

lication in succeeding numbers of the MONTHLY WEATHER REVIEW of tables giving similar data will furnish valuable material for determining the normal movement, rate of progress, intensity, and duration of areas of high and low pressure, and a study of the record of abnormal pressure changes in connection with the abnormal temperature changes and maximum wind-velocities will be of great value in the current work of this office in calculating the changes in temperature and the maximum wind-velocity which will probably attend the eastern movement of areas of high and low pressure which appear over the western part of the country, and which are first located by the telegraphic reports of this Service.

TABLE I.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum abnormal changes in pressure in twelve hours, with maximum abnormal changes in temperature and maximum wind velocities in connection therewith.									
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.	Rise.			Station.	Date.	Fall.	Station.	Date.	Miles per hour.	Direction.	Station.	Date.	
High areas.	0	0	0	0	0	Days.	Miles.	Inch.										
I.....	1	55	118	38	99	6.0	11	.46	Quebec, Quebec.....	7	44	Kansas City, Mo.....	5	30	nw.	Omaha, Nebr.....	5	
Ia.....	1	50	79	49	70	1.0	38	.62	Father Point, Quebec....	3	29	Keokuk, Iowa.....	2	46	nw.	Anticosti Island, G. of S. L.	4	
Ib.....	1	52	112	49	117	4.5	108	.34	Salt Lake City, Utah.....	7	24	Winnemucca, Nev.....	5	46	sw.	Ft. Assiniboine, Mont..	10	
II.....	10	53	74	43	60	1.5	30	.52	Anticosti Island, G. of S. L.	10	37	Quebec, Quebec.....	9	40	ne.	Block Island, R. I.....	10	
III.....	10	55	112	43	63	4.5	41	1.10	Alpena, Mich.....	13	36	Indianapolis, Ind.....	13	48	nw.	Fort McKinney, Wyo....	11	
IV.....	14	54	112	41	63	4.0	24	.88	Yarmouth, N. S.....	17	29	Keokuk, Iowa.....	15	36	nw.	Sandy Hook, N. J.....	17	
V.....	16	56	117	37	77	7.0	17	.78	Parry Sound, Ont.....	20	44	Rockliffe, Ont.....	16	58	nw.	do.....	22	
VI.....	22	55	107	35	77	2.5	41	.44	Saint Paul, Minn.....	23	26	Palestine, Tex.....	20	58	nw.	do.....	24	
VII.....	27	53	100	36	76	2.0	40	.62	Cheyenne, Wyo.....	26	20	Dubuque, Iowa.....	23	44	n.	Hatteras, N. C.....	28	
VIII.....	30	54	121	48	97	1.0	54	.66	Sault de Ste. Marie, Mich.	31	43	Moorhead, Minn.....	27	44	nw.	Atlantic City, N. J.....	27	
Mean.....		54	105	40	80	3.4	31	.64			33		47					
Low areas.								Fall.		Rise.								
I.....	1	47	93	49	55	2.0	42	.48	Chatham, N. B.....	1	36	Chatham, N. B.....	1	48	sw.	Sydney, C. B. I.....	2	
II.....	3	40	125	33	105	3.0	22	.26	Cheyenne, Wyo.....	4	17	Cheyenne, Wyo.....	3	48	sw.	Fort Canby, Wash.....	3	
III.....	5	48	83	48	55	1.5	44	.66	Chatham, N. B.....	6	16	Toledo, Ohio.....	5	52	w.	Anticosti Island, G. of S. L.	7	
IV.....	7	55	106	45	62	2.0	47	.54	Winnipeg, Man.....	7	30	Helena, Mont.....	7	68	nw.	Block Island, R. I.....	9	
V.....	8	54	115	43	67	4.0	36	.58	Quebec, Quebec.....	8	8	Quebec, Quebec.....	8	8	w.	Buffalo, N. Y.....	8	
VI.....	11	30	100	52	66	2.0	54	1.18	Moorhead, Minn.....	9	28	Rochester, N. Y.....	11	56	w.	Cheyenne, Wyo.....	9	
VII.....	13	40	111	46	62	3.5	30	.68	Halifax, N. S.....	13	37	Montreal, Quebec.....	13	84	w.	Buffalo, N. Y.....	13	
VIII.....	18	41	116	39	104	1.0	30	.18	Yarmouth, N. S.....	15	16	Nashville, Tenn.....	15	54	nw.	Sandy Hook, N. J.....	16	
IX.....	19	40	94	47	57	2.0	45	.64	Cheyenne, Wyo.....	19	15	Fort Elliott, Tex.....	19	42	w.	Pueblo, Col.....	19	
X.....	22	43	106	43	67	2.0	52	.52	Halifax, N. S.....	20	20	Portland, Me.....	20	64	w.	Buffalo, N. Y.....	20	
XI.....	23	50	125	40	71	3.5	37	1.00	Albany, N. Y.....	23	28	Fort Sully, S. Dak.....	22	46	sw.	do.....	23	
XII.....	29	48	125	50	71	2.5	46	.58	Marquette, Mich.....	23	28	La Crosse, Wis.....	24	60	w.	Cheyenne, Wyo.....	25	
Mean.....		45	108	45	70	2.7	40	.61	Calgary, N. W. T.....	24	31	Medicine Hat, N. W. T.....	29	64	sw.	Fort McKinney, Wyo.....	25	
									Father Point, Quebec....	31	44							

