

MONTHLY WEATHER REVIEW.

VOL. XIII.

WASHINGTON CITY, FEBRUARY, 1885.

No. 2.

INTRODUCTION.

This REVIEW contains a general summary of the meteorological conditions which prevailed over the United States and Canada during February, 1885, based upon the reports from the regular and voluntary observers of the Signal Service and from co-operating state weather services.

Descriptions of the storms which occurred over the north Atlantic ocean during the month are also given, and their approximate paths shown on chart i.

The paths of the centres of eleven atmospheric depressions are shown on chart i., and are described under "Areas of low barometer"; the average number of depressions for February during the last eleven years is twelve. The low area described as number viii. was of unusual severity along the Atlantic coast north of Virginia, and was accompanied by remarkably high tides, which, at numerous points are reported to have been the highest known for many years.

The month was colder than the average in all districts east of the Rocky mountains. In the lake region and central valleys the mean temperatures averaged from 10° to 15° below the normal. In the central Mississippi and Ohio valleys, in the Gulf states, and on the Atlantic coast south of New England the mean temperatures were the lowest that have occurred since the establishment of the Signal Service stations. The minimum temperatures occurring on the 10th and 11th during the prevalence of high-area number iii., were remarkably low, and in numerous instances they are reported to have been the lowest recorded in February during the period covered by Signal Service observations.

The precipitation was below the average in nearly all parts of the country, the exceptions being the Florida peninsula, Rio Grande valley, the northern and middle plateau districts, and a few isolated localities.

Very severe snow-storms occurred in the northern and western districts during the passage of low-areas v., vii., and viii. Railroads were blockaded and all kinds of travel interrupted.

In the preparation of this REVIEW the following data, received up to March 20th, 1885, have been used, viz.: the regular tri-daily weather-charts, containing data of simultaneous observations taken at one hundred and twenty-nine Signal Service stations and seventeen Canadian stations, as telegraphed to this office; one hundred and fifty-seven monthly journals and one hundred and sixty-two monthly means from the former, and twenty monthly means from the latter; two hundred and seventy-six monthly registers from voluntary observers; forty-six monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs, furnished by the publishers of "The New York Maritime

Register;" monthly reports from the New England Meteorological Society, and from the local weather services of Alabama, Georgia, Illinois, Indiana, Louisiana, Minnesota, Missouri, Nebraska, Ohio, and Tennessee, and of the Central Pacific Railway Company; trustworthy newspaper extracts; and special reports.

ATMOSPHERIC PRESSURE.

[Expressed in inches and hundredths.]

The distribution of mean atmospheric pressure for February, 1885, determined from the tri-daily telegraphic observations of the Signal Service, is shown by the isobaremetric lines on chart ii.

The regions of greatest mean pressure are inclosed by the the isobar for 30.2, and comprise parts of the northern and middle plateau districts, and a small area in northeastern Montana. The mean pressure is least over New England and the Canadian maritime provinces, where the barometric means decrease to 29.85 and below, the lowest, 29.81, being reported from Sidney, Nova Scotia. The isobar for 30.1 extends from Manitoba southward to the lower Rio Grande valley, and thence northwestward near the Mexican boundary to the coast of southern California; in the districts to the east of it the barometric means are lower and to the northward and westward they are higher, except in northern Washington Territory where the mean pressure falls to 30.01 at Tatoosh Island.

As compared with the mean pressure for the preceding month there has been a decrease in all parts of the United States, except at Cape Mendocino, California, and Fort Canby, Washington Territory, where a slight increase has occurred. In the Rocky mountain regions and in the northern districts to the eastward the decrease varies from .01 to .10; in the middle Atlantic and Gulf states, lower Missouri, central Mississippi, and Ohio valleys, and in Tennessee, from .10 to .15; in the south Atlantic states from .15 to .18.

The departures from the normal pressure for February are given in the table of miscellaneous meteorological data; they are also exhibited on chart iv. by lines connecting stations of equal departure. A very slight excess is shown in the central Rocky mountain districts, in northern California and southern Oregon, the departures not exceeding .03. In all other districts the mean pressure is below the normal, the deficiencies ranging from .01 to .07 west of the Mississippi; the deficiencies are most marked along the Atlantic coast, where they vary from .15 to .20.

BAROMETRIC RANGES.

The monthly ranges at the Signal Service stations are given in the table of miscellaneous meteorological data; they were greatest in the lower lake region, middle Atlantic states and New England, where they varied from 1.30 to 1.44, the greatest being reported from Erie, Pennsylvania; the monthly ranges were least in southern California, Arizona, and southern Florida, the smallest, 0.46, occurring at Key West, Florida, and Los Angeles, California.

AREAS OF HIGH BAROMETER.

During the month five areas of high barometer passed over the districts east of the Rocky mountains and one from the Pacific coast to the middle plateau district, where a well-defined area of high pressure was central at the last report of the

month. They were generally accompanied by a decided fall in temperature.

I.—The afternoon report of the 1st showed an area of high barometer extending from the upper lakes southwesterly over the upper Mississippi and Missouri valleys, the barometer having risen over this area from .20 to .50, and the temperature having fallen from 20° to 30°. This increase in pressure extended rapidly to the east and south during the 2d, the change in pressure ranging from .30 in southern to .60 in northern districts. During the 1st the temperature fell from 10° to 24° in the lake region and upper Mississippi valley, from 13° to 21° in Tennessee and the Ohio valley, and generally about 10° in the middle Atlantic states, except at Washington City, where it fell 30°. On the 2d the temperature fell from 11° to 36° in New England and from 4° to 11° in the south Atlantic states.

II.—During the 3d the barometer rose .15 to .31 in Manitoba. On the 4th the increase in pressure extended east to Lake Erie. On the 5th there was a decided rise in the barometer in all districts east of the Mississippi river, except in the south Atlantic states; in this district the rise occurred the next day, the change in pressure varying from .50 to .70. During this day (the 6th) the pressure increased decidedly in the middle Atlantic and New England states, with a still further rise in New England on the 7th. The centre of this area of high barometer moved from Manitoba (on the 4th) north of the lake region to the New England coast, which it reached during the night of the 7th. Accompanying the rise in the barometer a cold wave appeared in the extreme northwest on the 3d. On the 4th it extended over the lake region, with a fall in temperature of 8° to 18°, and as far south as Tennessee, where the temperature fell from 9° to 16°. On the 5th there was a fall of 20° to 30° in the lake region and Ohio valley, 13° to 17° in the Mississippi valley, and from 5° to 14° in Tennessee and the Gulf states. The minimum temperature occurred in the districts on the Atlantic coast on the morning of the 7th.

III.—This area appeared in the Northwest Territory on the 6th, where the barometer remained highest during the 7th, 8th, and 9th. During the 10th the centre moved southeasterly and at midnight was in the west Gulf states. During the next day the centre moved easterly and, at midnight of the 11th, the barometer was high on the south and middle Atlantic coasts. During the 7th the increase in pressure extended over the upper Mississippi and Missouri valleys, and, on the 8th, while continuing to rise in the extreme northwest, the pressure increased from .21 to .58 over the lower lakes. During the night of the 8th the wave of increasing pressure was divided by the advance of low area number v. from the southwest, so that, while the morning report of the 9th showed a decided rise west of the Missouri valley and New England and the middle Atlantic states, the barometer had fallen from .30 to .40 in the Ohio valley and Tennessee, the fall extending northward over lakes Michigan and Erie, and southward over the east Gulf and south Atlantic states. The rising barometer in New England and the middle Atlantic states was followed during the day by a very decided fall as low area number v. advanced. In the rear of this depression the barometer rose rapidly, the increase in pressure reaching the Atlantic coast on the 10th and continuing until the morning of the 12th. Accompanying the high barometer a cold wave appeared in the Northwest Territory and Montana on the 6th. During the 7th it extended to the upper Mississippi and Missouri valleys and southwesterly to Texas. On the 8th the temperature fell decidedly in all districts except on the Atlantic coast and in the east Gulf states. The eastward movement of the cold wave was checked during the 9th by low area number v., but, on this day, the temperature fell from 10° to 21° in the upper lake region, Tennessee, and the Ohio valley, and east Gulf states; from 25° to 40° in the west Gulf states; and from 14° to 27° in the upper Mississippi and Missouri valleys. The cold wave reached the Atlantic coast on the 10th, the temperature during the day falling 20° to 30° from Florida to Maine, and 10° to 40° in the lake

region. The minimum temperature occurred in the lake region, Tennessee and the Ohio valley, and the Gulf states on the morning of the 11th and in the districts on the Atlantic coast on the morning of the 12th.

IV.—This area of high barometer appeared central in Montana on the 11th. During the 12th it moved into the Mississippi valley, thence to the east and north to the Saint Lawrence valley. On the 14th the centre of high pressure was over the Gulf of Saint Lawrence, remaining there during the 15th. On the 11th the rise in the barometer extended from the Northwest Territory south to Colorado. On the 12th the pressure increased over the lake region, the upper Mississippi valley, and over the Canadian Maritime Provinces on the 13th. A fall in temperature of 5° to 10° in Montana, extending into the northern portion of the Missouri valley, was reported on the 11th, and a fall of 4° to 12° in the upper lake region and 15° to 25° in the upper Mississippi valley on the 12th. The cold wave reached the Atlantic coast on the 13th, causing a fall of 5° to 10°, the minimum generally occurring on the morning of the 14th.

V.—This high area appeared in Montana on the 14th, the increase in pressure during the day extending over the Missouri valley, Wyoming, and Colorado. The pressure remained highest in the northwest during the 15th, the increase in pressure extending southward to the Gulf, the rise in Texas during the day being from .30 to .40. This marked rise in the barometer, extending during the following day over the east Gulf and south Atlantic states, transferred the centre of high pressure to northern Florida on the 16th. The barometer remained high on the south Atlantic coast during the 17th, the pressure increasing over the Atlantic coast districts from .10 to .70. A cold wave appeared on the 14th over the northern slope, and during the day extended over the middle and southern slopes of the Rocky mountains; during the 15th it moved as far east as Lake Michigan and southward to the Gulf, the temperature falling from 14° to 21° in the upper Mississippi and Ohio valleys. It reached the middle and south Atlantic coast the next day, the greatest change being in the lake region, where the temperature fell from 12° to 43°. The minimum temperature occurred in the middle and south Atlantic states and in the lake region on the morning of the 17th, and in New England on the 18th.

VI.—This high area appeared in the Saskatchewan valley on the 17th, where it remained during the 17th, 18th and 19th. On the morning and afternoon the area of highest barometer was over the Missouri, and southern portion of the Mississippi valleys; by midnight, however, a change in pressure caused the centre of high pressure to again appear in the Saskatchewan region. It moved into the upper lake region on the 22d, and on the 23d was over lake Erie; it reached the middle Atlantic coast on the 24th. A cold wave appeared in Montana on the 17th and during the day extended south over Wyoming, Colorado, and Nebraska, the temperature falling from 12° to 32°. On the 18th the cold wave reached the Gulf states, the temperature falling from 8° to 22° in the west, and from 10° to 26° in the east Gulf states, and from 20° to 27° in Tennessee. The temperature fell from 6° to 10° in the south Atlantic states on the 19th, and from 7° to 11° on the 20th, and on the same day from 8° to 15° in the middle Atlantic states. The minimum temperature occurred in the Gulf states on the morning of the 19th, and in the south and middle Atlantic states on the morning of the 21st.

VII.—This high area advanced from the Pacific coast on the 24th, and on the morning of the 25th it was central in Utah, the barometer reading highest at Salt Lake City, where it remained highest until the morning of the 27th, when the greatest pressure was at Portland, Oregon, with a ridge of comparatively high barometric readings from that point southeasterly to the Gulf of Mexico. On the 27th the area of highest pressure was over Idaho, and during the 28th it moved southerly and at the last report of the month was again central near Salt Lake City. A cold wave appeared over the north Pacific coast

region on the 26th, the temperature falling from 9° to 13°. On the 27th it had extended eastward to Dakota and to the south-east over Utah, and on the following day caused a slight fall in temperature in the Missouri valley, and from 11° to 18° in Wyoming, Colorado, and northern Texas, and from 13° to 22° in Dakota and Minnesota.

AREAS OF LOW BAROMETER.

On chart i. are traced the paths of the centres of eleven areas low barometer, which are herein described.

The following table shows the latitude and longitude in which the centre of each area was first and last located, and the average hourly movement.

Areas of low barometer.	First observed.		Last observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
No. I.....	44 00	77 00	47 07	62 00	26.0
II.....	49 00	99 00	42 30	64 00	35.0
III.....	35 00	89 00	41 30	67 30	49.0
IV.....	43 30	95 30	45 30	59 00	55.0
V.....	29 30	67 00	50 00	61 30	42.0
VI.....	30 00	79 30	34 00	71 00	38.0
VII.....	47 30	101 30	45 00	84 30	30.0
VIII.....	37 30	76 30	47 00	58 00	29.0
IX.....	43 30	101 00	39 00	74 30	58.0
X.....	27 00	94 00	39 00	74 00	56.0
XI.....	51 00	109 00	46 00	82 00	28.0
Mean hourly velocity.....					40.5

I.—This low area is a continuation of number xi. described in the January REVIEW. On the morning of February 1st the centre was near Lake Ontario; it then moved directly eastward to the Atlantic coast, and thence northeastward to the Gulf of Saint Lawrence. Snows occurred in the lower lake region and in the New England and middle Atlantic states on the 1st, followed in the last two districts by fair weather. On the summit of Mount Washington, New Hampshire, when the centre of this low area was near Prince Edward Island, a northwesterly hurricane prevailed on the 2d, the wind reaching a velocity of one hundred miles per hour, and the temperature ranging from -15° to -38°; the hurricane continued on the 3d, the wind reaching ninety-nine miles from the northwest with a temperature from -11° to -33°.8.

II.—This low area appeared on the morning of the 3d, central in Manitoba; at midnight of the same day the centre was over Lake Michigan, and on the morning of the 5th passed off the New England coast near Boston, Massachusetts. Snow-fell in the lake region on the 2d, continuing on the 3d, 4th, and 5th. Rains occurred in New England and the middle Atlantic states on the 4th. The morning report of the 2d showed a rise in temperature of 30° to 40° in northern Minnesota and in Manitoba, the warm wave extending south to Missouri; during the next twenty-four hours it extended eastward over all the districts, except New England, where the rise in temperature did not occur until the afternoon of the 3d. The morning report of the 4th showed a further rise in all districts east of the Mississippi valley of 10° to 20°. High west to northwest winds prevailed in the lake region and on the middle Atlantic coast on the 4th.

III.—This area developed in the Gulf states during the 4th, and on the morning of the 5th was central near Memphis, Tennessee. Generally cloudy weather prevailed in all districts, and north of Tennessee, accompanied by snow and rain. The storm-centre moved southeasterly to the South Carolina coast, and then, recurving to the northeast, passed up the coast; it is further described in this REVIEW as number 5 of the north Atlantic storms. Rain or snow fell in all districts east of the Rocky mountains on the 5th, clearing on the Atlantic coast on the 6th, but continuing in the western districts in advance of low area number iv. The morning report of the 5th showed a slight rise in temperature in the Gulf states, but the movement of the centre of this low area caused the winds east of the Mississippi generally to shift to the northwest

and the temperature to fall from 10° to 30° on the 5th. On the Atlantic coast a further fall in temperature of 10° to 16° occurred on the 6th. The following maximum wind velocities were reported; midnight of the 5th, twenty to forty miles on the south Atlantic coast; morning of the 6th, seventeen to forty miles on the middle and south Atlantic coasts; midnight of the 6th and morning of the 7th, twenty-five to forty-seven miles on the New England and middle Atlantic coasts.

The following notes are reported by Signal Service observers:

Pensacola, Florida, 5th: high winds prevailed from 12.25 to 4 p. m., the maximum velocity being thirty-two miles southwest; this was the severest storm that has occurred in this vicinity for twelve months.

Cedar Keys, Florida: the severest storm for several months occurred on the 5th. The steamer "Bertha Lee" was driven from her moorings, and had a part of her wheel-house blown off. The lowest reading of the barometer was observed at 7.40 p. m.

Jacksonville, Florida: a thunder-storm accompanied by hail and high wind prevailed during the evening of the 5th; the wind attained a velocity of forty miles per hour.

Charleston, South Carolina: a violent thunder-storm passed over this station from southwest to northeast between 8.45 and 9.10 p. m. on the 5th, the wind attaining a velocity of thirty-two miles from the southwest.

Savannah, Georgia, 5th: flashes of lightning were observed at 7 p. m.; at 7.56 p. m. a severe storm set in, the wind blowing at the rate of forty miles per hour for about twenty minutes. Rain fell in torrents, accompanied by loud thunder and vivid lightning. Considerable hail fell during the first part of the storm. Vessels arriving at this port report having experienced rough weather on the 5th and 6th. The steamer "William Kennedy" was wrecked during the storm.

The "Savannah News" of February 13th states that during the storm of the 5th, the government hospital at Paris Island and numerous houses at Saint Helena Island were blown down.

IV.—This low area first appeared as a storm centre in northern Iowa on the morning of the 6th. At the afternoon report it was central near Keokuk, Iowa. This same report showed a fall of .40 to .50 in pressure over Utah. This decided decrease in pressure extended to the southeast during the next eight hours, and at midnight the storm-centre was in western Kansas. From this date it moved northwesterly to Lake Ontario and thence to Nova Scotia. Snow was reported from the upper Mississippi and Missouri valleys on the morning of the 6th, where it continued during the day, the snow area extending into the upper lake region. Snows were reported from the upper Mississippi valley and the lake region on the 7th, and from northern New England on the 8th. During the night of the 5th the winds in the upper Mississippi and Missouri valleys shifted to the south, and the morning report of the 6th showed a rise of 6° to 10° in temperature. This warm wave extended rapidly to the eastward, the temperature rising from 7° to 20° over the lake region, Tennessee and the Ohio valley, and the Gulf states on the 6th, and from 10° to 20° in the lower lake region, Tennessee and the Ohio valley, and the Gulf, middle, and south Atlantic states on the 7th, and from 7° to 8° in the Atlantic coast districts on the 8th.

