

pressure crossed the Rocky Mountains near the northern boundary during the night of the 9th and continued its northeasterly course during the 10th, leaving a barometric trough to the southward, within which afterwards developed the storm traced as number vi. The pressure continued low in the region north of Dakota and Minnesota until the 14th, without any apparent easterly movement of this area, and it was finally replaced by an increase of pressure from the Pacific coast due to the advance of high area described as number iii.

VI.—This depression formed in the southern portion of the barometric trough traced as number v. It extended over the central Rocky Mountain region on the 11th, being central in the eastern part of Utah. It passed eastward over Colorado during the 11th and 12th, and on the morning of the 13th it extended from Texas northward over Minnesota, causing local rains in the states of the Mississippi and Missouri valleys. The advance of an area of high pressure from the Rocky Mountain regions apparently caused the formation of two areas of low pressure, one central north of Minnesota and the other in eastern New Mexico, both of which were replaced by the extension of the high area previously referred to.

VII and VIII.—On the 18th the barometric pressure was unusually low over the plateau regions and north of Montana, where on the afternoon of that day this area of low pressure (vii) was first located. During several days preceding there had apparently been a gradual decrease of barometric pressure, extending along the Pacific coast from Arizona and southern California and to the eastward of the Coast Range. This northerly movement continued over the plateau region while an area of high pressure passed southeastward over the Rocky Mountains, and although this disturbance is not traced to the southward it probably resulted from the conditions above named. It moved southeastward, crossing the Rocky Mountains near the northern boundary during the 18th; on the 19th it passed eastward

over Dakota, number viii developing in the southern portion of the barometric trough central in Nevada on the same day. The latter moved eastward over Colorado on the 19th, and the two united on the 20th, remaining almost stationary in eastern Colorado and western Nebraska until the afternoon of the 21st, when two secondary areas again formed—one passing northeastward over Lake Superior, and the other passing southward and disappearing quickly by a gradual increase of pressure, due to the advance of an area of high pressure from the Rocky Mountain region.

IX.—This is the only storm of the month which was traced to the Atlantic coast. It was first observed north of Montana on the 22d, and moved southeastward to Lake Superior, where it was central on the 24th, attended by local rains throughout the Northern States. From Lake Superior it moved eastward during the 24th and 25th, and its centre could only be approximately located. After reaching the Saint Lawrence Valley an area of low pressure developed on the New England coast and continued almost stationary over that region until the 28th, when the centre of disturbance was east of the coast line, apparently south of Boston.

When this disturbance was first observed in the extreme northwest on the 23d, a second area of low pressure, possessing but slight energy, but accompanied by very heavy rains, extended over Florida and the south Atlantic coast. This second disturbance was quite well defined in that region during the 23d, but it was not considered of sufficient importance to be traced on chart number i.

X.—This low area appeared far to the north of Montana on the 28th, moving first to the southeastward and then to the southward, causing general rains in the central valleys and on the Atlantic coast. This low area apparently moved from western Lake Superior southward to Illinois, where the centre was last located on the afternoon of the 31st.

#### NORTH ATLANTIC STORMS DURING MAY, 1887.

[Pressure in inches and millimetres; wind-force by Beaufort scale.]

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 ships' logs and other data collected by the Signal Service agencies at the ports of New York, Boston, and Philadelphia; reports received through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs furnished by the proprietors of the "New York Maritime Register," and from other miscellaneous data received at this office up to June 21, 1887.

Eleven depressions are traced, of which two traversed the ocean from coast to coast; one originated over the Caribbean Sea and moved northward over Cuba; one first appeared south of Bermuda and advanced slowly northward; one passed southward from the American coast, in about N. 41°, and subsequently circled northeast; four developed to the southward or southeastward of Nova Scotia and Newfoundland; one is first charted northeast of Newfoundland, and two are first traced within the region of observation in European waters, one having advanced from the southwest and the other from the northwest. The general direction of movement of the depressions was east-northeast to the eastward of the fortieth meridian, while to the westward of that longitude the tracks were greatly diversified as regards position and direction.

The general character of the weather over the north Atlantic Ocean was seasonable, and the depressions which appeared within the region of observation were rather evenly distributed throughout the month. Storms of marked violence were not reported until the 10th, although previous to this date four depressions appeared, two of which passed from Newfound-

land to the European coast, their tracks being well to the northward of the trans-Atlantic routes; one pursued an irregular course southeast of Newfoundland, and one prevailed during the 2d to the southward of the British Isles. From the 10th to the 13th strong south to west gales were encountered to the eastward and southeastward of Newfoundland. From the 15th to the 20th unsettled and stormy weather prevailed from Bermuda to Jamaica, while on the 19th strong west to north gales were experienced to the southward of the British Isles. The severest storms of the month occurred over mid-ocean from the 22d to 25th, inclusive, with barometric pressure ranging below 29.00 (736.6). From the 26th to the 28th, inclusive, very heavy thunder-storms, accompanied by heavy rain, prevailed over the ocean south of Nova Scotia, and on the 28th strong to whole gales were reported in the vicinity of the Azores. During the first ten days of the month the barometric pressure fluctuated over the entire ocean, but continued relatively high in the vicinity of the Azores until the 7th when an appreciable fall, followed after the 8th by a rapid rise, in barometer occurred in that region. From the 10th to the 22d the pressure continued high over mid-ocean, after which a period of low barometric pressure continued over, and to the northward of, the Azores until the 29th. The month ended with an area of high barometer to the southward and southeastward of the Banks of Newfoundland; elsewhere the pressure was about normal.

For May, 1886, ten depressions were traced, of which one traversed the ocean from coast to coast. The positions of the tracks were, as in May, 1887, greatly diversified, and their general direction was east-northeast. In no instance were pressures below 29.00 (736.6) reported.

As compared with the corresponding month of previous

years, the depressions which appeared during May, 1887, correspond closely with the average as regards number, position, and direction of movement. The storms were not, as a rule, of exceptional strength, and the severe disturbances which prevailed over mid-ocean from the 22d to the 25th, inclusive, attending the passage of depressions numbers 8 and 9, constitute a noticeable feature of the month.

The following are brief descriptions of the depressions traced:

1.—This depression was central on the 1st over the west portion of the Gulf of Saint Lawrence, whence it followed the normal east-northeast track to the northwestward of Scotland by the 7th. The depression had moderate strength throughout, but passed too far to the northward to cause strong disturbances in the trans-Atlantic routes.

2.—This depression apparently advanced northeast to the vicinity of the French coast, in N. 48°, by the 2d, after which it passed beyond the region of observation; while exhibiting considerable depth, this depression was unaccompanied by gales of marked strength over the ocean.

3.—This depression first appeared over the ocean southeast of Nova Scotia on the 2d, and moved slowly southeast by the 3d; by the 4th the storm-centre had circled westward to the sixty-fourth meridian, whence it passed northeast to Newfoundland by the 5th. During the next three days it pursued an east-northeast course to the northwestward of the British Isles. The depression had slight depth throughout and occasioned gales of but moderate strength.

4.—This depression is first charted in N. 37°, W. 46° under date of the 7th, whence it moved slowly east by the 8th, after which it was deflected northward by an area of high pressure overlying the Azores. From the 9th to the 13th, inclusive, it pursued an irregular course over the ocean east of Newfoundland and thence passed northward beyond the region of observation. The depression was of moderate strength and exhibited barometric minima ranging to about 29.50 (749.3) on the 10th.

The following reports of shipmasters refer to gales encountered within the area of this depression: Capt. M. P. Lund, of the s. s. "Katie," reports a strong s. to w. gale on the 9th and 10th; lowest barometer, 29.51 (749.5), at 4 a. m. of the 10th, in N. 46° 30', W. 39° 00'. Capt. W. Skjodt, of the s. s. "Island," reports a fresh nw. to w. gale during the 11th and 12th; lowest barometer, 29.65 (753.1), at 4 p. m. of the 12th, in N. 40° 26', W. 54° 30'.

5.—This depression was central on the 15th to the southward of Bermuda, with fresh to strong gales and rain over a considerable area to the northward. By the 16th the centre of depression had moved to the northwest of Bermuda, with central pressure about 29.60 (751.8). Passing slowly northward the storm disappeared north of Newfoundland during the 20th, an area of high barometer over the ocean opposing an eastward course.

The following report shows the character of the disturbances which attended the passage of this depression over Bermuda: Capt. James S. Garvin, of the s. s. "Orinoco," reports: "15th, at Bermuda; in a. m. very heavy rain, falling barometer, fresh s. gale; 8 p. m., barometer 29.57 (751.1), fresh s. gale, heavy rain and thunder. 16th, 6 a. m., barometer 29.55 (750.6), fresh s. gale, heavy rain; 10 a. m., wind sse., rain; noon, heavy s. gale, barometer 29.45 (748.0); midnight, barometer 29.55 (750.6), fresh sw. gales. 17th, in a. m., fresh sw. wind, rising barometer; in p. m., fine weather."

6.—Vessel reports of the 17th indicated the presence of a cyclonic centre to the westward of Jamaica; moving slowly north the depression is traced to the south coast of Cuba, in W. 79°, by the 18th, whence it passed north over that island by the 19th. During the 20th and 21st the centre of depression advanced eastward to the seventy-first meridian, after which it disappeared. The passage of this depression was chiefly characterized by heavy rain, although the wind was heavy, in gusts, and barometric pressure 29.60 (751.8) was reported on the 18th.

The following reports relative to this storm have been rendered: Mr. James Mainwaring, observer on the s. s. "Athos," Capt. Horatio Low, commanding, reports: "17th, off the south-east end of Jamaica; weather very dark and thick, with torrents of rain, vivid lightning, and strong gusts of wind from se.; continued very squally and unsettled, with heavy rain, until the 18th." Capt. John Legoc, of the s. s. "Pomona," reports: "17-18th, in Montego Bay, Jamaica; very heavy rain, wind from sw., in heavy, short squalls, making a bad sea at times; at night very dark; lowest barometer, 29.71 (754.6), on the 18th. This was an unusually heavy wind for Jamaica, for the time of year." Second Officer Sengzelius, of the s. s. "Alvena," Captain Mackay, commanding, reports: "17th, from Kingston to Lucea, Jamaica, experienced very rough weather after leaving Port Royal at 10 a. m., Greenwich mean time. 18th, the wind commenced to blow from the southward, with heavy rain squalls, and increased in strength up to 4 p. m., during which time the wind hauled to the westward and a heavy sea was running from sw.; the barometer (mercurial) being down to 29.60 (751.8) at the last-mentioned hour. After 4 p. m. the wind and squalls decreased in strength, but wind continued to blow strong from the westward." The s. s. "Athos," on the 20th, in N. 26° 13', W. 74° 12', encountered an easterly gale, accompanied with heavy rain squalls lasting twelve hours; lowest barometer 29.85 (758.2).

7.—This storm advanced southeast over the ocean west of Ireland by the 19th, and thence passed eastward beyond the region of marine reports. The depression was accompanied by strong gales and rain to the thirty-fifth meridian on the 19th.

Capt. R. Griffiths, of the s. s. "Surrey," reports, relative to this depression: "19th, in N. 49° 13', W. 9° 40', at noon, experienced a strong gale from wnw., commencing at 13 hours; the sea ran very high until noon of the 20th, in N. 49° 53', W. 4° 05', the ship at that time being well sheltered under the English coast; the wind gradually moderated, with occasional heavy nw. squalls, the last passing over at 9 p. m.; lowest barometer, 29.69 (754.1), at 14 hours 45 minutes on the 19th."

8.—While it is probable that this depression was a continuation of ocean storm number v, an absence of reports from the region west and north of Newfoundland will not admit of connecting the tracks. Considered as a separate storm, this depression appeared within the region of observation, in N. 51°, W. 43° on the 22d, and, moving southeast, with barometric pressure below 29.50 (749.3), it united with depression number ix on the 23d.

The following report refers to this depression: Capt. Milburn, of the s. s. "British Prince," reports a gale on the 22d, in N. 48° 09', W. 37° 33', at noon. The gale was accompanied by a very bad sea, and ship was hove to; barometer fell to 29.48 (748.8) at 6 hours 35 minutes, when wind suddenly shifted to nw. in a very heavy shower.

9.—This depression was central on the 23d in N. 38°, W. 53° whence it had apparently advanced from the southwestward, and, while the course of direction held by depression number vi on the 21st would allow of its possible continuation to the position given number ix for the 22d, the large extent of intervening territory sparsely covered by reports will not admit of accurately tracing number vi subsequent to the 21st. Following the junction of numbers viii and ix on the 23d a depression of great energy, accompanied by the severest disturbances of the month, moved slowly northward along the west margin of an area of high pressure which occupied the British Isles and the ocean to the westward, and disappeared north of the fifty-fifth parallel after the 25th.

The following are reports descriptive of disturbances experienced within the area of this depression:

Capt. A. McRitchie, of the s. s. "Australia," reports: "22d, in N. 40° 23', W. 30° 42', at noon; at 1.30 p. m. wind increased to strong gale, steady from s., with heavy, threatening weather. 23d, 5.30 a. m., gale blowing force 11, with tremendous sea from s.; had to keep ship's head to wind and sea seven hours; position at noon, N. 40° 16', W. 34° 47'; 1 p. m., wind and sea

moderated; barometer 29.43 (747.5); wind veered to wsw. and at 4 p. m. to nw., moderating in shift and afterwards increasing to strong nw. gale, with heavy squalls and high cross seas from sw., w., and nw." Third Officer J. E. Peterson, of the s. s. "Aurania," Capt. W. H. P. Haines, commanding, reports: "24th, noon, Greenwich mean time, in N. 49° 47', W. 26° 42', strong breeze increasing to a moderate gale and backing from s. to sse. and se., with high sea rising; 16 hours 49 minutes, in N. 48° 29', W. 32° 18', barometer 28.92 (734.6) (lowest); wind fell light and then shifted to w. and blew a strong gale with confused sea. Gale moderated during the 25th, with sea running from wnw. and nw."

Capt. S. Nowell, of the s. s. "British Prince," reports a fresh gale from the 22d to 24th; wind veered from s. to nnw.; lowest barometer, 29.55 (750.6), at noon of the 24th, in N. 45° 45', W. 35° 18'. Capt. W. A. Griffiths, of the s. s. "Spain," reports: "25th, in N. 47° 47', W. 30° 52', experienced a sudden shift of wind from sse. to nw., during a squall of hurricane force; barometer 28.80 (731.5). Capt. James Dunn, of the s. s. "Lord O'Neill," reports a strong sw. to sse. gale on the 24th and 25th; lowest barometer, 29.67 (753.6), at 11 a. m. of the 24th, in N. 49° 05', W. 28° 07'.

10.—This depression was central on the 26th to the northward of the Azores, whence it had advanced from the southwestward. By the 29th the storm-centre had moved eastward to the vicinity of the French coast. Strong to whole gales accompanied this depression, and, subsequent to the 27th, the area of high pressure over, and to the eastward of, the Azores gave way to the southwestward and allowed the storm to pursue an easterly course to the European coast.

The following reports relative to this depression have been rendered by shipmasters: Capt. James Ross, of the s. s. "Bendalder," reports: "26th, wind increased suddenly to force 8 from the north and continued about two hours; at 6 p. m., in N. 47° 10', W. 27° 40', wind moderated and barometer read 29.25 (742.9). After 6 p. m. the barometer commenced to rise and wind backed from n. to w. and sw. and freshened to force 6, then backed gradually to se., with barometer rising steadily until 8 p. m. of the 27th, when it suddenly increased to force 8 and continued four hours, with rising barometer, then had moderate, steady, easterly winds to the English coast." Capt. G. J. Mills, of the s. s. "Kings' Cross," reports a whole gale on the 27th and 28th; wind veered from w. to s. to nnw.; lowest barometer, 29.50 (749.3), at noon of the 28th, in N. 38° 58', W. 26° 40'.

11.—This depression passed southward from the American coast, in about N. 42°, on the 28th, to the thirty-eighth parallel by the 29th, and thence circled northeast to the vicinity of Nova Scotia by the 30th, after which it apparently moved eastward south of Newfoundland. The depression was relatively shallow and was unaccompanied by disturbances of marked strength.

OCEAN ICE.

On chart i are also exhibited the limits within which icebergs and field ice were reported during May, 1887. These limits are determined from reports furnished by shipmasters, and from data collected by the Signal Service agencies.

During this month the easternmost and southernmost ice reported was a quantity of field ice passed on the 20th, in N. 39° 38', W. 46° 00', by the s. s. "Amoor." Ice was most frequently reported over and off the southern edge of the Banks of Newfoundland. Heavy ice was encountered from Cape Saint Francis to Cape Mary, and off Sydney and Cow bays, and in the Gut of Canso, and a number of vessels were damaged in those localities. Captain Mitchell, of the s. s. "Invermay," reports having encountered heavy ice in the Gut of Canso, and arrived at Pictou on the 10th, having been delayed three days in the Gut. Captain Grigs, of the s. s. "Straits of Gibraltar," reports that on the 13th a large quantity of field ice was packed about Sydney and Cow bays, and that steamers bound to those places were delayed at Louisburg. Mr. J. Higgins, observer at Saint John's, Newfoundland, reports that on the 30th and 31st a large iceberg floated across the Narrows.

Compared with the chart for the preceding month, April, 1887, the eastern limit of ice is about eight degrees further west, and the southern limit about one-half degree further south. The aggregate number of icebergs reported over and off the southern edge of the Banks, and off the east and southeast coasts of Newfoundland, correspond closely with that reported during April, while in the vicinity of Cape Breton there was a marked increase in the quantity of field ice.

Compared with the chart for May, 1886, the eastern limit of ice is shown to be about the same, while the southern limit is extended about two degrees.

Compared with the corresponding month of previous years the southward movement of ice in the vicinity of Newfoundland during May, 1887, did not differ materially from the average.

The following table shows the southern and eastern limits of the region within which ice was reported for May during the last five years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Lon. W.	Month.	Lat. N.	Lon. W.
May, 1883.....	40 30	47 00	May, 1883.....	45 40	45 12
May, 1884.....	41 30	47 30	May, 1884.....	43 30	44 50
May, 1885.....	40 50	48 15	May, 1885.....	42 30	40 10
May, 1886.....	41 36	51 30	May, 1886.....	48 55	46 13
May, 1887.....	39 38	46 00	May, 1887.....	39 38	46 00

Icebergs and field ice were reported as follows:

Date.	Vessels.	Position.		Remarks.
		Lat. N.	Lon. W.	
1	S. S. De Ruyter.....	43 02	51 22	One berg.
	S. S. Taormina.....	43 30	48 04	One large and five small bergs.
	S. S. Winnipeg.....	Saint Paul to Cape Race.		Large ice field.
	S. S. Beethoven.....	45 00	49 to 51	Six large bergs.
	S. S. Gothenburg City.....	46 40	48 00	One large berg.
2	S. S. Ethiopia.....	44 04	49 18	One small berg.
	S. S. Isthrian.....	44 02	49 25	Do.
	S. S. Azalen.....	43 43	49 23	One large berg.
	S. S. Gothenburg City.....	42 50	51 00	Do.
	S. S. Peruvian.....	46 33	48 24	Do.
3	S. S. Albano.....	In fairway of Saint John's channel.		Do.
4	S. S. Peruvian.....	47 20	48 08	Do.
5	S. S. Peruvian.....	Saint John's to Cape Ballard.		Numerous large bergs.
	Bk. Lovold.....	44 00	47 30	Three large bergs.
	Bk. Holden.....	44 00	47 50	Do.
6	S. S. Grecian.....	42 20	51 00	One berg.
7	S. S. Wyoming.....	42 10	51 44	One large berg.
	Sp. Cape of Good Hope.....	42 12	61 21	Pieces of field ice.
	S. S. Germanic.....	42 19	51 53	One large berg.
8	S. S. State of Nebraska.....	43 14	50 18	A medium sized berg.
	Bk. Aurora.....	42 40	50 25	One large berg.
9	do.....	42 23	51 34	Do.
10	S. S. Edam.....	41 35	51 05	Do.
	S. S. Schiedam.....	42 11	50 41	Two bergs.
12	S. S. Venetian.....	43 55	48 45	One large berg.
	S. S. