.2	+11.9
April	− 6.0	− 5.5	− 3.9	− 2.2	+ 0.4	+ 2.9	+ 5.4	+ 6.7
May	− 5.4	− 4.8	− 4.0	− 2.4	+ 1.5	+ 4.1	+ 6.5	+ 9.4
June	− 5.5	− 3.9	− 1.3	− 0.4	+ 1.8	+ 3.0	+ 4.7	+ 6.6
July	− 5.0	− 5.4	− 4.2	− 1.6	+ 1.3	+ 2.3	+ 4.5	+ 5.5
August	− 3.2	− 2.7	− 2.5	− 1.2	− 0.5	+ 1.6	+ 2.6	+ 4.4
April to September, inclusive	− 4.9	− 4.6	− 3.2	− 1.6	+ 1.0	+ 2.8	+ 4.5	+ 6.2
October to March, inclusive	− 9.6	− 7.2	− 5.6	− 3.7	+ 0.6	+ 3.9	+ 8.6	+10.7
Year	− 7.3	− 5.9	− 4.4	− 2.7	+ 0.8	+ 3.4	+ 6.6	+ 8.4

Göttingen civil time	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	k or scale value in parts of force 0.000
Uglaamie civil time	$4^h+53^m.6$.	$5^h+53^m.6$.	$6^h+53^m.6$.	$7^h+53^m.6$.	$8^h+53^m.6$.	$9^h+53^m.6$.	$10^h+53^m.6$.	$11^h+53^m.6$.	
1882.									
September	+ 6.4	+ 6.6	+ 4.4	+ 2.4	+ 0.2	− 0.7	− 1.0	− 0.6	0803
October	+ 9.9	+ 9.5	+ 5.6	+ 2.8	+ 4.7	0.0	− 1.0	− 1.5	0803
November	+24.5	+30.2	+18.0	+12.2	+13.3	+ 0.8	+ 7.8	− 6.9	1307
December	+ 5.7	+ 6.7	+ 5.6	+ 2.4	+ 0.2	− 0.6	− 2.2	− 1.4	1739
1883.									
January	+ 6.1	+ 5.3	+ 4.7	+ 3.0	+ 1.2	− 1.7	− 3.0	− 2.6	1739
February	+10.1	+ 9.5	+ 9.2	+ 8.0	+ 3.1	0.0	+ 0.2	− 2.0	1739
March	+14.5	+14.1	+12.2	+ 8.3	+ 3.2	− 0.1	− 0.3	− 1.3	1087
April	+ 7.6	+ 8.7	+ 8.6	+ 7.7	+ 5.4	+ 3.6	+ 2.4	+ 0.6	1844
May	+ 9.1	+ 8.4	+ 6.5	+ 8.3	+ 0.3	− 1.6	− 2.4	− 3.4	2031
June	+ 7.8	+ 8.8	+ 7.7	+ 4.6	+ 0.9	− 1.4	− 2.5	− 3.0	1948
July	+ 7.3	+ 8.6	+ 8.5	+ 6.8	+ 4.7	+ 2.0	0.0	− 1.1	1948
August	+ 5.2	+ 4.8	+ 4.4	+ 3.4	+ 1.6	+ 0.3	− 0.5	− 0.3	1948
April to September, inclusive	+ 7.2	+ 7.6	+ 6.7	+ 4.7	+ 2.2	+ 0.4	− 0.7	− 1.3	1754
October to March, inclusive	+11.8	+12.5	+ 9.2	+ 6.1	+ 4.3	− 0.3	+ 0.2	− 2.6	1402
Year	+ 9.5	+10.1	+ 8.0	+ 5.4	+ 3.2	+ 0.1	− 0.2	− 1.9	1578

TEMPERATURE COEFFICIENT.

There were no special observations made to determine the effect of change of temperature on the magnetic moment of the balance magnet. The instrument was mechanically compensated as near as could be judged, and it only remains to determine the outstanding effect by means of the ordinary readings. There was no thermometer in the case of the balance magnetometer, but the same temperature record as was given for the bifilar magnetometer answers, since the readings of the two thermometers—one with the unifilar, the other with the bifilar—rarely differ more than half a degree and less than 0°.1 Fahr., in the monthly means. Applying the same process as in the case of the bifilar, we find—

	Change.	Change corresponds to	Consequent change for 1° Fahr.
1882.	d	°	d
October 14-15	—11	+10.9	—1.0
October 30-31	—17	+13.4	—1.3
November 1-2	+14	—14.2	—1.0
November 10-11	+17	— 8.0	—2.1
November 23-24	—10	— 7.0	+1.4
December 1-2	—10.5	— 7.3	+1.4
December 14-15	+9	+11.0	+0.8
December 15-16	—16	—10.3	+1.5
1883.			
January 1-2	—13	+12.7	—1.0
January 22-23	— 7	+ 7.5	—0.9
February 9-10	+ 5	— 7.4	—0.7
March 1-2	+12	—12.7	—0.9
March 11-12	—10	+ 6.8	—1.5
March 24-25	—34	+12.2	—2.8
April 19-20	—11	+ 8.3	—1.3
July 19-20	+ 9	— 8.3	—1.1
August 7-8	— 7	+ 8.9	—0.8
Mean			—0.66±0.20

It is proposed to adopt for the present value the value—$0^d.7\pm0.2$, which is equivalent to a *decrease* of $0.7\times.0001584$ (0.7 time the average value for 1 division) or .000111 part of the vertical force for an *increase* of temperature of 1° Fahr.

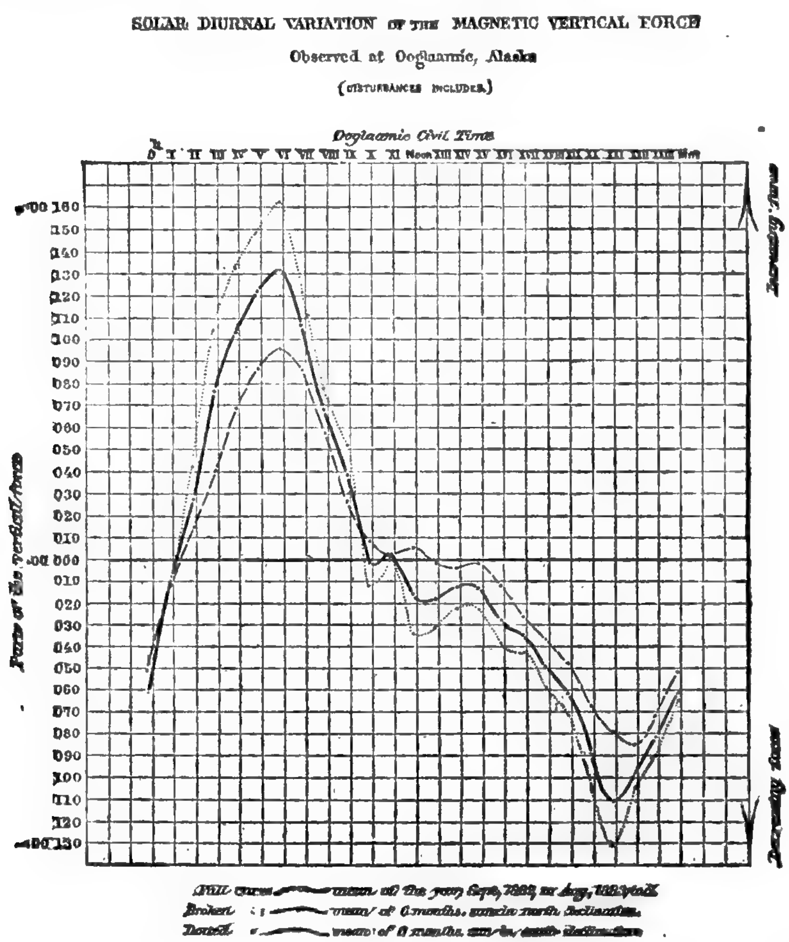
Solar-diurnal variation of the vertical force, inclusive of disturbances, and expressed in parts of the force; Uglaamie, 1882-'83.

Göttingen civil time.	Uglaamie civil time.		Six months, sun north of equator.	Six months, sun south of equator.	Whole year.	Temperature difference.			Solar diurnal variation.		
						t—35°.8 ⊙ N.	t—2°.1 ⊙ S.	t—19°.0 year.	Half year, sun north of equator.	Half year, sun south of equator.	Whole year.
h	h	m				°	°	°			
0	Noon	+53.6	—.00035	—.00039	—.00038	+3.1	+0.7	+1.8	—.00001	—.00031	—.00018
1	13	+53.6	—.00044	—.00038	—.00041	+3.6	+1.3	+2.4	—.00004	—.00024	—.00014
2	14	+53.6	—.00049	—.00042	—.00046	+4.2	+1.7	+2.9	—.00002	—.00023	—.00014
3	15	+53.6	—.00054	—.00059	—.00058	+3.8	+1.8	+2.8	—.00012	—.00039	—.00027
4	15	+53.6	—.00070	—.00069	—.00069	+4.0	+2.3	+3.1	—.00026	—.00043	—.00035
5	17	+53.6	—.00074	—.00083	—.00080	+3.4	+2.1	+2.7	—.00036	—.00060	—.00050
6	18	+53.6	—.00077	—.00093	—.00087	+2.8	+1.9	+2.3	—.00046	—.00072	—.00061
7	19	+53.6	—.00084	—.00123	—.00107	+1.6	+1.5	+1.5	—.00066	—.00106	—.00090
8	20	+53.6	—.00086	—.00135	—.00115	+0.6	+0.3	+0.4	—.00079	—.00132	—.00111
9	21	+53.6	—.00081	—.00101	—.00093	—0.4	—0.4	—0.4	—.00085	—.00105	—.00097
10	22	+53.6	—.00056	—.00079	—.00069	—1.4	—1.0	—1.2	—.00072	—.00090	—.00082
11	23	+53.6	—.00028	—.00052	—.00043	—2.2	—1.3	—1.8	—.00052	—.00066	—.00063
Noon	0	+53.6	+.00018	+.00008	+.00013	—2.6	—1.2	—2.0	—.00011	—.00005	—.00009
13	1	+53.6	+.00049	+.00055	+.00054	—3.1	—1.3	—2.3	+.00015	+.00041	+.00028
14	2	+53.6	+.00079	+.00121	+.00104	—3.5	—1.4	—2.5	+.00040	+.00105	+.00076
15	3	+33.6	+.00109	+.00150	+.00133	—3.6	—1.5	—2.6	+.00069	+.00133	+.00104
16	4	+53.6	+.00126	+.00165	+.00150	—3.6	—1.4	—2.6	+.00086	+.00149	+.00121
17	5	+53.6	+.00133	+.00175	+.00159	—3.4	—1.3	—2.4	+.00095	+.00161	+.00132
18	6	+53.6	+.00118	+.00129	+.00126	—2.8	—0.6	—1.7	+.00087	+.00122	+.00107
19	7	+53.6	+.00082	+.00086	+.00085	—2.2	—0.8	—1.5	+.00058	+.00077	+.00068
20	8	+53.6	+.00039	+.00060	+.00050	—1.2	—0.8	—1.0	+.00026	+.00051	+.00039
21	9	+53.6	+.00007	—.00004	+.00002	0.0	—0.6	—0.4	+.00007	—.00011	—.00002
22	10	+53.6	—.00012	+.00003	—.00003	+1.2	—0.3	+0.4	+.00001	00000	+.00001
23	11	+53.6	—.00023	—.00036	—.00030	+2.6	+0.2	+1.3	+.00006	—.00034	—.00016

The numbers contained in the last three columns of this table were plotted on the accompanying diagram, which shows the vertical force to be in excess of its average value in the (local) morning hours maximum about 6 a. m., and in deficiency in the (local) afternoon hours minimum about 9 p. m. Compared with the variation of the vertical force at more southern stations, there appears to be a complete inversion of the hours of greater and of less intensity, which may be due to the action of disturbances; or, if regular, it may be somehow connected with the circumstance that Uglaamie is near the central zone of maximum auroral display, and a little to the *north* of it. We note the apparent greater range of the diurnal variation in the half year including the winter than in the other six months, which is also an anomalous phenomenon.

The breakage of the magnetic and electric equilibrium in this auroral zone, resulting in an outburst of disturbances, probably occurs more frequently in this belt than outside of it, and possibly sudden changes of temperature may be favorable circumstances of disruption. The belt of maximum auroral development seems to be subject to fluctuations in position, and in studying the supposed connection of auroras with terrestrial magnetism, attention should be directed to the direction in which the aurora appears at a station, *i. e.*, at Uglaamie, whether to the south or to the north of the zenith.

The increased dip and total intensity in the Uglaamie morning hours, as contrasted with the diminished dip and intensity of the total force in the afternoon, is corroborated by the observations made in the first year by means of the dip circle and deflecting weight.



Solar diurnal variations in the magnetic dip and in the total magnetic intensity.

These variations are readily obtained from the variations in the horizontal and in the vertical components of the force; if $F=$ total force, H and V its horizontal and vertical components, then from the fundamental relations $H = F \cos \theta$ and $V = F \sin \theta$ we find by differentiation and elimination, the variation in the dip $\Delta \theta$ and the variation in the total force (in parts of the force) $\frac{\Delta F}{F}$, viz:

$$\Delta\theta = \sin \theta \cos \theta \left(\frac{\Delta V}{V} - \frac{\Delta H}{H} \right) \qquad \text{and} \qquad \frac{\Delta F}{F} = \cos^2 \theta \frac{\Delta H}{H} + \sin^2 \theta \frac{\Delta V}{V}$$

Solar-diurnal variations in the magnetic dip and in the total magnetic intensity, inclusive of disturbances; annual mean values 1882–'83.

Uglaamie civil time.	$\frac{\Delta H}{H}$	$\frac{\Delta V}{V}$	$\Delta\theta$	$\frac{\Delta F}{F}$	Uglaamie civil time.	$\frac{\Delta H}{H}$	$\frac{\Delta V}{V}$	$\Delta\theta$	$\frac{\Delta F}{F}$
h. m.			′		h. m.			′	
0 53.6	—.00136	—.00009	+0.65	—.00012	Noon + 53.6	+.00214	—.00018	—1.18	—.00013
1 53.6	.00249	+.00028	+1.41	+.00021	13 +53.6	.00276	.00014	—1.48	.00008
2 53.6	.00393	.00076	+2.39	+.00065	14 +53.6	.00346	.00014	—1.83	.00006
3 53.6	.00390	.00104	+2.51	+.00093	15 +53.6	.00488	.00027	—2.62	.00015
4 53.6	.00434	.00121	+2.82	+.00108	16 +53.6	.00593	.00035	—3.20	.00021
5 53.6	.00577	.00132	+3.61	+.00116	17 +53.6	.00589	.00050	—3.25	.00036
6 53.6	.00636	.00107	+3.78	+.00091	18 +53.6	.00601	.00061	—3.37	.00047
7 53.6	.00589	.00068	+3.34	+.00054	19 +53.6	.00486	.00090	—2.93	.00077
8 53.6	.00474	+.00039	+2.61	+.00027	20 +53.6	.00360	.00111	—2.40	.00101
9 53.6	.00274	—.00002	+1.38	—.00008	21 +53.6	.00250	.00097	—1.77	.00089
10 53.6	—.00076	+.00001	+0.39	—.00001	22 +53.6	+.00022	.00082	—0.53	.00080
11 53.6	+.00094	—.00016	—0.56	—.00014	23 +53.6	—.00101	—.00063	+0.19	—.00064

In presenting the foregoing results of the three variation instruments I had two objects in view, viz, to be in a position to form a close estimate of the character and value of the whole series of observations preparatory to their full analysis and discussion, and, secondly, to give at once, but preliminarily, such leading results as could be deduced without waiting for the publication of the results of the conference for the uniform treatment of the magnetic work at the international Polar stations. What has been presented will, in general, enable the reader to form a judgment of the magnetic outfit of the Uglaamie station, and of the value of the work done.

As has been already pointed out, there were no well-adapted magnetic variation instruments available in the first year; the range of the collimator scale was very limited, and the declinometer had frequently to be turned in azimuth in order to secure readings on days of disturbance; besides, the great changes in the torsion of the suspension renders it impossible to produce a uniform series with respect to a fixed direction. The record of the bifilar magnetometer has not yet been sufficiently examined to form an opinion as to its value, and at present I am still waiting for notes bearing on the adjustment and scale value of the instrument.* There was then no vertical force magnetometer, but hourly observations were made with a dipping needle deflected by a constant weight; corresponding values for the true dip or deflections by the same needle were only made on two or three days each month, so that the value of this series, as a differential measure of the total force, may be regarded as small. It has, however, enabled me independently to verify the fact brought out by the balance magnetometer of the greater total intensity during the morning than in the afternoon hours. There is no record of the effect of temperature changes on the angle of deflection of the loaded needle.

In the year 1881–'82 there were but few stations with which to compare results, and to publish the above-mentioned records in extenso would seem to me an expenditure of time and labor hardly to be recommended, and probably not warranted by the meager results the series may be capable of yielding. If this early record is to be published at all I would propose to set down the mean of the 10 readings (5 with scale extreme left and 5 with scale extreme right) for each instrument, viz, the declinometer and bifilar, and the mean of the 10 readings of the dipping needle (5 for south and 5 for north end); for each observing hour and during term days it would suffice to give only the mean of the two extreme scale readings. But on these and other points the result of the deliberations at Vienna may be awaited.

I conclude this report with a table of frequency of the aurora as seen and recorded in connection with the magnetic work at Uglaamie.

*No further information could be obtained (May, 1885.)

Table of frequency of the aurora as observed at Uglaamie, Alaska, between October, 1881, and August, 1883.

[The hours are local mean time hours at Uglaamie, and the numbers indicate the number of days in each month when auroras were seen at each of the hours indicated: Observations began October 17, 1881; end, August 27, 1883. The presence or absence of an aurora was noted a few minutes before each full hour.]

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Total number of hours.
1881.																									
September	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
October	2	2	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3	3	2	21
November	13	15	15	13	14	12	5	3	2	0	0	0	0	0	0	1	2	2	4	6	9	12	14	12	154
December	17	10	15	17	14	14	9	7	8	4	0	0	0	0	0	0	1	3	17	12	14	15	15	15	207
1882.																									
January	11	16	0	9	7	3	1	2	2	1	0	0	0	0	0	0	0	1	8	7	9	11	10	16	123
February	17	16	13	12	14	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	16	13	17	20	165
March	17	17	14	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	17	21	107
April	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	21
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
September	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	5	7	23
October	7	7	6	0	7	5	1	0	0	0	0	0	0	0	0	0	0	0	2	5	8	9	10	9	82
November	14	14	14	12	12	12	11	0	0	0	0	0	0	0	0	0	2	4	5	7	12	12	16	19	175
December	24	20	21	24	19	21	12	12	15	10	3	0	0	0	0	0	6	10	13	13	19	24	25	25	316
1883.																									
January	20	22	23	20	19	19	17	18	12	2	0	0	0	0	0	0	0	10	9	11	17	20	22	21	282
February	16	12	12	18	14	13	12	3	1	0	0	0	0	0	0	0	0	0	1	8	11	12	11	15	159
March	21	18	19	18	15	5	1	0	0	0	0	0	0	0	9	0	0	0	0	7	14	18	21	20	177
April	6	5	3	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	3	3	7	27
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sums: October, 1881, to August, 1882; 10½ months	84	79	71	63	53	40	16	12	12	[illegible]	0	0	0	0	0	1	3	6	36	35	51	60	77	94	798
Sums: September, 1882, to August, 1883; 12 months	110	101	100	98	86	75	54	42	28	12	3	0	0	0	0	0	8	24	30	51	82	101	113	123	1241

The total number of days when auroras were visible in the first 10½ months (1881–'82), was 145, hence the average duration, 5½ hours nearly: total number of days when auroras were seen in the year ending August, 1883, was 169, hence the average duration, 7⅓ hours nearly.

In the tabulation and preparation of the manuscript record for the printer I had the assistance of Sergeant J. E. Maxfield and Private G. W. Knopf, who performed their task with much zeal and commendable industry; they have also prepared a complete duplicate of the records of the report.

PART IV.—SEMI-MONTHLY TERM-DAY AND TERM-HOUR OBSERVATIONS.

OBSERVATIONS OF THE VARIATION IN DECLINATION, IN HORIZONTAL AND IN VERTICAL FORCE. READINGS OF THE DECLINOMETER ON TERM DAYS AT UGLAAMIE, ALASKA, SEPTEMBER 15, 1882, TO AUGUST 15, 1883.

[For scale values and other information see preceding part, III. Göttingen time is employed.]

Term-day readings of the Brooke declinometer, September 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	524	525	519	526	521	517	522	537	563	578	510	538	531	529	547	550	551	541	542	541	541	547	543	532
5	528	523	523	513	521	523	517	536	561	594	518	544	572	519	541	543	551	538	544	543	541	543	542	526
10	529	524	516	523	522	528	519	531	533	597	519	559	538	511	543	546	548	536	542	544	542	542	539	526
15	531	536	520	523	523	531	524	532	519	578	525	548	578	522	540	546	547	537	545	543	539	543	541	524
20	534	523	500	525	523	532	524	535	504	534	515	532	574	549	550	545	548	539	542	543	545	542	529	524
25	531	527	511	524	526	528	524	528	512	538	510	535	531	502	552	545	548	540	541	539	539	544	526	528
30	530	519	512	528	527	525	526	528	522	500	496	533	567	529	545	543	544	540	541	539	541	543	527	528
35	513	520	519	525	525	529	527	524	508	578	523	524	547	531	550	538	545	541	541	538	544	543	527	531
40	520	518	523	522	527	532	522	522	566	579	510	516	515	525	560	546	548	540	543	537	546	543	532	532
45	515	510	524	520	527	530	531	519	600	552	518	513	538	526	544	546	548	540	543	536	547	544	534	532
50	524	531	521	518	522	529	534	535	590	541	532	517	542	512	550	551	544	542	539	537	551	545	532	532
55	527	513	511	523	513	526	540	562	560	531	535	476	535	523	547	556	540	541	539	537	547	544	536	534

Term-day readings of the Brooke declinometer, October 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	508	516	520	519	522	519	518	522	522	521	519	514	523	531	526	523	546	543	522	529	532	524	524	527
5	506	518	521	520	523	520	519	522	522	521	515	498	524	531	527	522	545	552	528	531	527	527	524	523
10	510	516	519	520	520	520	520	522	515	521	515	490	531	529	522	532	538	551	530	532	527	528	523	521
15	513	516	521	521	517	519	520	522	521	521	519	484	533	526	530	536	541	550	531	532	527	527	522	518
20	514	517	521	520	514	518	522	523	518	521	516	518	523	535	531	538	544	549	531	531	527	526	521	518
25	516	517	518	520	516	518	523	523	520	521	512	488	515	527	529	549	543	542	532	530	527	530	523	512
30	515	518	518	520	521	516	524	522	520	520	517	513	522	525	530	557	542	539	531	530	528	528	523	515
35	515	518	518	522	512	516	523	522	520	520	514	490	524	525	527	553	541	538	530	531	528	526	524	517
40	514	518	516	521	516	518	523	522	521	520	511	498	527	527	528	548	539	537	530	529	526	525	523	516
45	513	517	517	520	515	518	523	522	521	519	522	517	527	524	522	568	533	537	529	529	526	524	524	519
50	514	518	518	520	517	518	522	522	522	518	592	538	525	529	522	541	546	530	529	530	529	523	526	518
55	515	519	520	521	519	518	523	522	522	518	525	525	525	530	520	546	545	525	531	532	526	524	525	520

Term-day readings of the Brooke declinometer, October 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	512	509	510	506	500	512	528	495	580	532	469	500	518	550	529	425	523	534	500	522	500	506	500	518
5	512	507	502	508	515	522	525	500	423	516	471	495	532	451	516	505	527	572	520	530	504	498	512	520
10	510	508	507	512	519	516	528	492	460	512	522	521	533	509	555	581	536	569	529	519	506	510	511	519
15	513	500	499	515	512	523	531	493	410	493	528	488	490	499	570	555	534	510	534	505	515	512	510	505
20	520	512	511	484	510	528	532	515	505	484	514	520	515	544	570	592	543	480	539	492	514	503	511	499
25	508	512	506	520	510	535	524	578	498	480	485	450	555	510	519	587	563	522	546	500	516	509	510	503
30	510	500	510	500	510	538	521	564	476	482	482	487	545	473	552	550	508	516	525	495	517	519	513	500
35	510	510	505	485	510	540	520	562	510	493	474	496	500	482	550	533	509	502	526	490	550	515	510	499
40	510	511	511	480	505	533	514	530	550	475	496	521	530	550	572	506	512	517	519	496	520	500	511	492
45	507	510	519	482	500	535	508	493	565	465	509	453	531	553	550	522	523	538	518	499	517	510	515	498
50	510	510	520	485	501	535	505	503	532	461	481	460	530	537	581	535	579	550	511	505	516	508	509	502
55	511	510	520	488	517	535	501	483	510	525	495	484	534	503	465	552	591	490	511	501	508	504	504	510

Term-day readings of the Brooke declinometer, November 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	501	517	524	525	518	524	522	530	525	519	559	475	518	532	537	534	591	511	523	535	531	500	502	498
5	508	510	525	525	520	523	527	520	528	517	568	511	520	532	545	535	578	513	520	512	554	506	484	501
10	517	508	523	525	521	525	522	520	527	520	552	582	532	535	548	550	569	522	528	532	508	515	498	500
15	520	515	522	526	523	523	520	520	532	522	465	577	535	540	564	608	512	538	529	549	517	519	496	500
20	513	515	522	526	526	524	520	520	526	522	483	542	513	531	570	610	526	534	530	525	522	512	497	499
25	517	518	526	522	523	525	521	518	531	518	522	481	509	533	586	570	524	530	531	539	500	505	493	503
30	519	518	524	520	518	525	526	518	522	521	445	492	525	532	500	542	529	532	519	520	499	510	492	504
35	517	522	522	522	518	525	524	520	520	517	423	502	514	532	529	544	528	524	532	542	509	500	493	500
40	517	507	525	520	518	522	527	520	518	518	432	530	508	534	540	500	527	520	533	517	510	499	498	505
45	515	509	523	520	520	522	520	525	520	526	445	537	523	542	525	472	.....	519	538	526	510	503	498	504
50	516	520	519	520	525	528	519	525	520	519	495	531	530	538	550	548	.....	524	558	532	510	501	495	502
55	516	518	524	523	522	520	520	523	518	521	478	495	531	540	542	588	509	525	544	518	490	500	500	498

Term-day readings of the Brooke declinometer, November 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	503	478	462	520	473	497	446	480	444	490	412	503	438	556	493	502	485	476	492	523	500	493	482	489
5	607	485	472	527	470	450	440	486	463	450	394	502	417	526	476	467	502	472	483	532	507	479	487	494
10	595	498	449	540	505	466	489	463	450	461	440	494	458	542	500	507	484	470	512	540	506	485	489	491
15	552	495	478	480	525	446	492	444	441	325	418	498	467	514	488	504	492	482	537	530	500	492	480	497
20	569	486	515	500	511	510	507	446	419	372	440	479	436	525	510	497	486	463	533	507	496	488	498	475
25	450	503	510	510	509	492	497	476	351	400	465	471	495	540	517	510	494	496	542	529	494	483	497	470
30	414	556	501	532	498	500	502	490	374	478	480	486	584	433	490	501	491	502	531	533	490	482	500	482
35	435	542	501	543	476	500	482	490	367	418	459	454	482	410	492	500	491	505	516	490	490	471	480	465
40	467	602	491	467	505	420	485	485	595	435	476	380	579	415	487	487	472	497	508	494	495	483	483	480
45	450	574	548	489	504	396	491	480	548	415	465	365	512	385	492	506	466	465	498	490	490	486	493	462
50	471	543	534	518	500	405	500	449	355	384	462	395	570	461	481	505	470	476	516	492	485	492	488	467
55	437	520	527	507	522	450	470	427	342	390	475	416	559	464	500	490	491	464	523	499	486	483	456	466

Term-day readings of the Brooke declinometer, December 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	469	469	484	482	483	487	474	476	490	488	483	486	481	510	487	492	455	474	490	514	500	495	498	502
5	493	476	476	478	484	473	476	477	487	487	482	488	482	517	493	500	496	475	479	500	487	502	498	514
10	464	487	477	482	480	462	481	483	483	486	485	485	490	478	509	482	571	479	497	490	484	504	498	499
15	498	480	486	484	485	451	490	473	486	483	486	485	492	509	464	500	566	474	491	483	483	506	503	501
20	466	488	490	491	479	453	491	489	487	486	488	484	485	533	491	507	496	492	497	482	480	515	499	500
25	481	483	495	478	487	473	498	484	500	488	492	481	482	515	495	522	471	480	503	490	489	512	488	508
30	482	475	486	483	483	483	503	487	490	487	490	486	482	501	474	520	473	478	496	500	488	504	488	501
35	475	486	478	483	485	483	502	487	494	487	491	486	459	429	480	486	476	486	492	495	493	493	485	482
40	469	478	470	484	489	474	494	485	495	487	488	485	453	470	488	531	463	491	494	492	492	488	485	496
45	484	485	473	484	491	478	488	486	496	485	488	482	472	458	508	578	463	488	494	493	493	495	485	500
50	471	483	477	493	485	476	484	480	490	482	489	479	454	455	484	525	470	492	492	510	496	500	498	502
55	470	486	476	490	486	475	467	482	491	480	484	479	542	474	489	531	462	487	503	502	495	499	496	503

Term-day readings of the Brooke declinometer, December 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	488	483	484	500	485	488	488	486	484	487	483	479	468	489	493	499	493	497	564	500	510	519	495	468
5	483	483	485	484	485	485	488	490	485	488	483	477	475	487	495	497	492	488	507	500	505	520	511	460
10	483	484	484	488	484	485	484	488	487	488	484	474	484	481	496	495	494	490	509	525	514	519	488	465
15	483	484	481	488	484	482	489	488	488	488	482	473	485	481	500	498	490	497	505	524	510	517	484	459
20	483	484	483	487	483	486	488	488	490	488	485	470	484	479	495	496	496	499	507	536	502	520	467	456
25	483	484	485	487	486	486	488	488	489	488	485	467	475	484	495	494	495	502	505	518	516	527	475	460
30	483	483	483	486	484	486	488	488	490	487	485	469	475	487	496	493	494	496	504	508	509	503	487	452
35	483	483	486	486	484	486	488	488	491	487	485	475	479	490	487	494	497	504	502	510	519	521	491	470
40	482	484	485	486	485	487	488	488	488	486	486	480	483	491	497	495	494	500	499	503	523	536	490	472
45	483	484	486	486	486	488	487	488	488	485	486	471	484	492	498	498	492	499	498	520	523	530	500	490
50	483	483	486	486	485	488	486	488	483	485	484	476	475	497	501	498	494	498	505	514	521	542	488	465
55	482	483	490	485	483	488	487	486	486	485	485	467	486	500	496	493	488	501	501	506	520	510	481	479

Term-day readings of the Brooke declinometer, January 2, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	478	482	481	480	488	485	489	488	486	485	480	484	485	446	425	526	515	484	512	513	536	519	485	468
5	490	478	480	482	487	483	486	487	486	480	484	485	484	458	411	519	513	486	519	500	504	499	481	468
10	470	479	477	479	487	480	489	491	485	480	482	489	484	517	427	511	515	504	515	510	504	500	482	472
15	486	483	482	479	488	474	487	487	487	482	486	488	487	497	462	504	500	498	515	529	496	493	482	477
20	474	483	483	479	486	486	488	486	488	482	487	480	485	445	485	457	503	502	520	518	491	500	481	470
25	482	483	485	485	483	473	488	485	488	483	488	486	485	447	493	489	491	504	523	494	495	502	490	472
30	493	484	480	472	488	490	485	486	482	485	484	485	487	425	491	495	490	499	522	492	500	493	482	482
35	479	485	[illegible]	483	479	480	490	486	477	483	479	479	481	382	512	491	490	493	[illegible]	499	496	486	483	480
40	477	491	481	482	484	486	487	489	484	484	476	485	489	405	518	482	487	490	520	500	515	480	472	484
45	472	493	478	[illegible]	487	485	585	488	488	485	482	485	435	463	512	500	494	502	520	514	517	482	466	487
50	481	481	482	[illegible]	487	483	486	486	486	487	482	485	442	415	525	509	486	514	513	528	538	470	468	482
55	480	481	478	468	487	484	488	486	486	479	487	485	450	402	544	485	488	509	517	545	547	486	458	479

Term-day readings of the Brooke declinometer, January 15, 1883.

0m	476	482	480	482	480	484	481	490	787	486	484	486	480	495	646	490	490	523	490	512	501	484	488	470
5	488	481	480	483	480	485	484	490	486	484	484	486	475	484	524	408	492	522	522	529	515	496	474	452
10	485	483	480	485	482	486	485	485	488	484	484	489	385	510	500	491	495	524	511	534	510	490	454	465
15	480	478	483	490	480	485	486	485	487	485	485	488	452	492	455	491	488	521	519	526	515	491	472	472
20	474	481	482	486	480	483	487	485	485	485	485	484	448	473	459	490	494	520	519	535	512	486	476	472
25	478	484	482	483	481	480	485	485	486	486	485	488	480	539	478	509	494	518	519	547	514	492	471	480
30	476	479	481	485	482	483	486	485	485	487	487	492	451	486	490	505	495	526	528	550	513	490	465	[illegible]
35	482	481	[illegible]	487	482	481	494	488	485	486	488	493	462	485	500	501	494	522	512	583	501	501	409	465
40	481	481	483	487	485	482	479	487	486	485	489	512	470	452	489	500	490	526	505	530	484	493	476	480
45	478	481	480	482	481	479	485	487	486	486	487	476	480	436	491	496	510	[illegible]	499	542	487	488	475	[illegible]
50	480	486	481	482	482	483	485	486	485	485	485	458	464	504	497	508	523	533	495	515	495	462	472	488
55	482	480	482	486	482	482	485	488	485	485	485	487	472	533	496	504	525	511	499	504	489	473	468	484

Term-day readings of the Brooke declinometer, February 1, 1883.

0m	486	475	474	488	479	470	488	485	483	486	483	482	470	470	486	483	499	498	534	795	459	589	652	609
5	484	480	473	485	481	468	488	486	488	486	482	481	473	433	492	486	492	499	536	615	452	553	573	403
10	479	482	472	487	479	468	488	486	481	485	482	473	476	398	495	489	492	502	519	504	433	513	453	383
15	473	481	471	488	485	483	489	483	485	485	482	469	459	445	488	495	500	511	522	662	463	670	930	379
20	475	479	472	486	495	486	488	486	484	484	481	473	460	476	490	488	499	529	541	603	466	679	298	504
25	476	482	473	484	486	486	489	485	486	484	481	485	458	476	493	488	492	523	529	534	522	540	682	420
30	481	482	475	482	481	487	486	486	486	486	480	478	469	490	482	498	497	522	544	542	595	522	598	456
35	478	481	481	483	478	489	486	486	488	488	480	483	473	480	492	497	497	528	541	471	601	506	399	432
40	477	478	482	482	472	489	486	486	487	487	476	490	481	500	486	492	496	533	583	462	609	509	469	410
45	474	478	485	482	470	492	486	486	486	485	476	475	487	465	480	487	498	540	621	510	508	540	546	409
50	475	478	486	480	465	498	485	485	488	484	475	462	488	463	487	498	490	543	504	500	609	568	441	407
55	476	476	490	478	469	488	485	486	485	483	481	463	479	500	483	494	497	541	752	464	650	572	629	443

Term-day readings of the Brooke declinometer, February 15, 1883.

0m	472	482	483	480	495	487	486	484	479	482	484	479	482	490	490	467	487	485	489	488	489	485	483	473
5	469	481	488	478	491	482	486	485	481	482	484	477	476	486	489	490	487	462	487	488	488	482	481	475
10	467	468	479	478	492	482	486	481	478	485	484	481	450	487	486	491	484	484	489	487	488	481	482	478
15	461	474	477	467	492	484	486	478	511	485	482	482	461	474	480	488	488	486	484	487	492	481	483	499
20	470	485	482	470	490	484	488	478	512	484	482	480	483	471	485	484	486	4 0	482	490	488	479	480	501
25	472	482	482	472	488	485	486	480	512	483	481	499	488	470	488	485	485	491	486	487	486	485	482	494
30	467	485	487	482	486	485	486	481	510	480	481	482	519	480	491	487	486	490	489	488	486	493	482	492
35	468	486	482	482	485	483	485	482	480	482	482	480	489	496	487	486	483	497	486	486	486	485	482	489
40	473	489	472	483	484	485	485	482	480	481	484	482	472	491	485	485	483	482	483	485	485	482	482	483
45	464	486	478	483	485	485	487	482	478	481	484	480	467	492	487	487	487	493	484	485	484	486	481	485
50	465	486	481	490	486	486	486	482	479	479	483	479	487	488	491	488	485	492	486	490	493	480	483	489
55	477	486	476	493	485	486	483	484	482	481	481	493	488	489	490	488	484	491	488	469	494	482	482	481

Term-day readings of the Brooke declinometer, March 1, 1883.

0m	472	490	480	468	465	473	457	467	477	491	581	445	448	250	479	513	506	589	480	546	652	506	492	490
5	473	489	479	473	478	462	453	468	485	476	539	444	555	290	529	551	495	560	460	540	552	490	500	470
10	480	437	484	453	468	463	466	468	490	480	555	450	562	288	554	566	500	552	468	559	537	442	461	483
15	448	489	486	456	466	468	466	465	489	475	502	500	395	350	546	552	520	504	488	592	585	480	456	500
20	482	488	480	479	460	482	483	460	492	474	469	458	416	405	534	544	590	500	520	615	555	498	443	552
25	487	481	472	479	469	482	506	464	492	412	485	449	475	418	508	455	578	498	534	550	584	467	502	400
30	483	481	472	472	476	479	505	464	492	452	512	485	530	418	407	410	562	480	514	730	488	462	470	467
35	487	483	474	472	475	474	457	464	487	510	468	490	591	412	487	454	529	492	522	562	466	473	456	465
40	494	483	472	473	488	460	462	464	484	491	466	439	692	497	550	470	507	511	530	670	508	502	464	486
45	475	479	473	464	487	469	443	468	482	487	439	447	620	476	488	497	529	476	541	595	510	433	473	477
50	482	478	477	480	489	464	469	464	498	486	400	455	225	500	482	521	454	449	578	630	601	460	463	409
55	488	478	473	478	478	468	467	481	502	506	502	413	(200?)	477	406	536	495	465	592	503	519	475	481	460

Term-day readings of the Brooke declinometer, March 15, 1883.

0m	476	480	479	481	482	477	481	480	473	466	480	527	470	495	492	491	510	500	492	496	490	491	484	484
5	476	480	482	473	484	470	483	478	474	486	487	525	470	486	492	486	506	492	491	490	497	488	483	482
10	475	480	481	485	489	481	484	484	472	500	488	454	479	496	488	482	499	490	490	502	491	482	484	485
15	479	480	482	475	478	478	483	487	504	496	486	479	488	496	490	475	497	499	496	499	490	462	480	485
20	476	482	480	487	480	478	488	485	493	492	485	449	497	491	486	480	496	492	497	492	492	479	484	488
25	479	482	481	479	486	461	478	485	525	498	484	460	500	487	485	484	497	489	493	491	498	484	485	480
30	479	480	481	471	483	479	482	483	484	488	485	492	498	490	484	488	490	488	487	492	492	484	486	482
35	479	482	478	470	484	475	485	481	506	488	505	488	485	497	493	489	502	490	494	492	496	487	484	486
40	477	481	479	465	484	478	487	484	438	487	505	473	479	493	484	497	499	486	504	490	490	485	485	486
45	479	482	477	464	479	475	484	477	439	480	514	484	484	497	486	500	504	487	505	462	488	483	484	488
50	483	481	478	472	479	472	468	473	488	472	512	459	486	404	490	506	505	490	502	480	480	486	482	488
55	481	481	479	478	482	475	491	473	467	470	488	438	484	492	480	512	504	491	502	494	490	488	481	484

Term-day readings of the Brooke declinometer, April 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	464	467	489	465	459	460	470	470	478	460	482	473	478	482	476	465	481	495	515	501	483	500	465	475
5	463	467	475	477	459	460	473	471	488	449	479	480	495	444	475	485	498	497	514	494	486	496	467	478
10	458	470	477	448	464	468	470	474	483	451	481	480	498	460	470	493	483	500	514	498	492	492	468	476
15	455	466	473	450	462	466	463	480	477	454	474	487	498	455	473	498	491	491	510	480	491	489	469	475
20	460	470	467	460	468	470	478	474	450	460	480	489	492	474	469	479	499	494	502	489	489	486	469	474
25	464	471	468	460	473	469	474	483	484	480	486	481	503	470	478	478	497	507	501	490	488	488	468	477
30	468	477	467	455	473	463	479	492	483	483	488	474	498	467	465	484	501	499	499	495	488	488	470	480
35	465	481	468	456	472	462	480	495	486	483	472	477	490	512	485	473	492	505	500	492	485	480	473	478
40	466	472	470	461	468	469	477	493	462	479	467	474	485	480	483	473	499	500	496	488	484	474	473	478
45	465	477	473	464	461	470	473	482	469	482	486	479	445	491	473	481	499	499	505	486	496	470	473	479
50	465	465	473	469	462	472	475	462	450	482	485	480	482	485	479	487	485	509	508	488	501	467	477	476
55	462	463	468	470	460	474	472	473	464	463	480	481	470	484	481	476	495	510	503	494	504	464	477	473

Term-day readings of the Brooke declinometer, April 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	474	473	472	473	474	473	472	479	478	474	471	470	497	478	472	496	495	524	492	490	482	486	478	489
5	476	473	472	473	474	473	474	473	478	475	470	470	470	478	473	510	499	501	497	494	481	486	484	488
10	478	472	473	473	473	474	473	473	480	473	473	482	470	470	478	527	493	577	485	499	483	487	483	489
15	475	471	473	473	472	474	474	476	478	474	470	478	472	455	474	521	498	505	491	490	488	488	483	486
20	474	473	473	473	473	475	475	474	478	475	475	475	471	463	475	517	500	510	497	493	489	487	486	482
25	474	473	473	473	475	474	475	476	478	476	472	470	464	480	475	509	504	498	493	488	484	490	492	483
30	474	473	472	473	475	474	477	480	475	476	471	492	468	481	476	509	527	475	489	480	489	489	495	484
35	474	473	472	473	474	475	475	480	478	476	470	510	470	478	477	498	555	486	494	482	483	487	500	483
40	474	473	471	473	472	474	476	478	475	476	470	512	472	470	473	483	521	492	492	480	485	485	501	483
45	474	472	472	473	471	475	476	478	477	475	469	501	474	470	471	489	531	500	491	481	488	480	490	480
50	473	472	471	473	474	475	472	478	478	474	468	491	474	469	476	497	508	499	503	484	489	481	494	482
55	472	472	472	474	472	475	477	478	776	474	470	463	476	475	480	492	526	487	497	486	490	483	491	481

Term-day readings of the Brooke declinometer, May 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	457	466	470	464	452	465	452	452	442	482	453	476	450	459	475	480	477	492	558	521	523	488	492	472
5	461	467	468	465	458	467	446	456	435	467	455	476	465	466	475	488	484	503	572	513	506	495	492	480
10	463	466	465	474	459	463	448	447	441	486	487	470	480	453	476	481	485	512	543	512	532	499	500	475
15	454	471	453	466	469	456	437	447	440	468	462	471	544	449	481	479	489	511	496	505	528	492	506	481
20	460	460	462	466	471	451	450	450	445	471	450	475	529	456	472	489	493	505	542	511	563	500	498	472
25	464	462	467	464	473	449	442	467	459	473	465	464	483	460	498	483	486	509	521	519	542	502	478	474
30	462	464	473	464	472	440	454	464	453	477	464	468	444	490	481	493	497	511	530	516	528	497	481	487
35	464	462	473	463	469	462	453	480	471	462	469	472	484	465	485	493	502	512	513	509	514	499	493	492
40	463	455	469	464	466	463	463	487	477	469	475	465	497	475	470	488	497	525	516	539	507	497	496	484
45	464	454	468	460	457	464	464	485	475	467	476	440	509	474	476	482	496	518	509	532	485	496	477	475
50	458	469	466	455	456	461	464	470	474	453	470	520	495	492	479	486	497	516	511	493	470	499	473	468
55	464	470	467	455	456	464	459	470	472	449	462	509	450	491	479	474	494	535	518	531	482	500	461	472

Term-day readings of the Brooke declinometer, May 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	462	463	463	466	466	465	470	467	467	483	465	451	459	482	481	481	498	495	514	509	488	461	466	470
5	462	465	463	465	463	468	467	467	470	521	466	457	460	447	483	485	490	498	530	506	482	463	466	469
10	462	464	462	465	460	470	468	468	465	497	463	454	471	488	482	483	498	501	523	505	481	462	467	468
15	462	464	463	465	459	470	468	465	468	458	470	451	456	467	481	484	494	504	511	500	490	563	467	467
20	463	460	463	465	458	470	463	465	465	438	484	470	459	479	479	488	502	500	508	499	487	463	467	467
25	460	462	462	467	465	470	460	465	465	459	489	427	468	477	482	493	519	499	517	495	492	462	466	468
30	460	461	463	468	467	470	455	465	463	468	487	432	461	486	483	495	519	500	533	493	491	464	467	468
35	462	463	464	473	468	468	455	465	467	466	476	478	459	467	479	484	509	519	530	491	491	463	468	468
40	461	465	465	463	470	463	457	465	472	487	438	477	460	477	482	490	510	514	526	486	494	464	469	462
45	460	462	466	463	465	460	459	465	473	480	454	447	452	485	479	485	501	519	530	485	481	465	469	466
50	461	462	465	465	464	462	462	466	480	469	487	452	441	480	486	487	498	524	520	485	462	466	469	467
55	463	465	467	468	463	462	467	467	485	468	458	457	466	481	480	492	497	544	515	489	462	466	470	468

Term-day readings of the Brooke declinometer, June 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	467	460	465	459	459	459	473	485	485	474	464	447	446	462	483	476	517	519	499	527	555	525	473	465
5	469	464	460	457	456	465	474	480	486	473	461	448	441	462	478	471	508	533	486	544	520	524	473	463
10	466	467	461	454	456	451	478	480	482	473	464	452	438	469	489	472	513	531	497	552	542	526	466	459
15	464	471	458	454	464	461	462	491	479	473	468	449	446	468	495	472	485	535	484	560	521	484	465	456
20	464	470	458	450	459	461	459	490	478	473	456	451	453	467	497	472	491	505	521	564	523	479	466	454
25	477	472	466	460	467	461	473	492	477	473	469	453	458	475	489	477	512	496	530	583	528	470	470	451
30	477	475	464	458	466	469	475	478	476	471	465	451	460	478	486	473	524	500	548	579	514	467	466	450
35	478	476	460	460	461	471	469	489	476	470	462	436	440	480	482	478	529	506	544	538	515	480	477	453
40	474	462	462	460	457	473	457	486	475	469	463	429	453	475	483	480	514	520	547	540	512	485	469	454
45	472	470	453	458	455	472	466	486	475	468	454	431	456	479	486	488	492	540	549	552	504	471	459	455
50	474	472	457	452	461	472	477	484	475	466	454	448	474	482	485	506	494	549	536	563	514	473	460	456
25	470	465	461	460	464	468	484	490	476	463	451	465	463	481	480	520	506	539	524	554	528	478	466	458

Term-day readings of the Brooke declinometer, June 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	468	458	472	471	472	468	470	476	474	477	474	475	475	476	474	483	483	485	494	510	516	495	471	470
5	469	459	469	473	465	467	474	475	473	477	470	472	777	475	473	484	490	482	494	504	514	495	472	468
10	470	459	477	467	468	469	471	475	474	475	477	473	478	476	473	483	489	485	496	492	517	484	473	474
15	481	459	469	463	466	471	473	470	478	476	476	473	478	476	475	483	490	490	498	494	512	472	473	470
20	476	457	467	465	464	471	474	476	473	476	476	472	476	478	477	483	483	500	495.	491	496	470	474	468
25	469	461	473	469	462	470	473	475	472	475	474	472	476	477	476	481	482	501	485	483	483	468	472	467
30	467	462	475	469	463	470	474	475	466	474	474	472	477	473	475	478	484	496	484	482	480	471	474	466
35	470	467	465	470	463	470	474	475	472	475	474	473	475	473	477	479	486	488	482	483	484	470	475	464
40	467	465	460	474	468	470	474	474	473	470	474	473	477	475	481	480	486	485	485	490	484	469	473	467
45	470	465	465	470	463	470	474	474	474	477	475	470	478	474	479	482	494	487	492	496	481	469	471	469
50	461	468	469	480	463	472	475	474	472	476	475	469	477	470	478	484	486	486	500	502	491	472	469	476
55	458	460	471	469	466	471	475	474	473	474	475	474	477	473	485	483	487	492	508	509	487	470	473	472

Term-day readings of the Brooke declinometer, July 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	481	483	481	476	469	474	449	469	386	437	473	436	493	432	454	443	494	463	583	531	576	509	478	[illegible]
5	498	507	515	476	447	466	457	471	379	429	452	467	462	416	451	436	507	463	525	547	554	[illegible]	485	485
10	494	512	496	477	472	452	484	473	394	437	461	452	479	440	449	428	502	500	570	610	607	527	483	488
15	484	523	489	484	470	443	505	477	408	437	471	478	477	454	409	489	506	504	558	549	506	509	472	470
20	496	485	511	497	466	420	500	481	417	430	462	469	442	428	477	488	501	503	583	563	532	529	464	458
25	483	450	506	465	467	418	494	462	419	426	487	468	438	430	489	466	503	518	700	572	602	502	469	462
30	484	494	463	463	467	457	490	457	420	421	458	482	428	425	590	470	491	562	570	515	635	483	456	473
35	469	500	496	465	485	472	494	439	422	425	453	456	399	442	584	484	463	519	538	559	509	468	454	478
40	474	498	474	472	466	446	493	427	419	417	436	435	334	450	529	564	460	527	566	630	514	467	450	406
45	464	490	434	471	457	449	478	410	424	431	415	427	354	468	498	482	477	542	631	655	481	473	484	502
50	484	518	447	489	463	460	469	392	422	421	434	447	418	458	432	525	481	555	592	602	482	474	506	486
55	477	460	432	481	463	448	479	389	441	464	415	447	447	450	433	528	452	549	603	600	504	489	507	522

Term-day readings of the Brooke declinometer, July 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	466	465	467	470	469	469	469	475	466	483	475	475	473	474	478	465	451	509	433	560	478	496	468	527
5	457	464	466	471	465	471	469	471	472	474	474	479	476	475	481	466	456	539	674	414	446	496	465	[illegible]
10	467	464	465	468	466	470	473	467	475	477	476	479	475	473	478	470	476	558	682	510	423	483	462	527
15	467	471	467	467	466	468	472	467	476	474	473	475	474	468	479	468	482	523	571	582	427	467	476	512
20	467	463	467	468	467	467	472	468	474	472	470	469	476	470	478	478	476	542	544	525	436	447	500	509
25	466	460	465	465	468	463	470	466	470	471	468	468	473	475	482	454	482	535	573	559	426	444	531	514
30	465	463	465	463	469	468	467	465	466	470	479	470	476	476	477	449	495	490	648	550	454	445	522	504
35	465	447	465	464	474	467	470	467	463	471	481	471	476	474	484	441	495	570	712	555	471	449	513	472
40	465	460	463	465	467	468	472	460	466	477	479	471	475	478	486	459	486	482	695	499	494	452	516	460
45	463	463	464	463	467	469	475	467	471	477	475	473	473	477	485	478	510	519	670	495	499	456	512	446
50	466	465	465	464	469	468	474	459	473	473	470	471	473	476	481	473	510	548	584	450	495	460	524	424
55	465	466	466	465	469	470	467	458	474	479	474	472	475	477	478	452	511	505	824	461	497	462	511	440

Term-day readings of the Brooke declinometer, August 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	499	472	470	466	440	441	420	509	498	406	411	484	384	450	444	478	473	518	532	546	463	532	502	428
5	501	460	480	471	454	467	422	503	488	377	390	338	390	479	440	475	487	531	552	539	468	534	504	443
10	506	475	465	470	451	451	466	493	480	381	394	290	380	468	441	471	485	520	539	501	474	511	490	446
15	513	478	476	454	457	437	453	506	484	380	400	288	424	457	457	463	488	519	550	482	480	502	478	458
20	533	507	468	475	461	418	452	490	477	367	381	321	476	444	473	458	493	506	515	442	471	504	507	453
25	534	481	484	476	470	437	473	502	466	360	453	449	471	402	489	461	487	474	498	480	470	506	512	449
30	539	436	482	470	482	451	470	490	456	369	550	455	440	431	514	476	495	472	488	491	475	485	496	446
35	534	466	470	464	484	395	456	481	448	390	535	440	432	446	561	473	485	488	483	478	490	475	483	455
40	533	498	488	447	457	466	505	490	450	400	527	454	414	450	562	470	491	522	484	476	519	463	469	459
45	563	450	466	450	403	440	493	492	434	383	434	439	451	455	527	455	495	556	529	471	553	504	474	468
50	500	491	438	455	397	432	504	480	426	403	432	415	449	455	510	450	494	524	562	482	572	515	440	427
55	485	481	473	447	429	470	489	497	416	446	371	444	456	458	476	452	500	518	555	474	566	519	418	434

Term-day readings of the Brooke declinometer, August 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	505	477	464	463	464	462	468	470	468	462	465	477	475	470	483	486	491	497	491	480	472	466	465	466
5	548	468	462	464	461	461	469	475	462	462	467	473	474	476	480	486	490	499	491	479	465	466	467	466
10	511	464	471	456	452	468	457	474	466	463	467	467	477	471	481	484	486	498	492	482	477	469	472	468
15	467	470	465	470	450	470	454	473	469	463	466	466	477	474	482	484	491	495	491	483	476	471	468	468
20	458	443	460	470	450	475	453	470	472	464	461	478	475	473	481	483	490	488	488	481	473	469	465	468
25	451	447	464	465	451	479	461	470	475	465	455	486	473	475	485	482	493	486	488	478	471	470	466	469
30	471	465	463	469	461	472	466	468	460	465	483	474	473	473	480	478	495	486	484	478	471	466	470	468
35	418	442	468	462	460	465	464	468	470	468	438	482	464	477	477	483	495	483	486	478	469	469	465	468
40	463	456	465	465	457	465	460	467	469	468	461	477	475	479	482	482	493	486	486	476	473	467	471	468
45	468	456	458	470	464	454	466	465	463	471	465	483	482	481	486	485	492	488	483	476	477	471	467	469
50	485	444	463	465	462	464	464	468	462	470	477	477	481	482	486	490	495	489	484	475	477	470	469	470
55	479	453	457	465	470	463	467	472	463	467	471	477	480	483	487	492	495	488	485	473	472	472	469	471

READINGS OF THE BIFILAR MAGNETOMETER ON TERM-DAYS, UGLAAMIE, ALASKA, SEPTEMBER, 1882, TO AUGUST, 1883.

Term-day readings of the Brooke bifilar magnetometer, September 15, 1882.

[Göttingen time is employed.]

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	830	807	812	838	818	853	892	844	670	763	930	846	716	700	745	713	768	790	832	792	850	834	824	866
5	815	815	828	841	815	835	905	844	768	747	875	815	620	770	747	745	758	819	828	796	850	836	828	860
10	811	805	831	834	805	830	913	855	760	695	870	842	*678	750	766	755	753	814	828	792	851	838	830	862
15	812	787	850	837	795	834	913	853	845	435	945	851	625	762	775	737	759	807	824	795	855	841	835	857
20	812	817	890	815	806	848	900	833	825	781	995	837	610	090	741	736	764	808	821	799	851	810	848	859
25	819	793	862	798	793	862	878	822	810	825	882	794	733	711	702	742	737	821	822	805	850	838	849	861
30	804	812	850	792	827	852	853	822	723	800	890	682	755	733	693	711	735	822	814	812	846	836	859	864
35	816	800	833	802	826	850	803	818	778	826	875	673	762	760	696	733	726	828	812	822	835	835	865	867
40	816	803	838	810	827	853	781	762	661	865	843	707	794	763	680	734	748	824	806	835	838	833	859	862
45	788	764	809	828	838	850	860	700	895	839	792	633	789	739	727	742	720	827	807	843	832	830	856	864
50	802	820	817	829	850	869	855	650	874	873	805	669	727	716	731	741	790	830	805	847	825	828	855	865
55	810	841	848	832	863	871	870	752	898	850	830	629	725	753	746	756	784	833	801	852	822	826	855	866

Term-day readings of the Brooke bifilar magnetometer, October 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	555	578	594	601	592	565	600	602	605	606	615	551	621	602	610	615	515	580	600	618	619	625	600	617
5	555	578	596	598	592	568	600	603	610	610	621	540	615	561	610	615	519	583	600	616	620	622	593	611
10	554	578	594	598	585	573	598	605	611	611	616	561	603	585	612	612	530	586	593	611	620	620	598	608
15	553	580	593	596	579	578	599	604	612	612	592	566	596	611	592	586	532	587	598	610	620	621	605	610
20	554	581	595	596	553	580	600	603	610	614	599	585	580	578	600	581	532	587	601	613	619	616	610	605
25	559	585	602	598	541	585	598	603	610	616	600	569	605	598	609	573	541	595	603	615	619	615	616	611
30	568	590	602	599	550	586	597	603	596	621	605	560	600	605	604	562	547	610	611	616	618	611	614	600
35	569	594	604	599	549	588	598	602	598	623	597	569	610	613	605	563	562	604	613	620	620	612	613	588
40	571	594	610	595	553	586	598	602	600	622	562	581	619	611	610	563	571	600	616	623	620	615	614	585
45	575	594	605	594	559	592	598	605	602	622	451	580	628	613	610	504	584	598	619	622	620	613	614	582
50	576	597	602	595	560	595	601	605	603	619	550	594	620	601	615	501	569	615	618	619	619	608	612	590
55	577	594	601	[illegible]	565	600	604	605	605	617	509	600	610	604	619	515	572	609	617	618	622	609	614	593

Term-day readings of the Brooke bifilar magnetometer, October 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	470	493	533	512	544	544	489	456	628	329	283	350	267	255	359	401	363	260	419	458	464	483	479	471
5	458	500	536	542	528	548	488	451	525	367	310	347	298	369	328	300	360	123	415	429	463	480	491	475
10	457	495	558	555	526	554	477	382	502	356	285	340	270	344	232	180	304	272	378	442	458	463	498	477
15	451	502	595	563	528	548	479	423	508	373	210	271	308	331	210	190	240	302	374	450	461	462	503	449
20	440	506	568	502	531	523	485	380	450	361	327	305	337	319	180	150	102	540	366	475	449	468	497	452
25	463	513	554	547	544	500	486	352	424	363	368	273	270	351	298	172	186	330	385	465	430	470	498	445
30	466	522	560	560	557	482	501	382	418	363	360	475	314	376	261	157	267	410	438	482	406	452	489	449
35	478	514	540	578	562	481	512	407	340	243	383	421	251	380	245	335	242	466	434	485	407	456	502	460
40	481	512	547	574	570	472	524	523	215	355	372	446	350	297	302	385	231	459	449	470	419	466	494	475
45	495	528	551	576	563	473	529	521	80	345	287	278	365	298	250	342	418	435	444	472	418	474	487	482
50	502	532	551	573	558	500	532	545	230	280	305	120	398	324	125	316	230	370	461	474	441	475	502	483
55	496	528	565	560	550	480	511	518	290	143	275	317	282	342	332	334	45	473	475	466	464	482	491	493

Term-day readings of the Brooke bifilar magnetometer, November 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	398	408	429	432	475	430	452	438	460	469	290	479	440	405	411	10	120	392	376	292	320	406	398	399
5	400	408	431	424	459	462	415	443	450	450	327	409	400	413	407	(—40—?)	(—40—?)	390	384	382	280	370	374	392
10	401	411	430	424	450	445	479	445	455	458	314	374	384	424	352	(—40—?)	170	355	368	335	356	366	402	395
15	401	435	429	423	454	440	450	445	459	457	349	375	385	419	308	(—40—?)	298	324	392	280	371	372	387	397
20	400	435	432	423	452	436	459	455	462	447	390	426	405	422	95	(—40—?)	314	325	376	278	317	359	410	404
25	402	434	425	428	455	423	455	463	465	438	341	376	402	420	12	(—40—?)	293	320	396	292	375	390	401	407
30	412	430	432	440	462	424	440	457	469	440	348	350	318	417	70	(—40—?)	315	329	376	288	389	402	409	402
35	410	425	410	438	462	436	435	445	465	433	285	308	383	418	57	(—40—?)	886	332	376	275	408	400	403	400
40	405	443	425	444	445	450	460	448	462	421	370	404	410	415	(—40—?)	(—40—?)	402	340	358	320	418	407	401	390
45	411	443	433	423	434	456	452	445	455	373	424	422	397	400	5	180	405	365	346	342	416	402	396	393
50	415	433	426	485	440	463	455	453	467	395	381	384	408	414	20	(—40—?)	396	363	274	315	390	400	391	400
55	412	425	431	476	434	455	449	402	472	399	442	461	402	412	(—40—?)	90	385	380	300	312	405	404	390	394

Term-day readings of the Brooke bifilar magnetometer, November 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	355	600	653	740	782	990	818	640	460	(800+?)	663	476	490	321	453	426	482	443	270	296	421	478	483	510
5	307	620	643	773	780	963	754	634	442	695	748	420	436	393	330	433	382	430	183	285	396	478	442	463
10	285	580	646	765	830	942	703	672	428	675	595	410	401	415	529	455	444	335	56	322	390	472	498	452
15	340	550	618	840	970	923	695	760	430	457	522	485	420	410	463	430	447	344	64	310	425	463	490	440
20	391	548	625	770	791	963	659	714	490	430	604	494	395	355	445	404	443	350	95	398	450	480	465	474
25	672	550	628	842	715	942	653	687	458	648	521	494	335	413	423	371	426	253	163	312	436	489	468	572
30	665	552	550	830	823	900	671	674	180	680	537	530	168	456	486	444	430	225	236	351	465	499	482	450
35	655	600	566	757	860	909	679	697	256	825	610	500	117	390	465	438	434	315	319	447	478	502	504	601
40	653	520	605	883	855	920	665	688	21	698	500	491	250	432	434	470	461	327	384	452	490	514	510	499
45	695	580	617	762	910	924	640	653	(—40—?)	832	563	541	331	560	450	419	425	444	449	443	494	489	490	504
50	665	518	600	703	1035	993	656	600	350	731	512	505	293	277	408	409	399	350	379	398	479	490	498	473
55	705	650	661	728	1010	821	639	549	447	750	478	455	378	480	415	467	352	356	335	399	478	504	590	498

Term-day readings of the Brooke bifilar magnetometer, December 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	. h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	2h	23h
0m	559	500	482	521	485	503	486	518	483	459	471	452	418	260	310	386	270	465	455	339	368	390	364	356
5	481	494	471	489	501	503	459	546	475	461	465	450	444	280	290	362	253	470	463	399	404	388	351	354
10	545	533	506	503	510	533	465	518	489	460	461	448	452	387	215	301	148	472	438	419	418	372	359	380
15	465	513	456	484	478	553	465	521	481	463	466	447	450	335	247	246	204	475	446	432	419	355	354	323
20	531	518	475	480	497	556	444	509	473	470	457	436	449	249	337	391	352	452	427	410	418	326	354	330
25	531	520	486	500	490	549	440	496	468	464	449	445	451	220	346	325	401	460	406	407	401	325	397	300
30	555	374	488	521	500	518	438	493	455	466	447	439	435	328	368	263	405	458	416	394	415	342	394	362
35	539	557	539	521	492	522	441	493	453	477	446	440	443	368	382	222	434	476	436	405	400	379	400	440
40	539	500	545	503	482	510	470	484	453	478	447	452	265	323	283	60	465	455	415	406	401	386	418	426
45	502	463	574	497	489	507	476	484	446	476	451	444	305	336	331	93	461	502	414	395	401	372	422	411
50	565	482	566	504	500	500	479	489	453	476	454	445	456	321	393	55	459	471	376	332	389	357	378	362
55	504	478	554	490	521	490	516	489	456	409	457	434	55	334	384	220	485	467	364	360	389	362	383	358

Term-day readings of the Brooke bifilar magnetometer, December 15, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	6h	17h	18h	19h	20h	21h	22h	23h
0m	503	507	503	504	510	499	400	496	502	482	480	450	499	440	468	445	473	441	412	360	344	306	180	398
5	500	510	503	508	508	494	489	476	502	484	480	424	489	456	459	446	463	454	410	359	363	297	219	421
10	502	508	511	514	506	497	488	485	497	482	477	450	491	472	445	458	454	456	398	215	345	288	255	419
15	501	506	503	508	506	495	485	483	500	482	475	474	503	473	436	455	469	447	410	299	390	281	279	462
20	501	507	497	506	502	490	485	481	491	482	473	487	490	468	440	448	432	420	393	292	386	246	320	490
25	503	504	511	506	502	483	484	488	489	482	470	487	490	489	445	456	441	417	394	294	359	144	334	478
30	502	502	502	498	497	483	482	488	475	483	469	502	498	490	434	468	444	432	394	302	371	170	354	488
35	505	502	504	498	503	483	483	488	479	481	485	481	493	474	490	467	435	412	389	339	350	159	366	464
40	505	510	509	496	495	490	488	488	489	480	466	507	475	462	444	466	436	435	408	350	348	112	376	487
45	506	508	510	496	497	499	489	480	483	476	468	493	466	465	438	452	442	437	404	302	352	125	353	455
50	504	508	509	495	504	499	480	492	480	483	474	496	436	463	431	455	441	436	374	340	330	72	367	450
55	504	504	500	505	500	486	487	488	475	483	468	505	438	464	437	483	456	423	360	350	322	92	396	441

Term-day readings of the Brooke bifilar magnetometer, January 2, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	438	438	429	422	439	461	416	415	428	415	441	430	409	337	359	151	203	391	272	131	77	218	398	384
5	446	434	433	432	438	455	429	443	433	421	438	490	403	326	456	220	201	392	246	165	214	279	373	384
10	392	428	440	450	418	428	438	387	424	422	425	423	404	140	358	206	262	355	250	170	254	309	378	370
15	457	428	424	439	429	426	429	403	431	422	435	422	402	353	301	213	341	357	248	160	332	323	363	375
20	448	418	414	429	417	389	441	413	423	430	436	426	399	255	316	268	331	349	234	182	329	320	354	372
25	417	420	421	439	407	418	428	405	431	425	440	425	409	398	300	257	375	347	206	210	321	307	350	367
30	439	415	429	473	412	420	426	415	418	420	438	425	363	452	278	242	371	345	160	248	320	331	342	350
35	427	420	429	412	436	440	424	415	420	426	442	427	358	417	175	292	376	300	188	282	319	352	371	376
40	438	415	429	448	439	440	431	410	426	430	444	420	305	414	104	246	350	372	183	270	316	373	354	365
45	422	414	421	429	444	435	421	414	419	429	431	427	92	278	60	228	343	335	197	249	296	380	392	378
50	437	425	420	441	430	426	420	426	409	435	481	410	295	359	106	219	376	300	179	199	272	412	379	373
55	434	418	428	439	452	443	424	422	408	438	422	412	346	447	97	222	364	306	134	65	215	344	380	386

Term-day readings of the Brooke bifilar magnetometer, January 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	468	467	470	462	465	464	456	428	454	460	461	459	540	232	61	450	400	367	203	299	375	424	431	465
5	467	463	471	460	464	465	452	440	455	463	460	457	496	287	154	437	430	368	140	275	347	441	408	489
10	462	467	473	460	459	461	452	449	454	457	462	458	473	264	235	459	424	350	164	260	312	390	428	447
15	464	468	457	468	474	450	448	446	451	459	465	466	459	338	410	454	429	344	153	257	359	382	405	443
20	470	459	455	453	479	466	446	453	456	452	461	473	447	325	449	420	416	338	186	266	361	410	418	455
25	467	461	458	460	473	473	450	453	460	454	463	434	426	234	375	394	419	341	226	217	343	375	416	466
30	466	466	458	458	460	465	451	454	459	452	465	438	417	341	413	383	414	311	219	229	334	388	459	521
35	461	468	467	448	461	465	447	454	459	456	470	397	390	140	400	400	413	319	243	182	374	355	410	469
40	464	460	463	448	450	468	420	454	454	454	465	416	388	316	420	395	394	254	289	292	402	372	434	449
45	467	455	468	457	462	481	456	453	453	459	465	444	308	316	438	401	370	180	316	289	455	378	482	436
50	464	467	463	456	469	458	446	457	455	458	462	480	283	210	430	366	355	103	330	320	423	439	455	442
55	465	468	458	453	478	434	442	453	454	462	462	461	327	110	439	358	349	185	316	373	416	472	408	452

Term-day readings of the Brooke bifilar magnetometer, February 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	476	477	436	447	473	502	442	428	434	422	445	420	411	312	398	431	357	373	233	(—40—?)	352	(—40—?)	(—40—?)	(—40—?)
5	480	476	434	434	483	476	439	440	418	430	447	419	402	249	398	418	388	350	259	(—40—?)	404	(—40—?)	(—40—?)	30
10	477	474	443	426	482	476	440	443	437	434	446	417	385	366	427	400	404	366	296	(—40—?)	467	—20	(—40—?)	272
15	471	463	447	446	486	462	444	436	434	432	443	394	368	363	445	387	388	315	272	(—40—?)	417	(—40—?)	(—40—?)	320
20	478	471	448	463	458	444	442	437	441	431	442	313	353	360	431	397	385	252	250	(—40—?)	432	(—40—?)	(—40—?)	183
25	468	461	434	455	445	444	436	432	440	433	438	307	395	357	430	396	389	255	281	52	264	300	(—40—?)	271
30	484	458	437	453	469	438	436	431	431	431	440	335	402	372	427	382	389	257	242	3	64	215	(—40—?)	210
35	491	450	419	456	489	458	436	428	422	425	436	313	407	380	426	377	393	242	234	252	19	282	(—40—?)	311
40	484	444	413	446	498	437	426	428	416	428	433	304	398	368	444	374	396	238	144	275	(—40—?)	234	(—40—?)	452
45	488	436	434	460	503	442	434	426	427	436	434	382	390	401	447	383	381	217	(—40—?)	223	(—40—?)	44	(—40—?)	510
50	482	435	420	465	500	437	431	427	423	437	430	408	382	398	423	360	388	215	(—40—?)	205	(—40—?)	(—40—?)	5	355
55	475	436	443	476	497	432	429	426	426	439	423	413	380	391	434	366	378	222	(—40—?)	346	(—40—?)	(—40—?)	(—40—?)	500

Term-day readings of the Brooke bifilar magnetometer, February 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	414	426	443	432	418	419	433	407	430	404	403	382	331	370	321	365	368	360	356	375	362	379	388	376
5	408	423	426	483	422	407	419	440	415	402	402	385	320	337	355	354	370	358	364	372	368	380	386	380
10	407	444	445	478	418	422	417	418	426	396	403	379	360	350	362	347	375	361	368	373	372	377	386	378
15	422	443	456	468	417	433	413	430	424	394	396	383	349	370	361	358	371	335	379	370	366	380	383	363
20	427	415	438	463	419	422	413	428	425	395	392	372	346	360	370	308	364	344	378	366	372	380	388	356
25	417	398	436	474	421	418	413	434	418	394	394	283	340	364	358	364	308	342	374	371	383	376	385	358
30	415	397	425	473	424	418	410	439	421	402	395	327	316	351	354	356	368	333	366	368	379	362	381	373
35	400	378	436	468	424	424	415	434	418	402	391	333	308	333	362	360	373	319	367	379	375	376	381	362
40	385	408	432	459	421	428	408	435	414	400	388	344	320	343	370	364	371	349	375	377	376	374	381	360
45	414	412	433	453	417	418	409	435	416	401	386	361	326	339	363	308	362	329	378	372	373	373	379	365
50	411	431	452	428	423	422	397	434	406	405	390	332	304	350	350	361	365	322	376	360	357	383	377	362
55	356	426	450	412	429	432	423	434	419	408	389	321	375	334	354	359	364	347	372	364	358	382	380	360

Term-day readings of the Brooke bifilar magnetometer, March 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	578	480	515	626	619	616	528	486	489	380	395	440	441	332	80	422	104	40	500	116	(—40—?)	120	516	578
5	550	482	473	618	574	618	530	550	485	389	415	441	441	402	15	373	178	60	479	170	(—40—?)	255	327	533
10	537	525	483	507	560	625	500	478	483	410	440	441	441	376	22	288	213	150	466	10	(—40—?)	370	406	530
15	603	498	512	578	574	683	561	450	479	402	442	441	441	240	75	387	160	210	413	(—40—?)	(—40—?)	380	353	518
20	460	496	543	569	576	626	530	444	474	285	440	441	441	190	134	393	(—40—?)	340	368	(—40—?)	(—40—?)	429	540	455
25	483	603	566	578	580	567	568	422	454	340	440	441	441	193	243	610	5	420	314	—37	(—40—?)	369	372	610
30	493	625	558	596	579	687	580	460	453	294	440	441	441	150	295	440	64	400	335	(—40—?)	(—40—?)	301	510	540
35	499	503	590	594	610	672	609	458	440	219	440	441	441	192	375	339	179	453	342	9	164	390	464	510
40	428	520	588	631	545	650	509	434	447	218	440	441	441	40	189	224	182	410	317	(—40—?)	76	305	492	489
45	505	538	626	642	553	617	559	435	451	285	440	441	(—40—?)	60	402	210	—19	520	284	(—40—?)	98	552	475	601
50	602	527	675	646	555	642	650	482	451	318	440	441	(—40—?)	135	431	190	356	591	201	(—40—?)	(—40—?)	565	571	572
55	527	543	650	607	564	560	580	477	432	279	440	441	250	143	430	80	299	509	176	65	198	510	611	495

Term-day readings of the Brooke bifilar magnetometer, March 15, 1883.

	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	Noon.	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ
0ᵐ	464	435	451	450	461	453	480	484	450	521	484	240	388	412	434	455	377	381	427	412	430	463	451	438
5	457	434	448	450	438	472	429	498	464	496	491	220	375	430	435	479	384	364	440	419	424	452	451	442
10	452	441	433	432	408	520	474	498	481	481	479	227	371	383	438	469	386	402	442	401	434	443	452	436
15	457	443	430	460	456	465	484	492	294	460	462	270	392	384	408	462	390	422	412	413	424	468	452	440
20	432	433	453	555	478	496	480	476	338	458	419	347	395	394	406	464	391	428	417	433	422	470	448	443
25	428	442	462	500	446	540	470	475	350	480	426	397	374	447	462	452	397	450	411	437	426	466	444	440
30	442	436	442	462	433	476	470	481	355	501	404	379	458	368	460	440	415	440	409	442	429	460	446	437
35	444	433	447	489	430	517	471	496	604	492	397	(—40—?)	463	375	455	430	379	428	387	444	450	459	441	430
40	438	439	444	512	436	478	459	493	528	504	380	370	446	391	442	392	413	442	350	442	453	460	449	430
45	436	438	449	519	446	430	481	516	400	524	342	296	437	379	456	386	395	440	366	453	470	460	446	426
50	436	441	436	479	475	485	463	499	450	507	377	313	430	431	446	377	361	437	377	439	443	449	445	432
55	435	439	449	469	478	447	454	473	485	500	270	472	429	421	451	349	304	425	389	428	421	448	444	432

Term-day readings of the Brooke bifilar magnetometer, April 1, 1883.

	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	Noon.	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ
0ᵐ	420	398	428	406	474	482	437	518	590	579	447	346	324	93	328	398	359	330	226	367	429	371	439	391
5	421	393	414	550	499	472	449	520	567	570	408	395	320	220	314	376	370	348	242	388	422	386	424	438
10	415	415	417	506	489	434	465	552	574	560	388	373	286	180	326	392	350	303	244	394	407	394	426	383
15	400	407	439	492	474	440	470	562	614	528	421	360	302	279	285	401	372	332	268	402	408	400	424	387
20	394	401	435	498	448	458	482	511	592	502	450	341	(—40—?)	260	336	362	371	309	302	401	416	404	418	382
25	405	395	459	501	423	468	440	519	552	474	403	340	(—40—?)	255	300	436	348	320	329	387	421	394	407	380
30	382	401	454	514	417	482	437	529	588	463	395	361	27	225	339	396	343	263	326	400	419	388	404	378
35	390	366	442	501	421	472	442	504	572	476	396	338	145	313	333	400	309	299	324	411	424	421	399	378
40	394	387	433	486	449	442	451	518	570	475	435	371	290	222	372	384	323	279	330	427	415	423	394	386
45	402	386	429	477	482	444	468	570	543	454	385	230	182	271	359	425	428	244	292	430	379	432	399	378
50	400	399	419	440	494	431	470	563	587	454	380	250	64	308	376	370	428	258	327	432	371	438	391	393
55	407	426	411	447	495	438	485	559	571	431	337	240	81	309	364	355	439	240	340	428	362	442	388	394

Term-day readings of the Brooke bifilar magnetometer, April 15, 1883.

	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	Noon.	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ
0ᵐ	368	356	354	347	354	368	382	364	381	415	418	392	359	377	373	334	280	(—40—?)	350	377	412	387	382	345
5	363	353	350	348	354	369	377	381	382	414	417	379	458	351	371	292	270	(—40—?)	354	357	426	386	378	350
10	360	356	347	347	356	368	373	371	389	410	389	372	454	362	366	246	277	(—40—?)	379	365	431	380	378	349
15	365	358	350	347	358	369	378	376	391	402	412	374	404	400	369	173	287	22	369	420	426	378	364	345
20	362	352	354	347	357	368	377	379	393	399	382	371	391	372	379	185	241	120	348	374	404	377	363	348
25	363	353	355	347	357	376	378	378	396	396	366	349	400	361	382	210	206	155	364	408	401	372	343	345
30	364	353	358	347	359	377	368	382	387	394	367	316	394	363	387	253	01	223	348	432	394	374	338	342
35	362	353	356	347	366	373	373	376	394	386	379	300	391	373	400	265	(—40—?)	244	381	437	409	376	329	343
40	362	353	356	361	369	374	367	380	386	393	384	298	388	392	404	290	(—40—?)	252	395	422	402	382	329	338
45	359	356	353	360	368	371	386	380	396	401	387	317	384	397	409	305	(—40—?)	265	396	420	392	390	331	336
50	359	354	354	360	369	371	374	380	399	408	396	310	385	389	391	287	(—40—?)	291	349	417	386	385	335	347
55	358	354	350	356	373	375	381	376	401	413	393	338	388	381	384	294	(—40—?)	330	377	409	386	387	342	343

Term-day readings of the Brooke bifilar magnetometer, May 1, 1883.

	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	Noon.	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ
0ᵐ	[illegible]	340	325	356	433	474	577	488	420	500	437	362	252	280	332	328	305	283	(—40—?)	83	192	216	237	218
5	387	353	332	358	443	452	610	467	486	483	381	383	304	291	354	340	300	267	(—40—?)	137	91	199	240	227
10	394	328	348	366	416	446	620	442	477	467	389	374	310	322	387	322	297	217	—44	172	42	160	210	269
15	370	349	347	364	391	461	643	439	562	456	381	363	185	372	316	326	271	198	07	154	48	202	179	260
20	374	354	316	364	389	510	628	461	504	454	334	342	207	345	380	317	262	216	08	159	— 30	193	171	305
25	364	352	324	374	372	560	628	358	508	454	383	348	183	280	337	309	269	192	12	150	— 29	187	214	342
30	366	339	333	374	373	554	600	304	506	439	357	340	295	269	339	306	238	130	—06	160	63	182	210	344
35	368	346	342	378	382	490	590	153	483	444	362	356	274	369	315	310	228	69	11	159	132	189	194	316
40	356	346	343	400	403	495	595	321	474	422	358	200	225	300	354	308	237	42	16	112	194	194	189	305
45	358	341	338	385	453	528	531	374	471	415	355	158	239	354	337	309	246	23	67	90	251	229	223	268
50	338	330	355	420	472	548	521	325	460	451	349	50	198	300	360	316	248	0	61	162	248	240	226	282
55	352	325	358	433	473	548	512	370	479	428	356	137	351	266	334	321	269	— 20	74	180	268	212	236	294

Term-day readings of the Brooke bifilar magnetometer, May 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	376	368	364	364	361	400	449	432	407	350	470	363	365	332	357	389	273	303	140	286	348	446	400	373
5	376	372	366	362	394	384	434	429	407	275	440	393	335	324	346	382	311	293	138	288	356	444	393	379
10	377	367	372	358	399	371	411	424	409	436	427	364	370	297	369	366	282	290	144	319	356	435	391	372
15	376	373	373	355	417	389	411	427	405	424	435	350	374	313	376	357	302	260	158	[illegible]	341	432	391	373
20	377	369	372	351	418	380	427	427	394	392	385	405	398	307	381	349	244	265	180	328	354	429	389	363
25	380	362	376	350	408	393	437	424	404	407	405	465	381	338	385	340	225	250	168	332	353	433	389	360
30	382	370	370	345	384	410	442	429	428	415	412	424	365	355	388	331	215	230	179	333	328	428	385	365
35	378	370	370	349	374	418	456	426	432	410	403	330	346	339	382	351	231	199	181	334	324	419	385	262
40	377	370	368	362	360	428	467	425	440	411	410	310	322	350	394	341	236	170	211	343	312	405	385	358
45	380	369	367	384	397	430	456	422	423	458	415	411	354	329	391	356	266	172	206	350	404	400	381	360
50	379	363	366	380	407	439	443	421	405	437	331	360	358	354	367	330	280	160	234	355	445	399	376	363
55	373	368	363	361	403	452	439	415	359	428	345	378	350	352	391	252	288	132	255	352	451	402	375	357

Term-day readings of the Brooke bifilar magnetometer, June 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	404	376	383	425	490	431	430	445	359	379	430	470	333	387	386	359	277	228	145	27	(—40—?)	89	223	233
5	402	384	381	437	496	417	438	440	353	391	418	466	366	405	379	363	248	136	128	12	(—40—?)	120	236	252
10	395	384	379	429	481	430	481	417	369	386	410	454	384	420	372	364	170	132	82	—15	(—40—?)	117	249	260
15	385	388	397	427	493	429	528	392	366	379	425	476	389	439	365	364	220	128	127	—27	—24	160	250	263
20	410	395	403	453	500	430	513	392	369	390	402	483	384	437	364	345	196	227	86	—35	—12	190	267	257
25	419	398	369	454	464	433	548	373	374	387	425	480	275	412	342	345	179	240	63	(—40—?)	56	229	220	273
30	385	410	393	447	454	438	502	378	375	384	409	470	398	426	366	338	130	210	32	(—40—?)	28	245	241	474
35	373	411	399	423	447	436	491	346	377	391	410	472	318	419	381	327	172	179	14	(—40—?)	67	209	226	483
40	370	396	400	418	462	443	500	368	371	400	436	451	274	421	382	296	235	152	— 08	(—40—?)	72	212	234	477
45	318	371	421	413	460	444	480	358	376	405	455	401	255	398	370	284	292	73	— 17	(—40—?)	68	214	246	479
50	364	377	427	444	440	430	484	375	382	411	452	350	296	397	370	257	281	42	— 09	(—40—?)	94	228	253	482
55	365	384	424	466	431	430	460	346	386	414	461	297	311	381	366	190	251	115	20	(—40—?)	88	216	242	480

Term-day readings of the Brooke bifilar magnetometer, June 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	371	353	319	335	367	333	332	341	372	394	406	412	389	398	401	380	370	410	395	337	238	366	353	327
5	374	354	330	316	351	339	333	340	364	388	384	411	386	404	404	374	373	418	390	366	264	370	353	319
10	371	354	343	342	351	327	333	342	371	388	396	411	389	404	409	371	370	414	391	389	286	379	352	337
15	357	349	336	352	362	325	331	349	365	401	402	418	386	406	403	371	370	402	386	378	301	400	351	329
20	376	350	331	341	353	321	334	346	370	398	405	416	385	406	390	371	395	384	390	362	346	390	344	332
25	376	333	312	348	354	330	396	345	346	392	410	411	385	404	396	378	398	388	388	368	356	389	350	336
30	374	332	313	349	357	328	334	342	335	399	414	411	383	400	402	384	398	398	389	362	350	384	346	330
35	370	316	311	358	361	328	334	345	370	392	411	398	381	398	394	390	405	409	384	347	319	380	337	333
40	368	328	316	366	377	335	337	353	376	394	412	404	384	398	379	392	388	412	361	302	324	376	331	348
45	357	327	316	375	372	329	341	357	380	392	412	369	390	402	384	382	366	409	344	282	333	366	335	343
50	372	316	311	373	363	327	339	362	379	403	413	390	397	415	374	383	402	403	328	261	246	362	339	340
55	360	319	336	376	351	325	338	375	382	406	409	386	400	410	375	389	384	392	327	254	340	354	321	334

Term-day readings of the Brooke bifilar magnetometer, July 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m ..	482	432	690	638	553	696	621	449	611	409	160	376	35	279	463	389	(—40—?)	140	(—40—?)	(—40—?)	(—40—?)	44	241	291
5 ..	438	442	708	544	521	703	590	443	601	407	207	291	218	346	538	401	(—40—?)	142	(—40—?)	(—40—?)	(—40—?)	133	229	293
10 ..	434	437	750	500	521	683	500	443	587	385	143	345	284	338	551	423	(—40—?)	99	(—40—?)	(—40—?)	(—40—?)	112	263	300
15 ..	400	384	880	503	572	740	505	418	555	398	189	323	300	349	518	287	— 28	53	(—40—?)	(—40—?)	(—40—?)	92	282	329
20 ..	352	406	704	504	525	703	487	387	524	385	226	396	236	420	362	402	— 30	62	(—40—?)	(—40—?)	(—40—?)	33	317	402
25 ..	395	539	749	584	578	704	465	406	507	377	296	395	450	450	308	450	— 60	24	(—40—?)	(—40—?)	(—40—?)	38	316	390
30 ..	397	403	838	792	560	711	505	401	476	399	360	(—40—?)	500	468	(—40—?)	407	02	— 22	(—40—?)	(—40—?)	(—40—?)	132	346	370
35 ..	407	351	791	643	591	711	439	500	471	373	282	476	317	405	72	380	84	00	(—40—?)	(—40—?)	(—40—?)	202	352	398
40 ..	376	226	777	510	583	687	450	518	470	381	245	364	342	451	160	58	90	— 10	(—40—?)	(—40—?)	(—40—?)	230	351	399
45 ..	374	482	648	503	602	583	473	563	469	375	320	70	330	440	212	(—40—?)	79	— 27	(—40—?)	(—40—?)	—38	211	270	390
50 ..	370	371	719	411	68?	523	475	600	442	393	256	(—40—?)	210	429	374	(—40—?)	85	— 35	(—40—?)	(—40—?)	18	241	275	447
55 ..	388	543	720	418	679	632	420	588	410	303	341	(—40—?)	168	454	402	(—40—?)	179	(—40—?)	(—40—?)	(—40—?)	16	220	268	350

Term-day readings of the Brooke bifilar magnetometer, July 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	356	352	325	343	310	392	363	415	458	440	391	414	411	415	397	410	430	122	(—40—?)	(—40—?)	309	395	362	269
5	374	348	326	340	320	374	368	403	460	444	392	431	412	402	379	421	426	20	(—40—?)	205	344	320	370	275
10	366	349	346	340	333	375	371	420	451	439	394	430	410	417	395	413	374	— 15	(—40—?)	— 55	442	362	366	277
15	364	306	350	335	319	378	376	437	459	431	406	433	422	421	407	405	315	10	(—40—?)	(—40—?)	426	412	321	329
20	366	319	355	326	350	380	379	435	474	426	400	425	411	413	410	406	322	— 27	(—40—?)	— 5	484	423	214	290
25	362	320	350	321	349	380	374	452	455	418	416	430	403	409	397	420	296	— 12	(—40—?)	— 27	496	452	165	309
30	373	321	347	326	350	370	383	457	506	409	398	432	405	401	410	432	264	33	(—40—?)	00	445	420	188	304
35	368	346	354	322	362	378	354	468	470	402	403	427	412	403	380	457	273	(—40—?)	(—40—?)	48	442	439	236	308
40	365	348	348	320	368	368	366	485	471	409	422	423	413	391	383	468	290	(—40—?)	(—40—?)	276	435	418	250	324
45	357	351	347	321	364	377	383	457	459	406	422	411	418	384	375	405	210	(—40—?)	(—40—?)	223	405	426	200	360
50	360	344	340	317	367	362	390	449	451	406	380	418	424	410	378	397	196	(—40—?)	(—40—?)	307	409	411	263	409
55	361	344	345	314	362	385	403	464	446	386	403	418	414	400	373	438	120	(—40—?)	(—40—?)	358	421	398	270	372

Term-day readings of the Brooke bifilar magnetometer, August 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	376	356	323	420	446	601	604	435	386	573	347	25	570	546	404	376	513	330	249	260	502	190	159	404
5	410	389	364	427	464	570	602	450	369	557	402	393	370	524	482	377	484	282	225	288	507	130	189	400
10	358	384	393	418	458	570	612	495	390	512	423	5	431	524	487	433	459	319	190	337	496	209	210	390
15	393	328	406	455	405	603	632	465	340	575	409	180	430	512	471	449	433	261	234	371	490	249	132	371
20	337	425	415	473	372	692	603	447	403	552	310	268	312	564	470	447	411	350	255	386	484	283	164	374
25	296	326	400	483	393	655	597	410	415	540	114	60	247	571	443	473	409	442	346	363	485	262	204	406
30	287	360	365	478	426	654	582	400	372	492	(—40—?)	130	421	594	325	530	406	470	370	418	448	340	241	412
35	187	351	372	482	457	734	560	432	450	457	(—40—?)	193	521	545	245	524	436	478	367	444	370	309	238	398
40	179	277	346	483	488	712	520	420	415	451	(—40—?)	224	566	503	331	524	436	408	332	452	322	280	306	384
45	146	356	382	465	570	642	505	418	466	397	145	284	522	448	414	544	453	387	249	443	176	199	272	392
50	281	313	351	460	605	700	493	438	483	375	244	610	516	450	318	558	409	301	210	442	115	202	361	464
55	310	355	409	465	639	650	504	426	539	264	132	664	522	426	345	530	374	329	208	466	95	152	415	428

Term-day readings of the Brooke bifilar magnetometer, August 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	711	746	770	741	701	770	700	686	722	717	715	760	749	750	731	738	725	707	699	703	688	700	702	689
5	663	774	763	663	742	780	742	608	700	723	723	739	752	765	738	721	720	703	700	705	708	668	702	700
10	685	778	763	710	747	756	747	700	718	722	723	733	755	751	744	722	721	712	708	696	705	708	708	702
15	726	743	750	682	775	762	751	711	717	715	714	741	753	746	737	732	708	730	711	692	699	704	700	703
20	747	761	775	697	811	730	742	709	715	713	732	751	742	743	736	737	708	733	707	688	700	703	706	702
25	756	774	757	708	804	724	744	712	695	729	748	748	750	734	726	741	709	737	711	697	700	704	700	698
30	738	752	742	605	785	726	709	712	745	706	685	755	751	736	770	743	710	734	710	698	700	706	696	696
35	746	780	736	700	782	719	728	722	734	724	776	774	770	734	732	739	716	717	706	697	702	700	695	693
40	735	7.9	742	713	780	732	716	715	768	716	783	762	744	780	715	739	722	708	707	700	695	704	691	695
45	750	786	746	674	758	744	710	712	725	707	788	758	735	733	736	732	719	707	705	698	694	706	692	696
50	772	781	753	682	774	737	704	698	731	709	769	751	739	737	746	728	707	703	702	695	695	692	689	695
55	754	784	728	699	769	746	715	722	724	708	762	744	775	731	743	728	705	700	699	693	698	683	687	693

READINGS OF THE BALANCE MAGNETOMETER ON TERM-DAYS AT UGLAAMIE, ALASKA, SEPTEMBER, 1882, TO AUGUST, 1883.

Term-day readings of the Brooke balance magnetometer, September 15, 1882.

[Göttingen time is employed.]

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	404	405	407	407	407	407	409	400	398	388	391	393	401	398	407	406	406	403	404	404	404	402	401	399
5	403	405	406	407	406	407	409	400	404	380	390	392	395	400	406	407	405	404	403	404	404	402	400	399
10	404	406	407	407	406	408	408	401	395	386	391	394	394	401	406	407	405	403	403	405	404	402	400	399
15	404	406	407	407	407	409	408	401	393	365	393	394	393	403	405	407	405	404	403	405	404	402	400	399
20	404	406	406	407	407	409	406	402	392	390	390	394	392	403	405	407	405	404	403	405	404	403	400	399
25	404	406	407	407	407	409	406	402	392	392	390	396	395	402	405	407	405	404	403	405	403	402	400	399
30	404	406	408	407	407	409	403	402	392	393	392	394	396	406	406	407	405	404	403	405	403	402	400	399
35	405	406	406	407	407	409	403	402	393	390	394	394	396	409	405	407	404	404	403	404	403	401	400	399
40	405	406	406	407	408	409	402	402	390	391	394	396	394	407	404	407	405	404	403	404	403	401	400	398
45	404	406	406	407	407	409	403	400	390	389	392	396	395	404	405	407	405	404	403	404	403	401	399	398
50	405	407	406	407	407	409	402	398	391	390	395	394	395	402	405	406	405	404	403	404	402	401	399	399
55	405	407	406	407	407	409	401	400	389	392	394	397	395	407	406	406	403	403	404	404	402	400	399	399

Term-day readings of the Brooke balance magnetometer, October 1, 1882.

0m	413	414	413	412	412	412	413	411	410	409	408	401	404	405	406	407	413	405	403	403	403	402	402	401
5	415	414	413	412	412	412	412	412	410	410	408	402	404	404	406	407	413	405	403	403	403	402	402	401
10	414	414	412	412	411	412	412	411	410	410	408	402	404	404	407	407	413	404	402	403	403	402	402	401
15	414	414	412	412	411	413	412	411	410	410	407	402	403	404	407	407	413	404	402	403	403	402	402	401
20	414	414	412	412	411	413	412	411	410	409	407	402	402	405	407	407	412	404	402	403	403	402	402	401
25	414	414	412	412	411	413	412	411	410	409	407	400	404	406	407	407	412	404	403	403	403	402	402	401
30	414	414	412	412	411	413	412	411	410	409	408	401	404	406	406	407	411	404	403	403	402	402	402	401
35	414	414	412	412	412	413	412	411	410	409	408	402	405	406	406	408	410	404	403	403	402	402	402	401
40	414	413	412	412	412	413	411	411	410	409	407	403	406	406	406	409	409	403	403	403	402	402	402	401
45	414	413	412	412	412	413	411	410	410	408	405	403	405	406	406	410	408	403	403	403	402	402	402	401
50	414	413	412	412	412	413	411	410	410	408	404	403	405	406	407	411	407	403	403	403	402	402	402	401
55	414	413	412	412	412	413	411	410	410	408	403	403	405	406	407	413	405	403	403	403	402	402	401	401

Term-day readings of the Brooke balance magnetometer, October 15, 1882.

0m	455	457	455	450	444	443	444	440	430	437	434	454	454	445	464	465	469	465	456	444	445	444	443	444
5	457	454	455	450	443	445	444	440	424	436	438	449	458	458	463	468	469	466	455	444	445	444	444	444
10	452	455	455	450	444	447	444	440	425	435	436	445	455	461	462	456	468	466	452	444	445	444	444	444
15	457	455	455	450	444	447	444	438	426	434	435	446	454	464	461	457	471	469	450	445	445	443	444	444
20	457	455	454	447	445	447	444	442	433	436	436	450	455	466	465	455	472	472	449	446	444	443	444	443
25	457	455	454	451	446	446	444	441	431	439	438	454	450	464	465	456	474	470	449	446	444	443	444	443
30	458	455	453	448	445	442	444	441	432	439	438	461	452	464	466	461	475	465	449	446	443	443	444	443
35	458	455	453	445	445	442	444	437	434	434	441	456	452	463	465	466	475	464	448	446	444	443	445	443
40	457	455	453	445	445	442	444	432	429	439	443	455	456	459	465	468	474	461	447	446	443	443	444	444
45	458	455	552	446	445	442	444	427	425	436	446	451	456	460	458	468	473	459	446	446	443	443	444	444
50	458	455	452	443	444	444	444	437	432	439	446	457	455	463	455	467	469	456	446	445	443	443	444	444
55	457	455	451	444	444	444	442	428	433	436	450	452	445	464	460	468	466	456	446	445	443	443	444	444

Term-day readings of the Brooke balance magnetometer, November 1, 1882.

0m	436	435	431	431	430	431	430	431	430	426	424	422	422	430	433	455	446	436	429	418	418	423	426	432
5	436	435	431	430	431	430	430	430·	430	425	420	427	424	430	433	457	444	434	427	420	418	422	427	433
10	436	435	431	430	431	431	431	430	431	425	415	426	424	430	432	453	444	434	427	419	418	422	428	432
15	436	435	430	430	431	431	430	430	431	425	414	428	425	430	434	450	447	434	425	419	418	423	428	432
20	435	435	430	430	431	431	431	430	431	424	420	416	425	430	436	449	447	433	424	419	418	423	428	432
25	436	434	430	430	430	431	431	430	430	424	418	416	426	430	442	455	445	433	425	419	419	423	429	432
30	436	434	430	430	431	431	431	431	429	425	417	420	426	430	451	459	444	433	423	418	419	424	430	432
35	435	432	430	430	430	431	430	430	429	425	414	424	429	430	457	455	445	432	424	418	421	424	431	432
40*	435	432	431	430	430	430	431	430	427	424	424	426	429	431	452	457	445	432	422	418	422	424	431	432
45	435	432	430	430	430	430	430	430	426	425	423	421	430	431	454	455	442	431	421	418	422	425	431	432
50	435	432	430	430	430	431	431	431	426	426	425	416	431	431	453	451	439	430	420	419	421	425	431	432
55	435	432	431	430	430	430	431	431	426	427	421	420	430	432	456	447	437	429	420	418	422	425	432	432

Term-day readings of the Brooke balance magnetometer, November 15, 1882.

0m	510	519	520	516	498	503	486	480	476	484	450	486	505	526	538	525	521	523	515	503	501	501	500	503
5	512	520	517	515	500	495	482	480	481	458	464	487	504	528	535	524	520	523	513	502	501	499	500	501
10	510	520	517	514	507	496	481	476	480	462	462	489	505	528	537	527	519	520	513	502	501	500	501	501
15	510	519	518	510	504	494	479	476	483	463	463	492	503	526	533	524	519	519	516	500	502	500	500	501
20	515	518	520	510	498	502	479	478	488	464	470	492	502	527	531	522	518	518	515	499	502	500	501	500
25	516	521	516	510	498	500	477	482	491	455	471	494	505	534	529	523	518	520	516	500	502	500	501	500
30	519	522	514	509	506	499	478	482	493	463	472	498	507	534	527	523	518	519	513	500	502	500	501	499
35	520	518	513	506	516	498	480	482	500	453	473	492	510	534	527	523	518	521	513	498	502	499	501	501
40	521	520	516	502	506	490	480	478	515	454	472	490	517	537	526	522	518	521	512	499	501	500	501	501
45	520	518	515	504	507	488	481	474	484	454	478	497	520	538	526	522	519	520	511	500	501	501	502	500
50	519	518	512	503	509	494	481	472	486	455	480	500	527	535	524	521	521	520	508	500	500	501	501	500
55	518	520	515	500	508	488	478	474	491	461	484	501	525	538	525	521	521	518	505	500	501	500	502	500

Term-day readings of the Brooke balance magnetometer, December 1, 1882.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	512	511	514	514	515	512	513	511	516	519	518	521	524	526	523	533	541	532	530	532	531	532	531	532
5	511	514	512	516	514	514	510	513	516	517	518	521	525	525	526	533	537	530	531	532	531	532	531	532
10	510	515	513	516	514	514	511	513	517	517	519	521	526	529	527	531	535	530	532	532	532	531	531	532
15	510	514	513	516	513	516	511	513	517	517	519	521	525	528	531	534	534	530	532	532	532	532	532	532
20	510	515	513	516	513	516	511	513	517	517	520	521	525	525	533	536	535	530	533	532	532	532	531	532
25	510	515	513	516	513	516	511	512	517	517	520	521	525	520	532	536	537	530	532	533	533	532	531	532
30	511	516	513	516	514	515	511	513	517	517	520	522	525	517	531	537	537	530	532	533	533	531	532	531
35	510	514	514	516	514	515	511	515	518	517	521	522	525	517	533	538	536	530	533	533	533	531	533	531
40	510	514	515	516	513	515	512	515	518	517	521	522	530	516	532	538	534	530	533	532	532	531	533	531
45	510	514	515	515	514	515	513	515	518	517	521	522	534	517	534	536	533	530	533	532	532	531	534	532
50	510	514	515	516	513	514	510	514	518	517	521	523	530	520	534	538	533	530	532	532	532	531	532	532
55	511	515	514	515	513	514	510	516	519	517	521	523	525	523	532	542	532	530	532	531	532	531	532	532

Term-day readings of the Brooke balance magnetometer, December 15, 1882.

0m	524	523	526	528	531	534	538	538	541	543	543	544	542	543	544	543	542	540	541	535	531	522	516	514
5	523	525	525	529	530	535	537	540	542	543	544	545	543	543	544	543	542	540	540	534	531	522	517	514
10	523	524	525	530	531	535	538	540	542	543	544	545	543	543	544	543	541	540	540	533	530	522	515	514
15	523	524	525	530	531	535	538	539	542	543	544	544	543	543	544	542	541	540	539	531	530	522	516	514
20	523	524	526	530	531	536	538	539	543	543	544	544	541	543	544	542	541	540	539	532	528	522	517	514
25	523	524	527	530	532	536	539	539	543	543	544	543	541	544	545	542	541	540	539	531	527	521	518	514
30	523	525	527	530	532	536	538	539	543	544	544	544	542	543	545	542	541	540	539	531	527	520	518	515
35	523	525	527	530	532	536	538	539	543	544	544	542	542	542	545	542	541	540	538	531	526	519	517	515
40	522	525	527	530	532	537	538	540	543	544	544	540	542	542	544	542	541	540	539	531	525	518	516	515
45	523	525	527	530	532	538	538	540	543	544	544	540	541	543	543	542	541	540	538	531	524	517	515	515
50	523	525	527	531	533	538	538	540	543	544	544	540	541	544	543	542	541	540	536	531	523	515	514	514
55	522	525	527	531	533	538	538	541	543	544	544	541	543	544	543	542	541	540	536	531	522	513	515	514

Term-day readings of the Brooke balance magnetometer, January 2, 1883.

0m	511	511	510	510	509	507	505	504	504	501	500	497	497	490	493	499	499	495	494	497	488	481	486	488
5	512	510	510	510	507	508	505	504	503	501	500	498	496	487	494	500	498	495	495	496	486	481	485	488
10	510	510	510	510	507	506	505	504	503	501	500	497	496	475	492	499	499	494	495	495	487	482	486	488
15	513	510	510	510	507	506	505	504	503	501	500	497	496	479	493	501	499	495	496	493	489	482	485	488
20	512	510	510	510	506	506	505	504	503	501	499	496	496	476	495	503	499	495	496	492	487	482	485	487
25	512	510	510	510	506	506	505	504	502	501	499	497	496	484	494	504	498	495	496	492	487	482	486	487
30	512	510	510	510	506	507	505	504	502	501	499	496	495	480	491	499	497	494	497	492	486	482	485	487
35	511	510	510	510	507	506	505	504	502	501	499	496	495	489	492	500	496	494	498	492	486	482	486	487
40	511	510	510	510	507	506	504	504	501	501	499	497	495	487	491	499	495	494	500	492	487	483	485	487
45	511	510	510	510	507	505	504	504	501	501	498	497	485	489	495	499	496	494	500	491	485	483	486	487
50	511	510	510	509	506	506	504	504	501	501	498	496	493	488	500	498	496	494	499	489	483	484	487	487
55	510	510	509	509	507	506	504	504	501	500	498	497	483	493	498	497	496	494	497	488	482	485	487	487

Term-day readings of the Brooke balance magnetometer, January 15, 1883.

0m	522	521	520	518	518	518	517	515	516	515	515	515	510	513	519	518	518	518	525	517	514	507	504	508
5	522	522	520	518	518	517	516	516	516	515	515	515	498	516	523	517	518	518	524	516	512	508	503	508
10	522	522	519	518	518	517	516	516	516	515	515	515	498	514	526	517	518	519	521	516	510	506	503	508
15	522	521	519	518	518	517	516	516	516	515	515	514	505	516	528	517	518	519	521	515	512	505	504	509
20	522	521	519	518	518	517	516	516	516	515	515	514	511	516	528	517	518	520	521	516	510	504	504	509
25	522	521	519	518	518	517	516	516	515	515	515	513	510	517	525	518	518	522	521	517	509	504	504	509
30	522	521	518	518	518	517	516	516	515	515	515	512	507	517	524	518	518	524	520	517	508	504	505	509
35	522	521	518	518	518	517	515	516	515	515	515	511	508	512	522	518	518	525	520	517	509	508	505	510
40	522	520	518	518	518	517	515	516	515	515	515	511	511	517	519	517	518	525	520	516	509	502	506	510
45	522	521	518	518	518	517	515	516	515	515	515	506	508	519	519	517	517	526	520	515	510	502	507	511
50	522	520	518	518	518	517	515	516	515	515	515	505	507	520	518	516	517	526	519	514	508	503	507	511
55	522	520	518	518	518	517	515	516	515	515	515	506	510	518	518	517	517	526	518	514	507	504	508	511

Term-day readings of the Brooke balance magnetometer, February 1, 1883.

0m	522	520	516	512	511	512	508	506	506	504	501	500	501	499	500	499	502	501	509	522	513	508	530	494
5	522	519	515	512	511	511	507	507	505	503	501	499	500	497	500	499	503	501	511	523	513	513	530	502
10	522	519	516	512	511	511	507	507	505	503	501	499	499	508	500	499	502	502	512	526	513	512	530	507
15	521	518	515	512	511	511	507	507	505	503	501	500	499	500	500	499	502	502	512	521	511	503	521	504
20	522	518	515	513	510	511	507	507	505	503	500	500	500	505	500	500	502	502	512	517	510	510	521	498
25	521	518	515	513	509	511	506	507	505	503	500	503	501	503	499	500	502	502	512	520	508	515	523	498
30	521	518	514	512	510	510	506	507	505	502	500	504	501	503	499	500	502	503	512	520	505	510	519	497
35	521	517	513	512	511	510	506	506	505	502	500	502	500	502	499	501	501	504	511	522	501	522	520	498
40	521	516	512	512	510	509	506	506	505	502	500	503	499	502	499	501	501	507	511	521	498	521	523	496
45	521	516	513	512	511	509	506	506	505	502	499	503	498	500	409	502	501	507	513	518	496	519	515	491
50	520	516	512	512	511	508	506	506	505	502	499	502	498	502	409	502	501	507	518	516	496	520	510	489
55	520	516	513	511	511	508	506	506	504	502	500	502	498	502	409	502	502	508	522	514	498	528	508	494

Term-day readings of the Brooke balance magnetometer, February 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	503	505	503	502	503	500	500	497	493	490	490	490	492	490	490	491	492	492	493	494	495	495	495	495
5	503	505	502	503	501	501	499	498	492	490	490	490	492	488	491	491	492	492	493	494	495	495	495	495
10	503	505	502	503	501	501	498	498	492	490	490	491	493	490	491	491	492	492	494	495	495	495	495	495
15	504	505	502	503	501	501	498	498	492	491	490	491	492	490	491	491	492	492	494	495	495	496	495	495
20	505	505	502	503	500	501	498	498	492	491	490	491	492	489	491	491	492	492	494	495	495	496	495	494
25	504	504	502	503	500	501	498	498	492	491	490	492	490	490	491	492	492	492	494	494	495	496	495	494
30	504	504	502	504	501	501	498	498	491	491	490	493	489	490	491	492	492	492	494	494	495	495	495	494
35	504	503	502	504	501	501	498	498	491	491	490	492	484	489	491	492	492	492	494	495	495	495	495	494
40	504	503	501	504	500	501	498	498	491	491	490	492	486	490	491	492	492	492	494	495	495	495	495	494
45	504	503	502	504	500	501	498	496	491	491	490	493	489	490	491	492	492	492	494	495	496	495	495	494
50	505	503	502	503	501	500	498	494	491	491	490	492	492	490	491	492	492	492	494	495	496	495	495	494
55	505	503	502	503	501	500	498	494	491	491	490	492	491	489	491	492	492	493	494	495	496	495	495	494

Term-day readings of the Brooke balance magnetometer, March 1, 1883.

0m	502	502	501	500	498	497	487	483	496	494	495	484	494	523	509	512	530	529	515	522	522	499	495	501
5	502	502	501	500	497	498	487	484	495	496	488	481	491	525	509	509	533	529	513	522	516	499	493	500
10	503	502	502	498	496	498	487	484	494	497	486	486	490	522	510	509	535	531	515	523	521	501	494	501
15	503	502	503	498	496	499	487	486	494	497	481	485	494	523	510	511	533	530	517	526	519	501	495	501
20	502	502	502	499	496	498	487	488	494	492	484	486	496	520	512	508	529	528	515	527	516	499	496	502
25	502	502	501	499	496	495	487	490	494	494	482	486	503	518	512	508	529	528	516	528	514	499	498	500
30	503	502	502	499	496	496	487	495	494	494	477	488	488	514	513	522	530	525	515	519	514	496	497	499
35	503	502	502	499	496	494	478	495	494	493	481	484	480	514	516	524	533	522	517	520	513	497	497	499
40	503	502	502	499	497	490	481	495	494	490	486	484	488	513	512	524	533	520	517	495	511	499	498	501
45	502	502	503	499	496	489	484	496	494	493	483	488	493	515	511	525	532	519	517	514	506	498	499	500
50	503	502	503	501	497	491	489	496	494	495	489	493	513	513	511	526	533	518	517	517	508	498	501	503
55	503	502	502	500	497	488	484	496	493	494	485	496	530	510	512	527	534	517	519	519	498	497	502	502

Term-day readings of the Brooke balance magnetometer, March, 15, 1883.

0m	548	540	547	542	524	514	519	526	525	521	524	520	537	542	544	540	539	541	538	537	537	537	538	533
5	548	548	546	541	523	525	518	527	525	522	526	521	543	543	544	539	540	541	539	537	537	537	537	538
10	548	548	545	541	521	525	522	527	525	522	526	523	543	544	544	539	541	541	539	537	537	537	537	538
15	548	548	545	541	521	524	523	527	523	523	526	526	543	545	543	539	541	540	538	537	537	537	537	538
20	548	547	545	541	520	524	524	526	520	523	526	524	544	544	543	539	542	540	538	537	537	537	538	538
25	548	547	545	541	519	524	526	527	521	525	527	529	545	544	543	539	543	540	538	537	537	537	538	537
30	548	547	545	539	517	524	525	527	519	525	526	529	544	542	543	539	542	539	538	537	536	537	538	537
35	549	547	545	535	516	520	526	527	525	524	525	527	542	544	542	539	542	539	538	537	537	537	538	537
40	549	547	545	535	516	517	527	527	516	524	522	524	542	541	541	539	542	539	537	537	537	537	538	537
45	549	547	545	532	516	516	526	527	518	524	522	529	543	544	541	539	541	539	537	537	537	538	528	537
50	549	547	544	531	517	517	526	527	520	523	521	530	543	544	540	539	541	539	537	537	537	538	538	537
55	549	547	541	529	517	518	526	525	519	524	521	536	542	544	540	539	541	538	537	537	537	538	538	537

Term-day readings of the Brooke balancc magnetometer, April 1, 1883.

0m	444	446	448	448	443	443	443	445	440	435	440	445	456	468	462	459	461	460	459	457	458	457	457	457
5	445	446	448	451	444	443	443	445	440	435	440	446	457	468	462	458	462	460	460	456	457	457	457	457
10	445	447	448	447	444	442	443	444	438	436	440	446	457	468	462	457	462	461	460	456	458	457	457	456
15	445	446	448	448	443	442	443	443	436	437	443	446	457	466	461	456	462	459	460	456	458	457	457	456
20	445	446	448	448	443	443	443	442	434	439	443	447	449	466	461	455	462	459	460	457	458	457	457	456
25	445	447	448	447	443	443	443	443	435	439	442	447	460	464	460	456	462	459	460	457	457	457	457	456
30	445	448	448	447	443	443	443	444	436	439	442	447	461	464	459	456	461	459	459	457	458	457	456	456
35	445	447	448	446	443	443	443	443	435	440	442	447	464	463	459	456	461	459	458	457	457	458	457	456
40	445	447	448	446	443	442	443	443	435	440	443	449	467	464	459	457	461	459	458	457	457	458	458	456
45	445	447	448	444	443	442	443	442	435	440	444	447	464	464	459	458	461	459	458	457	457	458	457	453
50	445	447	448	443	443	443	444	441	434	440	444	451	466	463	460	458	460	459	457	457	457	458	457	456
55	445	448	448	443	443	443	444	441	435	439	443	454	467	463	459	460	460	459	457	457	458	457	457	456

Term day readings of the Brooke balance magnetometer, April 15, 1883.

0m	452	451	452	450	449	449	449	448	448	449	448	448	448	448	448	449	452	453	452	454	450	446	442	439
5	452	452	450	450	449	449	449	448	449	448	448	448	448	448	448	449	452	452	451	454	449	446	442	439
10	452	452	450	450	449	449	448	448	449	449	448	448	448	448	448	449	452	452	451	453	449	445	442	438
15	452	452	450	450	449	449	448	448	449	449	448	448	448	448	449	450	452	452	451	453	449	445	442	438
20	452	452	450	450	449	449	448	448	449	449	448	448	448	448	449	450	452	452	451	453	448	444	442	438
25	452	452	450	450	449	449	448	448	449	449	448	448	448	448	449	450	453	452	451	453	448	444	441	438
30	452	452	450	450	449	449	448	448	449	449	448	448	448	448	449	450	453	452	451	452	448	444	441	438
35	452	452	450	450	449	449	448	448	449	448	448	448	448	448	449	451	453	452	451	452	448	444	440	437
40	452	452	450	450	449	449	448	448	449	448	448	448	448	448	449	451	453	452	451	452	447	444	440	437
45	452	452	450	450	449	449	448	448	449	448	448	448	448	448	449	451	453	452	450	451	447	443	439	437
50	452	452	450	450	449	449	448	448	449	448	448	448	448	448	449	451	453	452	450	451	447	443	439	437
55	451	452	450	449	449	449	448	448	449	448	448	448	448	448	449	452	453	452	450	450	446	443	439	437

Term-day readings of the Brooke balance magnetometer, May 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	530	530	530	531	531	531	531	527	524	529	529	531	533	530	532	534	536	537	537	536	531	529	528	528
5	529	530	531	531	531	532	531	527	526	529	529	531	533	530	533	534	536	537	537	536	530	529	528	528
10	529	530	531	531	531	532	530	527	526	529	529	531	533	530	533	534	536	537	537	536	530	529	528	528
15	529	530	531	531	531	532	530	527	526	529	529	531	533	531	533	534	536	537	538	535	530	529	527	528
20	530	530	531	531	531	532	529	527	526	529	530	531	533	531	533	534	536	537	540	535	529	529	527	527
25	530	530	531	531	531	532	528	527	526	529	530	531	530	531	533	534	536	537	539	534	528	529	527	527
30	530	530	531	531	531	532	528	527	526	529	530	531	532	530	533	534	536	537	538	534	529	529	527	527
35	530	530	531	531	531	532	528	527	527	529	530	532	532	531	533	534	536	537	538	533	529	528	527	527
40	530	530	531	531	531	531	528	525	527	529	530	532	530	531	533	535	536	538	538	531	529	528	527	527
45	530	530	531	531	531	532	527	526	527	529	530	530	529	532	533	535	536	538	538	531	529	529	527	528
50	530	530	531	531	531	532	528	524	527	529	530	530	529	532	534	535	536	538	537	531	529	529	527	528
55	530	530	531	531	531	532	527	524	528	529	530	532	530	532	534	535	536	538	537	532	530	528	527	528

Term-day readings of the Brooke balance magnetometer, May 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	492	486	485	487	479	479	479	472	467	456	457	456	466	481	482	487	493	497	489	488	483	478	476	470
5	487	488	485	485	479	479	477	472	466	457	456	461	465	479	482	487	496	494	490	488	482	478	475	470
10	487	484	485	485	480	479	476	472	466	454	456	457	468	479	483	487	499	493	489	488	480	477	475	470
15	487	483	486	485	480	479	475	472	466	445	458	461	472	470	483	489	499	492	490	487	480	477	475	470
20	487	486	486	483	480	479	475	472	465	444	457	461	474	480	483	489	498	491	490	486	479	477	475	470
25	483	485	487	483	479	479	475	471	465	449	458	458	476	481	483	489	496	490	489	485	478	477	475	470
30	483	486	487	483	478	479	475	470	464	452	456	468	476	481	483	489	495	491	490	484	477	477	475	470
35	486	486	487	483	478	479	475	469	464	452	455	463	477	480	484	490	495	491	487	484	477	477	473	470
40	486	485	488	483	478	479	475	468	462	454	452	459	474	481	485	491	495	491	489	484	476	477	472	471
45	486	485	488	482	479	479	474	468	460	454	453	461	478	481	486	491	497	491	489	484	477	476	471	472
50	486	485	488	482	479	479	473	468	457	454	448	462	478	481	487	491	498	490	489	484	478	475	471	472
55	486	485	488	480	479	479	472	467	455	456	450	466	479	481	487	492	497	489	490	484	478	476	470	472

Term-day readings of the Brooke balance magnetometer, June 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	536	537	534	533	533	530	530	532	535	532	531	534	534	537	532	534	538	543	540	542	531	517	518	517
5	536	538	534	534	533	530	531	530	535	531	531	534	534	537	532	535	538	542	543	542	531	517	518	517
10	536	538	534	534	532	530	532	532	534	531	532	534	534	537	532	536	538	542	544	541	532	517	518	518
15	536	538	534	533	532	531	531	532	534	531	533	534	534	535	532	536	541	541	544	540	529	517	518	519
20	537	537	534	534	532	531	531	532	533	531	534	534	534	534	532	536	542	541	545	540	524	519	518	519
25	538	536	531	534	532	531	532	532	533	532	534	533	535	534	532	536	542	541	544	538	524	519	517	519
30	537	535	534	534	531	531	532	532	533	532	535	533	541	533	533	536	541	540	543	539	523	519	517	519
35	537	534	534	531	531	531	531	533	533	532	535	532	542	533	533	537	541	540	542	538	522	519	517	519
40	537	534	534	534	531	531	532	533	532	532	535	532	538	532	533	537	541	540	542	538	521	519	517	519
45	537	534	534	534	531	530	532	533	532	531	534	533	538	532	533	537	542	540	542	535	520	518	517	519
50	537	534	534	534	531	530	532	533	532	531	534	533	538	532	533	537	542	539	542	532	517	518	517	519
55	537	534	534	534	531	530	532	534	532	531	534	534	537	532	534	537	543	539	542	532	518	518	517	519

Term-day readings of the Brooke balance magnetometer, June 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	530	528	526	526	525	525	524	524	524	524	524	524	525	525	526	527	527	530	529	528	527	525	525	523
5	531	528	526	526	525	525	524	522	524	524	524	524	525	526	526	527	528	530	529	528	526	525	524	523
10	531	528	527	526	525	524	524	522	524	524	524	524	525	526	526	527	528	530	529	527	526	524	525	523
15	531	528	526	526	525	524	524	522	524	524	524	524	525	526	526	526	528	530	529	527	526	525	525	523
20	531	528	526	526	525	524	524	523	524	524	524	524	525	526	526	526	528	530	529	527	525	525	524	523
25	531	528	526	526	526	524	524	523	524	524	524	524	525	526	526	526	529	530	529	528	525	525	524	523
30	531	528	526	526	526	524	524	523	525	524	524	524	525	526	526	526	529	529	529	528	525	525	524	523
35	530	527	526	526	526	524	524	523	525	524	524	524	525	526	526	526	529	530	529	528	524	525	524	524
40	530	527	526	526	526	524	524	523	525	524	524	524	525	526	526	526	529	530	529	528	524	525	524	525
45	530	527	526	526	525	524	523	523	525	524	524	524	525	526	526	526	529	529	528	528	524	525	524	525
50	529	527	526	525	525	524	523	524	525	524	524	524	525	526	526	526	529	529	528	527	524	526	523	524
55	529	527	526	525	525	524	523	524	525	524	524	524	525	526	526	527	530	529	528	527	524	526	523	523

Term-day readings of the Brooke balance magnetometer, July 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	525	519	499	500	511	515	502	518	517	512	509	520	538	536	536	545	547	557	558	563	554	543	534	534
5	524	512	500	503	516	512	502	519	517	512	508	519	539	536	537	545	558	535	560	565	554	541	534	535
10	524	511	501	506	519	511	503	520	517	514	508	521	537	535	534	544	557	555	562	564	552	538	535	536
15	523	508	501	507	519	510	506	519	516	515	508	521	537	534	535	544	557	555	564	564	549	536	535	537
20	523	507	496	507	519	507	504	520	515	515	511	524	531	535	536	543	557	555	561	565	548	536	535	539
25	523	507	491	505	518	506	506	519	515	515	513	522	534	535	534	543	556	555	560	566	547	534	536	539
30	524	503	492	507	518	506	509	518	514	516	512	522	538	536	535	543	555	554	559	566	543	535	536	538
35	522	501	493	507	519	504	509	520	514	516	511	527	529	536	535	542	557	555	563	563	543	536	536	538
40	520	491	495	509	518	504	512	520	514	517	513	522	531	537	538	543	558	556	563	557	545	537	535	538
45	522	497	494	509	517	502	513	520	514	518	514	530	532	537	540	538	558	556	558	557	547	[illegible]	536	537
50	521	492	498	512	517	502	516	519	513	518	516	529	533	536	543	544	557	557	559	537	547	534	535	537
55	519	495	497	512	516	501	516	518	512	516	518	529	534	537	545	546	557	557	561	554	546	533	535	533

Term-day readings of the Brooke balance magnetometer, July 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	545	546	544	543	539	544	542	545	544	542	543	545	543	542	543	544	546	556	563	549	543	539	539	535
5	546	515	543	544	539	544	542	545	543	541	543	546	543	542	542	545	546	558	567	554	541	538	538	537
10	546	544	544	543	540	544	543	545	543	542	544	545	543	542	542	545	545	558	562	557	542	539	538	537
15	546	544	544	542	541	544	542	545	542	542	544	545	543	542	543	545	547	558	559	554	542	540	538	537
20	546	544	544	542	541	543	543	545	543	542	544	544	543	542	543	545	550	559	560	551	543	541	536	538
25	547	544	544	541	542	543	544	545	543	542	544	543	543	542	543	545	550	558	559	550	542	541	537	538
30	547	514	544	541	542	543	544	545	544	542	544	544	543	543	543	546	550	558	558	550	543	541	537	538
35	546	544	543	541	543	543	544	544	544	543	544	544	543	543	542	546	550	558	555	547	541	542	536	539
40	546	543	543	541	543	543	545	544	544	543	544	544	544	543	542	547	550	561	554	547	542	542	535	539
45	546	514	543	540	542	542	545	514	544	542	544	544	544	543	544	546	553	560	555	546	540	542	536	541
50	546	543	543	540	543	542	545	544	544	542	544	544	544	543	543	545	554	560	556	545	540	541	536	542
55	546	544	541	540	543	542	546	544	544	542	544	543	543	543	543	545	555	564	556	544	541	540	535	543

Term-day readings of the Brooke balance magnetometer, August 1, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	550	536	530	536	534	528	530	542	548	547	546	555	551	549	549	558	557	560	560	559	553	545	546	549
5	550	536	532	534	536	530	529	543	547	547	547	557	546	547	550	558	555	559	560	559	552	544	549	550
10	549	535	532	534	536	528	534	545	548	548	548	557	547	546	551	560	555	561	560	558	551	546	549	549
15	548	532	534	534	536	528	535	545	548	448	547	564	549	546	552	559	554	562	560	559	551	547	548	548
20	545	532	535	534	536	530	534	545	548	545	547	567	549	547	552	550	554	562	560	559	550	546	551	548
25	542	532	536	534	535	530	536	545	548	546	547	562	549	548	552	560	555	563	561	558	549	546	551	547
30	541	531	536	534	535	528	536	545	547	545	553	559	551	551	551	559	555	563	562	556	549	546	549	547
35	540	530	536	534	533	528	538	546	547	546	559	559	554	549	553	558	555	562	502	555	548	546	548	548
40	539	529	536	534	532	530	539	547	548	545	562	560	554	548	553	558	556	562	562	555	547	544	549	548
45	538	530	535	534	530	527	539	548	547	544	563	559	553	547	555	557	557	561	561	554	546	546	549	548
50	537	530	536	535	528	530	541	548	547	545	563	561	550	548	555	557	557	560	561	553	544	546	550	547
55	537	530	536	535	530	530	541	558	548	545	561	557	550	547	557	557	558	561	560	553	545	545	549	549

Term-day readings of the Brooke balance magnetometer, August 15, 1883.

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
0m	548	546	545	544	544	546	545	544	545	546	545	545	545	549	547	549	549	548	547	543	543	542	541	539
5	547	547	544	545	543	548	544	544	545	546	545	543	545	548	547	548	548	548	547	543	543	541	540	539
10	545	544	545	544	544	547	546	544	545	546	545	543	546	548	547	549	548	548	546	544	543	542	540	539
15	546	545	545	545	544	547	546	544	545	545	544	543	544	548	547	549	549	548	544	544	542	542	540	538
20	547	544	546	545	546	546	546	544	546	545	545	544	544	547	547	549	548	548	546	543	542	542	541	538
25	547	544	546	545	546	546	545	544	545	545	545	544	545	547	548	549	548	548	545	543	542	542	539	538
30	547	544	544	544	547	545	545	543	547	545	546	544	546	547	547	549	549	548	546	543	542	542	539	539
35	545	544	546	544	546	545	544	544	547	545	546	544	546	547	549	548	549	547	544	543	541	542	541	539
40	547	544	546	543	546	545	545	544	547	545	547	543	546	547	549	549	549	547	545	543	542	542	539	538
45	547	545	546	543	546	545	544	545	546	545	546	543	547	547	550	549	549	546	545	543	540	542	540	538
50	547	545	547	544	547	545	545	545	546	545	545	543	547	547	550	549	549	546	544	543	541	541	539	537
55	544	545	544	544	547	545	544	545	546	545	545	543	547	548	549	549	549	546	544	543	541	541	539	537

READINGS OF THE BROOKE VARIATION INSTRUMENTS, THE UNIFILAR, BIFILAR AND BALANCE MAGNETOMETERS ON TERM-HOURS, AT UGLAAMIE, ALASKA, SEPTEMBER, 1882, TO AUGUST, 1883.

Readings of the Brooke instruments at Uglaamie, Alaska.

[Göttingen time is employed.]

September 15, 1882. (Temperature at beginning, 45°; at end, 45° F.)										October 1, 1882. (Temperature at beginning, 45°; at end, 44° F.)									
Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.			Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s		0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.										*h. m.*									
15 0	550	550	549	713	715	716	406	406	406	16 0	546	550	552	515	510	507	413	413	413
15 1	548	548	546	721	730	732	406	406	406	16 1	554	554	553	512	510	509	413	413	413
15 2	546	546	545	728	724	727	406	406	406	16 2	552	551	554	509	509	511	413	413	413
15 3	544	543	542	734	742	745	407	407	407	16 3	549	548	548	514	514	516	413	413	413
15 4	543	543	543	745	744	744	407	407	407	16 4	547	546	545	518	520	520	413	413	413
15 5	543	543	543	745	745	743	407	407	407	16 5	545	544	543	519	517	512	413	413	413
15 6	543	543	543	742	744	749	407	407	407	16 6	542	541	540	511	514	519	413	413	413
15 7	544	544	544	751	755	754	407	407	407	16 7	541	541	541	522	522	521	413	413	413
15 8	543	544	544	754	755	756	407	407	407	16 8	541	539	538	522	522	520	413	413	413
15 9	545	546	546	755	754	754	407	407	407	16 9	538	538	538	531	531	531	413	413	413
15 10	546	546	546	755	754	751	407	407	407	16 10	538	539	539	530	530	530	413	413	413
15 11	546	546	545	748	747	746	407	407	407	16 11	541	540	539	532	534	535	413	413	413
15 12	545	546	546	745	744	742	407	407	407	16 12	540	541	541	535	533	531	413	413	413
15 13	546	546	546	741	740	738	407	407	407	16 13	541	540	541	530	530	535	413	413	413
15 14	546	546	546	737	736	737	407	407	407	16 14	541	541	540	534	533	532	413	413	413
15 15	546	546	546	737	737	737	407	407	407	16 15	541	541	541	532	532	533	413	413	413
14 16	546	546	546	736	735	732	407	407	407	16 16	541	541	541	533	534	534	413	413	413
15 17	546	546	546	730	730	730	407	407	407	16 17	541	541	541	534	533	532	413	413	413
15 18	546	546	546	732	733	734	407	407	407	16 18	541	542	542	531	532	533	413	413	413
15 19	545	545	545	734	735	735	407	407	407	16 19	542	543	543	534	534	533	413	412	412
15 20	545	544	544	736	737	737	407	407	407	16 20	544	544	543	532	533	533	412	412	412
15 21	544	544	544	738	737	737	407	407	407	16 21	543	547	548	534	531	531	412	412	412
15 22	545	545	546	736	737	737	407	407	407	16 22	546	546	546	531	530	530	412	412	412
15 23	546	546	547	737	739	740	407	407	407	16 23	547	547	546	532	536	540	412	412	412
15 24	546	546	546	741	741	742	407	407	407	16 24	544	544	544	541	539	541	412	412	412
15 25	545	544	543	742	739	733	407	407	406	16 25	543	542	542	541	541	541	412	411	411
15 26	542	542	543	727	720	709	406	406	406	16 26	541	541	541	541	544	544	411	411	411
15 27	546	546	547	692	675	671	406	406	406	16 27	541	541	541	545	545	545	411	411	411
15 28	547	547	547	680	691	693	406	406	406	16 28	541	542	541	545	545	544	411	411	411
15 29	546	546	544	691	696	704	406	406	407	16 29	542	541	541	543	545	546	411	411	411
15 30	543	542	542	711	712	711	407	407	407	16 30	542	542	542	547	548	551	411	411	411
15 31	541	541	541	713	716	721	407	407	407	16 31	542	542	542	551	550	550	410	410	410
15 32	540	540	540	724	726	727	407	407	407	16 32	543	542	542	552	553	553	410	410	410
15 33	540	539	538	726	728	731	407	407	407	16 33	542	541	541	556	559	559	410	410	410
15 34	537	537	537	734	733	731	407	407	407	16 34	541	541	541	558	560	562	410	410	410
15 35	538	538	539	733	734	732	407	407	407	16 35	541	541	539	562	560	564	410	409	409
15 36	540	542	512	728	728	729	407	407	407	16 36	539	539	538	564	564	565	409	409	409
15 37	541	541	544	728	724	726	407	407	407	16 37	536	537	536	569	570	570	409	409	409
15 38	546	546	546	731	734	734	407	407	407	16 38	537	538	538	570	570	571	409	409	409
15 39	547	547	547	735	735	734	407	407	407	16 39	538	539	539	571	571	571	409	409	409
15 40	546	546	546	734	737	741	407	407	407	16 40	539	539	540	571	571	571	409	409	409
15 41	546	546	547	743	741	738	407	407	407	16 41	538	539	539	576	576	571	409	409	409
15 42	547	547	547	738	740	742	407	407	407	16 42	539	536	538	573	580	581	409	409	409
15 43	547	547	547	742	742	743	407	407	407	16 43	537	537	535	580	579	582	409	409	409
15 44	547	546	546	743	742	740	407	407	407	16 44	536	534	533	579	582	586	409	408	408
15 45	546	546	547	742	744	746	407	407	406	16 45	533	533	533	584	586	586	408	408	408
15 46	547	548	548	743	737	731	406	406	406	16 46	533	534	535	586	584	586	408	408	408
15 47	548	548	548	730	732	736	406	406	406	16 47	535	536	537	585	584	581	408	408	408
15 48	548	548	549	741	746	741	406	406	406	16 48	538	537	539	577	578	576	408	408	408
15 49	549	550	551	731	731	739	406	406	406	16 49	540	541	543	572	569	569	408	408	407
15 50	551	552	553	741	739	742	406	406	406	16 50	546	547	548	569	568	568	407	407	407
15 51	553	553	554	745	745	739	406	406	406	16 51	548	549	549	569	569	568	407	407	407
15 52	554	554	554	738	740	745	406	406	406	16 52	550	550	550	569	569	569	406	406	406
15 53	555	555	555	745	743	743	406	406	406	16 53	551	551	549	566	567	567	406	406	405
15 54	555	555	555	747	750	754	406	406	406	16 54	550	549	546	569	570	571	405	405	405
15 55	556	556	555	756	757	756	406	406	406	16 55	545	545	546	572	571	570	405	405	405
15 56	555	534	553	757	759	760	406	406	406	16 56	545	545	544	570	571	571	405	405	405
15 57	553	552	552	762	763	763	406	406	406	16 57	545	544	543	571	569	571	405	405	405
15 58	551	551	551	764	766	767	406	406	406	16 58	543	541	542	572	574	575	405	405	405
15 59	551	551	551	768	768	767	406	406	406	16 59	542	543	543	577	578	579	405	405	405

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.			Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
October 15, 1882. (Temperature at beginning, 27°; at end, 26°.8 F.)										November 1, 1882. Temperature at beginning, 28°.8; at end, 29°.5 F.)									
	0s	20s	40s	0s	20s	40s	0s	20s	40s		0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.										*h. m.*									
17 0	534	523	523	260	270	262	465	465	465	18 0	523	520	522	376	364	362	429	428	427
17 1	523	523	524	270	242	255	465	465	465	18 1	521	521	522	358	356	375	426	426	427
17 2	527	530	535	235	244	180	465	465	465	18 2	521	520	520	374	369	373	427	427	427
17 3	539	543	550	210	192	205	465	465	465	18 3	520	520	521	380	379	369	427	427	427
17 4	552	559	572	175	148	120	465	465	466	18 4	521	521	520	372	381	379	427	427	427
17 5	572	566	559	123	110	132	466	466	466	18 5	520	520	521	384	379	379	427	427	427
17 6	555	552	555	145	210	190	466	466	466	18 6	521	520	519	381	385	395	427	427	427
17 7	552	552	550	200	212	222	466	466	466	18 7	519	518	518	394	392	392	427	427	427
17 8	560	555	562	215	230	245	466	466	466	18 8	518	518	519	393	392	394	427	427	427
17 9	564	566	562	262	275	265	466	466	466	18 9	519	519	520	391	395	398	427	427	427
17 10	569	568	564	272	275	280	466	466	466	18 10	528	534	530	368	374	382	427	426	426
17 11	562	562	555	266	250	265	466	467	467	18 11	526	523	521	390	398	397	425	425	425
17 12	552	552	550	240	245	255	467	467	467	18 12	520	513	519	401	419	399	425	425	425
17 13	548	542	540	249	263	255	467	467	467	18 13	518	518	522	394	394	394	425	425	425
17 14	539	536	532	272	273	285	467	467	467	18 14	524	527	528	395	383	392	425	425	425
17 15	510	515	520	302	345	310	469	469	469	18 15	529	529	528	392	390	376	425	425	425
17 16	519	515	508	329	342	380	469	469	469	18 16	527	524	523	393	399	390	425	423	425
17 17	501	512	510	402	399	422	469	470	470	18 17	520	521	519	396	393	398	424	424	424
17 18	505	501	499	430	442	455	470	469	469	18 18	519	521	523	400	402	400	424	425	425
17 19	500	502	402	460	462	565	465	469	472	18 19	524	527	528	395	309	395	425	425	425
17 20	480	490	500	540	502	480	472	472	472	18 20	530	528	525	376	365	376	424	424	424
17 21	549	502	500	470	460	462	472	472	472	18 21	524	525	527	385	384	378	424	425	425
17 22	502	505	510	459	458	458	470	470	470	18 22	525	524	525	377	376	390	425	425	425
17 23	511	525	530	452	440	430	470	470	470	18 23	524	528	530	396	392	389	425	425	425
17 24	535	535	530	419	400	375	470	470	470	18 24	534	537	532	384	390	390	425	425	425
17 25	522	522	526	330	190	102	470	470	469	18 25	531	524	527	396	410	424	425	425	425
17 26	529	530	532	88	110	135	469	469	468	18 26	515	514	517	432	438	435	425	425	425
17 27	529	530	532	192	225	225	468	467	467	18 27	520	520	520	425	412	405	425	425	425
17 28	529	532	528	270	300	344	467	467	467	18 28	519	517	514	390	390	384	424	424	424
17 29	525	520	522	392	405	400	467	467	465	18 29	515	518	519	382	382	375	424	423	423
17 30	516	515	510	410	412	413	465	465	465	18 30	519	520	519	376	378	385	423	423	423
17 31	509	510	502	425	439	440	465	465	465	18 31	522	524	524	388	379	376	424	424	424
17 32	502	502	500	439	452	465	465	465	465	18 32	523	522	525	379	380	383	424	424	424
17 33	549	595	509	470	462	469	464	464	464	18 33	528	527	527	376	375	375	424	424	424
17 34	500	510	505	472	470	469	464	464	464	18 34	529	530	530	380	384	380	424	424	424
17 35	502	503	505	466	460	472	464	464	464	18 35	532	532	533	376	378	385	424	424	424
17 36	508	512	514	470	468	464	464	463	463	18 36	633	534	533	383	386	389	424	424	423
17 37	515	518	514	465	469	472	463	463	463	18 37	531	530	532	390	378	376	423	423	423
17 38	512	510	512	465	465	464	463	463	462	18 38	534	535	534	380	375	366	423	423	423
17 39	511	513	515	462	460	460	462	462	462	18 39	534	533	533	364	365	366	423	423	422
17 40	517	517	514	459	461	465	461	461	461	18 40	533	529	529	358	366	367	422	422	422
17 41	512	511	512	465	468	470	461	460	460	18 41	530	530	530	374	370	354	422	422	422
17 42	514	515	519	467	463	462	460	460	460	18 42	530	534	536	346	350	352	422	422	422
17 43	520	518	519	458	455	458	460	460	460	18 43	538	540	537	349	339	354	422	422	422
17 44	521	525	531	454	450	444	460	460	459	18 44	535	533	538	355	349	346	422	421	421
17 45	538	540	542	435	425	419	459	459	459	18 45	538	539	540	346	340	334	421	421	421
17 46	545	548	550	410	406	400	459	459	459	18 46	544	544	546	320	319	324	421	421	421
17 47	550	555	560	385	370	305	459	459	459	18 47	544	543	541	325	314	310	421	421	421
17 48	558	554	555	370	355	340	459	458	458	18 48	542	544	548	315	313	294	420	420	420
17 49	558	555	555	360	355	366	458	457	456	18 49	521	554	557	280	281	282	420	420	420
17 50	550	549	539	370	410	420	456	455	455	18 50	558	559	558	274	265	276	420	420	420
17 51	530	520	510	375	385	405	455	455	455	18 51	560	555	524	290	294	295	420	420	420
17 52	504	500	502	424	420	430	455	455	455	18 52	548	545	545	302	300	296	420	420	420
17 53	502	500	503	440	462	459	455	455	455	18 53	543	544	543	285	266	281	420	420	419
17 54	500	499	492	455	465	479	455	455	455	18 54	541	542	544	275	276	294	419	419	420
17 55	490	489	490	473	466	472	456	456	456	18 55	544	545	549	300	298	302	420	420	421
17 56	492	494	495	475	470	468	456	456	456	18 56	557	563	562	305	304	305	421	421	421
17 57	496	499	500	459	453	450	456	456	457	18 57	557	555	554	307	298	294	421	421	421
17 58	500	499	495	436	432	432	457	457	457	18 58	544	542	542	320	325	326	421	421	421
17 59	494	500	499	426	419	420	457	457	457	18 59	542	545	538	320	305	289	420	420	420

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

November 15, 1882. (Temperature at beginning, −2°.2; at end, −1°.5 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.									
19 0	523	527	465	296	272	291	503	501	500
19 1	519	520	520	320	315	305	501	501	501
19 2	525	522	518	310	319	320	501	501	501
19 3	515	514	517	312	309	313	501	501	501
19 4	522	524	529	314	312	306	501	501	502
19 5	532	538	542	285	270	265	502	503	503
19 6	542	544	546	252	245	240	503	503	503
19 7	544	544	543	249	245	245	503	503	503
19 8	540	539	538	260	280	299	503	502	502
16 9	542	542	544	311	315	322	503	502	502
19 10	540	539	534	322	320	317	502	502	502
19 11	528	524	522	309	303	300	500	499	499
19 12	525	529	530	288	272	270	497	500	500
19 13	529	532	531	281	290	292	500	500	500
19 14	533	533	534	297	309	315	500	500	500
19 15	530	526	521	319	322	339	500	500	500
19 16	520	517	518	352	369	371	500	500	500
19 17	516	514	512	368	370	383	499	499	499
19 18	511	510	508	400	396	384	499	499	499
19 19	508	508	508	386	399	404	499	499	499
19 20	507	507	506	398	393	392	499	499	499
19 21	507	508	510	390	383	369	499	499	499
19 22	512	513	519	355	349	343	499	499	500
19 23	520	522	521	331	324	329	500	500	500
19 24	524	528	525	330	322	313	500	500	500
19 25	529	527	529	312	317	321	500	500	500
19 26	526	526	526	330	342	348	500	500	500
19 27	525	526	528	349	342	339	500	500	500
19 28	530	532	534	339	334	327	500	500	500
19 29	534	535	534	322	348	359	500	500	500
19 30	533	532	530	351	339	348	500	500	500
19 31	529	524	520	371	392	399	500	500	499
19 32	518	514	514	411	432	425	499	499	499
19 33	508	503	500	449	444	454	499	498	498
19 34	495	495	492	470	466	449	498	498	498
19 35	490	489	488	447	450	453	498	498	498
19 36	490	489	491	459	462	458	498	498	498
19 37	492	496	499	448	439	433	498	498	499
19 38	502	504	506	408	382	376	499	499	499
19 39	504	500	498	392	415	433	499	499	499
19 40	494	488	486	452	469	483	499	499	499
19 41	488	491	496	469	482	471	499	499	499
19 42	499	504	509	458	432	408	500	501	501
19 43	514	513	512	389	385	333	502	502	502
19 44	500	502	495	370	399	413	502	502	500
19 45	490	488	482	443	463	470	500	500	500
19 46	483	485	488	463	466	460	500	500	500
19 47	490	492	496	443	418	402	500	500	500
19 48	495	496	496	400	403	394	500	500	500
19 49	496	497	493	389	388	391	500	500	500
19 50	492	494	495	398	401	405	500	500	500
19 51	490	491	489	402	408	414	500	500	500
19 52	486	485	486	420	419	422	499	499	499
19 53	488	485	487	428	433	429	499	499	499
19 54	489	494	493	421	414	409	500	500	500
19 55	499	500	503	390	387	379	500	500	501
19 56	502	501	500	375	378	382	501	501	501
19 57	500	500	502	389	399	408	501	501	501
19 58	502	502	500	412	415	412	501	501	501
19 59	500	499	502	410	418	415	501	501	501

December 1, 1882. (Temperature at beginning, 14°.0; 16°.0 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.									
20 0	500	500	498	368	380	384	531	530	531
20 1	497	495	494	396	392	392	531	530	530
20 2	493	492	491	393	396	396	530	530	531
20 3	490	488	488	396	396	397	531	531	531
20 4	488	488	488	400	400	402	531	531	531
20 5	487	487	486	404	405	406	531	531	531
20 6	485	485	485	407	408	409	532	532	532
20 7	484	485	484	410	410	411	532	532	532
20 8	484	484	484	412	413	414	532	532	532
20 9	482	484	484	414	414	413	532	532	532
20 10	484	484	484	413	412	411	532	532	532
20 11	484	484	483	411	413	413	532	532	532
20 12	483	483	483	414	414	416	532	532	532
20 13	483	483	483	416	417	418	532	532	532
20 14	483	483	483	419	419	419	532	532	532
20 15	483	482	481	419	419	420	532	532	532
20 16	481	481	480	420	420	419	532	532	532
20 17	480	480	480	419	419	419	532	532	532
20 18	480	480	480	418	418	418	582	532	532
20 19	481	481	480	418	417	417	532	532	532
20 20	480	480	481	418	418	416	532	532	532
20 21	482	482	483	416	415	414	632	532	532
20 22	483	484	484	414	413	411	532	532	532
20 23	484	485	486	409	407	405	532	532	532
20 24	487	487	488	404	403	402	532	532	[illegible]
20 25	489	490	490	401	400	400	533	533	533
20 26	492	493	493	401	403	404	533	533	533
20 27	493	492	491	406	409	411	533	533	533
20 28	490	490	489	413	414	415	533	533	533
20 29	489	489	488	417	417	416	533	533	533
20 30	488	487	487	415	414	411	533	533	533
20 31	487	488	489	408	406	406	533	[illegible]	533
20 32	489	490	491	404	403	401	533	533	533
20 33	491	491	492	401	401	399	533	533	533
20 34	492	492	493	399	399	400	533	533	533
20 35	493	493	493	400	400	400	533	533	533
20 36	493	492	493	401	402	403	533	533	533
20 37	492	492	492	403	404	405	532	532	532
20 38	492	491	491	405	404	403	532	532	532
20 39	491	491	491	404	405	403	532	532	532
20 40	492	492	492	401	401	401	532	532	532
20 41	493	494	494	400	399	399	532	532	532
20 42	494	494	494	399	399	399	532	532	532
20 43	494	494	491	400	400	401	532	532	532
20 44	494	494	494	401	400	400	532	532	532
20 45	493	493	492	401	401	400	532	532	532
20 46	493	493	494	399	307	396	532	532	532
20 47	494	494	494	393	392	392	532	532	532
20 48	495	495	495	392	390	389	532	532	532
20 49	496	496	496	389	390	390	532	532	532
20 50	496	497	498	389	389	389	532	532	532
20 51	497	498	498	390	391	391	532	532	532
20 52	498	496	495	393	395	396	532	532	532
20 53	494	494	494	396	397	396	532	532	532
20 54	493	493	494	396	394	392	532	533	532
20 55	495	496	497	389	386	385	532	532	532
20 56	498	498	498	386	386	387	532	532	532
20 57	498	498	497	338	389	390	532	532	532
20 58	492	495	495	389	390	390	532	532	532
20 59	495	495	496	391	391	391	532	532	532

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

December 15, 1882. (Temperature at beginning, 4°.2; at end, 5°.2 F.)										January 2, 1883. (Temperature at beginning, 12°.8; at end, 16°.8 F.)									
Time.	eclinometer.			Bifilar magnetometer.			Balance magnetometer.			Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0°	20°	40°	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°	0°	20°	40°
h. m.										*h. m.*									
21 0	519	520	523	306	305	308	522	522	522	22 0	485	484	486	398	388	377	486	486	486
21 1	522	523	521	314	320	318	522	522	522	22 1	488	485	485	371	366	364	485	485	485
21 2	520	523	521	307	305	309	522	522	522	22 2	483	482	480	367	378	384	485	485	485
21 3	524	524	523	306	300	298	522	522	522	22 3	480	481	483	379	372	366	485	485	485
21 4	520	519	520	306	310	302	522	522	522	22 4	485	484	480	369	377	375	485	485	485
21 5	520	518	517	297	300	304	522	521	521	22 5	481	481	479	373	375	377	485	485	485
21 6	520	516	518	299	296	303	521	521	521	22 6	480	479	483	379	377	371	485	485	485
21 7	513	517	516	314	312	307	521	521	521	22 7	482	483	488	369	369	360	486	485	486
21 8	516	518	519	302	307	311	521	521	521	22 8	488	487	482	356	369	390	486	486	486
21 9	520	519	520	304	292	286	522	522	522	22 9	485	479	484	390	372	369	486	486	486
21 10	519	521	522	288	285	277	522	522	522	22 10	482	480	482	378	378	364	486	486	486
21 11	522	523	520	272	281	290	522	522	522	22 11	480	484	484	372	367	355	485	485	485
21 12	518	518	518	281	269	272	522	522	522	22 12	485	485	485	355	364	366	485	486	485
21 13	519	520	518	289	296	283	522	522	522	22 13	484	483	487	357	357	368	485	485	485
21 14	517	516	518	271	275	282	522	522	522	22 14	480	485	480	373	365	362	483	486	485
21 15	517	518	516	281	274	261	522	522	522	22 15	482	480	480	363	359	355	485	485	485
21 16	518	519	522	252	250	256	522	522	522	22 16	481	481	484	351	345	344	485	486	485
21 17	522	523	522	252	244	240	522	522	522	22 17	484	486	486	350	353	356	485	485	486
21 18	522	522	523	244	249	243	522	522	522	22 18	483	484	481	361	362	360	486	486	486
21 19	520	520	520	240	243	245	522	522	522	22 19	480	483	488	356	357	358	485	485	485
21 20	520	516	516	240	232	224	522	521	521	22 20	481	481	486	354	348	345	485	485	485
21 21	512	511	510	225	222	215	521	520	520	22 21	483	488	489	348	346	349	485	486	486
21 22	512	514	520	212	215	208	520	520	521	22 22	481	489	492	351	350	347	486	486	486
21 23	522	520	526	198	180	177	521	521	521	22 23	490	495	490	340	338	344	486	[illegible]	486
21 24	525	529	530	177	160	152	521	521	521	22 24	492	497	493	352	353	350	486	486	486
21 25	527	532	535	144	136	129	521	521	521	22 25	490	491	490	350	360	366	486	486	486
21 26	534	528	524	122	120	129	521	521	520	22 26	484	482	480	370	372	372	486	486	485
21 27	518	524	520	141	152	150	520	520	520	22 27	481	481	482	364	360	362	485	485	485
21 28	518	520	512	158	165	169	520	520	520	22 28	481	484	479	359	340	360	485	485	485
21 29	514	506	502	182	190	174	520	520	520	22 29	484	479	480	369	372	363	485	485	485
21 30	503	500	501	170	179	182	520	520	520	22 30	482	485	477	342	339	341	485	485	485
21 31	502	501	504	172	162	160	520	519	519	22 31	486	483	483	344	354	364	486	486	486
21 32	508	514	510	166	165	157	519	519	519	22 32	483	486	487	353	343	353	486	486	486
21 33	511	513	510	149	157	164	519	519	519	22 33	489	488	487	359	358	353	486	486	486
21 34	518	514	510	173	166	155	519	519	519	22 34	489	489	488	363	379	377	486	486	486
21 35	521	526	520	159	170	179	519	520	520	22 35	483	489	484	371	378	385	486	486	486
21 36	518	523	522	179	170	160	520	519	519	22 36	475	475	473	380	368	362	485	485	485
21 37	529	522	526	145	134	136	519	519	519	22 37	471	471	474	359	361	374	485	485	485
21 38	527	529	534	130	124	108	518	518	518	22 38	472	472	475	374	352	341	485	485	485
21 39	537	539	540	102	108	110	518	518	518	22 39	476	476	475	348	356	358	485	485	485
21 40	536	541	540	112	107	100	518	518	518	22 40	472	472	472	354	364	378	485	486	486
21 41	539	530	532	107	113	121	518	518	517	22 41	472	468	467	374	378	384	486	486	486
21 42	541	532	533	115	102	100	517	517	517	22 42	466	462	468	382	373	364	486	485	486
21 43	530	535	533	101	107	96	517	517	517	22 43	463	463	466	386	375	376	486	486	486
21 44	532	535	529	84	88	105	517	517	517	22 44	461	464	461	363	341	379	486	486	486
21 45	530	525	527	126	132	126	517	517	516	22 45	466	468	461	392	371	[illegible]	486	486	486
21 46	522	528	530	129	137	135	516	516	516	22 46	468	468	468	344	371	380	[illegible]	486	487
21 47	536	533	540	123	132	134	516	516	516	22 47	471	469	472	371	373	385	487	487	487
21 48	537	545	537	130	122	90	516	515	515	22 48	467	465	470	394	394	385	487	487	487
21 49	544	539	545	94	72	88	515	515	515	22 49	476	467	467	378	380	388	487	487	487
21 50	542	540	542	72	64	72	515	515	515	22 50	468	468	[illegible]	379	366	379	487	487	487
21 51	543	532	535	80	70	64	515	515	515	22 51	468	468	465	394	381	370	487	487	487
21 52	526	540	519	71	68	62	515	514	514	22 52	470	468	467	385	399	386	487	487	487
21 53	532	523	528	55	60	69	514	514	514	22 53	470	468	466	370	375	391	487	487	487
21 54	520	519	500	80	84	84	514	514	513	22 54	467	462	461	398	390	376	487	487	487
21 55	510	500	508	92	100	132	513	513	513	22 55	458	464	462	380	396	398	487	487	487
21 56	496	500	[illegible]	155	163	179	513	513	514	22 56	473	461	464	373	360	376	487	487	487
21 57	492	496	489	198	189	182	515	515	515	22 57	462	465	466	375	390	370	487	488	488
21 58	499	490	499	179	200	182	515	515	515	22 58	468	467	467	366	375	390	488	488	488
21 59	490	486	500	[illegible]	179	192	515	515	515	22 59	468	469	470	385	374	374	488	488	488

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

January 15, 1883. (Temperature at beginning, —7°.2; at end, —6°.8 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.									
23 0	470	471	474	465	467	470	508	508	508
23 1	479	475	476	460	444	449	508	508	508
23 2	471	470	469	472	454	483	508	508	508
23 3	465	462	464	487	491	476	508	508	508
23 4	463	459	455	462	473	490	508	508	508
23 5	452	454	458	489	481	479	508	508	508
23 6	460	464	467	472	451	433	508	508	508
23 7	470	471	470	437	442	440	508	508	508
23 8	471	470	471	436	439	442	508	508	508
23 9	468	468	466	441	440	441	508	508	508
23 10	465	465	466	447	450	448	508	508	508
23 11	466	467	467	447	445	444	508	508	508
23 12	465	465	465	446	449	449	508	508	508
23 13	466	468	468	448	443	438	508	508	508
23 14	470	472	471	433	435	440	508	509	509
23 15	472	471	475	443	446	445	509	509	509
23 16	474	477	476	446	447	445	509	509	509
23 17	477	478	477	443	445	449	509	509	509
23 18	477	476	475	450	450	451	509	509	509
23 19	476	477	475	453	451	450	509	509	509
23 20	472	471	471	455	461	463	509	509	509
23 21	472	475	476	462	459	450	509	509	509
23 22	478	475	479	449	453	461	509	509	509
23 23	483	489	486	451	430	427	509	509	509
23 24	486	482	484	445	465	469	509	509	509
23 25	480	482	476	466	473	478	509	509	509
23 26	478	473	472	473	461	452	509	509	509
23 27	470	462	453	457	473	490	509	509	509
23 28	450	448	442	515	523	530	509	509	509
23 29	440	435	440	535	540	532	509	509	509
23 30	445	452	455	521	515	511	509	509	509
23 31	449	440	442	505	500	490	509	510	510
23 32	446	450	450	487	479	471	510	510	510
23 33	451	455	458	469	468	467	510	510	510
23 34	459	461	463	465	466	468	510	510	510
23 35	465	467	467	469	466	462	510	510	510
23 36	470	473	476	459	456	448	510	510	510
23 37	477	478	480	442	439	440	510	510	510
23 38	480	481	480	437	433	436	510	510	510
23 39	480	481	480	439	442	444	510	510	510
23 40	480	481	481	449	450	450	510	510	510
23 41	482	481	482	450	451	450	510	510	510
23 42	481	484	489	449	443	439	510	511	511
23 43	488	490	490	438	439	436	511	511	511
23 44	491	491	490	432	430	432	511	511	511
23 45	490	491	488	436	439	439	511	511	511
23 46	490	491	490	440	439	439	511	511	511
23 47	489	488	487	439	441	448	511	511	511
23 48	489	488	489	448	440	437	511	511	511
23 49	489	488	488	438	442	445	511	511	511
23 50	488	488	488	442	448	442	511	511	511
23 51	489	490	489	441	441	442	511	511	511
23 52	488	487	487	444	445	445	511	511	511
23 53	486	486	486	448	450	450	511	511	511
23 54	486	485	485	451	451	450	511	511	511
23 55	484	482	482	452	454	451	511	511	511
23 56	490	486	482	449	445	449	511	511	511
23 57	483	481	481	450	450	449	511	511	511
23 58	482	481	481	448	448	443	511	511	511
23 59	482	484	[illegible]	445	449	445	511	511	511

February 1, 1883. (Temperature at beginning, —9°.2; at end, —0°.5 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.									
0 0	486	486	485	476	478	481	522	522	522
0 1	485	484	484	485	477	480	522	522	522
0 2	484	484	485	481	479	477	522	522	522
0 3	485	485	485	481	483	484	522	522	522
0 4	485	485	483	485	484	482	522	522	522
0 5	484	483	483	480	480	482	522	522	522
0 6	482	482	481	481	479	480	522	522	522
0 7	481	479	480	478	477	477	522	522	522
0 8	478	479	478	478	478	476	522	522	522
0 9	478	478	478	474	477	481	522	522	522
0 10	479	478	478	477	473	474	522	522	522
0 11	478	477	478	478	480	478	522	522	522
0 12	477	477	476	477	480	479	522	522	522
0 13	475	475	475	474	472	473	522	522	522
0 14	474	474	473	475	472	470	522	521	521
0 15	473	473	472	471	472	470	521	521	521
0 16	472	472	472	470	472	474	521	521	521
0 17	471	471	471	476	474	473	521	521	521
0 18	471	471	472	473	471	469	521	521	521
0 19	472	473	473	472	477	480	521	522	522
0 20	475	475	476	478	474	474	522	522	522
0 21	475	476	475	476	477	474	522	522	522
0 22	475	476	476	473	476	477	522	522	522
0 23	475	476	475	472	468	467	522	521	521
0 24	475	475	475	468	469	468	521	521	521
0 25	476	476	477	468	469	469	521	521	521
0 26	477	477	477	469	468	469	521	521	521
0 27	477	477	477	468	466	465	521	521	521
0 28	477	478	478	467	470	470	521	521	521
0 29	479	479	480	469	473	482	521	521	521
0 30	481	481	481	484	482	481	521	521	521
0 31	481	479	478	483	481	478	521	521	521
0 32	477	477	477	479	483	485	521	521	521
0 33	477	477	477	485	486	486	521	521	521
0 34	477	477	477	487	491	493	521	521	521
0 35	478	477	477	491	488	489	521	521	521
0 36	477	476	477	489	486	483	521	521	521
0 37	477	477	476	482	483	484	521	521	521
0 38	477	476	476	484	485	485	521	521	521
0 39	476	477	477	484	484	484	521	521	521
0 40	477	476	476	484	480	477	521	521	521
0 41	475	474	474	480	482	481	520	520	520
0 42	473	474	473	481	483	488	520	520	521
0 43	475	474	474	489	488	487	521	521	521
0 44	474	474	474	486	485	485	521	521	521
0 45	474	474	474	488	488	487	521	521	521
0 46	475	476	476	484	482	481	521	521	521
0 47	476	477	476	481	483	482	521	521	521
0 48	475	475	475	481	481	482	521	521	520
0 49	475	475	475	481	479	479	520	520	520
0 50	475	475	474	482	483	478	520	520	520
0 51	474	474	475	477	479	478	520	520	520
0 52	474	475	474	473	475	[illegible]	520	520	520
0 53	475	475	476	487	484	481	520	520	520
0 54	475	476	475	482	482	479	520	520	520
0 55	476	476	477	475	478	473	520	520	520
0 56	477	478	477	473	471	470	520	520	520
0 57	476	476	476	471	473	473	520	520	520
0 58	476	476	476	472	472	476	520	520	520
0 59	477	476	477	477	476	477	520	520	520

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

February 15, 1883. (Temperature at beginning, 4°.0; at end, 9°.8 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.									
1 0	482	481	479	426	409	404	505	505	505
1 1	479	480	481	406	408	411	505	505	505
1 2	481	481	481	414	422	423	505	505	505
1 3	481	481	481	424	425	425	505	505	505
1 4	481	481	481	424	424	424	505	505	505
1 5	481	481	481	423	422	422	505	505	505
1 6	481	479	478	422	411	411	505	505	505
1 7	478	477	474	412	411	421	505	505	505
1 8	475	476	476	424	419	416	505	505	505
1 9	476	474	470	417	428	441	505	505	505
1 10	468	469	465	444	445	448	505	505	505
1 11	472	472	478	445	430	419	505	505	505
1 12	479	482	485	408	399	389	505	505	505
1 13	483	486	485	391	395	395	505	505	505
1 14	485	479	477	403	423	442	505	505	505
1 15	474	475	471	443	443	440	505	505	505
1 16	475	474	475	438	440	450	505	505	505
1 17	476	475	475	451	450	435	505	505	505
1 18	474	477	475	433	432	425	505	505	505
1 19	480	478	483	423	422	416	505	505	505
1 20	485	484	480	415	416	418	505	505	505
1 21	485	480	482	418	417	420	505	505	505
1 22	482	483	482	428	428	422	505	505	505
1 23	484	484	485	424	418	408	505	505	505
1 24	485	484	482	403	407	404	505	505	505
1 25	482	481	482	398	399	405	504	504	504
1 26	484	484	485	409	409	404	504	504	504
1 27	486	486	486	403	403	402	504	504	504
1 28	486	485	485	396	397	400	504	504	504
1 29	485	485	485	400	396	387	504	504	504
1 30	485	483	485	397	393	382	504	504	504
1 31	486	487	485	394	387	370	504	504	503
1 32	485	485	482	373	392	398	503	503	503
1 33	484	483	488	396	395	394	503	503	504
1 34	488	489	489	395	391	383	504	504	504
1 35	486	488	484	378	382	390	503	503	503
1 36	483	489	485	386	386	390	503	503	503
1 37	488	485	487	392	390	389	503	503	503
1 38	488	489	499	393	400	387	503	503	503
1 39	497	498	487	385	384	390	503	503	503
1 40	489	488	488	408	398	395	503	503	503
1 41	486	487	486	385	400	406	503	503	503
1 42	485	485	485	404	404	405	503	503	503
1 43	485	485	485	411	410	408	503	503	503
1 44	486	486	486	409	412	412	503	503	503
1 45	486	485	485	412	416	421	503	503	503
1 46	485	485	486	421	418	419	503	503	503
1 47	486	487	487	424	427	423	503	503	503
1 48	486	487	485	420	424	427	503	503	503
1 49	486	486	486	427	428	429	503	503	503
1 50	486	485	485	431	434	435	503	503	503
1 51	485	486	486	435	435	433	503	503	503
1 52	485	486	486	434	436	432	503	503	503
1 53	487	487	485	428	428	430	503	503	503
1 54	488	487	486	428	424	424	503	503	503
1 55	486	485	485	426	424	429	503	503	503
1 56	487	488	488	432	428	419	503	503	503
1 57	490	490	488	420	424	424	503	503	503
1 58	488	488	488	422	422	429	503	503	503
1 59	486	485	482	432	434	438	503	503	503

March 1, 1883. (Temperature at beginning, 9°.2; at end, 12°.0 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m									
2 0	480	479	479	515	520	518	501	501	501
2 1	482	477	482	507	498	503	501	501	501
2 2	480	480	483	513	514	503	501	501	501
2 3	480	482	483	486	473	473	501	501	501
2 4	482	481	481	481	484	478	501	501	501
2 5	479	480	479	473	480	490	501	501	501
2 6	478	477	478	492	485	480	501	501	501
2 7	477	473	474	486	498	510	501	501	501
2 8	476	479	478	512	503	490	502	502	502
2 9	478	483	483	490	497	495	502	502	502
2 10	484	481	483	483	482	490	502	502	502
3 11	482	482	483	493	485	479	502	502	502
2 12	482	483	483	478	490	508	502	502	502
2 13	484	486	487	523	522	510	502	503	503
2 14	487	487	486	507	513	515	503	503	503
2 15	486	486	485	512	512	520	503	503	503
2 16	486	486	486	530	535	533	503	503	503
2 17	485	485	486	524	521	524	503	502	502
2 18	485	485	484	530	531	525	502	502	502
2 19	483	484	481	523	530	537	502	502	502
2 20	480	480	480	543	553	558	502	502	502
2 21	478	478	476	558	556	554	502	501	501
2 22	475	474	473	552	545	542	501	501	501
2 23	473	472	471	545	540	527	501	501	501
2 24	469	471	470	516	521	542	501	501	501
2 25	472	471	468	566	553	545	501	501	501
2 26	466	468	470	555	580	589	501	502	502
2 27	469	468	469	581	574	576	502	501	502
2 28	471	472	473	587	583	565	502	502	502
2 29	474	471	473	552	552	560	502	502	502
2 30	472	474	470	558	547	533	502	501	501
2 31	473	468	475	527	528	535	501	501	501
2 32	469	472	467	534	533	535	501	501	501
2 33	476	472	468	554	580	592	501	501	502
2 34	467	471	472	599	601	595	502	502	502
2 35	474	473	474	590	592	591	502	502	502
2 36	473	475	474	575	547	520	502	501	501
2 37	477	478	477	515	524	534	501	501	501
2 38	477	477	478	531	525	532	501	501	501
2 39	477	475	475	548	565	580	501	501	502
2 40	472	476	472	588	592	598	502	502	502
2 41	474	471	467	600	595	596	502	502	502
2 42	467	463	462	601	602	498	501	501	501
2 43	462	463	464	601	603	603	502	502	502
2 44	467	470	471	606	617	626	502	503	503
2 45	473	475	478	626	615	599	503	503	503
2 46	474	479	482	593	611	630	503	503	503
2 47	482	478	481	632	626	623	503	503	503
2 48	480	479	478	630	636	636	503	503	503
2 49	480	476	479	634	641	662	503	503	503
2 50	477	472	472	675	675	677	503	503	503
2 51	473	468	472	683	679	665	503	502	502
2 52	472	472	469	658	645	635	502	502	502
2 53	472	475	470	637	644	648	502	502	502
2 54	471	478	476	648	649	655	502	502	502
2 55	473	474	473	650	631	615	502	501	501
2 56	478	470	475	614	620	618	501	501	501
2 57	472	474	473	601	589	596	501	500	500
2 58	468	470	468	612	620	611	500	500	500
2 59	471	478	468	600	603	620	500	500	500

Readings of the Brooke instruments at Uglaamie, Alaska.

Time.	March 15, 1883. (Temperature at beginning, 2°.8; at end, 8°.5 F.)									Time.	April 1, 1883. (Temperature at beginning, 22°.2; at end, 20°.8 F.)								
	Declinometer.			Bifilar magnetometer.			Balance magnetometer.				Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0°	20°	40°	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°	0°	20°	40°
h. m.										*h. m.*									
3 0	481	483	485	450	458	461	542	542	542	4 0	459	457	459	474	470	468	443	443	443
3 1	485	482	483	462	464	466	542	542	542	4 1	460	460	459	472	478	485	443	444	444
3 2	480	481	480	459	456	454	542	542	542	4 2	459	459	460	489	492	496	444	444	444
3 3	480	479	478	456	465	470	542	542	542	4 3	460	459	460	501	506	507	444	444	444
3 4	474	475	481	464	460	446	541	541	541	4 4	459	460	459	509	509	505	444	444	444
3 5	473	475	476	450	478	470	541	541	541	4 5	459	460	461	490	498	498	444	444	444
3 6	475	472	472	451	438	449	541	541	540	4 6	461	460	460	491	486	487	444	444	444
3 7	472	470	472	462	464	450	541	541	541	4 7	458	459	458	497	509	515	444	444	444
3 8	471	478	475	448	452	468	541	541	541	4 8	458	457	458	516	513	507	444	444	444
3 9	482	483	485	470	453	432	541	542	541	4 9	459	459	461	505	504	499	444	444	444
3 10	485	481	478	432	430	428	541	540	540	4 10	464	463	464	489	482	478	444	444	444
3 11	477	476	475	428	420	418	540	540	540	4 11	463	462	462	481	488	490	444	444	444
3 12	475	475	474	427	433	439	540	540	540	4 12	461	461	461	485	482	482	444	444	444
3 13	476	476	476	449	450	450	540	541	541	4 13	461	462	463	483	480	473	443	444	444
3 14	476	475	475	458	460	460	541	541	541	4 14	464	463	463	467	464	469	444	443	443
3 15	475	475	477	460	460	458	541	540	541	4 15	462	462	462	474	475	470	443	443	444
3 16	478	477	478	456	450	446	541	541	541	4 16	464	464	464	466	466	467	443	443	443
3 17	475	473	469	432	424	427	541	541	541	4 17	465	466	467	463	455	450	443	443	443
3 18	464	463	461	438	450	448	541	541	541	4 18	468	467	468	449	448	447	443	443	443
3 19	466	468	475	475	500	540	541	542	542	4 19	466	467	468	446	448	449	443	443	443
3 20	487	465	482	555	520	503	543	543	542	4 20	468	469	470	448	447	448	443	443	443
3 21	480	477	476	470	420	400	541	540	540	4 21	470	470	471	448	446	443	443	443	443
3 22	475	475	475	403	408	417	539	539	539	4 22	470	471	470	440	436	431	443	443	443
3 23	475	475	476	423	428	435	539	539	540	4 23	472	472	473	424	417	413	443	443	443
3 24	476	475	476	440	446	452	540	540	540	4 24	474	474	474	412	415	420	443	443	443
3 25	479	478	475	500	502	483	541	541	540	4 25	473	474	473	423	426	426	443	443	443
3 26	475	477	478	460	446	448	541	540	540	4 26	473	472	473	427	427	429	443	443	443
3 27	481	479	478	453	446	432	540	540	540	4 27	474	475	475	428	426	421	443	443	443
3 28	476	476	476	432	445	460	540	540	540	4 28	476	475	475	416	411	409	443	443	443
3 29	476	473	472	460	467	452	540	539	539	4 29	474	473	474	412	413	415	443	443	443
3 30	471	471	471	462	472	476	539	539	539	4 30	473	475	474	417	418	420	443	443	443
3 31	470	471	472	474	478	484	539	540	540	4 31	476	476	478	420	417	413	443	443	443
3 32	470	471	470	491	498	498	540	540	540	4 32	477	478	477	409	407	410	443	443	443
3 33	471	470	469	493	488	488	540	540	540	4 33	476	475	474	414	414	414	443	443	443
3 34	468	470	468	495	499	493	540	532	535	4 34	474	473	473	417	421	422	443	443	443
3 35	470	468	468	489	491	492	535	534	534	4 35	472	471	470	421	420	419	443	443	443
3 36	468	467	465	492	488	494	534	534	534	4 36	469	470	469	422	425	427	443	443	443
3 37	464	464	465	506	517	522	534	534	534	4 37	468	469	468	428	431	436	443	443	443
3 38	464	465	465	524	525	524	534	534	535	4 38	468	469	468	439	443	448	443	443	443
3 39	466	465	464	523	520	515	535	534	534	4 39	468	469	468	450	449	448	443	443	443
3 40	465	464	466	512	507	500	535	534	532	4 40	468	469	469	449	451	452	443	443	443
3 41	466	467	466	495	498	500	532	532	532	4 41	469	468	468	448	445	446	443	443	443
3 42	466	467	466	504	506	512	532	532	532	4 42	467	467	465	448	449	451	443	443	443
3 43	465	466	466	518	521	518	532	532	532	4 43	465	464	463	454	459	465	443	443	443
3 44	465	465	464	511	508	512	532	532	532	4 44	462	463	462	472	475	479	443	443	443
3 45	464	466	467	519	518	514	532	532	532	4 45	461	461	461	482	482	480	443	443	443
3 46	469	470	471	510	511	510	532	532	532	4 46	461	461	461	478	479	485	443	443	443
3 47	472	472	472	506	503	503	532	532	532	4 47	461	462	462	492	495	493	443	443	444
3 48	472	471	471	501	498	493	532	531	531	4 48	462	461	461	490	490	495	443	443	443
3 49	471	470	472	485	485	480	531	531	531	4 49	461	461	462	500	500	498	443	443	443
3 50	472	473	474	479	475	475	531	530	529	4 50	462	463	462	494	491	494	443	443	443
3 51	474	475	475	475	475	476	529	529	529	4 51	464	465	465	497	495	490	443	443	443
3 52	475	475	475	476	474	472	529	529	529	4 52	464	463	461	484	481	479	443	443	443
3 53	476	476	476	473	475	476	529	529	529	4 53	459	458	457	480	484	490	443	443	443
3 54	476	477	478	474	472	470	529	529	529	4 54	457	458	459	495	498	499	443	443	443
3 55	478	478	478	469	466	465	529	528	528	4 55	460	460	460	495	492	492	443	443	443
3 56	479	479	480	465	466	464	528	528	528	4 56	461	460	460	493	493	490	443	443	443
3 57	480	481	479	462	458	456	526	525	525	4 57	459	459	459	487	487	490	443	443	443
3 58	479	481	481	454	454	457	525	525	525	4 58	459	460	460	494	495	491	443	443	443
3 59	481	480	481	456	453	455	525	525	525	4 59	461	460	460	486	483	482	443	443	443

Readings of the Brooke instruments at Uglaamie, Alaska.

Time.	April 15, 1883. (Temperature at beginning, 20°.5; at end, 23°.5 F.)									Time.	May 1, 1883. (Temperature at beginning, 19°.8; at end, 19°.0 F.)								
	Declinometer.			Bifilar magnetometer.			Balance magnetometer.				Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0°	20°	40°	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°	0°	20°	40°
h. m.										*h. m.*									
5 0	473	474	474	368	371	370	449	449	449	6 0	452	452	451	577	577	574	531	531	531
5 1	474	474	474	367	366	368	449	449	449	6 1	451	450	451	577	580	579	531	531	531
5 2	474	474	474	370	368	367	449	449	449	6 2	449	449	449	588	592	596	531	531	531
5 3	474	474	474	368	369	369	449	449	449	6 3	448	448	447	599	601	606	531	531	531
5 4	474	474	473	368	368	368	449	449	449	6 4	447	446	446	610	612	615	531	531	531
5 5	473	473	473	369	369	368	449	449	449	6 5	446	444	443	619	625	660	531	531	531
5 6	473	474	473	368	368	370	449	449	449	6 6	442	441	441	631	627	623	531	531	531
5 7	473	473	473	371	370	369	449	449	449	6 7	439	439	438	623	625	625	531	530	530
5 8	473	473	473	369	370	370	449	449	449	6 8	440	440	440	623	619	615	530	530	530
5 9	473	473	473	370	368	368	449	449	449	6 9	440	440	440	612	612	616	530	530	530
5 10	474	474	474	368	369	368	449	449	449	6 10	443	443	443	620	621	623	530	530	530
5 11	474	474	474	368	369	370	449	449	449	6 11	440	436	435	632	644	650	530	530	530
5 12	474	474	474	370	368	368	449	449	449	6 12	435	439	440	644	639	645	530	530	530
5 13	474	474	474	368	368	369	449	449	449	6 13	439	441	444	648	642	613	530	530	530
5 14	474	474	474	369	369	369	449	449	449	6 14	443	444	440	634	642	647	530	530	530
5 15	474	474	474	369	369	369	449	449	449	6 15	437	437	439	643	631	628	530	530	530
5 16	474	474	474	369	369	369	449	449	449	6 16	439	442	445	636	644	644	530	530	530
5 17	474	474	475	369	370	370	449	449	449	6 17	444	448	449	635	629	636	530	530	530
5 18	475	475	475	368	368	368	449	449	449	6 18	449	451	450	646	643	626	530	529	529
5 19	475	475	475	369	369	368	449	449	449	6 19	451	451	450	611	613	624	529	529	529
5 20	475	475	475	368	368	370	449	449	449	6 20	450	449	450	628	626	626	529	529	529
5 21	475	474	474	370	371	371	449	449	449	6 21	450	453	452	632	637	635	529	529	529
5 22	474	474	474	371	374	375	449	449	449	6 22	454	453	451	628	622	620	529	529	529
5 23	474	474	474	374	374	375	449	449	449	6 23	448	446	446	614	611	609	529	528	528
5 24	474	474	474	376	376	376	449	449	449	6 24	446	444	442	612	615	619	528	528	528
5 25	474	474	474	376	376	376	449	449	449	6 25	442	441	441	628	635	637	528	528	528
5 26	474	474	474	376	376	376	449	449	449	6 26	444	448	452	630	618	602	528	528	528
5 27	474	474	474	376	376	376	449	449	449	6 27	458	458	458	595	571	566	528	528	528
5 28	474	474	474	375	375	375	449	449	449	6 28	454	452	452	560	580	592	528	528	528
5 29	474	474	474	376	376	376	449	449	449	6 29	453	448	452	602	603	601	528	528	528
5 30	474	474	474	377	376	376	449	449	449	6 30	454	456	456	600	601	597	528	528	538
5 31	474	474	474	376	376	376	449	449	449	6 31	455	454	457	598	593	597	528	528	528
5 32	474	474	474	376	376	376	449	449	449	6 32	457	459	459	594	586	582	528	528	528
5 33	474	474	475	376	374	374	449	449	449	6 33	457	455	453	585	593	598	528	528	528
5 34	475	475	475	374	374	374	449	449	449	6 34	451	450	448	596	589	586	528	528	528
5 35	475	475	475	373	373	373	449	449	449	6 35	453	455	459	590	592	586	528	528	528
5 36	475	475	475	374	374	374	449	449	449	6 36	458	458	454	578	573	574	528	528	528
5 37	475	475	475	374	374	374	449	449	449	6 37	451	453	458	583	592	595	528	528	528
5 38	474	474	474	375	375	375	449	449	449	6 38	458	463	463	591	588	590	528	528	528
5 39	474	474	474	375	375	375	449	449	449	6 39	469	467	466	593	591	588	528	528	528
5 40	474	474	474	374	373	373	449	449	449	6 40	463	466	465	595	606	602	528	528	528
5 41	474	474	474	372	371	371	449	449	449	6 41	467	468	470	583	568	567	528	528	528
5 42	474	475	475	371	371	371	449	449	449	6 42	469	467	467	567	559	550	528	528	528
5 43	475	475	475	371	371	371	449	449	449	6 43	467	468	466	548	553	554	528	528	527
5 44	475	475	475	371	371	371	449	449	449	6 44	467	467	467	548	529	533	527	527	527
5 45	475	475	475	371	371	371	449	449	449	6 45	464	462	460	531	528	526	527	527	527
5 46	475	475	475	370	369	369	449	449	449	6 46	461	459	458	527	534	544	527	527	527
5 47	475	475	474	370	370	370	449	449	449	6 47	457	460	462	552	554	550	527	527	527
5 48	475	475	475	370	370	371	449	449	449	6 48	463	464	463	544	540	539	528	528	528
5 49	475	475	475	372	372	372	449	449	440	6 49	461	463	463	536	529	523	528	528	528
5 50	475	475	475	371	375	375	449	449	449	6 50	464	464	465	521	525	533	528	528	528
5 51	475	475	475	375	375	375	449	449	449	6 51	464	406	466	527	536	532	528	528	528
5 52	475	475	475	376	375	375	449	449	449	6 52	463	461	461	527	524	526	528	528	528
5 53	475	475	475	375	375	375	449	449	449	6 53	461	461	460	532	533	532	528	528	528
5 54	475	475	475	375	375	375	449	449	449	6 54	459	459	458	522	510	505	528	528	528
5 55	475	475	475	375	375	375	449	449	449	6 55	459	457	456	512	521	518	527	527	527
5 56	475	475	475	375	373	373	449	449	449	6 56	454	453	452	507	501	507	527	527	527
5 57	475	475	475	373	373	373	449	449	449	6 57	453	451	451	516	514	504	527	527	527
5 58	474	474	474	374	375	376	449	449	449	6 58	450	451	452	499	500	504	527	527	527
5 59	474	473	473	376	377	375	449	449	449	6 59	451	452	451	500	491	485	527	527	527

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

Time.	May 15, 1883. (Temperature at beginning, 47°.2; at end, 47°.2 F.) Declinometer.			Bifilar magnetometer.			Balance magnetometer.			Time.	June 1, 1883. (Temperature at beginning, 45°.5; at end, 48°.5 F.) Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s		0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.										*h. m.*									
7 0	467	468	468	432	432	429	472	472	472	8 0	485	488	485	339	330	340	535	535	535
7 1	468	468	468	427	426	426	472	472	472	8 1	488	485	488	344	347	348	535	535	535
7 2	468	468	468	424	424	424	472	472	472	8 2	486	487	486	350	356	356	535	535	535
7 3	468	468	468	424	425	424	472	472	472	8 3	488	486	487	352	350	355	535	535	535
7 4	467	467	467	424	426	430	472	472	472	8 4	487	487	486	360	360	355	535	535	535
7 5	467	468	468	429	429	428	472	472	472	8 5	486	485	485	353	356	363	535	535	535
7 6	468	468	468	430	431	431	472	472	472	8 6	485	485	485	365	364	361	535	535	535
7 7	468	468	468	430	428	428	472	473	473	8 7	484	484	484	360	364	367	535	535	535
7 8	468	468	468	430	429	428	473	473	473	8 8	484	484	483	368	366	366	535	535	534
7 9	468	468	468	427	426	426	472	472	472	8 9	483	483	483	367	369	370	534	534	534
7 10	468	468	468	424	422	421	472	472	472	8 10	482	482	482	369	368	369	534	534	534
7 11	468	468	467	422	424	425	472	472	472	8 11	482	481	482	369	369	368	534	534	534
7 12	467	467	467	424	424	423	472	472	472	8 12	481	481	481	368	369	370	534	534	534
7 13	467	467	467	423	424	426	472	472	472	8 13	480	480	480	369	369	369	534	534	534
7 14	468	467	465	424	425	425	472	472	472	8 14	480	479	479	369	369	367	534	534	534
7 15	465	465	465	427	428	429	472	472	472	8 15	479	479	479	366	365	366	534	534	534
7 16	465	465	465	431	431	431	472	472	472	8 16	479	479	479	366	365	365	534	534	533
7 17	465	465	465	431	429	429	472	472	472	8 17	479	479	479	365	365	365	533	533	533
7 18	465	465	465	429	429	429	472	472	472	8 18	479	479	479	365	365	365	533	533	533
7 19	465	465	465	429	429	428	472	472	472	8 19	479	478	478	365	367	368	533	533	533
7 20	465	465	465	427	426	424	472	472	472	8 20	478	478	478	369	370	370	533	533	533
7 21	465	465	465	425	427	427	472	471	471	8 21	478	478	478	370	370	370	533	533	533
7 22	465	465	465	428	426	426	471	472	472	8 22	478	478	478	370	370	369	533	533	533
7 23	465	467	467	426	426	427	471	471	472	8 23	478	477	478	371	371	372	533	533	533
7 24	467	465	465	427	423	424	472	471	471	8 24	478	477	477	373	374	374	533	533	533
7 25	465	465	465	424	424	426	471	471	471	8 25	477	477	477	374	374	375	533	533	533
7 26	465	465	465	426	426	426	471	471	471	8 26	477	477	477	376	375	374	533	533	533
7 27	465	465	465	426	426	426	471	471	470	8 27	477	477	477	373	373	373	533	533	533
7 28	465	465	465	426	428	426	470	470	470	8 28	477	477	476	373	373	374	533	533	533
7 29	465	465	465	426	427	428	470	470	470	8 29	476	476	476	374	375	375	533	533	533
7 30	465	465	465	429	428	428	470	469	469	8 30	476	476	476	375	375	375	533	533	533
7 31	465	465	465	428	431	431	469	469	469	8 31	476	476	477	375	374	372	533	533	533
7 32	465	465	465	431	431	431	469	469	469	8 32	477	477	477	372	372	372	533	533	533
7 33	465	465	465	431	430	430	469	469	469	8 33	476	477	477	373	373	373	533	533	533
7 34	465	465	465	429	429	428	469	469	469	8 34	477	476	476	374	374	376	533	533	533
7 35	465	465	465	426	425	425	469	469	469	8 35	476	476	476	377	378	379	533	533	532
7 36	465	465	465	425	425	425	469	469	469	8 36	476	476	476	379	378	377	532	532	532
7 37	467	465	465	425	423	423	469	469	469	8 37	476	476	476	376	375	374	532	532	532
7 38	465	465	465	423	424	426	469	468	468	8 38	476	475	475	373	371	371	532	532	532
7 39	465	465	465	425	424	424	468	468	468	8 39	475	475	475	371	371	371	532	532	532
7 40	465	465	465	425	425	425	468	468	468	8 40	475	475	475	371	372	372	532	532	532
7 41	465	465	465	424	423	423	468	468	468	8 41	475	475	475	374	374	375	532	532	532
7 42	465	465	467	421	423	423	468	468	468	8 42	475	476	476	375	374	376	532	532	532
7 43	467	467	467	420	420	421	468	468	468	8 43	476	476	476	376	377	377	532	532	532
7 44	467	467	467	421	421	421	468	468	468	8 44	476	476	475	378	378	377	532	532	532
7 45	465	465	465	422	422	423	468	468	468	8 45	475	475	475	376	377	379	532	532	532
7 46	467	467	467	422	422	422	468	468	468	8 46	475	474	474	379	379	378	532	532	532
7 47	467	467	467	422	222	423	468	468	468	8 47	475	475	474	379	380	380	532	532	532
7 48	467	467	467	424	420	420	468	468	468	8 48	474	474	475	379	378	379	532	532	532
7 49	466	466	466	420	421	421	468	468	468	8 49	474	475	475	380	382	382	532	532	532
7 50	466	466	466	421	423	423	468	468	467	8 50	475	475	475	382	384	385	532	532	532
7 51	466	466	466	423	422	421	467	467	467	8 51	475	474	474	386	385	385	532	532	532
7 52	466	466	466	422	421	421	467	467	467	8 52	475	475	475	385	385	387	532	532	532
7 53	467	467	467	420	419	418	467	467	467	8 53	476	475	475	388	388	386	532	532	532
7 54	467	467	467	418	418	417	467	467	467	8 54	475	475	475	385	385	385	532	532	532
7 55	467	467	467	415	413	412	467	467	467	8 55	475	475	475	386	383	381	532	532	532
7 56	467	467	467	412	413	414	467	467	467	8 56	475	475	475	381	381	382	532	532	532
7 57	467	467	467	414	414	414	467	467	467	8 57	475	474	474	381	379	378	532	532	532
7 58	467	467	467	411	411	409	467	467	467	8 58	474	474	474	377	376	377	532	533	532
7 59	467	467	467	408	408	406	467	467	467	8 59	474	473	473	377	377	377	532	532	532

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

June 15, 1883. (Temperature at beginning, 49°.0; at end, 49°.2 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0°	20°	40°	0°	20°	40°	0°	20°	40°
h. m.									
9 0	477	477	476	394	390	386	524	524	524
9 1	477	476	476	383	383	386	524	524	524
9 2	476	476	476	389	386	380	524	524	524
9 3	476	476	475	380	383	387	524	524	524
9 4	476	476	476	387	385	385	524	524	524
9 5	477	477	477	388	390	390	524	524	524
9 6	477	477	476	388	387	387	524	524	524
9 7	476	476	476	387	386	384	524	524	524
9 8	476	476	475	384	384	385	524	524	524
9 9	475	475	475	386	386	386	524	524	524
9 10	475	475	474	388	390	391	524	524	524
9 11	474	474	474	393	394	395	524	524	524
9 12	474	474	474	397	399	400	524	524	524
9 13	474	474	475	400	401	402	524	524	524
9 14	475	475	476	402	402	401	524	524	524
9 15	476	476	476	401	400	400	524	524	524
9 16	476	477	477	400	400	400	524	524	524
9 17	477	477	477	399	399	400	524	524	524
9 18	477	477	476	400	399	399	524	524	524
9 19	476	476	476	398	399	399	524	524	524
9 20	476	476	475	398	395	395	524	524	524
9 21	476	476	476	396	396	395	524	524	524
9 22	475	476	476	394	395	396	524	524	524
9 23	476	476	475	396	394	394	524	524	524
9 24	475	475	475	393	393	393	524	524	524
9 25	475	475	474	392	392	392	524	524	524
9 26	474	474	474	392	393	394	524	524	524
9 27	474	474	474	394	394	394	524	524	524
9 28	474	474	474	395	396	398	524	524	524
9 29	474	474	474	398	398	398	524	524	524
9 30	474	474	474	399	399	399	524	524	524
9 31	474	474	475	398	398	397	524	524	524
9 32	475	475	475	396	396	396	524	524	524
9 33	475	474	475	396	395	395	524	524	524
9 34	475	475	475	394	394	393	524	524	524
9 35	475	475	475	392	392	392	524	524	524
9 36	475	475	476	393	393	394	524	524	524
9 37	476	476	476	394	393	394	524	524	524
9 38	476	476	476	394	393	393	524	524	524
9 39	476	476	476	393	393	394	524	524	524
9 40	476	476	477	394	394	393	524	524	524
9 41	477	477	477	394	394	394	524	524	524
9 42	477	476	476	393	394	394	524	524	524
9 43	477	477	477	394	394	393	524	524	524
9 44	477	477	477	392	392	392	524	524	524
9 45	477	477	477	392	392	393	524	524	524
9 46	476	476	476	394	395	396	524	524	524
9 47	476	476	476	397	398	398	524	524	524
9 48	476	476	476	400	400	401	524	524	524
9 49	476	476	476	402	402	403	524	524	524
9 50	476	476	476	403	403	403	524	524	524
9 51	476	475	475	404	404	404	524	524	524
9 52	475	475	475	404	404	404	524	524	524
9 53	474	474	474	405	405	405	524	524	524
9 54	474	474	474	405	406	406	524	524	524
9 55	474	474	474	406	406	406	524	524	524
9 56	474	474	474	406	405	405	524	524	524
9 57	474	474	474	405	405	405	524	524	524
9 58	474	474	474	405	405	406	524	524	524
9 59	474	474	474	406	406	406	524	524	524

July 1, 1883. (Temperature at beginning, 53°.5; at end, 53°.2 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0°	20°	40°	0°	20°	40°	0°	20°	40°
h. m.									
10 0	473	469	469	160	185	182	509	509	509
10 1	453	441	442	188	198	245	509	509	509
10 2	445	445	429	264	272	282	510	510	509
10 3	418	417	415	279	278	305	509	509	509
10 4	432	450	447	353	369	310	510	510	509
10 5	452	428	420	207	128	180	508	507	506
10 6	416	394	405	295	328	305	507	507	509
10 7	418	414	433	325	382	391	510	510	509
10 8	438	468	447	307	175	67	508	508	506
10 9	465	447	468	5	110	142	506	506	507
10 10	461	453	462	143	147	194	508	508	509
10 11	460	457	466	257	249	196	509	510	510
10 12	458	454	467	175	204	255	510	509	509
10 13	406	482	482	274	218	137	509	509	508
10 14	483	478	474	103	140	198	508	508	508
10 15	471	480	466	189	141	112	508	508	508
10 16	457	454	449	154	232	301	508	509	510
10 17	445	452	460	295	266	262	510	510	511
10 18	454	459	458	271	261	255	510	511	511
10 19	462	465	467	257	278	270	511	511	511
10 20	462	459	455	226	225	275	511	511	511
10 21	452	454	451	327	342	320	511	512	512
10 22	455	460	468	304	317	336	512	512	513
10 23	478	484	487	341	325	314	513	513	514
10 24	493	492	493	315	315	307	513	513	513
10 25	487	486	484	296	292	293	513	512	512
10 26	483	484	479	297	300	293	512	512	511
10 27	478	473	468	294	302	302	511	511	511
10 28	462	459	452	292	284	304	510	510	510
10 29	451	448	454	347	379	390	511	512	512
10 30	458	457	458	360	336	318	512	512	512
10 31	457	460	458	322	332	317	512	512	511
10 32	458	468	464	282	264	276	511	511	511
10 33	464	455	464	293	280	245	511	511	510
10 34	457	455	448	220	231	264	510	510	510
10 35	453	442	444	262	274	256	511	511	511
10 36	432	442	448	255	261	243	510	511	511
10 37	447	449	454	206	192	216	511	511	512
10 38	449	455	448	209	188	168	512	512	512
10 39	452	442	440	158	154	186	512	512	512
10 40	436	435	438	245	258	244	513	513	513
10 41	442	438	429	245	217	249	513	513	513
10 42	428	445	427	267	261	224	513	513	513
10 43	416	420	418	222	280	340	513	513	513
10 44	419	418	416	344	304	286	514	514	514
10 45	415	417	415	320	351	334	514	515	515
10 46	416	415	412	296	293	311	515	515	515
10 47	414	416	422	323	314	290	515	515	515
10 48	426	426	428	282	307	330	516	516	516
10 49	435	436	430	315	258	231	516	516	516
10 50	434	430	432	256	290	278	516	516	516
10 51	426	430	427	242	229	240	516	516	516
10 52	428	422	426	269	285	286	516	516	516
10 53	421	417	414	282	290	312	516	517	517
10 54	415	414	416	329	331	329	517	517	518
10 55	415	414	413	341	367	380	518	518	519
10 56	416	419	421	388	377	371	519	519	519
10 57	422	423	425	376	382	379	519	520	520
10 58	426	429	432	374	368	364	520	520	520
10 59	434	427	432	364	369	374	520	520	520

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

July 15, 1883. (Temperature at beginning, 51°.2; at end, 58°.2 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	4 •	0s	20s	40s	0s	20s	40s
h. m.									
11 0	475	474	475	414	418	428	545	545	545
11 1	476	476	477	432	426	418	545	545	545
11 2	477	478	478	417	424	429	546	546	546
11 3	479	479	479	426	422	425	546	546	546
11 4	479	479	479	430	433	432	546	546	546
11 5	479	480	481	431	431	434	546	546	546
11 6	481	482	483	438	437	435	546	546	546
11 7	483	484	483	435	436	436	546	546	546
11 8	483	482	481	434	429	428	546	546	546
11 9	481	480	480	430	431	431	546	546	545
11 10	479	478	478	430	430	430	545	545	546
11 11	477	477	477	429	428	426	545	545	545
11 12	476	476	477	426	425	424	545	545	545
11 13	477	477	477	425	429	432	545	545	545
11 14	476	476	475	434	433	432	545	545	545
11 15	475	474	473	433	432	431	545	545	545
11 16	472	472	471	430	430	430	545	545	545
11 17	471	471	471	430	430	428	545	544	545
11 18	470	470	470	427	426	426	545	545	545
11 19	469	469	469	425	425	425	544	544	544
11 20	469	469	469	425	426	426	544	544	544
11 21	469	469	469	427	429	430	544	544	544
11 22	469	469	469	431	431	431	545	545	545
11 23	468	468	468	431	432	431	544	544	544
11 24	468	468	468	431	431	430	544	542	543
11 25	468	468	467	430	431	430	543	544	544
11 26	467	467	467	430	430	430	544	544	544
11 27	468	468	468	431	431	431	544	544	544
11 28	468	468	469	431	431	431	544	544	544
11 29	469	469	469	431	431	431	544	544	544
11 30	470	470	470	432	432	431	544	544	544
11 31	470	470	471	431	431	431	544	544	544
11 32	471	471	471	430	430	429	544	544	544
11 33	471	471	471	429	428	428	544	544	544
11 34	471	471	471	428	427	427	544	544	544
11 35	471	471	471	427	428	427	544	544	544
11 36	471	471	471	427	426	427	544	544	544
11 37	471	471	471	427	427	426	544	544	544
11 38	471	471	471	425	425	425	544	544	544
11 39	471	471	471	425	424	424	544	544	544
11 40	471	472	472	423	422	421	544	544	444
11 41	472	472	472	420	419	419	544	544	544
11 42	472	472	472	418	416	414	544	544	544
11 43	472	473	473	413	413	413	544	544	544
11 44	473	473	473	412	411	411	544	544	544
11 45	473	472	472	411	411	411	544	544	544
11 46	472	472	472	411	412	412	544	544	544
11 47	472	472	471	413	414	415	544	544	544
11 48	471	471	471	415	415	416	544	544	544
11 49	471	471	471	417	417	417	544	544	544
11 50	471	471	471	418	418	410	544	544	544
11 51	471	471	471	419	419	420	544	544	544
11 52	471	471	471	420	420	420	544	544	544
11 53	471	472	472	420	420	419	543	543	543
11 54	472	472	472	419	419	419	543	543	543
11 55	472	472	472	418	418	418	543	543	543
11 56	473	473	473	418	417	417	543	543	543
11 57	472	472	472	416	416	415	543	543	513
11 58	472	472	472	414	413	413	543	543	543
11 59	472	473	473	412	412	411	543	543	543

August 1, 1883. (Temperature at beginning, 48°.2; at end, 48°.8 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0s	20s	40s	0s	20s	40s	0s	20s	40s
h. m.									
12 0	384	386	387	570	545	525	551	550	550
12 1	382	386	387	612	495	462	550	548	548
12 2	386	386	390	442	429	424	548	547	547
12 3	392	393	395	409	394	386	547	547	547
12 4	394	396	392	390	393	384	546	546	546
12 5	390	390	392	370	358	361	546	546	546
12 6	389	387	390	379	390	389	546	546	546
12 7	382	373	371	386	394	402	546	546	546
12 8	365	361	362	400	387	369	545	545	545
12 9	364	369	373	356	375	405	545	545	546
12 10	380	386	392	431	445	450	547	548	548
12 11	398	402	406	451	460	459	548	549	549
12 12	410	412	415	444	431	433	549	549	549
12 13	418	420	422	442	446	440	549	549	549
12 14	424	425	424	432	429	430	549	549	549
12 15	424	427	429	430	428	424	549	549	549
12 16	432	434	436	424	426	430	549	549	549
12 17	439	444	448	427	425	427	549	549	549
12 18	455	461	465	420	397	365	549	550	550
12 19	470	473	475	347	337	326	549	549	549
12 20	476	475	475	312	300	294	549	549	549
12 21	475	475	475	286	277	267	549	549	549
12 22	475	474	475	261	259	258	549	549	549
12 23	476	477	479	251	241	231	549	549	549
12 24	478	476	475	229	231	236	549	549	549
12 25	471	469	467	247	260	278	549	549	549
12 26	466	462	461	298	315	329	549	549	550
12 27	456	454	451	345	360	377	550	550	550
12 28	450	449	449	385	385	386	550	550	550
12 29	448	446	442	392	403	415	550	551	551
12 30	440	437	436	421	426	430	551	551	551
12 31	434	434	434	435	442	452	551	551	551
12 32	437	437	440	455	458	462	552	552	552
12 33	441	443	442	471	482	488	552	553	553
12 34	442	441	438	495	502	510	553	554	554
12 35	432	428	425	521	529	530	554	553	553
12 36	420	416	412	526	526	535	553	553	553
15 37	408	403	400	544	544	542	553	553	553
12 38	400	401	404	545	548	545	553	553	553
12 39	406	409	410	540	546	558	554	554	554
12 40	414	414	415	566	567	564	554	554	554
12 41	417	419	422	566	561	574	554	554	554
12 42	426	430	436	570	562	556	554	554	554
12 43	440	442	444	553	552	549	554	554	554
12 44	446	448	450	542	535	529	553	553	553
12 45	451	454	454	522	515	510	553	553	552
12 46	454	455	456	506	504	504	552	552	552
12 47	456	457	457	511	520	528	552	552	552
12 48	456	455	454	527	521	517	552	551	551
12 49	454	450	449	521	526	524	551	551	550
12 50	449	451	454	516	514	519	550	550	550
12 51	455	455	456	529	531	524	550	550	550
12 52	455	455	455	511	503	506	550	550	550
12 53	458	459	459	510	507	504	550	550	550
12 54	459	460	457	509	520	521	550	550	550
12 55	456	452	451	522	527	539	550	550	550
12 56	450	449	449	550	552	552	550	550	549
12 57	447	446	443	544	544	546	549	549	549
12 58	442	440	441	549	554	557	549	549	549
12 59	442	445	446	550	556	552	549	549	549

Readings of the Brooke instruments at Uglaamie, Alaska—Continued.

August 15, 1883.
(Temperature at beginning, 50°.0; at end, 50°.8 F.)

Time.	Declinometer.			Bifilar magnetometer.			Balance magnetometer.		
	0ᵐ	20ᵐ	40ᵐ	0ᵐ	20ᵐ	40ᵐ	0ᵐ	20ᵐ	40ᵐ
h. m.									
13 0	470	470	470	750	800	830	549	549	549
13 1	470	470	472	740	730	750	549	549	549
13 2	472	473	473	782	770	743	549	549	549
13 3	474	475	476	745	765	772	549	548	548
13 4	475	476	475	750	743	755	548	548	548
13 5	476	475	476	705	760	750	548	548	548
13 6	476	476	476	752	761	762	548	548	548
13 7	476	475	475	755	753	758	548	548	548
13 8	475	474	473	761	757	754	548	548	548
13 9	473	472	472	756	757	755	548	548	548
13 10	471	470	470	751	750	751	548	548	548
13 11	470	470	471	752	751	750	548	548	548
13 12	471	472	472	750	751	748	548	548	548
13 13	473	473	474	747	746	747	548	548	548
13 14	474	473	474	746	744	745	548	548	548
13 15	474	475	475	746	747	747	548	548	547
13 16	475	475	474	747	747	747	547	547	547
13 17	474	474	474	747	748	748	547	547	547
13 18	473	473	473	748	747	746	547	547	547
13 19	473	473	473	746	745	743	547	547	547
13 20	473	473	474	743	742	742	547	547	547
13 21	474	474	474	741	741	740	547	547	547
13 22	473	473	473	740	739	739	547	547	547
13 23	473	473	473	739	738	737	547	547	547
13 24	474	474	474	737	737	736	547	547	547
13 25	475	475	475	734	734	735	547	547	547
13 26	476	476	476	736	735	734	547	547	547
13 27	476	476	475	735	735	735	547	547	547
13 28	475	474	474	734	735	736	547	547	547
13 29	474	474	473	736	736	736	547	547	547
13 30	473	473	473	736	737	737	547	547	547
13 31	474	474	474	737	736	736	547	547	547
13 32	474	474	475	736	735	735	547	547	547
13 33	475	475	475	735	735	735	547	547	547
13 34	475	476	476	735	734	734	547	547	547
13 35	477	478	478	734	733	733	547	547	547
13 36	478	478	478	733	733	734	547	547	547
13 37	478	478	478	735	735	736	547	547	547
13 38	479	479	479	736	736	737	547	547	547
13 39	479	479	479	737	736	736	547	547	547
13 40	479	480	480	736	735	735	547	547	547
13 41	480	480	480	735	735	735	547	547	547
13 42	481	481	481	734	734	734	547	547	547
13 43	481	481	481	735	735	734	547	547	547
13 44	481	481	481	734	734	733	547	547	547
13 45	481	481	481	733	733	735	547	547	457
13 46	481	481	481	737	737	737	547	547	548
13 47	481	481	481	737	737	737	548	548	548
13 48	481	482	482	737	738	738	548	548	548
13 49	482	482	482	738	737	736	548	548	548
13 50	482	483	482	737	736	736	547	548	548
13 51	482	482	483	735	734	734	548	548	547
13 52	483	483	484	734	733	732	547	547	547
13 53	484	484	484	732	732	731	548	548	548
13 54	484	484	483	731	731	731	548	548	548
13 55	483	483	483	731	731	731	548	548	548
13 56	483	484	484	732	732	732	548	548	548
13 57	484	484	484	731	732	733	548	547	547
13 58	484	484	484	731	729	729	547	547	547
13 59	483	483	483	734	736	738	547	547	547

APPENDIX No. 1.

RECORD AND REDUCTION OF ASTRONOMICAL OBSERVATIONS MADE AT THE UNITED STATES POLAR STATION, UGLAAMIE, POINT BARROW, ALASKA, IN 1881-'82-'83, IN CONNECTION WITH MAGNETIC WORK.

[Computation by J. G. Porter, January 12, 1884. A. C. Dark, observer.]

[November 16, 1881. Altitudes of Jupiter. Stackpole theodolite. Chronometer, Bond 235 (sidereal).]

Time.				*Altitude.*	
10h	44m	42s	D =	28	18 .3
	48	28 .5			30 .0
11	05	50 .5	R =	31	01 .7
	14	26			30 .5
10	58	22		29	50 .1
			Refraction =		—1 .7
			z =	60	11 .6
			ϕ =	71	17 .7
			δ =	16	45 .3

$2s$ =	148° 14'.6	$\tan^2 \frac{1}{2}t$ =	9. 1941		
s =	74 07 .3	t =	43° 10'		
$s-\phi$ =	2 49 .6	43° 10' =	2h	52m	40s
$s-\delta$ =	57 22	a =	3	14	06
$s-z$ =	13 55 .7				
		Sid. t. =	0	21	26
$\sin(s-\phi)$ =	8. 6929	Ch. t. =	10	58	22
$\sin(s-\delta)$ =	9. 9254				
$\sec(s-z)$ =	0. 0130	ΔT =	—10	36	56
$\sec s$ =	0. 5628	or	+1	23	04

[November 28, 1881. Equal altitudes of Jupiter. Stackpole theodolite. Chronometer, Negus 544.]

Before culmination.	*After culmination.*
8h 10m 46s	9h 14m 12s.5
16 32 .5	08 26
19 53 .5	05 05
24 23 .5	00 35
30 00	8 54 58 .5

Chron. time of culmination.	8h	42m	29s
a =	3	07	41
Long. from Washington....	5	18	27
Washington sidereal time..	8	26	08
Sidereal time of noon	16	30	56
Sidereal interval	15	55	12
Sidereal into solar..........		—2	37
Mean time interval.........	15	52	35
Long. from Washington....	5	18	27
Local mean time............	10	34	08
Chronometer	8	42	29
ΔT =	+1	51	39

[November 30, 1881. Equal altitudes of Saturn. Stackpole theodolite. Chronometer, Negus 544.]

Before culmination.	*After culmination.*
7h 49m 48s.5	8h 01m 40s.5
52 19 .5	7 59 09 .5
53 09 .5	58 19 .5
55 01 .5	56 27 .5

Chron. time of culmination.	7h	55m	44s.5
a =	2	21	05
Long. from Washington....	5	18	27
Washington sidereal time..	7	39	32
Sidereal time of noon	16	38	49
Sidereal interval	15	00	43
Sidereal into solar..........		—2	28
Mean time interval.........	14	58	15
Long. from Washington....	5	18	27
Local mean time	9	39	38
Chronometer	7	55	44
ΔT =	+1	44	04

[January 24, 1882. Equal altitudes of Mars. Stackpole theodolite. Chronometer, Fletcher 1713.]

Before culmination.	*After culmination.*
7h 21m 21s	7h 33m 17s
21 58 .5	32 43 .5
22 33 .3	32 10
23 06 .4	31 36 .5
23 42 .5	31 01

Chron. time of culmination.	7h	27m	21s
a =	5	48	26
Long. from Washington....	5	18	27
Washington sidereal time..	11	06	53
Sidereal time of noon	20	15	40
Sidereal interval	14	51	13
Sidereal into solar..........		—2	26
Mean time interval.........	14	48	47
Long. from Washington....	5	18	27
Local mean time............	9	30	20
Chronometer	7	27	21
ΔT =	+2	02	59

[February 4, 1882. Equal altitudes of Mars. Stackpole theodolite. Chronometer, Fletcher 1713.]

Before culmination.	*After culmination.*
6h 33m 30s	6h 53m 41s.5
34 03	53 08
34 36	52 35
35 09	52 02
35 42	51 28 .5

Chron. time of culmination.	6h	43m	35s.5
a =	5	46	34 .5
Long. from Washington....	5	18	27
Washington sidereal time..	11	05	01 .5
Sidereal time of noon	20	59	02
Sidereal interval	14	05	59 .5
Sidereal into solar..........		—2	18 .5
Mean time interval.........	14	03	41
Long. from Washington....	5	18	27
Local mean time............	8	45	14
Chronometer	6	43	35 .5
ΔT =	+2	01	38 .5

[February 10, 1882. Equal altitudes of α Orionis. Stackpole theodolite. Chronometer, Hutton 312 (sidereal).]

Before culmination.	*After culmination.*
15h 57m 23s	16h 20m 30s
57 54	19 57
58 25	19 26 .5
58 56	18 56
59 27	18 23

Chron. time of culmination.	16h	08m	56s
a =	5	48	49
ΔT =	—10	20	07
or	+1	39	53

[February 21, 1882. Equal altitudes of ϵ Orionis. Stackpole theodolite. Chronometer, Hutton 312 (sidereal).]

Before culmination.	*After culmination.*
15h 44m 22s	16h 03m 19s.5
44 50	02 44
45 23 .5	02 11 .5
45 55	01 36
46 25	00 59

Chron. time of culmination.	15h	53m	47s
a =	5	30	16
ΔT =	—10	23	31
or	+1	36	29

[March 2, 1882. Equal altitudes of Mars. Stackpole theodolite. Chronometer, Hutton 312 (sidereal).]

Before culmination.	*After culmination.*
16h 10m 01s	16h 48m 41s
10 36	48 06 .5
11 10	47 34
11 42 .5	46 59 .5
12 19	46 23

Chron. time of culmination.	16h	29m	21s
a =	6	06	00
ΔT =	—10	23	21
or	+1	36	39

[March 11, 1882. Equal altitudes of β Canis Minoris. Stackpole theodolite. Chronometer, Fletcher 1713.]

Before culmination.	*After culmination.*
5h 56m 05s.5	6h 06m 58s
56 37 .5	06 27 .5
57 09	05 57 .5
57 30 .5	05 26
58 09 .5	04 56

Chron. time of culmination.	6h	01m	33s
a =	7	20	44
Long. from Washington.....	5	18	27
Washington sidereal time...	12	39	11
Sidereal time of noon	23	17	01
Sidereal interval	13	22	10
Sidereal into solar...........		—2	11
Mean time interval	13	10	50
Long. from Washington.....	5	18	27
Local mean time	8	01	32
Chronometer.................	6	01	33
ΔT =	+1	59	59

[March 30, 1882. Equal altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Before culmination.	*After culmination.*
9h 57m 40s	11h 10m 55s
10 01 01 .5	07 31 .5
04 23 .5	04 07

	10h	34m	16s
Correction for $\Delta\delta$............			—42
Chron. time of culmination.	10	33	34
Mean time of culmination ..	12	04	23
ΔT =	+1	30	49

RECORD AND REDUCTION OF ASTRONOMICAL OBSERVATIONS—Continued.

[April 11, 1882. Altitudes of sun. Chevallier sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
1h 32m 37s.5	⊙ 42° 25′
33 16	20
33 40.5	15
34 35	10
35 12	05
35 35.5	00
1 37 25	⊙ 42 55
38 13	50
38 39.5	45
39 30.5	40
40 08.5	35
1 34 11	⊙ 42 12.5
38 47	⊙ 42 45
Mean 1 36 29	⊖ 42 28.8

On arc 31′ 00″	Index correc. +1.0
Off arc 33 00	h' = 21 14.9
	Refraction = −1.0
In. cor. + 1′	z = 68 46.1
	ϕ = 71 17.7
	δ = 8 35.2
	$2s$ = 148 39.0
	s = 74 19.5
	$s-\phi$ = 3 01.8
	$s-\delta$ = 65 44.3
	$s-Z$ = 5 33.4
	sin $(s-\phi)$ 8.7231
	sin $(s-\delta)$ 9.9598
	sec $(s-z)$ 0.0021
	sec s 0.5683
	$\tan^2 \frac{1}{2}t$ 9.2533
	t = 45° 54′
	= 3h 03m 36s
	Equation of time = +54
Local mean time	3 04 30
Chronometer time	1 36 29
	ΔT = +1 28 01

[April 17, 1882. Altitudes of sun. Chevallier sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
8h 38m 01s	⊙ 53° 21′
38 55	24.5
39 31	28.8
40 45	35.0
41 38.5	40.0
42 38	45.0
Mean 8 40 15	53 32.4

	Index = +1.0
On arc 31′ 00″	
Off arc 33 00	h' = 26 46.7
	Refraction = −2.0
In. cor. +1′	Semidiam. = +15.9
	z = 62 59.4
	ϕ = 71 17.7
	δ = 10 39.3
	$2s$ = 144 56.4
	s = 72 28.2
	$s-\phi$ = 1 10.5
	$s-\delta$ = 61 48.9
	$s-z$ = 9 28.8
	sin $(s-\phi)$ 8.3119
	sin $(s-\delta)$ 9.9452
	sec $(s-z)$ 0.0060
	sec s 0.5211
	$\tan^2 \frac{1}{2} t$ 8.7842
	t = 27° 43′
	= 1h 50m 52s
	10 09 08
	Equation of time = −34
Local mean time	10 08 34
Chronometer time	8 40 15
	ΔT = +1 28 19

[April 23, 1882. Altitudes of sun. Chevallier sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
8h 03m 57s	⊙ 55° 25′
04 50	30
05 37	35
06 28	40
07 00.5	45
07 59.5	55
Mean 8 05 59	55 38.3

	Index = +1.0
	h' = 27 49.6
	Refraction = −1.8
	Semi diam. = −15.9
	z = 62 28.1
	ϕ = 71 17.7
	δ = 12 42.1
	$2s$ = 146 27.9
	s = 73 14.0
	$s-\phi$ = 1 56.3
	$s-\delta$ = 60 31.9
	$s-z$ = 10 45.9
	sin $(s-\phi)$ 8.5292
	sin $(s-\delta)$ 9.9398
	sec $(s-z)$ 0.0077
	sec s 0.5399
	$\tan^2 \frac{1}{2} t$ 9.0106
	t = 35° 44′
	= 2h 22m 56s
	9 37 04
	Equation of time = −1 50
Local mean time	9 35 14
Chronometer time	8 05 59
	ΔT = +1 29 15

[April 28, 1882. Altitudes of sun. Blunt sextant. Chronometer, Fletcher 1713.]

Time.	*Double altitudes.*
7h 32m 54s	⊙ 57° 30′
33 42	35
34 33	40
35 22	45
7 37 36	⊙ 59 05
38 24	10
39 10	15
39 56	20
Mean 7 36 27	⊖ 58 25

	Index = −2.8
On arc 35′ 15″	
Off arc 29 40	h' = 29 11.1
	Refraction = −1.7
In. cor. −2′.8	
	z = 60 50.6
	ϕ = 71 17.7
	δ = 14 18.6
	$2s$ = 146 26.9
	s = 73 13.5
	$s-\phi$ = 1 55.8
	$s-\delta$ = 58 54.9
	$s-z$ = 12 22.9
	sin $(s-\phi)$ 8.5274
	sin $(s-\delta)$ 9.9327
	sec $(s-z)$ 0.0102
	sec s 0.5397
	$\tan^2 \frac{1}{2}t$ 9.0100
	t = 35° 28′.5
	= 2h 21m 54s
	9 38 06
	Equation of time = −2 41
Local mean time	9 35 25
Chronometer time	7 36 27
	ΔT = +1 58 58

[May 16, 1882. Altitudes of sun. Blunt sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
7h 46m 07s	⊙ 65° 15′
47 07	20
47 46.5	25
48 26.5	30
49 05	35
49 47.7	40
Mean 7 48 03	65 27.5

	Index = −2.8
	h' = 32 42.4
	Refraction = −1.5
	Semi diam. = +15.8
	Z = 57 03.3
	ϕ = 71 17.7
	δ = 19 12.9
	$2s$ = 147 33.9
	s = 73 47.0
	$s-\phi$ = 2 29.3
	$s-\delta$ = 54 34.1
	$s-z$ = 16 43.7
	sin $(\delta-\phi)$ 8.6376
	sin $(s-\delta)$ 9.9110
	sec $(s-z)$ 0.0188
	sec s 0.5540
	$\tan^2 \frac{1}{2}t$ 9.1214
	t = 39° 58′
	2h 39m 52s
	9 20 08
	Equation of time = −3 51
Local mean time	9 16 17
Chronometer time	7 48 03
	ΔT = +1 28 14

[May 23, 1882. Altitudes of sun. Blunt sextant. Chronometer, Fletcher, 1713.]

Time.	*Double altitudes.*
12h 06m 42s.5	⊙ 71° 45′
07 15	40
08 51	30
09 35	25
12 17 08	⊙ 71 45
17 50	40
18 51	30
19 36.5	25
Mean 12 13 14	⊖ 71 35.0

	Index = −2.8
	h' = 35 46.1
	Refraction = −1.3
	z = 54 15.2
	ϕ = 71 17.7
	δ = 20 42.8
	$2s$ = 146 15.7
	s = 73 07.8
	$s-\phi$ = 1 50.1
	$s-\delta$ = 52 25.0
	$s-z$ = 18 52.6
	sin $(s-\phi)$ 8.5054
	sin $(s-\delta)$ 9.8990
	sec $(s-z)$ 0.0240
	sec s 0.5373
	$\tan^2 \frac{1}{2}t$ 8.9657
	t = 33° 50′
	2h 15m 20s
	Equation of time = −3 28
Local mean time	2 11 52
Chronometer time	0 13 14
	ΔT = +1 58 38

RECORD AND REDUCTION OF ASTRONOMICAL OBSERVATIONS—Continued.

[May 27, 1882. Altitudes of sun. Blunt sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
7h 49m 55s	⊙̅ 70° 50′
50 34	55
51 15	71 00
51 52	05
52 34	10
53 20 .5	15
54 22	20
7 59 14	⊙̲ 70 50
8 00 02	55
01 10	71 00
01 57 .5	05
02 41 .5	10
03 25	15
04 05 .5	20
Mean 7 56 53	⊖ 71 05 .0

On arc 34′ 00″	
Off arc 23 30	
In. cor. −5′ .8	
Index =	−5 .8
h' =	35 29 .6
Refraction =	−1 .3
z =	54 31 .7
ϕ =	71 17 .7
δ =	21 22 .5
$2s$ =	147 11 .9
s =	73 36 .0
$s-\phi$ =	2 18 .3
$s-\delta$ =	52 13 .5
$s-z$ =	19 04 .3
sin $(s-\phi)$	8. 6041
sin $(s-\delta)$	9. 8978
sec $(s-z)$	0. 0245
sec s	0. 5492
$\tan^2 \frac{1}{2}t$	9. 0756
t =	38° 04′
=	2h 32m 16s
	9 27 44
Equation of time =	−3 05
Local mean time	9 24 39
Chronometer time	7 56 53
ΔT =	+1 27 46

[May 27, 1882. Altitudes of sun. Chevallier sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
8h 22m 51s	⊙̲ 73° 10′
23 47	14
24 43	16
Mean 8 23 47	73 13 .3

On arc 30′ 15″	
Off arc 32 15	
In. cor. +1′	
Index =	+1 .0
h' =	36 37 .2
Refraction =	−1 .3
Semi diam. =	+15 .8
z =	53 08 .3
ϕ =	71 17 .7
δ =	21 23 .0
$2s$ =	145 49 .0
s =	72 54 .5
$s-\phi$ =	1 36 .8
$s-\delta$ =	51 31 .5
$s-z$ =	19 40 .2
sin $(s-\phi)$	8. 4495
sin $(s-\delta)$	9. 8937
sec $(s-z)$	0. 0264
sec s	0. 5318
$\tan^2 \frac{1}{2}t$	8. 9014
t =	31° 32′
=	2h 06m 08s
	9 53 52
Equation of time =	−3 05
Local mean time	9 50 47
Chronometer time	8 23 47
ΔT =	+1 27 00

[June 6, 1882. Altitudes of sun. Blunt sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
8h 06m 07s	⊙̅ 75° 00′
06 54	05
07 27 .5	10
08 10	15
08 49 .5	20
09 40	25
Mean 8 07 51	75 12 .5

On arc 34′ 00″	
Off arc 22 30	
In. cor. −5.8	
Index =	−5 8
h' =	37 33 .8
Refraction =	−1 .3
Semi diam. =	−15 .8
z =	52 43 .3
ϕ =	71 17 .7
δ =	22 42 .6
$2s$ =	146 43 .6
s =	73 21 .8
$s-\phi$ =	2 04 .1
$s-\delta$ =	50 39 .2
$s-z$ =	20 38 .5
sin $(s-\phi)$	8. 5574
sin $(s-\delta)$	9. 8883
sec $(s-z)$	0. 0288
sec s	0. 5431
$\tan^2 \frac{1}{2}t$	9. 0182
t =	35° 47′
=	2h 23m 08s
	9 36 52
Equation of time =	−1 35
Local mean time	9 35 17
Chronometer time	8 07 51
ΔT =	+1 27 26

[June 21, 1882. Altitudes of sun. Blunt sextant. Chronometer, Negus 544.]

Time	*Double altitudes.*
8h 03m 20s	⊙̅ 75 35
04 05	40
04 46	45
05 24	50
06 12	55
06 52	76 00
8 12 51	⊙̲ 75 35
13 40 .5	40
14 30	45
15 20	50
16 05	55
16 50	76 00
Mean 8 10 00	⊖ 75 47 .5

Index =	−5 .8
h' =	37 50 .9
Refraction =	−1 .2
z =	52 10 .3
ϕ =	71 17 .7
δ =	23 24 .9
$2s$ =	146 52 .9
s =	73 26 .5
$s-\phi$ =	2 08 .8
$s-\delta$ =	50 01 .6
$s-z$ =	21 16 .2
sin $(s-\phi)$	8. 5735
sin $(s-\delta)$	9. 8844
sec $(s-z)$	0. 0306
sec s	0. 5452
$\tan^2 \frac{1}{2}t$	9. 0337
t =	36° 23′.5
=	2h 25m 34s
	9 34 26
Equation of time =	+2 10
Local mean time	9 36 36
Chronometer time	8 10 00
ΔT =	+1 26 36

[July 7, 1882. Altitudes of sun. Blunt sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
1h 24m 22s	⊙̲ 74 56′
25 21	50
26 14	45
27 08	40
28 41	30
1 34 56	⊙̅ 74 56
35 42	50
36 26	45
37 12 .5	40
38 49	30
Mean 1 31 29	⊖ 74 44 .2

Index =	0 .0
h' =	37 22 .1
Refraction =	−1 .3
z =	52 39 .2
ϕ =	71 17 .7
δ =	22 31 .5
$2s$ =	146 28 .4
s =	73 14 .2
$s-\phi$ =	1 56 .5
$s-\delta$ =	50 42 .7
$s-z$ =	20 35 .0
sin $(s-\phi)$	8. 5300
sin $(s-\delta)$	9. 8887
sec $(s-z)$	0. 0286
sec s	0. 5399
$\tan^2 \frac{1}{2}t$	8. 9872
t =	34° 37′
=	2h 18m 28s
Equation of time =	+4 41
Local mean time	2 23 09
Chronometer time	1 31 29
ΔT =	+51 40

[August 16, 1882. Altitudes of sun. Blunt sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
8h 30m 42s	⊙̲ 54° 07′
32 18	20
33 08	25
34 07	30
35 25 .5	38
36 58	54
8 38 15	⊙̅ 56 04
41 26	25
42 08	29
8 33 47	⊙̅ 54 29 .0
8 40 36	⊙̲ 56 19 .3
Mean 8 37 12	⊖ 55 24 .2

Index =	0 .0
h' =	27 42 .1
Refraction =	−1 .8
z =	62 19 .7
ϕ =	71 17 .7
δ =	13 35 .9
$2s$ =	147 13 .3
s =	73 36 .6
$s-\phi$ =	2 18 .9
$s-\delta$ =	60 00 7
$s-z$ =	11 16 .9
sin $(s-\phi)$	8. 6063
sin $(s-\delta)$	9. 9376
sec $(s-z)$	0. 0085
sec s	0. 5495
$\tan^2 \frac{1}{2}t$	9. 1019
t =	39° 09′
=	2h 36m 36s
	9 23 24
Equation of time =	+4 01
Local mean time	9 27 25
Chronometer time	8 37 12
ΔT =	+50 13

RECORD AND REDUCTION OF ASTRONOMICAL OBSERVATIONS—Continued.

[September 3, 1882. Altitudes of Sun. Blunt sextant. Chronometer, Negus 544.]

Time.	*Double altitudes.*
1h 25m 59s.2	⊙ 45° 49'.7
28 23 .5	35
30 16	23
31 15	16
32 18	10 .2
33 35	02
1 35 47 .5	⊙ 43 44
37 03 .5	30 .1
38 27	26 .7
39 44	19
40 27	15 .3
42 06	04 .0
1 34 37	⊖ 44 22 .9

On arc 31' 40"
Off arc 33 20
In. cor. +0'.8

Index =	+ .8
h' =	22 11 .8
Refraction =	− 2 .3
z =	67 50 .5
φ =	71 17 .7
δ =	7 18 .5
2s =	146 26 .7
s =	73 13 .4
s − φ =	1 55 .7
s − δ =	65 54 .9
s − z =	5 22 .9
sin (s − φ)	8 .5270
sin (s − δ)	9 .9604
sec (s − z)	0 .0019
sec s	0 .5396
tan² ½t	9 .0289
t =	36° 12'
=	2h 24m 48s
Equation of time =	−57
Local mean time	2 23 51
Chronometer time	1 34 37
ΔT =	+49 14

[September 29, 1882. Altitudes of α Lyræ. Blunt sextant. Chronometer, Bond 235 (sidereal).]

Time.	*Double altitudes.*
8h 27m 28s	94° 52'
29 30	47
32 52	35 .3
36 25	28 .7
38 33	22
8 32 59	94 37 .0

Index =	+ .8
h' =	47 18 .9
Refraction =	— .9
z =	42 42 .0
φ =	71 17 .7
δ =	38 40 .5
2s =	152 40 .2
s =	76 20 .1
s − φ =	5 02 .4
s − δ =	37 39 .6
s − z =	33 38 .1
sin (s − φ)	8 .9438
sin (s − δ)	9 .7860
sec (s − z)	0 .0796
sec s	0 .6266
tan² ½t	9 .4360
t =	55° 10'
=	3h 40m 40s
α =	18 32 59
Local sidereal time	22 13 39
Chronometer time	20 32 59
ΔT =	+1 40 40

[November 1, 1882. Altitudes of α Lyræ. Blunt sextant. Chronometer, Bond 235 (sidereal).]

Time.	*Double altitudes.*
8h 20m 01s.5	96° 58'
20 50 .6	20
22 44	13 .7
24 37 .4	07 .3
25 27 .2	95 30
8 22 44	96 13 .8

Index =	+ .8
h' =	48 07 .3
Refraction =	— .9
z =	41 53 .6
φ =	71 17 .7
δ =	38 40 .5
2s =	151 51 .8
s =	75 55 .9
s − φ =	4 38 .2
s − δ =	37 15 .4
s − z =	34 02 .3
sin (s − φ)	8 .9076
sin (s − δ)	9 .7820
sec (s − z)	0 .0816
sec s	0 .6142
tan² ½t	9 .3854
t =	52° 29'
=	3h 29m 56s
α =	18 32 58
Local sidereal time	22 02 54
Chronometer time	20 22 44
ΔT =	+1 40 10

[December 1, 1882. Altitudes of Jupiter. Blunt sextant. Chronometer, Bond 235 (sidereal).]

Time.	*Double altitudes.*
11h 55m 16s	59° 50'
59 51	60 32
12 05 07	61 20
05 47	26
07 20	40
08 07	47 .2
10 30	62 09
11 13	18 .3
12 05 24	61 22 .8

Index =	+ .8
h' =	30 41 .8
Refraction =	— 1 .6
z =	59 19 .8
φ =	71 17 .7
δ =	23 02 .9
2s =	153 40 .4
s =	76 50 .2
s − φ =	5 32 .5
s − δ =	53 47 .3
s − z =	17 30 .4
sin (s − φ)	8 .9848
sin (s − δ)	9 .9068
sec (s − z)	0 .0206
sec s	0 .6425
tan² ½t	9 .5547
t =	61° 51'
=	4h 07m 24s
α =	5 53 18
Local sidereal time	1 45 54
Chronometer time	0 05 24
ΔT =	+1 40 30

[December 11, 1882. Altitudes of Jupiter. Blunt sextant. Chronometer, Bond 235 (sidereal).]

Time.	*Double altitudes.*
11h 59m 32s	61° 23'.7
12 00 57 .5	36 .5
04 39	62 09 .8
05 45 .5	20 .0
09 29 .5	40 .0
12 04 01	62 02 .0

Index =	+ .8
h' =	31 01 .4
Refraction =	— 1 .6
z =	59 00 .2
φ =	71 17 .7
δ =	23 02 .8
2s =	153 20 .7
s =	76 40 .4
s − φ =	5 22 .7
s − δ =	53 37 .6
s − z =	17 40 .2
sin (s − φ)	8 .9719
sin (s − δ)	9 .9059
sec (s − z)	0 .0209
sec s	0 .6373
tan² ½t	9 .5360
t =	60° 45'
=	4h 03m 00s
α =	5 47 41
Local sidereal time	1 44 41
Chronometer time	0 04 01
ΔT =	+1 40 40

[December 23, 1882. Altitudes of Saturn. Blunt sextant. Chronometer, Bond 235 (sidereal).]

Time.	*Double altitudes.*
9h 03m 00s	43° 59'
05 13 .5	44 20
06 27	31
07 31 .5	41
09 30	59
9 06 20	44 30

Index =	+ 0 .8
h' =	22 15 .4
Refraction =	— 2 .3
z =	67 42 .9
φ =	71 17 .7
δ =	15 30 .7
2s =	154 31 .3
s =	77 15 .6
s − φ =	5 57 .9
s − δ =	61 44 .9
s − z =	9 32 .7
sin (s − φ)	9 .0167
sin (s − δ)	9 .9449
sec (s − z)	0 .0061
sec s	0 .6565
tan² ½t	9 .6242
t =	65° 58'
=	4h 23m 52s
α =	3 12 36
Local sidereal time	22 48 44
Chronometer time	21 06 20
ΔT =	+ 1 42 24

RECORD AND REDUCTION OF ASTRONOMICAL OBSERVATIONS—Continued.

[January 7, 1883. Altitudes of Jupiter. Chevallier sextant. Chronometer, Bond 235 (sidereal).]

Time.		*Double altitudes.*
13h 03m 03s		72° 03'.2
06 37		29
08 17 .5		41
09 40		50
11 50		59
13 07 53		72 36 .4
	Index =	+ .8
	h' =	36 18 .6
	Refraction =	— 1 .3
	z =	53 42 .7
	φ =	71 17 .7
	δ =	22 59 .7
	2s =	148 00 .1
	s =	74 00 .0
	s — φ =	2 42 .3
	s — δ =	51 00 .2
	s — z =	20 17 .3
	sin (s — φ)	8 .6739
	sin (s — δ)	9 .8905
	sec (s — z)	0 .0278
	sec s	0 .5397
	tan² ½t	9 .1519
	t =	41° 17'
		2h 45m 08s
	α =	5 32 27
Local sidereal time..........		2 47 19
Chronometer time		1 07 53
	ΔT =	+1 39 26

[January 25, 1883. Altitudes of Jupiter. Chevallier sextant. Chronometer, Bond 235 (sidereal).]

Time.		*Double altitudes.*
14h 17m 33s		80° 09'
18 30 .5		13
20 10		20
21 16 .5		24 .7
22 48		29 .8
23 48		35
24 45 .5		39 .5
28 52 .5		54 .8
29 42 .5		58
14 23 03		80 31 .5
	Index =	+ .8
	h' =	40 16 .2
	Refraction =	— 1 .1
	z =	49 44 .9
	φ =	71 17 .7
	δ =	22 57 .4
	2s =	144 00 .0
	s =	72 00 .0
	s — φ =	0 42 .3
	s — δ =	49 02 .6
	s — z =	22 15 .1
	sin (s — φ)	8 .0899
	sin (s — δ)	9 .8781
	sec (s — z)	0 .0336
	sec s	0 .5100
	tan² ½t	8 .5116
	t =	20° 26'
		1h 21m 44s
	α =	5 25 19
Local sidereal time		4 03 35
Chronometer time		2 23 03
	ΔT =	+1 40 32

[March 2, 1883. Altitudes of Jupiter. Chevallier sextant. Chronometer, Bond 235 (sidereal).]

Time.		*Double altitudes.*
16h 57m 32s		81° 10'
17 00 44		80 57 .3
02 37 .5		51
03 08		48 .3
05 34		38 .5
17 01 55		80 53 .0
	Index =	+ .8
Sun's disc.		
On arc 31' 10"	h' =	40 26 .9
Off arc 32 50	Refrac. =	— 1 .1
In. cor. +0' .8	z =	49 34 .2
	φ =	71 17 .7
	δ =	23 02 .5
	2s =	143 54 .4
	s =	71 57 .2
	s — φ =	0 39 .5
	s — δ =	48 54 .7
	s — z =	22 23 .0
	sin (s — φ)	8 .0603
	sin (s — δ)	9 .8772
	sec (s — z)	0 .0340
	sec s	0 .5089
	tan² ½t	8 .4804
	t =	19° 44'
		1h 18m 56s
	α =	5 24 14
Local sidereal time...........		6 43 10
Chronometer time............		5 01 55
	ΔT =	+1 41 15

[March 18, 1883. Altitudes of Jupiter. Chevallier sextant. Chronometer, Bond 235 (sidereal).]

Time.		*Double altitudes.*
19h 03m 21s		69° 02'.5
04 55		68 50
07 58		25
10 28		04
12 39		67 44 .7
19 07 52		68 25 .2
	Index =	+ .8
	h' =	34 13 .0
	Refraction =	—1 .4
	z =	55 48 .4
	φ =	71 17 .7
	δ =	23 09 .0
	2s =	150 15 .1
	s =	75 07 .5
	s—φ =	3 49 .8
	s—δ =	51 58 .5
	s—z =	19 19 .1
	sin (s—φ)	8 .8248
	sin (s—δ)	9 .8964
	sec (s—z)	0 .0252
	sec s	0 .5906
	tan² ½t	9 .3370
	t =	49° 59'
	=	3h 19m 56s
	α =	5 29 31
Local sidereal time.......		8 49 27
Chronometer time........		7 07 52
	ΔT =	+1 41 35

[April 16, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Blunt 214 (mean time).]

Time.		*Double altitudes.*
8h 21m 31s.5	☉̲	49° 50'
22 09		55
22 55 .5		50 00
23 35		05
24 22		10
25 12		15
8 26 50 .5	☉̅	51 30
27 38 .5		35
28 27		40
29 20		45
30 15		50
31 09		55
8 26 07	⊖	50 52 .5
	Index =	+ .9
On arc 32' 00"	h' =	25 26 .7
Off arc 33 50	Refraction =	— 2 .0
In. cor. +0'. 9	z =	64 35 .3
	φ =	71 17 .7
	δ =	10 13 .3
	2s =	146 06 .3
	s =	73 03 .2
	s—φ =	1 45 .5
	s—δ =	62 49 .9
	s—z =	8 27 .9
	sin (s—φ)	8 .4869
	sin (s—δ)	9 .9492
	sec (s—z)	0 .0048
	sec s	0 .5354
	tan² ½t	8 .9763
	t =	34° 12'
	=	2h 16m 48s
	α =	9 43 12
Equation of time..		—16
Local mean time		9 42 56
Chronometer time		8 26 07
	ΔT =	+1 16 49

[May 3, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		*Double altitudes.*
9h 02m 07s.5	☉̲	61° 50'
02 56		55
03 48		62 00
04 32		05
05 26		10
9 08 06	☉̅	63 30
09 07		35
10 48		45
11 40		50
12 38		55
9 07 07	⊖	62 51 .5
	Index =	+ .9
On arc 32' 10"	h' =	31 26 .2
Off arc 34 00	Refraction =	—1 .6
In. cor. +0'.9	z =	58 35 .4
	φ =	71 17 .7
	δ =	15 45 .2
	2s =	165 38 .3
	s =	72 49 .2
	s—φ =	1 31 .5
	s—δ =	57 04 .0
	s—z =	14 13 .8
	sin (s—φ)	8 .4251
	sin (s—δ)	9 .9239
	sec (s—z)	0 .0135
	sec s	0 .5296
	tan² ½t	8 .8921
	t =	31° [illegible]'
		2h 04m 52s
	α =	9 55 08
Equation of time.........		—3 17
Local mean time........		9 51 51
Chronometer time........		9 07 07
	ΔT =	+44 44

RECORD AND REDUCTION OF ASTRONOMICAL OBSERVATIONS—Continued.

[May 12, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Blunt 214.]

Time.		Double altitudes.
8h 43m 33s	⊙	68° 00′
44 27		05
45 26		10
46 16		15
8 47 23 .5	$\overline{\odot}$	69 25
48 21 .5		30
49 19		35
50 15		40
8 46 53	⊖	68 50

On arc	32′ 10″
Off arc	34 00
In. cor.	+0′ .9

Index =	+ .9
h′ =	34 25 .4
Refraction =	−1 .4
z =	55 36 .0
φ =	71 17 .7
δ =	18 12 .3
2s =	145 06 .0
s =	72 33 .0
s−φ =	1 15 .3
s−δ =	54 20 .7
s−z =	16 57 .0
sin (s−φ)	8 .3405
sin (s−δ)	9 .9098
sec (s−z)	0 .0193
sec s	0 .5230
tan² ½t	8 .7926
t =	27° 58′
	1h 51m 52s
	10 08 08
Equation of time	− 3 50
Local mean time	10 04 18
Chronometer time	8 46 53
ΔT =	+1 17 25

[May 21, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		Double altitudes.
8h 18m 44s.5	⊙	65° 45′
20 07		55
20 43		66 00
21 28		05
8 27 11	$\overline{\odot}$	67 50
27 54		55
28 37		68 00
29 20		05
8 24 15		66 56 .9

Index =	+ .9
h′ =	33 28 .9
Refraction =	−1 .4
z =	56 32 .5
φ =	71 17 .7
δ =	20 14 .2
2s =	148 04 .4
s =	74 02 .2
s−φ =	2 44 .5
s−δ =	53 48 .0
s−z =	17 29 .7
sin (s−φ)	8 .6797
sin (s−δ)	9 .9068
sec (s−z)	0 .0206
sec s	0 .5605
tan² ½t	9 .1676
t =	41° 58′
	2h 47m 52s
	[illegible] 12 08
Equation of time	− 3 38
Local mean time	9 08 30
Chronometer time	8 24 15
ΔT =	+44 15

[June 6, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		Double altitudes.
8h 56m 12s	⊙	74° 30′
56 56 .5		35
57 42		40
58 33 .5		45
59 24		50
9 01 52	$\overline{\odot}$	76 10
02 46		15
03 35 .5		20
04 21 .5		25
05 15		30
9 00 40	⊖	75 30

On arc	32′ 10″
Off arc	34 00
In. cor.	+0′ .9

Index =	+ .9
h′ =	37 45 .5
Refraction =	− 1 .2
z =	52 15 .7
φ =	71 17 .7
δ =	22 41 .1
2s =	146 14 .5
s =	73 07 .2
s−φ =	1 49 .5
s−δ =	50 26 .1
s−z =	20 51 .5
sin (s−φ)	8 .5031
sin (s−δ)	9 .8870
sec (s−z)	0 .0294
sec s	0 .5370
tan² ½t	8 .9565
t =	33° 29′
	2h 13m 56s
	9 46 04
Equation of time	− 1 35
Local mean time	9 44 29
Chronometer time	9 00 40
ΔT =	+43 49

[June 19, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		Double altitudes.
3h 15m 51s.5	⊙	63° 00′
16 30 .5		62 55
16 58		50
17 34 .5		45
18 10		40
18 42		35
3 20 46		63 20
21 52 .5		10
22 27		05
22 59		00
24 06		62 50
25 50 .5		35
3 20 09		62 53. 8

Index =	+0 .4
On arc =	31′ 10″
Off arc =	32 00
Index cor. =	+0′ .4
h′ =	31 27 .1
Refr. =	−1 .6
z =	58 34.5
φ =	71 17.7
δ =	23 26.5
2s =	153 18.7
s =	76 39.4
s − φ =	5 21.7
s − δ =	18 04.9
sin (s − φ)	8. 9705
sin (s − δ)	9. 9036
sec (s − z)	0. 0220
sec s	0. 6368
tan² ½t	9. 5329
t =	60° 34′
	= 4h 02m 16s
Equat'n of time	+1 07
Local m. time	4 03 23
Chron. time	3 20 09
ΔT =	+43 14

[June 28, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		Double altitudes.
8h 33m 24s	⊙	72° 30′
34 07		35
34 49 .5		40
35 28		45
36 11		50
36 57		55
8 41 23	$\overline{\odot}$	74 30
42 03		35
42 45		40
43 30		45
44 15		50
44 59 .5		55
8 39 09	⊖	73 42 .5

Index =	+ .5
On arc =	31′ 10″
Off arc =	32 10
Index corr. =	+0′.5
h′ =	36 51 .5
Refr. =	−1 .3
z =	53 09 .8
φ =	71 17 .7
δ =	23 16 .9
2s =	147 44 .4
s =	73 52 .2
s − φ =	2 34 .5
s − δ =	50 35 .3
s − z =	20 42 .4
sin (s − φ)	8. 6525
sin (s − δ)	9. 8880
sec (s − z)	0. 0290
sec s	0. 5562
tan² ½t	9. 1257
t =	40° 09′
	= 2h 40m 36s
	9 19 24
Equa'n of time	+2 58
Local m. time	9 22 22
Chron. time	8 39 09
ΔT =	+43 13

[July 10, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		Double altitudes.
3h 16m 19s	⊙	61° 15′
16 53 .5		10
17 31 .5		05
18 01		00
18 36		60 55
3 22 20	$\overline{\odot}$	61 25
22 54 .5		20
23 30 .5		15
24 00		10
24 36		05
3 20 28	⊖	61 10

Index =	+0 .5
h′ =	30 35 .2
Refr. =	−1 .6
z =	59 26 .4
φ =	71 17 .7
δ =	22 11 .3
2s =	152 55 .4
s =	76 27 .7
s − φ =	5 10 .0
s − δ =	54 16 .4
s − z =	17 01 .3
sin (s − φ)	8. 9545
sin (s − δ)	9. 9095
sec (s − z)	0. 0194
sec s	0. 6306
tan² ½t	9. 5140
t =	59° 30′
	= 3h 58m 00s
Equa'n of time	+5 08
Local m. time	4 03 08
Chron. time	3 20 28
ΔT =	+42 40

[July 23, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Negus 544.]

Time.		Double altitudes.
8h 07m 54s	⊙	62° 30′
08 22		35
09 10		40
09 47 .5		45
10 27 .5		50
11 01		55
8 12 31	$\overline{\odot}$	64 10
13 10		15
13 46		20
14 25 .5		25
15 07		30
15 45		35
8 11 47	⊖	63 32 .5

Index =	+ .5
On arc =	31′ 10″
Off arc =	32 10
Index corr. =	+0′.5
h′ =	31 46 .5
Refr. =	−1 .5
z =	58 15 .0
φ =	71 17 .7
δ =	20 02 .8
2s =	149 35 .5
s =	74 47 .8
s − φ =	3 30 .1
s − δ =	54 45 .0
s − z =	16 32 .8
sin (s − φ)	8. 7859
sin (s − δ)	9. 9120
sec (s − z)	0. 0184
sec s	0. 5813
tan² ½t	9. 2976
t =	48° 03′
	= 3h 12m 12s
	8 47 48
Equa'n of time	+6 13
Local m. time	8 54 01
Chron. time	8 11 47
ΔT =	+42 14

[August 9, 1883. Altitudes of Sun. Chevallier sextant. Chronometer, Blunt 214.]

Time.		Double altitudes.
9h 06m 23s.5	⊙	64° 05′
07 32		10
08 33		15
09 36		20
10 42		25
9 12 35	$\overline{\odot}$	65 40
13 09		45
14 10		50
15 20		55
16 28		66 00
9 11 27	⊖	65 02 .5

Index =	+0 .3
On arc =	30′ 10″
Off arc =	30 50
Index corr. =	+0′.3
h′ =	32 31 .4
Refr. =	−1 .5
z =	57 30 .1
φ =	71 17 .7
δ =	15 47 .4
2s =	144 35 .2
s =	72 17 .6
s − φ =	0 59 .9
s − δ =	56 30 .2
s − z =	14 47 .5
sin (s − φ)	8. 2411
sin (s − δ)	9. 9211
sec (s − z)	0. 0146
sec s	0. 5169
tan² ½t	8. 6937
t =	25° 04′
	= 1h 40m 16s
	10 19 44
Equa'n of time	+5 17
Local m. time	10 25 01
Chron. time	9 11 27
ΔT =	+1 13 34

Tabulations of observed chronometer corrections, United States meteorological and magnetic polar station, Uglaamie, Alaska.

Chronometer, Negus No. 544 (mean time).

Date	ΔT	Date	ΔT
1881.		1882.	
November 28	$+1^h\ 51^m\ 39^s$	July 7	$+0^h\ 51^m\ 40^s$
November 30	1 44 04	August 16	0 50 13
1882.		September 3	0 49 14
March 30	1 30 49	1883.	
April 11	1 28 01	May 3	0 44 44
April 17	1 28 19	May 21	0 44 15
April 23	1 29 15	June 6	0 43 49
May 16	1 28 14	June 19	0 43 14
May 27	1 27 46	June 28	0 43 13
May 27	1 27 00	July 10	0 42 40
June 6	1 27 26	July 23	0 42 14
June 24	1 26 36		

Chronometer, Fletcher No. 1713 (mean time).

1882.	ΔT
January 24	$+2^h\ 02^m\ 59^s$
February 4	2 01 38
March 11	1 59 59
April 28	1 58 58
May 23	1 58 38

Chronometer, Blunt No. 214 (mean time).

1883.	ΔT
April 16	$+1^h\ 16^m\ 49^s$
May 12	1 17 25
August 9	1 13 34

Chronometer, Hutton No. 312 (sidereal).

1882.	ΔT
February 10	$+1^h\ 39^m\ 53^s$
February 21	1 36 29
March 2	1 36 39

Chronometer, Bond No. 235 (sidereal).

Date	ΔT
1881.	
November 16	$+1^h\ 23^m\ 04^s$
1882.	
September 29	1 40 40
November 1	1 40 10
December 1	1 40 30
December 11	1 40 40
December 28	1 42 24
1883.	
January 7	1 39 26
January 25	1 40 32
March 2	1 41 15
March 18	1 41 35

Observations for latitude at United States meteorological and magnetic polar station, Uglaamie, Alaska.

[April 28, 1882. **Sextant, Blunt No. 309. Chronometer, Fletcher No. 1713. Observer, A. C. Dark. Recorder, E. P. Herendeen.**]

Observed times.	Double altitudes.	Single altitudes, index correction applied.	Index correction −2′.8 reduction to meridian.	Meridian altitude.
$9^h\ 36^m\ 52^s$	$\underline{\odot}$ 65° 25′.8	32° 41′.5	5′.6	32° 47′.1
37 52.5	28.0	42.6	5.1	47.7
39 25	30.0	43.6	4.6	48.2
40 41	32.0	44.6	4.0	48.6
44 21.5	34.0	45.6	2.5	48.1
46 10.5	35.8	46.5	1.9	48.4
48 00	37.0	47.1	1.4	48.5
50 33	37.5	47.4	0.8	48.2
52 25	38.5	47.8	0.4	48.2
57 32	39.7	48.4	0.0	48.4
10 00 46.5	39.7	48.4	0.0	48.4
07 36.5	37.0	47.1	1.0	48.1
09 02	35.8	46.5	1.3	47.8
10 38.5	35.0	46.1	1.8	47.9
11 46	34.0	45.6	2.1	47.7
13 18	33.0	45.1	2.6	47.7
14 41.5	32.0	44.6	3.2	47.8
15 57	31.0	44.1	3.7	47.8
17 19	30.0	43.6	4.3	47.9
18 19	29.0	43.1	4.8	47.9

Mean time of culmination	$11^h\ 57^m\ 19^s$	Mean	32 48.0
ΔT +	1 58 58	Refr. and par	−1.4
Chron. time of culmination	9 58 21	$h\ \underline{\odot}$ =	32 46.6
		Semi-diameter	+15.9
		$h\ \odot$'s center	33 02.5
		δ =	14 20.5
		ϕ =	71 18.0

[June 24, 1882, noon. **Theodolite, Fauth & Co. Chronometer, Negus No. 544. Observer, A. C. Dark. Recorder, E. P. Herendeen.**]

Observed times.	Observed altitudes.	Reduction to meridian.	Meridian altitude.
$10^h\ 34^m\ 13^s$	$\underline{\odot}$ 42° 25′ R	0′.0	$\underline{\odot}$ 42° 25′.0
36 13	25 L		
37 16.5	24 R	0.0	24.0
37 58	24 L		
39 40	23 R	0.2	23.2
40 06	23 L		
40 40	$\overline{\odot}$ 42 56 R	0.4	$\overline{\odot}$ 56.4
42 04	56 L		
43 10	54 R	0.7	54.7
43 31	54 L		
44 20	53 R	1.0	54.0
44 40.5	53 L		

Mean time of cul	$12^h\ 02^m\ 12^s$	Mean $\odot$'s center	42 39.5
ΔT +	1 26 36	Refr. and par	−0.9
Chron. time of cul	10 35 36		42 38.6
		δ =	23 24.8
		ϕn =	70 46.2

[June 24, 1882, midnight. **Theodolite, Fauth & Co. Chronometer, ?. Observer, A. C. Dark. Recorder, E. P. Herendeen. The times given do not correspond to the time of lower culmination of the sun; therefore the mean of the four smallest readings (supposed to indicate the time of lower culmination) were taken. The discordance between the results at upper and lower culminations seems to indicate that the instrument was not adjusted for index error.**]

Observed altitudes.

	$\underline{\odot}$ 5° 07′	R.
	5 07	L.
	$\overline{\odot}$ 5 36	R.
	5 36	L.
Mean	5 21.5	
Refraction and par	−0.1	
	5 12.4	
	δ = 23 24.0	
	ϕ = 71 48.4	
Correction to refraction for displaced zenith.	−1.2	
Corrected ϕm	71 47.2	

From observations June 24, noon .... ϕn = 70° 46′.2
From observations June 24, midnight .... ϕm = 71 47.2

Mean 71 16.7

Observation of lunar distance for longitude, July 7, 1882, at the United States meteorological and magnetic polar station, Uglaamie, Alaska.

[Set I. Observer, A. C. Dark. Chronometer, Negus 554. Blunt sextant. Index correction = 0′.0.]

Time.		*Distance ☉ and ☾*	
	9ʰ 32ᵐ 16ˢ		90° 38′
	34 44 .5		35
	36 07 .5		33
Mean	9 34 23		90 35. 3
ΔT	+51 40	Semi.-d. ☉	15. 8
Mean time	10 26 03	Semi.-d. ☾	16. 1
Sidereal time	5 28 50	Δ′	91 07. 2
α☉	7 07 33		
α☾	0 49 46		
t☉	1 38 38 = 24° 39′.5		
t☾	4 39 09 = 69 47 .2		
δ☉	22° 32′.6		
δ☾	9 12 .5		

Formulæ.

z, Z = true zenith distances.
z', Z' = apparent zenith distances.
Δ, Δ' = true and apparent distances of objects.
t = hour angle.

$$\cos z = \sin\phi \sin\delta + \cos\phi \cos\delta \cos t$$
$$\cos\Delta' = \cos z' \cos Z' + \sin z' \sin Z' \cos A$$
$$\cos A = \frac{\cos\Delta' - \cos z' \cos Z'}{\sin z' \sin Z'}$$
$$\cos\Delta = \cos z \cos Z + \sin z \sin Z \cos A$$

☉				☾			
sin φ	9. 97643	cos φ	9. 50609	sin φ	9. 97643	cos φ	9. 50609
sin δ	9. 58363	cos δ	9. 96548	sin δ	9. 20419	cos δ	9. 99437
		cos t	9. 95847			cos t	9. 53847
sin φ sin δ	9. 56006				9. 18062		
cos φ cos δ cos t	9. 43004	Refr. =	−1. 2		9. 03893	Refr. =	− 3′.5
		π =	+ .1			π =	+57 .0
+	0. 24087			+	0. 23594		
		z =	50° 46′.7			Z =	74° 52′.4
cos z	9. 80093	z′ =	50 45 .6	cos Z	9. 41656	Z′ =	75 45 .9
sin z	9. 88914			sin Z	9. 98469		

cos Δ′	8. 2911 n	cos z′	9. 80111	sin z′	9. 88902
− cos z′ cos Z′	9. 19187n	cos Z′	9. 39076	sin Z′	9. 98646
	+0. 05142				
cos Δ′ − cos z′ cos Z′	9. 24329n				
sin z′ sin Z′	9. 87548				
cos A	9. 36781n				
sin z sin Z	9. 87383				
sin z sin Z cos A	9. 24164n				
cos z cos Z	9. 21749				
	−1. 26695				
cos Δ	7. 97469n				
Δ	90° 32′ 26″				

Δ for Greenwich 9ʰ....	90° 28′ 27″		
Observed Δ............	90 32 26		
Difference.............	4 01	log	2. 3820
		p. l.	0. 2645
	7ᵐ 23ˢ		2. 6465

Greenwich time....	8ʰ 52ᵐ 37ˢ p. m.
Local time.........	10 26 07 a. m.
Longitude..........	10 26 30

[Set. II. Chronometer, Negus 544. Blunt sextant.]

Time.		*Distance ☉ and ☾.*	
	9ʰ 44ᵐ 11ˢ.8		90° 30′ 42″
	46 15 .0		29 40
	48 22 .4		28 40
	50 23 .4		27 38
Mean	9 47 19		90 29. 2
ΔT	+51 40	Semi.-d. ☉	15. 8
Mean time	10 38 59	Semi.-d. ☾	16. 1
Sidereal time	5 41 53		91 01. 1
α☉	7 07 33		
α☾	0 50 13		
t☉	1 25 40 = 21° 25′		
t☾	4 51 40 = 72 55		
δ☉	22° 32′.6		
δ☾	9 15 .0		

☉				☾			
sin φ	9. 97643	cos φ	9. 50609	sin φ	9. 97643	cos φ	9. 50609
sin δ	9. 58363	cos δ	9. 96548	sin δ	9. 20613	cos δ	9. 99432
		cos t	9. 96893			cos t	9. 46800
	9. 56006				9. 18256		
	9. 44050	Refr. =	−1. 2		8. 96841	Refr. =	− 3. 7
		π =	+ .1			π =	+57. 2
+	0. 24536			+	0. 20702		
		z =	50° 17′.5			Z =	75° 48′.3
cos z	9. 80542	z′ =	50 16 .4	cos Z	9. 38958	Z′ =	76 41 .8
sin z	9. 88610			sin Z	9. 98653		

cos Δ′	8. 2497 n	cos z′	9. 80559	sin z′	9. 88598
− cos z′ cos Z′	9. 16752n	cos Z′	9. 36193	sin Z′	9. 98818
	+0. 04954				
cos Δ′ − cos z′ cos Z′	9. 21706n				
sin z′ sin Z′	9. 87416				
cos A	9. 34290n				
sin z sin Z	9. 87264				
sin z sin Z cos A	9. 21554n				
cos z cos Z	9. 19500				
	−1. 33534				
cos Δ	7. 88020n				
Δ	90° 26′ 05″				

Δ for Greenwich 9ʰ....	90° 28′ 27″		
Observed Δ............	90 26 05		
Difference.............	2 22	log	2. 1523
		p. l.	0. 2655
	4ᵐ 22ˢ		2. 4178

Greenwich mean time....	9ʰ 04ᵐ 22ˢ
Local mean time.........	10 39 03
Longitude...............	10 25 19

Observation for time at Point Barrow, Alaska, February 21, 1883.

[A. C. Dark, observer. Chronometer, Bond No. 235 (sidereal). Chevallier sextant.]

[Altitudes of Jupiter.]

	Time.		
	20h	02m	05s
		02	20
		04	52
		07	25
		08	22
		09	20.5
		10	30
Mean	20	06	25
On arc..........		31′	10″
Off arc..........		32	50
Index correction			+0′.8

	Double altitudes.	
	59°	00′
	58	58.5
	58	34
	58	12
	58	00
	57	52.3
	57	41.3
	58	19.7
Index —		+.8
h' =	29	10.2
Refraction =		—1.7
z =	60	51.5
ϕ =	71	22.0
δ =	22	59.8
$2s$ =	155	13.3

Double altitudes.			
$2s$ =	155°	13′.3	
s =	77	36.6	
$s—\phi$ =	6	14.6	
$s—\delta$ =	54	36.8	
$s—z$ =	16	45.1	
sin $(s—\phi)$	9.0364		
sin $(s—\delta)$	9.9113		
sec $(s—z)$	0.0188		
sec z	0.6684		
tan $^2\frac{1}{2}t$	9.6349		
t =	66°	36′	
	4h	26m	24s
α =	5	22	46
Local sidereal time =	9	49	10
Chronometer time....... =	8	06	25
ΔT =	+1	42	45

Observation for longitude, Point Barrow, Alaska, February 20, 1883.

[A. C. Dark, observer. Chronometer, Bond 235 (sidereal). Chevallier sextant.]

	Time.		
	22h	30m	37s
		33	56
		37	10.5
		39	57
		41	50
		44	51.5
	10		
Mean =	(22)	38	04
ΔT =	+1	42	45
Sidereal time	12	20	49
α ☾ =	9	03	25
α ♃ =	5	22	36
t ☾ =	3	17	24
t ♃ =	6	58	13

	Distance moon and Jupiter.		
	53°	05′	10″
		07	40
		10	00
		12	00
		13	30
		14	20
	53	10.4	
Misread by		15	
	53	25.4	
Index correction =		+.8	
Semi-di. ☾ =		15.0	
Δ' =	53	41.2	
δ ☾ =	11	34.6	
δ ♃ =	22	59.4	

Sidereal time	12h	20m	49s
Longitude from Washington.....	5	18	27
Washington sidereal time........	17	39	16
Sidereal time of noon............	21	57	13
Sidereal interval.................	19	42	03
		—3	14
Mean time interval	19	38	49
L =	5	18	27
Local mean time.................	14	20	22

Jupiter.

sin ϕ	9.97662	cos ϕ	9.50449
sin δ	9.59170	cos δ	9.96405
		cos t	9.40016n
	9.56832		
	8.86870n	Refr. =	—3.1
	—0.09674		
cos z	9.47158	Z =	72° 46′.2
sin z	9.98006	Z =	72 43.1
		cos z'	9.47286
		cos Z'	9.58104
Longitude of Point Barrow ..			10h 25m 49s
Reduction to Uglaamie			+1 25
Longitude			10 27 14

Moon.

sin ϕ	9.97662	cos ϕ	9.50449
sin δ	9.30250	cos δ	9.90107
		cos t	9.81387
	9.27912		
	9.30943	Refr. =	—2.2
		π =	+50.6
	+0.28614		
cos Z	9.59557	Z =	66° 47′.5
sin Z	9.96336	Z =	67 35.9
sin z'	9.97393		
sin Z'	9.96593		
Greenwich time....			0h 46m 11s
Local time			14 20 22
Longitude			10 25 49

cos Δ'	9.77247		
—cos z' cos Z'	9.05390n		
	—0.09215		
cos Δ' — cos z' cos Z	9.68032		
sin z' sin Z'	9.94586		
cos A	9.73446		
sin z sin Z	9.94342		
cos A sin z sin Z	9.67788		
cos z cos Z	9.06715		
	+0.09519		
cos Δ	9.77307		
Δ =	53°	37′	42″
Δ for Greenwich 0h =	53	14	01
Difference =		23	41
log.	3.1526		
	0.2901		
	3.4427		
Greenwich time..	46m 11s		

Reduction of observations for azimuth of magnetic marks at the United States meteorologic and magnetic polar station, Uglaamie, Alaska.

[A. C. Dark, observer.]

[November 21, 1881. Jupiter.* Stackpole theodolite.]

	Ver. circle.	*Hor. circle.*
D =	28° 40′	89° 42′.5
	28 55	90 52
R =	149 20	92 08.6
	149 00	93 20.5
h' =	29° 48′.8	
refr. =	—1.7	
h =	29 47.1	
ϕ =	71 17.7	
p =	73 24.7	
$2s$ =	174 29.5	
s =	87 14.8	
$s-\phi$ =	15 57.1	
$s-h$ =	57 27.7	
$s-p$ =	13 50.1	
sin $(s-\phi)$	9.4390	
sin $(s-h)$	9.9258	
sec $(s-p)$	0.0128	
sec s	1.3185	
$\tan^2 \frac{1}{2}$ A	0.6961	
(from N.) A =	131° 40′	
Hor. cir. =	91 31	
North reads =	319 51	
Mark reads =	223 38	
M'k W. of N. =	96 13	

[July 25, 1882. Sun.† Fauth theodolite.]

R.	*Ver. circle.*	*Hor. circle.*
⌟ =	146° 59′	299° 21′
	147 10	300 45
	147 26	302 00
⌜ =	147 12	303 13
	147 15	304 20
	147 44	306 20
h' =	32° 42′.3	
refr. =	—1.5	
h =	32 40.8	
ϕ =	71 17.7	
p =	70 28.5	
$2s$ =	174 27.0	
s =	87 13.5	
$s-\phi$ =	15 55.8	
$s-h$ =	54 32.7	
$s-p$ =	16 45.0	
sin $(s-\phi)$	9.4385	
sin $(s-h)$	9.9109	
sec $(s-p)$	0.0188	
sec s	1.3150	
$\tan^2 \frac{1}{2}$ A	0.6832	
A =	131° 02′	
Hor. cir. =	302 40	
North reads =	73 42	
Mark reads =	120 17	
M'k E. of N. =	46 85	

[July 25, 1882. Sun. Fauth theodolite.]

D.	*Ver. circle.*	*Hor. circle.*
⌟ =	211° 24′	306° 10′
	211 10	307 10
	211 03	307 36
⌜ =	211 22	308 50
	211 17	309 14
	211 13	310 40
h' =	31° 14′.8	
refr. =	—1.6	
h =	31 13 2	
ϕ =	71 17.7	
p =	70 28.5	
$2s$ =	172 59.4	
s =	86 29.7	
$s-\phi$ =	15 12.0	
$s-h$ =	55 16.5	
$s-p$ =	16 01.2	
sin $(s-\phi)$	9.4187	
sin $(s-h)$	9.9148	
sec $(s-p)$	0.0172	
sec s	1.2137	
$\tan^2 \frac{1}{2}$ A	0.5644	
A =	124° 52′	
Hor. cir. =	308 17	
North reads =	73 09	
Mark reads =	119 46	
M'k E. of N. =	46 37	

[August 31, 1882. Sun.‡ Fauth theodolite.]

	Ver. circle.	*Hor. circle.*
⌞ =	24° 08′	343° 30′
	24 06	344 00
⌟ =	24 01	344 00
	23 59	344 45
⌜ =	24 19	346 13
	24 14	346 37
⌝ =	24 11.5	347 35
	24 09.5	347 45
h' =	24° 08′.5	
refr. =	—2.1	
h =	24 06.4	
ϕ =	71 17.7	
p =	81 35.5	
$2s$ =	176 59.6	
s =	88 29.8	
$s-\phi$ =	17 12.1	
$s-h$ =	64 23.4	
$s-p$ =	6 54.3	
sin $(s-\phi$	9.4709	
sin $(s-h)$	9.9551	
sec $(s-p)$	0.0032	
sec s	1.5811	
$\tan^2 \frac{1}{2}$ A	1.0103	
A =	145° 18′	
Hor. cir. =	345 33	
North reads =	130 51	
Mark reads =	180 00	
M'k E. of N. =	49 09	

* Station: First magnetic observatory, first position, magnetometer pier. Mark, wire on dwelling-house.
† Station: First magnetic observatory, second position, magnetometer pier. Mark, 300 yards north (magnetic) from observatory.
‡ Station: Second magnetic observatory, declinometer pier. Mark, same as on July 25, 1882.

APPENDIX No. 2.

OBSERVATIONS MADE AT WASHINGTON, D. C., IN 1881 AND 1884, FOR DETERMINING THE CONSTANTS OF THEODOLITE MAGNETOMETER NO. 11 AND OF KEW DIP CIRCLE NO. 23, TOGETHER WITH THE COMPUTATION AND A RECAPITULATION OF RESULTS.

[Computer: E. H. Courtenay.]

Observations to determine the value of one scale-division of the long magnet L_{II}, accompanying theodolite magnetometer No. 11, made at the Magnetic Observatory on Capitol Hill, Washington, D. C., by M. Smith, in June, 1881, and by J. E. Maxfield, February 5, 1884.

Set 1.		Set 2.		Set 3.		Set 4.		Set 5.		Set 6.	
Scale.	Circle reading.	Scale.	Circle reading.	Scale.	Circle reading.	Scale.	Circle reading.	Scale.	Circle reading.	Scale.	Circle reading.
	° ′		° ′		° ′		° ′		° ′		° ′
0	102 04	0	102 13.5	0	58 47.25	0	58 41.75	80	53 46.25	80	175 14
10	101 27.5	10	101 37.75	10	58 11.5	10	58 07.25	70	54 22.25	70	175 52
20	100 50	20	101 00.25	20	57 33.75	20	57 29.25	60	55 00	60	176 28
30	100 13	30	100 22.25	30	56 56	30	56 52.75	50	55 37.25	50	177 04
40	99 36	40	99 45.75	40	56 19.25	40	56 13.5	40	56 12.5	40	177 40
50	99 00	50	99 08.25	50	55 43	50	55 40	30	56 49	30	178 17
60	98 23.5	60	98 33.0	60	55 05.25	60	55 01.25	20	57 25.75	20	178 54
70	97 44.5	70	97 56.25	70	54 26	70	54 23.75	10	58 02.75	10	179 29.75
80	97 06.5	80	97 18.5	80	53 49.75	80	53 46.25	0	58 40.75	0	180 06.5
40	99 36.1	40	99 46.17	40	56 19.08	40	56 15.08	40	56 12.94	40	177 40.58
40	2 27.9	40	2 27.3	40	2 28.2	40	2 26.7	40	2 26.7	40	2 26.6
30	1 51.4	30	1 51.6	30	1 52.4	30	1 52.2	30	1 50.7	30	1 48.6
20	1 13.9	20	1 14.1	20	1 14.7	20	1 14.2	20	1 12.9	20	1 12.6
10	0 36.9	10	0 36.1	10	0 36.9	10	0 37.7	10	0 35.7	10	0 36.6
0	0 00.1	0	0 00.4	0	0 00.2	0	0 01.6	0	0 00.4	0	0 00.6
10	0 36.1	10	0 37.9	10	0 36.1	10	0 35.1	10	0 36.1	10	0 36.4
20	1 12.6	20	1 13.2	20	1 13.8	20	1 13.8	20	1 12.8	20	1 13.4
30	1 51.6	30	1 49.9	30	1 53.1	30	1 51.3	30	1 49.8	30	1 49.2
40	2 29.6	40	2 27.7	40	2 29.3	40	2 28.8	40	2 27.8	40	2 25.9
200	12 20.1	200	12 18.2	200	12 24.7	200	12 21.4	200	12 12.9	200	12 09.9
$1^d=3'.700$		$1^d=3'.691$		$1^d=3'.724$		$1^d=3'.707$		$1^d=3'.665$		$1^d=3'.650$	

Mean of all $=3'.690$

Observations to determine moment of mass of the long magnet L_{II}.

[Date, June 10, 1881. Station, Schott's Observatory, Washington, D. C. Instrument, theodolite magnetometer No. 11. Magnet, L_{II}. Mass ring not used. Chronometer, P. Walther's No. 2780; daily rate, $236^s.4$, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	10 19 35.0	63.0	29.9	69.1	
10	20 28.0				
20	21 21.0				
30	22 14.0				
40	23 07.0				
50	24 00.0	63.5	35.5	62.9	
100	10 28 25.0				8 50.0
110	29 18.5				50.5
120	30 11.0				50.0
130	31 04.5				50.5
140	31 57.5				50.5
150	32 04.5	64.0	39.1	58.8	50.5
	Means	63.5			8 50.33

Computation.

$$T^2=T'^2\left(1+\frac{h}{f}\right)(1-[t'-t]q)$$

	s.
Observed time of 100 oscillations	530.33
Time of one oscillation	5.3033
Correction for rate	−0.0145
$T'=$	5.2888

$q=0.00085$

$t'-t=+0.1$

$mH=\frac{\pi^2 M}{T^2}$

Temp. $t=63°.4$

	Log'ms.
T'	0.72336
T'^2	1.44671
$1+\frac{h}{f}$	0.00073
$1-(t'-t)q$	9.99996
T^2	1.44740

Coefficient of torsion.					Value of one scale-division $=3'.69$	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
120	39.1	58.8	48.95			
				1.70		
210	24.1	77.2	50.65			
				3.00		
30	26.1	69.2	47.65		$v=9'.04$	
				5.10	$5400'+v'$	3.73312
120	30.0	75.5	52.75		5400 (ar. co.)	6.26761
Mean $v=2.45$					$1+\frac{h}{f}$	0.00073

Observations to determine the moment of mass of the long magnet $L_{,,,}$ &c.—Continued.

[Date, June 10, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,,}$. Mass ring suspended. Chronometer, P. Walther's No. 2780; daily rate, 236^s.4, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'.	Extreme scale readings.		Time of 80 oscillations. m.	s.
0	11	42	49.0	63.5	41.1	62.9		
8		43	49.5					
16		44	50.5					
24		45	51.0					
32		46	52.0					
40		47	53.0	62.5	43.5	59.9		
80	11	52	57.5				10	08.5
88		53	58.5					09.0
96		54	59.5					09.0
104		56	00.0					09.0
112		57	01.0					09.0
120		58	02.0	64.0	46.2	57.3		09.0
			Means	63.3			10	08.92

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
120	46.2	57.3	51.75			
				0.35		
210	40.8	62.0	51.40			
				2.05		
30	29.9	68.8	49.35		v=4′.57	
				2.55	5400′ + v'	3.73276
120	30.1	73.7	51.90		5400 (ar. co.)	6.26761
Mean v = 1.2375					$1+\frac{h}{f}$	0.00037

Computation.

	s.
Observed time of 80 oscillations	608.92
Time of one oscillation	7.6115
Correction for rate	−0.0208
T' =	7.5907

$t'-t = -0^\circ.1$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 63^\circ.4$

	Log'ms.
T'	0.88028
T'^2	1.76056
$1+\frac{h}{f}$	0.00037
$1-(t'-t)q$	0.00004
T^2	1.76097

[Date, June 11, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,,}$. Mass ring not used. Chronometer, P. Walther's No. 2780; daily rate, 236^s.4, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'	Extreme scale readings.		Time of 100 oscillations. m.	s.
0	10	03	45.9	....	....	....		
10		04	39.4					
20		05	33.2					
30		06	27.1					
40		07	20.4					
50		08	13.8	72.0	31.4	57.1		
100	10	12	40.9				8	55.0
110		13	34.1					54.7
120		14	27.6					54.4
130		15	20.8					53.7
140		16	13.7					53.3
150		17	07.2	73.0	33.2	52.1		53.4
			Means	72.5			8	54.08

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
120	33.2	52.1	42.65			
				1.00		
210	32.1	55.2	43.65			
				3.65		
30	24.1	55.9	40.00		v=6′.3	
				2.15	5400′ + v'	3.73290
120	33.1	51.2	42.15		5400 (ar. co.)	6.26761
Mean v = 1.70					$1+\frac{h}{f}$	0.00051

Computation.

	s.
Observed time of 100 oscillations	534.08
Time of one oscillation	5.3408
Correction for rate	−0.0146
T' =	5.3262

$t'-t = -4^\circ.3$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 76^\circ.8$

	Log'ms.
T'	0.72642
T'^2	1.45284
$1+\frac{h}{f}$	0.00051
$1-(t'-t)q$	0.00159
T^2	1.45494

Observations to determine the moment of mass of the long magnet $L_{,,}$, &c.—**Continued.**

[Date, June 11, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,}$. Mass ring suspended. Chronometer, P. Walther's No. 2780; daily rate, 236s.4, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	11 01 28.4				
8	02 29.7				
16	03 30.9				
24	04 32.5				
32	05 33.7				
40	06 35.1	75.0	23.9	62.8	
80	11 11 42.1				10 13.7
88	12 43.3				13.6
96	13 44.6				13.7
104	14 45.9				13.4
112	15 46.9				13.2
120	16 48.2	76.0	29.1	51.8	31.1
	Means	75.5			10 13.45

Coefficient of torsion. Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3'.69	Logarithms.
120	29.1	51.8	40.45			
				6.10		
210	17.2	75.9	46.55			
				9.75		
30	19.2	54.4	36.80		v=18'.0	
				3.70	5400'+v'	3.73384
120	15.1	65.9	40.50		5400 (ar. co.)	6.26761
Mean v=4.89					$1+\frac{h}{f}$	0.00145

Computation.

	s.
Observed time of 80 oscillations	613.45
Time of one oscillation	7.6681
Correction for rate	−0.0209
T'=	7.6472

$t'-t$= −1°.3

$mH=\frac{\pi^2 M}{T^2}$

Temp. t=76°.8

	Log'ms.
T'	0.88350
T'^2	1.76700
$1+\frac{h}{f}$	0.00145
$1-(t'-t)q$	0.00048
T^2	1.76893

[Date, June 11, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,}$. Chronometer, P. Walther's No. 2780; daily rate, 236s.4, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	11 42 43.6	77.0	25.3	56.1	
10	43 37.2				
20	44 30.4				
30	45 24.0				
40	46 17.5				
50	47 11.2	78.0	30.2	51.1	
100	11 51 38.2				8 54.6
110	52 31.9				54.7
120	53 25.2				54.8
130	54 19.1				55.1
140	55 13.1				55.6
150	56 06.9	79.0	34.6	47.2	55.7
	Means	78.0			8 55.08

Coefficient of torsion. Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3.69	Logarithms.
120	34.6	47.2	40.90			
				2.25		
210	22.2	64.1	43.15			
				4.60		
30	29.9	47.2	38.55		v=8'.7	
				2.55	5400'+v'	3.73309
120	28.1	54.1	41.10		5400 (ar. co.)	6.26761
Mean v=2.35					$1+\frac{h}{f}$	0.00070

Computation.

	s.
Observed time of 100 oscillations	535.08
Time of one oscillation	5.3508
Correction for rate	−0.0146
T'=	5.3362

$t'-t$= +1°.2

$mH=\frac{\pi^2 M}{T^2}$

Temp. t=76°.8

	Log'ms.
T'	0.72723
T'^2	1.45446
$1+\frac{h}{f}$	0.00070
$1-(t'-t)q$	9.99956
T^2	1.45472

Observations to determine the moment of mass of the long magnet $L_{,,,}$ &c.—Continued.

[Date, June 11, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,,}$. Mass ring suspended. Chronometer, P. Walther's No. 2780; daily rate, 236ˢ.4, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				*m. s.*
0	12 05 39.9				
8	06 41.6				
16	07 4[illegible].1				
24	08 44.8				
32	09 46.0				
40	10 47.5	81.0	30.9	57.2	
80	12 15 54.9				10 15.0
88	16 56.4				14.8
96	17 58.2				15.1
104	18 59.5				14.7
112	20 01.0				15.0
120	21 02.6	81.5	34.1	54.0	15.1
	Means	81.2			10 14.95

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
120	34.1	54.0	44.05			
				2.45		
210	29.1	63.9	46.50			
				3.90		
30	22.1	63.1	42.60		$v = 6'.7$	
				0.90	$5400' + v'$	3.73293
120	22.9	64.1	43.50		5400 (ar. co.)	6.26761
Mean $v = 1.81$					$1+\frac{h}{f}$	0.00054

Computation.

	s.
Observed time of 80 oscillations	614.95
Time of one oscillation	7.6869
Correction for rate	−0.0210
$T' =$	7.6659

$t' - t = +4°.4$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 76°.8$

	Log'ms.
T'	0.88456
T'^2	1.76913
$1+\frac{h}{f}$	0.00054
$1-(t'-t)q$	9.99838
T^2	1.76805

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,,}$. Mass ring not used. Chronometer, Bond No. 188 M. T. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				*m. s.*
0	2 58 35.4	76.5	22.1	67.1	
10	59 29.1				
20	3 00 22.9				
30	01 16.6				
40	02 10.3				
50	03 04.1	78.0	28.8	60.5	
100	3 07 32.1				8 56.7
110	08 26.0				56.9
120	09 20.1				57.2
130	10 13.9				57.3
140	11 07.9				57.6
150	12 01.9	79.0	34.1	54.5	57.8
	Means	77.8			8 57.25

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
330	34.1	54.5	44.3			
				1.65		
60	21.1	70.8	45.95			
				2.45		
240	21.8	65.2	43.50		$v = 4'.65$	
				0.95	$5400' + v'$	3.73277
330	9.8	79.1	44.45		5400 (ar. co.)	6.26761
Mean $v = 1.26$					$1+\frac{h}{f}$	0.00038

Computation.

	s.
Observed time of 100 oscillations	537.25
Time of one oscillation	5.3725
Correction for rate	+0.0006
$T' =$	5.3731

$t' - t = -9°.2$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 87°.0$

	Log'ms.
T'	0.73022+
T'^2	1.46045
$1+\frac{h}{f}$	0.00038
$1-(t'-t)q$	0.00339
T^2	1.46422

Observations to determine the moment of mass of the long magnet $L_{\prime\prime}$, &c.—Continued.

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{\prime\prime}$. Mass ring suspended. Chronometer, Bond No. 188. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				*m. s.*
0	3 26 53.5	80.5	19.8	72.4	
8	27 55.2				
16	28 56.9				
24	29 58.7				
32	31 00.3				
40	32 02.1	81.5	24.1	68.0	
80	3 37 11.1				10 17.6
88	38 12.9				17.7
96	39 14.7				17.8
104	40 16.4				17.7
112	41 18.1				17.8
120	42 19.9	82.5	30.9	61.1	17.8
	Means	81.5			10 17.73

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
330	30.9	61.1	46.0			
				3.00		
60	33.1	64.9	49.00			
				4.35		
240	14.9	74.4	44.65		v = 8′.60	
				1.95	5400′ + v'	3.73308
330	31.3	61.9	46.60		5400 (ar. co.)	6.26761
Mean v = 2.33					$1+\frac{h}{f}$	0.00069

Computation.

	s.
Observed time of 80 oscillations	617.73
Time of one oscillation	7.7216
Correction for rate	+0.0009
	T' = 7.7225

		Log'ms.
$t'-t=-5°.5$	T'	0.88776
$mH=\frac{\pi^2 M}{T^2}$	T'^2	1.77552
	$1+\frac{h}{f}$	0.00069
Temp. t = 87°.0	$1-(t'-t)\,q$	0.00203
	T^2	1.77824

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{\prime\prime}$. Mass ring not used. Chronometer, Bond No. 188. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				*m. s.*
0	3 59 45.5	84.0	16.1	70.8	
10	4 00 39.4				
20	01 33.3				
30	02 27.2				
40	03 21.1				
50	04 14.9	85.5	24.7	62.9	
100	4 08 44.9				8 59.4
110	09 39.0				59.6
120	10 32.9				59.6
130	11 26.7				59.5
140	12 20.8				59.7
150	13 14.8	86.5	31.1	56.1	59.9
	Means	85.3	....	....	8 59.62

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
330	31.1	56.1	43.60			
				1.90		
60	22.0	69.0	45.50			
				2.65		
240	17.3	68.4	42.85		v = 5′.13	
				1.00	5400′ + v'	3.73281
330	33.1	54.6	43.85		5400 (ar. co.)	6.26761
Mean v = 1.39					$1+\frac{h}{f}$	0.00042

Computation.

	s.
Observed time of 100 oscillations	539.62
Time of one oscillation	5.3962
Correction for rate	+0.0006
	T' = 5.3968

		Log'ms.
$t'-t=-1°.7$	T'	0.73214–
$mH=\frac{\pi^2 M}{T^2}$	T'^2	1.46427
	$1+\frac{h}{f}$	0.00042
Temp. t = 87°.0	$1-(t'-t)\,q$	0.00063
	T^2	1.46532

Observations to determine the moment of mass of the long magnet $L_{,,}$ &c.—**Continued.**

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,}$. Mass ring suspended. Chronometer, Bond No. 188. Observer, M. Smith.]

No. of oscillations.	Chronometer time.			Temp. t'	Extreme scale readings.		Time of 80 oscillations.	
	h.	m.	s.				m.	s.
0	4	24	48.1	86.5	30.5	61.9		
8		25	49.9					
16		26	51.9					
24		27	54.0					
32		28	55.9					
40		29	57.9	87.5	33.9	58.9		
80	4	35	10.2				10	22.1
88		36	12.1					22.2
96		37	14.1					22.2
104		38	16.2					22.2
112		39	18.1					22.2
120		40	20.0	88.0	39.9	50.9		22.1
			Means	87.3			10	22.17

Computation.

	s.
Observed time of 80 oscillations	622.17
Time of one oscillation	7.7771
Correction for rate	+0.0009
$T=$	7.7780

$t'-t=+0.3$°

$mH=\frac{\pi^2 M}{T^2}$

Temp. $t=87$°.0

	Log'ms.
T	0.89087
T^2	1.78174
$1+\frac{h}{f}$	0.00070
$1-(t'-t)q$	9.99989
T^2	1.78233

Coefficient of torsion.					Value of one scale-division $=3'.69$	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
330	39.9	50.9	45.40			
				2.65		
60	34.2	61.9	48.05			
				4.70		
240	16.9	69.8	43.35		$v=8'.71$	
				2.10	$5400'+v'$	3.73309
330	31.1	59.8	45.45		5400 (ar. co.)	6.26761
Mean $v=2.36$					$1+\frac{h}{f}$	0.00070

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, L. Mass ring not used. Chronometer, Bond No. 188. Observer, M. Smith.]

No. of oscillations.	Chronometer time.			Temp. t'	Extreme scale readings.		Time of 100 oscillations.	
	h.	m.	s.				m.	s.
0	4	51	52.2	87.0	22.1	64.9		
10		52	46.1					
20		53	40.2					
30		54	34.3					
40		55	28.4					
50		56	22.5	87.5	27.5	59.1		
100	5	00	52.9				9	00.7
110		01	47.0					00.9
120		02	41.0					00.8
130		03	35.1					00.8
140		04	29.3					00.9
150		05	23.2	88.5	32.9	53.3		00.7
			Means	87.7			9	00.80

Computation.

	s.
Observed time of 100 oscillations	540.80
Time of one oscillation	5.4080
Correction for rate	+0.0006
$T=$	5.4086

$t'-t=+0.7$°

$mH=\frac{\pi^2 M}{T^2}$

Temp. $t=87$°.0

	Log'ms.
T	0.73308
T^2	1.46617
$1+\frac{h}{f}$	0.00045
$1-(t'-t)q$	9.99974
T^2	1.46636

Coefficient of torsion.					Value of one scale-division $=3'.69$	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
330	32.9	53.3	43.10			
				1.90		
60	14.2	75.8	45.00			
				3.00		
240	33.1	50.9	42.00		$v=5'.61$	
				1.20	$5400'+v'$	3.73284
330	20.5	65.9	43.20		5400 (ar. co.)	6.26761
Mean $v=1.53$					$1+\frac{h}{f}$	0.00045

Observations to determine the moment of mass of the long magnet L,,, &c.—**Continued.**

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, L,,. Mass ring suspended. Chronometer, Bond No. 188. Observer M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	5 17 45.1	89.0	22.9	70.1	
8	18 47.1				
16	19 49.0				
24	20 51.1				
32	21 53.2				
40	22 55.3	89.5	28.1	66.2	
80	5 28 05.9				10 20.8
88	29 08 0				20.9
96	30 09.9				20.9
104	31 11.9				20.8
112	32 14.1				20.9
120	33 16.2	89.5	33 9	59.2	20.9
	Means	89.3			10 20.87

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
330	33.9	59.2	46.55	
				0.80
60	31.9	62.8	47.35	
				1.05
240	33.9	62.9	48.40	
				2.25
330	27.5	73.8	50.65	

Mean $v = 1.02$

Value of one scale-division = 3'.69	Logarithms.
$v = 3'.76$	
$5400' + v'$	3.73270
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00031

Computation.

	s.
Observed time of 80 oscillations	620.87
Time of one oscillation	7.7609
Correction for rate	+0.0009
$T' =$	7.7618

$t' - t = +2.°3$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 87°.0$

	Log'ms.
T'	0.88996
T'^2	1.77992
$1+\frac{h}{f}$	0.00031
$1-(t'-t\,q)$	0.99915
T^2	1.77938

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, L. Mass ring not used. Chronometer, Bond No. 188. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	5 51 43.1	89.5	12.9	73.4	
10	52 37.2				
20	53 31.1				
30	54 25.3				
40	55 19.4				
50	56 13.5	90.0	21.1	64.9	
100	6 00 44.5				9 01.4
110	01 38.9				01.7
120	02 33.0				01.9
130	03 27.1				01.8
140	04 21.1				01.7
150	05 15.1	91.0	29.8	56.4	01.6
	Means	90.2			9 01.68

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
330	29.8	56.4	43.10	
				1.75
60	32.6	57.1	44.85	
				2.65
240	13.5	70.9	42.20	
				1.10
330	32.9	53.7	43.30	

Mean $v = 1.37$

Value of one scale-division = 3'.69	Logarithms.
$v = 5'.06$	
$5400' + v'$	3.73280
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00041

Computation.

	s.
Observed time of 100 oscillations	541.68
Time of one oscillation	5.4168
Correction for rate	.0006
$T' =$	5.4174

$t' - t = +3.°02$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 87°.0$

	Log'ms.
T'	0.73379
T'^2	1.46758
$1+\frac{h}{f}$	0.00041
$1-(t'-t)\,q$	9.99882
T^2	1.46681

Observations to determine the moment of mass of the long magnet $L_{,,}$, &c.—Continued.

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,}$. Mass ring suspended. Chronometer, Bond No. 188. Observer, M. S.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	6 18 39.9	91.0	18.9	74.1	
8	19 42.0				
16	20 44.1				
24	21 46.0				
32	22 48.0				
40	23 50.1	92.0	24.9	68.2	
80	6 29 01.1				10 21.2
88	30 03.2				21.2
96	31 05.4				21.3
104	32 07.5				21.5
112	33 09.7				21.7
120	34 11.9	92.5	37.1	55.8	21.8
	Means	91.8			10 21.45

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
330	31.7	55.8	46.45	
				2.90
60	29.1	69.6	49.35	
				4.30
240	12.2	77.9	45.05	
				1.65
330	15.5	77.9	46.70	
Mean v = 2.21				

Value of one scale-division = 3′.69	Logarithms.
v = 8′.15	
5400′ + v'	3.73305
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00066

Computation.

	s.
Observed time of 80 oscillations	621.45
Time of one oscillation	7.7681
Correction for rate	.0009
T' =	7.7690

$t'-t=+4°.8$

$mH=\frac{\pi^2 M}{T^2}$

Temp. t = 87°.0

	Log'ms.
T'	0.89037
T'^2	1.78073
$1+\frac{h}{f}$	0.00066
$1-(t'-t)\,q$	9.99823
T^2	1.77962

[Date, June 17, 1881. Station, Washington, D. C. Instrument, No. 11. Magnet, $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188. Observer, M. S.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	6 49 52.9	91.0	32.1	53.1	
10	50 47.2				
20	51 41.1				
30	52 35.2				
40	53 29.3				
50	54 23.4	92.0	35.1	50.9	
100	6 58 54.0				9 01.1
110	59 48.1				00.9
120	7 00 42.3				01.2
130	01 36.4				01.2
140	02 30.5				01.2
150	03 24.7	92.5	32.9	48.1	01.3
	Means	91.8			9 01.15

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
330	32.9	48.1	40.50	
				4.45
60	27.2	62.7	44.95	
				2.90
240	16.1	68.0	42.05	
				1.10
330	32.9	53.4	43.15	
Mean v = 2.11				

Value of one scale-division = 3′.69	Logarithms.
v = 7′.79	
5400′ + v'	3.73302
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00063

Computation.

	s.
Observed time of 100 oscillations	541.15
Time of one oscillation	5.4115
Correction for rate	+0.0006
T' =	5.4121

$t'-t=+4°.8$

$mH=\frac{\pi^2 M}{T^2}$

Temp. t = 87°.0

	Log'ms.
T'	0.73337
T'^2	1.46673
$1+\frac{h}{f}$	0.00063
$1-(t'-t)\,q$	9.99823
T^2	1.46559

Observations to determine the moment of mass of the long magnet $L_{,,,}$ &c.—**Continued.**

[Date, January 28, 1884. Station, Washington, D. C. Instrument, theodolite magnetometer, No. 11. Magnet, $L_{,,,}$. Sidereal chronometer, Kessels No. 1237; daily rate, $4^{m}.06^{s}.0$, gaining on mean time. Observer, J. E. Maxfield.]

No. of oscillations.	Chronometer time.	Temp. t′	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	6 42 37.5	44.0	24.8	59.2	
10	43 31.5				
20	44 25.5				
31	45 24.6				
41	46 18.5				
51	47 12.5	44.5	25.0	59.4	
100	6 51 37.8	45.0	27.0	58.0	9 00.3
110	52 31.7				00.2
120	53 25.6				00.1
131	54 24.6				00.0
141	55 18.5				00.0
151	56 12.5	45.5	29.9	56.3	00.0
	Means	44.75			9 00.10

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
64	29.9	56.3	43.1			
				4.8		
154	30.0	65.8	47.9			
				7.9		
334	24.2	55.8	40.0		v = 16′	
				5.5	5400′ + v′	3.73374
64	28.0	63.0	45.5		5400 (ar. co.)	6.26761
	Mean v = 4.55				$1+\frac{h}{f}$	0.00135

Computation.

	s.
Observed time of 100 oscillations	540.10
Time of one oscillation	5.4010
Correction for rate	—0.0153
	T = 5.3857

			Log'ms.
q = 0.00085		T	0.73124
t′ — t = —1°.25		T^2	1.46248
$mH=\frac{\pi^2 M}{T^2}$		$1+\frac{h}{f}$	0.00135
		$1-(t'-t)q$	0.00046
Temp. t = 46°.0		T^2	1.46429

[Date, January 28, 1884. Station, Washington, D. C. Instrument, theodolite magnetometer, No. 11. Magnet, $L_{,,,}$. Sidereal chronometer, Kessels No. 1237; daily rate, $4^{m}.06^{s}.0$, gaining on mean time. Observer, J. E. Maxfield.]

No. of oscillations.	Chronometer time.	Temp. t′	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	7 16 12.6	45	23.4	77.0	
10	17 30.5				
20	18 48.0				
31	20 13.3				
41	21 30.7				
51	22 48.2	45	25.0	79.0	
100	7 29 08.5	45.5	30.0	75.4	12 55.9
110	30 25.9				55.4
120	31 43.5				55.5
131	33 08.0				54.7
141	34 25.3				54.6
151	35 42.9	46.0	36.8	72.4	54.7
	Means	45.4			12 55.13

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
32	36.8	72.4	54.6			
				5.7		
122	55.0	65.6	60.3			
				9.4		
302	44.4	57.4	50.9		v = 18′.7	
				5.2	5400′ + v′	3.73390
32	54.6	57.6	56.1		5400 (ar. co.)	6.26761
	Mean v = 5.08				$1+\frac{h}{f}$	0.00151

Computation.

	s.
Observed time of 100 oscillations	775.13
Time of one oscillation	7.7513
Correction for rate	—0.0220
	T = 7.7293

			Log'ms.
		T	0.88814
t′ — t = —0°.6		T^2	1.77628
$mH=\frac{\pi^2 M}{T^2}$		$1+\frac{h}{f}$	0.00151
		$1-(t'-t)q$	0.00022
Temp. t = 46°.0		T^2	1.77801

Observations to determine the moment of mass of the long magnet $L_{,,}$ &c.—Continued.

[Date, January 28, 1884. Station, Washington, D. C. Instrument, theodolite magnetometer, No. 11. Magnet, $L_{,,}$. Sidereal chronometer, Kessels No. 1237; daily rate, $4^m 06^s.0$, gaining on mean time. Observer, J. E. Maxfield.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 98 oscillations.
	h. m. s.				*m. s.*
0	7 52 35.6	46.	25.0	62.0	
10	53 29.6				
20	54 23.6				
31	55 22.5				
41	56 16.5				
51	57 10.6	46.5	29.6	58.0	
98	8 01 25.2	46.5	30.2	56.6	8 49.6
108	02 19.4				49.8
118	03 13.3				49.7
129	04 11.7				49.2
139	05 05.7				49.2
149	06 00.4	47.0	34.6	53.4	49.8
	Means	46.5			8 49.55

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale division=3′.69	Logarithms.
32	34.6	53.4	44.0			
				3.8		
122	41.4	54.2	47.8			
				7.7		
302	28.0	52.2	40.1		$v=14'.8$	
				4.5	$5400'+v'$	3.73358
32	40.6	48.6	44.6		5400 (ar. co.)	6.26761
Mean $v=4.60$					$1+\frac{h}{f}$	0.00119

Computation.

	s.
Observed time of 98 oscillations	529.55
Time of one oscillation	5.4036
Correction for rate	—.0153
$T=$	5.3883

$t'-t=+0.5^{\circ}$

$mH=\frac{\pi^2 M}{T^2}$

Temp. $t=46^{\circ}.0$

	Log'ms.
T'	0.73145
T'^2	1.46290
$1+\frac{h}{f}$	0.00119
$1-(t'-t)q$	9.99982
T^2	1.46391

[Date, January 28, 1884. Station, Washington, D. C. Instrument, theodolite magnetometer, No. 11. Magnet, $L_{,,}$. Sidereal chronometer, Kessels No. 1237, daily rate, $4^m 06^s.0$, gaining on mean time. Observer, J. E. Maxfield.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				*m. s.*
0	8 25 07.0	46.5	10.0	61.0	
10	26 25.0				
20	27 42.6				
31	29 08.6				
41	30 26.5				
51	31 44.1	46.5	06.0	63.0	
100	8 38 03.6	46.5	9.0	62.0	12 56.6
110	39 21.1				56.1
120	40 38.9				56.3
131	42 04.6				56.0
141	43 22.5				56.0
151	44 40.2	46.5	13.8	60.0	56.1
	Means	46.5			12 56.18

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale division=3′.69	Logarithms.
43	13.8	60.0	36.9			
				5.5		
133	16.4	68.4	42.4			
				10.0		
313	14.4	50.4	32.4		$v=18'.6$	
				4.7	$5400'+v'$	3.73389
43	19.2	55.0	37.1		5400 (ar. co.)	6.26761
Mean $v=5.05$					$1+\frac{h}{f}$	0.00150

Computation.

	s.
Observed time of 100 oscillations	776.18
Time of one oscillation	7.7618
Correction for rate	—0.0220
$T'=$	7.7398

$t'-t=+0.5^{\circ}$

$mH=\frac{\pi^2 M}{T^2}$

Temp. $t=47^{\circ}$

	Log'ms.
T'	0.88873
T'^2	1.77746
$1+\frac{h}{f}$	0.00150
$1-(t'-t)q$	9.99982
T^2	1.77878

Observations to determine the moment of mass of the long magnet $L_{,,}$, &c.—Continued.

[Date, January 28, 1884. Station, Washington, D. C. Instrument, theodolite magnetometer No. 11. Magnet, $L_{,,}$. Mass ring. Sidereal chronometer, Kessels No. 1237; daily rate, 4m 06s.0, gaining on mean time. Observer, J. E. Maxfield.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 100 oscillations.
	h. m. s.				m. s.
0	9 01 39.0	46.5	21.0	73.0	
10	02 33.3				
20	03 27.5				
31	04 25.6				
41	05 19.5				
51	06 13.3	46.5	30.0	67.4	
100	10 10 39.5	46.5	30.0	65.8	9 00.5
110	11 33.7				00.4
120	12 28.0				00.5
131	13 25.3				8 59.7
141	14 19.3				59.8
151	15 13.4	46.5	35.0	63.0	60.1
	Means	46.5			9 00.17

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
43	35.0	63.0	49.0			
				3.3		
133	42.6	62.0	52.3			
				6.1		
313	36.0	56.4	46.2		$v = 11'.4$	
				3.0	$5400' + v'$	3.73331
43	34.0	64.4	49.2		5400 (ar. co.)	6.26761
Mean $v = 3.10$					$1 + \frac{h}{f}$	0.00092

Computation.

	s.
Observed time of 100 oscillations	540.17
Time of one oscillation	5.4017
Correction for rate..............................	—0.0153
$T =$	5.3864

$t' - t = +0°.5$

$mH = \frac{\pi^2 M}{T^2}$

Temp. $t = 46°.0$

	Log'ms.
T	0.73130
T^2	1.46260
$1 + \frac{h}{f}$	0.00092
$1 - (t' - t)q$	9.99982
T^2	1.46334

Observations for dip and relative intensity.

[Date, January 30, 1884. Station, Magnetic Observatory, near corner of B and First streets southeast, Washington, D. C. Dip circle No. 28 (Kew). Needle No. 2. Observer, J. E. Maxfield. Time of beginning, 1h 20m p. m.; time of ending, 49m p. m (75th meridian time).]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 70 17 16	° ′ 69 58 57	° ′ 70 16 15	° ′ 69 55 55	° ′ 71 48 48	° ′ 71 25 24	° ′ 70 43 43	° ′ 70 24 24	° ′ 70 56 54	° ′ 70 32 31	° ′ 70 51 50	° ′ 70 34 33	° ′ 70 58 57	° ′ 70 36 35	° ′ 70 47 46	° ′ 70 35 34	*Circle N.* Needle N. 54° 39′ Needle S. 55 31
70 16.5	69 57.5	70 15.5	69 55	71 48	71 24.5	70 43	70 24	70 55	70 31.5	70 50.5	70 33.5	70 57.5	70 35.5	70 46.5	70 34.5	*Circle S.* Needle N. 55 00 Needle S. 52 40
70° 07′.0		70° 05′.2		71° 36′.3		70° 33′.5		70° 43′.2		70° 42′.0		70° 46′.5		70° 40′.5		Mag. mer. 54 27.5
70° 06′.1				71° 04′.9				70° 42′.6				70° 43′.5				
Mean...... 70° 35′.5								Mean...... 70° 43′.1								
Resulting dip, 70° 39′.3																

[Date, January 30, 1884. Station, Washington, D. C. Needle No. 2. Observer, J. E. Maxfield. Time of beginning, 2h 05m p. m.; time of ending, 35m p. m.]

Porlarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 71 20 20	° ′ 71 01 00	° ′ 71 01 00	° ′ 70 42 42	° ′ 70 29 29	° ′ 70 10 08	° ′ 70 19 19	° ′ 70 00 00	° ′ 70 48 48	° ′ 70 28 27	° ′ 70 12 12	° ′ 69 46 46	° ′ 71 22 22	° ′ 71 00 00	° ′ 70 40 40	° ′ 70 18 18	*Circle N.* Needle N. 57° 00′ Needle S. 55 40
71 20	71 00.5	71 00.5	70 42	70 29	70 09	70 19	70 00	70 48	70 27.5	70 12	69 46	71 22	71 00	70 40	70 18	*Circle S.* Needle N. 54 36 Needle S. 53 38
71° 10′.2		70° 51′.2		70° 19′.0		70° 09′.5		70° 37′.8		69° 59′.0		71° 11′.0		70° 29′.0		Mag. mer. 55 13.5
								70° 18′.4				70° 50′.0				
Mean...... 70° 37′.5								Mean...... 70° 34′.2								
Resulting dip, 70° 35′.9																

[Date, January 30, 1884. Station, Washington, D. C. Needle No. 3 (extra) used in place of needle No. 1, which was broken in transitu from Point Barrow to Washington. Observer, J. E. Maxfield. Time of beginning, $2^h 50^m$ p. m.; time of ending, $3^h 20^m$ p. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
71 06	70 46	70 00	69 38	70 56	70 31	70 31	70 09	70 29	70 05	70 50	70 31	70 50	70 24	71 11	70 51	Needle N. 56° 40′
05	45	69 40	38	56	31	31	09	29	05	50	31	50	24	11	51	Needle S. 56 09
71 05.5	70 45.5	69 54.5	69 38	70 56	70 31	70 31	70 09	70 29	70 05	70 50	70 31	70 50	70 24	71 11	70 51	*Circle S.*
70° 55′.5		69° 46′.3		70° 43′.5		70° 20′.0		70° 17′.0		70° 40′.5		70° 37′.0		71° 01′.0		Needle N. 55 36 Needle S. 55 05
70° 20′.9				70° 31′.7				70° 28′.8				71° 49′.0				Mag. Mer. 55 52.5
Mean...... 70° 26′.3								Mean...... 70° 38′.9								
Resulting dip, 70° 32′.6																

Observations for relative total intensity.

[Date, January 30, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning, $3^h 30^m$ p. m.; time of ending, 50^m p. m. Magnetic meridian reads 55° 52′.0]

Needle No. 3, No. 4 deflecting.				No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
71 52	71 54	33 55	33 04	41 30	40 56	41 38	41 02	42 07	41 01	44 06	42 50
48	50	[illegible]	02	[illegible]	52	34	40 58	11	05	10	54
71 50	71 52	33 54	33 03	41 28	40 54	41 36	41 00	42 09	41 03	44 08	42 52
71° 51′.0		33° 28′.5		41° 11′.0		41° 18′.0		41° 36′.0		43° 30′.0	
				41° 14′.5				42° 33′.0			
Mean...... 37° 20′.2 = u'_0				Mean...... 41° 53′.8 = η_0							

[Date, January 31, 1884. Station, Washington, D. C. Needle No. 2. Observer, J. E. Maxfield. Time of beginning, $9^h 55^m$ a. m.; time of ending, $10^h 22^m$ a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
70 55	70 37	71 13	70 49	70 30	70 10	70 47	70 26	70 31	70 13	70 44	70 24	70 58	70 38	71 08	70 43	Needle N. 54° 52′
55	36	12	49	29	10	47	25	31	13	43	23	57	37	08	43	Needle S. 53 12
70 55	70 36.5	71 12.5	70 49	70 29.5	70 10	70 47	70 25.5	70 31	70 13	70 43.5	70 23.5	70 57.5	70 37.5	71 08	70 43	*Circle S.*
70° 45′.7		71° 00′.7		70° 19′.8		70° 36′.2		70° 22′.0		70° 33′.5		70° 47′.5		70° 55′.5		Needle N. 56 26 Needle S. 53 42
70° 53′.2				70° 28′.0				70° 27′.7				70° 51′.5				Mag. mer. 54 33
Mean......70° 40′.6								Mean......70° 39′.6								
Resulting dip, 70° 40′.1																

[Date, January 31, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning 10ʰ 44ᵐ a. m.; time of ending 56ᵐ a. m. Magnetic meridian reads 54° 33′.]

Needle No. 3, No. 4 deflecting.				Needle 4, weighted.											
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.					
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.				
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′				
72 24 20	72 13 08	33 39 36	33 11 08	41 06 04	40 22 24	41 45 44	40 59 58	41 43 41	40 54 52	42 45 43	41 48 47				
72 22	72 10.5	33 37.5	33 09.5	41 05	40 23	41 44.5	40 58.5	41 42	40 53	42 44	41 47.5				
72° 16′.3		33° 23′.5		40° 44′.0		41° 21.5		41° 17′.5		42° 15′.7					
				41° 02′.8				41° 46′.6							
Mean......37° 10′.1 = u'_0				Mean......41° 24′.7 = η_0											

[Date, January 31, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning, 11ʰ 57ᵐ a. m.; time of ending, 11ʰ a. m. Magnetic meridian reads 54° 33′.]

Needle No. 3, No. 4 deflecting.				Needle 4, weighted.							
Circle east, mic. D, face east.		Circle east. mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east. face west.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
71 50 46	72 07 02	33 40 38	33 02 00	41 12 08	40 39 35	41 57 53	41 18 14	41 35 38	40 40 43	41 40 44	40 37 41
71 48	72 04.5	33 39	33 01	41 10	40 37	41 55	41 16	41 36.5	40 41.5	41 42	40 39
71° 56′.2		33° 20′.0		40° 58′.5		41° 35′.5		41° 09′.0		41° 10′.5	
				41° 14′.5				41° 09′.7			
Mean......37° 21′.9 = u'_0				Mean......41° 12′.1 = η_0							

[Date, January 31, 1884. Station, Washington, D. C. Needle No. 2. Observer, J. E. Maxfield. Time of beginning, 2ʰ 02ᵐ p. m.; time of ending, 22ᵐ p. m. Magnetic meridian reads 54° 33′.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
71 06 09	70 28 31	71 01 05	70 29 33	70 37 32	70 32 27	70 31 27	70 25 20	70 30 35	70 28 23	70 28 23	70 24 19	71 10 15	70 31 36	70 45 50	70 10 15
71 07.5	70 29.5	71 03	70 31	70 34.5	70 29.5	70 29	70 22.5	70 32.5	70 25.5	70 25.5	70 21.5	71 12.5	70 33.5	70 47.5	70 12.5
70° 48′.5		70° 47′.0		70° 32′.0		70° 25′.8		70° 29′.0		70° 23′.5		70° 53′.0		70° 30′.0	
70° 47′.7				70° 28′.9				70° 26′.3				70° 41′.5			
Mean......70° 38′.3								Mean......70° 33′.9							
Resulting dip, 70° 36′.1															

[Date, January 31, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning, 2^h 48^m p. m.; time of ending, 3^h 08^m p. m. Magnetic meridian reads 54° 33′.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
71 53 48	71 51 46	34 05 03	33 10 08	41 36 34	40 48 46	41 41 43	40 50 52	42 17 15	41 30 28	43 00 42 56	42 12 10
71 50.5	71 48.5	34 04	33 09	41 35	40 47	41 42	40 51	42 16	41 29	42 58	42 11
71° 49′.5		33° 36′.5		41° 11′.0		41° 16′.5		41° 52′.5		42° 34′.5	
				41° 13′.7				42° 13′.5			
Mean......37° 17′.0=u'_0				Mean......41° 43′.6=η_0							

[Date, January 31, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning, 3^h 05^m p. m.; time of ending, 3^h 22^m p. m. Magnetic meridian reads 54° 33′.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
72 02 00	71 42 40	34 10 13	33 06 10	40 53 49	40 13 08	41 19 15	40 45 41	41 46 50	40 39 43	42 23 27	41 20 24
72 01	71 41	34 11.5	33 08	40 51	40 10.5	41 14	40 43	41 48	40 41	42 25	41 22
71° 51′.0		33° 39′.8		40° 30′.7		40° 58′.5		41° 14′.5		41° 53′.5	
				40° 44′.6				41° 34′.0			
Mean......37° 14′.6=u'_0				Mean......41° 09′.3=η_0							

[Date, February 1, 1884. Station, Washington, D. C. Needle No. 2. Observer, J. E. Maxfield. Time of beginning, 2^h 05^m p. m.; time of ending, 2^h 28^m p. m. Magnetic meridian reads 55° 00′.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
71 08 07	70 45 44	71 23 22	71 05 04	70 22 22	70 02 02	70 44 44	70 24 24	70 15 15	69 55 55	70 46 46	70 19 19	70 50 50	70 30 30	71 09 09	70 49 49
71 07.5	70 44.5	71 22.5	71 04.5	70 22	70 02	70 44	70 24	70 15	69 55	70 46	70 19	70 50	70 30	71 09	70 49
70° 56′.0		71° 13′.5		70° 12′.0		70° 34′.0		70° 05′.0		70° 32′.5		70° 40′.0		70° 59′.0	
71° 04′.8				70° 23′.0				70° 18′.7				70° 49′.5			
Mean...... 70° 43′.9								Mean...... 70° 34′.1							
Resulting dip, 70° 39′.0															

[Date, February 1, 1884. Station, Washington, D. C. Needle No. 3 (extra). Observer, J. E. Maxfield. Time of beginning, 2^h 28^m p. m.; time of ending, 2^h 52^m p. m. Magnetic meridian reads 55° 00′.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
71 50 49	71 24 23	70 04 04	69 44 43	70 30 30	70 03 03	70 37 37	70 14 14	70 50 50	70 25 25	72 02 02	71 40 40	70 53 53	70 30 30	71 13 13	70 50 50
71 49.5	71 23.5	70 04	69 43.5	70 30	70 03	70 37	70 14	70 50	70 25	72 02	71 40	70 53	70 30	71 13	70 50
71° 36′.5		69° 53′.8		70° 16′.5		70° 25′.5		70° 37′.5		71° 51′.0		70° 41′.5		71° 01′.5	
70° 45′.2				70° 21′.0				70° 44′.3				70° 51′.5			
Mean...... 70° 33′.1								Mean...... 70° 47′.9							
Resulting dip, 70° 40′.5															

[Date, February 1, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning, 2^h 54^m p. m.; time of ending, 3^h 10^m p. m. Magnetic meridian reads 55° 00′.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
72 05 03	71 53 50	34 09 07	33 16 14	40 53 48	40 19 15	41 43 38	41 01 40 57	41 50 55	40 52 56	42 27 22	41 20 25
72 04	71 51.5	34 08	33 15	40 50.5	40 17	41 40.5	40 59	41 52.5	40 54	42 24.5	41 22.5
71° 57′.7		33° 41′.5		40° 33′.8		41° 19′.8		41° 23′.3		41° 53′.5	
				40° 56′.8				41° 38′.4			
Mean......37° 10′.4=u'_0				Mean......41° 17′.6=η_0							

[Date, February 2, 1884. Station, Washington, D. C. Needle No. 2. Observer, J. E. Maxfield. Time of beginning, 11^h 50^m a. m.; time of ending, 0^h 12^m p. m.; magnetic meridian reads 55° 00′.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
73 43 42	70 23 22	71 00 70 59	70 40 39	70 10 10	69 50 50	70 45 45	70 21 21	70 35 35	70 15 15	70 39 39	70 14 14	70 53 53	70 35 35	71 20 20	70 58 58
70 42.5	70 22.5	70 59.5	70 39.5	70 10	69 50	70 45	70 21	70 35	70 15	70 39	70 14	70 53	70 35	71 20	70 58
70° 32′.5		70° 49′.5		70° 00′.0		70° 33′.0		70° 25′.0		70° 26′.5		70° 44′.0		71° 09′.0	
70° 41′.0				70° 16′.5				70° 25′.7				70° 56′.5			
Mean......70° 28′.8								Mean......70° 41′.1							
Resulting dip, 70° 35′.0															

[February 2, 1884. Station, Washington, D. C. Needle No. 2, extra (this needle now takes the place of the broken needle 1). Observer, J. E. Maxfield. Time of beginning, 10h 20m a. m.; time of ending, 10h 50m a. m. Magnetic meridian reads 55° 00′.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west. face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 71 35 40	° ′ 70 59 71 04	° ′ 70 36 41	° ′ 69 57 70 02	° ′ 70 13 08	° ′ 70 05 00	° ′ 69 53 48	° ′ 69 43 38	° ′ 70 56 51	° ′ 70 46 41	° ′ 70 10 05	° ′ 70 03 69 58	° ′ 71 42 46	° ′ 71 08 12	° ′ 71 30 34	° ′ 70 55 59
71-37. 5	71 01. 5	70 38. 5	69. 59. 5	70 10. 5	70 02. 5	69 50. 5	69 40. 5	70 53. 5	70 43. 5	70 07. 5	70 00. 5	71 44	71 10	71 32	70 57
71° 19′. 5		70° 19′. 0		70° 06′. 5		69° 45′. 5		70° 48′. 5		70° 04′. 0		71° 27′. 0		71° 14′. 5	
70° 49′. 2				69° 56′. 0				70° 26′. 2				71° 20′. 8			
Mean...... 70° 22′. 1								Mean...... 70° 53′. 5							
Resulting dip, 70° 37′. 8															

[Date, February 2, 1884. Station, Washington, D. C. Needle No. 2. Observer, J. E. Maxfield. Time of beginning, 10h 55m a. m.; time of ending, 11h 15m a. m. Magnetic meridian reads 55° 00′.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 71 08 12	° ′ 70 30 35	° ′ 71 13 17	° ′ 70 42 46	° ′ 70 35 31	° ′ 70 23 18	° ′ 70 10 05	° ′ 70 00 69 55	° ′ 70 30 25	° ′ 70 19 14	° ′ 70 22 17	° ′ 70 10 05	° ′ 71 12 17	° ′ 70 38 43	° ′ 70 52 56	° ′ 70 20 24
71 10	70 32. 5	71 15	70 44	70 33	70 20. 5	70 07. 5	69 57. 5	70 27. 5	70 16. 5	70 19. 5	70 07. 5	71 14. 5	17 40. 5	70 54	70 22
70° 51′. 3		70° 59′. 5		70° 26′. 7		70° 02′. 5		70° 22′. 0		70° 13′. 5		70° 57′. 5		70° 38′. 0	
70° 55′. 4				70° 14′. 6				70° 17′. 8				70° 47′. 8			
Mean...... 70° 35′. 0								Mean...... 70° 32′. 8							
Resulting dip, 70° 33′. 9															

[Date, February 2, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Time of beginning, 11h 20m a. m.; time of ending, 11h 45m a. m. Magnetic meridian reads 55° 00′].

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 71 52 52	° ′ 71 34 34	° ′ 34 06 10	° ′ 33 14 18	° ′ 42 28 27	° ′ 41 37 36	° ′ 42 13 12	° ′ 41 28 27	° ′ 41 33 33	° ′ 40 41 41	° ′ 42 18 18	° ′ 41 40 40
71 52	71 34	34 08	33 16	42 27. 5	41 30. 5	42 12. 5	41 27. 5	41 33	40 41	42 18	41 40
71° 43′. 0		33° 42′. 0		42° 02′. 0		41° 50′. 0		41° 07′. 0		41° 59′. 0	
				41° 56′.0				41° 33′.0			
Mean ......37° 17′.5=u'_0				Mean......41° 44′.5=η_0							

Set 1.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Time of beginning, 9h 45m a. m. (75th meridian time.) Magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
33 08	34 20	72 02	71 50	40 22	39 50	41 13	40 24	42 14	41 26	42 44	41 53
06	18	71 58	46	24	52	15	26	16	24	42	51
33 07	34 19	72 00	71 48	40 23	39 51	41 14	40 25	42 15	41 25	42 43	41 52
33° 43′		71° 54′		40° 07′		40° 49′.5		41° 50′		42° 17′.5	
				40° 28′.2				42° 03′.8			
$37° 11'.5 = u'_0$				Mean......$41° 16' = \eta_0$							

Set 2.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
34 06	33 06	71 59	71 51	40 52	40 16	41 10	40 30	42 12	41 11	42 25	41 20
04	04	55	47	48	12	06	26	10	15	23	18
34 05	33 05	71 57	71 49	40 50	40 14	41 08	40 28	42 11	41 13	42 24	41 19
33° 35′		71° 53′		40° 32′		40° 48′		41° 42′		41° 51′.5	
				40° 40′				41° 46′.8			
$37° 16' = u'_0$				Mean......$41° 13'.4 = \eta_0$							

Set 3.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle 4, weighted.							
Circle east, Mic. D., face east.		Circle east, Mic. R., face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
33 55	32 56	71 51	71 32	41 15	40 28	40 44	39 57	42 03	41 17	42 14	41 20
59	33 00	53	30	13	26	46	59	01	15	12	18
33 57	32 58	71 52	71 31	41 14	40 27	40 45	39 58	42 02	41 16	42 13	41 19
33° 27′.5		71° 41′.5		40° 50′.5		40° 21′.5		41° 39′		41° 46′	
				40° 36′				41° 42′.5			
$37° 25'.5 = u'_0$				Mean...... $41° 09'.2 = \eta_0$							

Set 4.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, 4 deflecting. Observer, J. E. Maxfield. Magnetic meridian reads 55° 29′.]

Deflecting needle facing in.				Needle 4, weighted.							
Circle east, Mic. D., face east.		Circle east, Mic. R., face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
34 02	33 10	71 49	71 42	40 44	40 15	40 30	40 00	41 43	40 46	42 21	41 18
00	08	45	38	40	11	26	39 56	47	50	25	22
34 01	33 09	71 47	71 40	40 42	40 13	40 28	39 58	41 45	40 48	42 23	41 20
33° 35′		71° 43′.5		40° 27′.5		40° 13′		41° 16′.5		41° 51′.5	
				40° 20′.2				41° 34′			
37° 20′.8 = u'_0				Mean...... 40° 57′.1 = η_0							

Set 5.

[Date, February 15, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Needle No. 3 suspended, No. 4 deflecting. Magnetic meridian reads 55° 29′.]

Deflecting needle facing in.				Needle 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
34 28	33 23	71 50	71 30	42 28	41 37	41 50	41 02	41 13	40 28	40 43	40 02
30	27	46	26	26	35	48	00	15	26	43	00
34 29	33 25	71 48	71 28	42 27	41 36	41 49	41 01	41 14	40 27	40 43	40 01
33° 57′		71° 38′		42° 01′.5		41° 25′		40° 50′.5		40° 22′	
				41° 43′.2				40° 36′.2			
37° 12′.5 = u'_0				Mean...... 41° 09′.7 = η_0							

Set 6.

[Date, February 15, 1884. Station, Washington, D. C. Observer, J. E. Maxfield. Needle No. 3 suspended, No. 4 deflecting. Magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
34 03	33 07	71 51	71 48	40 36	39 56	40 57	40 20	41 49	41 03	42 31	41 37
01	05	47	44	38	58	59	22	47	01	29	35
34 02	33 06	71 49	71 46	40 37	39 57	40 58	40 21	41 48	41 02	42 30	41 36
33° 34′		71° 47′.5		40° 17′		40° 39′.5		41° 25′		42° 03′	
				40° 28′.2				41° 44′			
37° 19′.2 = u'_0				Mean...... 41° 06′.1 = η_0							

Set 7.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Time of ending, 11h 55m a. m.; magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 33 50 48	° ′ 33 02 00	° ′ 72 06 02	° ′ 71 53 49	° ′ 40 30 26	° ′ 39 51 47	° ′ 41 31 27	° ′ 40 47 43	° ′ 41 36 32	° ′ 40 47 43	° ′ 42 24 20	° ′ 41 37 33
33 49	33 01	72 04	71 51	40 28	39 49	41 29	40 45	41 34	40 45	42 22	41 35
33° 25′		71° 57′.5		40° 08′.5		41° 07′		41° 09′.5		41° 58′.5	
				40° 37′.8				41° 34′			
37° 18′.8 = u'_0				Mean......41° 05′.9 = η_0							

Set 8.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Time of beginning, 1h 00m p. m.; magnetic meridian reads 55° 29′.]

Deflecting needle facing in.				Needle No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 34 00 33 58	° ′ 33 11 09	° ′ 71 48 44	° ′ 71 42 46	° ′ 41 00 40 56	° ′ 40 26 22	° ′ 41 06 02	° ′ 40 25 21	° ′ 40 49 53	° ′ 39 57 40 01	° ′ 41 18 22	° ′ 42 19 23
33 59	33 10	71 46	71 44	40 58	40 24	41 04	40 23	40 51	39 59	41 20	42 21
33° 34′.5		71° 45′		40° 41′		40° 43′.5		40° 25′		41° 50′.5	
				40° 42′.2				41° 07′.8			
37° 20′.2 = u'_0				Mean......40° 55′ = η_0							

Set 9.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 33 30 32	° ′ 32 30 32	° ′ 72 25 27	° ′ 72 04 02	° ′ 41 21 23	° ′ 39 59 40 01	° ′ 41 00 40 58	° ′ 40 25 40 27	° ′ 41 17 15	° ′ 40 24 22	° ′ 41 20 18	° ′ 40 34 32
33 31	32 31	72 26	72 03	41 22	40 00	40 59	40 26	41 16	40 23	41 19	40 33
33° 01′		72° 14′.5		40° 41′		40° 42′.5		40° 49′.5		40° 56′	
				40° 41′.8				40° 52′.8			
37° 22′.2 = u'_0				Mean......40° 47′.3 = η_0							

Set 10.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Magnetic meridian reads 55° 29′.]

Deflecting needle facing in.				Needle No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 34 00 33 58	° ′ 33 06 04	° ′ 71 50 46	° ′ 71 41 37	° ′ 40 28 26	° ′ 39 47 45	° ′ 41 48 46	° ′ 40 56 54	° ′ 42 09 13	° ′ 41 07 11	° ′ 42 18 22	° ′ 41 15 19
33 59	33 05	71 48	71 39	40 27	39 46	41 47	40 55	42 11	41 09	42 20	41 17
33° 32′		71° 43′.5		40° 06′.5		41° 21′		41° 40′		41° 48′.5	
				40° 43′.8				41° 44′.2			
37° 22′.2 = u'_0				Mean......41° 14′ = η_0							

Set 11.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Magnetic meridian reads 55° 29′.]

Deflecting needle facing out.				Needle No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 33 54 52	° ′ 32 58 56	° ′ 72 10 08	° ′ 72 04 02	° ′ 40 42 38	° ′ 40 06 02	° ′ 41 04 00	° ′ 40 27 23	° ′ 41 33 37	° ′ 40 34 38	° ′ 42 07 11	° ′ 41 08 12
33 53	32 57	72 09	72 03	40 40	40 04	41 02	40 25	41 35	40 36	42 09	41 10
33° 25′		72° 06′		40° 22′		40° 43′.5		41° 05′.5		41° 39′.8	
				40° 32′.8				41° 22′.5			
37° 14′.5 = u'_0				Mean......40° 57′.6 = η_0							

Set 12.

[Date, February 15, 1884. Station, Washington, D. C. Needle No. 3 suspended, No. 4 deflecting. Observer, J. E. Maxfield. Time of ending, 2^h 20^m p. m.; magnetic meridian reads 55° 29′.]

Deflecting needle facing in.				Needle No. 4, weighted.							
Circle east, mic. D, face east.		Circle east, mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 33 58 34 00	° ′ 32 56 58	° ′ 71 48 52	° ′ 71 30 34	° ′ 40 38 36	° ′ 39 55 53	° ′ 41 15 17	° ′ 40 30 28	° ′ 41 43 41	° ′ 40 55 53	° ′ 41 17 15	° ′ 42 07 05
33 59	32 57	71 50	71 32	40 37	39 54	41 16	40 29	41 42	40 54	41 16	42 06
33° 28′		71° 41′		40° 15′.5		40° 52′.5		41° 18′		41° 41′	
				40° 34′				41° 29′.5			
37° 25′.5 = u'_0				Mean......41° 01′.8 = η_0							

DETERMINATION OF THE MOMENT OF MASS (M_1) OF THE MASS RING ACCOMPANYING THEODOLITE MAGNETOMETER NO. 11.

The mass ring accompanying theodolite magnetometer No. 11 is of brass or gun metal, and has no distinguishing mark on it. Its weight was determined at the Coast and Geodetic Survey Office, by E. B. Lefavour, April 29, 1881, and found to be 300.767 grains.

The following measurements to determine the inner and outer diameters were made at the Coast and Geodetic Survey Office by Assistant C. A. Schott:

1881, April 29.	Temp. 77° F.	1881, April 30.	Temp. 73° F.
Outer diameter.	Inner diameter.	Outer diameter.	Inner diameter.
3.778^{cm}	2.954^{cm}	1.489^{in}	1.160^{in}
.778	2.954	.489	.159
.780	2.952	.490	.161
.780	2.952	.490	.160
3.779	2.953	1.4895	1.1600

Thickness of ring$=0.529^{cm}=0.208^{in}$

$3.779^{cm}=1.4878^{in}$	$2.953^{cm}=1.1626^{in}$
1.4895	1.1600
Outer diameter=1.4886	Inner diameter=1.1613

$$M_1=\frac{1}{8}(r^2+r_1^2)\,w=\frac{(.7443)^2+(.5807)^2}{288}\times 300.767$$

$(.7443)^2=0.55398$	0.89119	9.94997
$(.5807)^2=0.33721$	300.767	2.47823
	288 (ar. co.)	7.54061
0.89119		9.96881

M_1 at 75° Fah.$=0.93070$

MOMENT OF MASS (M_1) OF THE MASS RING ACCOMPANYING THEODOLITE MAGNETOMETER NO. 11.

$$M_1=0.93070 \text{ at } 75° \text{ Fah.}$$

M_1 at any temperature t will be

$$0.93070\,[1+.00002\,(t-75)]$$

Temperature.	Log M_1.
10° F.	9.96824
20	33
30	42
40	51
50	59
60	68
70	77
80	85
90	9.96894

COMPUTATION OF THE MOMENT OF MASS (M) OF THE LONG MAGNET $L_{,,}$ ACCOMPANYING THE THEODOLITE MAGNETOMETER NO. 11.

[Station, Magnetic Observatory, Washington, D. C. Observer, M. Smith. Date, June 10, 1881.]

	Log's.	Log's.	T_1^2	T^2	$T_1^2-T^2$
T^2	1.44740	....	....	28.016	....
T_1^2	1.76097	....	57.673	....	29.657

28.016		1.44741
29.657 (a. c.)		8.52787
M_1		9.96871
M at 63.°4 Fah.	=0.87900	9.94399
(63.4−62) × .0000136	= .00001904	5.27967
Reduction to 62° Fah. = −0.00002		5.22366

M at 62° Fah.=0.87898; $w=1$

[Date, June 11, 1881.]

	Log's.	Log's.	T_1^2	T^2	$T_1^2-T^2$
T^2	1.45494				
T_1^2	1.76893	1.45483	58.739	28.499	30.210
T^2	1.45472	1.76849	58.680	28.492	30.188
T_1^2	1.76805				
				28.496	30.214

28.496		1.45478
30.214 (a. c.)		8.51979
M_1		9.96882
M at 76°.8 Fah.	= 0.87779	9.94339
(76.8−62) × .0000136	= .00020128	6.30380
Reduction to 62° Fah. = −.00018		6.24719

M at 62° Fah. = 0.87761; w=2

[Date, June 17, 1881.]

	Log's.	Log's.	T_1^2	T^2	$T_1^2-T^2$
T^2	1.46422				
T_1^2	1.77824	1.46477	60.012	29.159	30.853
T^2	1.46532	1.78028	60.295	29.196	31.099
T_1^2	1.78233	1.46584	60.580	29.231	31.349
T^2	1.46636	1.78086	60.375	29.266	31.109
T_1^2	1.77938	1.46658	60.170	29.281	30.889
T^2	1.46681	1.77950	60.187	29.296	30.891
T_1^2	1.77962	1.46620	60.203	29.255	30.948
T^2	1.46559				
				29.241	31.020

29.241		1.46599
31.020 (a. c.)		8.50836
M_1		9.96891
M at 87° Fah.	= 0.87753	9.94326
(87−62) × .0000136	= .0003400	6.53148
Reduction to 62° Fah. = −.00030		6.47474

M at 62° Fah. = 0.87723; w=7

[Date, January 28, 1884. Observer, J. E. Maxfield.]

	Log's.	Log's.	T_1^2	T^2	$T_1^2-T^2$
T^2	1.46429				
T_1^2	1.77801	1.46410	59.980	29.114	30.866
T^2	1.46391	1.77840	60.034	29.101	30.933
T_1^2	1.77878	1.46362	60.087	29.082	31.005
T^2	1.46334				
				29.099	30.935

29.099		1.46388
30.935 (a. c.)		8.50955
M_1		9.96856
M at 46° Fah.	= 0.87496	9.94199
(62−46) × .0000136	= .0002176	6.33766
Reduction to 62° Fah. = +.00019		6.27965

M at 62° Fah. = 0.87515; w=3

RECAPITULATION.

Date.	M at 62° Fah.	w
1881.		
June 10	0.87898	1
June 11	0.87761	2
June 17	0.87723	7
1884.		
June 28	0.87515	3
	0.87694	

M at any temperature t will be 0.87694 [1+.0000136 (t−62°)]

Temperature.	Log M.
60°	9.94296
50	90
40	84
30	78
20	72
10	66
0	60
−10	54
−20	48
−30	9.94242

[Base Station, Washington, D. C. Year, 1884. Kew Dip Circle No. 23. Observer, J. E. Maxfield.]

	°	′
Jan. 30, Needle 2	70	39.3
Needle 2		35.9
Needle 3 (extra)		32.6
	70	35.9
Jan. 31, Needle 2	70	40.1
Needle 2		36.1
	70	38.1
Feb. 1, Needle 2	70	39.0
Needle 3 (extra)		40.5
	70	39.7
Feb. 2, Needle 2	70	35.0
Needle 2 (extra)		37.8
Needle 2		33.9
	70	35.6

Recapitulation.

	°	′
Jan. 30	70	35.9
Jan. 31		38.1
Feb. 1		39.7
Feb. 2		35.6
	70	37.3 $=\theta_0$

	°	′
Jan. 30, Needle 4 weighted	41	53.8
Jan. 31, Needle 4 weighted	41	24.7
		12.1
		43.6
		09.3
	41	22.4
Feb. 1, Needle 4 weighted	41	17.6
Feb. 2, Needle 4 weighted	41	44.5

Recapitulation.

	°	′
Jan. 30	41	53.8
Jan. 31		22.4
Feb. 1		17.6
Feb. 2		44.5
	41	34.6 $=\eta_0$
	70	37.3 $=\theta_0$
	29	02.7

	°	′
Jan. 30, Needle 3, needle 4 deflecting	37	20.2
Jan. 31, Needle 3, needle 4 deflecting	37	10.1
		21.9
		17.0
		14.6
	37	15.9
Feb. 1, Needle 3, needle 4 deflecting	37	10.4
Feb. 2, Needle 3, needle 4 deflecting	37	17.5

Recapitulation.

	°	′
Jan. 30	37	20.2
Jan. 31		15.9
Feb. 1		10.4
Feb. 2		17.5
	37	16.0 $=u'_0$

	Log's.
$\sin u_0 = \sin 29°\ 02'.7$	9.68619
$\sin u'_0 = \sin 37\ \ 16.0$	9.78213
$\sec \eta_0 = \sec 41\ \ 34.6$	0.12606
	2) 9.59438
	9.79719
$\sec \theta_0 = \sec 70°\ 37'.3$	0.47912
$H_0 = 4.378$*	0.64128
$A = 8.2716$	0.91759

	°	′
Feb. 15, Needle 4 weighted.	41	16.0
	41	13.4
	41	09.2
	40	57.1
	41	09.7
	41	06.1
	41	05.9
	40	55.0
	40	47.3
	41	14.0
	40	57.6
	41	01.8
$\eta_0 =$	41	04.4
$\theta_0 =$	70	39.4
$u_0 =$	29	35.0

	°	′
Feb. 15, Needle 3, needle 4 deflecting.	37	11.5
		16.0
		25.5
		20.8
		12.5
		19.2
		18.8
		20.2
		22.2
		22.2
		14.5
		25.5
$\gamma'_0 =$	37	19.1

	Log's.
$\sin u_0 = \sin 29°\ 35'.0$	9.69345
$\sin u'_0 = \sin 37\ \ 19.1$	9.78265
$\sec \eta_0 = \sec 41\ \ 04.4$	0.12270
	2) 9.59680
	9.79940
$\sec \theta_0 = \sec 70°\ 39'.4$*	0.47987
$H_0 = 4.378$*	0.64128
$A = 8.3282$ †	0.92055

* Deduced from annual observations for 18 years, 1867–'84.

† This value of A is to be used only in connection with observations made at Uglaamie, Alaska, previous to September, 1882, a different weight having been employed after August, 1882.

APPENDIX No. 3.

OBSERVATIONS MADE AT UGLAAMIE, ALASKA, IN 1881-'82-'83, FOR DETERMINING THE ABSOLUTE MAGNETIC DECLINATION, TOGETHER WITH THE COMPUTATION AND A RECAPITULATION OF RESULTS.

[Computer, E. H. Courtenay.]

[Date, December 11, 1881. Instrument, theodolite magnetometer No. 11. Magnet L,, suspended. Observers: Cassidy, Murdoch, Smith, and Dark. Each hourly value is the mean of five readings, which are recorded in the "observations of variations."]

Time.	Mean scale-readings.
	d.
1 a. m.	21. 70
2 a. m.	27. 63
3 a. m.	25. 14
4 a. m.	27. 04
5 a. m.	28. 27
6 a. m.	24. 02
7 a. m.	23. 96
8 a. m.	19. 91
9 a. m.	23. 15
10 a. m.	25. 39
11 a. m.	20. 95
12 m.	21. 32
1 p. m.	22. 53
2 p. m.	16. 90
3 p. m.	24. 43
4 p. m.	24. 09
5 p. m.	24. 74
6 p. m.	24. 36
7 p. m.	24. 62
8 p. m.	24. 71
9 p. m.	23. 68
10 p. m.	23. 04
11 p. m.	21. 82
12 p. m.	23. 00
Sum	= 566. 40
Mean	= 23. 60

Computation.		
Line of detorsion		18° 00′
Azimuth circle	A.	232 11
	B.	52 13
Reading of mark.		
At beginning of a. m. observations	A.	99 59
	B.	280 01
At end of p. m. observations		....
		....
Mean		100 00
Value of one division of scale		=3′.69
Scale-reading of axis		*35. 33
Mean scale-reading of east and west magnetic elongation		23. 60
diff. =		11. 73
Reduction to axis		—0° 43′.3
Azimuth circle reads		232 12. 0
Magnetic meridian reads		231 28. 7
Mean reading of mark		100 00. 0
Azimuth of mark		96 13. 0
True meridian reads		196 13. 0
Magnetic declination		35 15. 7 E.

*Former determination of axis = 34.80, April, 1882; determination = 35.85, mean = 35.33

[Date, January 24, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, suspended. Observers: Cassidy, Murdoch, Smith, and Dark. Each hourly value is the mean of five readings, which are recorded in the "observations of variations."]

Time.	Mean scale-readings.
	d.
1 a. m.	36. 37
2 a. m.	39. 69
3 a. m.	39. 68
4 a. m.	36. 84
5 a. m.	41. 47
6 a. m.	35. 65
7 a. m.	40. 83
8 a. m.	37. 57
9 a. m.	36. 46
10 a. m.	41. 54
11 a. m.	37. 65
12 m.	62. 32
1 p. m.	34. 60
2 p. m.	37. 96
3 p. m.	35. 12
4 p. m.	32. 11
5 p. m.	44. 61
6 p. m.	45. 59
7 p. m.	38. 15
8 p. m.	40. 14
9 p. m.	35. 01
10 p. m.	35. 33
11 p. m.	38. 71
12 p. m.	37. 70
Sum	= 941. 10
Mean	= 32. 21

Computation.		
Line of detorsion		18° 00′
Azimuth circle	A.	229 21
	B.	49 21
Reading of mark.		
At beginning of a. m. observations	A.	95 53
	B.	275 54
At end of p. m. observations		....
		....
Mean—Jan. 23, 10.30 p. m.		95 53. 5
Value of one division of scale		= *3′.69
Scale-reading of axis		35. 33
Mean scale-reading of east and west magnetic elongation		39. 21
diff. =		3. 88
Reduction to axis		+0° 14′.3
Azimuth circle reads		229 21. 0
Magnetic meridian reads		229 35. 3
Mean reading of mark		95 53. 5
*Azimuth of mark		96 13. 0
True meridian reads		192 06. 6
Magnetic declination		37 28. 8 E.

* Mean of six determinations made at Washington, D. C., in June, 1881, and February, 1884.

[Date, April 18, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, suspended. Observers: Cassidy, Murdoch, Smith, and Dark.]

Time.	Mean scale-readings.
	d.
1 a. m.	30. 28
2 a. m.	43. 93
3 a. m.	48. 56
4 a. m.	38. 30
5 a. m.	40. 90
6 a. m.	42. 60
7 a. m.	44. 90
8 a. m.	47. 94
9 a. m.	45. 40
10 a. m.	42. 32
11 a. m.	42. 15
12 m.	48. 28
1 p. m.	45. 79
2 p. m.	49. 87
3 p. m.	45. 32
4 p. m.	55. 61
5 p. m.	45. 12
6 p. m.	51. 15
7 p. m.	61. 52
8 p. m.	60. 35
9 p. m.	66. 20
10 p. m.	49. 92
11 p. m.	44. 67
12 p. m.	51. 73
Sum	= 1142. 81
Mean	= 47. 62

Line of detorsion ° ′ 15

Az. cir { A. 231 13; B. 51 13

Computation.		
Reading of mark.		
At beginning of a. m. observations	A.	275° 54′
	B.	95 53
At end of p. m. observations		....
		....
Mean		275 53. 5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	33. 0	55. 0	44. 00	....	....
I	31. 0	33. 5	32. 25	42. 60	37. 42
E	37. 8	44. 6	41. 20	28. 50	34. 85
I	20. 5	29. 0	24. 75	42. 53	33. 64
E	40. 2	47. 5	43. 85	29. 17	36. 51
I	30. 2	37. 0	33. 60	40. 05	36. 83
E	32. 5	40. 0	36. 25	....	....

Value of one division of scale	3′.69
Scale reading of axis	35. 85
Mean scale-reading of east and west magnetic elongation	47. 62
diff. =	11. 77
Reduction to axis	+0° 43′.4
Azimuth circle reads	231 13. 0
Magnetic meridian reads	231 56. 4
Mean reading of mark	275 53. 5
Azimuth of mark	96 13. 0
True meridian reads	12 06. 5
Magnetic declination	39 49. 9 E

[Date, May 24, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, suspended. Observers: Cassidy, Murdoch, Smith, and Dark.]

Time.	Mean scale-readings.
	d.
1 a. m.	36. 54
2 a. m.	39. 37
3 a. m.	39. 77
4 a. m.	39. 66
5 a. m.	39. 11
6 a. m.	39. 45
7 a. m.	40. 37
8 a. m.	39. 48
9 a. m.	39. 18
10 a. m.	33. 07
11 a. m.	33. 13
12 m.	31. 14
1 p. m.	37. 18
2 p. m.	42. 74
3 p. m.	44. 19
4 p. m.	41. 72
5 p. m.	51. 16
6 p. m.	54. 14
7 p. m.	50. 98
8 p. m.	48. 79
9 p. m.	39. 85
10 p. m.	39. 94
11 p. m.	33. 09
12 p. m.	39. 95
Sum	= 974. 00
Mean	= 40. 58

Line of detorsion ° ′ 15

Az. cir { A. 231 30; B. 51 30

Computation.		
Reading of mark.		
At beginning of a. m. observations	A.	276° 28
	B.	96 30
At end of p. m. observations		....
		....
Mean		276 29. 0

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	33. 9	36. 2	35. 05	....	....
I	30. 0	43. 0	36. 50	35. 78	36. 14
E	33. 5	39. 5	36. 50	35. 92	36. 21
I	26. 2	44. 5	35. 35	36. 43	35. 89
E	33. 2	39. 5	36. 35	34. 43	35. 39
I	22. 5	44. 5	33. 50	36. 02	34. 76
E	33. 2	38. 2	35. 70	....	....

Value of one division of scale	=3′.69
Scale reading of axis	*35. 68
Mean scale-reading of east and west magnetic elongation	40. 58
diff. =	4. 90
Reduction to axis	+0° 18′.1
Azimuth circle reads	231 30. 0
Magnetic meridian reads	231 48. 1
Mean reading of mark	276 29. 0
Azimuth of mark	96 13. 0
True meridian reads	12 42. 0
Magnetic declination	39 06. 1 E.

*Observations made May 23.

Observations for determining the absolute magnetic declination—Continued.

[Date, June 17, 1882. Instrument, theod. magnetometer No. 11. Magnet $L_{,,}$ suspended. Observers: Cassidy, Murdoch, Smith, and Dark.]

Time.	Mean scale-readings.
	d.
1 a. m.	58.80
2 a. m.	54.80
3 a. m.	57.82
4 a. m.	61.50
5 a. m.	62.55
6 a. m.	60.34
7 a. m.	57.63
8 a. m.	68.15
9 a. m.	52.06
10 a. m.	52.31
11 a. m.	61.67
12 m.	60.18
Sum =	707.81

		°	′
Line of detorsion		15	
Az. circle	A.	51	30
	B.	231	29

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A.	277	06
	B.	97	04
At end of p. m. observations		....	
		....	
Mean		277	05.0

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	34.8	36.0	35.40	......	......
I	20.8	49.4	35.10	34.70	34.90
E	28.0	40.0	34.00	35.68	34.84
I	25.5	47.0	36.25	34.50	35.37
E	29.0	41.0	35.00	35.45	35.23
I	41.8	27.5	34.65	35.37	35.01
E	28.2	43.3	35.75	......	......

Value of one division of scale =	3′.69
Scale-reading of axis	35.07

[Date, June 18, 1882. Instrument, theod. magnetometer No. 11. Magnet $L_{,,}$ suspended. Observers: Cassidy, Murdoch, Smith, and Dark.]

Time.	Mean scale-readings.
	d.
1 p. m.	50.64
2 p. m.	48.55
3 p. m.	61.38
4 p. m.	68.19
5 p. m.	60.28
6 p. m.	73.94
7 p. m.	71.46
8 p. m.	65.04
9 p. m.	63.27
10 p. m.	64.38
11 p. m.	68.95
12 p. m.	61.72
Sum.	
June 18	757.74
June 17	707.81
	1465.55
Mean	61.06

		°	′
Line of detorsion		15	
Az. circle	A.	51	30
	B.	231	29

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A.	277	09
	B.	97	04
At end of p. m. observations		....	
		....	
Mean		277	06.5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	36.6	50.7	43.65	......	......
I	20.7	36.0	28.35	41.77	35.06
E	29.0	50.8	39.90	30.42	35.16
I	17.8	47.2	32.50	37.52	35.01
E	27.0	43.3	35.15	31.95	33.55 rej.
I	19.8	43.0	31.40	38.75	35.07
E	38.0	46.7	42.35	......	......

	°	′
Value of one division of scale =		3′.69
Scale-reading of axis		35.07
Mean scale-reading of E. and W. magnetic elongation		61.06
diff. =		25.99
Reduction to axis	+1	35.9
Azimuth circle reads	51	29.5
Magnetic meridian reads	53	05.4
Mean reading of mark	277	05.0
Azimuth of mark	96	13.0
True meridian reads	13	18.0
Magnetic declination	39	47.4 E.

[Date, July 19–20, 1882. Instrument, theod. magnetometer 11. Magnet $L_{,,}$ suspended. Observers: Cassidy, Murdoch, Smith, and Dark.]

Time.	Mean scale-readings.
	d.
1 a. m.	55.60
2 a. m.	45.63
3 a. m.	44.89
4 a. m.	44.26
5 a. m.	44.17
6 a. m.	43.06
7 a. m.	59.31
8 a. m.	42.65
9 a. m.	47.22
10 a. m.	44.74
11 a. m.	50.83
12 m.	44.15
1 p. m.	34.06
2 p. m.	52.40
3 p. m.	53.50
4 p. m.	57.20
5 p. m.	63.16
6 p. m.	58.20
7 p. m.	55.85
8 p. m.	51.99
9 p. m.	55.60
10 p. m.	44.95
11 p. m.	47.82
12 p. m.	49.72
Sum =	1,190.96
Mean =	49.62

		°	′
Line of detorsion		15	
Az. circle	A.	52	31
	B.		28
			30
			28

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations, direct	A.	277	28
	B.	97	26
At end of p. m. observations, reversed	A.	97	04
	B.	277	06
Mean		277	16

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	35.0	35.2	35.10	......	......
I	10.0	52.0	31.00	37.55	34.28
E	34.0	46.0	40.00	30.25	35.13
I	26.0	33.0	29.50	40.50	35.00
E	36.0	46.0	41.00	29.50	35.25
I	27.0	32.0	29.50	41.25	35.37
E	36.5	46.5	41.50	......	......

	°	′
Value of one division of scale =		3′.69
Scale-reading of axis	35.01	35.04*
Mean scale-reading of E. and W. magnetic elongation		49.62
diff. =		14.58
Reduction to axis	+0	53.8
Azimuth circle reads	52	20.2
Magnetic meridian reads	53	23.0
Mean reading of mark	277	16.0
Azimuth of mark	96	13.0
True meridian reads	13	29.0
Magnetic declination	39	54.0 E.

[Date, August 19, 1882. Instrument, theod. magnetometer No. 11. Magnet $L_{,,}$ suspended. Observer: A. C. Dark.]

Time.	Mean scale-readings.
	d.
1 a. m.	31.28
2 a. m.	39.55
3 a. m.	37.64
4 a. m.	38.64
5 a. m.	35.38
6 a. m.	39.10
7 a. m.	39.38
8 a. m.	37.00
9 a. m.	38.82
10 a. m.	37.46
11 a. m.	35.08
12 m.	38.51
1 p. m.	37.28
2 p. m.	29.91
3 p. m.	67.48
4 p. m.	58.88
5 p. m.	46.18
6 p. m.	43.48
7 p. m.	47.60
8 p. m.	52.81
9 p. m.	42.66
10 p. m.	33.56
11 p. m.	41.32
12 p. m.	43.54
Sum =	992.31
Mean =	41.35

		°	′
Line of detorsion		15	
Az. circle	A.	354	10
	B.		08

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A.	359	56
	B.		54
At end of p. m. observations	A.	359	53
	B.		52
Mean		359	53.8

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	32.0	39.0	35.50	......	......
I	5.7	51.0	28.35	38.43	33.39 rej.
E	33.2	49.5	41.35	28.57	34.96
I	22.2	35.4	28.80	41.05	34.92
E	16.5	65.0	40.75	28.83	34.79
I	17.5	40.2	28.85	41.13	34.99
E	36.0	47.0	41.50	......	......

	°	′
Value of one division of scale =		3′.69
Scale-reading of axis		34.92
Mean scale-reading of E. and W. magnetic elongation		41.35
diff. =		6.43
Reduction to axis	+0	23.7
Azimuth circle reads	354	09.0
Magnetic meridian reads	354	32.7
Mean reading of mark	359	53.8
Azimuth of mark	46	36.0
True meridian reads	313	17.8
Magnetic declination	41	14.9 E.

Observations for determining the absolute magnetic declination—Continued.

[Date, August 31, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8.00 a. m.	56.40
8.15 a. m.	42.25
8.30 a. m.	43.60
8.45 a. m.	43.40
9.00 a. m.	46.50
9.15 a. m.	46.55
9.30 a. m.	43.30
9.45 a. m.	45.00
10.00 a. m.	45.75
10.15 a. m.	41.75
10.30 a. m.	38.85
10.45 a. m.	41.40
11.00 p. m.	45.30
11.15 p. m.	42.30
11.30 p. m.	44.20
11.45 p. m.	38.50
12.00 p. m.	35.85
12.15 p. m.	37.70
12.30 p. m.	39.90
12.45 p. m.	40.60
1.00 p. m.	41.50
Sum	= 900.60
Mean	= 42.89

Line of detorsion: 15° ; Az. circle { A. 354° 11′ ; B. 09′

Computation.		°	′
Reading of mark.			
At beginning of a. m. observations	A.	359	51
	B.		53
At end of p. m. observations	A.	359	51
	B.		53
Mean		359	52.0
Value of one division of scale		=3′.69	
Scale-reading of axis		34.92	
Mean scale-reading of east and west magnetic elongation		42.89	
diff. =		7.97	
Reduction to axis		+0	29.4
Azimuth circle reads		354	10.0
Magnetic meridian reads		354	39.4
Mean reading of mark		359	52.0
Azimuth of mark		46	36.0
True meridian reads		313	16.0
Magnetic declination		41	23.4 E.

[Date, September 14, 1882, local time. Instrument, U. S. C. and G. S. unifilar magnetometer No. 11. Magnet $L_{\prime\prime}$ suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m.	42.90
9 a. m.	46.90
10 a. m.	53.70
11 a. m.	36.10
12 m.	40.80
1 p. m.	41.75

Readings of the differential unifilar taken at 9, 10, 11 a. m., and 12 m. and at 1 p. m.

9 a. m	536
10 a. m	553
11 a. m	510
12 m	521
1 p. m	525

d.		
43.85		529.0
		521.7
−1.98	=	7.3
41.87		

Line of detorsion: 15° ; Az. circle { A. 354° 11′ ; B. 09′

Computation.		°	′
Reading of mark.			
At beginning of a. m. observations	A.	359	51
	B.		52
At end of p. m. observations	A.	359	51
	B.		52
Mean		359	51.5
Value of one division of scale		=3′.69	
Scale-reading of axis		35.05*	
Mean scale-reading of east and west magnetic elongation		41.87	
diff.		6.82	
Reduction to axis		+0	25.2
Azimuth circle reads		354	10.0
Magnetic meridian reads		354	35.2
Mean reading of mark		359	51.5
Azimuth of mark		46	36.0
True meridian reads		313	15.5
Magnetic declination		41	19.7

*From observations of August 19 and September 30, 1882.

[Date, September 30, 1882, local time. Instrument, U. S. C. and G. S. unifilar magnetometer No. 11. Magnet $L_{\prime\prime}$ suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m.	41.40
9 a. m.	41.20
10 a. m.	39.85
11 a. m.	38.90
12 m	37.90
1 p. m.	37.00

Readings of the differential unifilar at 8, 9, 10, 11 a. m., and 12 m. and at 1 p. m.

8 a. m	519
9 a. m	520
10 a. m	518
11 a. m	516
12 m.	511
1 p. m	508

d.		
39.37		515.3
		521.7
+1.73	=	6.4
41.10		

Line of detorsion: 15° ; Az. circle { A. 354° 30′ ; B. 28′

Reading of mark.

		°	′
At beginning of a. m. observations	A.	359	52
	B.		50
At end of p. m. observations	A.	359	50
	B.		52
Mean		359	51

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Alt'n'te mean.	Axis.
					d.
E	35.0	36.8	35.90		
I	29.0	39.0	34.00	36.82	35.41
E	29.0	46.5	37.75	33.25	35.50
I	17.0	48.0	32.50	38.00	35.25
E	34.0	42.5	38.25	32.25	35.25
I	24.0	40.0	32.00	37.88	34.94
E	24.0	51.0	37.50		

	°	′
Value of one division of scale	=3′.69	
Scale-reading of axis	35.27	
Mean scale-reading of E. and W. magnetic elongation	41.10	
diff. =	5.83	
Reduction to axis	+0	21.5
Azimuth circle reads	354	29.0
Magnetic meridian reads	354	50.5
Mean reading of mark	359	51.0
Azimuth of mark E. of N	46	36.0
True meridian reads	313	15.0
Magnetic declination	41	35.5 E.

[Date, October 14, 1882, local time. Instrument, U. S. C. and G. S. unifilar magnetometer No. 11. Magnet $L_{\prime\prime}$ suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m.	49.00
9 a. m.	50.55
10 a. m.	32.00
11 a. m.	32.10
12 m	34.40
1 p. m.	33.70

Readings of the differential unifilar at 8, 9, 10, 11 a. m., and 12 m. and at 1 p. m.

8 a. m	533
9 a. m	548
10 a. m	504
11 a. m	509
12 m.	518
1 p. m	512

d.		
38.62		520.7
		514.6
−1.65	=	6.1
36.97		

Line of detorsion: 15° ; Az. circle { A. 354° 32′ ; B. 30′

Computation.		°	′
Reading of mark.			
At beginning of a. m. observations	A.	359	52
	B.		50
At end of p. m. observations	A.	359	50
	B.		52
Mean		359	51
Value of one division of scale		=3′.69	
Scale-reading of axis		35.08*	
Mean scale-reading of E. and W. magnetic elongation		36.97	
diff. =		1.89	
Reduction to axis		+0	7.0
Azimuth circle reads		354	31.0
Magnetic meridian reads		354	38.0
Mean reading of mark		359	51.0
Azimuth of mark		46	36.0
True meridian reads		313	15.0
Magnetic declination		41	23.0

* Mean of results from the observations of September 30, and October 31.

Observations for determining the absolute magnetic declination—Continued.

[Date, October 31, 1882, local time. Instrument, U. S. C. and G. S. unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	39. 20
9 a. m	40. 00
10 a. m	50. 50
11 a. m	39. 20
12 m	35. 80
1 p. m	35. 60

Readings of the differential unifilar taken at 8, 9, 10, 11 a. m., and 12 m. and 1 p. m.

8 a. m	523
9 a. m	529
10 a. m	532
11 a. m	525
12 m	512
1 p. m	511

d.	
40. 05	522. 0
	514. 6
—2. 01 =	7. 4
38. 04	

	°	′
Line of detorsion	15	
Az. circle { A	354	20
B		22

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	50
	B		52
At end of p. m. observations	A	359	52
	B		50
Mean		359	51

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	21. 0	55. 0	38. 00	......	......
I	25. 0	39. 0	32. 00	38. 00	35. 00
E	34. 0	42. 0	38. 00	31. 25	34. 62
I	13. 0	48. 0	30. 50	38. 75	34. 62
E	27. 0	52. 0	39. 50	30. 68	35. 09
I	23. 5	38. 2	30. 85	39. 30	35. 07
E	27. 2	51. 0	39. 10	......	......

	°	′
Value of one division of scale	=3′. 69	
Scale-reading of axis	31. 88	
Mean scale-reading of E. and W. magnetic elongation	38. 04	
diff. =	3. 16	
Reduction to axis	+0	11. 7
Azimuth circle reads	354	21. 0
Magnetic meridian reads	354	32. 7
Mean reading of mark	359	51. 0
Azimuth of mark E. of N	46	36. 0
True meridian reads	313	15. 0
Magnetic declination	41	17. 7 E.

[Date, November 16, 1882, local time. Instrument, U. S. C. and G. S. unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark, Smith, and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	33. 8
9 a. m	31. 0
10 a. m	36. 2
11 a. m	33. 9
12 m	17. 2
1 p. m	50. 4

Comparative readings between magnetometer No. 11 and the differential unifilar.

8 a. m	33. 8 = 501
9 a. m	31. 0 = 500
10 a. m	36. 2 = 513
11 a. m	33. 9 = 494
12 m	17. 2 = 448
1 p. m	50. 4 = 560

d.	
33. 67	502. 7
	489. 8
—3. 50 =	12. 9
30. 17	

	°	′
Line of detorsion	15	
Az. circle { A	354	50
B		52

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	50
	B		52
At end of p. m. observations	A	359	52
	B		50
Mean		359	51

	°	′
Value of one division of scale	= 3′. 69	
Scale-reading of axis	34 85*	
Mean scale-reading of E. and W. magnetic elongation	30. 17	
diff. =	4. 68	
Reduction to axis	—0	17. 3
Azimuth circle reads	354	51. 0
Magnetic meridian reads	354	33. 7
Mean reading of mark	359	51. 0
Azimuth of mark E. of N	46	36. 0
True meridian reads	313	15. 0
Magnetic declination	41	18. 7 E.

* From observations of October 31, 1882, and April 14, 1883.

[Date, November 30, 1882, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	34. 4
9 a. m	40. 0
10 a. m	38. 2
11 a. m	44. 1
12 m	24. 9
1 p. m	28. 8

Comparative readings between magnetometer No. 11 and the differential unifilar.

8 a. m	34. 4 = 491
9 a. m	40. 0 = 508
10 a. m	38. 2 = 504
11 a. m	44. 1 = 523
12 m	24. 9 = 466
1 p. m	28. 8 = 476

d.	
35. 80	494. 7
	489. 8
— 1. 33 =	4. 9
34. 47	′

	°	′
Line of detorsion	15	
Az. circle { A	354	32
B		30

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	52
	B		50
At end of p. m. observations	A	359	50
	B		52
Mean		359	51

	°	′
Value of one division of scale	= 3′. 69	
Scale-reading of axis	34. 81*	
Mean scale-reading of E. and W. magnetic elongation	34. 47	
diff. =	0. 34	
Reduction to axis	—0	1. 3
Azimuth circle reads	354	31. 0
Magnetic meridian reads	354	29. 7
Mean reading of mark	359	51. 0
Azimuth of mark E. of N	46	36. 0
True meridian reads	313	15. 0
Magnetic declination	41	14. 7 E.

[Date, December 14, 1882, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark, Maxfield, and Smith.]

Time.	Mean scale-readings.
	d.
8 a. m	50. 8
9 a. m	50. 0
10 a. m	49. 0
11 a. m	51. 0
12 m	48. 4
1 p. m	47. 5

Brooke declinometer readings.

8 a. m	495
9 a. m	492
10 a. m	488
11 a. m	496
12 m	486
1 p. m	482

d.	
49. 36	489. 8
	489. 9
+ 0. 00 =	0. 1
49. 36	

	°	′
Line of detorsion	15	
Az. circle { A	358	29
B		31

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	50
	B		52
At end of p. m. observations	A	359	50
	B		52
Mean		359	51

	°	′
Value of one division of scale	= 3′. 69	
Scale-reading of axis	34. 78*	
Mean scale-reading of E. and W. magnetic elongation	49. 36	
diff =	14. 58	
Reduction to axis	+ 0	53. 8
Azimuth circle reads	353	30. 0
Magnetic meridian reads	354	23. 8
Mean reading of mark	359	51. 0
Azimuth of mark E. of N	46	36. 0
True meridian reads	313	15. 0
Magnetic declination	41	08. 8 E.

* From observations of October 31, 1882, and April 14, 1883.

Observations for determining the absolute magnetic declination—Continued.

[Date, January 1, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark, Maxfield, and Smith.]

Time.	Mean scale-readings.
	d.
8 a. m.	49.0
9 a. m.	50.0
10 a. m.	43.0
11 a. m.	37.1
12 m.	40.1
1 p. m.	41.0

Brooke declinometer readings.

8 a. m.	504
9 a. m.	511
10 a. m.	486
11 a. m.	461
12 m.	481
1 p. m.	485

d. 44.27	488.0
	488.0
	0.0

	°	′
Line of detorsion	15	
Az. circle... A	353	54
B		56

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A	359	50
	B		52
At end of p. m. observations	A	359	52
	B		50
Mean		359	51
Value of one division of scale =			3′.69
Scale-reading of axis			34.75*
Mean scale-reading of E. and W. magnetic elongation			44.27
diff. =			9.52
Reduction to axis		+0	35.1
Azimuth circle reads		353	55.0
Magnetic meridian reads		354	30.1
Mean reading of mark		359	51.0
Azimuth of mark E. of N.		46	36.0
True meridian reads		313	15.0
Magnetic declination		41	15.1 E.

* From observations of October 31, 1882, and April 14, 1883.

[Date, January 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark, Maxfield, and Smith.]

Time.	Mean scale-readings.
	d.
8 a. m.	50.0
9 a. m.	38.5
10 a. m.	39.8
11 a. m.	39.0
12 m.	37.4
1 p. m.	35.6

Brooke declinometer readings.

8 a. m.	522
9 a. m.	487
10 a. m.	490
11 a. m.	490
12 m.	483
1 p. m.	478

d. 40.40	491.7
	488.0
—1.00	= 3.7
39.40	

	°	′
Line of detorsion	15	
Az. circle... A	354	06
B		08

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A	359	49
	B		51
At end of p. m. observations	A	359	49
	B		51
Mean		359	50
Value of one division of scale =			3′.69
Scale-reading of axis			34.72*
Mean scale-reading of E. and W. magnetic elongation			39.40
diff. =			4.68
Reduction to axis		+0	17.3
Azimuth circle reads		354	07.0
Magnetic meridian reads		354	24.3
Mean reading of mark		359	50.0
Azimuth of mark E. of N.		46	36.0
True meridian reads		313	14.0
Magnetic declination		41	10.3 E.

* From observations of October 31, 1882, and April 14, 1883.

[Date, January 31, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark, Maxfield, and Smith.]

Time.	Mean scale-readings.
	d.
8 a. m.	40.0
9 a. m.	38.0
10 a. m.	35.0
11 a. m.	36.5
12 m.	29.9
1 p. m.	33.1

Brooke declinometer readings.

8 a. m.	504
9 a. m.	494
10 a. m.	484
11 a. m.	493
12 m.	470
1 a. m.	481

d 35.34	487.7
	488.0
+0.08	= 0.3
35.42	

	°	′
Line of detorsion	15	
Az. circle... A	354	37
B		35

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A	359	49
	B		51
At end of p. m. observations	A	359	49
	B		51
Mean		359	50
Value of one division of scale =			3′.69
Scale-reading of axis			34.69*
Mean scale-reading of E. and W. magnetic elongation			35.42
diff. =			0.73
Reduction to axis		+0	2.7
Azimuth circle reads		354	36.0
Magnetic meridian reads		354	38.7
Mean reading of mark		359	50.0
Azimuth of mark E. of N.		46	36.0
True meridian reads		313	14.0
Magnetic declination		41	24.7 E.

* From observations of October 31, 1882, and April 14, 1883.

[Date, February 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark, Maxfield, and Smith.]

Time.	Mean scale-readings.
	d.
8 a. m.	....
9 a. m.	45.0
10 a. m.	43.0
11 a. m.	40.2
12 m.	42.9
1 p. m.	36.0

Brooke declinometer readings.

9 a. m.	507
10 a. m.	499
11 a. m.	487
12 a. m.	496
1 a. m.	469

d. 41.50	491.6
	489.5
—0.57	= 2.1
40.93	

	°	′
Line of detorsion	15	
Az. circle... A	354	16
B		18

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A	359	49
	B		51
At end of p. m. observations	A	359	49
	B		51
Means		359	50
Value of one division of scale =			3′.69
Scale-reading of axis			34.66*
Mean scale-reading of E. and W. magnetic elongation			40.93
diff. =			6.27
Reduction to axis		+0	23.1
Azimuth circle reads		354	17.0
Magnetic meridian reads		354	40.1
Mean reading of mark		359	50.0
Azimuth of mark E. of N.		46	36.0
True meridian reads		313	14.0
Magnetic declination		41	26.1 E.

* From observations of October 31, 1882, and April 14, 1883.

Observations for determining the absolute magnetic declination— Continued.

[Date, February 28, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet $L_{,,}$ suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	42.0
9 a. m	27.0
10 a. m	40.0
11 a. m	29.0
12 m	23.0
1 p. m	24.0

Brooke declinometer readings.

8 a. m	529
9 a. m	492
10 a. m	514
11 a. m	505
12 m	467
1 p. m	468

d.	
30.83	495.8
	489.5
−1.71 =	6.3
29.12	

Line of detorsion ....

Az. circle { A 353° 52′; B 50

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	51
	B		49
At end of p. m. observations	A	359	51
	B		49
Mean		359	50
Value of one division of scale			=3′.69
Scale-reading of axis			34.63*
Mean scale-reading of E. and W. magnetic elongation			29.12
diff.=			5.51
Reduction to axis		−0°	20′.3
Azimuth circle reads		353	51.0
Magnetic meridian reads		353	30.7
Mean reading of mark		359	50.0
Azimuth of mark E. of N		46	36.0
True meridian reads		313	14.0
Magnetic declination		40	16.7 E.

* From observations of October 31, 1882, and April 14, 1883.

[Date, March 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet $L_{,,}$ suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	45.8
9 a. m	40.0
10 a. m	44.0
11 a. m	42.1
12 m	38.9
1 p. m	40.2

Brooke declinometer readings.

8 a. m	496
9 a. m	477
10 a. m	489
11 a. m	480
12 m	472
1 p. m	475

d.	
41.83	481.5
	484.8
+.89 =	3.3
42.72	

Line of detorsion ..... 15°

Az. circle { A. 348° 45′; B. 47

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	49
	B		51
At end of p. m. observations	A	359	49
	B		51
Mean		359	50
Value of one division of scale			=3′.69
Scale-reading of axis			34.60*
Mean scale-reading of E. and W. magnetic elongation			42.72
diff.=			8.12
Reduction to axis		+0°	30′.0
Azimuth circle reads		348	46.0
Magnetic meridian reads		349	16.0
Mean reading of mark		359	50.0
Azimuth of mark E. of N		46	36.0
True meridian reads		313	14.0
Magnetic declination		36	02.0 E.

* From observations of October 31, 1882, and April 14, 1883.

[Date, March 31, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet $L_{,,}$ suspended. Observer: Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	34.2
9 a. m	32.9
10 a. m	31.1
11 p. m	30.4
12 m	26.0
1 p. m	22.3

Brooke declinometer readings.

8 a. m	502
9 a. m	497
10 a. m	490
11 p. m	488
12 m	470
1 a. m	458

d.	
29.48	484.2
	484.8
+.02 =	0.6
29.50	

Line of detorsion . 114° 30′
Until 1 p. m., when it was 119 00

Az. circle { A .. 349 05; B... 07

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	49
	B		51
At end of p. m. observations	A	359	49
	B		51
Mean		359	50
Value of one division of scale			=3′.69
Scale-reading of axis			34.57*
Mean scale-reading of E. and W. magnetic elongation			29.50
diff.=			5.07
Reduction to axis		−0°	18′.7
Azimuth circle reads		349	06.0
Magnetic meridian reads		348	47.3
Mean reading of mark		359	50.0
Azimuth of mark E. of N		46	36.0
True meridian reads		313	11.0
Magnetic declination		35	33.3E.

* From observations of October 31, 1882, to April 14, 1883.

[Date, April 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet $L_{,,}$ suspended. Observers, Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	40.0
9 a. m	39.0
10 a. m	37.0
11 a. m	38.5
12 m	35.2
1 p. m	36.9

Brooke declinometer readings.

8 a. m	484
9 a. m	487
10 a. m	482
11 a. m	484
12 m	479
1 p. m	475

d	
37.77	481.8
	482.1
+ .08 =	0.3
37.85	

Line of detorsion .... 249°

Az. circle. { A 348° 40′; B 42

Line of detor. at 1 p. m .. 374

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	57
	B		58
At end of p. m. observations	A	359	57
	B		58
Mean		359	57.5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Alt'n'te mean.	Axis.
d					d
E	37.0	37.0	37.0	......	......
I	31.8	32.8	32.3	36.35	34.32
E	32.4	39.0	35.7	33.25	34.48
I	29.4	39.0	34.2	35.30	34.75
E	33.0	36.8	34.9	34.35	34.63
I	32.8	36.2	34.5	34.50	34.50
E	33.2	35.0	34.1	......	......

	°	′
Scale-reading of axis		34.54
Mean scale-reading of E. and W. magnetic elongation		37.85
diff.=		3.31
Reduction to axis	+0	12.2
Azimuth circle reads	348	41.0
Magnetic meridian reads	348	53.2
Mean reading of mark	359	57.5
Azimuth of mark E. of N	46	36.0
True meridian reads	313	21.5
Magnetic declination	35	31.7E.

Observations for determining the absolute magnetic declination—Continued.

[Date, April 30, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	52.0
9 a. m	36.0
10 a. m	20.0
11 a. m	22.0
12 m	00.0
1 p. m	10.5

Brooke declinometer readings.

8 a. m	618
9 a. m	555
10 a. m	497
11 a. m	497
12 m	419
1 p. m	459

d.	
23.42	507.5
	482.1
−6.88	= 25.4
16.54	

	°	′
Line of detorsion	135	
Az. circle A	349	56
Az. circle B		55
Line of detorsion at 11 a.m.	258	
Az. circle A	359	56
Az. circle B		55

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	57
	B		58
At end of p. m. observations	A	359	57
	B		58
Mean		359	57.5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	24.0	24.0	24.0	......	......
I	42.9	47.5	45.2	24.35	34.78
E	24.2	25.2	24.7	44.55	34.62
I	43.0	44.8	43.9	25.70	34.80
E	25.4	28.0	26.7	43.70	35.20
I	41.9	45.1	43.5	26.40	34.95
E	24.8	27.4	26.1	......	......

Value of one division of scale		=3′.69
Scale-reading of axis		34.87
Mean scale-reading of E. and W. magnetic elongation		16.54
diff. =		18.33
	°	′
Reduction to axis	−0	67.6
Azimuth circle reads	349	55.5
Magnetic meridian reads	348	47.9
Mean reading of mark	359	57.5
Azimuth of mark E. of N	46	36.0
True meridian reads	313	21.5
Magnetic declination	35	26.4

[Date, May 14, 1883, local time. Instrument, unifilar magnetometer. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	37.0
9 a. m	35.5
10 a. m	34.0
11 a. m	31.7
12 m	31.4
1 p. m	30.1

Brooke declinometer readings.

8 a. m	487
9 a. m	486
10 a. m	480
11 a. m	468
12 m	467
1 p. m	462.5

d.	
33.28	475.1
	476.1
+ .27	= 1.0
33.55	

	°	′
Line of detorsion	250	
Az. circle A	348	56
Az. circle B		58
Line of detorsion	297	
Az. circle A	348	56
Az. circle B		57

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	57
	B		58
At end of p. m. observations	A	359	57
	B		57
Mean		359	57.25

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	30.0	30.2	30.10	......	......
I	37.0	41.5	39.25	29.95	34.60
E	28.4	31.2	29.80	39.63	34.72
I	39.0	41.0	40.00	29.90	34.95
E	28.8	31.2	30.00	40.05	35.02
I	37.3	42.9	40.10	29.75	34.93
E	28.1	30.9	29.50	......	......

Value of one division of scale		=3′.69
Scale-reading of axis		34.84
Mean scale-reading of E. and W. magnetic elongation		33.55
diff. =		1.29
	°	′
Reduction to axis	−0	4.8
Azimuth circle reads	348	56.8
Magnetic meridian reads	348	52.0
Mean reading of mark	359	57.2
Azimuth of mark E. of N	46	36.0
True meridian reads	313	21.2
Magnetic declination	35	30.8 E.

[Date, May 31, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	37.8
9 a. m	40.0
10 a. m	32.0
11 a. m	32.7
12 m	31.1
1 p. m	31.2

Brooke declinometer readings.

9 a. m	499
10 a. m	472
11 a. m	474
12 m	469
1 p. m	469

d.	
33.40	476.6
	476.1
−.14	= 0.5
33.26	

	°	′
Line of detorsion	265	
Az. circle A	348	53
Az. circle B		55
Line of detorsion	244	

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A	359	57
	B		58
At end of p. m. observations	A	359	57
	B		58
Mean		359	57.5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	31.2	31.2	31.20	......	......
I	30.9	46.1	38.50	31.20	34.85
E	27.6	34.8	31.20	38.50	34.85
I	27.0	50.0	38.50	31.25	34.88
E	22.4	40.2	31.30	39.00	35.15
I	32.5	46.5	39.50	30.55	35.03
E	25.9	33.7	29.80	......	......

Value of one division of scale		=3′.69
Scale-reading of axis		34.95
Mean scale-reading of E. and W. magnetic elongation		33.26
diff. =		1.69
	°	′
Reduction to axis	−0	06.2
Azimuth circle reads	348	54.0
Magnetic meridian reads	348	47.8
Mean reading of mark	359	57.5
Azimuth of mark E. of N	46	36.0
True meridian reads	313	21.5
Magnetic declination	35	26.3 E.

[Date, June 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	44.0
9 a. m	43.0
10 a. m	39.0
11 a. m	34.5
12 m	34.1
1 p. m	34.2

Brooke declinometer readings.

8 a. m	499
9 a. m	500
10 a. m	486
11 a. m	470
12 m	471
1 p. m	469

d.	
38.13	482.5
	475.7
−1.84	6.8
36.29	

	°	′
Line of detorsion	300	
Az. circle A.	348	40
Az. circle B.		42
Line of detorsion	280	

Computation.

Reading of mark.

		°	′
At beginning of a. m. observations	A.	359	56
	B.		58
At end of p. m. observations	A.	359	56
	B.		58
Mean		359	57

Value of one division of scale		=3′ 69
Scale-reading of axis		34.87*
Mean scale-reading of E. and W. magnetic elongation		36.29
diff. =		1.42
	°	′
Reduction to axis	+0	5.2
Azimuth circle reads	348	41.0
Magnetic meridian reads	348	46.2
Mean reading of mark	359	57.0
Azimuth of mark E. of N	46	36.0
True meridian reads	313	21.0
Magnetic declination	35	25.2 E.

* From observations of May 31 and July 14, 1883.

Observations for determining the absolute magnetic declination—Continued,

[Date, June 30, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	39. 0
9 a. m	48. 0
10 a. m	43. 0
11 a. m	45. 0
12 m	53. 0
1 p. m	50. 0

Brooke declinometer readings.

8 a. m	448
9 a. m	498
10 a. m	482
11 a. m	484
12 m	514
1 p. m	499

d.
46. 33   487. 5
         475. 7
−3. 20 = 11. 8
43. 13

	°	′
Line of detorsion.	60	
Az. circle ... A.	347	48
Az. circle ... B.		49
Line of detorsion	62	

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A.	359	56
	B.		58
At end of p. m. observations	A.	359	56
	B.		58
Mean		359	57
Value of one division of scale		=3′. 69	
Scale-reading of axis			34. 79*
Mean scale-reading of E. and W. magnetic elongation			43. 13
diff.=			8. 34
Reduction to axis		+0	30. 8
Azimuth circle reads		347	48. 5
Magnetic meridian reads		348	19. 3
Mean reading of mark		359	57. 0
Azimuth of mark E. of N		46	36. 0
True meridian reads		313	21. 0
Magnetic declination		34	58. 3

N. B.—Instruments very much disturbed all the morning.
* From observations of May 31 and July 14, 1883.

[Date, July 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	39. 0
9 a. m	32. 0
10 a. m	38. 0
11 a. m	19. 9
12 m	27. 0
1 p. m	18. 1

Brooke declinometer readings.

8 a. m	513
9 a. m	474
10 a. m	482
11 a. m	464
12 m	471
1 p. m	467

d.
29. 00   478. 5
         473. 9
− 1. 25 = 4. 6
27. 75

	°	′
Line of detorsion.	324	
Az. circle ... A.	349	33
Az. circle ... B.		35
Line of detorsion.	275	
Till 1 p. m., then.	950	

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A.	359	57
	B.		56
At end of p. m. observations	A.	359	56
	B.		57
Mean		359	56. 5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	16. 6	19. 6	18. 10	......	......
I	29. 8	72. 8	51. 30	17. 95	34. 63
E	05. 6	30. 0	17. 80	51. 75	34. 79
I	46. 4	58. 0	52. 20	17. 55	34. 88
E	01. 9	32. 7	17. 30	52. 25	34. 77
I	36. 0	68. 6	52. 30	16. 80	34. 55
E	02. 6	30. 0	16. 30	......	......

	°	′
Scale-reading of axis		34. 72
Mean scale-reading of E. and W. magnetic elongation		27. 75
diff.=		6. 97
Reduction to axis	−0	25. 7
Azimuth circle reads	349	34. 0
Magnetic meridian reads.	349	08. 3
Mean reading of mark	359	56. 5
Azimuth of mark E. of N	46	36. 0
True meridian reads	313	20. 5
Magnetic declination	35	47. 8 E.

N. B.—New suspension thread put in just before observation.

[Date, July 31, 1883, local time. Instrument, unifilar magnetometer. Magnet L,, suspended. Observer: A. C. Dark.]

Time.	Mean scale-readings.
	d.
8 a. m	39. 0
9 a. m	33. 0
10 a. m	29. 0
11 a. m	29. 0
12 m	46. 0
1 p. m	45. 0

Brooke declinometer readings.

8 a. m	477
9 a. m	455
10 a. m	449
11 a. m	449
12 m	511
1 p. m	515

d.
36. 83   476. 0
         473. 9
−. 57 = 2. 1
36. 26

	°	′
Line of detorsion	360	
Az. circle ... A.	358	09
Az. circle ... B.		11
Line of detorsion	108	

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A.	359	56
	B.		57
At end of p. m. observations	A.	359	56
	B.		57
Mean		359	56. 5
Value of one division of scale.		=3′. 69	
Scale-reading of axis			35. 09*
Mean scale-reading of E. and W. magnetic elongation			36. 26
diff.=			1. 17
Reduction to axis		+0	4. 3
Azimuth circle reads		353	10. 0
Magnetic meridian reads.		353	14. 3
Mean reading of mark		359	56. 5
Azimuth of mark E. of N		46	36. 0
True meridian reads		313	20. 5
Magnetic declination		39	53. 8 E.

N. B.—Both instruments much disturbed.
* Mean of observations of July 14 and August 14.

[Date, August 14, 1883, local time. Instrument, unifilar magnetometer No. 11. Magnet L,, suspended. Observers: Dark and Maxfield.]

Time.	Mean scale-readings.
	d.
8 a. m	39. 0
9 a. m	40. 0
10 a. m	37. 2
11 a. m	29. 4
12 m	18. 7
1 p. m	46. 2

Brooke declinometer readings.

8 a. m	490
9 a. m	496
10 a. m	484
11 a. m	457
12 m	419
1 p. m	521

d.
35. 08   477. 8
         473. 3
−1. 22 = 4. 5
33. 86

	°	′
Line of detorsion.	30	
Az. circle ... A.	348	57
Az. circle ... B.		58
Line of detorsion.	27	

Computation.

Reading of mark.		°	′
At beginning of a. m. observations	A.	359	57
	B.		58
At end of p. m. observations	A.	359	57
	B.		58
Mean		359	57. 5

Determination of axis of magnet.

Scale.	Scale-readings.		Mean.	Altn'te mean.	Axis.
					d.
E	30. 6	37. 2	33. 90	......	......
I	32. 8	40. 8	36. 80	33. 78	35. 29
E	30. 0	37. 3	33. 65	37. 35	35. 50
I	35. 0	40. 8	37. 90	33. 47	35. 69
E	31. 7	34. 9	33. 30	37. 60	35. 45
I	31. 8	42. 8	37. 30	33. 40	35. 35
E	32. 0	35. 0	33. 50	......	......

	°	′
Value of one division of scale.	=3′. 69	
Scale-reading of axis		35. 46
Mean scale-reading of E. and W. magnetic elongation		33. 86
diff.=		1. 60
Reduction to axis	−0	5. 9
Azimuth circle reads	348	57. 5
Magnetic meridian reads.	348	51. 6
Mean reading of mark	359	57. 5
Azimuth of mark E. of N	46	36 0
True meridian reads	313	21. 5
Magnetic declination	35	30. 1 E.

Recapitulation of results for declination.

	°	′		°	′
1881.			1883.		
December 11	*35	15.7	January 1	41	15.1
1882.			January 14	41	10.3
January 24	37	28.8	January 31	41	24.7
April 18	39	49.9	February 14	41	26.1
May 24	39	06.1	February 28	40	16.7
June 17, 18	39	47.4	March 14	36	02.0
July 19, 20	39	54.0	March 31	§35	33.3
August 19	†41	14.9	April 14	35	31.7
August 31	‡41	23.4	April 30	35	26.4
September 14	‖41	19.7	May 14	35	30.8
September 30	41	35.5	May 31	35	26.3
October 14	41	23.0	June 14	35	25.2
October 31	41	17.7	June 30	34	58.3
November 16	41	18.7	July 14	35	47.8
November 30	41	14.7	July 31	¶35	53.8
December 14	41	08.8	August 14	35	30.1

* Torsion probably attended to. The first 7 results all refer to the mean of the day, hourly observations being given.
† Now azimuth from here.
‡ Unreduced to mean of day.
§ Torsion attended to from here to end.
‖ Reduced to mean of month from here to end.
¶ Record gives 39°, a misreading of az. cir. of 4° assumed

APPENDIX No. 4.

OBSERVATIONS MADE AT UGLAAMIE, ALASKA, IN 1881-'82-'83, FOR DETERMINING THE ABSOLUTE MAGNETIC HORIZONTAL INTENSITY, TOGETHER WITH THE COMPUTATION AND A RECAPITULATION OF RESULTS.

[Computer, E. H. Courtenay.]

$$\frac{m}{H}=\frac{1}{2}\, r^3 \sin u\left(1-\frac{P}{r^2}\ \cdot\ \cdot\ \cdot\right)$$

Date, December 17, 1881. Göttingen time. Instrument, theodolite magnetometer No 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, M. Smith.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	233 12	14	13.0				
	W.					2	228 49	50	49.5
	E.	3	233 13	15	14.0				
	W.					4	228 51	52	51.5
	E.	5	233 12	13	12.5				
	Mean				13.17				50.50
West.	W.					6	228 49	50	49.5
	E.	7	233 17	15	16.0				
	W.					8	48	47	47.5
	E.	9	16	13	14.5				
	W.					10	50	51	50.5
	Mean				15.25				49.17

Computation.

	° ′
Magnet East, $2u$=	4 22.67
Magnet West, $2u$=	26.08
Mean	24.38
u=	2 12.19

	Log'ms.
$\frac{1}{2}$	9.69897
r^3	0.29073
Sin. u	8.58482
$\frac{m}{H}$	8.57452

	h m		°
Time of beginning	1 27	Temp.	−10.8
Time of ending	1 55	Temp.	− 9.8
Mean	1 41	t=	−10.3

Date, December 18, 1881. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r = 1.25 feet. Observer, M. Smith.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	233 15	16	15.5				
	W.					2	228 52	53	52.5
	E.	3	233 16	16	16.0				
	W.					4	53	53	53.0
	E.	5	233 15	17	16.0				
	Mean				15.83				52.75
West.	W.					6	228 54	55	54.5
	E.	7	233 13	15	14.0				
	W.					8	55	56	55.5
	E.	9	14	16	15.0				
	W.					10	54	55	54.5
	Mean				14.5				54.83

Computation.

	° ′
Magnet East, $2u$=	4 23.08
Magnet West, $2u$=	19.67
Mean	21.38
u=	2 10.69

	Log'ms.
$\frac{1}{2}$	9.69887
r^3	0.29073
Sin. u	8.57086
$\frac{m}{H}$	8.56950

	h m		°
Time of beginning	1 15	Temp.	−20.9
Time of ending	1 40	Temp.	−20.0
Mean	1 27.5	t=	−20.45

Observations for determining the absolute magnetic horizontal intensity—**Continued.**

Date, December 19, 1881. Göttingen time. Instrument, the theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, M. Smith.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	233 13	15	14.0				
	W.					2	228 50	52	51.0
	E.	3	12	14	13.0				
	W.					4	49	51	50.0
	E.	5	12	14	13.0				
	Mean				13.33				50.50
West.	W.					6	228 51	53	52.0
	E.	7	233 11	13	12.0				
	W.					8	52	54	53.0
	E.	9	10	12	11.0				
	W.					10	53	55	54.0
	Mean				11.50				53.00

Computation.

Magnet East, $2u$ = 4° 22′.33
Magnet West, $2u$ = 18.50
Mean 20.66
u = 2 10.33

Time of beginning 1h 12m | Temp. −27°.8
Time of ending 1 35 | Temp. −27.5
Mean 1 23.5 | t = −27.65

Log'ms.
$\frac{1}{r^3}$ 9.69897
0.29073
Sin. u 8.57867
$\frac{m}{H}$ 8.56837

Date, January 18, 1882. Göttingen time. Instrument, the theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	235 18	18	18.0				
	W.					2	230 38	38	38.0
	E.	3	09	09	09.0				
	W.					4	34	34	34.0
	E.	5	12	12	12.0				
	Mean				13.00				36.00
West.	W.					6	230 39	39	39.0
	E.	7	235 29	28	28.5				
	W.					8	38	38	38.0
	E.	9	24	24	24.0				
	W.					10	30	30	30.0
	Mean				26.25				35.67

Computation.

Magnet East, $2u$ = 4° 37′.00
Magnet West, $2u$ = 4 50.58
Mean 4 43.79
u = 2 21.90

Time of beginning 2h 55m | Temp. − 8°
Time of ending 3 35 | Temp. − 8
Mean a. m. 3 15 | t = − 8

Log'ms.
$\frac{1}{r^3}$ 9.69897
0.29073
Sin. u 8.61559
$\frac{m}{H}$ 8.60529

Date, January 19, 1882. Göttingen time. Instrument, the theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	235 26	26	26.0				
	W.					2	230 38	38	38.0
	E.	3	22	22	22.0				
	W.					4	35	35	35.0
	E.	5	24	24	24.0				
	Mean				24.00				36.50
West.	W.					6	230 34	34	34.0
	E.	7	235 20	20	20.0				
	W.					8	30	30	30.0
	E.	9	22	22	22.0				
	W.					10	33	33	33.0
	Mean				21.00				32.33

Computation.

Magnet East, $2u$ = 4° 47′.50
Magnet West, $2u$ = 48.67
Mean 48.08
u = 2 24.04

Time of beginning 3h 15m | Temp. − 6°
Time of ending 3 50 | Temp. − 6
Mean a. m. 3 32.5 | t = − 6

Log'ms.
$\frac{1}{r^3}$ 9.69897
0.29073
Sin. u 8.62208
$\frac{m}{H}$ 8.61178

Date, January 20, 1882. Göttingen time. Instrument, the theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	234 54	54	54.0				
	W.					2	230 24	24	24.0
	E.	3	59	59	59.0				
	W.					4	32	32	32.0
	E.	5	56	56	56.0				
	Mean				56.33				28.00
West.	W.					6	230 27	27	27.0
	E.	7	234 57	58	57.5				
	W.					8	26	26	26.0
	E.	9	52	53	52.5				
	W.					10	21	21	21.0
	Mean				55.00				24.67

Computation.

Magnet East, $2u$ = 4° 28′.33
Maghet West, $2u$ = 30.33
Mean 29.33
u = 2 14.67

Time of beginning 3h 20m | Temp. − 2°
Time of ending 3 50 | Temp. − 2
Mean a. m. 3 35 | t = − 2

Log'ms.
$\frac{1}{r^3}$ 9.69897
0.29073
Sin. u 8.59288
$\frac{m}{H}$ 8.58258

Observations for determining the absolute magnetic horizontal intensity—**Continued.**

Date, February 16, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	230 30	30	30.0				
	W.					2	226 12	13	12.5
	E.	3	49	49	49.0				
	W.					4	40	42	41.0
	E.	5	35	35	35.0				
	Mean				38.00				26.75
West.	W.					6	226 00	02	01.0
	E.	7	230 20	21	20.5				
	W.					8	10	12	11.0
	E.	9	25	26	25.5				
	W.					10	20	20	20.0
	Mean				23.00				10.67

Computation.

	° ′		Log'ms.
Magnet East, 2 u=	4 11.25	½	9.69897
Magnet West. 2 u=	12.33	r^3	0.29073
Mean	11.79	Sin. u	8.56365
u=	2 05.90		

			°		
Time of beginning	1^h 15^m	Temp.−	1.4	$\frac{m}{H}$	8.55335
Time of ending	2 15	Temp.−	0.8		
Mean	1 45	t=−	1.1		

Date, February 17, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	230 10	12	11.0				
	W.					2	225 47	48	47.5
	E.	3	26	27	26.5				
	W.					4	20	21	20.5
	E.	5	18	20	19.0				
	Mean				18.83				34.00
West.	W.					6	225 35	36	35.5
	E.	7	230 10	12	11.0				
	W.					8	40	41	40.5
	E.	9	30	32	31.0				
	W.					10	59	59	59.0
	Mean				21.00				45.00

Computation.

	° ′		Log'ms.
Magnet East, 2 u=	4 44.83	½	9.69897
Magnet West, 2 u=	36.00	r^3	0.29073
Mean	40.42	Sin. u	8.61038
u=	2 20.21		

			°		
Time of beginning	1^h 55^m	Temp.−	3.0	$\frac{m}{H}$	8.60008
Time of ending	2 30	Temp.−	3.5		
Mean	2 12.5	t=−	3.25		

Date, February 18, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r= 1.25 feet. Observer, A. C. Dark

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	230 44	45	44.5				
	W.					2	226 16	18	17.0
	E.	3	40	41	40.5				
	W.					4	15	15	15.0
	E.	5	40	40	40.0				
	Mean.				41.67				16.00
West.	W.					6	226 09	10	09.5
	E.	7	230 38	40	39.0				
	W.					8	10	12	11.0
	E.	9	39	40	39.5				
	W.					10	03	04	03.5
	Mean.				39.25				08.0

Computation.

	° ′		Log'ms.
Magnet East, 2 u=	4 25.67	½	9.69897
Magnet West, 2 u=	31.25	r^3	0.29073
Mean	28.46	Sin. u	8.59147
u=	2 14.23		

			°		
Time of beginning	1^h 21^m	Temp.−	11.5	$\frac{m}{H}$	8.58117
Time of ending	1 52	Temp.−	9.5		
Mean	1 36.5	t=−	10.5		

Date, March 17, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	231 54	53	53.5				
	W.					2	227 27	28	27.5
	E.	3	54	56	55.0				
	W.					4	36	38	37.0
	E.	5	53	55	54.0				
	Mean.				54.17				32.25
West.	W.					6	227 34	33	33.5
	E.	7	231 60	60	60.0				
	W.					8	27	27	27.0
	E.	9	54	56	55.0				
	W.					10	27	28	27.5
	Mean.				59.50				29.33

Computation.

	° ′		Log'ms.
Magnet East, 2 u=	4 21.92	½	9.69897
Magnet West, 2 u=	28.17	r^3	0.29073
Mean	25.04	Sin. u	8.58590
u=	2 12.52		

			°		
Time of beginning	1^h 25^m	Temp.−	1	$\frac{m}{H}$	8.57560
Time of ending	1 48	Temp.+	1		
Mean	1 36.5	t=	0		

Date, March 18, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	231 46	44	45.0				
	W.					2	227 08	08	08.0
	E.	3	41	43	42.0				
	W.					4	12	12	12.0
	E.	5	40	40	40.0				
	Mean				42.33				10.00
West.	W.					6	227 14	14	14.0
	E.	7	231 44	44	44.0				
	W.					8	08	08	08.0
	E.	9	45	45	45.0				
	W.					10	06	06	06.0
	Mean				44.50				09.33

Computation.

Magnet East, 2 u = 4° 32′.33
Magnet West, 2 u = 35.17
Mean. 33.75
u = 2 16.88

Time of beginning 1h 26m | Temp. −2°.0
Time of ending 1 50 | Temp. −0.0
Mean 1 38 | t = −1.0

Log'ms.
$\frac{1}{2}$ 9.69897
r^3 0.29073
Sin. u 8.59995
$\frac{m}{H}$ 8.58965

Date, March 19, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	231 48	48	48.0				
	W.					2	227 16	16	16.0
	E.	3	49	49	49.0				
	W.					4	18	18	18.0
	E.	5	48	48	48.0				
	Mean				48.33				17.00
West.	W.					6	227 17	17	17.0
	E.	7	231 49	49	49.0				
	W.					8	14	14	14.0
	E.	9	48	48	48.0				
	W.					10	24	24	24.0
	Mean				48.50				18.33

Computation.

Magnet East, 2 u = 4° 31′.33
Magnet West, 2 u = 30.17
Mean. 30.75
u = 2 15.38

Time of beginning 1h 26m | Temp. 4°
Time of ending 1 54 | Temp. 6
Mean 1 40 | t = 5.0

Log'ms.
$\frac{1}{2}$ 9.69897
r^3 0.29073
Sin. u 8.59517
$\frac{m}{H}$ 8.58487

Date, April 17, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	230 26	26	26.0				
	W.					2	226 36	36	36.0
	E.	3	232 18	20	19.0				
	W.					4	229 00	00	00.0
	E.	5	233 20	22	21.0				
	Mean.		232		02.00		227		48.00
West.	W.					6	230 25	25	25.0
	E.	7	233 54	54	54.0				
	W.					8	229 05	05	05.0
	E.	9	230 50	50	50.0				
	W.					10	226 06	06	06.0
	Mean		232		22.00		228		32.00

Computation.

Magnet East, 2 u = 4° 14′.00
Magnet West, 2 u = 3 50.00
Mean 4 02.00
u = 2 01.00

Time of beginning 1h 15m | Temp. 21°.0
Time of ending 1 50 | Temp. 21.0
Mean 1 32.5 | t = 21.0

Log'ms.
$\frac{1}{2}$ 9.69897
r^3 0.29073
Sin. u 8.54642
$\frac{m}{H}$ 8.53612

Date, April 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	231 55	55	55.0				
	W.					2	227 44	44	44.0
	E.	3	53	53	53.0				
	W.					4	45	45	45.0
	E.	5	58	58	58.0				
	Mean.				55.33				44.50
West.	W.					6	227 42	42	42.0
	E.	7	231 60	60	60.0				
	W.					8	46	46	46.0
	E.	9	59	59	59.0				
	W.					10	44	44	44.0
	Mean.				59.50				44.00

Computation.

Magnet East, 2 u = 4° 10′.83
Magnet West, 2 u = 15.50
Mean. 13.16
u = 2 06.58

Time of beginning 1h 20m | Temp. 12°.0
Time of ending 1 45 | Temp. 18.0
Mean 1 32.5 | t = 15.0

Log'ms.
$\frac{1}{2}$ 9.69897
r^3 0.29073
Sin. u 8.56599
$\frac{m}{H}$ 8.55569

Observations for determining the absolute magnetic horizontal intensity, &c.—**Continued.**

Date, April 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	232 12	12	12.0				
	W.					2	227 40	40	40.0
	E.	3	14	14	14.0				
	W.					4	40	40	40.0
	E.	5	08	08	08.0				
	Mean				11.33				40.00
West.	W.					6	227 35	35	35.0
	E.	7	231 59	59	59.0				
	W.					8	32	32	32.0
	E.	9	61	61	61.0				
	W.					10	33	33	33.0
	Mean				60.00				33.33

Computation.

Magnet East, 2 u = 4° 31.33′
Magnet West, 2 u = 26.67
Mean. 29.00
u = 2 14.50

	Log'ms.
$\frac{1}{2}$	9.69897
r^3	0.29073
Sin. u	8.59284
$\frac{m}{H}$	8.58204

Time of beginning 1^h 15^m Temp. 24.0°
Time of ending 1 50 Temp. 26.5
Mean 1 32.5 t=25.25

Date, May 17, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	232 55	55	55.0				
	W.					2	228 35	35	35.0
	E.	3	54	54	54.0				
	W.					4	35	35	35.0
	E.	5	55	55	55.0				
	Mean				54.67				35.00
West.	W.					6	228 55	55	55.0
	E.	7	233 08	08	08.0				
	W.					8	54	54	54.0
	E.	9	10	10	10.0				
	W.					10	45	45	45.0
	Mean				09.00				51.33

Computation.

Magnet East, 2 u = 4° 19.67′
Magnet West, 2 u = 17.67
Mean. 18.67
u = 2 09.33

	Log'ms.
$\frac{1}{2}$	9.69897
r^3	0.29073
Sin. u	8.57533
$\frac{m}{H}$	8.56503

Time of beginning 1^h 20^m Temp. 45°
Time of ending 1 45 " 47
Mean a.m. 1 32.5 t=46.0

Date, May 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	232 37	37	37.0				
	W.					2	228 15	15	15.0
	E.	3	40	40	40.0				
	W.					4	14	14	14.0
	E.	5	39	39	39.0				
	Mean.				38.67				14.50
West.	W.					6	228 20	20	20.0
	E.	7	232 35	35	35.0				
	W.					8	22	22	22.0
	E.	9	33	33	33.0				
	W.					10	24	24	24.0
	Mean.				34.00				22.00

Computation.

Magnet East, 2 u = 4° 24.17′
Magnet West, 2 u = 12.00
Mean. 18.08
u = 2 09.04

	Log'ms.
$\frac{1}{2}$	9.69897
r^3	0.29073
Sin. u	8.57442
$\frac{m}{H}$	8.56412

Time of beginning 1^h 20^m Temp. 47°
Time of ending 1 45 Temp. 45
Mean a.m. 1 32.5 t=46.0

Date, May 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	233 30	30	30.0				
	W.					2	228 18	16	17.0
	E.	3	30	30	30.0				
	W.					4	01	01	01.0
	E.	5	25	27	26.0				
	Mean.				28.67				09.00
West.	W.					6	228 15	13	14.0
	E.	7	232 23	23	23.0				
	W.					8	07	07	07.0
	E.	9	21	21	21.0				
	W.					10	07	07	07.0
	Mean				22.00				09.33

Computation.

Magnet East, 2 u = 4° 19.67′
Magnet West, 2 u = 12.67
Mean. 16.17
u = 2 08.08

	Log'ms.
$\frac{1}{2}$	9.69897
r^3	0.29073
Sin. u	8.57111
$\frac{m}{H}$	8.56081

Time of beginning 1^h 30^m Temp. 36.0°
Time of ending 1 50 Temp. 36.5
Mean a.m. 1 40 t=36.25

Observations for determining the absolute magnetic horizontal intensity—**Continued.**

Date, June 17, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	53 26	24	25.0				
	W.					[illegible]	49 23	21	22.0
	E.	3	31	30	30.5				
	W.					[illegible]	24	22	23.0
	E.	5	35	34	34.5				
	Mean				30 00				22.50
West.	W.					[illegible]	49 28	26	27.0
	E.	7	53 46	46	46.0				
	W.					[illegible]	28	26	27.0
	E.	9	49	47	48.0				
	W.					10	31	29	30.0
	Mean				47.00				28.00

Computation.

	° ′
Magnet East, 2 u=	4 07.50
Magnet West, 2 u=	19.00
Mean	13.25
u=	2 06.62

Time of beginning 2[h] 22[m] — Temp. 53°
Time of ending 2 50 — Temp. 53
Mean 2 36 — t=53.0

	Long'ms
$\frac{1}{2}$	9.69897
r^3	0.29073
Sin. u	8.56613
$\frac{m}{H}$	8.55583

Date, June 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11 Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r 1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	53 46	44	45.0				
	W.					2	49 30	2[illegible]	29.0
	E.	3	45	43	44.0				
	W.					4	28	26	27.0
	E.	5	41	39	40.0				
	Mean				43.00				28.00
West.	W.					6	49 23	21	22.0
	E.	7	53 37	35	36.0				
	W.					8	20	18	19.0
	E.	9	37	35	36.0				
	W.					10	13	11	12.0
	Mean				36.00				17.67

Computation.

	° ′
Magnet East, 2 u=	4 15.00
Magnet West, 2 u=	18.33
Mean	16.66
u=	2 08.33

Time of beginning 1[h] 23[m] — Temp. 50°
Time of ending 1 54 — Temp. 50
Mean 1 38.5 — t=50.0

	Long'ms.
$\frac{1}{2}$	9 69897
r^3	0 29073
Sin. u	8.57196
$\frac{m}{H}$	8.56166

Date, June 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11., Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	54 00	00	00.0				
	W.					2	49 51	49	50.0
	E.	3	53 55	53	54.0				
	W.					4	59	57	58.0
	E.	5	54 00	00	00.0				
	Mean		53		58.00				54.00
West.	W.					[illegible]	49 47	45	46.0
	E.	7	54 00	00	00.0				
	W.					8	50	48	49.0
	E.	9	[illegible]	00	00.0				
	W.					10	52	50	51.0
	Mean				00.00				48.67

Computation.

	° ′
Magnet East, 2 u=	4 04.00
Magnet West, 2 u=	11.33
Mean	07 66
u=	2 03.83

Time of beginning 1[h] 20[m] — Temp. 60°
Time of ending 1 50 — Temp. 60
Mean 1 35 — t=60.0

	Log'ms.
$\frac{1}{2}$	9 69897
r^3	0 2907[illegible]
Sin. u	8.55646
$\frac{m}{H}$	8.54616

Date, July 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	233 55	53	54.0				
	W.					2	229 45	43	44.0
	E.	3	61	59	60.0				
	W.					4	45	43	44.0
	E.	5	65	63	64.0				
	Mean				59.33				44 00
West.	W.					6	229 46	44	45.0
	E	7	234 04	02	03.0				
	W.					8	39	37	38.0
	E	9	02	00	01.0				
	W.					10	43	41	42.0
	Mean				02.00				41.67

Computation.

	° ′
Magnet East, 2 u=	4 15.33
Magnet West, 2 u=	20.33
Mean.	17.83
u=	2 08 92

Time of beginning 1[h] 20[m] — Temp 48°
Time of ending 1 50 — Temp. 48
Mean 1 35 — t=48.0

	Log'ms.
$\frac{1}{2}$	9 69897
r^3	0 29073
Sin. u	8.57394
$\frac{m}{H}$	8 56364

Observations for determining the absolute magnetic horizontal intensity—**Continued.**

Date, July 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance $r = 1.25$ feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	233 40	38	39.0				
	W.					2	229 31	29	30.0
	E.	3	46	44	45.0				
	W.					4	31	29	30.0
	E.	5	52	50	51.0				
	Mean				45.00				30.0
West.	W.					6	229 31	29	30.0
	E.	7	233 51	49	50.0				
	W.					8	39	37	38.0
	E.	9	51	49	50.0				
	W.					10	41	39	40.0
	Mean				50.00				36.00

Computation.

Magnet East, $2u$ = 4° 15′.00
Magnet West, $2u$ = 14.00
Mean 14.50
u = 2° 07′.25

Log'ms. $\frac{1}{2}$ 9.69897; r^3 0.29073; Sin. u 8.56828; $\frac{m}{H}$ 8.55798

Time of beginning 1h 25m; Temp. 58°
Time of ending 1 50; Temp. 58
Mean 1 37.5; t = 58.0

Date, July 20, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance $r = 1.25$ feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	234 02	00	01.0				
	W.					2	229 49	47	48.0
	E.	3	03	01	02.0				
	W.					4	53	51	52.0
	E.	5	02	00	01.0				
	Mean				01.33				50.00
West.	W.					6	229 51	49	50.0
	E.	7	234 10	08	09.0				
	W.					8	52	50	51.0
	E.	9	08	06	07.0				
	W.					10	52	50	51.0
	Mean				08.00				50.67

Computation.

Magnet East, $2u$ = 4° 11′.33
Magnet West, $2u$ = 17.33
Mean 14.33
u = 2° 07′.17

Log'ms. $\frac{1}{2}$ 9.69897; r^3 0.29073; Sin. u 8.56800; $\frac{m}{H}$ 8.55770

Time of beginning 1h 30m; Temp. 62°
Time of ending 1 50; Temp. 62
Mean 1 40; t = 62.0

Date, August 17, 1882. Instrument, theodolite magnetometer, No. 11. Magnet L,, deflecting at right angles to Magnet S'' suspended. Distance $r = 1.25$ feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	355 30	28	29.0				
	W.					2	351 26	24	25.0
	E.	3	30	28	29.0				
	W.					4	23	21	22.0
	E.	5	30	28	29.0				
	Mean				29.00				23.50
West.	W.					6	351 31	29	30.0
	E.	7	355 36	34	35.0				
	W.					8	30	28	29.0
	E.	9	38	36	37.0				
	W.					10	32	30	31.0
	Mean				36.00				30.00

Computation.

Magnet East, $2u$ = 4° 05′.50
Magnet West, $2u$ = 06.00
Mean 05.75
u = 2° 02′.88

Log'ms. $\frac{1}{2}$ 9.69897; r^3 0.29073; Sin. u 8.55311; $\frac{m}{H}$ 8.54281

Time of beginning 1h 20m; Temp. 43°
Time of ending 1 55; Temp. 43
Mean 1 37.5; t = 43.0

Date, August 18, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance $r = 1.25$ feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	355 04	02	03.0				
	W.					2	350 52	50	51.0
	E.	3	03	01	02.0				
	W.					4	50	48	49.0
	E.	5	02	00	01.0				
	Mean				02.00				50.00
West.	W.					6	350 03	01	02.0
	E.	7	*355 32	30	31.0				
	W.					8	350 05	03	04.0
	E.	9	28	26	27.0				
	W.					10	349 58	56	57.0
	Mean		354		29.00		350		01.00

Computation.

Magnet East, $2u$ = 4° 12′.00
Magnet West, $2u$ = 28.00
Mean 20.00
u = 2° 10′.00

Log'ms. $\frac{1}{2}$ 9.69897; r^3 0.29073; Sin. u 8.57757; $\frac{m}{H}$ 8.56727

Time of beginning 1h 20m; Temp. 39°
Time of ending 1 50; Temp. 39
Mean 1 35; t = 39.0

* No doubt should be 354.

Observations for determining the absolute magnetic horizontal intensity—Continued.

Date, August 19, 1882. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	355 16	14	15.0				
	W.					2	351 08	06	07.0
	E.	3	17	15	16.0				
	W.					4	05	03	04.0
	E.	5	14	12	13.0				
	Mean				14.67				05.50
West.	W.					6	351 02	00	01.0
	E.	7	355 16	14	15.0				
	W.					8	35 04	02	03.0
	E.	9	13	11	12.0				
	W.					10	350 57	55	56.0
	Mean				13.50		351 00		00.0

Computation.

	° ′		Log'ms.
Magnet East, 2 u=	4 09.17	½	9.69897
Magnet West, 2 u=	4 13.50	r^3	0.29073
Mean	4 11.34	Sin. u	8.56285
u=	2 05.67	$\frac{m}{H}$	8.55255

			°
Time of beginning	1^h^ 15^m^	Temp.	40
Time of ending	1 55	Temp.	40
Mean.	1 35		t=40

Date, August 31, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	75 22	20	21.0				
	W.					2	71 14	12	13.0
	E.	3	20	18	19.0				
	W.					4	08	06	07.0
	E.	5	20	18	19.0				
	Mean.				19.67				10.00
West.	W.					6	71 00	00	00.0
	E.	7	75 10	08	09.0				
	W.					8	02	00	01.0
	E.	9	15	13	14.0				
	W.					10	03	01	02.0
	Mean				11.50				01.0

Computation.

	° ′		Log'ms.
Magnet East, 2 u=	4 09.67	½	9.69897
Magnet West, 2 u=	10.50	r^3	0.29073
Mean	10.08	Sin. u	8.56068
u=	2 05.04	$\frac{m}{H}$	8.55038

			°
Time of beginning	4^h^ 20^m^	Temp.	40
Time of ending	4 50	Temp.	40
Mean.	4 35		t=40 0

Date, September 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet; log. r=0.09691. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 20	22	21				
	W.					2	171 06	08	07
	E.	3	18	20	19				
	W.					4	07	09	08
	E.	5	08	10	09				
	Mean		175		16.33		171		07.5
West.	W.					6	170 42	44	43
	E.	7	174 55	57	56				
	W.					8	40	42	41
	E.	9	57	59	58				
	W.					10	39	41	40
	Mean		174		57		170		41.33

Computation.

	° ′		Log'ms.
Magnet East, 2u=	4 08.83	½	9.69897
Magnet West, 2u=	4 15.67	r^3	0.29073
Mean	4 12.25	Sin. u	8.56442
u=	2 06.125	$\frac{m}{H}$	8.55412

			°
Time of beginning	3^h^ 35^m^	Temp.	42.5
Time of ending	4 05	Temp.	41.5
A. M. mean	3 50		t=42.0

Date, September 30, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet; log. r=0.09691. Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	75 33	31	32				
	W.					2	71 15	13	14
	E.	3	31	29	30				
	W.					4	13	11	12
	E.	5	32	30	31				
			75	31	31		71		13
West.	W.					6	71 19	17	18
	E.	7	75 36	34	35				
	W.					8	19	17	18
	E.	9	35	33	34				
	W.					10	20	18	19
	Mean		75		34.5				18.33

Computation.

	° ′		Log'ms.
Magnet East, 2u=	4 18.0	½	9.69897
Magnet West, 2u=	4 16.17	r^3	0.29073
Mean	4 17.08	Sin. u	8.57266
u=	2 08.54	$\frac{m}{H}$	8.56236

			°
Time of beginning	3^h^ 10^m^	Temp.	44
Time of ending	4 00	Temp.	44
A. M. mean	3 35		t=44.0

Observations for determining the absolute magnetic horizontal intensity—Continued.

Date, October 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1.25 feet; log. r = 0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	75 32	30	31				
	W.					2	71 09	07	08
	E.	3	34	32	33				
	W.					4	11	09	10
	E.	5	35	33	34				
	Mean		75		32.67		71		09
West.	W.					6	71 16	14	15
	E.	7	75 33	31	32				
	W.					8	15	13	14
	E.	9	32	30	31				
	W.					10	14	12	13
	Mean		75		31.5		71		14

Computation.

	° ′
Magnet East, $2u$ =	4 23.67
Magnet West, $2u$ =	4 17.5
Mean	4 20.58
u =	2 10.29

			°
Time of beginning	$3^h 20^m$	Temp.	10.0
Time of ending	4 05	Temp.	11.0
A. M. mean	3 42.5		t=10.5

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.57853
$\frac{m}{H}$	8.56823

Date, October 31, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1.25 feet; log. r=0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	75 21	23	22				
	W.					2	71 02	04	03
	E.	3	22	24	23				
	W.					4	06	08	07
	E.	5	26	28	27				
	Mean		75		24		71		05
West.	W.					6	71 06	08	07
	E.	7	75 20	22	21				
	W.					8	00	02	01
	E.	9	22	24	23				
	W.					10	01	03	02
	Mean		75		22		71		03.33

Computation.

	° ′
Magnet East, $2u$ =	4 19
Magnet West, $2u$ =	4 18.67
Mean	4 18.84
u =	2 09.42

	° ′		°
Time of beginning	$4^h 00^m$	Temp.	18
Time of ending	4 55	Temp.	19
A. M. mean	4 27.5		t=18.5

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.57502
$\frac{m}{H}$	8.56532

Date, November 14, 1882. Gottingen time. Instrument, theodolite magnetometer, No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet; log. r=0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 10	12	11				
	W.					2	170 57	59	58
	E.	3	15	17	16				
	W.					4	55	57	56
	E.	5	15	17	16				
	Mean		175		14.33		170		57
West.	W.					6	171 00	02	01
	E.	7	175 21	23	22				
	W.					8	04	06	05
	E.	9	20	22	21				
	W.					10	06	08	07
	Mean		175		21.5		171		04.33

Computation.

	° ′
Magnet East, $2u$ =	4 17.33
Magnet West, $2u$ =	4 17.17
Mean	4 17.25
u =	2 08.62

			°
Time of beginning	$4^h 21^m$	Temp.	−21.5
Time of ending	4 55	Temp.	−20.5
A. M. mean	4 38		t=−21.0

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.57293
$\frac{m}{H}$	8.56263

Date, November 30, 1882. Gottingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet; log. r=0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 23	25	24				
	W.					2	171 04	06	05
	E.	3	25	27	26				
	W.					4	03	05	04
	E.	5	26	28	27				
	Mean		175		25.67		171		04.5
West.	W.					6	171 03	05	04
	E.	7	175 25	27	26				
	W.					8	05	07	06
	E.	9	27	29	28				
	W.					10	04	06	05
	Mean		175		27		171		05

Computation.

	° ′
Magnet East, $2u$ =	4 21.17
Magnet West, $2u$ =	4 22.00
Mean	4 21.58
u =	2 10.79

			°
Time of beginning	$4^h 20^m$	Temp.	−5
Time of ending	4 55	Temp.	−3
A. M. mean	4 37.5		t=−4

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.58020
$\frac{m}{H}$	8.56990

Observations for determining the absolute magnetic horizontal intensity—Continued.

Date, December 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet; log r =0.09691 Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 27	29	28.0				
	W.					2	171 13	15	14.0
	E.	3	30	32	31.0				
	W.					4	10	12	11.0
	E.	5	28	30	29.0				
	Mean.		175		29.33		171		12.50
West.	W.					6	171 05	07	06.0
	E.	7	175 30	32	31.0				
	W.					8	06	08	07.0
	E.	9	31	33	32.0				
	W.					10	07	09	08.0
	Mean		175		31.5		171		07.0

Computation.

	° ′
Magnet East, 2 u=	4 16.83
Magnet West, 2 u=	4 24.50
Mean	4 20.665
u=	2 10.332

Time of beginning	3^h 30^m	Temp.	−13°
Time of ending	4 00	Temp.	−13
A. M. mean	3 45	t=	−13

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.57367
$\frac{m}{H}$	8.56837

Date, January 1, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet; log. r =0.09691 Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A	B	Mean.	Circle readings. No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 25	27	26.0				
	W.					2	171 04	06	05.0
	E.	3	26	28	27.0				
	W.					4	06	08	07.0
	E.	5	28	30	29.0				
	Mean		175		27.33		171		06.0
West.	W.					6	171 57	59	58.0
	E.	7	175 22	24	23.0				
	W.					8	55	57	56.0
	E.	9	24	26	25.0				
	W.					10	54	56	55.0
	Mean		175		24.0		171		56.33*

Computation.

	° ′
Magnet East, 2 u=	4 21.33
Magnet West, 2 u=	4 27.67
Mean	4 24.50
u=	2 12.25

Time of beginning	3^h 50^m	Temp.	−11.5°
Time of ending	4 15	Temp.	−11.5
A. M. mean	4 02.5	t=	−11.5

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.58501
$\frac{m}{H}$	8.57471

* (170 56.33)? So used in computation.

Date, January 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r= 1.25 feet; log. r =0.09691 Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A.	B.	Mean.	Circle readings. No.	A.	B.	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 23	25	24.0				
	W.					2	171 02	03	02.5
	E.	3	22	24	23.0				
	W.					4	01	02	01.5
	E.	5	24	26	25.0				
	Mean		175		24.0		171		02.0
West.	W.					6	171 01	02	01.5
	E.	7	175 31	33	32.0				
	W.					8	170 54	56	55.0
	E.	9	27	29	28.0				
	W.					10	53	55	54.0
	Mean		175		30.0		170		56.83

Computation.

	° ′
Magnet East, 2 u=	4 22.00
Magnet West, 2 u=	4 33.17
Mean	4 27.58
u=	2 13.79

Time of beginning	6^h 05^m	Temp.	−30°
Time of ending	6 55	Temp.	−30
A. M. mean	6 27.5	t=	−30

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.59004
$\frac{m}{H}$	8.57974

Date January 31, 1883. Göttingen time. Instrument, theodolite magnetometer, No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1.25 feet; log. r =0.09691 Observer, A. C. Dark.

Magnet.	North end.	Circle readings. No.	A.	B.	Mean.	Circle readings. No.	A.	B.	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 33	35	34.0				
	W.					2	171 01	03	02.0
	E.	3	31	33	32.0				
	W.					4	02	04	03.0
	E.	5	33	35	34.0				
	Mean		175		33.33		171		02.5
West.	W.					6	170 58	60	59.0
	E.	7	175 26	28	27.0				
	W.					8	56	58	57.0
	E.	9	24	26	25.0				
	W.					10	54	56	55.0
	Mean		175		26.0		170		57.0

Computation.

	° ′
Magnet East, 2 u=	4 30.83
Magnet West, 2 u=	4 29.00
Mean	4 29.92
u=	2 14.96

Time of beginning	4^h 05^m	Temp.	−30°
Time of ending	4 29	Temp.	−30
A. M. mean,	4 17	t=	−30

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.59382
$\frac{m}{H}$	8.58352

Observations for determining the absolute magnetic horizontal intensity—Continued.

Date, February 14, 1883. Göttingen time. Instrument, theodo-lite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r = 1.25 feet; log. r = 0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	175 21	23	22.0				
	W.					2	170 58	59	58.5
	E.	3	20	22	21.0				
	W.					4	57	58	57.5
	E.	5	20	22	21.0				
	Mean		175		21.33		170		58
West.	W.					6	171 05	07	06.0
	E.	7	175 17	19	18.0				
	W.					8	04	06	05.0
	E.	9	19	21	20.0				
	W.					10	05	07	06.0
	Mean		175		19.0		171		05.67

Computation.

	° ′
Magnet East, $2u$ =	4 23.33
Magnet West, $2u$ =	4 13.33
Mean	4 18.33
u =	2 09.16

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.57475
$\frac{m}{H}$	8.56445

Time of beginning 4^h 00^m Temp. −8°
Time of ending 4 40 Temp. −8
A. M. mean 4 20 t = −8

Date, February 28, 1883. Göttingen time. Instrument, theodo-lite magnetometer No. 11. Magnet $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r = 1.25 feet; log. r = 0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	174 26	28	27.0				
	W.					2	170 02	04	03.0
	E.	3	30	32	31.0				
	W.					4	06	08	07.0
	E.	5	30	32	31.0				
	Mean		174		29.67		170		05.0
West.	W.					6	170 13	15	14.0
	E.	7	174 30	32	31.0				
	W.					8	11	13	12.0
	E.	9	33	35	34.0				
	W.					10	10	12	11.0
	Mean		174		32.50		170		12.33

Computation.

	° ′
Magnet East, $2u$ =	4 24.67
Magnet West, $2u$ =	4 20.17
Mean	4 22.42
u =	2 11.21

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.58159
$\frac{m}{H}$	8.57129

Time of beginning 4^h 00^m Temp. −14°
Time of ending 4 30 Temp. −13
A. M. mean 4 15 t = −13.5

Date, March 14, 1883. Göttingen time. Instrument, theodo-lite magnetometer No. 11. Magnet, $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet; log. r =0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	171 11	13	12.0				
	W.					2	166 41	43	42.0
	E.	3	08	10	09.0				
	W.					4	37	39	38.0
	E.	5	05	07	06.0				
	Mean		171		09.0		166		40.0
West.	W.					6	166 40	42	41.0
	E.	7	171 05	07	06.0				
	W.					8	40	42	41.0
	E.	9	06	08	07.0				
	W.					10	40	42	41.0
	Mean		171		06.5		166		41.0

Computation.

	° ′
Magnet East, $2u$ =	4 29
Magnet West, $2u$ =	4 25.5
Mean	4 27.25
u =	2 13.625

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.58950
$\frac{m}{H}$	8.57920

Time of beginning 4^h 40^m Temp. −3.0°
Time of ending 5 10 Temp. −3.0
A. m. mean 4 55 t = −3.0

Date, March 31, 1883. Göttingen time. Instrument, theodo-lite magnetometer No. 11. Magnet, $L_{,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance r=1.25 feet; log. r =0.09691 Observer, J. E. Maxfield.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	° ′
East.	E.	1	346 34	36	35.0				
	W.					2	350 52	54	53.0
	E.	3	40	42	41.0				
	W.					4	42	44	43.0
	E.	5	31	33	32.0				
	Mean		346		36.0		350		48.0
West.	W.					6	350 39	41	40.0
	E.	7	346 25	27	26.0				
	W.					8	39	41	40.0
	E.	9	25	27	26.0				
	W.					10	44	45	44.5
	Mean		346		26.0		350		41.5

Computation.

	° ′
Magnet East, $2u$ =	4 12
Magnet West, $2u$ =	4 15.5
Mean	4 13.75
u =	2 06.875

	Log'ms.
$\frac{1}{r^3}$	9.69897
	0.29073
Sin. u	8.56700
$\frac{m}{H}$	8.55670

By chron. Bond, No. 188: Temp. 28°
Temp. 24
Time of beginning 3^h 29^m
Time of ending 4 25 t=26
A. m. mean 3 57

Observations for determining the absolute magnetic horizontal intensity—Continued.

Date, April 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r=1.25 feet, log. r=0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B.	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	° ′	° ′
East.	E.	1	171 01	00	00. 5				
	W.					2	166 57	55	56. 0
	E.	3	03	01	02. 0				
	W.					4	58	56	57. 0
	E.	5	03	01	02. 0				
	Mean		171		01. 5		166		56. 5
West	W.					6	166 58	56	57. 0
	E.	7	171 08	10	09. 0				
	W.					8	59	57	58. 0
	E.	9	10	12	11. 0				
	W.					10	167 00	166 58	166 59. 0
	Mean		171		10. 0		166		58. 0

Computation.

Magnet East, 2 u= 4° 05′. 0	Log'ms.
Magnet West, 2 u= 4 12. 0	½ 9. 69897
Mean 4 08. 5	r^3 0. 29073
u= 2 04. 25	Sin. u 8. 55793
Chron. Bond No. 188.	$\frac{m}{H}$ 8. 54763
Time of beginning 4^h 30^m — Temp. 25°. 0	
Time of ending 4 50 — Temp. 23. 0	
A. M. mean 4 40 — t= 24. 0	

Date, April 30, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r= 1.25 feet, log. r= 0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	170 39	40	39. 5				
	W.					2	166 32	33	32. 5
	E.	3	39	40	39. 5				
	W.					4	31	32	31. 5
	E.	5	40	41	40. 5				
	Mean		170		39. 83		166		32. 0
West.	W.					6	166 31	32	31. 5
	E.	7	170 41	43	42. 0				
	W.					8	32	33	32. 5
	E.	9	40	42	41. 0				
	W.					10	32	33	32. 5
	Mean		170		41. 5		166		32. 17

Computation.

Magnet East, 2 u= 4° 07′. 83	Log'ms.
Magnet West, 2 u= 4 09. 33	½ 9. 69897
Mean 4 08. 58	r^3 0. 29073
u= 2 04. 29	Sin. u 8. 55807
Chron. Bond No. 188.	$\frac{m}{H}$ 8. 54777
Time of beginning 4^h 20^m — Temp. 26°	
Time of ending 4 50 — Temp. 26	
A. M. mean 4 35 — t= 26	

Date, May 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1. 25 feet, log. r = 0. 09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	170 33	35	34. 0				
	W.					2	166 26	24	25. 0
	E.	3	32	34	33. 0				
	W.					4	25	23	24. 0
	E.	5	32	34	33. 0				
	Mean		170		33. 33		166		24. 50
West.	W.					6	166 30	28	29. 0
	E.	7	170 39	37	38. 0				
	W.					8	29	27	28. 0
	E.	9	40	38	39. 0				
	W.					10	30	28	29. 0
	Mean		170		38. 5		166		28. 67

Computation.

Magnet East, 2 u= 4° 08′. 83	Log'ms.
Magnet West, 2 u= 09 83	½ 9. 69897
Mean 4 09. 33	r^3 0. 29073
u= 2 04. 665	Sin. u 8. 55938
Chron. Bond No. 188.	$\frac{m}{H}$ 8. 54908
Time of beginning 4^h 10^m — Temp. 35°. 0	
Time of ending 4 50 — Temp. 35. 0	
A. M. mean 4 30 — t= 35. 0	

Date, May 31, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,, deflecting at right angles to Magnet S,, suspended. Distance r = 1. 25 feet, log. r = 0. 09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			Circle readings.				Circle readings.		
			° ′	′	′		° ′	′	′
East.	E.	1	170 39	37	38. 0				
	W.					2	166 32	30	31. 0
	E.	3	43	41	42. 0				
	W.					4	40	38	39. 0
	E.	5	45	43	44. 0				
	Mean		170		41. 33		166 00		35. 0
West.	W.					6	166 41	39	40. 0
	E.	7	170 51	49	50. 0				
	W.					8	43	41	42. 0
	E.	9	51	49	50. 0				
	W.					10	41	39	40. 0
	Mean		170		50. 0		166		40. 67

Computation.

Magnet East, 2 u= 4° 06′. 33	Log'ms.
Magnet West, 2 u= 4 09. 33	½ 9. 69897
Mean 4 07. 86	r^3 0. 29073
u= 2 03. 92	Sin. u 8. 55677
Chron. Bond No. 188.	$\frac{m}{H}$ 8. 54647
Time of beginning 4^h 00^m — Temp. 41°. 0	
Time of ending 4 30 — Temp. 40. 5	
A. M. mean 4 15 — t= 40. 75	

Observations for determining the absolute magnetic horizontal intensity—**Continued.**

Date, June [illegible], 1883. Göttingen time. Instrument the-odolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance $r=1.25$ feet, log. r [illegible] Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	170 50	48	49.0				
	W.					2	166 45	43	44.0
	E.	3	49	47	48.0				
	W.					4	45	43	44.0
	E.	5	45	43	44.0				
	Mean		170		47		166		44
West.	W.					6	166 45	43	44.0
	E.	7	170 49	47	48.0				
	W.					8	43	41	42.0
	E.	9	50	48	49.0				
	W					10	45	43	44.0
	Mean		170		48.50		166		43.33

Computation.

	° ′		Log'ms.
Magnet East, 2 u =	4 03.00	½	9.69897
Magnet West, 2 u =	4 05.17	r^3	0.29073
Mean	4 04.08	Sin. u	8.[illegible]5014
u =	2 02.04		
		$\frac{m}{H}$	8.53984

Chron. Bond No. 188.

			°
Time of beginning,	4^h 20^m	Temp.	42.0
Time of ending,	4 45	Temp.	42.0
A. M. mean	4 32.5	t =	42.0

Date, June 30, 1883. Göttingen time. Instrument, the-odolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance $r=1.25$ feet, log. $r=0.09691$ Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	170 06	08	07.0				
	W.					2	166 12	14	13.0
	E.	3	05	07	06.0				
	W.					4	10	12	11.0
	E.	5	06	08	07.0				
	Mean		170		06.67		166		12.00
West.	W.					6	166 08	10	09.0
	E.	7	170 12	14	13.0				
	W.					8	08	10	09.0
	E.	9	12	14	13.0				
	W.					10	09	11	10.0
	Mean		170		13.00		166		09.33

Computation.

	° ′		Log'ms.
Magnet East, 2 u =	3 54.67	½	9.69897
Magnet West, 2 u =	4 03.67	r^3	0.29073
Mean	3 59.17	Sin. u	8.54130
u =	1 59.58		
		$\frac{m}{H}$	8.53100

Chron. Bond No. 188.

			°
Time of beginning,	3^h 05^m	Temp.	53.0
Time of ending,	3 45	Temp.	53.0
A. M. mean	3 25	t =	53.0

Date, July 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance $r=1.25$ feet, log. $r=0.09691$ Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	168 27	29	28.0				
	W.					2	164 22	24	23.0
	E.	3	30	32	31.0				
	W.					4†	23	25	24.0
	E.	5	32	34	33.0				
	Mean		168		30.67		164		23.5
West.	W.					6	164 47	49	48.0
	E.	7	168 57	59	58.0				
	W.					8	54	56	55.0
	E.	9*	06	08	07.0				
	W.					10	57	59	58.0
	Mean		169		02.5		164		53.67

Computation.

	° ′		Log'ms.
Magnet East, 2 u =	4 67.17	½	9.69897
Magnet West, 2 u =	4 08.83	r^3	0.29073
Mean	4 08.00	Sin u	8.55705
u =	2 04.00		
		$\frac{m}{H}$	8.54675

Chron. Bond, No. 188.

			°
Time of beginning,	3^h 30^m	Temp.	53.0
Time of ending,	4 10	Temp.	53.0
A. M. mean	3 50	t =	53.0

Date, July 31, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$ deflecting at right angles to Magnet $S_{\prime\prime}$ suspended. Distance $r=1.25$ feet, log. $r=0.09691$ Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	170 35	37	36.0				
	W.					2	166 25	27	26.0
	E.	3	31	33	32.0				
	W.					4	23	25	24.0
	E.	5	28	30	29.0				
	Mean		170		32.33		166		25.0
West.	W.					6	166 23	25	24.0
	E.	7	170 30	32	31.0				
	W.					8	24	26	25.0
	E.	9	31	33	32.0				
	W.					10	26	28	27.0
	Mean		170		31.5		166		25.33

Computation.

	° ′		Log'ms.
Magnet East, 2 u =	4 07.33	½	9.69897
Magnet West, 2 u =	4 06.17	r^3	0.29073
Mean	4 06.75	Sin. u	8.55488
u =	2 03.38		
		$\frac{m}{H}$	8.54458

Chron. Bond No. 188.

			°
Time of beginning,	2^h 50^m	Temp.	44.0
Time of ending,	3 30	Temp.	44.0
A. M. mean	3 10	t =	44.0

* Probably 169° 06′ etc. † Computed on that assumption.

Observations for determining the absolute magnetic horizontal intensity—Continued.

Date, August 14, 1883. Göttingen time. Instrument, theodolite magnetometer, No. 11. Magnet $L_{,,,}$ deflecting at right angles to Magnet $S_{,,}$ suspended. Distance $r = 1.25$ feet. Log. r=0.09691 Observer, A. C. Dark.

Magnet.	North end.	No.	A	B	Mean.	No.	A	B	Mean.
			° ′	′	′		° ′	′	′
East.	E.	1	171 00	02	01				
	W.					2	166 55	57	56
	E.	3	170 57	59	58				
	W.					4	56	58	57
	E.	5	56	58	57				
	Mean		170		58.67		166		56.50
West.	W.					6	166 54	56	55
	E.	7	170 50	52	51				
	W.					8	50	52	51
	E.	9	49	51	50				
	W.					10	47	49	48
	Mean		170		50.5		166		51.33

Computation.

	° ′				Log'ms.
Magnet East, 2 u=	4 02.17			½	9.69897
Magnet West, 2 u=	3 59.17			r^3	0.29073
Mean	4 00.67			Sin. u	8.54403
u=	2 00.335				
			°	$\frac{m}{H}$	8.53373
Time of beginning	3^h 45^m	Temp.	47.5		
Time of ending	4 16	Temp.	47.5		
A. M. mean	4 00.5	t=	47.5		

Magnetic observations at Uglaamie, Alaska.

[Date, December 17, 1881. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, Bond No. 188; daily rate, $1^s.5$, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 19 06.0	−8.0	10.5	40.9	
8	20 09.0				
16	21 12.0				
24	22 14.9				
32	23 18.0				
40	24 21.0	−8.0	12.2	38.4	
80	29 33.6	−8.0	14.5	32.2	10 27.6
88	30 36.8				27.8
96	31 40.0				28.0
104	32 43.0				28.1
112	33 46.0				28.0
120	34 49.0	−8.0	17.2	30.1	28.0
	Means	−8.0	....	....	10 27.92

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	17.2	30.1	23.65			
				10.95		
105	29.2	40.0	34.60			
				20.15		
285	11.0	17.9	14.45		$v = 38'.4$	
				10.55	$5400' + v'$	
15	9.5	40.5	25.00		5400 (ar. co.)	3.73547
						6.26761
Mean $v = 10.41$					$1+\frac{h}{f}$	0.00308

Computation.

$$T^2 = T'^2 \left(1+\frac{h}{f}\right)(1-(t'-t)\,q)$$

	s.
Observed time of 80 oscillations............	627.92
Time of one oscillation......................	7.8490
Correction for rate..........................	−0.0001
$T' =$	7.8489

	Log'ms.
T'	0.89481
T'^2	1.78962
$1+\frac{h}{f}$	0.00308
$1-(t'-t)\,q$	9.09915
T^2	1.79185
(ar. co.) T^2	8.20815
π^2	0.99430
M	9.94254
mH	9.14499
m	8.85976
H	0.28523

$q = 0.0008$*
$t'-t = +2.3$
$mH = \frac{\pi^2 M}{T^2}$
$m = 0.0724$
$H = 1.929$

Observations of deflections: Date, December 17; hour, 1^h41^m. Temp. $t = -10^\circ.3$

$\frac{m}{H}$	8.57452
mH	9.14499
m^2	7.71951
m	8.85976

* This value deduced from observations of oscillations at widely different temperatures was adopted as producing the best agreement in the value of m when reduced to a standard temperature.

[Date, December 18, 1881. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, Bond No. 188; daily rate $1^s.5$, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 07 05.0	−19.7	2.2	36.0	
8	08 08.0				
16	09 11.1				
24	10 14.0				
32	11 17.0				
40	12 20.0	−19.2	2.0	34.2	
80	17 34.9				10 29.9
88	18 38.0				30.0
96	19 41.0		/		29.9
104	20 44.1				30.1
112	21 47.1				30.1
120	22 50.0	−19.0	8.1	31.0	30.0
	Means	−19.3	....	....	10 30.00

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	19.2	28.1	23.65			
				10.95		
105	34.2	35.0	34.60			
				20.15		
285	12.1	16.8	14.45		$v = 38'.2.$	
				10.30	$5400' + v'$	
15	11.2	38.3	24.75		5400 (ar. co.)	3.73546
						6.26761
Mean $v = 10.35$					$1+\frac{h}{f}$	0.00307

Computation.

	s.
Observed time of 80 oscillations...........	630.00
Time of one oscillation	7.8750
Correction for rate..........................	−0.0001
$T' =$	7.8749

	Log'ms.
T'	0.83624
T'^2	1.79249
$1+\frac{h}{f}$	0.00307
$1-(t'-t)\,q$	9.99959
T^2	1.79515
(ar. co.) T^2	8.20485
π^2	0.99430
M	9.94248
mH	9.14163
m	8.85560
H	0.28603

$t'-t = +1.1$
$mH = \frac{\pi^2 M}{T^2}$
$m = 0.0717$
$H = 1.932$

Observations of deflections: Date, December 18; hour, $1^h27^m.5$ Temp. $t = -20^\circ.4$

$\frac{m}{H}$	8.56956
mH	9.14163
m^2	7.71119
m	8.85560

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, December 19, 1881. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet. $L_{,,}$. Chronometer, Bond No. 188; daily rate, $1^s.5$, gaining on mean time. Observer, M. Smith.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	1 38 03.0	−27.5	11.5	28.8	
8	39 05.9				
16	40 08.9				
24	41 11.9				
32	42 14.9				
40	43 17.8				
80	48 32.4	−27.6	13.5	26.9	10 29.4
88	49 35.5				29.6
96	50 38.5				29.6
104	51 41.5				29.6
112	52 44.6				29.7
120	53 47.4	−27.6	15.2	27.0	29.6
	Means	−27.6	......	....	10 29.58

Coefficient of torsion.					Value of one scale-division = 3'.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	16.0	26.0	21.00			
				11.40		
105	22.9	41.9	32.40			
				22.90		
285	1.5	17.5	9.50		$v = 41'.8$	
				11.05	$5400' + v'$	3.73574
15	5.1	36.0	20.55		5400 (ar. co.)	6.26761
Mean $v = 11.34$					$1 + \frac{h}{f}$	0.00335

Computation.

	s.
Observed time of 80 oscillations............	629.58
Time of one oscillation......................	7.8698
Correction for rate..........................	−0.0001
T' =	7.8697

	Log'ms.
T'	0.89596
T'^2	1.79192
$1 + \frac{h}{f}$	0.00335
$1-(t'-t)\,q$	0.00000
T^2	1.79527
(ar. co.) T^2	8.20473
π^2	0.99430
M	9.94243
mH	9.14146
m	8.85491
H	0.28655

$t'-t=0$

$mH = \frac{\pi^2 M}{T^2}$

$m = 0.0716$
$H = 1.934$

Observations of deflections: Date, December 19; hour, $1^h 23^m.5$; Temp. $t = -27^\circ.6$

$\frac{m}{H}$	8.56837
mH	9.14146
m^2	7.70983
m	8.85491

[Date, January 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, Bond No. 188; daily rate, $1^s.625$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	6 48 10.5	−6.0	33.1	63.5	
8	49 13.5				
16	50 16.5				
24	51 19.5				
32	52 22.0				
40	53 25.0	−6.0	36.5	61.0	
80	58 39.0	−6.0	39.0	57.2	10 28.5
88	59 42.0				28.5
96	7 00 45.5				29.0
104	01 48.5				29.0
112	02 51.5				29.5
120	03 54.5	−6.0	39.8	50.2	29.5
	Means	−6.0	....	....	10 29.00

Coefficient of torsion.					Value of one scale-division = 3'.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	44.2	53.0	48.60			
				3.50		
105	35.0	69.2	52.10			
				4.75		
285	30.2	64.5	47.35		$v = 10'.9$	
				3.55	$5400' + v'$	3.73327
15	42.0	59.8	50.90		5400 (ar. co.)	6.26761
Mean $v = 2.95$ (?)					$1 + \frac{h}{f}$	0.00088 (?)

Computation.

	s.
Observed time of 80 oscillations............	629.00
Time of one oscillation......................	7.8625
Correction for rate..........................	−0.0001
T' =	7.8624

	Log'ms.
T'	0.89556
T'^2	1.79111
$1 + \frac{h}{f}$	0.00088*
$1-(t'-t)\,q$	9.99926
T'^2	1.79125
(ar. co.) T^2	8.20875
π^2	0.99430
M	9.94255
mH	9.14560*
m	8.87544
H	0.27016

$t'-t = +2^\circ$

$mH = \frac{\pi^2 M}{T^2}$

$m = 0.0751$
$H = 1.863$

Observations of deflections: Date, January 18; hour, $3^h 15^m$. Temp. $t = -8^\circ.0$

*9.14560
8.86114

0.28446 1.925

$\frac{m}{H}$	8.60529
mH	9.14560
m^2	7.75089
m	8.87544

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, January 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L_{II}. Chronometer, Bond No. 188; daily rate, 1s.625, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	6 25 42.5	−7.0	48.1	62.3	
8	26 45.0				
16	27 47.0				
24	28 49.5				
32	29 51.5				
40	30 53.5	−7.0			
80	36 04.5	−6.0	49.8	59.8	10 22.0
88	37 06.5				21.5
96	38 09.0				22.0
104	39 12.0				22.5
112	40 14.5				23.0
120	41 17.0	−6.0	53.1	58.9	23.5
Means.......		−6.5	....	....	10 22.42

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3'.69	Logarithms.
15	53.1	58.9	56.00			
				8.30		
105	51.2	77.4	64.30			
				17.10		
285	42.2	52.2	47.20		$v=28'.9$	
				5.95	$5400'+v'$	3.73471
15	27.8	78.5	53.15		5400 (ar. co.)	6.26761
Mean $v=7.84$?					$1+\frac{h}{f}$	0.00232?

Computation.

Observed time of 79* oscillations .... 622.42 s.
Time of one oscillation 7.8787
Correction for rate .... −0.0001

$T=$ 7.8786

Log'ms.
T' 0.89645
T'^2 1.79290
$1+\frac{h}{f}$ 0.00232
$1-(t'-t)\,q$ 0.00018
T^2 1.79540

$t'-t=-0°.5$
(ar. co.) T^2 8.20460
π^2 0.99430
M 9.94256

$mH=\frac{\pi^2 M}{T^2}$
mH *9.14146
$m=0.0753$ — m 8.87662
$H=1.840$ — H 0.26484

Observations of deflections: Date, January 19; hour, 3h 32m.5. Temp. $t=-6°.0$

$\frac{m}{H}$ 8.61178
*9.14146 — mH 9.14146
8.86040
0.28106 1.910 — m^2 7.75324
m 8.87662

* Apparently 79 instead of 80 oscillations have been counted.

[Date, January 20, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L_{II}. Chronometer, Bond No. 188; daily rate, 1s.625, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	6 14 11.5	−2.0	44.3	49.5	
8	15 14.0				
16	16 17.0				
24	17 19.5				
32	18 22.5				
40	19 25.5	−1.0	40.1	60.3	
80	24 37.5				10 26.0
88	25 40.5				26.5
96	26 43.5				26.5
104	27 46.0				26.5
112	28 49.0				26.5
120	29 52.0				27.0
Means......		−1.5	....	....	10 26.50

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3'.69	Logarithms.
15	42.0	52.8	47.40			
				16.60		
[105?] 115	62.0	66.0	64.00			
				13.00		
285	24.8	77.2	51.00		$v=42'.8$	
				16.75	$5400'+v'$	3.73582
15	57.3	78.2	67.75		5400 (ar. co.)	6.26761
Mean $v=11.59$?					$1+\frac{h}{f}$	0.00343?

Computation.

Observed time of 80 oscillations .... 626.50 s.
Time of one oscillation 7.8313
Correction for rate .... −0.0001

$T=$ 7.8312

Log'ms.
T' 0.89383
T'^2 1.78766
$1+\frac{h}{f}$ 0.00343
$1-(t'-t)\,q$ 9.99982
T^2 1.79091

$t'-t=+0°.5$
(ar. co.) T^2 8.20909
π^2 0.99430
M 9.94259

$mH=\frac{\pi^2 M}{T^2}$
mH 9.14598
$m=0.0732$ — m 8.86428
$H=1.913$ — H 0.28170

Observations of deflections: Date, January 20; hour, 3h 35m. Temp. $t=-2°.0$

$\frac{m}{H}$ 8.58258
mH 9.14598
m^2 7.72856
m 8.86428

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, February 16, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,,. Chronometer, Bond No. 188; daily rate, 1s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'.	Extreme scale readings.		Time of oscillations. m.	s.
0	2	42	35.5	−1.2	6.2	16.2		
8		43	38.0					
16		44	40.5					
24		45	43.0					
32		46	45.5					
40		47	48.0	−1.2	7.8	15.2		
80		53	02.0	−1.2	7.9	18.0	10	26.5
88		54	05.0					27.0
96		55	08.0					27.5
104		56	11.0					28.0
112		57	13.5					28.0
120		58	16.0	−1.2	7.5	14.8		28.0
Means......				−1.2	....	....	10	27.50

Coefficient of torsion. Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	10.0	12.2	11.10			
				11.20		
105	19.2	25.4	22.30			
				10.40		
285	3.5	20.3	11.90		v = 20′.2	
				0.30	5400′ + v'	3.73402
15	3.2	20.0	11.60		5400 (ar. co.)	6.26761
Mean v = 5.47 ?					$1+\frac{h}{f}$	0.00163 ?

Computation.

		s.
Observed time of 80 oscillations		627.50
Time of one oscillation		7.8438
Correction for rate		−0.0001
	$T' =$	7.8437
		Log'ms.
	T'	0.89452
	T'^2	1.78904
	$1+\frac{h}{f}$	0.00163
$t'-t = -0^{\circ}.1$	$1-(t'-t)q$	0.00004
	T^2	1.79071
	(ar. co.) T^2	8.20929
	π^2	0.99430
$mH = \frac{\pi^2 M}{T^2}$	M	9.94259
	mH	9.14618
$m = 0.0708$	m	8.84976
$H = 1.979$	H	0.29642

Observations of deflections: Date, February 16; hour, $1^h\,45^m$. Temp. $t = -1^{\circ}.1$

$\frac{m}{H}$	8.55335
mH	9.14618
m^2	7.69953
m	8.84976

[Date, February 17, 1882. Göttingen mean time. Instrument, theodolite magnetometer No. 11. Magnet L,,. Chronometer, Bond No. 188; daily rate, 1s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'.	Extreme scale readings.		Time of oscillations. m.	s.
0	3	15	30.5	−3.8	14.5	38.4		
8		16	33.5					
16		17	35.5					
24		18	38.5					
32		19	41.0					
40		20	43.0	−3.8	16.2	35.0		
80		25	55.5	−3.8	18.2	32.0	10	25.0
88		26	58.5					25.0
96		28	01.5					26.0
104		29	04.5					26.0
112		30	06.5					25.5
120		31	08.5	−3.8	19.0	31.5		25.5
Means......				−3.8	....	....	10	25.50

Coefficient of torsion. Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	19.0	31.5	25.25			
				7.60		
105	24.5	41.2	32.85			
				5.45		
285	12.5	42.3	27.40		v = 12′.2	
				0.20	5400′ + v'	3.73337
15	22.2	33.0	27.60		5400 (ar. co.)	6.26761
Mean v = 3.31 ?					$1+\frac{h}{f}$	0.00098 ?

Computation.

		s.
Observed time of 80 oscillations		625.50
Time of one oscillation		7.8188
Correction for rate		−0.0001
	$T' =$	7.8187
		Log'ms.
	T'	0.89313
	T'^2	1.78627
	$1+\frac{h}{f}$	0.00098
$t'-t = -0^{\circ}.5$	$1-(t'-t)q$	0.00018
	T^2	1.78743
	(ar. co.) T^2	8.21257
	π^2	0.99430
$mH = \frac{\pi^2 M}{T^2}$	M	9.94258
	mH	9.14945
$m = 0.0749$	m	8.87476
$H = 1.882$	H	0.27469

Observations of deflections: Date, February 17; hour, $2^h\,12^m.5$. Temp. $t = -3^{\circ}.3$

$\frac{m}{H}$	8.60008
mH	9.14945
m^2	7.74953
m	8.87476

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, February 18, 1882. Göttingen mean time. Instrument, theodolite magnetometer No. 11. Magnet L,,. Chronometer, Bond No. 188; daily rate, 1.5s, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 54 39.5	10.3	32.2	63	
8	55 41.5				
16	56 43.5				
24	57 46.5				
32	58 49.0				
40	59 51.5	10.3	40	62	
80	3 05 03	10.0	42.5	62	10 23.5
88	06 05.5				24.0
96	07 07.5				24.0
104	08 10.0				23.5
112	09 12.5				23.5
120	10 15.0	9.5	48	[illegible]	23.5
	Means......	10.0*	....	....	10 23.67

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	48	68	58.00			
				0.00		
105	44.5	71.5	58.00			
				9.75		
285	39.0	57.5	48.25		$v=14'.3$	
				5.75	$5400'+v'$	3.73354
15	50.5	57.5	54.00		5400 (ar. co.)	6.26761
Mean $v=3.87$?					$1+\frac{h}{f}$	0.00115?

Computation.

	s.
Observed time of 80 oscillations	623.67
Time of one oscillation	7.7959
Correction for rate	—0.0001
$T'=$	7.7958

		Log'ms.
	T'	0.89186
	T'^2	1.78372
	$1+\frac{h}{f}$	0.00115
$t'-t=+0°.5$	$1-(t'-t)q$	9.99982
	T^2	1.78469
	(ar. co.) T^2	8.21531
	π^2	0.99430
	M	9.94254
$mH=\frac{\pi^2 M}{T^2}$	mH	9.15215
	m	8.86666
$m=0.0736$ $H=1.930$	H	0.28549

Observations of deflections: Date, February 18; hour, $1^h\ 36^m.5$. Temp. $t=-10°.5$

$\frac{m}{H}$	8.58117
mH	9.15215
m^2	7.73332
m	8.86666

* No doubt —10°.0.

[Date, March 17, 1882. Göttingen mean time. Instrument, theodolite magnetometer No. 11. Magnet L,,. Chronometer, Bond No. 188; daily rate, 3s.0, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 17 22.5	2.0	19	[illegible]	
8	18 25.5				
16	19 28.5				
24	20 31.5				
32	21 34.0				
40	22 37.0	3.0	31	74.3	
80	27 50.5	3.0	36.2	69.2	10 28.0
88	28 53.5				28.0
96	29 56.5				28.0
104	30 59.0				27.5
.112	32 01.5				27.5
120	33 05	3.0	30	66	28.0
	Means.....	2.8	....	....	10 27.83

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	39	66	52.50			
				9.25		
105	51.5	72	61.75			
				6.75		
285	51	59	55.00		$v=16'.6$	
				2.00	$5400'+v'$	3.73373
15	38	68	53.00		5400 (ar. co.)	6.26761
Mean $v=4.50$					$1+\frac{h}{f}$	0.00134?

Computation.

	s.
Observed time of 80 oscillations	627.83
Time of one oscillation	7.8479
Correction for rate	—0 0003
$T'=$	7.8476

		Log'ms.
	T'	0.89474
	T'^2	1.78947
	$1+\frac{h}{f}$	0.00134
$t'-t=+2°.8$	$1-(t'-t)q$	9.99897
	T^2	1.78978
	(ar. co.) T^2	8.21022
	π^2	0.99430
	M	9.94260
$mH=\frac{\pi^2 M}{T^2}$	mH	9.14712
	m	8.86136
$m=0.0727$ $H=1.931$	H	0.28576

Observations of deflections: Date, March 17; hour, $1^h\ 30^m.5$. Temp. $t=0°.0$

$\frac{m}{H}$	8.57560
mH	9.14712
m^2	7.72272
m	8.86136

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, March 18, 1882. Göttingen mean time. Instrument, theodolite magnetometer No. 11. Magnet $L_{//}$. Chronometer, Bond No. 188; daily rate, $3^s.0$, gaining on mean time. Observer, A. C. Daık.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 18 14.0	0	34.5	63	
8	19 16.5				
16	20 19.5				
24	21 22.5				
32	22 25.0				
40	23 28.0	1.0	39	60	
80	28 41.5	1.0	40	57	10 27.5
88	29 44.5				28.0
96	30 47.0				27.5
104	31 49.5				27.0
112	32 52.5				27.5
120	33 55.5	2.0	42	56	27.5
	Means......	1.0	....	....	10 27.50

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	42	56	49.00			
				10.50		
105	52	67	59.50			
				16.30		
285	37.2	49.2	43.20		$v = 31'.0$	
				6.80	$5400' + v'$	3.73488
15	44	56	50.00		5400 (ar. co.)	6.26761
Mean $v = 8.40$?					$1 + \frac{h}{f}$	0.00249?

Computation.

	s.
Observed time of 80 oscillations	627.50
Time of one oscillation	7.8438
Correction for rate	—0.0003
$T' =$	7.8435

		Log'ms.
	T'	0.89451
	T'^2	1.78902
	$1 + \frac{h}{f}$	0.00249
$t' - t = +2^\circ$	$1 - (t' - t) q$	9.99926
	T^2	1.79077
	(ar. co.) T^2	8.20923
	π^2	0.99430
$mH = \frac{\pi^2 m}{T^2}$	M	9.94259
	mH	9.14612
	m	8.86788
$m = 0.0738$ $H = 1.898$	H	0.27824

Observations of deflections: Date, March 18; hour, $1^h\ 38^m$. Temp. $t = -1^\circ.0$

$\frac{m}{H}$	8.58965
mH	9.14612
m^2	7.73577
m	8.86788

[Date, March 19, 1882. Göttingen mean time. Instrument, theodolite magnetometer No. 11. Magnet $L_{//}$. Chronometer, Bond No. 188; daily rate, $3^s.0$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 21 12.0	7	26	77	
8	22 15.0				
16	23 17.5				
24	24 20.5				
32	25 23.5				
40	26 26.5	8	32	70	
80	31 40.5	9	35.4	68.2	10 28.5
88	32 43.5				28.5
96	33 46.5				29.0
104	34 49.5				29.0
112	35 52.0				28.5
120	36 55.0	10	41	65	28.5
	Means......	8.5	....	....	10 28.67

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	41	65	53			
				8		
105	59	63	61			
				16		
285	39	51	45		$v = 30'.0$	
				8.5	$5400' + v'$	3.73480
15	50	57	53.5		5400 (ar. co.)	6.26761
Mean $v - 8.12$					$1 + \frac{h}{f}$	0.00241

Computation.

	s.
Observed time of 80 oscillations	628.67
Time of one oscillation	7.8584
Correction for rate	—0.0003
$T' =$	7.8581

		Log'ms.
	T'	0.89532
	T'^2	1.79064
	$1 + \frac{h}{f}$	0.00241
$t' - t = +3.5^\circ$	$1 - (t' - t) q$	9.99871
	T^2	1.79176
	(ar. co.) T^2	8.20824
	π^2	0.99430
$mH = \frac{\pi^2 M}{T^2}$	M	9.94263
	mH	9.14517
	m	8.86502
$m = 0.0733$ $H = 1.906$	H	0.28015

Observations of deflections: Date, March 19; hour, $1^h\ 40^m$. Temp. $t = 5^\circ.0$

$\frac{m}{H}$	8.58487
mH	9.14517
m^2	7.73064
m	8.86502

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, April 17, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, $L_{,,,}$. Chronometer, Bond No. 188; daily rate, 3ˢ.2, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t′.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	3 30 18.5	25.0	32.0	65.2	
8	31 21.5				
16	32 24.5				
24	33 27.5				
32	34 30.5				
40	35 33.0	25.0	55.0	85.0	
80	40 45.0	25.0	52.0	83.0	10 26.5
88	41 47.5				26.0
96	42 50.5				26.0
104	43 53.5				26.0
112	44 56.5				26.0
120	45 59.0	25.0	57.0	110.0	26.0
	Means	25.0	....	....	10 26.08

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	27.0	59.0	43.0	
				7.5
105	32.0	39.0	35.5	
				9.5
285	20.0	32.0	26.0	
				11.5
15	22.0	53.0	37.5	
	Mean r=7.12?			

Value of one scale-division=3′.69	Logarithms.
v=26′.3	
5400′+v'	3.73450
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00211?

Computation.

	s.
Observed time of 80 oscillations	626.08
Time of one oscillation	7.8260
Correction for rate	−0.0003
T'=	7.8257

	Log'ms.
T'	0.89352
T'^2	1.78705
$1+\frac{h}{f}$	0.00211
$1-(t'-t)q$	9.99852
T^2	1.78768
(ar. co.)T^2	8.21232
π^2	0.99430
M	9.94273
mH	*9.14935
m	8.84274
H	0.30661

$t'-t=+4^\circ$

$mH=\frac{\pi^2 M}{T^2}$

m=0.0696
H=2.026

Observations of deflections: Date, April 17; hour, 1ʰ.32ᵐ.5. Temp. t=21.0

*9.14935	$\frac{m}{H}$ 8.59612
8.85660	mH 9.14935
0.29275 1.962	m^2 7.68547
	m 8.84274

[Date, April 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,,}$ Chronometer, Bond No. 188; daily rate, 3ˢ.2, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t′.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 27 19.0	17.0	4.5	60.2	
8	28 22.0				
16	29 25.0				
24	30 28.0				
32	31 31.0				
40	32 34.5	17.0	23.5	67.5	
80	37 49.5	17.0	29.0	63.8	10 30.5
88	38 52.7				30.5
96	39 55.5				30.5
104	40 58.5				30.5
112	42 01.5				30.5
120	43 04.5	18.0	33.5	60.0	30.0
	Means	17.2	....	....	10 30.42

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	33.5	66.0	49.75	
				3.25
105	45.0	61.0	53.00	
				19.00
285	22.0	46.0	34.00	
				11.00
15	40.5	49.5	45.00	
	Mean r=8.31?			

Value of one scale-division = 3.69	Logarithms.
v=30.7	
5400′+v'	3.73486
5400(ar. co.)	6.26761
$1+\frac{h}{f}$	0.00247?

Computation.

	s.
Observed time of 80 oscillations	630.42
Time of one oscillation	7.8802
Correction for rate	−.0003
T'=	7.8799

	Log'ms.
T'	0.89652
T'^2	1.79304
$1+\frac{h}{f}$	0.00247
$1-(t'-t)q$	9.99919
T^2	1.79470
(ar. co.)T^2	8.20530
π^2	0.99430
M	9.94269
mH	9.14229
m	8.84899
H	0.29330

$t'-t+2.2^\circ$

$mH-\frac{\pi^2 M}{T^2}$

m=0.0706
H=1.965

Observations of deflections: Date, April 18; hour, 1ʰ 32ᵐ.5. Temp. t=15°.0

$\frac{m}{H}$	8.55569
mH	9.14229
m^2	7.69798
m	8.84899

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, April 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, Bond No. 188; daily rate, $3^s.2$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				*m. s.*
0	2 26 44.0	23.0	12.0	78.0	
8	27 46.5				
16	28 49.5				
24	29 52.0				
32	30 54.5				
40	31 57.5	24.0	22.0	76.2	
80	37 11.5	25.0	27.5	70.2	10 27.5
88	38 14.5				28.0
96	39 17.5				28.0
104	40 20.5				28.5
112	41 23.5				29.0
120	42 26.5	25.0	28.0	60.0	29.0
	Means......	24.2	....	....	10 28.33

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	28	60	44	
				9
105	41	65	53	
				16
285	29	45	37	
				7
15	33	55	44	
Mean $v=8.00$				

Value of one scale-division $=3'.69$	Logarithms.
$v=29'.5$	
$5400'+v'$	3.73476
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00237

Computation.

	s.
Observed time of 80 oscillations	628.33
Time of one oscillation	7.8541
Correction for rate	—0.0003
$T'=$	7.8538
	Log'ms.
T'	0.89508
T'^2	1.79016
$1+\frac{h}{f}$	0.00237
$1-(t'-t)q$	0.00037
T^2	1.79290
(ar. co.) T^2	8.20710
π^2	0.99430
M	9.94275
mH	9.14415
m	8.86310
H	0.28105

$t'-t=-1^\circ.0$

$mH=\frac{\pi^2 M}{T^2}$

$m=0.0730$
$H=1.910$

Observations of deflections: Date, April 19; hour, $1^h\ 32^m.5$. Temp. $t=25^\circ.2$

$\frac{m}{H}$	8.58204
mH	9.14415
m^2	7.72619
m	8.86310

[Date, May 17, 1882. Göttengen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, Bond No. 188; daily rate, $3^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				*m. s.*
0	2 19 07.0	46.5	13.0	62.0	
8	20 10.5				
16	21 14.5				
24	22 18.5				
32	23 22.5				
40	24 26.5	47.0	20.0	55.0	
80	2 29 47.5	47.0	23.0	51.0	10 40.5
88	30 51.0				40.5
96	31 54.5				40.0
104	32 58.5				40.0
112	34 02.5				40.0
120	35 06.5	47.5	15.0	49.9	40.0
	Means......	47.0	....	....	10 40.17

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	14	49	31.5	
				1.00
105	24	41	32.5	
				13.50
285	13.5	24.5	19.0	
				9.00
15	11	45	28.0	
Mean $v=5.87$?				

Value of one scale-division $=3'.69$	Logarithms.
$v=21'.7$	
$5400'+v'$	3.73414
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00175?

Computation.

	s.
Observed time of 80 oscillations	640.17
Time of one oscillation	8.0021
Correction for rate	—0.0003
$T'=$	8.0018
	Log'ms.
T'	0.90319
T'^2	1.80638
$1+\frac{h}{f}$	0.00175
$1-(t'-t)q$	9.99963
T^2	1.80776
(ar. co.) T^2	8.19224
π^2	0.99430
M	9.94288
mH	9.12942
m	8.84722
H	0.28220

$t'-t=+1^\circ.0$

$mH=\frac{\pi^2 M}{T^2}$

$m=0.0703$
$H=1.915$

Observations of deflections: Date, May 17; hour, $1^h\ 32^m.5$. Temp. $t=46^\circ.0$

$\frac{m}{H}$	8.56503
mH	9.12942
m^2	7.69445
m	8.84722

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, May 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L_{II}. Chronometer, Bond No. 188; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 18 12.5	43.0	14.0	78.0	
8	19 16.5				
16	20 20.5				
24	21 24.5				
32	22 28.0				
40	23 32.0	43.0	29.0	74.0	
80	28 51.5	43.0	70.0	43.0	10 39.0
88	29 55.0				38.5
96	30 59.0				38.5
104	32 02.5				38.5
112	33 06.0				38.0
120	34 09.5	43.0	63.0	43.0	37.5
	Means......	43.0	....	....	10 38.33

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	36	63	49.5	
				5.5
105	52	58	55.0	
				12.0
285	37	49	73.0	
				7.5
15	37	64	50.5	
Mean v = 6.25				

Value of one scale-division = 3'.69	Logarithms.
v = 2'.31	
5400' + v'	3.73425
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00186

Computation.

		s.
Observed time of 80 oscillations		638.33
Time of one oscillation		7.9791
Correction for rate		−0.0003
	$T' =$	7.9788
		Log'ms.
	T'	0.90194
	T'^2	1.80388
	$1+\frac{h}{f}$	0.00186
$t'-t = -3°.0$	$1-(t'-t)q$	0.00111
	T^2	1.80685
	(ar. co.) T^2	8.19315
	π^2	0.99430
	M	9.94288
$mH = \frac{\pi^2 M}{T^2}$	mH	9.13083
	m	8.84722
$m = 0.0703$; $H = 1.919$	H	0.28311

Observations of deflections: Date, May 18; hour, 1h 32m.5. Temp. $t = 46°.0$

$\frac{m}{H}$	8.56412
mH	9.13033
m^2	7.69445
m	8.84722

[Date, May 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L_{II}. Chronometer, Bond No. 188; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 33 05.0	36.5	2.0	76.0	
8	34 08.5				
16	35 12.0				
24	36 16.0				
32	37 20.0				
40	38 24.0	36.5	21.0	68.0	
80	43 41.5	36.0	27.0	56.0	10 36.5
88	44 45.0				36.5
96	45 48.0				36.0
104	46 51.5				35.5
112	47 55.5				35.5
120	48 59.0	36.0	22.8	52.8	35.0
	Means......	36.2	....	....	10 35.83

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	25.0	52.8	38.9	
				6.1
105	31.0	59.0	45.0	
				7.5
285	27.5	47.5	37.5	
				11.5
15	46.0	52.0	49.0	
Mean v = 6.28?				

Value of one scale-division = 3'.69	Logarithms.
v = 23'.2	
5400' + v'	3.73426
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00187?

Computation.

		s.
Observed time of 80 oscillations		685.83
Time of one oscillation		7.9479
Correction for rate		−0.0003
	$T' =$	7.9476
		Log'ms.
	T'	0.90024
	T'^2	1.80048
	$1+\frac{h}{f}$	0.00187
$t'-t = 0°$	$1-(t'-t)q$	0.00000
	T^2	1.80235
	(ar. co.) T^2	8.19765
	π^2	0.99430
	M	9.94282
$mH = \frac{\pi^2 M}{T^2}$	mH	9.13477
	m	8.84779
$m = 0.0704$; $H = 1.936$	H	0.28698

Observations of deflections: Date, May 19; hour, 1h 40m. Temp. $t = 36°.2$

$\frac{m}{H}$	8.56081
mH	9.13477
m^2	7.69558
m	8.84779

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, June 17, 1882, Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{//}$. Chronometer, Bond No. 188; daily rate, $4^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	3 21 07	53.0	35.0	80.0	
8	22 10.5				
16	23 14.5				
24	24 18.0				
32	25 22.0				
40	26 26.0	53.0	37.0	76.0	
80	31 43.5	53.0	40.0	70	10 36.5
88	32 46.5				36.0
96	33 50.0				35.5
104	34 54				36.0
112	35 58				36.0
120	37 02	53.0	45.2	67.2	36.0
	Means......	53.0	....	....	10 36.00

Computation.

Observed time of 80 oscillations .... = 636.00 s.
Time of one oscillation .... = 7.9500
Correction for rate .... = − .0004

T = 7.9496

	Log'ms.
T'	0.90035
T'^2	1.80069
$1+\frac{h}{f}$	0.00190
$t'-t=0$ $1-(t'-t)q$	0.00000
T^2	1.80268
(ar. co.) T^2	8.19732
π^2	0.99430
M	9.94292
$mH=\frac{\pi^2 M}{T^2}$ mH	9.13454
m	8.84518
$m=0.0700$, $H=1.947$ H	0.28936

Observations of deflections: Date, June 17; hour, $2^h\ 36^m$. Temp. $t=53.0$

$\frac{m}{H}$	8.55583
mH	9.13454
m^2	7.69037
m	8.84518

Coefficient of torsion.					Value of one scale-division = 3'.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	45.2	67.2	56.2			
				8.3		
105	57	72	64.5			
				13.0		
285	47	56	51.5		$v=24'.7$	
				5.5	$5400'+v$	3.73438
15	53	61	57.0		5400 (ar. co.)	6.26761
Mean $v=6.70$					$1+\frac{h}{f}$	0.00199

[Date, June 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{//}$. Chronometer, Bond No. 188; daily rate, $4^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 23 10.5	49.5	26.5	80.0	
8	24 15.0				
16	25 19.0				
24	26 23.5				
32	27 27.5				
40	28 31.5	50.5	40.5	74.0	
80					
88	34 57.5	50.0	44.0	71.0	10 42.5
96	36 01.0				42.0
104	37 05.0				41.5
112	38 08.5				41.0
120	39 12.5	50.0	46.0	67.0	41.0
	Means......	50.0	....	....	10 41.60

Computation.

Observed time of 80 oscillations.......... = 641.60 s.
Time of one oscillation .... = 8.0200
Correction for rate .... = − .0004

T = 8.0196

	Log'ms.
T'	0.90415
T'^2	1.80831
$1+\frac{h}{f}$	0.00248
$t'-t=0$ $1-(t'-t)q$	0.00000
T^2	1.81079
(ar. co.) T^2	8.18921
π^2	0.99430
M	9.94290
$mH=\frac{\pi^2 M}{T^2}$ mH	9.12641
m	8.84404
$m=0.0698$, $H=1.916$ H	0.28237

Observations of deflections: Date, June 18; hour, $1^h\ 38^m.5$. Temp. $t=50^\circ.0$

$\frac{m}{H}$	8.56166
mH	9.12641
m^2	7.68807
m	8.84404

Coefficient of torsion.					Value of one scale-division = 3'.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	46	67	56.5			
				8.5		
105	63	67	65.0			
				16.0		
285	39	59	49.0		$v=30'.9$	
				9.0	$5400'+v'$	3.73487
15	56.5	59.5	58.0		5400 (ar. co.)	6.26761
Mean $v=8.37$					$1+\frac{h}{f}$	0.00248

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, June 19, 1882. Instrument, theodolite magnetometer No. 11. Magnet, L,,. Chronometer, Bond No. 188; daily rate, 4s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 22 00.5	59	50	78	
8	23 05.0				
16	24 09.5				
24					
32	26 16.0				
40	27 20.5	59	40	80	
80	2 32 42.5	59	44.8	78.2	10 42.0
88	33 47				42.0
96	34 51.5				42.0
104	35 56				
112	37 00.5				44.5
120	38 04.5	59	47.0	72.0	44.0
Means		59.0	....	....	10 42.90

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	47	72	59.5			
				7.5		
105	61	73	67.0			
				15.5		
285	40	63	51.5		$v=30'.0$	
				9.5	$5400'+v'$	3.73480
15	54	68	61.0		5400 (ar. co.)	6.26761
Mean $v=8.12$					$1+\frac{h}{f}$	0.00241

Computation.

		s.
Observed time of 80 oscillations	=	642.90
Time of one oscillation	=	8.0362
Correction for rate	=	—.0004
	$T'=$	8.0358

	Log'ms.
T'	0.90503
T'^2	1.81006
$1+\frac{h}{f}$	0.00241
$1-(t'-t)q$	0.00037
T^2	1.81284
(ar. co.) T^2	8.18716
π^2	0.99430
M	9.94296
mH	9.12442
m	8.83529
H	0.28913

$t'-t=-1.0^\circ$

$mH=\frac{\pi^2 M}{T^2}$

$m=0.0684$
$H=1.946$

Observations of deflections: Date, June 19; hour, 1h 35m. Temp. $t=60^\circ.0$

$\frac{m}{H}$	8.54616
mH	9.12442
m^2	7.67058
m	8.83529

[Date, July 18, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,,. Chronometer, Bond No. 188; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 20 06	48	18.0	75	
8	21 10				
16	22 13.5				
24	23 17.5				
32	24 21.0				
40	25 24.5	48	21.0	66	
80	2 30 42.0	48	24.5	61	10 36.0
88	31 45.5				35.5
96	32 49.0				35.5
104	33 52.5				35.0
112	34 56.0				35.0
120	35 59.5	48	30.0	58	35.0
Means		48	....	....	10 35.33

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	30	58	44.0			
				7.00		
105	37	65	51.0			
				12.25		
285	27.5	50	38.75		$v=25'.1$	
				8.00	$5400'+v'$	3.73441
15	30.5	68	46.75		5400 (ar. co.)	6.26761
Mean $v=6.81$					$1+\frac{h}{f}$	0.00202

Computation.

		s.
Observed time of 80 oscillations	=	635.33
Time of one oscillation	=	7.9416
Correction for rate	=	—.0003
	$T'=$	7.9413

	Log'ms.
T'	0.89969
T'^2	1.79978
$1+\frac{h}{f}$	0.00202
$1-(t'-t)q$	0.00000
T^2	1.80180
(ar. co.) T^2	8.19820
π^2	0.99430
M	9.94289
mH	9.13539
m	8.84952
H	0.28587

$t'-t=0$

$mH=\frac{\pi^2 M}{T^2}$

$m=0.0707$
$H=1.931$

Observations of deflections: Date, July 18; hour, 1h 35m. Temp. $t=48^\circ.0$

$\frac{m}{H}$	8.56364
mH	9.13539
m^2	7.69903
m	8.84952

Magnetic observations at Uglaamie, Alaska—Continued

[Date, July 19, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$. Chronometer, Bond No. 188; daily rate, $3^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				*m. s.*
0	2 23 20.0	58.0	7.0	78.0	
8	24 24.0				
16	25 28.5				
24	26 32.5				
32	27 37.0				
40	28 41.5	58.0	38.2	76.0	
80	2 34 03.5	58.0	38.2	74.0	10 43.5
88	35 07.5				43.5
96	36 12.0				43.5
104	37 16.0				43.5
112	38 20.5				43.5
120	39 25.0	58.0	42.0	68.0	43.5
	Means	58.0	....	....	10 43.50

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division =3'.69	Logarithms.
15	56.5	65.5	61.0			
105	56.0	65.0	60.5	0.5		
285	59.0	80.0	69.5	9.0	v=23'.1	
15	47.5	60.5	54.0	15.5	5400'+v'	3.73425
					5400 (ar. co.)	6.26761
Mean v=6.25 ?					$1+\frac{h}{f}$	0.00186

Computation.

	s.
Observed time of 80 oscillations .... =	643.50
Time of one oscillation .... =	8.0437
Correction for rate .... =	−0.0003
T' =	8.0434

		Log'ms.
	T'	0.90544
	T'^2	1.81088
$t'-t=0$	$1+\frac{h}{f}$	0.00186
	$1-(t'-t)\,q$	0.00000
	T^2	1.81274
	(ar. co.) T^2	8.18726
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	m	9.94295
	mH	9.12451
m=0.0694	m	8.84124
H=1.920	H	0.28327

Observations of deflections: Date, July 19; hour, $1^h\ 37^m.5$. Temp. t=58°.0

$\frac{m}{H}$	8.55798
mH	9.12451
m^2	7.68249
m	8.84124

[Date, July 20, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L″. Chronometer, Bond No. 188; daily rate, $3^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of oscillations.
	h. m. s.				*m. s.*
0	2 22 10.5	61.0	22.5	68.0	
8	23 15.0				
16	24 19.5				
24	25 23.5				
32	26 28.0				
40	27 32.0	61.0	23.0	61.3	
80	2 32 53.5	61.0	32.0	57.2	10 43.0
88	33 58.0				43.0
96	35 02.5				43.0
104	36 06.5				43.0
112	37 11.0				43.0
120	38 15.0	61.0	35.0	55.2	43.0
	Means	61.0	....	....	10 43.00

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division =3'.69	Logarithms.
15	35.2	54.8	45.0			
105	47.5	59.5	53.5	8.5		
285	22.0	53.0	37.5	16.0	v=31'.4	
15	38.0	56.0	47.0	9.5	5400'+v'	3.73491
					5400 (ar. co.)	6.26761
Mean v=8.50					$1+\frac{h}{f}$	0.00252

Computation.

	s.
Observed time of 80 oscillations .... =	643.00
Time of one oscillation .... =	8.0375
Correction for rate .... =	−.0003
T' =	8.0372

		Log'ms.
	T'	0.90510
	T'^2	1.81021
$t'-t=-1^{\circ}.0$	$1+\frac{h}{f}$	0.00252
	$1-(t'-t)\,q$	0.00037
	T^2	1.81310
	(ar. co.) T^2	8.18690
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94297
	mH	9.12417
m=0.0693	m	8.84094
H=1.920	H	0.28323

Observations of deflections: Date, July 20; hour, $1^h\ 40^m$. Temp. t=62°.0

$\frac{m}{H}$	8.55770
mH	9.12417
m^2	7.68187
m	8.84094

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, August 17, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$. Chronometer, Bond No. 188; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 32 01.5	41.0	7.0	67.0	
[illegible]	33 05.0				
16	34 09.0				
24	35 12.5				
32	36 15.5				
40	37 19.0	41.0	56.0	3.0	
80	42 37.0	41.0	22.0	49.0	10 35.5
88	43 40.5				35.5
96	44 44.0				35.0
104	45 47.5				35.0
112	46 51.0				35.5
120	47 54.5	41.0	22.0	46.0	35.5
	Means	41.0	....	....	10 35.33

Coefficient of torsion.					Value of one scale-division =3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	22.0	46.0	34.0			
				7.5		
105	33.0	50.0	41.5			
				14.0		
285	15.0	40.0	27.5		v=28′.1	
				9.0	5400′+v'	3.73465
15	21.0	52.0	36.5		5400 (ar. co.)	6.26761
Mean v=7.62					$1+\frac{h}{f}$	0.00226

Computation.

Observed time of 80 oscillations		=635.33 s.
Time of one oscillation		= 7.9416
Correction for rate		= −.0003
	T'=	7.9413
		Log'ms.
	T'	0.89989
	T'^2	1.79978
	$1+\frac{h}{f}$	0.00226
	$1-(t'-t)\,q$	0.00074
	T^2	1.80278
$t'-t=-2^\circ$	(ar. co.) T^2	8.19722
	π^2	0.99430
$mH=\frac{\pi^2 m}{T^2}$	M	9.94286
	mH	9.13438
m=0.0690	m	8.83860
H=1.976	H	0.29578

Observations of deflections: Date, August 17; hour, $1^h\,37^m.5$. Temp. t=43°.0

$\frac{m}{H}$	8.54281
mH	9.13438
m^2	7.67719
m	8.83860

[Date, August 18, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime}$. Chronometer, Bond No. 188; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 28 22.0	41.0	14.0	53.0	
8	29 25.5				
16	30 28.5				
24	31 32.0				
32	32 36.0				
40	33 40.5	42.2	25.0	54.0	
80	38 58.5	42.3	2.0	42.0	10 36.5
88	40 02.0				36.5
96	41 05.0				36.5
104	42 08.5				36.5
112	43 12.5				36.5
120	44 17.0	42.5	30.0	45.0	36.5
	Means	42.0	....	....	10 36.50

Coefficient of torsion.					Value of one scale-division =3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	30.0	45.0	37.5			
				7.0		
105	38.0	51.0	44.5			
				19.4		
285	18.2	32.0	25.1		v=31′6	
				7.9	5400′+v'	3.73493
15	18.0	48.0	33.0		5400 (ar. co.)	6.26761
Mean v=8.57					$1+\frac{h}{f}$	0.00254

Computation.

Observed time of 80 oscillations		=636.50 s.
Time of one oscillation		= 7.9562
Correction for rate		= −.0003
	T'=	7.9559
		Log'ms.
	T'	0.09069
	T^2	1.80138
	$1+\frac{h}{f}$	0.00254
	$1-(t'-t)\,q$	9.99889
	T^2	1.80281
$t'-t=+3^\circ.0$	(ar. co.) T^2	8.19719
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94283
	mH	9.13432
m=0.0709	m	8.85080
H=1.921	H	0.28352

Observations of deflections: Date, August 18; hour, $1^h\,35^m$. Temp. t=39.0

$\frac{m}{H}$	8.56727
mH	9.13432
m^2	7.70159
m	8.85080

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, August 19, 1882. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, Bond No. 188; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	2 24 10.0	43.0	6.0	63.8	
8	25 14.0				
16	26 18.5				
24	27 23.0				
32	28 27.0				
40	29 30.5	43.0	16.0	55.5	
80	34 50.5	43.0	26.0	55.0	10 40.5
88	35 54.0				40.0
96	36 57.5				39.0
104	38 01.5				38.5
112	39 05.5				38.5
120	40 09.0	43.0	25.0	49.5	38.5
	Means......	43.0	....	....	10 39.17

Computation.

Observed time of 80 oscillations..........		=639.17 s.
Time of one oscillation....................		= 7.9896
Correction for rate........................		=−0.0003
	T' =	7.9893
		Log'ms.
	T'	0.90251
	T'^2	1.80502
	$1+\frac{h}{f}$	0.00237
$t'-t=+3°.0$	$1-(t'-t)q$	9.99889
	T^2	1.80628
	(ar. co.) T^2	8.19372
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94284
	mH	9.13086
$m=0.0695$	m	8.84170
$H=1.946$	H	0.28916

Observations of deflections: Date, August 19; hour, 1h 35m. Temp. t=40°.0

$\frac{m}{H}$	8.55255
mH	9.13086
m^2	7.68341
m	8.84170

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division=3'.69	Logarithms.
15	25.0	49.5	37.25			
				10.25		
105	19.0	76.0	47.50			
				14.50		
285	13.0	53.0	33.00		v=29'.5	
				7.25	5400'+v'	3.73476
15	39.0	41.5	40.25		5400 (ar. co.)	6.26761
Mean v=8.00					$1+\frac{h}{f}$	0.00237?

[Date, August 31, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Chronometer, *Bond No. 188; daily rate, 5s.0, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				m. s.
0	6 31 24.2	36.0	11.5	61.0	
8	32 27.9				
16	33 31.5				
24	34 35.3				
32	35 38.8				
40	36 42.4	36.0	19.0	55.0	
80	42 00.5	37.0	22.0	53.0	10 36.3
88	43 04.0				36.1
96	44 07.5				36.0
104	45 11.1				35.8
112	46 14.8				36.0
120	47 18.5	39.0	27.5	47.5	36.1
	Means......	37.0	....	....	10 36.05

Computation.

Observed time of 80 oscillations..........		=636.05 s.
Time of one oscillation....................		= 7.9506
Correction for rate........................		=−0.0005
	T' =	7.9501
		Log'ms.
	T'	0.90037
	T'^2	1.80075
	$1+\frac{h}{f}$	0.00193
$t'-t=-3°.0$	$1-(t'-t)q$	0.00111
	T^2	1.80379
	(ar. co.) T^2	8.19621
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94284
	mH	9.13335
$m=0.0695$	m	8.84186
$H=1.957$	H	0.29149

Observations of deflections: Date, August 31; hour, 4h 35m. Temp. t=40° 0

$\frac{m}{H}$	8.55038
mH	9.13335
m^2	7.68373
m	8.84186

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division=3'.69	Logarithms.
15	27.5	47.5	37.5			
				6.00		
105	30.0	57.0	43.5			
				13.00		
285	22.0	39.0	30.5		v=24'.0	
				7.00	5400'+v'	3.73432
15	27.0	48.0	37.5		5400 (ar. co.)	6.26761
Mean v=6.50					$1+\frac{h}{f}$	0.00193

* 16m 31s.5 fast.

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, September 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L. Mass ring not used. Chronometer, Bond No. 188, fast $18^m 33^s$; daily rate, 3^s, losing on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				*m. s.*
0	4 28 40.9	42.0	7.0	68.0	
8	29 44.5				
16	30 47.9				
24	31 51.0				
32	32 54.5				
40	33 57.5	40.5	15.0	57.0	
80	4 39 17.3	40.0	64.0	12.0	10 36.4
88	40 21.0				36.5
96	41 24.5				36.6
104	42 28.0				37.0
112	43 31.5				37.0
120	44 35.0	40.5	16.0	57.0	37.5
	Means......	40.75	....	....	10 36.83

Coefficient of torsion. Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	16.0	57.0	36.5			
				7.0		
285	23.0	36.0	29.5			
				11.0		
105	18.0	63.0	40.5		v=23′.1	
				7.0	5400′+v'	3.73425
15	24.0	43.0	33.5		5400 (ar. co.)	6.26761
Mean v = 6.25					$1+\frac{h}{f}$	0.00186

Computation.

		s.
Observed time of 80 oscillations	=	636.83
Time of one oscillation	=	7.9604
Correction for rate	=	+0.0003
	T' =	7.9607
		Log'ms.
	T'	0.90095
	T'^2	1.80190
	$1+\frac{h}{f}$	0.00186
$t'-t$ = −1°.25	$1-(t'-t)\,q$	0.00046
	T^2	1.80422
	(ar. co.) T^2	8.19578
$mH=\frac{\pi^2 M}{T^2}$	π^2	0.99430
	M	9.94285
	mH	9.13293
m=0.0697	m	8.84352
H=1.947	H	0.28941
Observations of deflections: Date, September 14; hour, 3.35–4.05 a. m. Temp. t=42°.0		
	$\frac{m}{H}$	8.55412
	mH	9.13293
	m^2	7.68705
	m	8.84352

[Date, September 30, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L. Mass ring not used. Chronometer, Bond No. 188; fast $18^m 56^s$; daily rate, 2^s, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of oscillations.
	h. m. s.				*m. s.*
0	4 24 23.0	43.0	7.0	64.0	
8	25 26.8				
16	26 31.0				
24	27 35.2				
32	28 39.4				
40	29 43.2	43.0	2.0	76.0	
80	4 35 05.2	43.0	2.0	74.0	10 42.2
88	36 09.5				42.7
96	37 13.5				42.5
104	38 17.5				42.3
112	39 21.6				42.2
120	40 25.5	43.0	9.0	67.0	42.3
	Means......	43.0	....	....	10 42.37

Coefficient of torsion. Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	9.0	67.0	38.0			
				4.0		
105	22.0	62.0	42.0			
				10.5		
285	12.0	51.0	31.5		v=19′.9	
				7.0	5400′+v'	3.73399
15	20.0	57.0	38.5		5400 (ar. co.)	6.26761
Mean v = 5.38					$1+\frac{h}{f}$	0.00160

Computation.

		s.
Observed time of 80 oscillations	=	642.37
Time of one oscillation	=	8.0296
Correction for rate	=	−0.0002
	T' =	8.0294
		Log'ms.
	T'	0.90468
	T'^2	1.80937
	$1+\frac{h}{f}$	0.00160
$t'-t$ = −1°.0	$1-(t'-t)\,q$	0.00037
	T^2	1.81134
	(ar. co.) T^2	8.18866
$mH=\frac{\pi^2 M}{T^2}$	π^2	0.99430
	M	9.94286
	mH	9.12582
mH=0.0698	m	8.84409
H=1.913	H	0.28173
Observations of deflections: Date, September 30; hour, 3.10–4.00 a. m. Temp. t=44°.0		
	$\frac{m}{H}$	8.56236
	mH	9.12582
	m^2	7.68818
	m	8.84409

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, October 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L_{II}. Mass ring not used. Chronometer, Bond No. 188; fast 19m 10s daily rate, 1s.75, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'.	Extreme scale readings.		Time of oscillations. m.	s.
0	4	33	14.0	10.0	23	40		
8		34	17.2					
16		35	20.2					
24		36	23.3					
32		37	27.0					
40		38	30.0	11.0	27	41		
80	4	43	45.0	11.5	22	43	10	31.0
88		44	48.0					30.8
96		45	50.7					30.5
104		46	53.8					30.5
112		47	56.9					29.9
120		49	00.1	11.5	26	45		30.1
Means.......				11.0	....	....	10	30.47

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division=3'.69	Logarithms.
15	26.0	45.0	35.5			
				7.00		
105	45.7	39.3	42.5			
				15.5		
285	20.5	33.5	27.0		v=27'.9	
				7.76	5400'+v'	3.73463
15	32.5	37.0	34.8		5400'(ar. co.)	6.26761
Mean v=7.56					$1+\frac{h}{f}$	0.00224

Computation.

Observed time of 80 oscillations .... = 630.47 s.
Time of one oscillation .... = 7.8809
Correction for rate .... = −0.0002

T' = 7.8807

$t'-t=+0^\circ.5$

	Log'ms.
T'	0.89656
T'^2	1.79313
$1+\frac{h}{f}$	0.00224
$1-(t'-t)q$	9.99982
T'^2	1.79519
(ar. co.) T'^2	8.20481
π^2	0.99430
M	9.94266
mH	9.14177
m	8.85500
H	0.28677

$mH=\frac{\pi^2 M}{T^2}$

m=0.0716

H=1.935

Observations of deflections: Date, October 14; hour, 3h 42m.5 a. m. Temp. t=10.5

$\frac{m}{H}$	8.56823
mH	9.14177
m^2	7.71000
m	8.85500

[Date, October 31, 1882. Göttingen time. Instrument, theodolite magnetometer. Magnet L_{II}. Mass ring not used. Chronometer, Bond No. 188; fast 19m 01s; daily rate, 1s.75, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'	Extreme scale-readings.		Time of oscillations. m.	s.
0	6	33	59.5	19	10	62		
8		35	02.5					
16		36	05.8					
24		37	09.4					
32		38	12.5					
40		39	15.5	19.5	16.5	55.5		
80	6	44	31.5	20.5	21	53	10	32.0
88		45	34.7					32.2
96		46	38.0					32.2
104		47	41.4					32.0
112		48	44.7					32.2
120		49	47.9	21.0	25	[illegible]		32.4
Means......				20.0	....	....	10	32.17

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3'.69	Logarithms.
15	25	49	37.0			
				7.80		
105	44.4	45.2	44.8			
				13.80		
285	15.0	47.0	31.0		v = 26'.4	
				7.00	5400' + v'	3.73451
15	19.0	57.0	38.0		5400 (ar. co.)	6.26761
Mean v = 7.15					$1+\frac{h}{f}$	0.00212

Computation.

Observed time of 80 oscillations .... = 632.17 s.
Time of one oscillation .... = 7.9021
Correction for rate .... = −0.0002

T' = 7.9019

$t'-t=+1^\circ.5$

	Log'ms.
T'	0.89773
T'^2	1.79546
$1+\frac{h}{f}$	0.00212
$1-(t'-t)q$	9.99945
T^2	1.79703
(ar. co.) T^2	8.20297
π^2	0.99430
M	9.94271
mH	9.13998
m	8.85265
H	0.28733

$mH=\frac{\pi^2 M}{T^2}$

m = 0.0712
H = 1.938

Observations of deflections: Date, October 31; hour, 4h 27m.5. Temp. t = 18°.5

$\frac{m}{H}$	8.56532
mH	9.13998
m^2	7.70530
m	8.85265

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, November 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, $L_{,,}$. Mass ring not used. Chronometer, Bond 188; 18^m 38^s fast; daily rate, $1^s.75$, losing on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.			Temp. t'	Extreme scale-readings.		Time of oscillations.	
	h.	*m.*	*s.*				*m.*	*s.*
0	6	30	15.5	−23.0	21	42		
8		31	17.0					
16		32	19.0					
24		33	20.8					
32		34	22.5					
40		35	24.4	−20.5	21	38		
80	6	40	34.5	−20.5	26	39	10	19.0
88		41	36.1					19.1
96		42	37.8					18.8
104		43	39.5					18.7
112		44	41.2					18.7
120		45	42.9	−20.0	25	36		18.5
	Means......			−21.0	....	....	10	18.80

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	25	36	30.5			
				8.75		
105	36	42.5	39.25			
				19.75		
285	05	34.0	19.5		$v = 36'.9$	
				11.5	$5400' + v'$	3.73536
15	28	34.0	31.0		5400 (ar. co.)	6.26761
Mean $v = 10.0$					$1+\frac{h}{f}$	0.00296

Computation.

	s.
Observed time of 80 oscillations..........	=618.80
Time of one oscillation	= 7.7350
Correction for rate.......................	=+0.0002
$T' =$	7.7352

		Log'ms.
	T'	0.88847
	T'^2	1.77694
	$1+\frac{h}{f}$	0.00296
	$1-(t'-t)q$	0.00000
	T^2	1.77990
$t'-t=0$	(ar. co.) T^2	8.22010
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94247
	mH	9.15687
$m = 0.0724$	m	8.85975
$H = 1.982$	H	0.29712

Observations of deflections: Date, November 14; hour, 4^h 38^m. Temp. $t = -21°.0$

$\frac{m}{H}$	8.56263
mH	9.15687
m^2	7.71950
m	8.85975

[Date, November 30, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; fast 18^m 15^s; daily rate, $3^s.5$, losing on mean time. Observer, A. C. Dark]

No. of oscillations.	Chronometer time.			Temp. t'	Extreme scale-readings.		Time of oscillations.	
	h.	*m.*	*s.*				*m.*	*s.*
0	6	27	33	0.0	13	46		
8		28	35.5					
16		29	37.5					
24		30	39.5					
32		31	42.0					
40		32	44.0	0.0	18	43		
80	6	37	54.5	0.0	21	42	10	21.5
88		38	57					21.5
96		39	59					21.5
104		41	01					21.5
112		42	03.5					21.5
120		43	05.5	0.0	23	40		21.5
	Means......			0.0	....	....	10	21.50

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
15	23	40	31.5			
				10.0		
105	40	43	41.5			
				18.75		
285	03	42.5	22.75		$v = 36'.5$	
				10.75	$5400' + v'$	3.73532
15	14.2	52.8	33.5		5400 (ar. co.)	6.26761
Mean $v = 9.88$					$1+\frac{h}{f}$	0.00293

Computation.

	s.
Observed time of 80 oscillations..........	=621.50
Time of one oscillation	= 7.7688
Correction for rate.......................	=+0.0003
T'	7.7691

		Log'ms.
	T'	0.89037
	T'^2	1.78074
	$1+\frac{h}{f}$	0.00293
	$1-(t'-t)q$	9.99852
	T^2	1.78219
$t'-t=+4°$	(ar. co.) T^2	8.21781
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94258
	mH	9.15469
$m=0.0728$	m	8.86230
$H=1.961$	H	0.29239

Observations of deflections: Date, November 30; hour, 4^h $37^m.5$. Temp. $t = -4.0$

$\frac{m}{H}$	8.56990
mH	9.15469
m^2	7.72459
m	8.86230

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, December 14, 1882. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; fast 18^m 16^s; daily rate, $1^s.75$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale-readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	4 46 34.5	−13.0	40.0	60.0	
8	47 36.5				
16	48 39.0				
24	49 41.0				
32	50 43.5				
40	51 46.0	−13.0	42.0	57.0	
80	4 56 57.5	−13.0	43.0	55.0	10 23.0
88	58 00				23.5
96	59 02.5				23.5
104	5 00 04.5				23.5
112	01 06.5				23.0
120	02 09.0	−13.0	44.0	54.0	23.0
	Means	−13.0	....	....	10 23.25

Computation.

		s.
Observed time of 80 oscillations		623.25
Time of one oscillation		7.7906
Correction for rate		−0.0002
	T'	7.7904
		Log'ms.
	T'	0.89156
	T'^2	1.78312
$t'-t=0$	$1+\frac{h}{f}$	0.00296
	$1-(t'-t)q$	0.00000
	T^2	1.78608
	(ar. co.) T^2	8.21392
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94252
	mH	9.15074
$m=0.0724$	m	8.85956
$H=1.955$	H	0.29118

Observations of deflections: Date, December 14; hour, 3.45 a. m. Temp. $t=-13°.0$

$\frac{m}{H}$	8.56837
mH	9.15074
m^2	7.71911
m	8.85956

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	43.7	54.3	49.0			
				10		
105	44.5	73.5	59.0			
				20		
285	34.0	44.0	39.0		$v=36'.9$	
				10	$5400'+v'$	3.73535
15	43.0	55.0	49.0		5400 (ar. co.)	6.26761
Mean $v=10.0$					$1+\frac{h}{f}$	0.00296

[Date, January 1, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; 18^m 40^s fast; daily rate, 3^s. gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	4 28 47	−12	18	58	
8	29 50				
16	30 52				
24	31 54				
32	32 56.5				
40	33 58.5	−12	27	53	
80	4 39 09.5	−12	27	47	10 22.5
88	40 12.0				22.0
96	41 14.5				22.5
104	42 17.0				23.0
112	43 19.0				22.5
120	44 21.0	−12	29	45	22.5
	Means	−12	....	....	10 22.50

Computation.

		s
Observed time of 80 oscillations		622.50
Time of one oscillation		7.7813
Correction for rate		−0.0003
	$T'=$	7.7810
		Log'ms.
	T'	0.89104
$t'-t=-0°.5$	T'^2	1.78207
	$1+\frac{h}{f}$	0.00326
	$1-(t'-t)q$	0.00018
	T^2	1.78541
	(ar. co.) T^2	8.21459
	π^2	0.99430
$m\,H=\frac{\pi^2 M}{T^2}$	M	9.94253
	$m\,H$	9.15142
$m=0.0730$	m	8.86306
$H=1.942$	H	0.28836

Observations of deflections: Date, January 1; hour, 4 02.5 a. m. Temp. $t=$ ......

$\frac{m}{H}$	8.57471
$m\,H$	9.15142
m^2	7.72613
m	8.86306

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	29	45	37.0			
				13.0		
105	45	55	50.0			
				21.5		
285	18	39	28.5		$v=40'.6$	
				9.5	$5400'+v'$	3.73565
15	36	40	38.0		5400 (ar. co.)	6.26761
Mean $v=11.0$					$1+\frac{h}{f}$	0.00326

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, January 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; fast 18ᵐ 50ˢ; daily rate, 1ˢ.75, losing on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h. m. s.	Temp. t'	Extreme scale readings.		Time of 80 oscillations. m. s.
0	6 51 32.5	−30.0	15.4	59	
8	52 34				
16	53 36				
24	54 38				
32	55 40				
40	56 41.5	−30.0	25	51	
80	7 01 51	−30.0	28	47	10 18.5
88	02 53				19.0
96	03 55				19.0
104	04 57				19.0
112	05 59				19.0
120	07 00.5	−30.0	30.5	47	19.0
	Means	−30.0	....	....	10 18.92

Computation.

		s.
Observed time of 80 oscillations		618.92
Time of one oscillation		7.7365
Correction for rate		+0.0002
	$T'=$	7.7367
		Log'ms.
	T'	0.88856
$t'-t=0^\circ.0$	T'^2	1.77711
	$1+\frac{h}{f}$	0.00326
	$1-(t'-t)\,q$	0.00000
	T^2	1.78037
$mH=\frac{\pi^2 M}{T^2}$	(ar. co.) T^2	8.21963
	π^2	0.99430
	M	9.94242
	mH	9.15635
$m=0.0738$	m	8.86804
$H=1.942$	H	0.28831

Observations of deflections: Date, January 14; hour, 6 27.5 a. m. Temp. $t=-39^\circ$.

$\frac{m}{H}$	8.57974
mH	9.15635
m^2	7.73609
m	8.86804

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	30.5	47	38.75			
				10.40		
105	27.3	71	49.15			
				22.65		
285	17.0	36	26.50		$v=40'.7$	
				11.05	$5400'+v'$	3.73565
15	33.0	42.1	37.55		5400 (ar. co.)	6.26761
Mean $v=$ 11.03					$1+\frac{h}{f}$	0.00326

[Date, January 31, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; 19ᵐ 07ˢ fast; daily rate, 3ˢ.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h. m. s.	Temp. t'	Extreme scale readings.		Time of 80 oscillations. m. s.
0	4 36 55	−30.0	17.0	45.0	
8	37 58.4				
16	39 01.0				
24	40 03.8				
32	41 06.5				
40	42 09.0	−30.0	21.0	38.5	
80	4 47 23.0	−30.0	26.0	36.0	10 28.0
88	48 26.3				27.9
96	49 29.0				28.0
104	50 31.5				27.7
112	51 33.8				27.3
120	52 36.0	−30.0	27.2	35.2	27.0
	Means	−30.0	....	....	10 27.65

Computation.

		s.
Observed time of 80 oscillations		627.65
Time of one oscillation		7.8456
Correction for rate		−0.0003
	$T'=$	7.8453
		Log'ms.
$t'-t=0^\circ.0$	T'	0.89461
	T'^2	1.78922
	$1+\frac{h}{f}$	0.00321
	$1-(t'-t)\,q$	0.00000
	T^2	1.79243
$mH=\frac{\pi^2 M}{T^2}$	(ar. co.) T^2	8.20757
	π^2	0.99430
	M	9.94242
	mH	9.14429
$m=0.0731$	m	8.86390
$H=1.907$	H	0.28039

Observations of deflections: Date, January 31; hour, 4ʰ 17ᵐ a. m.; Temp. $t=-30^\circ$.

$\frac{m}{H}$	8.58352
mH	9.14429
m^2	7.72781
m	8.86390

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	27.2	35.2	31.2			
				12.3		
105	31.0	56.0	43.5			
				21.0		
285	15.0	30.0	22.5		$v=40'.0$	
				10.0	$5400'+v'$	3.73560
15	30.0	35.0	32.5		5400 (ar. co.)	6.26761
Mean $v=$ 10.83					$1+\frac{h}{f}$	0.00321

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, February 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; fast $19^m\ 31^s$; daily rate, $8^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'	Extreme scale readings.		Time of 80 oscillations. m.	s.
0	4	46	46	− 6.0	01	75		
8		47	49.5					
16		48	53.0					
24		49	56.0					
32		50	59.0					
40		52	02.5	− 6.0	11	67		
80	4	57	18.5	− 6.0	18.5	60	10	32.5
88		58	21.5					32.0
96		59	25.0					32.0
104	5	00	28.0					32.0
112		01	31.0					32.0
120		02	34.5	− 6.0	20.2	52.2		32.0
			Means	− 6.0			10	32.08

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	20.2	50.2	35.2	
				11.3
105	43.0	50.0	46.5	
				18.6
285	16.0	39.8	27.9	
				10.6
15	29.0	48.0	38.5	
Mean v=10.13				

Value of one scale-division = 3′.69	Logarithms.
v=37′.4	
5400′+v'	3.73539
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00300

Computation.

	s.
Observed time of 80 oscillations	632.08
Time of one oscillation	7.9010
Correction for rate	−0.0003
T'=	7.9007

$t'-t=+2°.0$

	Log'ms.
T'	0.89767−
T'^2	1.79533
$1+\frac{h}{f}$	0.00300
$1-(t'-t)\,q$	9.99926
T^2	1.79759
(ar. co.) T^2	8.20241
π^2	0.99430
M	9.94255
mH	0.13926
m	8.85186
H	0.28740

$$mH=\frac{\pi^2 M}{T^2}$$

m=0.0711

H=1.938

Observations of deflections: Date, February 14; hour, $4^h\ 20^m$ a. m.; Temp. t=−8°.

$\frac{m}{H}$	8.56445
mH	9.13926
m^2	7.70371
m	8.85186

[Date, February 28, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,}$. Mass ring not used. Chronometer, Bond No. 188; fast 20^m; daily rate, $3^s.5$, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'.	Extreme scale readings.		Time of 80 oscillations. m.	s.
0	4	44	23.0	−13.0	1.0	56.0		
8		45	25.5					
16		46	28.5					
24		47	30.5					
32		48	33.0					
40		49	36.0	−13.0	1.0	47.0		
80	4	54	48.0	−13.0	7.0	42.0	10	25.0
88		55	50.5					25.0
96		56	53.0					24.5
104		57	55.5					25.0
112		58	58.0					25.0
120	5	00	00.5	−13.0	11.5	42.0		24.5
			Means	−13.0			10	24.83

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.
15	11.5	42.0	26.75	
				3.75
105	12.0	34.0	23.0	
				12.00
285	02.0	20.0	11.0	
				12.75
15	16.5	31.0	23.75	
Mean v = 7.13				

Value of one scale-division = 3′.69	Logarithms.
v = 26′.3	
5400′ + v'	3.73450
5400 (ar. co.)	6.26761
$1+\frac{h}{f}$	0.00211

Computation.

	s.
Observed time of 80 oscillations	624.83
Time of one oscillation	7.8104
Correction for rate	−0.0003
T'=	7.8101

$t'-t=+0°.5$

	Log'ms.
T'	0.89266−
T'^2	1.78531
$1+\frac{h}{f}$	0.00211
$1-(t'-t)q$	9.99982
T^2	1.78724
(ar. co.) T^2	8.21276
π^2	0.99430
M	9.94252
mH	9.14958
m	8.86044
H	0.28914

$$mH=\frac{\pi^2 M}{T^2}$$

m = 0.0725

H = 1.946

Observations of deflections: Date, February 28; hour, 4.15 a. m. Temp. t= −13°.5

$\frac{m}{H}$	8.57129
mH	9.14958
m^2	7.72087
m	8.86044

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, March 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{\prime\prime\prime}$. Mass ring not used. Chronometer, Bond No. 188; fast 20m 41s.5; daily rate, 1s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	5 16 37.0	−8.0	22.0	43.0	
8	17 39.0				
16	18 41.5				
24	19 45.0				
32	20 48.0				
40	21 51.5	−8.0	26.5	38.0	
80	5 27 06.5	−8.0	35.0	28.0	10 29.5
88	28 09.0				30.0
96	29 12.0				30.5
104	30 14.5				29.5
112	31 17.0				29.0
120	32 19.5	−8.0	30.0	35.0	28.0
	Means	−8.0	....	....	10 29.42

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
15	30	35.0	32.5			
				6.0		
105	34	43.0	38.5			
				15.0		
285	14	33.0	23.5		$v = 27'.9$	
				9.25	$5400' + v'$	3.73463
15	29	36.5	32.75		5400 (ar. co.)	6.26761
Mean $v = 7.56$					$1 + \frac{h}{f}$	0.00224

Computation.

	s.
Observed time of 80 oscillations	629.42
Time of one oscillation	7.8678
Correction for rate	−0.0001
T'	7.8677

		Log'ms.
	T'	0.89585
	T'^2	1.79170
	$1 + \frac{h}{f}$	0.00224
$t' - t = -5^\circ.0$	$1 - (t' - t)q$	0.00184
	T^2	1.79578
	(ar. co.) T^2	8.20422
	π^2	0.99430
$mH = \frac{\pi^2 M}{T^2}$	M	9.94258
	mH	9.14110
$m = 0.0725$	m	8.86015
$H = 1.910$	H	0.28095

Observations of deflections: Date, March 14; hour, 4.55 a. m. Temp. $t = -3^\circ.6$

$\frac{m}{h}$	8.57920
mH	9.14110
m^2	7.72030
m	8.86015

[Date, March 31, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, $L_{\prime\prime\prime}$. Mass ring not used. Chronometer, Bond No. 188; fast, 21m 32s; daily rate, 5s gaining on mean time. Observer, J. C. Maxfield.]

No. of oscillations.	Chronometer time.	Temp. t'.	Extreme scale readings.		Time of 100 oscillations
	h. m. s.				m. s.
0	4 45 28.5	21.5	13.0	45.4	
10	46 48.5				
20	48 07.5				
31	49 33.0				
41	50 52.5				
51	52 12.0	21.0	18.0	41.0	
100	58 44.0	20.5	24.0	40.0	13 15.5
110	5 00 03.5				15.0
120	01 23.0				15.5
131	02 49.5				16.5
141	04 09.0				16.5
151	05 28.5	20.0	29.8	39.4	16.5
	Means	20.75	....	....	13 15.92

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithm.
133	29.4	38.8	34.1			
				5.9		
223	37.6	42.4	40.0			
				10.4		
43	22.8	36.4	29.6		$v = 19'.7$	
				5.0	$5400' + v'$	3.73398
133	15.1	54.1	34.6		5400 (ar. co.)	6.26761
Mean $v = 5.33$					$1 + \frac{h}{f}$	0.00159

Computation.

	s.
Observed time of 100 oscillations	795.92
Time of one oscillation	7.9592
Correction for rate	−0.0005
$T =$	7.9587

		Log'ms.
$t' - t = -5^\circ.25$	T	0.90084
	T^2	1.80168
	$1 + \frac{h}{f}$	0.00159
	$1 - (t' - t)q$	0.00194
	T^2	1.80521
	(ar. co.) T^2	8.19618
	π^2	0.99430
$mH = \frac{\pi^2 M}{T^2}$	M	9.94276
	mH	9.13463
$m = 0.0701$	m	8.84566
$H = 1.945$	H	0.28897

Observations of deflections: Date, March 31; hour, 3.57 a. m., by Bond No. 188. Temp. $t = 26$

$\frac{m}{H}$	8.55670
mH	9.13463
m^2	7.69133
m	8.84566

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, April 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,,,. Mass ring not used. Chronometer, Bond No. 188; fast, 22^m 20^s; daily rate, 5^s.25, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.			Temp. t'.	Extreme scale readings.		Time of 80 oscillations.	
	h.	*m.*	*s.*				*m.*	*s.*
0	4	51	57.0	23.0	29.8	50.0		
8		53	01.0					
16		54	05.0					
24		55	09.0					
32		56	12.5					
40		57	16.0	22.0	34.0	48.5		
80	5	02	36.0	22.0	36.0	48.0	10	39
88		03	40.0					39
96		04	44.0					39
104		05	48.0					39
112		06	52.5					40
120		07	57.0	21.0	38.2	47.0		41
			Means	22.0	....	....	10	39.50

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
249	38.2	47.0	42.60			
				1.55		
159	38.0	44.1	41.05			
				3.00		
339	41.3	46.8	44.05		$v = 4'.8$	
				0.65	$5490' + v'$	3.73278
249	41.8	45.0	43.40		5400 (ar. co.)	6.26761
Mean $v = 1.30$					$1+\frac{h}{f}$	0.00039

Computation.

	s.
Observed time of 80 oscillations...........	639.50
Time of one oscillation.....................	7.9938
Correction for rate.........................	−0.0005
T' =	7.9933

$t'-t=-2°$

$mH=\frac{\pi^2 M}{T^2}$

$m=0.0690$

$H=1.956$

	Log'ms.
T'	0.90273−
T'^2	1.80545
$1+\frac{h}{f}$	0.00039
$1-(t'-t)q$	0.00074
T^2	1.80658
(ar. co.) T^2	8.19342
π^2	0.99430
M	9.94274
mH	9.13046
m	8.83904
H	0.29142

Observations of deflections: Date, April 14; hour, 4.40 a. m., by Bond No. 188. Temp. $t = 24°.0$

$\frac{m}{H}$	8.54763
mH	9.13046
m^2	7.67809
m	8.83904

[Date, April 30, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, L,,,. Mass ring not used. Chronometer, Bond No. 188; fast 23^m 39^s daily rate, gaining 5^s.0 on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.			Temp. t'	Extreme scale readings.		Time of 80 oscillations.	
	h.	*m.*	*s.*				*m.*	*s.*
0	4	52	48.0	26.0	26.0	47.5		
8		53	52.0					
16		54	56.0					
24		56	00.0					
32		57	04.0					
40		58	08.0	26.0	27.5	44		
80	5	03	28.6	29.0	29.0	42.5	10	40.00
88		04	32.0					40.00
96		05	36.0					40.00
104		06	40.0					40.00
112		07	44.0					40.00
120		08	48.0	26.0	30.0	40.8		40.00
			Means	26.0	......	....	10	40.00

Coefficient of torsion. Value of one scale division = 3′.69

Tors. circle.	Scale.		Mean.	Differences.		Logarithms.
185	30.0	40.8	35.4			
				1.85		
95	29.5	37.6	33.55			
				3.85		
275	35.8	39.0	37.4		$v = 6'.8$	
				1.70	$5400' + v'$	3.73294
185	33.2	38.2	35.7		5400 (ar. co.)	6.26761
Mean $v = 1.85$					$1+\frac{h}{f}$	0.00055

Computation.

	s.
Observed time of 80 oscillations............	640.00
Time of one oscillation......................	8.0000
Correction for rate.........................	−0.0005
T' =	7.9995

$t'-t=0.0°$

$mH=\frac{\pi^2 M}{T^2}$

$m=0.0690$

$H=1.956$

	Log'ms.
T'	0.90306+
T'^2	1.80613
$1+\frac{h}{f}$	0.00055
$1-(t'-t)q$	0.00000
T^2	1.80668
(ar. co.) T^2	8.19332
π^2	0.99430
M	9.94276
mH	9.13038
m	8.83908
H	0.29130

Observations of deflections: Date, April 30; hour, 4.35 a. m.; by Bond No. 188. Temp. $t = 26$.

*$\frac{m}{H}$	8.54777
mH	9.13038
m^2	7.67815
m	8.83908

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, May 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, L,,,. Mass ring not used. Chronometer, Bond No. 188, 23m.20s fast, daily rate, 3s.5, losing on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	4 55 15	35.0	12	30	
8	56 19				
16	57 23				
24	58 26				
32	59 30				
40	5 00 33.5	35.0	13	31	
80	5 05 50	35.0	16	25.8	10 35
88	06 53				34
96	07 57				34
104	09 01.5				35.5
112	10 05.5				35.5
120	11 09.0	35.0	19.5	28.2	35.5
	Means	35.0			10 34.92

Coefficient of torsion. Value of one scale division = 3'.69

Tors. circle.	Scale.		Mean.	Differences.		Logarithms.
290	19.0	23.0	21.0			
				0.75		
200	12.0	28.5	20.25			
				2.40		
20	14.0	31.3	22.65		$v=4'.5$	
				1.75	$5400'+v'$	3.73276
290	17.9	23.9	20.9		5400 (ar. co.)	6.26761
Mean $v=1.23$					$1+\frac{h}{f}$	0.00037

Computation.

		s.
Observed time of 80 oscillations		634.92
Time of one oscillation		+7.9365
Correction for rate		+0.0003
	$T'=$	7.9368
		Log'ms.
	T	0.89965–
$t'-t=0.0$	T^2	1.79929
	$1+\frac{h}{f}$	0.00037
	$1-(t'-t)q$	0.00000
	T^2	1.79966
	(ar. co.) T^2	8.20034
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94281
	mH	9.13745
$m=0.697$	m	8.84326
$H=1,969$	H	0.29419

Observations of deflections: Date, May 14; hour, 4.30 a.m.; by Bond No. 188. Temp. $t=35°$.

$\frac{m}{H}$	8.54908
mH	9.13745
m^2	7.68653
m	8.84326

[Date, May 31, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,,,. Mass ring not used. Chronometer, Bond No. 188; fast 23m 43s; daily rate, 3s.5, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	4 42 17.0	39.5	41.3	52.0	
8	43 21.0				
16	44 25.0				
24	45 29.0				
32	46 33.0				
40	47 37.0	39.5	44.0	53.0	
80	53 03.0	40.0	39.0	51.0	10 46.0
88	54 07.0				46.0
96	55 11.0				46.0
104	56 15.5				46.5
112	57 20.0				47.0
120	58 24.5	40.0	40.1	54.2	47.5
	Means	39.75	....	....	10 46.50

Coefficient or torsion. Value of one scale-division = 3'.69

Tors. circle.	Scale.		Mean.	Differences.		Logarithms.
258	40.1	54.2	47.15			
				1.05		
168	44.2	48.0	46.10			
				1.80		
348	44.6	51.2	47.90		$v=3'.8$	
				1.25	$5400'+v'$	3.73270
258	44.0	49.3	46.65		5400 (ar. co.)	6.26761
Mean $v=1.03$					$1+\frac{h}{f}$	0.00031

Computation.

		s.
Observed time of 80 oscillations		646.50
Time of one oscillation		8.0812
Correction for rate		−0.0003
	$T'=$	8.0809
		Log'ms.
$t'-t=1°$	T	0.90746
	T^2	1.81492
	$1+\frac{h}{f}$	0.00031
	$1-(t'-t)q$	0.00037
	T^2	1.81560
	(ar. co.) T^2	8.18440
	π^2	0.99430
$mH=\frac{\pi^2 M}{T^2}$	M	9.94284
	mH	9.12154
$m=0.0682$	m	8.83400
$H=1.939$	H	0.28754

Observations of deflections: Date, May 31; hour, 4.15 a.m.; by Bond, No. 188. Temp. $t=40°.75$

$\frac{m}{H}$	8.54647
mH	9.12154
m^2	7.66801
m	8.83400

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, June 14, 1883. Göttingen time. Instrument, theodolite magnetometer No 11. Magnet $L_{,,,}$. Mass ring not used. Chronometer, Bond No. 188, fast 24^m 21^s.5; daily rate, 1^s.75, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'	Extreme scale readings.		Time of 80 oscillations. m.	s.
0	4	47	10.0	43.0	12.0	36.0		
8		48	14.5					
16		49	19.0					
24		50	24.0					
32		51	29.0					
40		52	34.0	43.0	13.2	33.0		
80	4	57	58.0	43.0	16.5	21.5	10	48.0
88		59	03.0					48.5
96	5	00	07.0					48.0
104		01	12.0					48.0
112		02	17.0					48.0
120		03	21.5	43.0	16.2	27.8		47.5
			Means	43.0			10	48.00

Coefficient of torsion. Value of one scale-division = 3′.69

Tors. circle.	Scale.		Mean.	Differences.		Logarithms.
260	16.2	27.8	22.0	1.8		
170	16.2	24.2	20.2	2.8		
50	18.3	27.7	23.0	0.1	$v = 4'.4$	
260	18.3	27.5	22.9		$5400' + v'$	3.73275
					5400 (ar. co.)	6.26761
Mean v = 1.18					$1 + \frac{h}{f}$	0.00036

Computation.

	s.
Observed time of 80 oscillations	648.00
Time of one oscillation	8.1000
Correction for rate	−0.0002
	T' = 8.0998

		Log'ms.
$t' - t = +1°$	T'	0.90847+
	T'^2	1.81695
	$1 + \frac{h}{f}$	0.00036
	$1 - (t' - t)q$	9.99963
	T^2	1.81694
	(ar. co.) T^2	8.18306
$mH = \frac{\pi^2 M}{T^2}$	π^4	0.99430
	m	9.94285
	mH	9.12021
m = 0.0676	m	8.83002
H = 1.951	H	0.29019

Observations of deflections: Date, June 14; hour, 4.32.5 a.m., by chronometer Bond No. 188. Temp. $t = 42°$.

$\frac{m}{H}$	8.53984
mH	9.12021
m^2	7.66005
m	8.83002

[Date, June 30, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet $L_{,,,}$. Mass ring not used. Chronometer, Bond No. 188; 28^m 53^s slow; daily rate, 4^s.0 gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time. h.	m.	s.	Temp. t'	Extreme scale readings.		Time of 80 oscillations. m.	s.
0	3	50	44.5	52.0	19.7	41.1		
8		51	49.5					
16		52	54.5					
24		53	59.5					
32		55	04.5					
40		56	09.5	52.0	22.5	33.5		
80	3	01	35.5	52.0	19.5	42.0	10	51.0
88		02	40.5					51.0
96		03	45.5					51.0
104		04	50.5					51.0
112		05	56.0					51.5
120		07	01.0	52.0	19.3	41.2		51.5
			Means	52.0	....	....	10	51.17

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3′.69	Logarithms.
40	18.0	43.0	30.5	2.35		
130	20.5	45.2	32.85	4.35		
310	15.0	42.0	28.5	1.90	$v = 7'.9$	
40	19.7	41.1	30.4		$5400' + v'$	3.73303
					5400 (ar. co.)	6.26761
Mean v = 2.15					$1 + \frac{h}{f}$	0.00064

Computation.

	s.
Observed time of 80 oscillations	651.17
Time of one oscillation	8.1396
Correction for rate	−0.0004
	T' = 8.1392

		Log'ms.
	T'	0.91058
	T'^2	1.82116
$t' - t = 1°$	$1 + \frac{h}{f}$	0.00064
	$1 - (t' - t)q$	0.00037
	T^2	1.82217
	(ar. co.) T^2	8.17783
$mH = \frac{\pi^2 M}{T^2}$	π^2	0.99450
	M	9.94292
	mH	9.11505
m = 0.0665	m	8.82302
H = 1.959	H	0.29203

Observations of deflections: Date, June 30; hour, 3^h 25^m a.m., by Bond, No. 188. Temp. $t = 53°.0$

$\frac{m}{H}$	8.53100
mH	9.11505
m^2	7.64605
m	8.82302

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, July 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet L,,. Mass ring not used. Chronometer, Bond No. 188; 28m 07s slow; daily rate, 3s.0, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	4 14 14	53.0	18.0	43.0	
8	15 19.5				
16	16 25.0				
24	17 30.5				
32	18 35.5				
40	19 41	53.0	24.0	41.0	
80	4 25 08	53.0	27.2	41.2	10 54.0
88	26 13.5				54.0
96	27 18.5				53.5
104	28 23.5				53.0
112	29 29.0				53.5
120	30 34.0	53.0	31.0	41.0	53.0
	Means	53.0	....	....	10 53.50

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
120	31.0	41.0	36.0			
				2.1		
210	36.8	39.4	38.1			
				3.6		
30	32.2	36.8	34.5		v=7′.6	
				2.5	5400′+v'	3.73300
120	33.8	40.2	37.0		5400 (ar. co.)	6.26761
Mean v=2.05					$1+\frac{h}{f}$	0.00061

Computation.

Observed time of 80 oscillations	s. 653.50
Time of one oscillation	8.1688
Correction for rate	−0.0003
T'=	8.1685

		Log'ms.
	T'	0.91214
	T'^2	1.82428
$t'-t=0^\circ.0$	$1+\frac{h}{f}$	0.00061
	$1-(t'-t)\,q$	0.00000
	T^2	1.82489
	(ar. co.) T^2	8.17511
$mH=\frac{\pi^2 M}{T^2}$	π^2	0.99430
	M	9.94292
	mH	9.11233
m=0.0675	m	8.82957
H=1.918	H	0.28276

Observations of deflections: Date, July 14; hour, 3h 50m a. m., by Bond, No. 188. Temp. t=53°.0

$\frac{m}{H}$	8.54475
mH	9.11233
m^2	7.65908
m	8.82954

[Date, July 31, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, L,,. Mass ring not used. Chronometer, Bond, No. 188; slow 27m 15.5s; daily rate, 4s.0, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	3 45 38.5	44.0	17.5	47.0	
8	46 43.5				
16	47 48.0				
24	48 52.5				
32	49 57.5				
40	51 02.0	44.0	20.8	43.0	
80	3 56 26.0	44.0	23.5	44.5	10 47.5
88	57 30.5				47.0
96	58 34.5				46.5
104	59 38.5				46.0
112	4 00 43.0				45.5
120	01 47.5	44.0	21.0	34.5	45.5
	Means	44.0	....	....	10 46.33

Coefficient of torsion.					Value of one scale-division = 3′.69	Logarithms.
Tors. circle.	Scale.		Mean.	Differences.		
350	21.0	34.5	27.75			
				3.65		
80	26.4	36.4	31.4			
				3.40		
260	25.0	31.0	28.0		v = 9′.3	
				3.0	5400′ + v'	3.73314
350	28.0	34.0	31.0		5400 (ar. co.)	6.26761
Mean v = 2.51					$1+\frac{h}{f}$	0.00075

Computation.

Observed time of 80 oscillations	s. 646.33
Time of one oscillation	8.0791
Correction for rate	−0.0004
T'=	8.0787

		Log'ms.
	T'	0.90734
	T'^2	1.81468
$t'-t=0^\circ.0$	$1+\frac{h}{f}$	0.00075
	$1-(t'-t)\,q$	0.00000
	T^2	1.81543
	(ar. co.) T^2	8.18457
	π^2	0.99430
	M	9.94286
$mH=\frac{\pi^2 M}{T^2}$	mH	9.12173
m = 0.0681	m	8.83316
H = 1.943	H	0.28857

Observations of deflections; date, July 31; hour, 3.10 a. m., by Bond, No. 188. Temp. t = 44°.0

$\frac{m}{H}$	8.54458
mH	9.12173
m^2	7.66631
m	8.83316

Magnetic observations at Uglaamie, Alaska—Continued.

[Date, August 14, 1883. Göttingen time. Instrument, theodolite magnetometer No. 11. Magnet, $L_{,,}$. Mass ring not used. Chronometer, Bond, No. 188; slow $26^m\ 28^s$; daily rate, 4^s, gaining on mean time. Observer, A. C. Dark.]

No. of oscillations.	Chronometer time.	Temp. t'	Extreme scale readings.		Time of 80 oscillations.
	h. m. s.				m. s.
0	4 17 57.5	47.0	15.0	39.2	
[illegible]	19 02.0				
16	20 06.5				
24	21 11.0				
32	22 15.5				
40	23 20.0	47.0	13.2	41.5	
80	4 28 46.0	47.0	14.3	40.0	10 48.5
88	29 51.5				49.5
96	30 57.0				50.5
104	32 02.0				51.0
112	33 07.0				51.5
120	34 12.0	47.0	17.2	35.3	52.0
	Means	47.0	....	....	10 50.50

Coefficient of torsion.

Tors. circle.	Scale.		Mean.	Differences.	Value of one scale-division = 3'.69	Logarithms.
78	17.2	35.3	20.25			
				0.25		
168	18.8	34.2	26.5			
				3.25		
348	18.5	28.0	23.25		$v = 3'.4$	
				0.15	$5400' + v'$	3.73267
78	17.2	29.0	23.1		5400 (ar. co.)	6.26761
Mean $v = 0.91$					$1 + \frac{h}{f}$	0.00628

Computation.

	s.
Observed time of 80 oscillations............	650.50
Time of one oscillation	8.1313
Correction for rate..........................	−0.0004
$T' =$	8.1309

$t' - t = -0°.5$

	Log'ms.
T'	0.91014
T'^2	1.82028
$1 + \frac{h}{f}$	0.00028
$1 - (t' - t)\,q$	0.00018
T^2	1.82074
(ar. co.) T^2	8.17926
π^2	0.99430
M	9.94288
$m\,H$	9.11644
m	8.82508
H	0.29136

$$m\,H = \frac{\pi^2 M}{T^2}$$

$m = 0.0668$
$H = 1.956$

Observations of deflections; date, August 14; hour, 4.05 a.m., by Bond, No. 188. Temp. $t = 47°.5$

$\frac{m}{H}$	8.53373
$m\,H$	9.11644
m^2	7.65017
m	8.82508

Recapitulation of results for H and m.

Date.	H	m at 62° F.
1881.		
Dec. 17	1.929	
18	1.932	
19	1.934	
	1.932	0.0671
1882.		
Jan. 18	1.925	
19	1.910	
20	1.913	
	1.916	0.0693
Feb. 16	1.979	
17	1.882	
18	1.930	
	1.930	0.0690
Mar. 17	1.931	
18	1.898	
19	1.906	
	1.912	0.0696
Apr. 17	1.962	
18	1.965	
19	1.910	
	1.946	0.0690
May 17	1.9[illegible]5	
18	1.919	
19	1.936	
	1.923	0.0692

Date.	H	m at 62° F.
1882.		
June 17	1.947	
18	1.916	
19	1.946	
	1.936	0.0690
July 18	1.931	
19	1.929	
20	1.920	
	1.924	0.0695
Aug. 17	1.976	
18	1.921	
19	1.946	
	1.948	0.0685
Aug. 31	1.957	
Sept. 14	1.947	
30	1.91[illegible]	
	1.939	0.0685
Oct. 14	1.935	
31	1.938	
	1.936	0.06[illegible]6
Nov. 14	1.982	
30	1.961	
	1.972	0.0682
Dec. 14	1.955	0.0679

Date.	H	m at 62° F.
1883.		
Jan. 1	1.942	
14	1.942	
31	1.907	
	1.930	0.0681
Feb. 14	1.938	
28	1.946	
	1.942	0.0675
Mar. 14	1.910	
31	1.945	
	1.928	0.0683
Apr. 14	1.956	
30	1.956	
	1.956	0.0669
May 14	1.969	
31	1.939	
	1.954	0.0676
June 14	1.951	
20	1.959	
	1.955	0.0662
July 14	1.9[illegible]8	
31	1.943	
	1.930	0.0670
Aug. 14	1.956	0.0660

APPENDIX No. 5.

OBSERVATIONS MADE AT UGLAAMIE, ALASKA, IN 1881, 1882, *AND* 1883 *FOR DETERMINING THE MAGNETIC DIP AND THE MAGNETIC INTENSITY BY MEANS OF THE DIPPING NEEDLE, TOGETHER WITH THE COMPUTATION AND A RECAPITULATION OF RESULTS.*

[Computer, E. H. Courtenay.]

[Date, November 30, 1881. Göttingen time. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 1. Observer, M. Smith. Time of beginning 10^h 15^m p. m.; time of ending, 10^h 47^m p. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 41 42	° ′ 81 21 18	° ′ 81 35 37	° ′ 81 15 17	° ′ 81 27 24	° ′ 81 10 14 12 15	° ′ 81 18 17 19 16	° ′ 81 22 18 21 17	° ′ 81 25 23	° ′ 81 17 15	° ′ 81 18 15	° ′ 81 20 22	° ′ 81 35 38	° ′ 81 14 16	° ′ 81 30 32	° ′ 81 08 10	*Circle N.* Needle N. 11° 45′.5 Needle S. 47.5 *Circle S.* Needle N. 11 42.5 Needle S. 10 42.0
81 41.5	81 19.5	81 36	81 16	81 25.5	81 12.7	81 17.5	81 19.5	81 24	81 16	81 16.5	81 21	81 36.5	81 15	81 31	81 09	
81° 30′.5		81° 26′.0		81° 19′.1		81° 18′.5		81° 20′.0		81° 18′.8		81° 25′.8		81° 20′.0		Mag. mer. 11 29.375
81° 28′.2				81° 18′.8				81° 19′.4				81° 22′.9				
Mean .... 81° 23′.5								Mean .... 81° 21′.1								
Resulting dip, 81° 22′.3																

[Date, December 17, 1881. Göttingen time. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 2. Observer, J. Cassidy.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′ 81 51 47	° ′ 81 40 37	° ′ 81 50 48	° ′ 81 30 27	° ′ 81 23 20	° ′ 81 16 16	° ′ 61 30 28	° ′ 81 25 24	° ′ 81 40 34	° ′ 81 43 35	° ′ 81 18 16	° ′ 81 07 07	° ′ 81 43 40	° ′ 81 28 28	° ′ 81 30 30	° ′ 81 08 07
81 49	81 38.5	81 49	81 28.5	81 21.5	81 16	81 29	81 24.5	81 37	81 39	81 17	81 07	81 41.5	81 28	81 30	81 07.5
81° 43′.7		81° 38′.8		81° 18′.7		81° 26′.8		81° 38′.0		81° 12′.0		81° 34′.7		81° 18′.8	
81° 41′.2				81° 22′.8				81° 25′.0				81° 26′.8			
Mean .... 81° 32′.0								Mean .... 81° 25′.9							
Resulting dip, 81° 28′.9															

[Date, December 18, 1881. Göttingen time. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 1. Observer, J. Murdoch. Time of beginning, 1^h 09^m a. m.; time of ending, 1^h 55^m a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 35 35	° ′ 81 00 07	° ′ 81 47 47	° ′ 81 23 22	° ′ 81 05 06	° ′ 81 04 04	° ′ 81 19 29	° ′ 81 21 29	° ′ 81 25 25	° ′ 81 23 23	° ′ 81 08 03	° ′ 81 26 18	° ′ 81 35 35	° ′ 81 11 13	° ′ 81 35 40	° ′ 81 20 20	*Circle N.* Needle N. Needle S. *Circle S.* Needle N. Needle S.
81 35	81 03 5	81 47	81 22.5	81 05.5	81 04	81 24	81 25	81 25	81 23	81 05.5	81 22	81 35	81 12	81 37.5	81 20	
81° 19′.2		81° 34′.8		81° 04′.7		81° 24′.5		81° 24.′0		81° 13′.8		81° 23′.5		81° 28′.7		Mag. mer. 11° 30′
81° 27′.0				81° 14′.6				81° 18′.9				81° 26′.1				
Mean .... 81° 20′.8								Mean .... 81° 22′.5								
Resulting dip, 81° 21′.7																

[Date, December 19, 1881. Göttengen time. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 2. Observer, J. Cassidy.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
81 31 33	81 14 10	81 47 48	81 20 23	81 21 15	81 21 16	81 30 30	81 40 39	81 13 15	81 18 21	81 18 18	81 19 23	81 41 40	81 18 18	81 41 38	81 19 21
81 32	81 12	81 47.5	81 21.5	81 18	81 18.5	81 30	81 39.5	81 14	81 19.5	81 18	81 21	81 40.5	81 18	81 39.5	81 20
81° 22′.0		81° 34′.5		81° 18′.2		81° 34′.8		81° 16′.7		81° 19′.5		81° 29′.2		81° 29′.8	
81° 28′.3				81° 26′.5				81° 18′.1				81° 29′.5			
Mean......81° 27′.4								Mean......81° 23′.8							
Resulting dip, 81° 25′.6															

[Date, January 18, 1882. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 1. Observer, J. Cassidy. Time of beginning, $1^h\ 10^m$ a. m.; time of ending, $1^h\ 50^m$ a. m. Göttingen time.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
81 47 50	81 23 20	81 31 33	81 12 15	81 10 07	81 20 22	81 17 16	81 23 21	81 35 34	81 29 29	81 14 15	81 17 18	81 55 51	81 30 28	81 35 37	81 15 15
81 48.5	81 21.5	81 32	81 13.5	81 08.5	81 21	81 16.5	81 22	81 34.5	81 29	81 14.5	81 17.5	81 53	81 29	81 36	81 15
81° 35′.0		81° 22′.8		81° 14′.7		81° 19′.3		81° 31′.8		81° 16′.0		81° 41′.0		81° 25′.5	
81° 28′.9				81° 17′.0				81° 23′.9				81° 33′.3			
Mean......81° 22′.9								Mean..... 81° 28′.6							
Resulting dip, 81° 25′.8															

[Date, January 19, 1882. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 2. Observer, J. Cassidy. Time of beginning, $1^h\ 10^m$ a. m.; time of ending, $1^h\ 45^m$ a. m. Göttingen time.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 39 43	81 12 12	81 35 32	81 12 10	81 19 25	81 20 20	81 06 09	81 13 13	81 24 26	81 25 27	81 16 16	81 06 07	81 15 16	81 18 17	81 16 20	81 06 08	Needle N. Needle S.
81 41	81 12	81 33.5	81 11	81 22	81 20	81 07.5	81 13	81 25	81 26	81 16	81 06.5	81 15.5	81 17.5	81 18	81 07	*Circle S.*
81° 26′.5		81° 22′.3		81° 21′		81° 10′.2		81° 25′.5		81° 11′.3		81° 16′.5		81° 12′.5		Needle N. Needle S.
81° 24′.4				81° 15′.6				81° 18′.4				81° 14′.5				Mag. mer. 11° 25′
Mean......81° 20′.0								Mean......81° 16′.4								
Resulting dip, 81° 18′.2																

[Date, January 20, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 10m a. m.; time of ending, 1h 40m a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 27	81 02	81 40	81 20	81 05	81 04	81 30	81 27	81 26	81 17	81 27	81 25	81 50	81 13	81 38	81 22	Needle N.
26	00	42	21	07	04	30	27	23	17	24	25	45	16	41	22	Needle S.
81 26.5	81 01	81 41	81 20.5	81 06	81 04	81 30	81 27	81 24.5	81 17	81.25.5	81 25	81 47.5	81 14.5	81 39.5	81 22.0	*Circle S.*
81° 13′.8		81° 30′.7		81° 05′.0		81° 28′.5		81° 20′.8		81° 25′.2		81° 31′.0		81° 30′.8		Needle N. Needle S.
81° 22′.2				81° 16′.8				81° 23′.0				81° 30′.9				Mag. mer. 11° 25.0
Mean...... 81° 19′.5								Mean...... 81° 26.9								
Resulting dip, 81° 23′.2																

[Date, February 16, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, 1h 10m a. m.; time ending 1h 40m a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 46	81 38	81 40	81 39	81 38	81 27	81 20	81 20	81 22	81 23	81 27	81 18	81 49	81 11	81 40	81 15	Needle N.
47	34	38	43	36	31	15	20	25	24	24	17	53	13	44	17	Needle S.
81 46.5	81 36	81 39	81 41	81 37	81 29	81 17.5	81.20	81 23.5	81 23.5	81 25.5	81 17.5	81 51	81 12	81 42	81 16	*Circle S.*
81° 41′.2		81° 40′.0		81° 33′.0		81° 18′.8		81° 23′.5		81° 21′.5		81° 31′.5		81° 29′.0		Needle N. Needle S.
81° 40′.6				81° 25′.9				81° 22′.5				81° 30′.2				Mag. mer. 32° 10′.0
Mean...... 81° 33′.3								Mean...... 81° 26′.4								
Resulting dip, 81° 29′.8																

[Date, February 17, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 2h 10m a. m.; time of ending, 2h 55m. a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 42	81 22	81 45	81 31	81 10	81 05	81 27	81 28	81 21	81 18	81 17	81 17	81 35	81 17	81 44	81 21	Needle N.
42	23	43	30	09	07	29	29	18	21	21	15	33	21	44	25	Needle S.
81 42	81 22.5	81 44	81 30.5	81 09.5	81 06	81 28	81 28.5	81 19.5	81. 19.5	81 19	81 16	81 34	81 19	81 44	81 23	*Circle S.*
81° 32′.2		81° 37′.3		81° 07′.8		81° 28′.2		81° 19′.5		81° 17′.5		81° 26′.5		81° 33′.5		Needle N. Needle S.
81° 34′.8				81° 18′.0				81° 18′.5				81° 30′.0				Mag. mer. 32° 10′.0
Mean...... 81° 26′.4								Mean...... 81° 24′.2								
Resulting dip, 81° 25′.3																

[Date, February 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 10m; a. m.; time of ending, 1h 45m a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 14	81 24	81 50	81 35	81 42	81 19	81 21	81 22	81 15	81 18	81 23	81 26	81 32	81 10	81 40	81 25	Needle N.
12	21	51	35	41	19	23	23	19	18	25	27	33	10	40	27	Needle S.
81 13	81 22.5	81 50.5	81 35	81 41.5	81 19	81 22	81 22.5	81 17	81 18	81 24	81 26.5	81 32.5	81 10	81 40	81 26	*Circle S.*
81° 17′.5		81° 42′.7		81° 30′.2		81° 22′.3		81° 17′.5		81° 25′.3		81° 21′.2		81° 33′.0		Needle N. Needle S.
81° 30′.1				81° 26′.3				81° 21′.4				81° 27′.1				Mag. mer. 32° 10′.0
Mean ..... 81° 28′.2								Mean...... 81° 24′.2								
Resulting dip, 81° 26′.2																

[Date, March 17, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 20m a. m. time of ending, 1h 52m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 62	81 32	81 39	81 14	81 23	81 29	81 15	81 18	81 27	81 27	81 09	81 12	81 50	81 21	81 39	81 10	Needle N.
58	30	36	14	27	29	17	18	25	28	08	10	46	24	36	11	Needle S.
81 60	81 31	81 37.5	81 14	81 25	81 29	81 16	81 18	81 26	81 27.5	81 08.5	81 11	81 48	81 22.5	81 37.5	81 10.5	*Circle S.*
81° 45′.5		81° 25′.8		81° 27′.0		81° 17′.0		81° 26′.7		81° 09′.8		81° 35′.2		81° 24′.0		Needle N. Needle S.
81° 35′.6				81° 22′.0				81° 18′.2				81° 29′.6				Mag. mer. 36° 10′.0
Mean ..... 81° 28′.8								Mean...... 81° 23′.9								
Resulting dip, 81° 26′.3																

[Date, March 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, 1h 20m a. m. time of ending, 1h 55m a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 44	81 20	81 40	81 20	81 25	81 23	81 21	81 25	81 36	81 32	81 26	81 25	81 48	81 34	81 30	81 15	Needle N.
43	23	37	20	22	24	21	26	35	32	26	24	51	34	34	16	Needle S.
81. 43.5	81 21.5	81 38.5	81. 20	81 23.5	81 23.5	81 21	81 25.5	81 35.5	81 32	81 26	81 24.5	81 49.5	81 34	81 32	81 15.5	*Circle S.*
81° 32′.5		81° 29′.3		81° 23′.5		81° 23′.3		81° 33′.7		81° 25′.2		81° 41′.7		81° 23′.8		Needle N. Needle S.
81° 30′.9				81° 23′.4				81° 29′.5				81° 32′.7				Mag. mer. 32° 10′.0
Mean...... 81° 27′.1								Mean...... 81° 31′.1								
Resulting dip, 81° 29′.1																

[Date, March 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, $1^h 15^m$ a. m.; time of ending, $1^h 50^m$ a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 33 34	° ′ 81 10 09	° ′ 81 54 51	° ′ 81 30 29	° ′ 81 17 13	° ′ 81 18 14	° ′ 81 35 36	° ′ 81 34 36	° ′ 81 22 24	° ′ 81 20 20	° ′ 81 22 23	° ′ 81 20 23	° ′ 81 40 40	° ′ 81 21 19	° ′ 81 42 45	° ′ 81 23 22	*Circle N.* Needle N. Needle S.
81 33.5	81 09.5	81 52.5	81 29.5	81 15	81 16	81 35.5	81 35	81 23	81 20	81 22.5	81 21.5	81 40	81 20	81 43.5	81 22.5	*Circle S.*
81° 21′.5		81° 41′.0		81° 15′.5		81° 35′.3		81° 21′.5		81° 22′.0		81° 30′.0		81° 33′.0		Needle N. Needle S.
81° 31′.2				81° 25′.4				81° 21′.7				81° 31′.5				Mag. mer. 32° 10′.0
Mean...... 81° 28′.3								Mean...... 81° 26′.6								
Resulting dip, 81° 27′.5																

[Date, April 17, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, $2^h 12^m$ a. m.; time of ending, $2^h 40^m$ a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 15 15	° ′ 80 58 59	° ′ 81 22 22	° ′ 81 00 80 58	° ′ 80 58 58	° ′ 81 05 06	° ′ 81 08 09	° ′ 81 00 02	° ′ 81 20 22	° ′ 81 15 16	° ′ 81 04 05	° ′ 80 58 81 00	° ′ 81 37 36	° ′ 81 37 38	° ′ 81 24 24	° ′ 81 15 16	*Circle N.* Needle N. Needle S.
81 15	80 58.5	81 22	80 59	80 58	81 05.5	81 08.5	81 01	81 21	81 15.5	81 04.5	80 59	81 36.5	81 37.5	81 24	81 15.5	*Circle S.*
81° 06′.8		81° 10′.5		81° 01′.8		81° 04′.7		81° 18′.3		81° 01′.7		81° 37′.0		81° 19′.8		Needle N. Needle S
81° 08′.6				81° 03′.3				81° 10′.0				81° 28′.4				Mag. mer. 32° 10′.0
Mean...... 81° 05′.9								Mean...... 81° 19′.2								
Resulting dip, 81° 12′.6																

[Date, April 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, $1^h 15^m$ a. m.; time of ending, $1^h 45^m$ a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 24 25	° ′ 81 04 04	° ′ 81 43 42	° ′ 81 26 24	° ′ 81 43 44	° ′ 81 27 27	° ′ 81 27 27	° ′ 81 24 25	° ′ 81 35 37	° ′ 81 42 43	° ′ 81 21 21	° ′ 81 28 27	° ′ 81 45 45	° ′ 81 20 21	° ′ 81 26 28	° ′ 81 09 10	*Circle N.* Needle N. Needle S.
81 24.5	81 04	81 42.5	81 25	81 43.5	81 27	81 27	81 24.5	81 36	81 42.5	81 21	81 27.5	81 45	81 20.5	81 27	81 09.5	*Circle S.*
81° 14′.3		81° 33′.7		81° 35′.2		81° 25′.8		81° 39′.2		81° 24′.3		81° 32′.7		81° 18′.3		Needle N. Needle S.
81° 24′.0				81° 30′.5				81° 31′.7				81° 25′.5				Mag. mer. 32° 10′.0
Mean...... 81° 27′.2								Mean...... 81° 28′.6								
Resulting dip, 81° 27′.9																

[Date, April 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 15m a. m. time of ending, 1h 35m a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
82 10	81 49	81 55	81 33	81 20	81 18	81 32	81 30	81 34	81 27	81 25	81 17	81 50	81 16	81 32	81 08	Needle N.
12	48	50	33	22	18	31	30	36	27	25	16	47	17	31	08	Needle S.
82 11	81 48.5	81 55.5	81 33	81 21	81 18	81 31.5	81 30	81 35	81 27	81 25	81 16.5	81 48.5	81 16.5	81 31.5	81 08	*Circle S.*
81° 59′.7		81° 44′.2		81° 19′.5		81° 30′.7		81° 31′.0		81° 20′.8		81° 32′.5		81° 19′.7		Needle N. Needle S.
81° 52′.0				81° 25′.1				81° 25′.9				81° 26′.1				Mag. mer. 32° 10′.0
Mean...... 81° 38′.6								Mean...... 81° 26′.0								
Resulting dip, 81° 32′.3																

[Date, May 17, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 2h 15m a. m. time of ending, 2h 50m a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 32	81 08	81 37	81 19	81 14	81 13	81 21	81 18	81 24	81 19	81 00	81 00	81 43	81 12	81 28	81 02	Needle N. 37° 46
32	08	40	17	15	14	21	19	21	19	00	03	43	13	27	02	Needle S. 38 48
81 32	81 08	81 38.5	81 18	81 14.5	81 13.5	81 21	81 18.5	81 22.5	81 19.0	81 00	81 01.5	81 43	81 12.5	81 27.5	81 02	*Circle S.*
81° 20′.0		81° 28′.2		81° 14′.0		81° 19′.8		81° 20′.7		81° 00′.8		81° 27′.7		81° 14′.8		Needle N. 34 30 Needle S. 36 22
81° 24′.1				81° 16′.9				81° 10′.8				81° 21′.2				Mag. mer. 36 51.5
Mean...... 81° 20′.5								Mean...... 81° 16′.0								
Resulting dip, 81° 18′.3																

[Date, May 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, 1h 20m a. m. time of ending, 1h 39m a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 30	81 10	81 48	81 26	81 11	81 03	81 27	81 25	81 20	81 16	81 19	81 18	81 38	81 19	81 30	81 04	Needle N.
34	10	47	29	22	03	29	26	20	17	19	19	38	18	30	05	Needle S.
81 32	81 10	81 47.5	81 27.5	81 16.5	81 03	81 28	81 25.5	81 20	81 16.5	81 19	81 18.5	81 38	81 18.5	81 30	81 04.5	*Circle S.*
81° 21′.0		81° 37′.5		81° 09′.8		81° 26′.7		81° 18′.2		81° 18′.8		81° 28′.2		81° 17′.2		Needle N. Needle S.
81° 29′.2				81° 18′.2				81° 18′.5				81° 22′.7				Mag. mer. 36° 51′.0
Mean...... 81° 23′.7								Mean...... 81° 20′.6								
Resulting dip, 81° 22′.																

[Date, May 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 20m a. m.; time of ending, 1h 52m a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 37	81 14	81 52	81 30	81 15	81 11	81 36	81 32	81 24	81 19	81 23	81 20	81 38	81 13	81 37	81 15	Needle N.
39	15	53	30	15	12	36	32	24	20	22	20	39	13	37	15	Needle S.
81 38	81 14.5	81 52.5	81 30	81 15	81 11.5	81 36	81 32	81 24	81 19.5	81 22.5	81 20	81 38.5	81 13	81 37	81 15	*Circle S.*
81° 26′.2		81° 41′.2		81° 13′.2		81° 34′.0		81° 21′.7		81° 21′.3		81° 25′.7		81° 26′.0		Needle N. Needle S.
81° 33′.7				81° 23′.6				81° 21′.5				81° 25′.9				Mag. mer. 36° 51′
Mean...... 81° 28′.7								Mean...... 81° 23′.7								
Resulting dip, 81° 26′.2																

[Date, June 16, 1882, Göttingen time. Station, Uglaamie, Alaska. Observer, A. C. Dark. Dip circle No. 23. Needle No. 1. Time of beginning, 11h 15m p. m.; time of ending, 11h 45m p. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 27	81 07	81 35	81 34	81 25	81 20	81 31	81 22	81 27	81 30	81 20	81 19	81 42	81 22	81 34	81 04	Needle N. 36° 48′
30	12	38	36	27	23	33	23	25	33	17	16	39	19	32	02	Needle S. 37 13
81 28.5	81 09.5	81 36.5	81 35	81 26	81 21.5	81 32	81 22.5	81 26	81 31.5	81 18.5	81 17.5	81 40.5	81 20.5	81 33	81 03	*Circle S.*
81° 19′.0		81° 35′.8		81° 23′.7		81° 27′.3		81° 28′.7		81° 18′.0		81° 30′.5		81° 18′.0		Needle N. 36 40 Needle S. 36 19
81° 27′.4				81° 25′.5				81° 23′.4				81° 24′.2				Mag. mer. 36 45
Mean......81° 26′.4								Mean......81° 23′.8								
Resulting dip, 81° 25′.1																

[Date, June. Station, Uglaamie, Alaska. Observer, A. C. Dark. Dip circle No. 23. Needle No. 3, 4 deflecting.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
59 01	58 31	42 30	41 23	65 40	65 26	68 09	67 39	65 45	65 02	67 04	66 17
00	29	30	24	38	24	06	36	47	04	06	20
59 00.5	58 30	42 30	41 23.5	65 39	65 25	68 07.5	67 37.5	65 46	65 03	67 05	66 18.5
58° 45′.3		41° 56′.7		65° 32′		67° 52′.5		65° 24′.5		66° 41′.7	
				66° 42′.3				66° 03′.1			
κ' = 39° 39′.0				η' = 66° 22′.7							

[Date, June 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, 2ʰ 20ᵐ a. m. time of ending, 2ʰ 40ᵐ a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 35	81 10	81 37	81 08	81 20	81 21	81 12	81 09	81 39	81 34	81 05	81 00	81 47	81 28	81 35	81 20	Needle N.
36	10	38	09	20	22	13	09	39	33	06	00	47	29	35	20	Needle S.
81 35.5	81 10	81 37.5	81 08.5	81. 20	81 21.5	81 12.5	81 09	81 39	81. 33. 5	81 05.5	81 00	81 47	81 28.5	81 35	81 20	*Circle S.*
81° 22′.7		81° 23′.0		81° 20′.7		81° 10′.8		81° 36′.2		81° 02′.8		81° 37′.7		81° 27′.5		Needle N. Needle S.
81° 22′.9				81° 15′.7				81° 19′.5				81° 32′.6				Mag. mer. 36 45
Mean......81° 19′.3								Mean......81° 26′.1								
Resulting dip, 81° 22′.7																

[Date, June 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip. circle No. 23. Needle No. 4, weighted. Time of beginning, 3ʰ 10ᵐ a. m.]

Needle No. 4, weighted.								Needle No. 3, No. 4 deflecting.			
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west. face west.		Circle east, Mic. D, face east.		Circle east, Mic. R, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
67 04	66 24	66 05	65 20	69 48	69 26	66 40	66 17	58 48	59 18	42 04	41 22
04	18	05	21	48	26	41	18	52	22	08	20
67 04	66 21	66 05	65 20.5	69 48	69 26	66 40.5	66 17.5	58 50	59 20	42 06	41 21
66° 42′.5		65° 42′.7		69° 37′.0		66° 29′.0		59° 05′.0		41° 43′.5	
66° 12′.6				68° 03′							
Mean......67° 07′.8								$u' = 39° 35'.7$			

[Date, June 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1ʰ 20ᵐ a. m.; time of ending, 1ʰ 45ᵐ a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*							
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
81 35	81 11	81 42	81 19	81 12	81 14	81 21	81 18	81 19	81 14	81 25	81 23	81 44	81 19	81 45	81 22
35	12	42	18	14	14	22	18	18	15	25	24	44	19	46	22
81 35	81 11.5	81 42	81 18.5	81 13	81 14	81 21.5	81 18	81 18.5	81 14.5	81 25	81 23.5	81 44	81 19	81 45.5	81 22
81° 23′.2		81° 30′.3		81° 13′.5		81° 19′.7		81° 16′.5		81° 24′.3		81° 31′.5		81° 33′.7	
81° 26′.8				81° 16′.6				81° 20′.4				81° 32′.6			
Mean......81° 21′.7								Mean......81° 26′.5							
Resulting dip, 81° 24′.1															

[Date, June 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 4, weighted. Time of beginning, 3h 10m a. m.]

Needle No. 4, weighted.								Needle No. 3, No. 4 deflecting.			
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle east, Mic. D, face east.		Circle east, Mic R, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
66 53	66 08	65 54	65 09	68 32	68 11	65 21	65 00	59 08	59 04	41 45	41 14
53	09	56	08	33	11	23	00	09	05	46	16
66 53	66 08.5	65 55	65 08.5	68 32.5	68 11	65 22	65 00	59 08.5	59 04.5	41 45.5	41 15
66° 30′.7		65° 31′.8		68° 21′.7		65° 11′.0		59° 06′.5		41° 30′.3	
66° 01′.2				66° 46′.4							
Mean...... 66° 23′.8								u′=39° 41′.6			

[Date, July 17, 1882. Station, Uglaamie, Alaska. Dip circle No. 23. Needle No. 2. Time of beginning, 1h 10m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 23	81 07	81 36	81 15	81 00	81 02	81 23	81 24	81 17	81 19	81 14	81 05	81 26	81 07	81 35	81 13	Needle N.
22	08	38	15	02	03	25	22	18	19	15	04	27	07	36	14	Needle S.
81 22.5	81 07.5	81 37	81 15	81 01	81 02.5	81 24	81 23	81 17.5	81 19	81 14.5	81 04.5	81 26.5	81 07	81 35.5	81 13.5	*Circle S.*
81° 15′.0		81° 26′.0		81° 01′.7		81° 23′.5		81° 18′.2		81° 09′.5		81° 16′.7		81° 24′.5		Needle N. Needle S.
81° 20′.5				81° 12′.6				81° 13′.9				81° 20′.6				Mag. mer. 36° 45′.
Mean...... 81° 16′.6								Mean...... 81° 17′.2								
Resulting dip, 81° 16′.9																

[Date, July 17, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Time of ending, 1h 50m a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
60 37	60 18	40 02	41 16	66 15	65 32	66 35	65 50	67 02	66 18	66 45	66 00
38	20	03	18	16	32	37	51	01	18	45	00
60 37.5	60 19	40 02.5	41 17	66 15.5	65 32	66 36	65 50.5	67 01.5	66 18	66 45	66 00
60° 28′.2		40° 39′.8		65° 53′.7		66° 13′.3		66° 39′.7		66° 22′.5	
				66° 03′.5				66° 31′.1			
u′=[illegible]° 20′.0				Mean...... 66° 17′.3							

[Date, July 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, $1^h 18^m$ a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 42 42	81 17 16	81 37 36	81 10 12	81 26 26	81 19 18	81 10 11	81 08 09	81 25 25	81 23 22	81 20 21	81 15 15	81 38 37	81 32 82	81 21 20	81 05 05	Needle N. Needle S.
81 42	81 16.5	81 36.5	81 11	81 26	81 18.5	81 10.5	81 08.5	81 25	81 22.5	81 20.5	81 15	81 37.5	81 32	81 20.5	81 05	*Circle S.*
81° 29′.3		81° 23′.7		81° 22′.2		81° 09′.5		81° 23′.7		81° 17′.7		81° 34′.7		81° 12′.7		Needle N. Needle S.
81° 26′.5				81 15.9				81° 20′.7				81 23.7				Mag. mer. 36° 45′
Mean......81° 21′.2								Mean......81° 22′.2								
Resulting dip, 81° 21′.7																

[Date, July 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No 23.

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. B, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
60 45 46	61 11 11	41 49 48	41 13 14	67 05 05	66 22 21	66 11 12	65 30 32	66 05 07	65 48 48	65 20 22	65 04 04
60 45.5	61 11	41 48.5	41 13.5	67 05	66 21.5	66 11.5	65 31	66 06	65 48	65 21	65 04
60° 58′.2		41° 31′.0		66° 43′.2		65° 51′.2		65° 57′.0		65° 12′.5	
				66° 17′.2				65° 34′.8			
u' = 38° 45′.4				Mean......65° 56′.0							

[Date, July 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, $1^h 26^m$]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 48 47	81 22 22	81 48 48	81 25 26	81 19 19	81 23 22	81 23 23	81 17 18	81 32 32	81 28 28	81 11 12	81 08 08	81 48 47	81 26 26	81 32 31	81 08 06	Needle N. Needle S.
81 47.5	81 22	81 48	81 25.5	81 19	81 22.5	81 23	81 17.5	81 32	81 28	81 11.5	81 08	81 47.5	81 26	81 31.5	81 07	*Circle S.*
81° 34′.7		81° 36′.7		81° 20′.7		81° 20′.3		81° 30′.0		81° 09′.8		81° 36′.7		81° 19′.3		Needle N. Needle S.
81° 35′.7				81° 20′.5				81° 19′.9				81° 28′.0				Mag. mer. 35° 45′.0
Mean...... 81° 28′.1								Mean...... 81° 23′.9								
Resulting dip, 81° 26′.0																

[Date, July 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Time of ending, 1h 50m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
60 45	60 22	42 48	41 42	67 00	66 16	65 48	65 08	66 26	66 04	65 24	65 14
45	23	47	42	00	15	49	08	27	05	24	15
60 45	60 22.5	42 47.5	41 42	67 00	66 15.5	65 48.5	65 08	66 26.5	66 04.5	65 24	65 14.5
60° 33′.7		42° 14′.8		66° 37′.7		65° 28′.3		65° 15′.5		65° 19′.3	
				66° 03′.0				65° 47′.4			
u′ = 38° 35′.7				Mean...... 65° 55′.2							

[Date, August 17, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 15m a. m.; time of ending, 1h 40m a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.	
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.			
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.		
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*	
81 28	81 04	81 51	81 25	81 07	81 07	81 32	81 29	81 24	81 16	81 12	81 15	81 45	81 18	81 35	81 11	Needle N.	
29	04	51	24	09	08	32	30	24	17	14	16	45	18	36	11	Needle S.	
81 28.5	81 04	81 51	81 24.5	81 08	81 07.5	81 32	81 29.5	81 24	81 16.5	81 13	81 15.5	81 45	81 18	81 35.5	81 11	*Circle S.*	
81° 16′.2		81° 37′.8		81° 07′.8		81° 30′.7		81° 20′.2		81° 14′.2		81° 31′.5		81° 23′.3		Needle N. Needle S.	
81° 27′.0				81° 19′.2				81° 17′.2				81° 27′.4				Mag. mer.	68° 51′
Mean ..... 81° 23′.1								Mean...... 81° 22′.3									
Resulting dip, 81° 22′.7																	

[Date, August 17, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.	
Circle east, Mic. D, face east.		Circle east, Mic. R, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.			
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.		
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*	
58 58	59 15	42 45	41 35	65 26	65 08	65 59	65 32	65 52	65 10	65 15	65 30	Needle N.	
58	17	46	35	26	07	59	33	54	12	16	30	Needle S.	
58 58	59 16	42 45.5	41.35	65 26	65 07.5	65 59	65 32.5	65 53	65 11	65 15.5	65.30	*Circle S.*	
59° 07′.0		42° 10′.2		65° 16′.7		65° 45′.7		65° 32′.0		65° 22′.8		Needle N. Needle S.	
				65° 31′.2				65° 27′.4				Mag. mer.	68° 51′
u′ = 39° 21′.4				Mean...... 65° 29′.3									

[Date, August 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 2. Time of beginning, 1h 12m a. m.; time of ending, 1h 35m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 28	81 10	81 51	81 28	81 10	81 05	81 29	81 25	81 08	81 03	81 19	81 14	81 45	81 24	81 49	81 23	Needle N.
28	12	51	29	10	06	30	25	08	03	20	16	45	24	49	24	Needle S.
81 28	81 11	81 51	81 28.5	81 10	81 05.5	81 29.5	81 25	81 08	81 03	81 19.5	81 15	81 45	81 24	81 49	81 23.5	*Circle S.*
81° 19′.5		81° 39′.7		81° 07′.7		81° 27′.3		81° 05′.5		81° 17′.3		81° 34′.5		81° 36′.3		Needle N. Needle S.
81° 29′.6				81° 17′.5				81° 11′.4				81° 35′.4				Mag. mer. 68° 51′.0
Mean...... 81° 23′.6								Mean .... 81° 23′.4								
Resulting dip, 81° 23′.5																

[Date, August 18, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23.]

Needle No. 3, No. 4 deflecting.								Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
59 25	59 08	59 03	59 34	42 35	41 30	42 20	41 05	65 21	65 00	65 53	65 30	65 19	64 39	66 40	65 54
24	06	03	35	35	32	19	05	21	00	52	29	19	40	40	55
59 24.5	59 07	59 03	59 34.5	42 35	41 31	42 19.5	41 05	65 21	65 00	65 52.5	65 29.5	65 19	64 39.5	66.40	65 54.5
59° 15′.7		59° 18′.7		42° 03′.0		41° 42′.2		65° 10′.5		65° 41′.0		65° 29′.2		66° 17′.2	
59° 17′.2				41° 52′.6				65° 25′.7				65° 53′.2			
u′=39° 25′.1								Mean .... 65° 39′.5							

[Date, August 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 10m a. m.; time of ending, 1h 35m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 49	81 25	81 40	81 16	81 13	81 23	81 17	81 13	81 19	81 16	81 09	81 04	81 45	81 21	81 34	81 08	Needle N.
47	26	40	18	13	24	19	14	19	17	09	06	45	22	34	10	Needle S.
81 48	81 25.5	81 40	81 17	81 13	81 23.5	81 18	81 13.5	81 19	81 16.5	81 09	81 05	81 45	81 21.5	81 34	81 09	*Circle S.*
81° 36′.7		81° 28′.5		81° 18′.2		81° 15′.8		81° 17′.7		81° 07′.0		81° 33′.2		81° 21′.5		Needle N. Needle S.
81° 32′.6				81° 17′.0				81° 12′.4				81° 27′.4				Mag. mer. 68° 51′.0
Mean...... 81° 24′.8								Mean...... 81° 19′.9								
Resulting dip, 81° 22′.3																

[Date, August 19, 1882. Station, Uglaamie, Alaska. Observer, J. Cassidy. Dip circle No. 23. Needle No. 3, 4 deflecting.]

Needle No. 3, No. 4 deflecting.								Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, face east.		Circle east, Mic. R, face east.		Circle east, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	′	° ′	° ′
59 30 31	59 50 50	59 23 24	59 00 00	41 56 56	41 05 05	42 22 23	41 15 15	65 16 16	64 54 54	65 34 35	65 14 16	65 35 36	64 56 56	66 43 44	66 02 04
59 30.5	59 50	59 23.5	59 00	41 56	41 05	42 22.5	41 15	65 16	64 54	65 34.5	65 15	65 35.5	64 56	66 43.5	66 03
59° 40′.2		59° 11′.8		41° 30′.5		41° 48′.7		65° 05′.0		65° 24′.8		65° 15′.7		66° 23′.3	
59° 26′.0				41° 39′.6				65° 14′.9				65° 49′.5			
u'=39° 29′.2								Mean...... 65° 32′.2							

[Date, August 31, 1882. Station, Uglaamie, Alaska. Observer, J. E. Maxfield. Dip circle No. 28. Needle No. 1. Time of beginning, 2^h 10^m a. m.; time of ending, 2^h 40^m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 00 02	81 28 30	81 53 51	81 27 26	81 29 27	81 27 25	81 26 24	81 21 19	81 31 29	81 29 26	81 19 16	81 16 14	81 53 54	81 28 28	81 30 31	81 06 08	Needle N. 71° 00′ Needle S. 72 34
81 01	81 29	81 52	81 26.5	81 28	81 26	81 25	81 20	81 30	81 27.5	81 17.5	81 15	81 53.5	81 28	81 30.5	81 07	*Circle S.*
81° 15′.0		81° 39′.2		81° 27′.0		81° 22′.5		81° 28′.7		81° 16′.3		81° 40′.7		81° 18′.7		Needle N. 68 53 Needle S. 69 03
81° 27′.1				81° 24′.7				81° 22′.5				81° 29′.7				Mag. mer. 70 22.5
Mean...... 81° 25′.9								Mean...... 81° 26′.1								
Resulting dip, 81° 26′.0																

[Date, August 31, 1882. Station, Uglaamie, Alaska. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 3^h 10^m a. m.; time of ending, 3^h 35^m a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 09 07	58 42 39	42 43 40	41 30 32	65 10 05	64 55 49	65 32 32	65 12 10	65 36 37	64 52 53	66 20 22	65 27 30	Needle N. Needle S.
59 08	58 40.5	42 41.5	41 31	65 07.5	64 52	65 32	65 11	65 36.5	64 52.5	66 21	65 28.5	*Circle S.*
58° 54′.2		42° 06.5′		64° 59′.7		65° 21′.5		65° 14′.5		65° 54′.7		Needle N. Needle S.
u'=39° 29′.7				65° 10′.6				65° 34′.6				Mag. mer. 70° 22′.5
				Mean...... 65° 22′.6								

[Date, September 14, 1882. Göttingen time. Station, Uglaamie, Alaska. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 17m a. m.; time of ending, 1h 59m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 20 23	81 46 50	81 34 38	81 11 15	81 09 07	81 15 13	81 28 25	81 34 30	81 10 07	81 03 01	81 26 22	81 27 24	81 41 40	81 20 18	81 37 41	81 15 19	Needle N. Needle S.
81 21.5	81 48	81 36	81 13	81 08	81 14	81 26.5	81 32	81 08.5	81 02	81 24	81 25.5	81 40.5	81 19	81 39	81 17	*Circle S.*
81° 34′.8		81° 24′.5		81° 11′		81° 29′.2		81° 05′.0		81° 24′.8		81° 29′.8		81° 28′		Needle N. Needle S.
81° 29′.6				81° 20′.1				81° 15′				81° 28′.9				Mag. mer. 70° 22′.5
Mean...... 81° 24′.9								Mean...... 81° 21′.9								
Resulting dip, 81° 23′.4																

[Date, September 14, 1882. Göttingen time. Station, Uglaamie, Alaska. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting.]

Needle No. 3, No. 4 deflecting.				Needle No. 3, weighted.								
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
59 15 17	59 26 28	42 19 21	42 26 28	65 30 28	65 20 18	67 00 02	66 30 32	65 36 38	64 58 65 00	67 04 06	65 37 39	*Circle N.* Needle N. Needle S.
59 16	59 27	42 20	42 27	65 29	65 19	67 01	66 31	65 37	64 59	67 05	65 38	*Circle S.*
59° 21′.5		42° 23′.5		65° 24′		66° 46′		65° 18′		66° 21′.5		Needle N. Needle S.
				66° 05′				65° 49′.8				Mag. mer. 70° 22′.5
u′=39° 07′.5				Mean...... 65° 57′.4								

[Date, September 30, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 20m a. m.; time of ending, 2h 05m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 33 35	81 07 11	81 24 26	81 02 04	81 12 10	81 22 18	81 05 03	81 28 26	81 08 05	81 32 28	81 06 02	81 17 15	81 52 54	81 13 16	81 28 28	80 50 50	Needle N. 73° 20′ Needle S. 72 51′
81 34	81 09	81 25	81 03	81 11	81 20	81 04	81 27	81 06.5	81 30	81 04	81 16	81 53	81 14.5	81 28	80 50	*Circle S.*
81° 21′.5		81° 14′		81° 15′.5		81° 15′.5		81° 18′.2		81° 10′		81° 33′.8		81° 09′		Needle N. 69 28 Needle S. 69 39
81° 17′.8				81° 15′.5				81° 14′.1				81° 21′.4				Mag. mer. 71 19.5
Mean...... 81° 16′.6								Mean...... 81° 17′.8								
Resulting dip, 81° 17′.2																

[Date, September 30, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle, No. 23. Needle No. 3, 4 deflecting. Time of beginning, 2h 10m a. m.; time of ending, 2h 55m a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	Needle N. Needle S.
61 01 03	60 05 07	42 26 24	42 10 08	65 12 10	65 01 64 59	66 03 01	65 43 41	66 11 13	65 26 28	66 40 42	65 54 52	*Circle S.*
61 02	60 06	42 25	42 09	65 11	65 00	66 02	65 42	66 12	65 27	66 41	65 53	Needle N. Needle S.
60° 34′		42° 17′		65° 05′.5		65° 52′		65° 49′.5		66° 17′		Mag. mer. 71° 19′.5
				65° 28′.8				66° 03′.2				
u′ = 38° 34′.5				Mean...... 65° 46′								

[Date, October 14, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip. circle No. 23. Needle No. 1. Time of beginning, 1h 25m a. m.; time of ending, 2 a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	Needle N. 72° 15′ Needle S. 74 27
81 14 18	80 55 59	81 40 45	81 23 27	81 05 01	81 04 01	81 25 21	81 26 22	81 27 24	81 28 25	81 25 21	81 26 22	81 41 45	81 12 16	81 36 40	81 07 11	*Circle S.*
81 16	80 57	81 42.5	81 25	81 03	81 02.5	81 23	81 24	81 25.5	81 26.5	81 23	81 24	81 43	81 14	81 38	81 09	Needle N. 68 58 Needle S. 69 52
81° 06′.5		81° 33′.8		81° 02′.8		81° 23′.5		81° 26′		81° 23′.5		81° 28′.5		81° 23′.5		Mag. mer. 71° 23′
81° 20′.2				81° 13′.2				81° 24′.8				81° 26′				
Mean...... 81° 16.′7								Mean...... 81° 25′.4								
Resulting dip, 81° 21′																

[Date, October 14, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 2h 10m a. m.: time of ending, 2h 50m a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	Needle N. Needle S.
60 40 44	61 23 27	43 33 37	42 14 18	65 53 50	65 42 38	67 21 17	67 00 66 56	66 28 32	65 45 48	67 13 17	65 56 59	*Circle S.*
60 42	61 25	43 35	42 16	65 51.5	65 40	67 19	66 58	66 30	65 46.5	67 15	65 57.5	Needle N. Needle S.
61° 03′.5		42° 55.5		65° 45′.8		67° 08′.5		66° 08′.2		66° 36′.2		Mag. emr. 71° 28′
				66° 27′.2				66° 22′.2				
u′ = 38° 0′.5				Mean...... 66° 24′.7								

[Date, October 31, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, 2^h 30^m a. m.; time of ending, 3^h 10^m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 41 45	81 06 10	81 50 54	81 11 14	81 17 14	81 22 18	81 21 17	81 28 24	81 26 23	81 35 31	81 10 06	81 17 13	81 56 59	81 18 21	81 30 34	81 01 05	Needle N. 72° 07′ Needle S. 71 21
81 43	81 08	81 52	81 12.5	81 15.5	81 20	81 19	81 26	81 24.5	81 33	81 08	81 15	81 57.5	81 19.5	81 32	81 03	*Circle S.*
81° 25′.5		81° 32′.3		81° 17′.8		81° 22′.5		81° 28′.8		81° 11′.5		81° 38′.5		81° 17′.5		Needle N. 69 47 Needle S. 70 07
81° 28′.9				81° 20′.1				81° 20′.2				81° 28′				Mag. mer. 70° 50′.5
Mean...... 81° 24′.5								Mean...... 81° 24′.1								
Resulting dip, 81° 24′.3																

[Date, October 31, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Time of beginning, 3^h 20^m a. m.; time of ending, 4^h a. m.]

Needle No. 3, 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east; face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
60 54 58	61 15 19	42 14 18	41 34 36	66 05 01	65 54 50	66 49 45	66 34 30	65 53 57	65 02 06	67 06 09	65 05 09	Needle N. Needle S.
60 56	61 17	42 16	41 35	66 03	65 52	66 47	66 32	65 55	65 04	67 07.5	65 07	*Circle S.*
61° 06′.5		41° 55′.5		65° 57′.5		66° 39′.5		65° 29′.5		66° 07′.2		Needle N. Needle S.
				66° 18′.5				65° 48′.4				Mag. mer. 70° 50′.5
u'_0 = 38° 29′				Mean...... 66° 03′.4								

[Date, November 16, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, 1^h 50^m a. m.; time of ending, 2^h 52^m a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 36 38 27 30	81 26 29 80 59 81 01	81 52 55 48 52	81 13 17 11 13	81 06 02 80 59 55	81 10 05 13 11	81 24 21 17 13	81 28 24 35 31	81 06 02 05 02	81 22 18 27 23	81 12 08 14 10	81 21 17 23 19	81 40 44 46 50	81 13 17 10 14	81 40 44 40 44	80 59 81 02 81 05 09	Needle N. 48° 14′ Needle S. 51 13 *Circle S.*
81 32.8	81 13.8	81 51.8	81 13.5	81 00.5	81 09.8	81 18.8	81 29.5	81 03.8	81 22.5	81 11	81 20	81 45	81 13.5	81 42	81 03.8	Needle N. 45 33 Needle S. 51 17
81° 23′.3		81° 32′.6		81° 05′.2		81° 24′.2		81° 13′.2		81° 15′.5		81° 29′.2		81° 22′.9		Mag. mer. 49° 04′
81° 28′				81° 14′.7				81° 14′.4				81° 26′				
Mean...... 81° 21′.3								Mean...... 81° 20′.2								
Resulting dip, 81° 20′.8																

[Date, November 16, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23, Needle No. 3, No. 4 deflecting. Time of beginning, 2h 55m a. m.; time of ending, 4m a. m.]

Needle No. 3, 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 52	59 30	42 15	41 58	66 27	66 11	66 01	66 10	66 02	65 24	67 58	66 34	Needle N.
49	26	11	42 02	23	07	65 57	06	06	27	68 02	38	Needle S.
59 50.5	59 28	42 13	42 00	66 25	66 09	65 59	66 08	66 04	65 25.5	68 00	66 36	*Circle S.*
59° 39′.2		42° 06′.5		66° 17′		66° 03′.5		65° 44′.8		67° 18′		Needle N. Needle S.
				66° 10′.2				66° 31′.4				Mag. mer. 49° 04′
u′ = 39° 07′.2				Mean...... 66° 20′.8								

[Date, November 30, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, 1h 10m a. m.; time of ending, 1h 56m a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 19	81 52	81 04	81 42	81 33	81 10	81 21	81 08	81 40	81 30	81 16	81 06	81 17	82 01	80 59	81 38	Needle N. 50° 01′
23	56	07	46	29	06	17	04	36	26	12	02	21	04	81 03	42	Needle S. 58 28
81 21	81 54	81 05.5	81 44	81 31	81 08	81 19	81 06	81 38	81 28	81 14	81 04	81 19	82 02.5	81 01	81 40	*Circle S.*
81° 37′.5		81° 24′.8		81° 19′.5		81° 12′.5		81° 33′		81° 09′		81° 40′.8		81° 20′.5		Needle N. 51 07 Needle S. 50 12
81° 31′.2				81° 16′				81° 21′				81° 30′.6				Mag. mer. 51° 12′
Mean...... 81° 23′.6								Mean...... 81° 25′.8								
Resulting dip...... 81° 24′.7																

[Date, November 30, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Needle No. 3, 4 deflecting. Time of beginning, 2h 05m a. m.; time of ending, 2h 40m a. m.]

Needle No. 3, 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 31	58 23	42 30	41 48	65 14	65 29	65 02	65 27	65 22	66 05	65 59	66 55	Needle N.
34	27	27	46	11	25	64 58	24	26	09	66 03	58	Needle S.
59 32.5	58 25	42 28.5	41 47	65 12.5	65 27	65 00	65 25.5	65 24	66 07	66 01	66 56.5	*Circle S.*
58° 58′.8		42° 07′.8		65° 19′.8		65° 12′.8		65° 45′.5		66° 28′.8		Needle N. Needle S.
				65° 16′.3				66° 07′.2				Mag. mer. 51° 12′
u′ = 39° 26′.7				Mean...... 65° 41′.8								

[Date, December 14, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, 1^h 02^m a. m.; time of ending, 1^h 58^m a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circles in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 42	81 07	81 54	81 23	81 12	81 11	81 16	81 20	81 19	81 21	81 20	81 14	81 37	81 07	81 43	81 13	Needle N. 15° 02′
46	11	58	27	08	06	12	16	15	16	16	10	41	11	47	17	Needle S. 20 15
81 44	81 09	81 56	81 25	81 10	81 08.5	81 14	81 18	81 17	81 18.5	81 18	81 12	81 39	81 09	81 45	81 15	*Circle S.*
81° 26′.5		81° 40′.5		81° 09′.2		81° 16′		81° 17′.8		81° 15′		81° 24′		81° 30′		Needle N. 14 15 Needle S. 17 33
81° 33′.5				81° 12′.6				81° 16′.4				81° 27′				Mag. mer. 16 46
Mean...... 81° 23′								Mean...... 81° 21′.7								
Resulting dip, 81° 22′.4																

[Date, December 14, 1882. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4, deflecting. Time of beginning, 2^h a. m.; time of ending, 3^h a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.							
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.	
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
58 52	58 51	42 24	41 12	65 54	65 52	66 28	66 13	66 46	65 23	66 57	66 03
48	47	28	16	50	48	24	09	50	27	67 00	07
58 50	58 49	42 26	41 14	65 52	65 50	66 26	66 11	66 48	65 25	66 58.5	66 05
58° 49′.5		41° 50′		65° 51′		66° 18′.5		66° 06′.5		66° 31′.8	
				66° 04′.8				66° 19′.2			
u'=39° 40′.2				Mean...... 66° 12′							

[Date, January 1, 1883. Station, Uglaamie, Alaska. Göttingen time.. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1 Time of beginning, 1^h 20^m a. m.; time of ending, 1^h 55^m a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		Circle in magnetic prime vertical.
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 37	81 09	81 41	81 02	81 12	81 17	81 08	81 20	81 26	81 31	81 08	81 12	81 47	81 18	81 26	81 05	Needle N. 82° 24′
41	13	45	06	08	12	04	16	21	27	04	08	52	23	30	09	Needle S. 83 04
81 39	81 11	81 43	81 04	81 10	81 14.5	81 06	81 18	81 23.5	81.29	81 06	81 10	81 49.5	81 20.5	81 28	81 07	*Circle S.*
81° 25′		81° 23′.5		81° 12′.2		81° 12′		81° 26′.2		81° 08′		81° 35′		81° 17′.5		Needle N. 80 02 Needle S. 77 40
81° 24′.2				81° 12′.1				81° 17′.1				81° 26′.2				Mag. mer. 80 47.5
Mean...... 81° 18′.2								Mean...... 81° 21′.6								
Resulting dip, 81° 19′.9																

[Date, January 1, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 2^h a. m.; time of ending, $2^h 25^m$ p. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 06 02	58 58 54	42 33 36	41 20 24	65 43 39	65 32 28	66 42 38	65 20 16	65 38 42	65 13 17	66 56 67 00	66 01 05	Needle N. ° ′ Needle S.
59 04	58 56	42 34.5	41 22	65 41	65 30	66 40	65 18	65 40	65 15	66 58	66 03	*Circle S.*
59° 00′		41° 58′.2		65° 35′.5		65° 59′		65° 27′.5		66° 30′.5		Needle N. Needle S.
				65° 47′.2				65° 59′				Mag. mer. 80 47.5
u′=39° 30′.9				Mean...... 65° 53′.1								

[Date, January 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, $1^h 25^m$ a. m.; time of ending, $2^h 05^m$.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 33 36	80 51 55	81 56 82 00	81 11 15	81 06 02	81 13 09	81 24 19	81 37 33	81 10 06	81 21 17	81 12 08	81 32 28	81 45 40	81 08 12	81 51 55	81 09 13	Needle N. 20° 00′ Needle S. 23 19
81 34.5	80 53	81 58	81 13	81 04	81 11	81 21.5	81 35	81 08	81 19	81 10	81 30	81 47	81 10	81 53	81 11	*Circle S.*
81° 13′.8		81° 35′.5		81° 07′.5		81° 28′.2		81° 13′.5		81° 20′		81° 28′.5		81° 32′		Needle N. 19 38 Needle S. 17 16
81° 24′.6				81° 17′.8				81° 16′.8				81° 30′.2				Mag. mer. 20 02
Mean...... 81° 21.′2								Mean...... 81° 23′.5								
Resulting dip ......81° 22′.4.																

[Date, January 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, $2^h 10^m$ a. m.; time of ending, $2^h 44^m$ a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
60 19 15	60 16 12	43 42 45	43 24 28	65 44 40	65 30 26	68 32 28	68 30 26	65 36 40	64 52 56	67 17 21	66 24 27	Needle N. ° ′ Needle S.
60 17	60 14	43 43.5	43 26	65 42	65 28	68 30	68 28	65 38	64 54	67 19	66 25.5	*Circle S.*
60° 15′.5		43° 34′.8		65° 35′		68° 29′		65° 15′		66° 52′.2		Needle N. Needle S.
				67° 02′				66° 04′.1				Mag. mer. 20° 02′
u′=38° 04′.8				Mean......66° 33′								

[Date, January 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 1. Time of beginning, $1^h\ 40^m$ a. m.; time of ending, $2^h\ 25^m$ a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 44 48	81 13 18	81 40 44	81 08 12	81 14 09	81 27 23	81 22 18	81 32 27	81 32 28	81 34 30	81 05 01	81 09 05	81 48 52	81 16 21	81 33 37	81 02 06	Needle N. 88° 37′ Needle S. 91 29
81 46	81 15.5	81 42	81 10	81 11.5	81 25	81 20	81 29.5	81 30	81 32	81 03	81 07	81 50	81 18.5	81 35	81 04	*Circle S.*
81° 30′.8		81° 26′		81° 18′.2		81° 24′.8		81° 31′		81° 05′		81° 34′.2		81° 19′.5		Needle N. 87 01 Needle S. 87 33
81° 28′.4				81° 21′.5				81° 18′				81° 26′.8				Mag. mer. 88 40
Mean...... 81° 25′								Mean...... 81° 22′.4								
Resulting dip, 81° 23′.7																

[Date, January 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, S. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, $2^h\ 30^m$ a. m.; time of ending, $2^h\ 57^m$ a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
58 45 41	59 00 58 56	42 27 30	41 10 14	66 56 53	66 08 04	66 52 48	66 48 45	65 12 16	64 38 42	67 18 21	66 26 30	Needle N. ° ′ Needle S.
58 43	58 58	42 28.5	41 12	66 54.5	66 06	66 50	66 40.5	65 14	64 40	67 19.5	66 28	*Circle S.*
58° 50′.5		41° 50′.2		66° 30′.2		66° 48′.2		64° 57′		66° 53′.8		Needle N. Needle S.
				66° 39′.2				65° 55′.4				Mag. mer. 88 40
$u' = 39° 39'.6$				Mean...... 66° 17′.3								

[Date, February 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, $1^h\ 55^m$ a. m.; time of ending, $2^h\ 27^m$ a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 44 50	81 18 25	81 33 39	81 08 15	81 26 19	81 29 23	81 28 21	81 30 23	81 30 23	81 27 20	81 20 14	81 17 10	81 49 56	81 20 27	81 28 35	81 05 12	Needle N. 78° 28 Needle S. 81 48
81 47	81 21.5	81 36	81 11.5	81 22.5	81 26	81 24.5	81 26.5	81 26.5	81 23.5	81 17	81 13.5	81 52.5	81 23.5	81 31.5	81 08.5	*Circle S.*
81° 34′.2		81° 23′.8		81° 24′.2		81° 25′.5		81° 25′		81° 15′.2		81° 38′		81° 20′		Needle N. 77 07 Needle S. 79 41
81° 29′				81° 24′.8				81° 20′.1				81° 29′				Mag. mer. 79 16
Mean...... 81° 26′.9								Mean...... 81° 24′.6								
Resulting dip, 81° 25′.8																

[Date, February 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle Nos. 3, 4 deflecting. Time of beginning, 2^h 32 a. m.; Time of ending, 3^h a. m.]

Needle No. 3, 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 11	58 41	42 30	41 19	66 15	65 47	66 08	66 00	66 01	65 07	66 35	65 30	Needle N. ° ′
07	34	28	21	12	43	06	65 58	03	10	37	33	Needle S.
59 09	58 37.5	42 29	41 20	66 13.5	65 45	66 07	65 59	66 02	65 08.5	66 36	65 31.5	*Circle S.*
58° 53′.2		41° 54′.5		65 59.2		66 03		65 35.2		66 03.8		Needle N. Needle S.
				66 01.1				65 49.5				Mag. mer. 79 16
u′= 39° 36′.2				Mean...... 65 55.3								

[Date, February 28, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 11^h 10^m p. m.; time of ending, 11^h 40^m p. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 45	81 10	81 48	81 11	81 15	81 28	81 24	81 29	81 18	81 24	81 26	81 32	81 38	81 04	81 37	80 59	Needle N. 79° 12′
50	14	52	14	10	19	20	24	14	20	22	28	42	08	41	81 03	Needle S. 82 52
81 47.5	81 12	81 50	81 12.5	81 12.5	81 21	81 22	81 26.5	81 16	81 22	81 24	81 30	81 40	81 06	81 39	81 01	*Circle S.*
81° 29′.8		81° 31′.2		81° 16′.8		81° 24′.2		81° 19′		81° 27′		81° 23′		81° 20′		Needle N. 76 56 Needle S. 81 48
81° 30′.5				81° 20′.5				81° 23′				81° 21′.5				Mag. mer. 80 12
Mean...... 81° 25.′5								Mean...... 81° 22′.2								
Resulting dip, 81° 23′.8																

[Date, February 28, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3. 4, deflecting. Time of beginning, 11^h 43^m p. m.; time of ending, 12^{hm} 07 a. m., March 1.]

Needle No. 3, 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic D, face east.		Circle east, Mic R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 21	59 00	43 56	42 32	66 09	65 54	66 28	66 03	66 42	65 54	65 57	65 18	Needle N.
16	58 55	44 00	35	04	48	22	65 58	47	66 00	66 02	23	Needle S.
59 18.5	58 57.5	43 58	42 33.5	66 06.5	65 51	66 25	66 00.5	66 44.5	65 57	65 59.5	65 20.5	*Circle S.*
59° 08′		43° 15′.8		65° 58′.8		66° 12′.8		66° 20′.8		65° 40′		Needle N. Needle S.
				66° 05′.8				66° 00′.4				Mag. mer. 80 12
u′=38° 48′.1				Mean...... 66° 03′.1								

[Date, March 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No 23 Needle No. 2 Time of beginning, 12h 45m a. m.; time of ending, 1h 20m a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 49	81 20	81 20	80 56	81 24	81 17	81 14	81 24	81 29	81 27	81 25	81 27	81 38	81 23	81 22	80 56	Needle N. 83° 01′
55	28	28	81 02	17	11	08	18	22	20	18	20	45	30	29	81 02	Needle S. 82 06
81 52	81 24	81 24	80 59	81 20.5	81 14	81 11	81 21	81 25.5	81 23.5	81 21.5	81 23.5	81 41.5	81 26.5	81 25.5	80 59	*Circle S.*
81° 38′		81° 11′.5		81° 17′.2		81° 16′		81° 24′.5		81° 22′.5		81° 34′		81° 12′.2		Needle N. 79 04 Needle S. 79 59
81° 24′.8				81° 16′.6				81° 23′.5				81° 23′.1				Mag. mer. 81 02.5
Mean...... 81° 20′.7								Mean...... 81° 23′.3								
Resulting dip, 81° 22′																

[Date, March 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4, deflecting. Time of beginning, 1h 25m a. m.; time of ending, 2h a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, M. D, face east.		Circle east, M. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	Needle N. ° ′
59 30	59 00	42 18	41 40	65 42	65 30	66 32	66 19	66 30	65 46	66 52	65 58	Needle S.
22	58 52	20	42	38	26	28	16	33	50	56	66 02	*Circle S.*
59 26	58 56	42 19	41 41	65 40	65 28	66 30	66 17.5	66 31.5	65 48	66 54	66 00	Needle N. Needle S.
59° 11′		42°		65° 34′		66° 23′.8		66° 09′.8		66° 27′		Mag. mer. 81 02.5
				65° 58′.9				66° 18′.4				
$u' = 39°$ 24′5				Mean...... 66° 08′.6								

[Date, March 25, 1883. Station, Uglamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 9h 40m p. m.; time of ending, 10h 20m p. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 53	81 21	81 41	81 12	81 20	81 18	81 28	81 27	81 36	81 33	81 26	81 25	81 37	81 09	81 45	81 17	Needle N. 74° 16′
58	26	46	16	16	14	24	22	31	29	22	20	42	13	49	22	Needle S. 76 42
81 55.5	81 23.5	81 43.5	81 14	81 18	81 16	81 26	81 24.5	81 33.5	81 31	81 24	81 22.5	81 39.5	81 11	81 47	81 19.5	*Circle S.*
81° 39′.5		81° 28′.8		81° 17′		81° 25′.2		81° 32′.2		81° 23′.2		81° 25′.2		81° 33′.2		Needle N. 76 24 Needle S. 77 22
81° 34′.2				81° 21′.1				81° 27′.7				81° 29′.2				Mag. mer. 76 11
Mean ...... 81° 27′.6								Mean...... 81° 28′.4								
Resulting dip, 81° 28′																

[Date, March 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, $10^h\ 15^m$ p. m.; time of ending, $10^h\ 40^m$ p. m.

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 56	81 43	81 59	81 30	80 52	80 49	81 27	81 25	81 11	81 12	81 25	81 22	81 58	81 29	81 48	81 17	Needle N. 80° 38′
82 00	48	82 03	35	48	45	23	20	07	07	20	18	82 03	34	53	21	Needle S. 82 28
81 58	81 45.5	82 01	81 32.5	80 50	80 47	81 25	81 22.5	81 09	81 09.5	81 22.5	81 20	82 00.5	81 31.5	81 50.5	81 19	*Circle S.*
81° 51′.8		81° 46′.8		80° 48′.5		81° 23′.8		81° 09′.2		81° 21′.2		81° 46′		81° 34′.8		Needle N. 80 44 Needle S. 82 14
81° 49′.3				81° 06′.2				81° 15′.2				81° 40′.4				Mag. mer. 81 31
Mean...... 81° 27′.8								Mean ...... 81° 27′.8								
Resulting dip, 81° 27′.8																

[Date, March 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, $2^h\ 05^m$ a. m.; time of ending, $2^h\ 35^m$ a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face east.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
61 17	61 02	43 09	42 05	65 29	65 17	65 50	65 32	65 32	64 55	66 59	66 02	Needle N. 80° 48′
11	60 56	12	08	25	13	46	28	36	58	67 03	06	Needle S. 81 36
61 14	60 59	43 10 5	42 06.5	65 27	65 15	65 48	65 30	65 34	64 56.5	67 01	66 04	*Circle S.* Needle N. 78 20 Needle S. 79 15
61° 06′.5		42° 38′.5		65° 21′		65° 39′		65° 15′.2		66° 32′.5		Mag. mer. 80 02
				65° 30′				65° 53′.8				
u'=38° 07.5				Mean......65° 41′.9								

[Date, April 14, 1883. Station. Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, $12^h\ 36^m$ a. m.; time of ending, $1^h\ 05^m$ a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 42	81 16	81 41	81 10	81 06	81 04	81 27	81 25	81 02	81 24	81 21	81 28	81 35	81 11	81 47	81 15	Needle N. 76° 41′
48	22	47	16	00	80 58	21	19	80 56	18	14	22	40	16	52	20	Needle S. 81 17
81 45	81 19	81 44	81 13	81 03	81 01	81 24	81 22	80 59	81 21	81 17.5	81 25	81 37.5	81 13.5	81 49.5	81. 17.5	*Circle S.*
81° 32′		81° 28′.5		81° 02′		81° 23′		81° 10′		81° 21′.2		81° 25′.5		81° 33′.5		Needle N. 80 46 Needle S. 76 48
81° 30′.2				81° 12′.5				81° 15′.6				81° 29′.5				Mag. mer. 78 53
Mean......81° 21′.4								Mean......81° 22′.6								
Resulting dip, 81° 22′.0																

[Date, April 24, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 1h 16m a. m.; time of ending, 1h 39m a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 59 16 12	° ′ 58 58 53	° ′ 42 35 39	° ′ 41 23 28	° ′ 66 38 44	° ′ 65 53 58	° ′ 65 53 58	° ′ 65 10 15	° ′ 65 12 06	° ′ 64 47 41	° ′ 65 41 35	° ′ 65 27 22	*Circle N.* Needle N. Needle S.
59 14	58 55.5	42 37	41 25.5	66 41	65 55.5	65 55.5	65 12.5	65 09	64 44	65 38	65 24.5	*Circle S.* Needle N. Needle S.
59° 04′.8		42° 01′.2		66° 18′.2		65° 34′		64° 56′.5		65° 31′.2		
				65° 56′.1				65° 13′.8				Mag. mer. 78 53
u′=39° 27′.0				Mean......65° 35′								

[Date, April 30, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 12h 21m a. m.; time of ending, 1h 19m a. m.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 36 40	° ′ 81 06 11	° ′ 81 49 53	° ′ 81 21 27	° ′ 81 13 07	° ′ 81 09 03	° ′ 81 26 21	° ′ 81 25 19	° ′ 81 27 22	° ′ 81 26 20	° ′ 81 15 09	° ′ 81 17 11	° ′ 81 49 55	° ′ 81 20 25	° ′ 81 34 39	° ′ 81 08 13	*Circle N.* Needle N. 79° 43′ Needle S. 81 50
81 38	81 08.5	81 51	81 24	81 10	81 06	81 23.5	81 22	81 24.5	81 23	81 12	81 14	81 52	81 22.5	81 36.5	81 10.5	*Circle S.* Needle N. 80 54 Needle S. 80 06
81° 23′.2		81° 37′.5		81° 08′		81° 22′.8		81° 23′.8		81° 13′		81° 37′.2		81° 25′.5		
81° 30′.4				81° 15′.4				81° 18′.4				81° 30′.4				Mag. mer. 80 38
Mean...... 81° 22′.9.								Mean..... 81° 24′.4.								
Resulting dip, 81° 23′.6																

[Date, April 30, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 1h 20m a. m.; time of ending, 1h 40m a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 59 37 33	° ′ 59 16 10	° ′ 42 15 18	° ′ 41 14 17	° ′ 66 20 14	° ′ 66 03 65 58	° ′ 66 19 13	° ′ 66 13 07	° ′ 66 23 29	° ′ 65 47 53	° ′ 66 40 45	° ′ 65 51 57	*Circle N.* Needle N. Needle S.
59 35	59 13	42 16.5	41 15.5	66 17	66 00.5	66 16	66 10	66 26	65 50	66 42.5	65 54	*Circle S.* Needle N. Needle S.
59° 24′		41° 46′		66° 08′.8		66° 13′		66° 08′		66° 18′.2		
				66° 10′.9				66° 13′.1				Mag. mer. 80 38
u′=39° 25′				Mean .... 66° 12′								

[Date, May 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 12ʰ 59ᵐ a. m. time of ending, 1ʰ 31ᵐ a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime verticle.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 29 32	° ′ 80 51 53	° ′ 81 51 54	° ′ 81 19 22	° ′ 80 52 48	° ′ 81 09 06	° ′ 81 36 32	° ′ 81 43 40	° ′ 81 15 11	° ′ 81 26 22	° ′ 81 24 21	° ′ 81 35 31	° ′ 81 51 54	° ′ 81 14 17	° ′ 81 41 44	° ′ 81 02 04	*Circle N.* Needle N. 74° 08′ Needle S. 77 39
81 30.5	80 52	81 52.5	81 20.5	80 50	81 07.5	81 34	81 41.5	81 13	81 24	81.22.5	81 33	81 52.5	81 15.5	81 42.5	81 03	*Circle S.*
81° 11′.2		81° 36′.5		80° 58′.8		81° 37′.8		81° 18′.5		81° 27′.8		81° 34′.0		81° 22′.8		Needle N. 77 16 Needle S. 81 04
81° 23′.8				81° 18′.3				81° 23′.2				81° 28′.4				Mag. mer. 77 47
Mean......81° 21′								Mean......81° 25′.8								
Resulting dip, 81° 23′.4																

[Date, May 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 1ʰ 35ᵐ a. m.; time of ending, 1ʰ 56ᵐ a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D. face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 59 22 18	° ′ 58 58 54	° ′ 42 28 30	° ′ 41 36 38	° ′ 65 44 41	° ′ 65 33 29	° ′ 66 23 20	° ′ 66 13 10	° ′ 65 46 49	° ′ 65 10 13	° ′ 66 49 53	° ′ 65 54 57	*Circle N.* Needle N. Needle S.
59 20	58 56	42 29	41 37	65 42.5	65 31	66 21.5	66 11.5	65 47.5	65 11.5	66 51	66 55.5	*Circle S.*
59° 08′		42° 03′		65° 36′.8		66° 16′.5		65° 29′.5		66° 23′.2		Needle N. Needle S.
				65° 56′.6				65° 56′.4				Mag. mer. 77 47
u′=39° 24′.5				Mean......65° 56′.5								

[Date, May 23, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 12ʰ 47ᵐ a. m.; time of ending, 1ʰ 18ᵐ a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east,		Circle west, face west,		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 39 41	° ′ 81 05 08	° ′ 81 40 43	° ′ 81 04 07	° ′ 81 09 05	° ′ 81 15 11	° ′ 81 12 08	° ′ 81 20 17	° ′ 81 38 34	° ′ 81 48 44	° ′ 81 02 80 58	° ′ 81 10 05	° ′ 82 00 03	° ′ 81 21 25	° ′ 81 32 35	° ′ 80 58 81 01	*Circle N.* Needle N. 83° 48′ Needle S. 80 02
81 40	81 06.5	81 41.5	81 05.5	81 07	81 13	81 10	81 18.5	81 36	81 46	81 00	81 07.5	82 01.5	81 23	81 33.5	80 59.5	*Circle S.*
81° 23′.2		81° 23′.5		81° 10′		81° 14.′2		81° 41′		81° 03′.8		81° 42′.2		81° 16.′5		Needle N. 83 59 Needle S. 83 42
81° 23′.4				81° 12.′1				81° 22′.4				81° 29′.4				Mag. mer. 82 58
Mean......81° 17′8								Mean......81° 25′.9								
Resulting dip, 81° 21.′8																

[Date, May 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 12ʰ 58ᵐ a. m.; time of ending, 1ʰ 30ᵐ a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 42 45	° ′ 81 03 07	° ′ 81 47 51	° ′ 81 09 13	° ′ 81 19 15	° ′ 81 28 24	° ′ 81 23 20	° ′ 81 31 27	° ′ 81 14 10	° ′ 81 25 22	° ′ 81 15 11	° ′ 81 28 25	° ′ 82 08 11	° ′ 81 25 29	° ′ 81 55 58	° ′ 81 12 15	*Circle N.* Needle N. 76° 35′ Needle S. 80 41
81 43.5	81 05	81 49	81 11	81 17	81 26	81 21.5	81 29	81 12	81 23.5	81 13	81 26.5	82 09.5	81 27	81 56.5	81 13.5	*Circle S.*
81° 24′.2		81° 30′		81° 21.′5		81° 25′.2		81° 17′.8		81° 19′.8		81° 48′.2		81° 35′		Needle N. 76 40 Needle S. 80 47
81° 27′.1				81° 23.′4				81° 18′.8				81° 41′.6				Mag. mer. 78 41
Mean......81° 25.′2.								Mean......81° 30′.2								
Resulting dip, 81° 27′.7																

[Date, May 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, 1ʰ 32ᵐ a. m.; time of ending, 1ʰ 49ᵐ a. m.]

Needle No. 3, 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 59 32 30	° ′ 59 11 08	° ′ 42 42 45	° ′ 41 38 41	° ′ 65 28 24	° ′ 65 18 14	° ′ 66 07 04	° ′ 65 58 55	° ′ 66 26 30	° ′ 65 32 35	° ′ 67 31 34	° ′ 67 02 06	*Circle N.* Needle N. Needle S.
59 31	59 09.5	42 43.5	41 39.5	65 26	65 16	66 05.5	65 56.5	66 28	65 33.5	67 32.5	67 04	*Circle S.*
59° 20′.2		42° 11′.5		65° 21′		66° 01′		66° 00′.8		67° 18′.2		Needle N. Needle S.
				65° 41′				66° 39′.5				Mag. mer. 78° 41′
u′=39° 14′.2				Mean......66° 10′.2								

[Date, June 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip-circle No. 23. Needle No. 2. Time of beginning, 12ʰ 57ᵐ a. ; m. time of ending, 1ʰ 26ᵐ a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′ 81 40 45	° ′ 81 14 19	° ′ 81 44 48	° ′ 81 18 23	° ′ 81 20 15	° ′ 81 16 11	° ′ 81 21 16	° ′ 81 23 18	° ′ 81 21 16	° ′ 81 18 13	° ′ 81 17 12	° ′ 81 21 15	° ′ 81 53 57	° ′ 81 22 26	° ′ 81 31 35	° ′ 81 05 09	*Circle N.* Needle N. 80° 55′ Needle S. 83 04
81 42.5	81 16.5	81 46	81 20.5	81 17.5	81 13.5	81 18.5	81 20.5	81 18.5	81 15.5	81 14.5	81 18	81 55	81 24	81 33	81 07	*Circle S.*
81° 29′.5		81° 33′.2		81° 15′.5		81° 19′.5		81° 17′		81° 16′.2		81° 39′.5		81° 20′		Needle N. 83 28 Needle S. 84 56
81° 31′.4				81° 17′.5				81° 16′.6				81° 29′.8				Mag. mer. 83 06
Mean......8°. 24′.4								Mean......81° 23′.2								
Resulting dip, 81° 23′.8																

[Date, June 14, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, No. 4 deflecting. Time of beginning, $1^h 28^m$ a. m.; time of ending, $1^h 48^m$ a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
59 46	59 33	42 58	41 50	66 50	66 31	66 10	65 50	66 43	65 42	66 52	66 10	Needle N
43	30	43 00	54	44	26	05	45	49	47	57	16	Needle S.
												Circle S.
59 44.5	59 31.5	42 59	41 52	66 47	66 28.5	66 07.5	65 47.5	66 46	65 44.5	66 54.5	66 13	Needle N.
												Needle S.
59° 38′		42° 25′.5		66° 37′.8		65° 57′.5		66° 15′.2		66° 33′.8		Mag. mer. 83° 06′
				66° 17′.6				66° 24′.5				
u′ = 38° 58′.2				Mean...... 66° 21′								

[Date, June 30, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, $12^h 59^m$ a. m.; time of ending, $1^h 27^m$ a. m.]

Polarity of marked end *A north.*								Polarity of marked end *B north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
81 20	80 54	81 41	81 06	81 09	81 07	81 26	81 25	81 21	81 21	81 19	81 16	81 42	81 14	81 49	81 16	Needle N. 79° 11′
24	58	45	10	05	03	22	21	16	16	14	11	40	18	53	21	Needle S. 82 22
																Circle S.
81 22	80 56	81 43	81 08	81 07	81 05	81 24	81 23	81 18.5	81 18.5	81 16.5	81 13.5	81 44	81 16	81 51	81 18.5	Needle N. 77 29
81° 09′		81° 25′.5		81° 06′		81° 23′.5		81° 18′.5		81° 15′		81° 30′		81° 34′.8		Needle S. 82 09
81° 17′.2				81° 14′.8				81° 16′.8				81° 32′.4				Mag. mer. 80 18
Mean...... 81° 16′								Mean...... 81° 24′.6								
Resulting dip, 81° 20′.3																

[Date, June 30, 1883, Station. Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, 4 deflecting. Time of beginning, $1^h 29^m$ a. m.; time of ending, $1^h 53^m$ a. m.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D. face east.		Circle east, Mic. R. face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	*Circle N.*
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
59 28	50 12	42 21	41 09	65 50	65 29	66 04	65 43	65 43	64 59	66 49	65 59	Needle N.
24	08	24	12	45	24	00	38	47	65 03	54	66 04	Needle S.
												Circle S.
59 26	59 10	42 22.5	41 10.5	65 47.5	65 26.5	66 02	65 40.5	65 45	65 01	66 51.5	66 01.5	Needle N.
												Needle S.
59° 18′		41° 46′.5		65° 37′		65° 51′.2		65° 23′		66° 26′.5		Mag. mer. 80° 18′
				65° 44′.1.				65° 54′.8.				
u′ = 39° 27′.8				Mean...... 65° 49′.4								

[Date, July 14, 1883. Station, Uglaamie, Alaska, Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 12^{h} 59^{m} a. m.; time of ending, 1^{h} 30^{m} a. m.]

Polarity of marked end *B north*.								Polarity of marked end *A north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west. face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
81 31	81 03	81 18	80 55	81 37	81 32	81 33	81 32	81 08	81 04	81 15	81 16	81 53	81 21	81 36	81 09	Needle N. 83° 05′
35	08	22	59	33	28	28	27	03	00	10	12	57	25	40	13	Needle S. 80 24
81 33	81 05.5	81 20	80 57	81 35	81 30	81 30.5	81 20.5	81 05.5	81 02	81 12.5	81 14	81 55	81 23	81 38	81 11	*Circle S.*
81° 19′.2		81° 08′.5		81° 32′.5		81° 30′		81° 03′.8		81° 13′.2		81° 39′		81° 24′.5		Needle N. 84 17 Needle S 82 23
81° 13′.8				81° 31′.2				81° 08′.5				81° 31′.8				Mag. mer. 82 33.5
Mean......81° 22′.5								Mean..... 81° 20′.2								
Resulting dip, 81° 21′.4																

[Date, July 14, 1883. Station, Uglaamie, Alaska, Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 3, No. 4 deflecting. Time of beginning, 1^{h} 35^{m} a. m.; time of ending, 1^{h} 55^{m}.]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S,	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 36	59 17	42 22	41 12	65 08	64 58	65 53	65 40	65 28	64 35	66 37	65 34	Needle N.
33	14	26	16	05	55	49	37	31	38	41	37	Needle S.
59 34.5	59 15.5	42 24	41 14	65 06.5	64 56.5	65 51	65 38.5	65 29.5	64 36.5	66 39	65 35.5	*Circle S.*
59° 25′		41° 49′		65° 01′.5		65° 44′.8		65° 03′		66° 07′.2		Needle N. Needle S.
				65° 23′.2				65° 35′.1				Mag. mer. 82° 33′.5
u′=39° 23′				Mean......65° 29′.2								

[Date, July 31, 1883. Station, Uglaamie, Alaska, Göttingen time. Observer, J. E. Maxfield. Dip circle No. 23. Needle No. 2. Time of beginning, 1^{h} 57^{m} a. m.; time of ending, 2^{h} 17^{m} a. m.]

Polarity of marked end *A north*.								Polarity of marked end *B north*.								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
80 56	80 29	81 10	80 41	80 54	80 52	81 14	81 10	81 09	81 11	81 11	81 10	81 30	81 02	81 17	80 50	Needle N. 80° 53′
81 01	34	14	46	49	47	09	06	04	06	06	05	35	07	22	55	Needle S. 82 22
80 58.5	80 31.5	81 12	80 43.5	80 51.5	80 49.5	81 11.5	81 08	81 06.5	81 08.5	81 08.5	81 07.5	81 32.5	81 04.5	81 19.5	80 52.5	*Circle S.*
80° 45′		80° 57′.8		80° 50′.5		81° 09′.8		81° 07′.5		81° 08′		81° 18′.5		81° 06′		Needle N. 77 24 Needle S. 78 21
80° 51′.4				81° 00′.2				81° 07′.8				81° 12′.2				Mag. mer. 79 45
Mean......80° 55′.8								Mean......81° 10′.0								
Resulting dip, 81° 02′.9																

[Date, July 31, 1883. Station, Uglaamie, Alaska. Göttingen time. Observer, J. E. Maxfield. **Dip circle No. 23. Time of beginning, 2^h 19^m a. m.; time of ending, 2^h 33^m a. m.**]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 47	59 33	42 22	41 24	64 13	63 54	65 27	65 06	65 21	64 35	65 54	65 07	Needle N.
43	29	26	28	09	50	22	01	25	39	59	12	Needle S.
59 45	59 31	42 24	41 26	64 11	63 52	65 24.5	65 03.5	65 23	64 37	65 56.5	65 09.5	*Circle S.*
59° 38′		41° 55′		64° 01′.5		65° 14′		65° 00′		65° 33′		Needle N. Needle S.
				64° 37′.8				65° 16′.5				Mag. mer. 79° 45′
u′=39° 13′.5				Mean......64° 57′.2								

[Date, August 14, 1883. Station, Uglaamie, Alaska. Observer, J. E. Maxfield. **Dip circle No. 23. Needle No. 2. Time of beginning, 1^h 35^m a. m.;** time of ending, 1^h 56^m p. m. Magnetic meridian reads, 78° 20′.]

Polarity of marked end *B north.*								Polarity of marked end *A north.*								Circle in magnetic prime vertical.
Circle east, face east.		Circle east, face west.		Circle west, face east.		Circle west, face west.		Circle west, face west.		Circle west, face east.		Circle east, face west.		Circle east, face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	°	° ′	° ′	*Circle N.*
81 40	81 09	81 40	81 15	81 31	81 23	81 32	81 36	81 37	81 37	81 20	81 21	81 59	81 28	81 45	81 20	Needle N. 78° 33′
45	14	44	20	26	18	28	31	32	32	15	16	82 03	32	50	24	Needle S. 09
81 42.5	81 11.5	81 42	81 17.5	81 28.5	81 20.5	81 30	81 33.5	81 34.5	81 34.5	81 17.5	81 18.5	82 01	81 30	81 47.5	81 22	*Circle S.*
81° 27′		81° 29′.8		81° 24′.5		81° 31′.8		81° 34′.5		81° 18′.0		81° 45′.5		81° 34′.8		Needle N. 32 Needle S. 06
81° 28′.4				81° 28′.2				81° 26′.2				81° 40′.2				Mag. mer. 78 20
Mean......81° 28′.3								81° 33′.2								
Resulting dip, 81° 30′.8																

[Date, August 14, 1883. Station, Uglaamie, Alaska. Observer, J. E. Maxfield. **Dip circle No. 23. Time of beginning, 2^h 00^m a. m.; time of ending, 2^h 18^m a. m.**]

Needle No. 3, No. 4 deflecting.				Needle No. 4, weighted.								Circle in magnetic prime vertical.
Circle east, Mic. D, face east.		Circle east, Mic. R, face east.		Circle west, face west.		Circle west, face east.		Circle east face west.		Circle east face east.		
S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	S.	N.	
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	*Circle N.*
59 33	59 16	42 39	41 33	67 14	66 26	65 41	65 00	65 05	65 47	65 38	65 22	Needle N.
29	13	42	37	18	30	45	04	00	42	34	18	Needle S.
59 31	59 14.5	42 40.5	41 35	67 16	66 28	65 43	65 02	66 02.5	65 44.5	65 36	65 20.5	*Circle S.*
59° 22′.8		42° 07′.8		66° 52′		65° 22′.5		65° 53′.5		65° 28′.2		Needle N. Needle S.
				66° 07′.2				65° 40′.8				Mag. mer. 78° 20′
u′= 39° 14′.7				Mean......65° 54′								

Recapitulation of results for dip.

Date.	Needle.	Dip.
1881		° ′
Nov. 30	1	81 22.3
Dec. 17	2	28.9
18	1	21.7
19	2	25.6
		81 24.6
1882		
Jan. 18	1	81 25.8
19	2	18.2
20	1	23.2
		81 22.4
Feb. 16	1	81 29.8
17	2	25.3
18	1	26.2
		81 27.1
Mar. 17	1	81 26.3
18	2	29.1
19	1	27.5
		81 27.6
Apr. 17	1	81 12.6
18	2	27.9
19	1	32.3
		81 24.3

Date.	Needle.	Dip.
1882		° ′
May 17	1	81 18.3
18	2	22.1
19	1	26.2
		81 22.2
June 16	1	81 25.1
18	2	22.7
19	1	24.1
		81 24.0
July 17	2	81 16.9
18	1	21.7
19	2	26.0
		81 21.5
Aug. 17	1	81 22.7
18	2	23.5
19	1	22.3
		81 22.8
Aug. 31	1	81 26.0
Sept. 14	1	23.4
30	1	17.2
		81 22.2

Date.	Needle.	Dip.
1883		° ′
Oct. 14	1	81 21.0
31	1	24.3
		81 22.6
Nov. 16	1	81 20.8
30	1	24.7
		81 22.8
Dec. 14	1	81 22.4
1883		
Jan. 1	1	81 19.9
14	1	22.4
31	1	23.7
		81 22.0
Feb. 14	2	81 25.8
28	2	23.8
		81 24.8
Mar. 14	2	81 22.0
25	2	28.0
		81 25.0

Date.	Needle.	Dip.
1883		° ′
Mar. 31	2	81 27.8
Apr. 14	2	22.0
30	2	23.6
		81 24.5
May 14	2	81 23.4
23	2	21.8
		81 22.6
May 31	2	81 27.7
June 14	2	23.8
30	2	20.3
		81 23.9
July 14	2	81 21.4
31	2	02.9 w=½
Aug. 14	2	30.8 w=½
		81 19.2

June 16, 1882.

Cos	66° 22′.7	9.60281
Cosec	39 39 .0	0.19511
Cosec	15 02 .4	0.58587
		2)0.38379
		0.19190
A		0.92055
F		1.11245
Cos	81 24 .0	9.17474
H	1.937	0.28719

July 17, 1882.

Cos	66° 17′.3	9.60437
Cosec	39 26 .0	0.19710
Cosec	14 59 .6	0.58719
		2)0.38866
		0.19433
A		0.92055
F		1.11488
Cos	81 21 .5	9.17683
H	1.958	0.29171

August 17, 1882.

Cos	65° 29′.3	9.61792
Cosec	39 21 .4	0.19781
Cosec	15 53 .4	0.56258
		2)0.37831
		0.18916
A		0.92055
F		1.10971
Cos	81 22 .8	9.17575
H	1.930	0.28546

August 31, 1882.

Cos	65° 22′.6	9.61977
Cosec	39 29 .7	0.19654
Cosec	16 03 .4	0.55817
		2)0.37448
		0.18724
A		0.92055
F		1.10779
Cos	81 22 .8	9.17575
H	1.921	0.28354

October 14, 1882.

Cos	66° 24′.7	9.60224
Cosec	38 00 .5	0.21058
Cosec	14 56 .3	0.58875
		2)0.40157
		0.20078
A		0.91759
F		1.11837
Cos	81 22 .6	9.17591
H	1.969	0.29428

June 18, 1882.

Cos	67° 07′.8	9.58955
Cosec	39 35 .7	0.19562
Cosec	14 14 .9	0.60884
		2)0.39401
		0.19700
A		0.92055
F		1.11755
Cos	81 24 .0	9.17474
H	1.960	0.29229

July 18, 1882.

Cos	65° 56′.0	9.61045
Cosec	38 45 .4	0.20342
Cosec	15 25 .7	0.57506
		2)0.38893
		0.19446
A		0.92055
F		1.11501
Cos	81 21 .5	9.17683
H	1.958	0.29184

August 18, 1882.

Cos	65° 39′.5	9.61508
Cosec	39 25 .1	0.19724
Cosec	15 44 .0	0.56677
		2)0.37909
		0.18954
A		0.92055
F		1.11009
Cos	81 22 .8	9.17575
H	1.931	0.28584

September 14, 1882.

Cos	65° 57′.4	9.61005
Cosec	39 07 .5	0.19996
Cosec	15 26 .0	0.57493
		2)0.38494
		0.19247
A		0.91759
F		1.11006
Cos	81 22 .2	9.17624
H	1.933	0.28630

October 31, 1882.

Cos	66° 03′.4	9.60835
Cosec	38 29 .0	0.20601
Cosec	15 20 .9	0.57727
		2)0.39163
		0.19582
A		0.91759
F		1.11341
Cos	81 22 .6	9.17591
H	1.947	0.28932

June 19, 1882.

Cos	66° 23′.8	9.60250
Cosec	39 41 .6	0.19472
Cosec	15 00 .8	0.58686
		2)0.38408
		0.19204
A		0.92055
F		1.11259
Cos	81 24 .0	9.17474
H	1.938	0.28733

July 19, 1882.

Cos	65° 55′.2	9.61067
Cosec	38 35 .7	0.20495
Cosec	15 30 .8	0.57274
		2)0.38836
		0.19418
A		0.92055
F		1.11473
Cos	81 21 .5	9.17683
H	1.967	0.29156

August 19, 1882.

Cos	65° 32′.2	9.61712
Cosec	39 27 .2	0.19692
Cosec	15 50 .1	0.56405
		2)0.37809
		0.18904
A		0.92055
F		1.10959
Cos	81 22 .8	9.17575
H	1.929	0.28534

September 30, 1882.

Cos	65° 46′.0	9.61326
Cosec	38 34 .5	0.20514
Cosec	15 31 .2	0.57255
		2)0.39095
		0.19548
A		0.91759
F		1.11307
Cos	81 22 .2	9.17624
H	1.947	0.28931

November 16, 1882.

Cos	66° 20′.8	9.60336
Cosec	39 07 .2	0.20001
Cosec	15 00 .0	0.58700
		2)0.39037
		0.19518
A		0.91759
F		1.11277
Cos	81 22 .8	9.17575
H	1.943	0.28852

November 30, 1882.

Cos	65° 41′.8	9. 61444
Cosec	39 26 .7	0. 19700
Cosec	15 42 .9	0. 56727
		2)0. 37871
		0. 18936
A		0. 91759
F		1. 10695
Cos	81 22 .8	9. 17575
H	1. 917	0. 28270

January 14, 1883.

Cos	66° 33′.0	9. 59983
Cosec	38 04 .8	0. 20999
Cosec	14 49 .4	0. 59203
		2)0. 40185
		0. 20092
A		0. 91759
F		1. 11851
Cos	81 22 .0	9. 17641
H	1. 972	0. 29492

February 28, 1883.

Cos	66° 03′.1	9. 60843
Cosec	38 48 .1	0. 20299
Cosec	15 20 .7	0. 57736
		2)0. 38878
		0. 19439
A		0. 91759
F		1. 11198
Cos	81 24 .8	9. 17408
H	1. 932	0. 28606

April 14, 1883.

Cos	65° 35′.0	9. 61634
Cosec	39 27 .0	0. 19695
Cosec	15 47 .0	0. 56543
		2)0. 37872
		0. 18936
A		0. 91759
F		1. 10695
Cos	81 24 .5	9. 17433
H	1. 911	0. 28128

May 31, 1883.

Cos	66° 10′.2	9. 60641
Cosec	39 14 .2	0. 19892
Cosec	15 17 .5	0. 57884
		2)0. 38417
		0. 19208
A		0. 91759
F		1. 10967
Cos	81 22 .6	9. 17591
H	1. 930	0. 28558

December 14, 1882.

Cos	66° 12′.0	9. 60589
Cosec	39 40 .2	0. 19493
Cosec	15 10 .4	0. 58213
		2)0. 38295
		0. 19148
A		0. 91759
F		1. 10907
Cos	81 22 .4	9. 17608
H	1. 928	0. 28515

January 31, 1883.

Cos	66° 17′ 3	9. 60437
Cosec	39 39 .6	0. 19502
Cosec	15 06 .4	0. 58400
		2)0. 38339
		0. 19170
A		0. 91759
F		1. 10929
Cos	81 22 .0	9. 17641
H	1. 931	0. 28570

March 14, 1883.

Cos	66° 08′.6	9. 60686
Cosec	39 24 .5	0. 19733
Cosec	15 13 .4	0. 58073
		2)0. 38492
		0. 19246
A		0. 91759
F		1. 11005
Cos	81 25 .0	9. 17391
H	1. 923	0. 28396

April 30, 1883.

Cos	66° 12′.0	9. 60589
Cosec	39 25 .0	0. 19726
Cosec	15 11 .6	0. 58157
		2)0. 38472
		0. 19236
A		0. 91759
F		1. 10995
Cos	81 24 .5	9. 17433
H	1. 924	0. 28428

June 14, 1883.

Cos	66° 21′.0	9. 60331
Cosec	38 58 .2	0. 20141
Cosec	15 02 .8	0. 58569
		2)0. 39041
		0. 19520
A		0. 91759
F		1. 11279
Cos	81 23 .9	9. 17483
H	1. 939	0. 28762

January 1, 1883.

Cos	65° 53′.1	9. 61127
Cosec	39 30 .9	0. 19635
Cosec	15 26 .8	0. 57456
		2)0. 38218
		0. 19109
A		0. 91759
F		1. 10868
Cos	81 22 .0	9. 17641
H	1. 928	0. 28509

February 14, 1883.

Cos	65° 55′.3	9. 61064
Cosec	39 36 .2	0. 19554
Cosec	15 30 .5	0. 57287
		2)0. 37905
		0. 18952
A		0. 91759
F		1. 10711
Cos	81 24 .8	9. 17408
H	1. 911	0. 28119

March 31, 1883.

Cos	65° 41′.9	9. 61441
Cosec	38 07 .5	0. 20945
Cosec	15 45 .9	0. 56592
		2)0. 38978
		0. 19489
A		0. 91759
F		1. 11248
Cos	81 25 .0	9. 17391
H	1. 934	0. 28639

May 14, 1883.

Cos	65° 56′.5	9. 61030
Cosec	39 24 .5	0. 19733
Cosec	15 26 .9	0. 57452
		2)0. 38215
		0. 19108
A		0. 91759
F		1. 10867
Cos	81 22 .6	9. 17591
H	1. 926	0. 28458

June 30, 1883.

Cos	65° 49′.4	9. 61231
Cosec	39 27 .8	0. 19683
Cosec	15 30 .9	0. 57269
		2)0. 38183
		0. 19092
A		0. 91759
F		1. 10851
Cos	81 23 .9	9. 17483
H	1. 920	0. 28334

July 14, 1883.

Cos	65° 29′.2	9. 61795
Cosec	39 23 .0	0. 19756
Cosec	15 52 .2	0. 56311
		2)0. 37862
		0. 18931
A		0. 91759
F		1. 10690
Cos	81 19 .2	9. 17873
H	1. 930	0. 28563

July 31, 1883.

Cos	64° 57′.2	9. 62671
Cosec	39 13 .5	0. 19903
Cosec	16 05 .7	0. 55716
		2)0. 38290
		0. 19145
A		0. 91759
F		1. 10904
Cos	81 19 .2	9. 17873
H	1. 940	0. 28777

August 14, 1883.

Cos	65° 54′.0	9. 61101
Cosec	39 14 .7	0. 19884
Cosec	15 36 .8	0. 57002
		2)0. 37987
		0. 18994
A		0. 91759
F		1. 10753
Cos	81 19 .2	9. 17873
H	1. 933	0. 28626

Recapitulation of results for horizontal component of force H by Dr. Lloyd's method.

1882.	*H.*	1882.	*H.*	1883.	*H.*	1883.	*H.*
June 16	1. 937	Aug. 31	1. 921	Jan. 1	1. 928	Apr. 30	1. 924
18	1. 960	Sept. 14	1. 933	14	1. 972		
19	1. 938	30	1. 947	31	1. 931		1. 918
						May 14	1. 926
	1. 945		1. 934		1. 944	31	1. 930
							1. 928
July 17	1. 958	Oct. 14	1. 969	Feb. 14	1. 911		
18	1. 958	31	1. 947	28	1. 932	June 14	1. 939
19	1. 957					30	1. 920
			1. 958		1. 922		
	1. 958						1. 929
Aug. 17	1. 930	Nov. 16	1. 943	Mar. 14	1. 923	July 14	1. 930
18	1. 931	30	1. 917	31	1. 934	31	1. 940
19	1. 929						
			1. 930		1. 928		1. 935
	1. 930	Dec. 14	1. 928	Apr. 14	1. 911	Aug. 14	1. 933

APPENDIX No. 6.

MEMORANDUM RESPECTING MAGNETICALLY DISTURBED AND UNDISTURBED DAYS AT UGLAAMIE, ALASKA, 1882-'83.

COMPUTING DIVISION, COAST AND GEODETIC SURVEY, *December* 6, 1884.

A complete examination was made of the tabulated observations at Uglaamie of variations in declination and in the horizontal and vertical components of the earth's magnetism—for all those days on which disturbances were observed at other polar stations and for those days which were selected as normal or quiet days—according to circular No. 39, issued by Dr. Wild, president of the International Polar Commission.

Our series with the Brooke differential instruments commences with September 12, 1882, and for these instruments it was found that for *every one* of the 21 days, designated as disturbed at other stations, disturbances occurred at Uglaamie in the declination and in the horizontal force and generally also in the vertical force, as may be seen in the accompanying list. Certain times, extending over several days, present themselves very prominently, and these may aptly be designated as times of stormy magnetic weather, suggesting their collective study.

Respecting the so-called quiet days (steady condition of magnetism) it is not so easy to make any positive statement, for the reason that the normal or undisturbed observations have not yet been reported and treated by themselves, hence only an indistinct idea as to the limits of variability can at present be had. In general the days mentioned as quiet were also found to be so at Uglaamie, yet there are exceptions, and in particular the horizontal force appears to have been rather restless. The Uglaamie record would exclude the following days from the table of quiet days and place them among those of ordinary ones, viz: 1882, September 30, declination and horizontal force agitated; 1883, February 8, ditto; March 15, declination, horizontal and vertical force agitated; May 15, horizontal and vertica force excited; June 11, ditto.

Respectfully submitted by

CHAS. A. SCHOTT,
Assistant.

J. E. HILGARD,
Superintendent United States Coast and Geodetic Survey.

UGLAAMIE MAGNETIC RECORD, 1882-'83.

***Examination of days of disturbance mentioned in Circular No.* 39, *issued by President Wild, November* 8, 1884.**

August 5, 1882 (Observation with inferior instrument).—Declination disturbance commenced August 4, and was dying out in the forenoon of August 5.

October 6, 1882.—Declination greatly disturbed. Horizontal force heavily disturbed. Vertical force slightly affected.

October 28, 1882.—Declination slightly disturbed, extending to the 29th. Horizontal force greatly disturbed on the 28th and 29th. Vertical force slightly affected.

November 12 *and* 13, 1882.—Declination greatly disturbed; continued to 14th. Strong auroral display on both days. Great disturbance of horizontal force on the 12th, 13th, 14th, and 15th. Vertical force disturbance excessive on 12th, 13th, and 14th.

November 17 *to* 20, 1882.—Declination greatly disturbed on these days; brilliant auroral display on the 20th. Great disturbance in horizontal force on the 17th, 18th, 19th, 20th, and 21st. Vertical force but little affected.

The magnetic equilibrium was disturbed during the entire period, November 12 to November 21, inclusive, with daily displays of auroras.

December 20, 21, 1882.—Declination disturbance commenced on the 19th and continued to the 24th, inclusive. Bright auroras every day. Horizontal force greatly disturbed on the 20th and 21st. Vertical force slightly, if at all, affected.

February 24, 25, 27, 28, 1883.—Declination disturbances commence February 22, and extend at least to March 3; daily auroras, very brilliant February 23, 25, 26, 28, March 2 and 3. Horizontal force on the 24th and 25th greatly disturbed (already on preceding days, 22d and 23d), and continues in a state of unrest to March 3, inclusive. The vertical force appears undisturbed on the 24th and 25th, and is but slightly affected on the 28th.

March 27, 1883.—Declination greatly disturbed on the 27th and 28th. Bright auroras on the 26th, 27th, and 28th. Days of disturbance of the horizontal force 26th, 27th, 28th, 29th, and 30th. Vertical force very little affected.

April 3, 1883.—Declination greatly disturbed April 2 and 3; auroras. Great disturbance in horizontal force on the 1st, 2d, 3d, 4th, and 5th. Vertical force slightly affected.

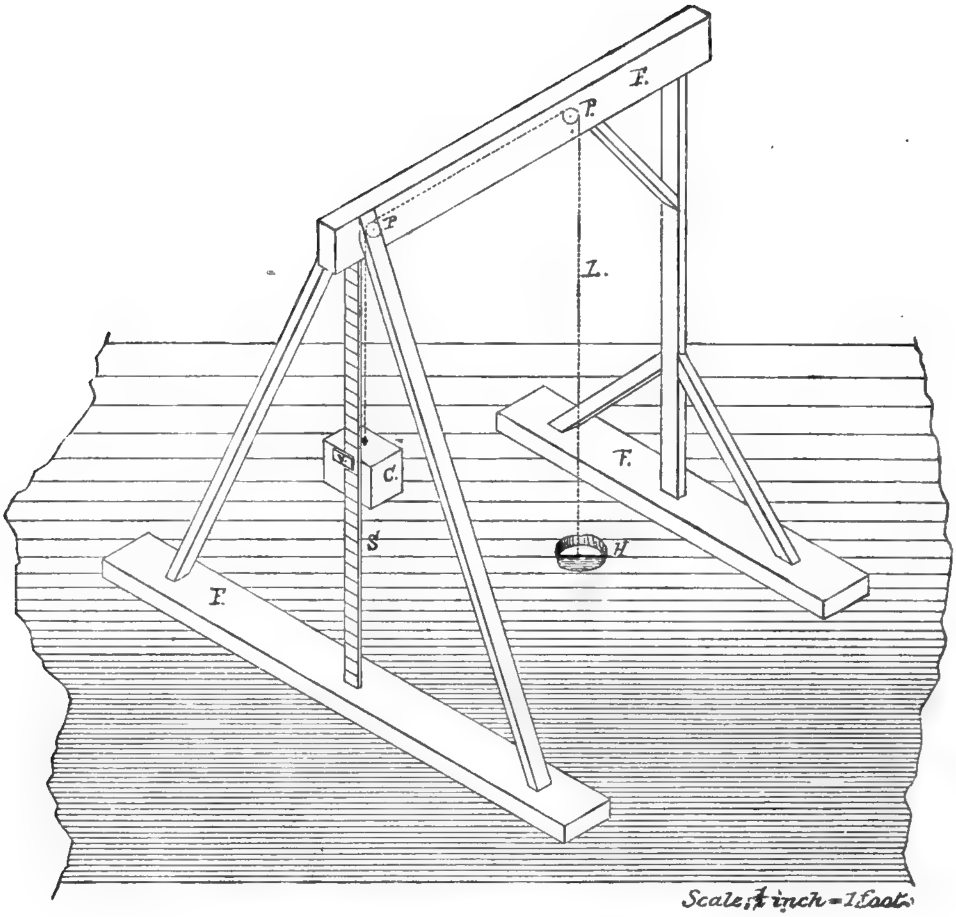
May 21, 22, 1883.—Declination disturbed on the 20th, 21st, and 22d; horizontal force likewise Vertical force disturbed on the 21st but not on the 22d.

June 18, 1883.—Declination greatly disturbed on the 17th, 18th, 19th; horizontal force disturbed on the 17th, 18th, 19th, and 20th. Vertical force apparently normal.

June 27, 1883.—Large disturbance in declination. Horizontal force disturbed on the 25th, 26th, 27th, 28th, 29th, and 30th, and very heavily on July 1. Vertical force apparently normal.

PART VII.

TIDES.



Tide Gauge at Uglaamie, Alaska.

F, F, F, frame.
H, hole in ice.
L, line.
P, P, pulleys.
C, counterpoise.
S, scale.
V, vernier.

TIDES.

Observations of tides at the United States 1tnernational Polar Station, Uglaamie, Alaska, were made half-hourly and uninterruptedly for a period of 112 days, beginning at midnight February 26, and ending with midnight June 17, 1883. This series, consisting of 5,376 observations, is complete, not a single reading being missed. These observations form a part of the general series of records secured at this station, and were made by the same observers as were the meteorological and magnetic observations.

Six observers were on duty daily, each making all the observations for four hours. These observers were Charles Ancor, A. C. Dark, J. A. Guzman, J. E. Maxfield, John Murdoch, and Middleton Smith. How faithfully these observers did their duty may be inferred from the fact that not a single observation was missed. To make a tidal observation, the observer walked out over the level ice to the gauge, about 100 yards from the shore, broke through the ice in the hole formed since the last observation, a half-hour before, scooped out the slush so as to clear the line, and then read the scale to the nearest hundredth of a foot. Returning to the house, he wrote down this *reading*, together with the *hour*, the *direction of the wind*, and the *initial* of his name. He further noted whether the tide had turned since the last observation, and if so, the highest or lowest reading reached. This was done by means of a maximum and minimum index, to be described in connection with the gauge. When a maximum or minimum reading occurred *between* the half-hourly readings, this fact is noted in the record, but is not here reproduced, as it does not appear to much increase the knowledge afforded by the record as here printed. The record was kept in duplicate, the second or duplicate copy being made daily, and thus kept up with the original.

Although wind observations were made *half-hourly* in connection with these tidal observations, nevertheless it is believed that the regular *hourly* observations of wind and atmospheric pressure will afford all the necessary data for determining the fluctuations of sea-level due to meteorological causes; for these reasons the *half-hourly* observations are not here printed.

Gauge.—The gauge was constructed at the station in February, 1883, and put in position so that observations began on the 26th, as before mentioned. No photograph of the gauge was made, but a drawing to scale appears on the plate opposite, from which its method of operation will be readily understood.

FFF is a wooden frame-work standing on the ice over the hole H. A line, L, passes from the 200-pound anchor through the hole H over pulleys PP, and terminates at the counterpoise C; this counterpoise weighing about 20 pounds. A fixed wooden scale, S, attached to the frame of the gauge, was subdivided to feet and tenths and hundredths, and to the line was attached an index which, moving along the scale, gave readings showing the stage of the tide.

The zero of the scale was placed low down, and the numbers increased upward and downward from this zero. The numbers above zero were considered positive (+) and those below it negative (−). When the tide rose, the ice, the gauge, and all its appurtenances were lifted up, and in such manner that the difference between any two index readings would indicate the change of level between the readings.

From the construction, as well as from observation, therefore, we see that *increasing* numbers indicate *rising* tide and *diminishing* numbers *falling* tide.

In order to record automatically the heights of high and low water, a self-registering index was adjusted as follows:

A piece of cod line was stretched along the face of the scale and led through an ivory stud attached to the counterpoise. This ivory stud coincided with the zero of the vernier or reading index. On either side of this stud cork slides were attached to the cod line and were pushed one up, the other down, with rising and falling tide, respectively. Attached to these corks were brass verniers moving along the scale and enabling close readings to be made. The highest and lowest readings of the sea-level falling between the regular half-hourly observations were thus automatically recorded.

Location of gauge.—The gauge was placed on the shore ice due west from the station and at a distance of about 100 yards from the beach. The water at the hole was 17 feet deep at mean low water. The ice was level, and at the beginning of observations in February was $4\frac{1}{6}$ feet thick and at the close of observations in June was 5 feet thick.

About one mile and a half from the beach and parallel with it is a bar having about 3 fathoms water upon it. On this bar the heavy pack-ice grounds and thus leaves the inshore ice comparatively undisturbed. During this entire series of observations the ice remained undisturbed except in elevation. The anchor remained unmoved and the line hung free in the middle of the hole. The accumulations of ice on the side of the hole were chopped away each day. That the ice, however, rose and fell was obvious, independent of the gauge readings, for along the "ice foot" at the beach the rise and fall was clearly seen, though there was never open water between the beach and the gauge, except for a few moments when the general level of ice would break off from the "ice foot" with falling or rising tide and make a narrow seam, which was soon after solidly frozen over.

In this location the gauge was practically free from local peculiarities and so disposed as to give the fluctuations of level in the open ocean.

Time.—The observations were made on *local mean time.* At intervals of one, two, or three weeks, as the weather permitted, time observations were made with transit or sextant, for the regulation of the standard chronometer upon which all other time-pieces depended.

Flood tides came from the southward and westward and there was a prevailing current setting to the northeast. The ebb current slackened but did not reverse this current.

The daily rise and fall of tide is quite small, being about 6 or 7 inches, but during the series of observations the level of the sea varied more than 3 feet.

The duplicate record has been placed in the hands of the superintendent of the Coast and Geodetic Survey for reduction, discussion, and publication. A preliminary discussion has been made, from which enough of the peculiarities of these Arctic tides have been brought out to show that a more complete analysis, study, and comparison with other Arctic tides is desirable. It has been deemed desirable to substitute here the original record of observations for this preliminary discussion and to give the full discussion hereafter. This discussion will be made and published by the Coast and Geodetic Survey.

Tidal observations at the United States International Polar Station, Uglaamie, Alaska, 1883.

[Half-hourly readings made on local mean time. Heights expressed in feet. Increasing numbers denote rising tide.]

Hour.	Feb. 26	Feb. 27	Feb. 28	Mar. 1	Mar. 2	Mar. 3	Mar. 4	Mar. 5	Mar. 6	Mar. 7	Mar. 8	Mar. 9	Mar. 10	Mar. 11	Mar. 12	Mar. 13
0.5....	1.14	1.23	1.90	2.28	1.17	1.99	1.53	2.59	1.78	1.95	2.68	2.39	1.67	0.23	0.39	1.90
1.0....	1.09	1.26	1.97	2.23	1.18	2.03	1.51	2.56	1.75	1.93	2.60	2.36	1.62	0.23	0.46	1.93
1.5....	1.13	1.33	2.05	2.25	1.21	2.02	1.54	2.52	1.71	1.89	2.54	2.32	1.57	0.19	0.50	1.97
2.0....	1.19	1.38	2.08	2.26	1.12	2.00	1.58	2.50	1.69	1.84	2.52	2.30	1.53	0.17	0.53	2.01
2.5....	1.23	1.38	2.16	2.29	1.22	2.00	1.64	2.47	1.66	1.77	2.48	2.21	1.48	0.14	0.54	1.96
3.0....	1.18	1.35	2.20	2.29	1.08	1.99	1.67	2.46	1.62	1.69	2.43	2.14	1.36	+0.10	0.56	1.95
3.5....	1.07	1.31	2.17	2.30	1.05	1.98	1.72	2.46	1.55	1.66	2.36	2.05	1.25	−0.02	0.56	1.94
4.0....	1.02	1.28	2.17	2.27	1.03	1.98	1.08	2.43	1.55	1.66	2.34	1.98	1.20	−0.05	0.55	1.89
4.5....	1.02	1.28	2.19	2.22	1.06	1.95	1.67	2.42	1.54	1.60	2.30	1.90	1.08	−0.08	0.51	1.85
5.0....	0.91	1.28	2.17	2.22	1.14	1.95	1.81	2.42	1.60	1.73	2.31	1.85	1.03	−0.22	0.48	1.81
5.5....	0.86	1.25	2.18	2.20	1.02	1.95	1.76	2.46	1.63	1.69	2.32	1.79	0.98	−0.31	0.45	1.72
6.0....	0.83	1.19	2.15	2.11	1.02	1.95	1.81	2.46	1.62	1.78	2.35	1.68	0.86	−0.36	0.43	1.66
6.5....	0.82	1.14	2.14	2.04	0.97	1.92	1.85	2.48	1.71	1.83	2.38	1.68	0.87	−0.38	0.43	1.60
7.0....	0.78	1.13	2.13	2.04	0.88	1.91	1.90	2.49	1.72	1.99	2.42	1.73	0.85	−0.40	0.43	1.58
7.5....	0.78	1.10	2.12	2.01	0.84	1.84	1.94	2.46	1.76	2.04	2.47	1.77	0.83	−0.38	0.45	1.55
8.0....	0.68	1.09	2.08	1.99	0.84	1.81	1.94	2.46	1.84	2.05	2.50	1.81	0.85	−0.39	0.51	1.52
8.5....	0.69	1.11	2.07	1.89	0.86	1.80	1.99	2.44	1.92	2.10	2.54	1.90	0.89	−0.35	0.55	1.51
9.0....	0.69	1.13	2.09	1.87	0.90	1.76	2.03	2.43	1.92	2.15	2.57	1.97	0.93	−0.30	0.62	1.51
9.5....	0.70	1.16	2.10	1.87	0.83	1.75	2.04	2.43	1.94	2.28	2.65	2.04	1.00	−0.27	0.70	1.52
10.0....	0.71	1.20	2.11	1.81	0.84	1.74	2.03	2.39	1.92	2.32	2.69	2.07	1.09	−0.18	0.83	1.54
10.5....	0.72	1.24	2.13	1.82	0.86	1.74	2.06	2.34	1.93	2.33	2.69	2.10	1.10	−0.12	0.92	1.57
11.0....	0.72	1.27	2.17	1.82	0.84	1.72	2.07	2.33	1.94	2.33	2.70	2.12	1.14	−0.05	1.00	1.61
11.5....	0.72	1.33	2.20	1.83	0.87	1.71	2.13	2.36	1.92	2.34	2.70	2.15	1.18	+0.01	1.11	1.66
Noon ..	0.72	1.34	2.22	1.84	0.87	1.71	2.13	2.23	1.91	2.39	2.79	2.15	1.18	0.08	1.26	1.75
12.5....	0.72	1.43	2.23	1.84	1.02	1.71	2.14	2.16	1.85	2.37	2.63	2.15	1.18	0.12	1.36	1.78
13.0....	1.07	1.51	2.27	1.87	1.12	1.70	2.16	2.08	1.83	2.23	2.58	2.13	1.18	0.15	1.42	1.85
13.5....	1.09	1.54	2.28	1.87	1.18	1.68	2.16	2.03	1.82	2.23	2.53	2.07	1.13	0.17	1.49	1.90
14.0....	1.10	1.61	2.29	1.86	1.23	1.67	2.17	2.00	1.75	2.23	2.47	2.01	1.05	0.15	1.58	1.93
14.5....	1.11	1.63	2.32	1.86	1.31	1.67	2.17	1.97	1.68	2.20	2.38	1.95	0.95	0.15	1.61	1.93
15.0....	1.12	1.66	2.32	1.86	1.38	1.72	2.18	1.94	1.66	2.15	2.31	1.87	0.84	0.14	1.63	1.93
15.5....	1.12	1.66	2.33	1.86	1.40	1.72	2.25	1.93	1.65	2.14	2.23	1.74	0.74	0.11	1.63	1.92
16.0....	1.12	1.67	2.33	1.86	1.58	1.74	2.30	1.95	1.63	2.10	2.16	1.63	0.62	+0.01	1.63	1.86
16.5....	1.09	1.68	2.33	1.85	1.62	1.75	2.40	1.91	1.64	2.08	2.12	1.56	0.47	−0.05	1.33	1.83
17.0....	1.00	1.65	2.33	1.82	1.69	1.80	2.41	1.92	1.64	2.07	2.09	1.47	0.35	−0.16	1.62	1.76
17.5....	0.99	1.63	2.33	1.81	1.72	1.80	2.46	1.92	1.68	2.08	2.08	1.41	0.25	−0.22	1.58	1.71
18.0....	0.95	1.61	2.33	1.72	1.73	1.80	2.49	1.93	1.72	2.09	2.07	1.34	0.16	−0.25	1.55	1.65
18.5....	0.87	1.57	2.33	1.70	1.76	1.78	2.53	1.91	1.72	2.11	2.08	1.31	0.09	−0.28	1.51	1.57
19.0....	0.89	1.57	2.33	1.63	1.87	1.79	2.57	1.92	1.80	2.23	2.12	1.34	+0.02	−0.30	1.49	1.50
19.5....	0.87	1.57	2.31	1.47	1.91	1.79	2.57	1.92	1.85	2.24	2.14	1.35	−0.02	−0.30	1.48	1.45
20.0....	0.86	1.55	2.29	1.46	1.92	1.78	2.58	1.93	1.92	2.39	2.19	1.36	−0.03	−0.29	1.46	1.39
20.5....	0.85	1.55	2.26	1.36	1.93	1.75	2.59	1.94	1.95	2.44	2.27	1.48	+0.01	−0.29	1.46	1.36
21.0....	0.85	1.56	2.26	1.34	1.94	1.73	2.60	1.95	1.99	2.51	2.30	1.49	0.01	−0.27	1.57	1.36
21.5....	0.88	1.59	2.26	1.36	1.95	1.70	2.61	1.93	2.03	2.55	2.34	1.52	0.02	−0.21	1.57	1.35
22.0....	0.96	1.63	2.23	1.34	1.94	1.68	2.62	1.92	2.07	2.57	2.38	1.58	0.06	−0.13	1.59	1.36
22.5....	0.92	1.67	2.22	1.25	1.95	1.63	2.62	1.90	2.07	2.59	2.39	1.60	0.11	−0.03	1.66	1.36
23.0....	1.04	1.72	2.22	1.26	1.96	1.62	2.62	1.82	2.05	2.60	2.42	1.63	0.16	+0.07	1.70	1.37
23.5....	1.05	1.75	2.21	1.26	1.97	1.61	2.62	1.80	2.05	2.61	2.42	1.61	0.18	0.18	1.76	1.41
Midn't	1.20	1.79	2.21	1.27	1.99	1.57	2.59	1.80	2.02	2.63	2.43	1.65	0.22	0.27	1.81	1.46

Hour.	Mar. 14	Mar. 15	Mar. 16	Mar. 17	Mar. 18	Mar. 19	Mar. 20	Mar. 21	Mar. 22	Mar. 23	Mar. 24	Mar. 25	Mar. 26	Mar. 27	Mar. 28	Mar. 29
0.5....	1.49	1.24	0.29	0.52	1.38	1.52	2.01	1.81	2.02	3.12	2.44	3.17	2.39	2.78	2.64	2.90
1.0....	1.51	1.25	0.29	0.52	1.34	1.50	1.97	1.76	1.97	3.10	2.45	3.16	2.36	2.86	2.55	2.93
1.5....	1.56	1.26	0.30	0.53	1.34	1.47	1.93	1.74	1.91	3.06	2.45	3.15	2.32	3.00	2.52	[illegible]
2.0....	1.57	1.27	0.32	0.58	1.35	1.47	1.90	1.71	1.83	2.99	2.45	3.12	2.24	3.03	2.47	2.96
2.5....	1.59	1.28	0.36	0.65	1.37	1.46	1.85	1.65	1.83	2.90	2.44	3.08	2.13	3.07	2.39	2.96
3.0....	1.59	1.28	0.37	0.69	1.38	1.48	1.83	1.62	1.83	2.83	2.41	3.01	2.03	3.08	2.30	2.96
3.5....	1.58	1.28	0.38	0.70	1.41	1.50	1.83	1.56	1.84	2.78	2.46	2.92	1.98	3.07	2.16	2.96
4.0....	1.58	1.26	0.38	0.72	1.42	1.46	1.78	1.55	1.77	2.71	2.40	2.83	1.89	3.07	2.05	2.97
4.5....	1.57	1.22	0.37	0.73	1.43	1.48	1.79	1.58	1.72	2.69	2.42	2.74	1.78	3.04	1.98	2.97
5.0....	1.51	1.20	0.32	9.78	1.44	1.49	1.80	1.50	1.78	2.70	2.40	2.65	1.66	2.97	1.85	2.96
5.5....	1.47	1.11	0.28	0.82	1.47	1.50	1.82	1.64	1.79	2.70	2.40	2.60	1.60	2.90	1.78	2.92
6.0....	1.44	1.09	0.24	0.84	1.50	1.55	1.87	1.56	1.83	2.66	2.46	2.57	1.48	2.89	1.76	2.84
6.5....	1.40	1.00	0.24	0.88	1.51	1.55	1.90	1.58	1.91	2.59	2.50	2.55	1.40	2.85	1.78	2.84
7.0....	1.34	0.95	0.22	0.88	1.56	1.60	1.92	1.75	1.93	2.58	2.55	2.54	1.36	2.85	1.67	2.83
7.5....	1.30	0.89	0.20	0.89	1.56	1.64	1.98	1.70	1.92	2.58	2.55	2.54	1.32	2.90	1.65	2.79
8.0....	1.28	0.84	0.13	0.89	1.57	1.66	1.99	1.79	2.00	2.63	2.55	2.57	1.28	2.96	1.65	2.78
8.5....	1.25	0.80	0.10	0.90	1.57	1.72	2.03	1.84	2.10	2.68	2.60	2.59	1.30	3.10	1.68	2.78
9.0....	1.25	0.73	0.06	0.95	1.58	1.77	2.03	1.91	2.14	2.71	2.71	2.63	1.27	3.21	1.71	2.78
9.5....	1.25	0.70	0.02	0.97	1.58	1.78	2.03	1.96	2.23	2.72	2.82	2.68	1.31	3.23	1.80	2.78
10.0....	1.26	0.67	0.00	0.97	1.58	1.79	2.05	2.02	2.32	2.72	2.87	2.73	1.32	3.37	1.89	2.80
10.5....	1.27	0.68	0.00	0.98	1.57	1.79	2.02	2.05	2.38	2.73	2.92	2.82	1.34	3.44	2.02	2.81
11.0....	1.29	0.64	0.02	0.99	1.53	1.77	2.04	2.06	2.38	2.69	2.96	2.89	1.34	3.47	2.05	2.82
11.5....	1.31	0.62	0.03	0.99	1.49	1.75	2.00	2.08	2.35	2.70	2.99	2.94	1.37	3.60	2.17	2.83
Noon ..	1.41	0.61	0.03	0.99	1.47	1.71	1.89	2.04	2.42	2.67	2.99	3.01	1.42	3.73	2.29	2.85
12.5....	1.47	0.65	0.04	0.97	1.46	1.66	1.88	2.04	2.42	2.61	2.98	3.14	1.46	3.77	2.36	2.92
13.0....	1.52	0.66	0.04	0.97	1.42	1.64	1.80	1.94	2.30	2.57	2.97	3.14	1.49	3.79	2.38	2.96
13.5....	1.58	0.66	0.05	0.97	1.40	1.62	1.84	1.92	2.28	2.51	2.94	3.14	1.50	3.84	2.46	3.02
14.0....	1.62	0.67	0.10	0.99	1.37	1.60	1.74	1.82	2.26	2.42	2.93	3.11	1.52	3.84	2.51	3.04
14.5....	1.66	0.69	0.17	1.03	1.36	1.60	1.71	1.82	2.22	2.30	2.87	3.06	1.53	3.85	2.55	3.04
15.0....	1.67	0.70	0.21	1.08	1.38	1.60	1.67	1.76	2.17	2.23	2.86	2.96	1.54	3.87	2.61	3.05
15.5....	1.67	0.75	0.25	1.13	1.39	1.61	1.62	1.68	2.20	2.14	2.82	2.87	1.55	3.79	2.64	3.06
16.0....	1.68	0.75	0.34	1.18	1.40	1.63	1.59	1.64	2.18	2.09	2.82	2.77	1.58	3.77	2.62	3.03
16.5....	1.65	0.74	0.36	1.20	1.41	1.64	1.57	1.68	2.20	1.98	2.76	2.68	1.60	3.71	2.62	2.99
17.0....	1.63	0.72	0.42	1.24	1.43	1.66	1.58	1.68	2.16	1.92	2.75	2.60	1.63	3.61	2.65	2.97
17.5....	1.61	0.71	0.39	1.29	1.45	1.69	1.59	1.65	2.17	1.85	2.74	2.50	1.63	3.50	2.67	2.94
18.0....	1.58	0.68	0.41	1.30	1.47	1.77	1.60	1.69	2.16	1.84	2.74	2.49	1.63	3.37	2.65	2.89
18.5....	1.53	0.61	0.42	1.37	1.49	1.83	1.64	1.75	2.20	1.82	2.76	2.43	1.63	3.27	2.66	2.82
19.0....	1.49	0.55	0.44	1.39	1.51	1.89	1.69	1.84	2.20	1.81	2.77	2.33	1.68	3.20	2.65	2.70
19.5....	1.43	0.54	0.45	1.41	1.57	1.97	1.79	1.85	2.30	1.82	2.81	2.33	1.73	3.14	2.68	2.75
20.0....	1.35	0.51	0.57	1.38	1.60	2.06	1.80	1.86	2.40	1.87	2.85	2.33	1.83	3.02	2.66	2.72
20.5....	1.34	0.43	0.57	1.37	1.65	2.07	1.82	1.95	2.47	1.95	2.90	2.32	1.89	2.95	2.65	2.68
21.0....	1.29	0.41	0.58	1.39	1.64	2.09	1.85	2.02	2.53	2.03	2.99	2.33	1.95	2.91	2.67	2.68
21.5....	1.26	0.39	0.56	1.42	1.65	2.11	1.89	2.10	2.65	2.09	3.02	2.35	2.06	2.88	2.71	2.62
22.0....	1.25	0.35	0.54	1.42	1.64	2.11	1.95	2.11	2.72	2.19	3.05	2.36	2.19	2.79	2.73	2.61
22.5....	1.24	0.28	0.53	1.43	1.64	2.10	1.96	2.07	2.75	2.25	3.10	2.38	2.41	2.81	2.76	2.61
23.0....	1.21	0.28	0.53	1.41	1.62	2.09	1.91	2.14	3.00	2.30	3.12	2.40	2.46	2.71	2.78	2.59
23.5....	1.21	0.30	0.50	1.43	1.54	2.08	1.88	2.07	3.11	2.34	3.16	2.38	2.60	2.70	2.83	2.59
Midn't.	1.24	0.29	0.51	1.41	1.54	2.04	1.84	2.04	3.15	2.39	3.17	2.37	2.67	2.70	2.84	2.57

Tidal observations at the United States International Polar Station, Uglaamie, Alaska, 1883—Cont'd.

[Half-hourly readings made on local time. Heights expressed in feet. Increasing numbers denote rising tide.]

Hour	Mar. 30	Mar. 31	Apr. 1	Apr. 2	Apr. 3	Apr. 4	Apr. 5	Apr. 6	Apr. 7	Apr. 8	Apr. 9	Apr. 10	Apr. 11	Apr. 12	Apr. 12	Apr. 14
0.5....	2.62	2.24	1.69	1.21	1.15	1.25	1.04	1.28	1.81	2.00	2.02	1.94	2.29	2.42	2.11	1.45
1.0....	2.62	2.26	1.71	1.21	1.14	1.20	1.00	1.23	1.77	1.98	1.96	1.96	2.35	2.46	2.15	1.48
1.5....	2.63	2.28	1.71	1.21	1.12	1.16	0.92	1.16	1.70	1.95	1.87	1.97	2.41	2.51	2.22	1.53
2.0....	2.64	2.29	1.69	1.19	1.09	1.10	0.87	1.11	1.62	1.89	1.80	2.01	2.41	2.51	2.22	1.52
2.5....	2.66	2.31	1.67	1.18	1.11	1.08	0.84	1.08	1.55	1.80	1.72	2.03	2.40	2.49	2.20	1.49
3.0....	2.69	2.31	1.67	1.19	1.14	1.07	0.79	1.05	1.46	1.72	1.63	2.00	2.38	2.46	2.20	1.50
3.5....	2.67	2.30	1.65	1.21	1.15	1.09	0.76	1.03	1.41	1.67	1.56	1.95	2.35	2.43	2.20	1.48
4.0....	2.62	2.29	1.64	1.22	1.15	1.08	0.73	1.00	1.38	1.61	1.50	1.94	2.25	2.42	2.24	1.43
4.5....	2.59	2.28	1.62	1.22	1.18	1.11	0.73	1.01	1.35	1.59	1.40	1.89	2.20	2.39	2.25	1.45
5.0....	2.55	2.27	1.63	1.23	1.19	1.16	0.74	1.02	1.34	1.55	1.34	1.86	2.16	2.35	2.15	1.43
5.5....	2.51	2.27	1.65	1.28	1.21	1.20	0.76	1.08	1.34	1.53	1.30	1.81	2.07	2.28	2.07	1.40
6.0....	2.49	2.22	1.62	1.28	1.26	1.24	0.82	1.13	1.36	1.54	1.26	1.81	2.02	2.21	2.00	1.38
6.5....	2.43	2.21	1.59	1.28	1.30	1.27	0.87	1.23	1.41	1.57	1.25	1.82	2.00	2.18	1.99	1.34
7.0....	2.39	2.20	1.48	1.29	1.31	1.30	0.90	1.28	1.48	1.61	1.25	1.77	1.98	2.12	1.92	1.33
7.5....	2.37	2.19	1.52	1.29	1.33	1.33	0.98	1.35	1.57	1.67	1.26	1.80	1.97	2.08	1.87	1.28
8.0....	2.34	2.14	1.50	1.30	1.34	1.36	1.03	1.44	1.66	1.73	1.30	1.88	1.96	2.04	1.83	1.26
8.5....	2.32	2.13	1.40	1.31	1.34	1.40	1.08	1.52	1.73	1.85	1.31	1.92	1.98	2.02	1.84	1.20
9.0....	2.30	2.10	1.37	1.26	1.35	1.39	1.10	1.60	1.80	1.94	1.37	1.99	2.00	2.02	1.79	1.18
9.5....	2.30	2.09	1.40	1.23	1.34	1.40	1.12	1.65	1.89	2.04	1.48	2.10	2.04	2.05	1.79	1.18
10.0....	2.31	2.11	1.35	1.22	1.30	1.40	1.13	1.69	1.94	2.11	1.52	2.21	2.11	2.09	1.78	1.13
10.5....	2.32	2.11	1.37	1.20	1.28	1.37	1.14	1.75	2.01	2.18	1.61	2.28	2.14	2.14	1.80	1.07
11.0....	2.33	2.10	1.33	1.18	1.28	1.32	1.14	1.75	2.02	2.24	1.64	2.37	2.22	2.16	1.82	1.13
11.5....	2.35	2.10	1.33	1.16	1.23	1.27	1.13	1.74	2.03	2.26	1.71	2.41	2.31	2.20	1.83	1.12
Noon ..	2.38	2.13	1.37	1.16	1.20	1.22	1.08	1.72	2.03	2.27	1.73	2.48	2.40	2.26	1.85	1.07
12.5....	2.42	2.14	1.35	1.16	1.16	1.16	1.04	1.68	2.02	2.27	1.71	2.55	2.44	2.31	1.91	1.08
13.0....	2.47	2.13	1.36	1.14	1.15	1.12	0.98	1.62	2.00	2.25	1.69	2.55	2.52	2.36	1.92	1.10
13.5....	2.50	2.15	1.34	1.14	1.14	1.07	0.91	1.57	1.98	2.17	1.65	2.55	2.54	2.41	1.97	1.16
14.0....	2.53	2.18	1.35	1.14	1.13	1.04	0.83	1.51	1.84	2.10	1.55	2.54	2.56	2.46	2.01	1.18
14.5....	2.57	2.21	1.38	1.16	1.13	1.01	0.81	1.46	1.75	2.02	1.38	2.53	2.55	2.47	2.07	1.20
15.0....	2.59	2.26	1.46	1.17	1.10	0.98	0.76	1.38	1.69	1.91	1.35	2.49	2.55	2.48	2.08	1.19
15.5....	2.60	2.24	1.43	1.18	1.11	0.96	0.76	1.32	1.62	1.84	1.38	2.45	2.55	2.50	2.09	1.26
16.0....	2.58	2.27	1.46	1.20	1.14	0.93	0.74	1.29	1.54	1.76	1.28	2.40	2.52	2.48	2.16	1.29
16.5....	2.58	2.24	1.49	1.22	1.20	0.96	0.74	1.27	1.48	1.71	1.20	2.34	2.50	2.45	2.08	1.30
17.0....	2.54	2.21	1.51	1.29	1.22	0.97	0.76	1.27	1.45	1.63	1.13	2.28	2.45	2.43	2.04	1.31
17.5....	2.54	2.21	1.52	1.28	1.24	0.99	0.80	1.28	1.44	1.56	1.09	2.18	2.38	2.40	2.01	1.23
18.0....	2.51	2.19	1.51	1.29	1.26	1.02	0.82	1.30	1.45	1.55	1.05	2.12	2.32	2.33	1.95	1.28
18.5....	2.48	2.14	1.49	1.30	1.32	1.05	0.90	1.33	1.48	1.54	1.01	2.06	2.29	2.30	1.90	1.31
19.0....	2.45	2.09	1.47	1.33	1.34	1.11	0.98	1.43	1.57	1.55	1.00	2.03	2.23	2.22	1.85	1.26
19.5....	2.39	2.07	1.48	1.35	1.36	1.16	1.04	1.49	1.60	1.56	1.02	2.00	2.20	2.19	1.78	1.24
20.0....	2.35	2.08	1.47	1.36	1.38	1.17	1.09	1.49	1.69	1.60	1.04	1.98	2.17	2.15	1.74	1.25
20.5....	2.32	2.08	1.38	1.35	1.39	1.19	1.14	1.63	1.74	1.64	1.15	1.98	2.16	2.09	1.72	1.24
21.0....	2.28	2.05	1.36	1.33	1.39	1.20	1.20	1.71	1.79	1.69	1.23	2.03	2.16	2.05	1.63	1.17
21.5....	2.27	1.88	1.32	1.31	1.40	1.22	1.26	1.77	1.84	1.74	1.35	2.03	2.17	2.07	1.64	1.07
22.0....	2.23	1.84	1.31	1.29	1.38	1.22	1.30	1.81	1.90	1.81	1.49	2.05	2.20	2.03	1.57	1.17
22.5....	2.21	1.78	1.29	1.25	1.32	1.18	1.32	1.83	1.96	1.87	1.56	2.10	2.23	2.03	1.46	1.08
23.0....	2.19	1.77	1.25	1.21	1.32	1.17	1.31	1.84	2.02	1.90	1.69	2.18	2.27	2.03	1.52	1.05
23.5....	2.21	1.72	1.21	1.17	1.31	1.12	1.30	1.84	2.03	1.94	1.80	2.22	2.35	2.07	1.43	1.03
Midn't.	2.24	1.69	1.20	1.17	1.28	1.09	1.30	1.83	2.02	1.98	1.88	2.24	2.37	2.10	1.42	1.00

Hour.	Apr. 15	Apr. 16	Apr. 17	Apr. 18	Apr. 19	Apr. 20	Apr. 21	Apr. 22	Apr. 23	Apr. 24	Apr. 25	Apr. 26	Apr. 27	Apr. 28	Apr. 29	Apr. 30
0.5....	1.02	1.03	1.01	1.18	1.53	1.60	1.86	1.63	1.60	1.53	1.54	1.62	1.45	1.06	0.63	0.51
1.0....	1.02	1.01	0.99	1.16	1.51	1.56	1.82	1.61	1.54	1.55	1.54	1.61	1.47	1.09	0.64	0.54
1.5....	1.03	1.00	0.96	1.13	1.47	1.55	1.79	1.58	[illegible]	1.49	1.56	1.65	1.48	1.12	0.67	0.56
2.0....	1.03	1.00	1.00	1.07	1.42	1.50	1.77	1.59	1.47	1.45	1.53	1.63	1.48	1.14	0.71	0.59
2.5....	1.04	1.02	0.97	1.06	1.41	1.47	1.73	1.46	1.46	1.41	1.51	1.62	1.47	1.14	0.72	0.65
3.0....	1.04	1.04	0.97	1.06	1.39	1.45	1.67	1.43	1.39	1.36	1.47	1.60	1.46	1.15	0.71	0.65
3.5....	1.10	1.05	0.99	1.07	1.35	1.44	1.64	1.42	1.35	1.32	1.42	1.56	1.44	1.14	0.74	0.64
4.0....	1.14	1.07	1.01	1.08	1.35	1.38	1.60	1.37	1.30	1.26	1.41	1.53	1.40	1.10	0.75	0.66
4.5....	1.18	1.12	1.03	1.11	1.38	1.40	1.58	1.32	1.24	1.23	1.31	1.47	1.36	1.09	0.74	0.69
5.0....	1.18	1.13	1.06	1.15	1.42	1.38	1.56	1.31	1.21	1.18	1.30	1.44	1.34	1.07	0.74	0.69
5.5....	1.18	1.15	1.10	1.20	1.46	1.38	1.55	1.28	1.18	1.18	1.24	1.41	1.30	1.05	0.74	0.69
6.0....	1.17	1.18	1.14	1.24	1.50	1.40	1.58	1.30	1.17	1.13	1.20	1.37	1.27	1.01	0.70	0.72
6.5....	1.16	1.20	1.17	1.30	1.55	1.43	1.61	1.30	1.17	1.12	1.22	1.34	1.22	0.99	0.67	0.70
7.0....	1.15	1.20	1.19	1.35	1.61	1.48	1.63	1.35	1.17	1.13	1.20	1.33	1.19	0.94	0.64	0.72
7.5....	1.17	1.23	1.22	1.39	1.65	1.54	1.67	1.40	1.23	1.19	1.22	1.32	1.15	0.93	0.61	0.68
8.0....	1.15	1.23	1.25	1.40	1.67	1.58	1.76	1.41	1.29	1.20	1.21	1.32	1.16	0.92	0.61	0.65
8.5....	1.10	1.22	1.28	1.42	1.73	1.69	1.83	1.50	1.33	1.22	1.25	1.33	1.16	0.86	0.54	0.63
9.0....	1.10	1.21	1.28	1.43	1.75	1.73	1.87	1.55	1.37	1.29	1.31	1.36	1.16	0.86	0.53	0.60
9.5....	1.09	1.17	1.27	1.46	1.78	1.76	1.92	1.66	1.44	1.37	1.37	1.41	1.17	0.84	0.55	0.58
10.0....	1.02	1.17	1.27	1.47	1.80	1.79	1.96	1.62	1.49	1.47	1.47	1.50	1.20	0.86	0.54	0.58
10.5....	1.02	1.14	1.25	1.47	1.82	1.82	1.98	1.70	1.54	1.52	1.50	1.55	1.22	0.88	0.54	0.56
11.0....	0.99	1.11	1.23	1.44	1.79	1.83	1.99	1.71	1.57	1.58	1.56	1.62	1.27	0.92	0.56	0.54
11.5....	1.00	1.09	1.19	1.42	1.76	1.82	1.94	1.75	1.62	1.60	1.63	1.65	1.31	0.96	0.56	0.53
Noon ..	0.97	1.05	1.14	1.40	1.72	1.78	1.96	1.69	1.63	1.65	1.64	1.69	1.33	0.96	0.57	0.53
12.5....	0.97	1.04	1.12	1.32	1.69	1.77	1.92	1.63	1.63	1.70	1.67	1.73	1.38	0.99	0.60	0.54
13.0....	1.00	1.02	1.10	1.28	1.63	1.73	1.85	1.54	1.65	1.71	1.71	1.79	1.43	1.01	0.63	0.54
13.5....	1.02	1.00	1.06	1.24	1.58	1.70	1.78	1.52	1.61	1.71	1.73	1.77	1.45	1.06	0.65	0.58
14.0....	1.00	0.98	1.04	1.22	1.53	1.64	1.75	1.45	1.55	1.69	1.73	1.77	1.47	1.08	0.69	0.59
14.5....	1.02	1.00	1.03	1.20	1.47	1.58	1.68	1.36	1.48	1.66	1.72	1.77	1.48	1.13	0.69	0.62
15.0....	1.04	0.97	1.02	1.18	1.43	1.54	1.61	1.28	1.42	1.58	1.68	1.76	1.48	1.12	0.71	0.05
15.5....	1.10	0.99	1.01	1.17	1.40	1.50	1.53	1.28	1.41	1.55	1.65	1.73	1.44	1.11	0.73	0.69
16.0....	1.11	1.02	1.03	1.18	1.40	1.47	1.45	1.17	1.30	1.48	1.60	1.65	1.41	1.06	0.73	0.70
16.5....	1.13	1.01	1.05	1.18	1.39	1.47	1.44	1.18	1.25	1.43	1.52	1.62	1.36	1.04	0.74	0.73
17.0....	1.16	1.06	1.10	1.25	1.30	1.46	1.41	1.14	1.21	1.37	1.47	1.57	1.33	0.99	0.74	0.75
17.5....	1.19	1.09	1.11	1.26	1.34	1.49	1.37	1.10	1.20	1.32	1.45	1.51	1.29	0.91	0.71	0.76
18.0....	1.20	1.12	1.13	1.31	1.34	1.50	1.38	1.18	1.12	1.27	1.40	1.48	1.23	0.88	0.69	0.80
18.5....	1.21	1.12	1.22	1.34	1.37	1.52	1.39	1.09	1.13	1.25	1.37	1.40	1.18	0.82	0.66	0.78
19.0....	1.23	1.13	1.22	1.37	1.40	1.55	1.41	1.16	1.13	1.23	1.33	1.36	1.15	0.80	0.62	0.77
19.5....	1.23	1.14	1.25	1.42	1.43	1.59	1.42	1.23	1.13	1.24	1.35	1.32	1.09	0.74	0.59	0.74
20.0....	1.18	1.14	1.30	1.47	1.48	1.68	1.45	1.25	1.17	1.29	1.35	1.31	1.06	0.67	0.57	0.73
20.5....	1.17	1.14	1.30	1.51	1.57	1.71	1.54	1.26	1.21	1.27	1.33	1.30	1.03	0.64	0.52	0.73
21.0....	1.17	1.14	1.33	1.54	1.60	1.79	1.56	1.37	1.27	1.32	1.34	1.29	1.00	0.60	0.50	0.73
21.5....	1.14	1.12	1.36	1.59	1.63	1.82	1.60	1.38	1.36	1.34	1.38	1.29	1.00	0.58	0.46	0.68
22.0....	1.13	1.13	1.31	1.59	1.68	1.87	1.63	1.46	1.39	1.38	1.45	1.30	0.98	0.57	0.46	0.70
22.5....	1.09	1.10	1.30	1.61	1.69	1.90	1.67	1.46	1.44	1.43	1.51	1.30	1.00	0.56	0.45	0.71
23.0....	1.09	1.05	1.28	1.57	1.70	1.91	1.69	1.51	1.46	1.46	1.55	1.33	1.02	0.57	0.44	0.69
23.5....	1.07	1.05	1.27	1.57	1.68	1.90	1.68	1.55	1.48	1.52	1.60	1.37	1.03	0.58	0.44	0.62
Midn't.	1.03	1.03	1.20	1.54	1.63	1.90	1.67	1.58	1.49	1.52	1.62	1.43	1.04	0.63	0.49	0.62

***Tidal observations at the United States International Polar Station, Uglaamie, Alaska*, 1883—Cont'd.**

[Half-hourly readings made on local mean time. Heights expressed in feet. Increasing numbers denote rising tide.]

Hour.	May 1.	May 2.	May 3.	May 4.	May 5.	May 6.	May 7.	May 8.	May 9.	May 10.	May 11.	May 12.	May 13.	May 14.	May 15.	May 16.
0.5....	0.61	0.40	0.64	0.99	1.21	2.07	1.61	1.87	1.51	1.56	1.49	1.14	1.16	1.22	1.42	1.41
1.0....	0.65	0.39	0.60	0.95	1.17	2.00	1.60	1.86	1.52	1.65	1.52	1.20	1.20	1.28	1.43	1.42
1.5....	0.68	0.38	0.58	0.93	1.15	1.98	1.57	1.83	1.52	1.73	1.52	1.23	1.24	1.32	1.45	1.44
2.0....	[illegible]	0.38	0.56	0.92	1.12	1.90	1.53	1.80	1.53	1.79	1.52	1.27	1.32	1.35	1.49	1.45
2.5....	[illegible]	0.41	0.58	0.97	1.10	1.79	1.48	1.76	1.49	1.78	1.52	1.32	1.3[illegible]	1.43	1.57	1.46
3.0....	0.73	0.45	0.57	0.94	1.17	1.72	1.44	1.70	1.42	1.75	1.52	1.36	1.33	1.52	1.57	1.48
3.5....	0.76	0.50	0.59	0.98	1.15	1.69	1.38	1.64	1.34	1.74	1.52	1.35	1.37	1.56	1.59	1.52
4.0....	0.77	0.54	0.68	1.01	1.18	1.66	1.34	1.61	1.28	1.73	1.48	1.37	1.38	1.58	1.63	1.56
4.5....	0.81	0.58	0.71	1.00	1.26	1.60	1.33	1.56	1.20	1.70	1.42	1.37	1.38	1.61	1.66	1.58
5.0....	0.84	0.61	0.73	1.07	1.33	1.60	1.32	1.51	1.15	1.65	1.39	1.37	1.38	1.62	1.69	1.61
5.5....	0.84	0.63	0.82	1.09	1.39	1.60	1.34	1.50	1.12	1.62	1.33	1.36	1.38	1.62	1.72	1.63
6.0....	0.86	0.64	0.88	1.14	1.44	1.60	1.39	1.49	1.08	1.56	1.28	1.33	1.37	1.62	1.72	1.66
6.5....	0.86	0.66	0.94	1.24	1.54	1.62	1.45	1.48	1.04	1.53	1.22	1.24	1.35	1.63	1.73	1.69
7.0....	0.86	0.68	0.96	1.27	1.63	1.68	1.50	1.50	1.04	1.52	1.19	1.22	1.34	1.63	1.75	1.72
7.5....	0.83	0.70	0.99	1.36	1.68	1.69	1.54	1.52	1.05	1.53	1.14	1.21	1.29	1.63	1.76	1.75
8.0....	0.83	0.72	1.00	1.35	1.84	1.73	1.66	1.54	1.06	1.54	1.12	1.13	1.28	1.62	1.75	1.77
8.5....	0.81	0.73	1.02	1.36	1.96	1.80	1.73	1.63	1.08	1.56	1.11	1.13	1.22	1.60	1.73	1.78
9.0....	0.79	0.72	1.00	1.37	2.05	1.82	1.81	1.69	1.19	1.60	1.11	1.12	1.22	1.58	1.70	1.78
9.5....	0.75	0.68	1.01	1.37	2.13	1.99	1.88	1.78	1.23	1.62	1.11	1.12	1.20	1.56	1.65	1.77
10.0...	0.73	0.63	0.96	1.39	2.25	2.01	1.92	1.83	1.32	1.66	1.12	1.11	1.19	1.50	1.62	1.77
10.5....	0.70	0.59	0.98	1.38	2.27	2.02	1.97	1.88	1.37	1.77	1.14	1.13	1.14	1.49	1.63	1.73
11.0....	0.66	0.53	0.90	1.29	2.31	2.03	2.04	1.96	1.42	1.80	1.19	1.16	1.16	1.44	1.59	1.70
11.5....	0.61	0.42	0.90	1.21	2.33	2.04	2.06	1.98	1.47	1.82	1.24	1.19	1.18	1.45	1.57	1.65
Noon ..	0.60	0.43	0.77	1.16	2.33	2.03	2.05	2.00	1.53	1.84	1.28	1.22	1.18	1.46	1.56	1.62
12.5....	0.55	0.41	0.74	1.08	2.31	1.98	2.08	2.00	1.60	1.92	1.30	1.24	1.19	1.44	1.57	1.60
13.0....	0.55	0.40	0.67	1.02	2.27	1.91	2.05	2.00	1.62	1.98	1.33	1.31	1.20	1.44	1.56	1.57
13.5....	0.54	0.38	0.62	0.98	2.24	1.84	2.05	1.97	1.65	2.04	1.37	1.34	1.25	1.45	1.54	1.55
14.0....	0.54	0.34	0.58	0.97	2.17	1.78	1.98	1.97	1.65	2.04	1.40	1.37	1.28	1.48	1.57	1.52
14.5....	0.55	0.35	0.61	0.85	2.14	1.70	1.92	1.88	1.65	2.04	1.37	1.39	1.30	1.50	1.57	1.51
15.0....	0.56	0.35	0.62	0.80	2.05	1.60	1.82	1.80	1.63	2.01	1.37	1.42	1.30	1.51	1.58	1.49
15.5....	0.60	0.36	0.61	0.79	2.03	1.49	1.77	1.72	1.63	1.98	1.37	1.44	1.30	1.51	1.59	1.49
16.0....	0.60	0.40	0.63	0.76	2.02	1.40	1.69	1.63	1.60	1.89	1.34	1.44	1.31	1.53	1.6.	1.52
16.5....	0.64	0.43	0.64	0.84	2.00	1.36	1.62	1.55	1.51	1.84	1.30	1.43	1.33	1.58	1.61	1.53
17.0....	0.62	0.44	0.72	0.81	1.98	1.28	1.57	1.47	1.41	1.71	1.21	1.40	1.34	1.59	1.64	1.53
17.5....	0.66	0.47	0.72	0.81	1.97	1.23	1.55	1.39	1.36	1.68	1.18	1.35	1.32	1.62	1.66	1.54
18.0....	0.67	0.50	0.76	0.86	1.98	1.24	1.51	1.34	1.27	1.62	1.11	1.33	1.32	1.62	1.68	1.58
18.5....	0.64	0.56	0.82	0.90	1.98	1.24	1.50	1.29	1.23	1.59	1.07	1.31	1.30	1.62	1.69	1.61
19.0....	0.69	0.65	0.87	0.94	1.99	1.20	1.49	1.27	1.23	1.54	1.03	1.25	1.28	1.60	1.69	1.63
19.5....	0.65	0.66	0.94	1.03	2.00	1.32	1.51	1.25	1.24	1.51	1.00	1.22	1.27	1.60	1.70	1.63
20.0....	0.64	0.70	0.95	1.05	2.04	1.34	1.54	1.24	1.25	1.48	1.95	1.17	1.24	1.59	1.69	1.63
20.5....	0.61	0.71	1.02	1.06	2.06	1.40	1.58	1.27	1.29	1.44	1.91	1.15	1.24	1.54	1.68	1.65
21.0....	0.58	0.71	1.04	1.12	2.14	1.44	1.62	1.28	1.30	1.42	1.93	1.12	1.22	1.54	1.63	1.66
21.5....	0.52	0.71	1.08	1.18	2.19	1.50	1.67	1.31	1.32	1.30	1.93	1.12	1.21	1.53	1.62	1.65
22.0....	0.46	0.63	1.09	1.20	2.20	1.53	1.73	1.35	1.35	1.38	1.96	1.10	1.19	1.52	1.58	1.63
22.5....	0.50	0.63	1.10	1.23	2.21	1.55	1.82	1.42	1.44	1.40	1.96	1.09	1.18	1.48	1.54	1.60
23.0....	0.44	0.65	1.04	1.25	2.20	1.58	1.84	1.46	1.48	1.41	1.98	1.07	1.19	1.47	1.46	1.59
23.5...	0.43	0.66	1.05	1.24	2.19	1.60	1.86	1.49	1.52	1.43	1.01	1.09	1.20	1.45	1.43	1.55
Midn't.	0.43	0.67	1.02	1.28	2.12	1.60	1.87	1.50	1.53	1.44	1.06	1.12	1.20	1.42	1.41	1.52

Hour.	May 17.	May 18.	May 19.	May 20.	May 21.	May 22.	May 23.	May 24.	May 25.	May 26.	May 27.	May 28.	May 29.	May 30.	May 31.	June 1.
0.5....	1.49	1.57	1.40	1.39	1.50	1.33	1.69	1.98	1.93	1.84	1.64	1.59	0.98	1.02	1.33	1.25
1.0....	1.48	1.53	1.36	1.34	1.47	1.31	1.68	1.98	1.98	1.82	1.68	1.63	1.00	1.09	1.38	1.24
1.5....	1.46	1.48	1.32	1.28	1.44	1.28	1.64	2.01	1.95	1.82	1.70	1.66	1.02	1.15	1.40	1.23
2.0....	1.46	1.41	1.29	1.27	1.40	1.24	1.59	2.06	1.94	1.81	1.75	1.68	1.01	1.21	1.44	1.23
2.5....	1.46	1.41	1.25	1.24	1.35	1.20	1.57	2.02	1.92	1.82	1.76	1.72	1.02	1.30	1.45	1.30
3.0....	1.46	1.39	1.23	1.22	1.31	1.17	1.53	1.97	1.91	1.82	1.74	1.74	1.02	1.36	1.50	1.30
3.5....	1.50	1.37	1.21	1.20	1.29	1.11	1.50	1.90	1.87	1.80	1.74	1.75	1.00	1.44	1.54	1.33
4.0....	1.53	1.38	1.20	1.20	1.25	1.10	1.48	1.91	1.77	1.77	1.73	1.73	0.99	1.48	1.56	1.35
4.5....	1.55	1.40	1.20	1.18	1.22	1.06	1.43	1.82	1.76	1.70	1.71	1.74	0.95	1.50	1.60	1.42
5.0....	1.62	1.43	1.22	1.20	1.23	1.05	1.40	1.82	1.70	1.66	1.68	1.70	0.90	1.52	1.66	1.46
5.5....	1.63	1.49	1.25	1.23	1.24	1.05	1.41	1.80	1.65	1.64	1.63	1.72	0.86	1.58	1.68	1.48
6.0....	1.69	1.53	1.31	1.27	1.27	1.04	1.41	1.82	1.61	1.60	1.62	1.71	0.84	1.58	1.70	1.48
6.5....	1.73	1.58	1.39	1.34	1.30	1.08	1.42	1.82	1.60	1.54	1.57	1.66	0.80	1.58	1.71	1.59
7.0....	1.75	1.63	1.42	1.40	1.33	1.12	1.44	1.82	1.60	1.50	1.51	1.60	0.75	1.59	1.75	1.63
7.5....	1.77	1.65	1.47	1.46	1.39	1.15	1.47	1.83	1.60	1.48	1.50	1.60	0.72	1.60	1.77	1.67
8.0....	1.82	1.70	1.50	1.52	1.43	1.22	1.56	1.88	1.61	1.49	1.49	1.58	0.68	1.61	1.74	1.62
8.5....	1.82	1.72	1.56	1.57	1.49	1.30	1.63	2.00	1.67	1.49	1.48	1.55	0.65	1.58	1.72	1.63
9.0....	1.84	1.73	1.60	1.63	1.54	1.36	1.71	2.04	1.70	1.48	1.47	1.52	0.63	1.57	1.69	1.58
9.5....	1.83	1.72	1.61	1.68	1.62	1.41	1.78	2.08	1.78	1.50	1.48	1.51	0.60	1.49	1.64	1.54
10.0....	1.83	1.72	1.64	1.70	1.65	1.47	1.81	2.13	1.82	1.54	1.49	1.48	0.58	1.42	1.61	1.53
10.5 ...	1.78	1.68	1.63	1.72	1.68	1.52	1.88	2.20	1.90	1.60	1.56	1.49	0.54	1.42	1.59	1.49
11.0....	1.78	1.68	1.62	1.73	1.69	1.55	1.92	2.20	1.93	1.65	1.60	1.50	0.53	1.40	1.56	1.44
11.5....	1.76	1.63	1.60	1.73	1.70	1.56	2.02	2.24	1.98	1.71	1.65	1.51	0.51	1.38	1.55	1.50
Noon ..	1.70	1.57	1.55	1.72	1.68	1.58	2.04	2.30	2.02	1.73	1.69	1.54	0.53	1.40	1.48	1.47
12.5....	1.65	1.55	1.52	1.70	1.65	1.56	2.02	2.31	2.05	1.80	1.72	1.57	0.53	1.41	1.47	1.42
13.0....	1.67	1.51	1.47	1.65	1.60	1.54	2.04	2.31	2.08	1.83	1.75	1.59	0.54	1.42	1.49	1.38
13.5....	1.62	1.43	1.43	1.60	1.53	1.52	2.03	2.35	2.08	1.83	1.78	1.62	0.60	1.43	1.45	1.43
14.0....	1.59	1.39	1.37	1.54	1.47	1.50	2.00	2.27	2.08	1.87	1.80	1.63	0.61	1.45	1.44	1.36
14.5....	1.55	1.37	1.33	1.50	1.46	1.41	1.93	2.27	2.08	1.84	1.85	1.63	0.67	1.49	1.44	1.38
15.0....	1.59	1.34	1.30	1.41	1.30	1.34	1.88	2.17	2.07	1.85	1.84	1.62	0.71	1.48	1.44	1.34
15.5....	1.59	1.34	1.23	1.38	1.25	1.32	1.82	2.14	2.07	1.85	1.82	1.62	0.75	1.50	1.47	1.36
16.0....	1.56	1.32	1.21	1.34	1.15	1.23	1.77	2.05	1.95	1.78	1.82	1.64	0.78	1.55	1.49	1.36
16.5....	1.59	1.32	1.20	1.29	1.11	1.22	1.70	1.97	1.88	1.74	1.80	1.61	0.82	1.53	1.52	1.41
17.0....	1.61	1.33	1.21	1.25	1.08	1.18	1.69	1.89	1.86	1.69	1.75	1.58	0.83	1.57	1.52	1.37
17.5....	1.67	1.33	1.24	1.26	1.06	1.19	1.63	1.83	1.81	1.62	1.70	1.54	0.84	1.60	1.53	1.45
18.0....	1.69	1.38	1.26	1.27	1.05	1.18	1.55	1.77	1.74	1.57	1.65	1.51	0.87	1.60	1.54	1.50
18.5 ...	1.67	1.40	1.28	1.29	1.05	1.17	1.51	1.71	1.70	1.51	1.61	1.46	0.85	1.61	1.54	1.45
19.0....	1.70	1.43	1.32	1.32	1.07	1.17	1.51	1.71	1.66	1.49	1.57	1.38	0.84	1.57	1.55	1.49
19.5....	1.72	1.47	1.36	1.36	1.08	1.21	1.52	1.70	1.65	1.44	1.53	1.34	0.82	1.53	1.53	1.53
20.0....	1.78	1.54	1.41	1.41	1.11	1.29	1.53	1.72	1.62	1.42	1.49	1.34	0.83	1.59	1.53	1.53
20.5 ..	1.75	1.52	1.44	1.45	1.13	1.32	1.54	1.73	1.62	1.41	1.46	1.19	0.82	1.49	1.52	1.53
21.0....	1.73	1.57	1.48	1.50	1.17	1.39	1.60	1.74	1.62	1.42	1.46	1.14	0.81	1.44	1.48	1.53
21.5....	1.75	1.57	1.49	1.51	1.21	1.46	1.67	1.79	1.65	1.43	1.42	1.10	0.81	1.42	1.41	1.49
22.0....	1.71	1.57	1.49	1.54	1.25	1.53	1.74	1.80	1.68	1.45	1.42	1.06	0.80	1.36	1.40	1.45
22.5....	1.70	1.54	1.48	1.55	1.30	1.55	1.78	1.84	1.70	1.49	1.44	1.03	0.80	1.33	1.37	1.36
23.0....	1.70	1.52	1.46	1.54	1.31	1.58	1.86	1.88	1.73	1.50	1.45	1.02	0.84	1.31	1.36	1.32
23.5....	1.65	1.46	1.45	1.54	1.33	1.60	1.89	1.89	1.75	1.52	1.48	1.01	0.87	1.29	1.31	1.30
Midn't	1.62	1.41	1.43	1.52	1.33	1.65	1.91	1.91	1.80	1.58	1.53	1.00	0.92	1.30	1.29	1.29

Tidal observations at the United States International Polar Station, Uglaamie, Alaska, **1883—Cont'd.**

[Half-hourly readings made on local mean time. Heights expressed in feet. Increasing numbers denote rising tide.]

Hour.	June 2.	June 3.	June 4.	June 5.	June 6.	June 7.	June 8.	June 9.	June 10.	June 11.	June 12.	June 13.	June 14.	June 15.	June 16.	June 17.
0.5....	1.26	1.60	1.51	1.44	1.54	1.56	1.47	1.38	1.46	1.00	1.02	1.17	0.84	1.60	1.50	1.17
1.0....	1.24	1.55	1.50	1.41	1.52	1.59	1.50	1.47	1.50	1.05	1.06	1.19	0.84	1.60	1.46	1.12
1.5....	1.23	1.59	1.45	1.37	1.49	1.57	1.50	1.50	1.53	1.09	1.11	1.22	0.87	1.60	1.45	1.10
2.0....	1.21	1.53	1.38	1.32	1.45	1.52	1.52	1.54	1.57	1.12	1.18	1.26	0.91	1.59	1.44	1.07
2.5....	1.20	1.50	1.32	1.25	1.38	1.47	1.49	1.57	1.61	1.14	1.21	1.29	0.97	1.61	1.44	1.07
3.0....	1.18	1.46	1.30	1.20	1.35	1.43	1.46	1.55	1.63	1.17	1.22	1.34	1.00	1.64	1.45	1.08
3.5....	1.22	1.47	1.26	1.13	1.30	1.36	1.41	1.52	1.64	1.17	1.27	1.35	1.05	1.68	1.48	1.10
4.0....	1.29	1.46	1.27	1.06	1.24	1.30	1.34	1.47	1.63	1.16	1.34	1.37	1.10	1.69	1.50	1.14
4.5....	1.29	1.50	1.27	1.06	1.20	1.25	1.31	1.42	1.60	1.10	1.34	1.37	1.18	1.74	1.56	1.19
5.0....	1.39	1.56	1.26	1.08	1.19	1.24	1.25	1.40	1.55	1.08	1.35	1.38	1.21	1.77	1.59	1.20
5.5....	1.41	1.58	1.32	1.09	1.18	1.18	1.20	1.38	1.53	1.05	1.35	1.39	1.28	1.79	1.64	1.25
6.0....	1.51	1.67	1.34	1.14	1.18	1.15	1.15	1.34	1.49	1.02	1.35	1.39	1.31	1.81	1.67	1.30
6.5....	1.55	1.72	1.48	1.20	1.20	1.14	1.13	1.27	1.47	0.99	1.34	1.38	1.37	1.83	1.70	1.33
7.0....	1.66	1.76	1.50	1.24	1.24	1.14	1.11	1.27	1.38	0.94	1.33	1.36	1.41	1.83	1.73	1.37
7.5....	1.68	1.82	1.57	1.33	1.30	1.14	1.10	1.25	1.34	0.87	1.31	1.32	1.45	1.85	1.74	1.40
8.0....	1.71	1.86	1.63	1.36	1.31	1.18	1.10	1.26	1.31	0.84	1.30	1.30	1.48	1.86	1.76	1.48
8.5....	1.75	1.88	1.70	1.48	1.50	1.22	1.12	1.27	1.28	0.84	1.25	1.22	1.48	1.86	1.77	1.48
9.0....	1.96	1.93	1.74	1.56	1.55	1.28	1.19	1.27	1.27	0.80	1.22	1.18	1.49	1.87	1.76	1.49
9.5....	1.82	1.97	1.81	1.65	1.66	1.36	1.20	1.36	1.22	0.80	1.21	1.14	1.50	1.85	1.77	1.50
10.0....	1.80	1.98	1.87	1.70	1.73	1.42	1.27	1.39	1.23	0.77	1.21	1.12	1.52	1.83	1.78	1.50
10.5....	1.79	1.98	1.86	1.78	1.80	1.51	1.32	1.43	1.24	0.78	1.21	1.08	1.52	1.80	1.75	1.50
11.0....	1.77	1.92	1.95	1.81	1.85	1.57	1.38	1.47	1.29	0.78	1.21	1.04	1.53	1.75	1.72	1.49
11.5....	1.70	1.91	1.90	1.83	1.86	1.63	1.44	1.51	1.30	0.80	1.20	1.04	1.55	1.71	1.64	1.42
Noon ..	1.65	1.82	1.83	1.86	1.91	1.68	1.49	1.57	1.28	0.80	1.23	1.02	1.56	1.68	1.59	1.36
12.5....	1.65	1.81	1.80	1.82	1.93	1.71	1.51	1.63	1.34	0.82	1.23	1.00	1.56	1.65	1.52	1.32
13.0....	1.64	1.72	1.73	1.81	1.91	1.73	1.53	1.67	1.35	1.15	1.24	1.00	1.56	1.64	1.48	1.25
13.5....	1.48	1.64	1.63	1.78	1.90	1.74	1.58	1.68	1.37	1.18	1.30	1.02	1.58	1.60	1.42	1.20
14.0....	1.45	1.59	1.58	1.73	1.87	1.74	1.58	1.70	1.39	1.22	1.31	1.02	1.60	1.58	1.37	1.13
14.5....	1.40	1.54	1.49	1.68	1.82	1.71	1.54	1.73	1.39	1.24	1.36	1.02	1.64	1.57	1.35	1.08
15.0....	1.36	1.50	1.41	1.60	1.72	1.68	1.52	1.73	1.40	1.27	1.40	1.05	1.65	1.57	1.34	1.05
15.5....	1.35	1.44	1.34	1.55	1.68	1.63	1.49	1.70	1.40	1.27	1.42	1.05	1.69	1.57	1.31	1.00
16.0....	1.35	1.39	1.26	1.49	1.60	1.56	1.45	1.67	1.38	1.27	1.43	1.07	1.72	1.58	1.20	0.98
16.5....	1.34	1.30	1.22	1.42	1.54	1.46	1.36	1.65	1.34	1.27	1.46	1.08	1.75	1.59	1.29	0.97
17.0....	1.44	1.37	1.19	1.36	1.48	1.31	1.31	1.59	1.31	1.27	1.48	1.09	1.77	1.59	1.28	0.95
17.5....	1.47	1.34	1.15	1.33	1.43	1.36	1.26	1.53	1.24	1.25	1.46	1.10	1.77	1.59	1.28	0.96
18.0....	1.49	1.35	1.17	1.30	1.37	1.31	1.21	1.50	1.20	1.20	1.44	1.10	1.80	1.60	1.28	0.96
18.5....	1.53	1.41	1.15	1.30	1.34	1.27	1.15	1.45	1.13	1.16	1.43	1.10	1.82	1.61	1.29	0.99
19.0....	1.55	1.38	1.17	1.29	1.32	1.23	1.10	1.40	1.10	1.10	1.40	1.10	1.82	1.62	1.31	1.00
19.5....	1.59	1.42	1.20	1.31	1.31	1.21	1.09	1.37	1.06	1.10	1.37	1.10	1.82	1.64	1.32	1.01
20.0...	1.68	1.51	1.23	1.33	1.30	1.20	1.07	1.34	1.02	1.05	1.34	1.06	1.82	1.65	1.33	1.02
20.5....	1.68	1.54	1.29	1.37	1.33	1.20	1.06	1.31	1.00	0.99	1.30	1.03	1.80	1.65	1.35	1.03
21.0....	1.70	1.55	1.35	1.43	1.35	1.22	1.09	1.31	0.95	0.95	1.25	1.00	1.77	1.65	1.34	1.05
21.5....	1.73	1.61	1.39	1.46	1.37	1.26	1.11	1.31	0.92	0.95	1.22	0.95	1.75	1.64	1.32	1.07
22.0....	1.72	1.59	1.42	1.49	1.43	1.30	1.15	1.30	0.92	0.95	1.19	0.92	1.71	1.53	1.30	1.08
22.5....	1.74	1.63	1.44	1.52	1.47	1.35	1.21	1.32	0.92	0.95	1.16	0.90	1.68	1.59	1.29	1.08
23.0....	1.70	1.60	1.46	1.56	1.50	1.40	1.25	1.35	0.92	0.95	1.16	0.88	1.65	1.58	1.27	1.05
23.5....	1.68	1.59	1.46	1.57	1.53	1.44	1.28	1.37	0.93	0.95	1.15	0.86	1.64	1.55	1.24	1.03
Midn't.	1.64	1.53	1.48	1.57	1.55	1.45	1.30	1.41	0.96	0.98	1.16	0.85	1.62	1.53	1.20	0.99

PART VIII.

MISCELLANEOUS OBSERVATIONS.

MISCELLANEOUS OBSERVATIONS.

I. A REPORT ON THE GROUND CURRENT OBSERVATIONS MADE AT UGLAAMIE, ALASKA.

By A. L. McRae, *Private Signal Corps, U. S. Army.*

The observations were commenced August 11, 1882, and were continued at hourly intervals until November 14, 1882.

The lines were insulated wires one thousand yards in length. One was in the magnetic meridian, and the other at right angles to it.

The terminals were copper plates 2 (1?) feet square. The N., S. and W. terminals were in water; the E. in land.

Compass galvanoscopes were used to measure the strength of the current.

As the observations possess especial interest because they were made in such a high latitude, several deflections of the galvanoscope have been reduced to something like absolute measure by comparison with a galvanometer in the laboratory.

Unfortunately the electromotive force due to the terminals and the resistance of the complete circuit were not determined, so that their effects cannot be accurately estimated.

But from an experiment with copper plates one square foot in area it was found that the electromotive force under the most favorable circumstances, when both plates were in sea is less than .05 volt, and when one plate was in sea and the other in land is less than .2 volt.

Mr. Wild has found that the electromotive force due to copper plates buried in the earth may reach .05 volt. We can therefore safely assume that the electromotive force between the plates used in the observations was not greater than .2 volts.

Mr. Wild has already found that the resistance of the ground between copper plates one square meter in area buried two meters below the surface and one kilometer apart was between thirty and sixty ohms. By comparison the resistance of the ground at Uglaamie would be between eighty and one hundred and sixty ohms. But since all the plates except one were in water it is probable the resistance was much less.

If we assume that the resistance of the line and the ground was so small compared to the resistance of the galvanoscope as to be inappreciable, we find that at times there was an electromotive force of .8 volt acting. Deducting the .2 due to the terminals we have .6 volt remaining, which must be due to a ground current.

The difficulties mentioned above of eliminating everything from the true ground current prevent a careful study of the observations; but by plotting the total current it appears that:

1. The current is generally steady in strength and direction for several days at a time. There are periods when there is no current. There are also rare moments when the intensity of the current changes rapidly. The direction of the current usually changes slowly.

2. The north and south component is the stronger.

3. The general direction of the current is from the first (NW.) to the third (SE.) quadrant, and not from the second (NE.) to the fourth (SW.) as in Europe.

The general direction varied from due west to a little east of north.

In connection with auroras it is noticed that:

On September 4 a weak variable current suddenly changed to a strong north by east currrent six or seven hours before an aurora was observed. This strong current continued for several days and auroras on the 6th, 12th, and 15th did not seem to affect its intensity or direction.

On September 25 there was quite a disturbance of the needle five hours in advance of the aurora. Just after the appearance of the aurora the current began to weaken and shifted from north to northwest.

On September 26 there was an increased current one hour in advance of the aurora.

On October 8 a westerly current changed to a little south of west one hour in advance of the aurora.

At other times auroras occurred when there was a strong or moderately strong current without apparently having the slightest effect.

NOTE ON AN IMPROVED METHOD FOR OBSERVING GROUND CURRENTS.

Heretofore the best method for observing ground currents has been that of two lines, one in the magnetic meridan and one at right angles to it. By this method the difference of potential between N. and S. and between E. and W. giving the components of the current in these two directions can be obtained. This, however, is not sufficient to enable us to determine the exact direction and strength of the current.

Now, if the difference of potential between N. and W. is taken at the same time as that of N. and S. and of E. and N., there will be all the necessary data to plat the equipotential surfaces, from which the direction of the current can be obtained.

Then, knowing distance between the equipotential surfaces, we can get the variation of the potential with respect to the distance and hence the strength of the current.

The lines need not be at right angles, nor is it necessary that one should be in the magnetic meridian.

II. THICKNESS OF THE ICE.

The thickness of the ice in the lagoon close to the station, and in the still water of the sea near shore, was measured at intervals of about a month during the winter.

The following table presents the results of these observations:

Date.	Thickness.		Remarks.
LAGOON ICE.			
	Feet.	*Inches.*	
1881.			
November 1	1	0¼	
1882.			
January 1	3	9	
February 27	5	1¼	
April 1	6	....	
May 4	6	2¼	
SEA ICE.			
December 4		29	Sea ice.
1883.			
January 3	3	8	Measured about 200 yards from shore.
February 2	4	2	
March 7	5	2	
April 2	4	11	
May 2	5	0¼	
July 1	5	....	

NOTE.—In the meteorological observations, the readings of the barometer are not reduced to the sea-level.

INDEX.

N.

O.

P.

R.

S.

T.

U.