V.—This low area developed in the west Gulf states during the night of the 7th and morning of the 8th. On the afternoon of this day the centre was in Texas; its general course from this date was northeasterly until the morning of the 10th, when it was central in the Province of Ontario; during the next eight hours it moved to the southeast, then again recurved to the northeast and moved off the Gulf of Saint Lawrence. Rain occurred in the east Gulf and south Atlantic states on the 8th, and in the Gulf, south Atlantic, and southern portion of the middle Atlantic states on the 9th. Snow fell on this day in the lake region and northern part of the middle Atlantic states, and on the 10th in the lower lake region, New England, and the middle Atlantic states. High winds prevailed on the

Texas coast during the 7th, 8th, 9th, and 10th; maximum velocities of forty-four miles at Indianola and thirty-six miles at Galveston were reported. The following velocities were reported from the lake and coast stations: on the 8th, thirty miles on Lake Erie; on the 9th, twenty-five to forty-three miles on the lakes, and twenty-five to thirty-two miles on the New England and middle Atlantic coasts; and from thirty to forty-seven miles on the New England and middle Atlantic coasts on the 10th and 11th.

Signal Service observers report the following:

Buffalo, New York: a severe southwesterly storm set in at 11 p. m. on the 9th and continued during the night, a velocity of fifty-six miles occurring at 2.15 a. m.

Rochester, New York: during the evening of the 9th, the wind increased to forty miles per hour, and during the night it veered from south to west and continued high until the early morning of the 11th, a maximum velocity of forty-five miles occurring at 12.15 a. m. of that date.

Mount Washington, New Hampshire: a westerly hurricane of one hundred and one miles per hour, with temperature from -16° to -32° , prevailed on the 10th.

New London, Connecticut, 9th: high southeasterly winds began at 9 p. m. and continued until 5.45 a. m.; a maximum velocity of forty-five miles, southeast, was recorded at 3.05 a. m.

Point Judith, Rhode Island, 9th: a high easterly wind set in at 4.30 p. m., later it veered to southeast and continued all night. From 1 to 4 a. m. on the 10th, the storm was very severe, the wind blowing at the rate of about forty-five miles per hour.

Eastport, Maine, 10th: high winds prevailed at intervals during the day; a velocity of thirty-six miles from the east occurred at 2.55 p. m. All telegraph lines west of Bangor were prostrated.

VI.—The centre of this low area was near Jacksonville, Florida, on the morning of the 14th; it moved to the northeast, the centre some distance from the coast; it is further described as number 7, under "north Atlantic storms." The winds along the Atlantic coast were generally from northeast to northwest with velocities from twenty-five to fifty-two miles. Rain occurred in the south Atlantic states and snow in the middle Atlantic states on the 14th, and snow in New England and the middle Atlantic states on the 15th. There was a slight fall in temperature along the Atlantic coast from the morning of the 14th to the morning of the 15th.

VII.—This low area appeared central in Nebraska on the afternoon of the 13th, and on the morning of the 14th was central in southern Colorado. At this time number vi. was central near Jacksonville, Florida, and while the latter was moving up the coast number vii. moved into the Mississippi valley, and on the morning of the 15th was central near Saint Louis, Missouri, and during the day and night it passed over the lake region. Snow fell in the upper Mississippi and Missouri valleys on the 14th, and in the Mississippi valley, lake region, Tennessee and the Ohio valley, and middle Atlantic states on the 15th; rain occurred on this day in the south Atlantic and east Gulf states, and snow in the lower lake region, New England, and middle Atlantic states on the following day. Velocities of twenty-five to thirty miles were reported from the lake region on the 15th, and twenty-five to forty miles on the 16th; on the Atlantic coast velocities of twenty-five to forty-seven miles were reported on the 16th. Accompanying the fall in the barometer a warm wave appeared over the northern slope of the Rocky mountains on the morning of the 13th; by the next morning it covered all the districts east of the Rocky mountains except those on the Atlantic coast. Its advance over these districts was prevented during the next twenty-four hours, by the passage of low area number vi. moving up the coast. After this had passed, the warm wave advanced, and from the morning of the 15th to the morning of the 16th the temperature rose from 10° to 19° in the Atlantic coast districts.

VIII.—The morning report of the 16th showed this low area

central near Cape Henry, Virginia, where the barometer had fallen .58 in eight hours. General and heavy rains occurred during the night in the south Atlantic states with wind velocities on the coast of eighteen to thirty-two miles. The storm moved rapidly to the north until near the Saint Lawrence valley; thence it passed off to the east over Nova Scotia. Snow fell in New England and the middle Atlantic states on the 16th with high winds on the coast, maximum velocities of twenty-five to forty-seven miles being reported. In the lake region and on the Atlantic coast the temperature fell from 10° to 28° from the morning of the 16th to the morning of the 17th.

The following notes are from the reports of the Signal Service observers:

Atlantic City, New Jersey: an easterly gale prevailed during the morning of the 16th, the wind reaching a velocity of forty miles per hour. The tide rose to an unusual height and caused much damage to property near the water-line.

Little Egg Harbor, New Jersey, 16th: high southeasterly shifting to southwesterly and northwesterly winds prevailed during the day. The high tides washed away the bath-houses, fences, &c., in this vicinity, and the coast telegraph line was blown down.

Sandy Hook, New Jersey: very heavy surf and dangerously high winds prevailed on the 16th. The tide was very high, the water coming within twenty feet of the signal office; a part of the New Jersey Southern Railroad at Highland station was washed away.

New York City, 16th: high southeasterly winds set in at 6 a. m.; a maximum velocity of forty miles occurred at 8.18 a. m. The tide was the highest that has occurred for many years. At 10.05 a. m. the water was on a level with the wharves on the west and south water fronts, and at Battery park the sea broke over the wall. In the lower streets cellars and basements were flooded, resulting in much damage.

New Haven, Connecticut, 16th: high northeasterly winds prevailed during the afternoon and evening; a maximum wind velocity of fifty miles per hour occurred at 4.50 p. m. This storm was of unusual severity throughout this section and caused considerable damage; in this city plate-glass windows were blown in and other damage caused. The tide rose to a height three feet above high-water mark; the sewers of this city were flooded and many bath-houses, together with five hundred feet of Kelsey's wharf were washed away.

New London, Connecticut, 16th: the severest storm which has occurred since the establishment of this station began at 7.05 a. m., the wind blowing from the east; the storm reached its height (forty-eight miles, east) at 5.15 and subsided at 8.15 p. m., the wind meanwhile veering to west; much damage was caused in this locality. The roof of the New London steam woolen mill was blown off and many outbuildings, signs, &c., were blown down. Between 8 and 9 p. m. the tide was very high and flooded many cellars in the lower part of the city. The total movement of the air for the twenty-four hours ending at 11 p. m. was six hundred and thirteen miles, which exceeds by one hundred miles the highest daily movement previously recorded at this station.

Narragansett Pier, Rhode Island, 16th: during the morning high easterly winds prevailed which increased in force and reached a maximum velocity, estimated at sixty-five miles per hour at 1.45 p. m.; it continued with great violence until 8.40 p. m., the wind shifting from southeast to southwest. The high southeasterly winds caused the heaviest surf and highest tide that have occurred since the establishment of this station. Had the wind continued from the southeast a few hours longer, it is probable that damage to the extent of \$100,000 would have resulted. The observer at Point Judith reports a maximum wind velocity of sixty-five miles at 6 p. m., and states that the seas broke over the banks in many places. The men of the Life-Saving Service state that the tide was the highest that has occurred since the Life-Saving station was established in 1876.

Block Island, Rhode Island, 16th: high southeasterly winds, increasing to a strong gale, prevailed during the day, causing the highest tide known for many years. The steamer "Danielson" was blown from her moorings and damaged; several small houses were blown over and carried away by the sea.

Boston, Massachusetts, 16th: high winds set at 9.30 a. m., and continued during the day, a velocity of fifty-four miles from the east occurring at 5 p. m. This storm is considered one of the severest experienced for several years. Reports from Newport, Rhode Island, state that at that place the wind reached a velocity of fifty miles, and from Fall River, Massachusetts, a velocity of sixty-five miles is reported. The storm was accompanied by heavy snow, and in the interior of Massachusetts the railroads were blockaded. The high winds continued until the afternoon of the 17th.

Mount Washington, New Hampshire: a southwesterly hurricane prevailed on the 16th, the wind reaching a velocity of one hundred and eight miles per hour. Two anemometers were rendered temporarily useless during the storm, and it was with much difficulty that they were replaced during its violence. From the Ammonoosuc valley it is reported that the severest storm for many years prevailed on this date, and that the snow fell to depths of from eighteen to twenty-four inches.

IX.—This low area appeared central in Nebraska at midnight of the 16th; it moved southeasterly until the next afternoon, after which time it moved slightly north of east and passed off the Atlantic coast on the morning of the 18th. Snow fell in the upper Mississippi and Missouri valleys during the night of the 16th; in the upper Mississippi valley, the lake region, Tennessee and the Ohio valley, and the Gulf and middle Atlantic states on the 17th, and in the middle Atlantic states on the 18th, with wind velocities, on the coast, of eighteen to thirty miles. During the 16th the temperature rose in the Missouri valley from 8° to 21°; during the following twenty-four hours this warm wave was felt in all districts to the east of the Mississippi river except in New England; in the last-district the temperature rose from 6° to 10° on the 18th. At Fort Maginnis, Montana, a high westerly wind prevailed from 12.40 to 9.30 p. m., on the 16th; a velocity of sixty-four miles per hour was recorded at 7.20.

The observer at Denver, Colorado, reports the following: on the 16th a high wind set in at 12.40 p. m., and continued until 10.15 p. m.; the wind reached a velocity of sixty-two miles from the west at 4.35. The Denver and Rio Grande car shops were damaged and three cars were blown from the track.

X.—This low area moved from the Gulf of Mexico across the east Gulf and south Atlantic states during the day and night of the 24th. It was attended by general and heavy rains in the Gulf and south Atlantic states, and snow in the middle Atlantic states and southern New England. The following wind velocities were reported: Indianola, Texas, thirty-four miles; Galveston, Texas, twenty-five miles, New Orleans, Louisiana, thirty-two miles, and twenty-five to thirty-six miles on the south and middle Atlantic coasts. The morning report of the 25th showed a rise in temperature of 10° to 30° in the districts on the Atlantic coast.

XI.—This low area first appeared in the Saskatchewan valley at midnight of the 26th; it moved easterly and north of the lake region, and at the last report of the month was central just north of Lake Huron. Cloudy weather prevailed in the lake region from the 26th to the 28th, with snow on the 26th and 27th, and the upper lakes on the 28th; no high wind velocities were reported. A warm wave accompanying this depression appeared in the Missouri valley at midnight of the 26th, where the temperature rose from 3° to 13°. On the 27th the temperature rose from the upper lakes south to the Gulf, and on the 28th in all districts east of the Mississippi river.

REDUCTION OF BAROMETER READINGS TO LATITUDE 45°.

The following memorandum is published with a view to elucidating the nature of the gravity correction as applied to

barometric observations, a matter that is not fully explained in the ordinary text books of meteorology.

By the well-known principle of hydrostatics on which the action of the mercurial barometer is based, the pressure of the atmosphere is equal to the pressure of the column of mercury that it will support. But this latter pressure is only another name for the weight of the mercury, and for columns of equal section, the weight varies both with the height of the column and with the force of gravity.

The force of gravity varies with latitude and altitude, therefore the height of the barometer (corrected for temperature and instrumental error) cannot be directly used as a true measure of the atmospheric pressure, but must be reduced to what the height would have been if the force of gravity and the weight of a given mass of mercury were constant all over the earth.

The force of gravity at the latitude of 45° and sea-level is assumed as the standard value to which barometer readings shall be reduced and is called "standard gravity." Our unit of mass becomes a standard unit of weight when weighed in vacuo at latitude 45° and sea-level.

According to the formula for the force of gravity adopted by the International Bureau of Weights and Measures, we have for the variations in gravity due to the latitude

$$G_{\varphi} = g_{45} (1 - 0.00259 \cos 2\varphi)$$

The variation in the force of gravity for different altitudes is small and is given by the formula $g_h = g_0 (1 - 11400000^{-1} h)$

Neglecting this latter factor, the gravity correction consists, therefore, in multiplying the height of the barometer by the factor $(1 - 0.00259 \cos 2\varphi)$.

This is accomplished practically by computing a table of corrections with the latitude as an argument, the height of the barometer being assumed for low stations as 30 inches.

Observations of aneroid barometers do not need this correction as their readings are dependent on the elasticity of metal; this may vary with instrumental temperature, but does not depend on gravity; but they do need a correction to take account of the latitude in which they stood when compared with the standard mercurial barometer by which their scale was adjusted, unless the readings of that mercurial were already reduced to standard gravity.

It should be noticed that when the barometer is thus corrected for its peculiar error due to the influence on it of variations of gravity, the pressure that it then gives is the actual pressure of the air at each latitude expressed in terms of an absolute and not a variable standard.

It is important to remember that the barometer does not indicate directly the simple weight of the atmosphere. Thus in a storm-centre the weight of the air above the barometer is partly counter-balanced by the centrifugal force accompanying the wind; the barometric pressure is due not only to the weight of the air, but also to the prevailing winds, the rapid heating or cooling and consequent expansion and contraction of low layers of air, and to other causes.

In the mercurial barometer we balance this gaseous molecular elastic pressure by the gravitation or weight of quiescent mercury; a change of the force of gravity will change the weight of the column of mercury without necessarily changing the atmospheric pressure.

NORTH ATLANTIC STORMS DURING FEBRUARY, 1885.

[Pressure expressed in inches and in millimetres; wind-force by scale of 0-10.]

The paths of the depressions that have appeared over the north Atlantic ocean during the month are determined, approximately, from international simultaneous observations furnished by captains of ocean steamships and sailing vessels; abstracts of logs and other data collected by the Signal Service agencies at the ports of New York, Boston, and Philadelphia; reports obtained through the co-operation of the "New York Herald Weather Service," and from other miscellaneous data received at this office up to March 23d, 1885.

The attention of international co-operating observers is called to the change in the time of recording the simultaneous obser-

vation, which is now taken at 7 a. m., seventy-fifth meridian (*eastern*) time, corresponding to noon Greenwich time, or eight minutes earlier than heretofore.

Eleven depressions are traced over the ocean within the region covered by the reports. Five of these, viz: numbers 3, 4, 5, 7, and 8, are continuations of storms which passed into the Atlantic from the North American continent. Of the remainder, the depression charted as number 2, apparently developed over the region between Bermuda and the coast of the United States; numbers 9 and 10 appeared near N. 40°, and between the meridians of 40° and 60° W., and numbers 1, 6, and 11, are shown to the eastward of the first-mentioned meridian. The general direction of movement of these depressions was to the northeastward, but at somewhat lower latitudes than usual; especially is this noticeable with reference to the tracks of numbers 6, 7, 9, and 10.

The weather over the Atlantic during the month of February, 1885, was, with the exception of a few days in the middle of the month, of a very stormy character; along the coast of the United States south of 38° N., it is reported by captains of coasting vessels to have been unusually stormy and unsettled. The barometer remained generally low throughout the month, and in some of the depressions charted it fell below 29.0 (736.6). Over the region south of 50° N. and east of the forty-fifth meridian, the winds were mostly easterly, strong in force, while in the region west of the above-mentioned meridian, and between 45° and 50° N., they were from sw. to nw., blowing with the force of a moderate to strong gale; south of 45° N. and along the coast of the United States they were variable, blowing strongly from e., s., nw., and n.

The following are brief descriptions of the depressions charted:

1.—This was probably a continuation of the depression traced as number 9 on the chart for January. At the close of that month an extensive area of low barometer occupied the ocean north of the forty-fifth parallel; these conditions, accompanied by steadily decreasing pressure, continued during February 1st and 2d, and on the latter date the centre of disturbance apparently passed to the northeastward over the British Isles. During those dates the disturbance extended southward as far as the Azores, the barkentine "Corisande," off Fayal, reporting barometer 29.39 (746.5), with w. gale of force 7. Heavy gales from sw. to nw., occurred over the region from the Bay of Biscay westward to the thirtieth meridian. The following are some of the lowest barometer readings observed during this depression. The s. s. "Gallia," M. Murphy, commanding, at 8 a. m., on the 2d, in N. 51° 20', W. 15° 0', had a minimum reading of 28.32 (719.3), wind se. to nw., strong gale; s. s. "England," T. S. Healy, commanding, in N. 50° 56', W. 11° 55', at noon on the 2d, barometer, 28.66 (728.0), wind sw., fresh gale; s. s. "Egyptian Monarch," W. S. Morgan, commanding, in N. 49° 00', W. 13° 27', at noon, barometer 28.76 (730.5), wind sw., whole gale; s. s. "Labrador," Perier d' Hauterive, commanding, from the 1st to the 2d, between N. 49° 10', W. 26° 30', and N. 46° 12', W. 39° 30', had pressure ranging from 28.74 (730.0) to 28.94 (735.0), wind from sse. to nw., whole gale. The pressure over the region near N. 50° and between the British coasts and W. 30°, did not exceed 29.0 (736.6) until the 3d.

2.—This was probably a continuation of a storm which developed between Bermuda and the coast of the United States on the last of the preceding month. The gale began about noon of January 31st, from ese. to sse. with falling barometer; by 4 p. m. of February 1st the s. s. "Glenfyne" E. H. Dunn, commanding, in N. 32° 40', W. 72° 05', had barometer down to 29.3 (744.2), whole gale from ese. veering to n., with heavy rain squalls and thunder and lightning; the s. s. "Edith Godden," J. H. Bennett, commanding, had the lowest barometer, 29.68 (753.9), at 3.30 a. m., on the 1st, in N. 31° 46', W. 74° 21', wind ese. to sw. and nw., blowing with the force of a fresh gale. At 7 a. m. the bark "Rosina," G. Tomaselli, commanding, in N. 32° 32', W. 71° 52', had barometer 29.52 (749.8),

wind nnw., force 9, squally; while the s. s. "Sir Garnet Wolseley," D. Morgan, commanding, near N. 35° W. 60°, had violent gales from s. to w., and reported on the morning of the 1st moderate gale from s. with a deluge of rain; 2 p. m., wind became moderate; 3 p. m. squally from wsw. and increasing to the force of a hurricane until 4 a. m. of the 2d; lowest barometer (aneroid, corrected) 29.28 (743.7), at midnight of the 1st. The brig "Sarah E. Kennedy," Captain Walters, had a heavy ne. gale veering to nnw., in N. 34° 43', W. 74° 50', on the 1st, during which she lost sails.

By the morning of the 2d the depression had reached N. 40°, W. 60°, attended by moderate to strong easterly winds to the northward, and strong nw. and n. gales to the westward and southwestward. As the disturbance moved eastward the winds increased to the force of a gale, the s. s. "Nürnberg," A. Jaeger, commanding, reporting barometer 29.01 (736.8), at 7 p. m. of the 2d, in N. 40° 52', W. 50° 23', the east wind of force 9 decreasing to force 4, and shifting slowly through s. and w. to wnw., when it increased to a whole gale with rising barometer.

On the 3d, the depression was off the eastern coast of Newfoundland, where it was joined by number 3, which had moved over the Gulf of Saint Lawrence during the 2d; strong w. and nw. gales now prevailed over the region between W. 50° and 65°, accompanied by very heavy and dangerous seas, which caused some damage to steamers.

During the 4th and 5th the disturbance moved northeastward, causing w. gales of nearly hurricane force over the region to the south of its track, and, by the 6th, it had reached the coasts of the British Isles, the pressure near the centre being about 29.0 (736.6). During its passage northeastward this disturbance was accompanied by heavy rain, thunder and lightning, the rain changing to sleet and snow with the shift of wind to the westward; the minimum pressures reported were: 29.00 (736.6) at noon of the 5th, in N. 48° 14', W. 37° 48'; 29.11 (739.4) in N. 49° 30', W. 22° 26', from 8 p. m. to 8 a. m. of the 5-6th; 29.18 (741.2) at noon of the 5th, in N. 47° W. 38° 49'; 29.10 (739.1) on the 6th, in N. 50° 24' W. 18° 0'.

3.—This was a continuation of the depression described as low area i., under "Areas of low barometer." It passed over the Gulf of Saint Lawrence during the 2d, with pressure near the centre about 29.25 (742.9), and on the following day it merged in the depression above described.

4.—This was a continuation of a disturbance which passed into the Atlantic from the New England coast on the 5th, being that described as low area ii. under "Areas of low barometer." On the morning of the 6th it was apparently central on the Banks of Newfoundland, the minimum barometric reading reported, being 29.28 (743.7); moderate n. and nw. gales occurred over the region from Nova Scotia to W. 58°, with strong s. and se. winds between N. 45° and 50° and W. 40° and 50°. On the 7th the depression was off the eastern coast of Newfoundland, the pressure remaining unchanged, and after this date it cannot be traced as a separate storm.

5.—This was a continuation of low area iii. described under "Areas of low barometer." It passed off the Carolina coast about midnight of the 5th, and was accompanied by very heavy gales along the coast of the United States during its passage northeastward. The following reports indicate the severity of the gales during the 6th; the schooner "E. B. Leisenring," Captain Davidson, reported at noon of the 5th, in N. 28° 31', W. 79° 57', had a fresh gale from sw. shifting suddenly at 11 p. m. to nw. and blowing with hurricane force until midnight; at 10 p. m. the barometer read 29.31 (744.5).

On the 6th the s. s. "Orinoco," J. S. Garvin, commanding, reported 7 a. m. barometer 29.22 (742.2), fresh wind from ne.; noon (N. 37° 58', W. 70° 46'), barometer 28.89 (733.8), strong ne. gale, with thunder, lightning, and rain; ship hove to until 9 p. m., and during that time the wind blew with hurricane force; at 4 p. m. the barometer read 29.17 (740.9), and by 4 a. m. of the 7th the wind had hauled to nw. and was blowing a fresh gale, barometer 29.52 (749.8). The s. s. "Flamborough,"

P. J. Fraser, commanding, at 7 a. m. on the 6th, in N. $37^{\circ} 45'$, W. $73^{\circ} 45'$, had barometer 29.37 (746.0), wind of hurricane force from e. backing to n. and wnw.; on the same date the bark "Sarou," in N. $34^{\circ} 27'$, W. $71^{\circ} 13'$, had a heavy gale from w. and nw., and was obliged to scud before the wind from 5 p. m. of the 6th until 7 p. m. of the 7th. The ship "Jabez Howes," on the 6th experienced a hurricane from e., se., s., sw., and nw., in N. $36^{\circ} 45'$, W. $71^{\circ} 30'$, which lasted thirty hours, with thunder, lightning, and heavy rain; the lowest barometer was 28.85 (732.8), falling .85 inch in eleven hours. By the morning of the 7th the storm-centre was near N. 41° , W. 60° , where the pressure was below 28.5 (723.9); heavy nw. gales prevailed over the region from the United States coast north of Cape Hatteras eastward to the sixtieth meridian, while equally strong gales from s. and se. occurred over the region to the eastward.

The following are the lowest barometer readings reported on the 7th: s. s. "France" W. Pearce, commanding, at 5 a. m. of the 7th, in N. $41^{\circ} 20'$, W. $61^{\circ} 59'$, barometer, 28.2 (716.3), wind ese. backing to ne., n., and nnw., blowing throughout with hurricane force; s. s. "Lake Huron" W. Bernson, commanding, at 9 p. m. on the 7th, in N. $44^{\circ} 00'$, W. $53^{\circ} 00'$, barometer, 28.2 (716.3), wind from sw. to u., ne., and e., force 10, afterwards moderating to force 9; s. s. "Illinois," Captain Dodge commanding, during the 7th and 8th, between N. $43^{\circ} 35'$, W. $56^{\circ} 42'$ and N. $42^{\circ} 7'$, W. $57^{\circ} 30'$, barometer 29.39 (721.1), wind from se. to w., hurricane force; s. s. "Devon," Captain Lobbett, commander, reported: a gale set in from ese. at 6 p. m. on the 6th, backed to nnw. at midnight, and ended at noon of the 7th., from nw.; the lowest barometer was 28.63 (727.2), at 11 p. m. on the 6th, in N. 41° , W. 65° ; s. s. "Siberian," R. P. Moore, commanding, 7th, 11 a. m., in N. 43° , W. 60° , barometer (lowest) 28.6 (726.4), wind se. to ne., blowing with hurricane force.

On the 8th the region of least pressure was over the Banks, and during that and the following days, strong s., shifting to w. gales were reported between N. 40° and 45° and from W. 60° eastward to W. 40° with s. winds between W. 40° and 30° and N. 45° and 50° ; within the above-mentioned region, the atmospheric pressure ranged from 29.0 (736.6) to 29.3 (744.2). During the 10th, this disturbance moved northeastward beyond the range of the observations.

6.—This depression appeared on the 13th in the region south of N. 45° and between W. 30° and 40° ; during the 12th the winds shifted to e. over the ocean to the northward, with falling barometer. At 5 p. m. of the 13th the s. s. "Waesland," J. Uberweg, commanding, had barometer 29.56 (750.8), wind ne., force 6, shifting to nnw. and attaining force 10. During the 14th and 15th the disturbance apparently moved northeastward, with barometer about 29.6 (751.8) and wind shifting from ene. to e. and attaining the force of a whole gale. On the last-mentioned date the region of least pressure was off the southwest coast of Ireland, while the area of low readings appeared to extend in a southwesterly direction towards the Azores.

7.—This was a continuation of the depression described under "Areas of low barometer" as number vi. It appeared near the coast of Florida on the 14th, and moved northeastward, attended by moderate to strong gales from s. to n. and ne. At 11 p. m. on the 14th, the s. s. "Orinoco," in N. $39^{\circ} 13'$, W. $72^{\circ} 28'$, had barometer 29.52 (749.8), strong ene. gale, with rain, hail, and snow. On the 15th the centre of disturbance was near N. 40° , W. 63° , with pressure about 29.1 (739.0), and accompanied by strong e. backing to n. gales, with snow and sleet. By the morning of the 16th the disturbance had apparently passed eastward to about the forty-seventh meridian, where a decrease of pressure had occurred while an increase had set in over the region to the westward of the fifty-fifth meridian. Moderate to strong e. winds prevailed between N. 42° and 50° and W. 50° and 30° , with the pressure ranging from 29.35 (745.5) to 29.7 (754.4).

During the 17th and 18th, the disturbance occupied the ocean

between N. 40° and 45° , and W. 40° and 25° , and probably passed near the Azores, but the reports from that region are not sufficiently numerous to determine its track. During the dates mentioned the barometer ranged from 29.4 (746.7) to 29.7 (754.4).

8.—This was a continuation of low-area viii.; it was central off the southern coast of Newfoundland on the morning of the 8th, causing moderate to strong w. gales between N. 40° and 45° and W. 60° and 50° ; the lowest pressure reported was 29.42 (747.3), in N. $42^{\circ} 06'$, W. $55^{\circ} 12'$, with wind shifting from sw. to wnw. During the 19th and 20th the depression moved northeastward, attended by steadily decreasing pressure and moderate gales. On the 20th the pressure had fallen below 29.0 (736.6), and the winds between W. 20° and 35° increased to strong gales from s. to sw. and w. On the 21st the region of least pressure was situated near W. 20° , where the barometer now read 28.8 (731.5), and s. and sw. gales prevailed over the ocean to the westward of the British Isles. The s. s. "Spain," J. Sumner, commanding, reported barometer 28.65 (753.1) at 2 p. m. of the 21st, in N. $51^{\circ} 38'$, W. $21^{\circ} 5'$, with heavy gale from ssw. to w.; the s. s. "Amaryllis," W. W. Black, commanding, in N. 54° , W. 18° , at 11 p. m. on the 21st, had barometer 28.8 (731.5), whole gale from se. to sw. and w. During the 21st the disturbance moved northeastward to the northwestern coasts of the British Isles.

9.—On the 21st, falling barometer and the shifting of the winds to the eastward indicated the presence of a barometric depression near N. 40° and between W. 55° and 60° . On that date the lowest reported pressure was 29.11 (739.4) in N. 43° W. 54° ; strong breezes to moderate gales from e. were reported to the northward while fresh nnw. and nw. gales prevailed to the westward of the low area. By the 22d the disturbance had reached N. 45° , W. 40° where the pressure had now fallen below 28.9 (734.0); the s. s. "Leerdam," P. Stierendregt, commanding, reported barometer 28.6 (728.2), at 4 p. m., on the 22d, in N. $47^{\circ} 25'$, W. $36^{\circ} 30'$, with heavy gales from se. to sw; the s. s. "Nessmore," J. Inch, commanding, at 2 a. m. on the 22d, had a terrific w. gale with heavy squalls of snow, barometer 28.45 (722.6); at 4 p. m., same weather; 8 p. m., barometer 28.8 (731.5) rising, wind and sea moderating slightly; the vessel's position was between N. $45^{\circ} 39'$, W. $37^{\circ} 46'$ and N. $45^{\circ} 19'$, W. $39^{\circ} 24'$.

During the 23d and 24th the depression moved northeastward, attended by strong s. to w. gales during its passage, and on the last-mentioned date it was central between W. 20° and the British coasts. On the 23d the pressure remained below 29.0 (736.6), but it apparently exceeded that amount on the 24th. At 2 p. m. on the 23d the s. s. "Spain," J. Sumner, commanding, reported barometer 28.67 (728.2), with strong s. to w. gale, in N. $50^{\circ} 20'$, W. $26^{\circ} 39'$, and the s. s. "Nürnberg," A. Jaeger, commanding, had barometer 28.71 (729.2) at 9.30 p. m. of the 23d, with wsw. gale of force 10, in N. $49^{\circ} 7'$, W. $23^{\circ} 0'$.

10.—This disturbance apparently developed during the 23d near N. 45° and between W. 50° and 40° , and by the following day the pressure in that region had fallen below 29.0 (736.6.) The s. s. "Republic," P. J. Irving, commanding, reported that at 1 p. m. on the 24th a dark mass of clouds appeared to the southward; at 6 p. m. the wind increased to a moderate gale from ene., with drizzling rain; at 10 p. m. the wind increased to force 9, barometer fluctuating greatly; at 4 a. m. on the 25th, in N. $46^{\circ} 36'$ W. $39^{\circ} 24'$, the barometer read 28.85 (732.8), and the wind was blowing a strong gale from e., afterwards shifting to ne., and n. At 6 p. m. of the 24th, in N. $45^{\circ} 30'$, W. $42^{\circ} 0'$, the s. s. "Leerdam," P. Stierendregt, commander, had barometer 28.8 (731.5), wind e., whole gale shifting to ne., n. and nw.

On the 25th, the storm-centre was near N. 45° , W. 35° . At noon, Greenwich time, the s. s. "Westernland," W. G. Randle, commanding, in N. $45^{\circ} 09'$, W. $36^{\circ} 08'$, reported, barometer 28.67 (728.2), a strong sw. gale had prevailed throughout the night, when the wind died out at 8 a. m., leaving a high, con-

fused sea, barometer stationary; at 11 a. m. the wind suddenly burst out from n. veering to nne. and accompanied by violent squalls of rain and hail; at 4 p. m. the weather moderated slightly. The following observations for the 25th were furnished by Captain Jaeger, commanding the s. s. "Nürnberg."

Hour.	Position.		Barometer (corrected.)		Wind.		Remarks.
	Lat. N.	Long. W.	Inches.	Mill.	Direction.	Force 0-10	
a. m.	o /	o /					
6.30.....	47 7	30 5	28.88	733.5	sw.	6	Rain squalls; dangerous sea.
8.30.....	47 7	31 0	28.90	734.0	sw.	4-6	
p. m.							
2.30.....	47 7	31 9	28.78	731.0	sw.	6-7	Fair; high cross sea.
6.30.....	47 5	32 8	28.66	728.0	calm		Very heavy sky; dangerous sea.
7.30.....	47.4	33 0	28.65	727.7	nne.	3-5	High sea from all directions; heavy bank of clouds in s. and s.w.; clearing in nne.
			(mini- mum.)				
8.30.....			28.69	728.7	nw.	5	Clearing. Heavy rain squalls; very rough sea.
10.45.....	47 1	33 6	28.77	730.7	nw.	6	
Midnight.....	46 8	34 0	28.98	736.1	nw.	6-8	

On the 26th the storm-centre was near N. 50°, W. 22°; the lowest reported barometer at the simultaneous observation being 28.85 (732.8), wind e., light, while moderate s. to sw. gales occurred to the eastward of the centre. At 4 a. m. of the 26th the s. s. "Pennland," in N. 47° 50', W. 25° 50', reported barometer 28.75 (730.2), strong gale from sw. shifting to s., sse., and again to sw. The s. s. "Bohemia," in N. 46° 0', W. 33° 20', had barometer down to 28.77 (730.7), with moderate breeze from sw. and w.; the s. s. "Scythia," Captain Whealan, also reported only strong breeze with this depression, although the barometer fell to 28.9 (734.0); vessel's position between N. 49° 26', W. 26° 47' and N. 47° 54', W. 34° 33'. By the 27th this depression had advanced to the British coasts, but the pressure had increased to 29.0 (736.6).

11.—This depression appeared between N. 45° and 50° and W. 35° and 40° on the 27th, and displayed great energy during its progress. The storm-centre passed near to the steamers "Canada" and "Venetian" on the 27th; Captain G. de Kersabiec, commanding the "Canada," reported barometer 28.39 (721.1), at 9 a. m., in N. 46° 45', W. 41° 05', calm, or light breeze; the wind then suddenly shifted from s. to se., ese., ne. and nw., blowing with hurricane force. Captain Trant, commanding the s. s. "Venetian," reported as follows: 27th, 4 a. m., ese. gale, increasing; 8 a. m., hard gale, se., rain, squally; slowed engines and hove to; 8.30 a. m., same wind, sky breaking; 9.30 a. m., moderate wind, high sea; 10.30 a. m., moderate, frequent lulls (in vortex for one hour, in about N. 46° W. 39°); 11 a. m., gale commenced with great fury from sw., with heavy rain and mist, barometer 28.44 (722.4); 11.30 a. m., violent hurricane, barometer 28.5 (723.9), atmosphere thick with rain and foam; impossible to see more than fifty yards in any direction; noon, same weather; 3.30 p. m., hurricane continues with high sea; vessel run before the sea under bare poles; 6 p. m., moderating slightly, barometer 28.94 (735.1). As the "Venetian" appears to have moved eastward with the depression, but to the southward of it, she experienced a continuation of more or less stormy weather, with gales from w. and nw. during the 28th. The steamers "Scythia," "Hanoverian," "Bohemia," "Pennland," and "State of Indiana," encountered this disturbance during the 27th, between W. 35° and 45°, and had barometer ranging from 28.6 (726.4) to 29.2 (741.7), with very heavy gales from sw. to nw. On the 28th the centre of disturbance was apparently between W. 20° and 25°, and near N. 50°, attended by strong w. gales to the southward, and between W. 25° and 40°.

On February 18th a very heavy squall, which caused considerable damage to shipping, occurred in the vicinity of Cardenas, Cuba, W. I. The following reports relating thereto have been received: Captain Darrah, commanding the brig "Mary Fink," off Cardenas, reported, "18th, 5.54 p. m., barometer 29.98 (76.15), a squall of hurricane-like force, lasting 45 minutes, oc-

curred, the wind veering from s. to nw. very suddenly and without any warning whatever; lost and split several sails; Cay Piedros bore about ssw., 10 miles distant, when the squall struck us; the rain came down in torrents, and the force of the wind threw the vessel on her beam ends. The whole fleet of vessels at anchor in Cardenas inner roads dragged their anchors, with full scope of chain and both anchors out; and a number of lighters were sunk or driven ashore. In the inner harbor the wind was more northerly than with us."

Captain W. M. Lank, commanding the schooner "Mary Nowell," reported, "18th, ten miles east of Moro Castle, experienced a violent squall, lasting two hours and accompanied by heavy thunder and sharp lightning; the wind was from nnw. and backed to ne.; rain fell in torrents."

OCEAN ICE.

On chart i. are also exhibited the eastern and southern limits of the region within which icebergs have been observed during February, 1885. These limits are determined from reports furnished by shipmasters and from trustworthy data published in the "New York Maritime Register," and other newspapers.

During this month the eastern limit of icebergs reached 42° W. longitude in about 47° N. latitude; from that point the outer edge of the ice-region extended in a southwesterly direction to about latitude 42° N., longitude 51° W., and thence west-northwestward along the forty-third parallel to Nova Scotia and the coast of Maine. The southernmost iceberg was observed in N. 41° 50', W. 51° 10'.

The area of the ice-region during February, 1885, was somewhat greater than in the same month of the years 1882, 1883, and 1884, as shown by the following:

Southern limit.			Eastern limit.		
Date.	Lat. N.	Lon. W.	Date.	Lat. N.	Lon. W.
February, 1882.....	45 19	49 48	February, 1882.....	47 40	43 28
February, 1883.....	42 01	52 46	February, 1883.....	46 19	45 44
February, 1884.....	42 00	50 00	February, 1884.....	46 50	43 45
February, 1885.....	41 50	51 10	February, 1885.....	47 52	42 00

Field-ice was generally reported in the region from N. 44°, W. 49° northeastward to N. 47°, W. 46°.

Icebergs and field-ice were reported as follows:

February 1st.—The s. s. "Thingvalla," between N. 49° 5', W. 44° 0', and N. 47° 20', W. 46° 5', passed twenty-five large and many small icebergs; also passed large pieces of field-ice from N. 46° 50', W. 46° 35' to N. 46° 28', W. 46° 45'. The s. s. "Helvetia," in N. 47° 01', W. 44° 23', passed an iceberg at 10 p. m. The s. s. "Ethiopia," in N. 47° 16', W. 46° 30', passed a large field of ice, taking three hours to clear it; in N. 46° 28', W. 48° 09', saw a large iceberg.

2d.—The s. s. "Helvetia" from 9.45 a. m. till noon, saw a continuous field of ice four or five miles to the northward; position at noon, N. 46° 07', W. 47° 24'.

3d.—S. S. "France," between N. 45° 52', W. 47° 28', and N. 45° 45', W. 47° 40', passed field-ice extending northward as far as could be seen from the topsail yard.

4th.—S. S. "Habsburg," from N. 45° 35', W. 48° 12' to N. 45° 37', W. 48° 04', passed several large fields of ice; temperature of water 24° S Fahr; temperature of the air, 26° 6 Fahr. S. S. "Pennland" in N. 46° 06', W. 47° 55', passed through a large ice-field.

5th.—S. S. "Illinois," in N. 47° 05', W. 43° 47', passed a large iceberg. The s. s. "Lake Huron," between N. 47° 52', W. 42° 00' and N. 46° 00', W. 47° 30' passed numerous large and small icebergs, also a great quantity of field-ice to the northward of the last position on the 6th; kept ship away 20 miles to the southward to clear it. The s. s. "Pennland," in N. 46° 52', W. 43° 15', passed two sunken icebergs surrounded by heavy breakers.

6th.—S. S. "Furnessia," between N. 48°, W. 44° 18', and N. 46° 48', W. 45° 53', from 2 a. m. till noon, passed ten ice-

bergs; s. s. "Palestine," in N. 45° 41', W. 47° 42', at 5 p. m., passed a large iceberg, also passed some field-ice and two small bergs at 3 p. m.

7th.—S. S. "Newfoundland," at Halifax, Nova Scotia, reports very heavy field-ice in N. 45° 20', W. 59° 40', (special bulletin, New York Maritime Association). The s. s. "Rhaetia," in N. 47° 09', W. 43° 23', passed an iceberg; in N. 46° 36', W. 45° 54', passed two bergs; also from N. 46° 24', W. 46° 12' to N. 45° 52', W. 48° 7', passed through a large field of drift ice extending as far northward as the eye could reach.

The British s. s. "Ripon City," Jenkins, commanding, from New York, February 1, for Newcastle, England, put into Halifax, February 16, damaged by ice. Captain Jenkins reports, on the 7th they met ice, and same evening sailed right into an open bay in an immense field. By 11 p. m., it had become impossible to force their way any further, and at about midnight the plates on both sides of the bow, near the water-line, were cracked and damaged. The steamer's position at the time was about N. 45° 30', W. 48°. When day broke the ice had closed in all around her, and as far as the eye could reach nothing was visible but a vast field of ice, with here and there an immense berg, the tips towering hundreds of feet above the surface. North of latitude 45° seemed to be a solid field of ice. For four days the steamer was wedged in solid ice. ("New York Maritime Register, February 18, 1885.")

8th.—S. S. "England," in N. 47° 15', W. 42° 31', at 4 p. m., passed an iceberg; s. s. "Rhaetia," in N. 45° 38', W. 48° 52', passed eight large and small icebergs; some were about two hundred feet high and 1,000 feet long.

9th.—S. S. "England," in N. 46° 10', W. 46° 0', passed an iceberg.

10th.—Bark "St. Olaves," after being in the ice for several days off Cape Enrage, returned to St. John, New Brunswick, having sustained damage. S. S. "Salier," in N. 46° 15', W. 44° 8', passed a small iceberg.

11th.—Captain Parry of the s. s. "Bulgarian," reported: "In N. 47° 0', W. 46° 0', sighted three large icebergs ranging from three hundred to four hundred feet high, with four smaller bergs near; 8.40 p. m. came to field-ice in N. 46° 26', W. 47° 34'; steered on the outer or east side for fourteen miles, then put ship on her course; field-ice not very thick. At 2 a. m. of the 12th, the field-ice became thick; at 5.30 a. m. got clear of field-ice in N. 45° 38', W. 48° 30', the western edge being very solid. From 7 a. m. to noon on the 12th, in N. 44° 59', W. 50° 12', passed between very large icebergs, four to the southward and three to the northward; the distance across the ice-field was sixty-one miles. I should recommend all steamers to keep well south as the ice-field was evidently setting to the southward."

The s. s. "Salier," from N. 45° 27', W. 48° 23', to N. 45° 24', W. 48° 29', passed field-ice; in N. 45° 22', W. 48° 31', passed an iceberg, and in N. 45° 20', W. 48° 39', field-ice; in N. 45° 13', W. 48° 50', an iceberg.

12th.—S. S. "Boston City," in N. 48° 47', W. 48° 15', saw an iceberg to the northward, also encountered large fields of ice.

13th.—S. S. "Boston City," in N. 47° 43', W. 48° 40' met solid ice-fields; s. s. "Nederland," between N. 47° 16', W. 45° 22', and N. 45° 45', W. 47° 47', passed twelve or thirteen icebergs, also sighted large quantities of field-ice. The s. s. "Bristol," between N. 46° 25', W. 47° 08', and N. 45° 10', W. 49° 58' passed large quantities of field-ice and several icebergs; s. s. "Caspian," in N. 43° 25', W. 48° 40', passed two small icebergs.

14th.—S. S. "Norseman," in N. 44° 0', W. 53° 0', at 1 p. m., passed a large iceberg, also passed several between 9 and 11 p. m.; s. s. "Nederland," in N. 44° 40', W. 48° 54', sighted field-ice; s. s. "Serpho," in N. 44° 0', W. 62° 55', passed field-ice; s. s. "Nestorian," in N. 43°, W. 49° passed three large bergs; s. s. "Wyoming," between N. 43° 31', W. 48° 37' and N. 43° 06', W. 49° 48', between 10 a. m., and 2 p. m., passed four icebergs; (also reported by s. s. "Bothnia.") The s. s. "Moravia," between N. 46° 32', W. 46° 50' and N. 45° 5', W. 47° 48', passed several icebergs and large ice-fields; at noon the ship's position was N. 44° 48', W. 48° 29' and from then till 3 p. m. eight large icebergs were seen.

15th.—S. S. "Canada," in N. 44° 58', W. 47° 0' passed a large iceberg, also two others in N. 44° 30', W. 47° 55'; a large piece of field-ice was seen in N. 43° 43', W. 49° 30'; s. s. "Boston City," 9 a. m., in N. 43° 40', W. 50° 42', passed a large iceberg.

16th.—S. S. "Assyrian Monarch," 8 p. m., in N. 46° 20', W. 47° 30' fell in with field-ice; temperature of air, 28°; water, 28°; steered to the southwestward until 6 p. m. of February 17th, passing immense fields of floating ice and numerous very large icebergs. To the westward, on the Banks, the field-ice appeared to be solid and heavy; ship put on proper course to the westward, in N. 42° 45', W. 50° 40'. The s. s. "Edam," in 45° 00', W. 45° 30', at 7.30 a. m., passed an iceberg; s. s. "Main," 1.30 p. m. in N. 44° 47', W. 45° 45', passed an iceberg; s. s. "Troqueur," in N. 45° 50', W. 45° 19', passed an iceberg and a few minutes later some field-ice.

17th.—S. S. "Britannic," in N. 45° 30', W. 45° 10', 2 p. m. passed three icebergs; s. s. "Main," in N. 43° 31', W. 49° 13' 1 a. m., passed three icebergs; s. s. "Jan Breydel," at 1 a. m. fell in with fields of ice which lasted from N. 44° 44', W. 48° 21' to twenty miles south-southwestward.

18th.—S. S. "Caledonia," in N. 41° 52', W. 51° 0' passed several icebergs; s. s. "City of Montreal," in N. 43° 6', W. 48° 50' at 8 a. m. passed an iceberg, also between N. 42° 48', W. 49° 45' and N. 42° 15', W. 50° 18' passed a group of five icebergs; s. s. "Geiser," in N. 45° 4', W. 47° 0' at 7 a. m. passed some small pieces of ice; between N. 44° 12', W. 48° 28' and N. 43° 39', W. 48° 33' from 2 to 6 p. m., passed several icebergs and extensive fields of pack-ice; steered southward to avoid them. The s. s. "Britannic," in N. 43° 00', W. 49° 15' at 5 a. m., passed one iceberg and a quantity of field-ice; N. 42° 51', W. 50° 3' at 9 a. m. passed two icebergs; N. 42° 37', W. 50° 45' passed one iceberg; s. s. "America," in N. 43° 20', W. 49° 30', passed a large iceberg five miles to the southward and saw several small bergs; from 10.30 a. m. till noon passed through drift-ice; to the northward and southward, streaks of field-ice a mile in width, were in sight. The s. s. "Sussex," in N. 45° 30', W. 48° 00', at 7.45 a. m. struck a large cake of ice and stove bows, also passed loose ice in N. 44° 10', W. 49° 0'.

19th.—S. S. "Aurania," in N. 44° 23', W. 45° 36', passed an iceberg; s. s. "Serpho" passed large quantities of field-ice just outside of Boston harbor; s. s. "Lepanto," between N. 42° 10', W. 50° 10', and N. 42° 1', W. 50° 30', passed several icebergs.

20th.—S. S. "Grecian," in N. 42° 36', W. 50° 47', at 7.30 a. m., passed three large icebergs; s. s. "Devonia," in N. 44° 45', W. 45° 6', at 1 p. m., passed an iceberg to the southward of the vessel.

21st.—S. S. "Greece," in N. 44° 38', W. 44° 37', passed an iceberg; s. s. "Virginian," in N. 46° 8', W. 46° 59', at 5.45 p. m., saw some field-ice; s. s. "Saint Germain," in N. 45° 4', W. 57° 58', at 10 a. m., passed an iceberg. The s. s. "Devonia," between N. 43° 21', W. 48° 48', and N. 43° 10', W. 49° 50', passed several icebergs; s. s. "Gallia," in N. 42° 2', W. 50° 8', passed an iceberg; s. s. "Westphalia," in N. 45° 2', W. 47° 18', passed an iceberg eighty feet high; saw some field-ice in N. 44° 40', W. 48° 29', also passed an iceberg about one hundred and twenty feet high in N. 44° 38', W. 48° 52'.

22d.—S. S. "Virginia," saw several icebergs to the southward at 10 a. m.; noon, passed a number of small bergs and several large ones in N. 43° 52', W. 48° 0'; between 1.30 and 3.30 p. m., passed six large and several small icebergs. The s. s. "Missouri," in N. 44° 0', W. 48° 10', passed three icebergs from 10 to 11.30 a. m., also two smaller bergs about noon; 1 p. m., passed five miles south of two icebergs, and at 2 p. m. five miles north of several small bergs; s. s. "St. Germain," in N. 42° 50', W. 52° 10', at 10 a. m. passed an iceberg; also in N. 42° 30', W. 53° 45', at 3 p. m. passed another; the first was about seventy-five feet high and 1,300 feet long, and the second about one hundred and fifteen feet high and 1,300 feet long; s. s. "St. Laurent," between N. 43° 47', W. 48° 25' and N. 44° 32', to 45° 37', passed ten icebergs.

23d.—S. S. "Europa," in N. 44° 24', W. 45° 12' passed a large iceberg; s. s. "Greece," between N. 43° 0', W. 48° 50', and N. 42° 30', W. 51° 3', from 6 a. m. to 6 p. m., passed nine icebergs, some of which were very large.

24th.—Bark "Olbers," in N. 50° 36', W. 42° 22', passed an iceberg one hundred feet high.

25th.—S. S. "Nessmore," between the parallels of N. 42° 50' and N. 42° 10', and the meridians of 49° W. and 51° W., passed six icebergs, two of which were of very large dimensions.

26th.—S. S. "Tower Hill," in N. 43° 7', W. 49° 10' passed an iceberg; s. s. "Leerdam," in N. 42° 15', W. 51° 15', 5 p. m., passed several icebergs; s. s. "Republic," in N. 43° 40', W. 47° 53', at 8.30 a. m., passed a large iceberg about two hundred feet high; by 10 a. m. we had passed the last of nine others, scattered about north and south of the ship's course; at noon, in N. 43° 29', W. 49° 4', passed a quantity of broken field-ice. The s. s. "Neckar," in N. 42° 27', W. 49° 28', at 7.30 a. m. passed an iceberg about seventy feet high and 1,500 feet long; 10.30 a. m., in N. 42° 19', W. 50° 25', passed a large iceberg; 5.15 p. m., in N. 42° 6', W. 52° 17', passed another.

27th.—S. S. "Oder," at Bremen, reported having passed several icebergs in N. 41° 50', W. 51° 10'.

28th.—S. S. "Martello," in N. 42° 40', W. 50° 0', at 8 a. m., passed eight large icebergs; s. s. "Spain," between N. 44° 0', W. 48° 0' and N. 43° 13', W. 49° 10', passed four icebergs and a quantity of loose field-ice.

The following is taken from the advance sheets of the "International Nautical Magazine," published in New York:

HALIFAX, N. S., February 23, 1885.

To the publishers International Nautical Magazine:

DEAR SIR: The ice north of Sable Island, which comes out of the Gulf of Saint Lawrence, extends at present nearly from the Banks of Saint Peters to past the Straits of Canso and northward into the gulf.

On the previous voyage we passed through over one hundred miles of very heavy ice from latitude 45° 35', longitude 57° 20', to latitude 45° 20', longitude 59° 40', and we were jammed in it for twenty hours.

This voyage I took a more southerly course, and keeping south of latitude 45° 17', I passed through the southern edge of the ice, running through about eighty miles each way.

I have not, during the twelve winters I have run the mails to Newfoundland found such heavy ice so early in the localities mentioned until this season. The temperature of the water seems to be lower this spring than in many former years, and the ocean seems to be one congealed mass.

The Banks, south of Newfoundland and towards the coast of Nova Scotia, are full of what we term *slot* ice, and the sea from Cape Race to Belle Isle is full of heavy ice and icebergs.

I was this time detained two days, twelve hours through the ice blockade on the coast, and according to all accounts from incoming Dundee sealing steamers and other observations, I firmly believe this will be a trying spring for ocean steamers and vessels in the north Atlantic trade. It has been reported to me by the above-mentioned sealing steamers that the icebergs were uncountable.

Yours, respectfully,

CHARLES MYLIUS,
Master, Mail Steamer "Newfoundland."

SIGNAL SERVICE AGENCIES.

Signal Service Agencies have been established in the Maritime Exchange Buildings at New York and Philadelphia, and in the Custom House at Boston, where the necessary blanks and other information will be furnished to ship-masters. In the January REVIEW was published an explanation of the object of these agencies.

In pursuance of the arrangements made with the Meteorological Office of London, England, there were, during February, 1885, ten reports cabled to that office, concerning storms and icebergs encountered by vessels on the Atlantic west of the forty-fifth meridian. Three messages were sent from Boston.

TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

The distribution of mean temperature over the United States and Canada for February, 1885, is exhibited on chart ii. by the dotted isothermal lines; and in the table of miscellaneous data are given the means for the various stations of the Signal Service.

In the following table are given the mean temperatures for

the several geographical districts with the normals and departures, as deduced from the Signal Service observations:

Average temperatures for February, 1885.

Districts.	Average for Feb. Signal-Service observations.		Comparison of Feb., 1885, with the average for several years.
	For several years.	For 1885.	
New England.....	25.6	20.4	- 5.2
Middle Atlantic states.....	36.3	27.7	- 8.6
South Atlantic states.....	50.6	43.8	- 6.8
Florida peninsula.....	64.2	59.1	- 5.1
Eastern Gulf states.....	53.4	46.0	- 7.4
Western Gulf states.....	52.8	46.5	- 6.3
Rio Grande valley.....	63.0	56.5	- 6.5
Tennessee.....	45.3	36.9	- 8.4
Ohio valley.....	35.8	24.8	-12.0
Lower lake region.....	28.0	16.0	-12.0
Upper lake region.....	21.0	9.4	-11.6
Extreme northwest.....	9.8	2.9	- 6.9
Upper Mississippi valley.....	29.3	18.1	-11.2
Missouri valley.....	22.3	14.0	- 8.3
Northern slope.....	21.3	22.7	+ 1.4
Middle slope.....	31.5	27.6	- 3.9
Southern slope.....	48.5	46.3	- 2.2
Southern plateau.....	45.7	46.5	+ 0.8
Middle plateau.....	32.9	38.2	+ 5.3
Northern plateau.....	29.2	39.2	+10.0
North Pacific coast region.....	40.4	30.7	- 9.7
Middle Pacific coast region.....	49.8	54.0	+ 4.2
South Pacific coast region.....	55.5	56.7	+ 1.2
Mount Washington, N. H.....	6.8	0.6	- 6.2
Pike's Peak, Colo.....	3.6	1.9	- 1.7

The mean temperature for February, 1885, was below the normal in all parts of the United States east of the one hundred and fifth meridian. In the lake region, upper Mississippi, lower Missouri and Ohio valleys the month was unusually cold, the mean temperature averaging from 10° to 15° below the normal. In the Ohio valley and Tennessee, along the Atlantic coast south of Massachusetts, and in the Gulf states the monthly mean temperatures were, with a few exceptions, the lowest recorded since the establishment of the Signal Service stations. At Cincinnati, Ohio, and Nashville, Tennessee, the mean temperatures for February, 1885, were 4° 2 and 4° 8, respectively, below that for February, 1875, which, in the northern districts east of the Rocky mountains, was the coldest February that has occurred since the Signal Service stations were established.

In the Rocky mountain districts and on the Pacific coast February, 1885, was warmer than the average, the departures above the normal temperature averaging from 2° to 10°.

RANGES OF TEMPERATURE.

The monthly and daily ranges of temperature at the various Signal Service stations are given in the table of miscellaneous meteorological data. The monthly ranges were greatest in the extreme northwest and least along the Pacific coast, the extremes being 90°.6 at Poplar River, Montana, and 22°.5 at San Francisco, California.

DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for the various districts, in the table of miscellaneous data, and on chart iv. The following notes in connection with this subject are reported by voluntary observers:

Arkansas.—Lead Hill, Boone county: mean temperature, 32°.2, is 9°.5 below the February average for the three preceding years.

California.—Hydesville, Humboldt county: mean temperature, 50°.3, is 5°.9 above that for February, 1884, and is considerably above the average for the month for several years.

Connecticut.—Mr. W. W. Ellsworth, voluntary observer at Hartford, reports: "February was remarkable for its low mean temperature, which was 18°.0, or the lowest recorded for fifty years."

Mr. L. Andrews, at Southington reports: "Without exception this has been the coldest February for the last thirty