NORTH ATLANTIC STORMS FOR JANUARY, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the north Atlantic Ocean during January, 1890, are shown on chart i. These paths have been determined from international simultaneous observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Twelve depressions have been traced for January, 1890, the average number traced for the corresponding month of the last seven years being 9.7. The greatest number of depressions previously traced for January was twelve, in 1884 and 1887, and the least number was seven, in 1886. Of the depressions traced for the current month six advanced eastward over Newfoundland, three passed eastward between Newfoundland and the forty-second parallel, and three first appeared over the ocean. Of the nine depressions that moved eastward from the American continent, four were traced to the British Isles, as were also two of the storms which first appeared over the ocean. The depressions generally pursued a uniform east-northeast course, and, while the tracks were more southerly than during the preceding fall and winter months, no storms were located south of the fortieth parallel. Over the western part of the ocean the severest storms occurred on the 3d, 7th, 9th, 10th, 17th, and 28th, when the pressure fell to, or below, 29.00 (737), and the wind attained hurricane force; on the 14th, 21st to 23d, 25th, and 26th, heavy gales were reported in that region. At Saint John's, N. F., the gale of the 7th was accompanied by snow and rain; that of the 10th by a heavy snow storm; that

of the 17th by snow, sleet, and rain; and on the 21st a blinding snow storm prevailed all day. Over mid-ocean severe storms prevailed throughout the entire month, the 4th, 5th, 15th to 18th, 22d to 24th, 28th, and 29th being dates for which pressure falling to, or below, 29.00 (737) and gales of hurricane force were noted; on the 24th pressure below 28.30 (719) was indicated, and an extreme reading of 28.08 (713) was reported. Stormy weather prevailed over and near the British Isles on the 3d to 6th, 9th, and 14th to 27th; on the 5th a heavy gale prevailed over Great Britain and Ireland, causing many wrecks and much damage; from the 18th to 26th the barometer continued very low over the British Isles, falling to 28.97 (736) at Leith, Scotland, on the 19th, on which latter date a terrific storm raged over Ireland and the more northern and western parts of Great Britain and caused much damage to property and shipping.

The movements of areas of high pressure over the north Atlantic Ocean during the month were as follows: On the 1st the pressure was highest over Nova Scotia, and an area of high pressure extended thence to the West Indies and the Azores. By the 2d the area of high pressure had settled southward and was central off the south Atlantic coast, where it remained until the 3d, and by the 4th the pressure was highest over the middle Atlantic states and the area of high pressure over the ocean had apparently contracted to the westward of the fiftieth meridian. By the 6th this area had moved to the vicinity of Bermuda, whence it apparently moved eastward. On the 10th an area of high pressure was central over the lower Saint Law-

rence valley, where it remained during that and the following date, and on the 12th the pressure was high along the entire Atlantic coast. By the 13th the area of high pressure had moved southeastward over Nova Scotia, and by the following date had apparently united with the area of high pressure over the Azores. From the 14th to 16th an area of high pressure advanced from the middle Atlantic coast to the Azores. On the 17th and 18th an area of high pressure extended along the Atlantic coast and the pressure was high over and near the Azores. During the 19th and 20th the area of high pressure moved from the Atlantic coast to the southward of the Azores. From the 22d to 25th the pressure was high over the southeastern part of the United States; by the 26th this area of high pressure had advanced eastward to about the sixtieth meridian, where it apparently disappeared by a decrease in pressure by the 28th. On the 29th the pressure was high along the Atlantic coast south of the fortieth parallel, and on the 30th an area of high pressure extended from the American coast to the Azores. On the 31st high pressure prevailed over the entire ocean south of the fiftieth parallel.

Among notable January storms of preceding years over the eastern part of the United States and off the Atlantic coast were the following: In 1878 a depression, which was first located south of the mouth of the Rio Grande River on the 6th, moved slowly east-northeast over the Gulf of Mexico and crossed Florida on the 9th, and thence advanced northeastward just off the coast line to the Maine coast by the morning of the 11th, whence it recurved to the eastward and passed over Nova Scotia by the 12th. While central over New England this was one of the severest storms ever known on the coast of the United States, along the whole extent of which innumerable wrecks occurred. At Mount Washington, N. H., a wind velocity of 186 miles per hour from the northeast was measured at 4 a. m. of the 11th. In this month a storm advanced from the lower Mississippi valley to the Georgia coast during the 30th, and thence moving northeastward off the coast was central off the New Jersey coast the night of the 31st. This storm was very severe along the coast, the wind attaining a velocity of 120 miles per hour at Kitty Hawk, N. C., at 2.20 a. m. of the 31st. Among other disasters the steamship "Metropolis" was wrecked on the North Carolina coast. In 1886 a storm, which first appeared in southern Texas on the 7th, moved to southern Alabama by the 8th, thence northeastward to the New Jersey coast by the morning of the 9th, and thence northeastward over New England to the lower Saint Lawrence valley by the 10th. This storm increased in energy as it passed over the Gulf States, and attained great violence as it moved northeastward along the Atlantic coast. At Boston, Mass., the barometer fell to 28.73 (730) during the afternoon of the 9th, to 28.72 (730) at Sandy Hook, N. J., at 9 a. m. of the 9th, and the gradient was steep in all directions, the pressure being 30.80 (782) in Minnesota and Dakota. The storm developed its maximum energy while passing along the middle Atlantic coast; after passing over New England the winds decreased in force. This storm was followed by one of the most widespread and intense cold waves ever experienced over the United States east of the Rocky Mountains.

Compared with the corresponding month of the last seven years the weather along the trans-Atlantic steamship routes during January, 1890, was exceptionally severe. The low pressure storms which advanced eastward from the American continent exceeded in number and energy the January average, and by their uniform movement towards the European coast, which an unusually large proportion of them reached, caused continuously low pressure over mid-ocean and prevailingly low pressure over and near the British Isles.

The following are brief descriptions of the depressions traced for January, 1890:

1.—On the 1st and 2d an area of low pressure was central north of the region of observation between the fifteenth and thirtieth meridians, whence it moved eastward and disappeared

north of the British Isles after the 3d, with pressure falling below 29.40 (747) and fresh to strong gales.

2.—This depression was a continuation of low area i, which moved eastward over the Saint Lawrence Valley during the 2d. By the 3d the centre of depression had advanced over northern Newfoundland to north of the Grand Banks, with pressure about 29.00 (737) and gales of hurricane force. Passing thence east-northeast the storm-centre reached the twentieth meridian by noon, Greenwich time, of the 5th, its progress being attended by fresh to strong gales, and on the 4th by gales of hurricane force and pressure falling below 28.70 (729). By the 6th this depression had apparently moved northeastward beyond the region of observation.

3.—This depression first appeared over mid-ocean, and on the 6th was central between the twentieth and thirtieth meridians, with pressure falling below 29.20 (742) and strong to whole gales, after which it passed beyond the region of observation, apparently following in the wake of depression 2.

4.—This depression was a continuation of low area iii, which advanced from the Lake region to Nova Scotia during the 6th. By the 7th the storm-centre had passed over southern Newfoundland, with pressure below 29.00 (737) and heavy gales, and thence moving north of east disappeared over the British Isles east of the region of observation after the 9th, attended by strong to whole gales over the ocean.

5.—This depression was a continuation of low area iv, which was central over eastern Nova Scotia the morning of the 9th. By the 10th the centre of depression had moved northeast over Newfoundland to about the forty-fourth meridian, and thence passed to the twenty-fifth meridian in about N. 57° by the 11th, after which it disappeared north of the region of observation. This depression was attended on the 9th and 10th by pressure falling below 29.00 (737) and gales of hurricane force, after which there was an apparent loss of energy, although strong to whole gales continued over mid-ocean during the 11th and 12th.

6.—This depression was a continuation of low area vi, which advanced from north of the Lake region to Nova Scotia during the 13th. By the 14th the storm-centre had moved northeast over Newfoundland to about the forty-eighth meridian, with pressure below 29.40 (747) and fresh to strong gales. During the next three days the depression passed east-northeast to the fifteenth meridian, and disappeared north of the British Isles after the 17th. From the 15th to 17th the depression was attended by heavy gales, attaining hurricane force on the 15th and 17th, and pressure falling below 29.00 (737); on the 18th by pressure falling below 29.00 (737) north and northwest of Ireland; and on the 19th by pressure falling to 28.79 (731) at Leith, Scotland, on which latter date destructive storms prevailed over the British Isles.

7.—This depression was a continuation of low area vii, which was central over New England on the 16th. By the 17th the depression had advanced over Newfoundland, with pressure falling to 28.82 (732) at Saint John's, N. F., and gales of hurricane force over the ocean, after which it apparently moved rapidly east-northeast and united with an extensive area of low pressure which occupied the eastern part of the ocean.

8.—This depression was a continuation of low area ix, which advanced from the upper lake region to Nova Scotia during the 20th. By the morning of the 21st the centre of depression had moved to the south of Newfoundland, with pressure below 29.27 (742) and heavy gales, whence it moved rapidly east-northeast to about the twenty-fifth meridian by the 22d, attended by strong to whole gales and pressure below 28.90 (734), after which it disappeared north of the British Isles without evidence of diminished energy.

9.—This depression apparently originated east of the Banks of Newfoundland and was central on the 23d in about N. 48°, W. 38°, with pressure below 29.00 (737) and gales of hurricane force, whence it moved northeast to about the twenty-ninth meridian by noon, Greenwich time, of the 24th, on which latter date the pressure was probably the lowest and the storms

the severest of the month over mid-ocean. On this date an extreme low barometer reading of 28.08 (713) was reported near the storm's centre, and terrific hurricanes were encountered east of the fortieth meridian.

10.—This depression was a continuation of low area x, which was central off the southern coast of Nova Scotia on the morning of the 24th. By the 25th the storm-centre had moved eastward over the Grand Banks, attended by fresh gales, after which it apparently passed rapidly northeastward and united with an extensive area of low pressure which occupied the ocean east of the thirtieth meridian.

11.—On the morning of the 26th this storm was central south of Newfoundland, whence it moved northeast and disappeared north of the region of observation after the 27th without evidence of marked energy.

12.—This depression was a continuation of low area xi, which was central off the New England coast on the morning of the 27th. By the 28th the depression had moved eastward to the fiftieth meridian, with pressure below 29.00 (737) and gales of hurricane force, after which it passed rapidly northeastward beyond the region of observation without an apparent decrease in energy.

OCEAN ICE IN JANUARY.

Vast fields of Arctic ice and enormous icebergs were encountered over and near the Grand Banks north of the forty-third parallel throughout a greater part of the month. Within the period covered by the ice records of this office, which embraces the last eight years, the current month is by far the most remarkable January as regards the quantity of Arctic ice reported, and while it may be stated that the southward movement of icebergs and field ice was unprecedentedly early, and that a general and extensive movement of Arctic ice over the Grand Banks is not commonly inaugurated until the early spring months, it may also be remarked that during the present winter the southward movement of Arctic ice over the Banks of Newfoundland has been practically uninterrupted, and that, in the preceding as well as during the current month, the Arctic ice reported over and near the Grand Banks would compare, in quantity, with that noted during the spring and summer months, in which seasons it is, as a rule, most prevalent in that region. On the 15th large quantities of drift and field ice were reported between the south coast of Newfoundland and Cape Breton Island, and on the 25th, ice along the eastern coast of Newfoundland prevented steamers from reaching Saint John's. In the corresponding month of 1889 no Arctic ice was reported; in 1888, two bergs, one very large, were observed in N. 45° 20', W. 50° 01' on the 31st, and an ice bank was seen to the northward of that position; in 1887, a medium-sized berg was reported in N. 48° 30', W. 46° on the 30th; in 1886, several icebergs were reported off the southeast coast of Newfoundland; in 1885, icebergs were reported between W. 45° 30' and W. 42° 24', none being observed south of the forty-seventh parallel; in 1884, icebergs were reported about four degrees farther west, and about eleven days later, on the 24th, than in January, 1885; in 1883, the first icebergs were reported in 47° 35', W. 45° 04' on the 30th; in 1882, the first icebergs were observed in N. 47° 30', W. 48° 35' on the 30th.

The following positions of icebergs and field-ice reported for January, 1890, are shown on chart i by ruled shading:

1st.—N. 47° 50', W. 48° 05', small berg, with two peaks.

5th.—N. 47° 16', W. 44° 52', two bergs, about one hundred feet high; N. 48° 10', W. 48° 30', berg from seven to eight hundred feet long and seventy feet high; N. 47° 19', W. 45° 05', large berg; N. 46° 45', W. 48° 48', medium berg.

6th.—N. 46° 24', W. 48° 15', large berg; N. 50° 20', W. 44°, two small bergs; N. 47° 20', W. 44° 27', berg about eighty feet high; N. 48° 02', W. 49° 15', large berg, with detached pieces; N. 48° 12', W. 49° 15', large pieces of drift ice; N. 50° 08', W. 43° 30', two small bergs.

7th.—N. 48° 35', W. 48° 45', large berg and field ice; N. 48°, W. 49°, large berg; N. 45° 59', W. 49° 09', berg, four hundred

feet long and one hundred feet high; N. 48°, W. 49°, fifteen miles of field ice.

8th.—N. 46° 01', W. 48° 40', enormous berg, about one-fourth of a mile long and two hundred feet high; N. 48° 34', W. 48°, drift ice for ten hours; thence to Saint John's N. F., ice fields; N. 46° 40', W. 44° 05', berg twenty-five feet high and one hundred and thirty feet long; N. 46° 50', W. 44° 10', berg one hundred and thirty feet high and three hundred and twenty-five feet long.

9th.—N. 45° 25', W. 48° 35', two large blocks of ice; N. 46° 46', W. 45° 08', berg about six hundred feet long and one hundred and twenty feet high.

10th.—N. 47°, W. 47°, field of ice, extending northward; N. 46° 10', W. 48° 16', berg.

11th.—N. 46°, W. 47°, large berg; N. 45° 25', W. 48° 16', berg with three peaks; N. 47° 39', W. 47° 47', small quantity of field ice, and two small bergs.

12th.—N. 46° 01', W. 47° 53', one large and one small berg; N. 45° 32', W. 48° 07', small berg eighty feet high; N. 46° 01', W. 46° 47', small berg.

13th.—N. 46° 03', W. 47° 47', small piece of ice; N. 46° 18', W. 47° 02', large berg about two hundred feet high, and five hundred to six hundred feet long.

14th.—N. 46° 01', W. 47° 53', small flat iceberg; N. 46° 46', W. 47° 22', detached ice for an hour, field ice to the northward.

15th.—Steamer "St. Pierre" could not get into Sydney, C. B. I., on account of ice. She also passed a quantity of drift ice in the Gulf on her way across from Saint Pierre, N. F.

16th.—N. 45°, W. 48°, large berg; N. 46° 32', W. 47° 07', field ice to the northward.

19th.—N. 47°, W. 47°, field ice to northward; evening of same day a berg; N. 47° 56', W. 48°, field ice studded with large bergs.

20th.—N. 47° 52', W. 47° 52', large quantities of drift ice, with one large and several small bergs; N. 47°, W. 50° 40', field ice; N. 45° 53', W. 41° 33', berg one hundred and fifty feet high and two hundred and fifty feet long; N. 45° 48', W. 41° 42', berg sixty feet high and one hundred feet long, with two turrets; N. 46° 34', W. 45° 02', large berg about two hundred feet high.

20th-21st.—N. 46° 37', W. 44° 58', sloping berg two hundred feet high at one end and one hundred and fifty feet at the other, eight hundred feet long; N. 46° 03', W. 46° 43', large amount of closely packed field ice.

21st.—N. 46° 44', W. 39° 40', berg; N. 46° 15', W. 47° 59', large berg about four hundred feet long and fifty feet high; also several about three hundred feet long and forty feet high; N. 46° 38', W. 44° 44', high berg; N. 47° 30', W. 46° 35' to N. 46° 16', W. 47° 13', great quantities of ice and several large bergs; N. 47° 40', W. 47° 40' to N. 47° 07', W. 48° 30', field ice for fifty-six hours; N. 46°, W. 45°, bergs and field ice; N. 46° 50', W. 46° 30', berg about sixty feet high and four hundred feet long; N. 46° 15', W. 47° 29', bergs about forty feet high and three hundred feet long, and a densely packed field of ice twenty miles long; N. 46° 25', W. 46° 36', to N. 46° 06', W. 47° 12', berg twenty-five feet high and one hundred and sixty feet long, and heavy field ice to the northward; N. 46° 44', W. 44° 35', berg, large at the base and rising to a peak, sixty feet high; N. 45° 42', W. 47° 58', ten miles of field ice, ice thin and spongy.

22d.—East of Virgin Rocks, an ice pack for fifty-six hours; N. 44° 37', W. 41° 28', berg; N. 48°, W. 48°, field ice and heavy bergs; N. 45° 50', W. 41° 30', a large and a small berg.

22-23d.—N. 47° 27', W. 45° 16', double-peaked berg, forty feet high and one hundred and thirty feet long; large quantities of field ice and several small bergs awash.

23d.—N. 45° 54', W. 48°, quantity of field ice; N. 46° 23', W. 47° 25' to N. 46° 11', W. 48° 03', fields of pack ice, twenty-nine miles long; N. 46° 44', W. 48° 20', entered field ice with several small bergs; N. 45° 44', W. 46° 36' to N. 45° 52', W. 46° 46', passed south of field ice; N. 45° 52', W. 47° 33', bergs and drift ice, the largest berg was one hundred feet high; N.

47° 33', W. 47° 27', light field ice; N. 45° 41', W. 47° 36', several small icebergs; N. 45° 10', W. 48° 12', three large bergs among field ice, one of which was about one-fourth of a mile long.

24th.—N. 45° 47', W. 47° 17' to N. 45° 47', W. 47° 39', three large bergs; N. 45° 27', W. 47° 24', one large and two small bergs; N. 45° 04', W. 48° 21', berg.

25th.—The whole eastern coast of Newfoundland was blockaded with ice. The steamers "Caspian" and "Miranda" were unable to get into Saint John's, N. F., on account of ice; N. 46° 17', W. 47° 50' to N. 45° 10', W. 48° 14', field ice and several bergs.

26th.—N. 46° 24', W. 47° 28', large berg three hundred feet long and two hundred feet high; N. 45° 59', W. 47° 59', two small bergs; N. 46° 15', W. 47° 39', large quantities of field ice; N. 46° 57', W. 47° 42', several small bergs and field ice; N. 45°, W. 51°, four bergs and field ice for four hours.

27th.—Thirty miles east of Scatari Island, heavy field ice, extending beyond view; N. 45° 17', W. 47° 21', two hummocks, estimated seventy feet out of water; N. 44° 50', W. 48° to N. 45°, W. 49°, several flocs of field ice; N. 46° 40', W. 52° 55', field ice; N. 44° 18', W. 49°, large berg; N. 48° 30', W. 48° 48', two wide streaks of field ice; at 3.30 p. m., vessel completely jammed, engines stopped till 11.30 p. m.; N. 46° 13', W. 41° 11', field of ice, extending one hundred miles to the westward and as far north as could be seen.

27-28th.—N. 46° 10', W. 47° 15' to 45° 30', W. 48° 40', fields of ice; heavy packed ice and small bergs.

28th.—N. 44° 29', W. 47° 40', five large and several small bergs in fields of ice five to fifteen miles long; N. 46° 24', W. 47° 29', two bergs, and steamed for twelve hours through field ice; one hundred and thirty miles east of Saint John's, N. F., several large bergs; N. 44° 20', W. 50°, field ice; N. 45° 06', W. 58° 40' to N. 44° 51', W. 59° 40', fields of ice.

29th.—N. 43°, W. 49° 35', berg two hundred feet high and four hundred feet long; N. 45° 52', W. 47° 59' to N. 45° 22', W. 49° 14', continuous heavy field ice; N. 43°, W. 49° 10', large berg; N. 44° 34', W. 48° 40', two bergs; N. 44° 29', W. 47° 40', large berg, one-half mile wide and one mile long.

29-30th.—N. 46° 50', W. 46° 52' to N. 45° 12', W. 48° 50', ice field.

30th.—N. 46° 50', W. 46° 45' to N. 45° 32', W. 48° 15', large fields of ice and several large and small bergs; N. 43° 19', W. 48° 52', very large berg; N. 45°, W. 47°, three bergs and large quantities of field ice.

31st.—N. 46° 05', W. 47° 13', large fields of densely packed ice and several bergs from one hundred to one hundred and fifty feet long and thirty to fifty feet high; N. 44° 38', W. 60°, numerous streaks of field ice with a few large pieces; N. 43° 05', W. 48° 56', large berg about one hundred and fifty feet high.

FOG IN JANUARY.

The following are limits of fog-areas on the north Atlantic Ocean, west of the fortieth meridian, for January, 1890, as reported by shipmasters:

Date.	Entered.			Cleared.			Date.	Entered.			Cleared.		
	Lat. N.	Lon. W.	W.	Lat. N.	Lon. W.	W.		Lat. N.	Lon. W.	W.	Lat. N.	Lon. W.	W.
5-6	42 18	61 21		43 16	58 15		14	44 18	49 20		44 11	50 01	
5-6	31 25	80 07		31 56	80 29		16	42 57	57 36		42 56	58 03	
5-6	31 47	80 46		31 56	80 29		15-16	38 42	72 32		38 30	73 02	
6	41 30	64 00		41 20	64 35		15-16	42 51	64 54		41 21	66 59	
6	41 30	65 17		40 59	66 30		16-17	43 55	58 00		43 22	60 00	
6	44 32	61 06		43 31	62 45		16-17	44 15	50 35		43 45	51 58	
6-7	43 22	57 03		43 58	54 37		16-17	42 27	60 08		42 04	61 48	
7	42 31	59 31		42 56	48 57		27	43 00	58 08		42 25	60 19	
12	42 18	68 40		42 55	64 36		27-28	41 30	65 00		41 20	65 05	
12-13	40 39	66 40		40 32	69 49		31	41 25	65 20		41 05	68 10	
13-14	42 52	61 52		42 50	62 59								

The limits of fog belts west of the fortieth meridian are shown on chart i by dotted shading. In the vicinity of the Banks of Newfoundland fog was reported on four dates; between the fifty-fifth and sixty-fifth meridians on nine dates; and west of the sixty-fifth meridian on eight dates. Compared with the corresponding month of the last two years the dates of occurrence of fog near the Grand Banks numbered two less than the average; west of the fifty-fifth meridian the dates of occurrence of fog were two less than the average for the last two years. Over and near the Grand Banks fog was reported on the 7th, 14th, and 17th, with the approach and passage to the northward of areas of low pressure, and on the 16th, with the advance over New England and Nova Scotia of an area of low pressure. Between the fifty-fifth and sixty-fifth meridians fog was generally reported attending or following the passage to the northward of areas of low pressure, and was preceded or attended by rain. West of the sixty-fifth meridian fog generally occurred with south to east winds and rain, attending the approach or passage to the northward of areas of low pressure. Along the immediate coast of the United States fog was more generally noted on the 5th, when it occurred at Nantucket, Mass., and Block Island, R. I., in the evening, with an area of low pressure central over the Lake region; on the 6th at Portland, Me., and Boston, Mass., attending the passage of a storm-centre over New England; on the morning of the 12th at Nantucket and Wood's Holl, Mass., Block Island, R. I., New London, Conn., and New York City, with the passage of an area of low pressure from the Lake region over New England; and on the morning of the 13th at Nantucket, Wood's Holl, and Boston, Mass., Portland, Me., Block Island, R. I., New London, Conn., and Atlantic City, N. J., with the passage of an area of low pressure from the Lake region to Nova Scotia.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for January, 1890, is exhibited on chart ii by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

For January, 1890, the mean temperature was highest over southern Florida, where it was above 70°; the highest mean reading, 73°.4, being reported at Key West. The mean values were above 60° over southern Georgia and in the

southern parts of the east and west Gulf states. South of a line traced irregularly south of west from the coast of Virginia to extreme western Texas, and in southwestern Arizona and extreme southern California, the mean temperature was above 50°. The mean temperature was lowest in the lower valley of the Red River of the North, in Manitoba, and the eastern part of the British Northwest Territory, where it fell to or below -10°. The mean readings were below zero north of a line traced from northeastern Minnesota southwestward to south-central North Dakota and thence west-northwest to the British Possessions north of western Montana; they were below 10° north of a line traced from Prince Edward Island, Gulf of Saint Lawrence, westward to Lake Superior, thence irregularly southwestward to southern South Dakota, and thence irregularly west-northwestward to northwestern Montana, the mean values also fell below 10° in the more elevated parts of west-central Colorado. North of a line traced from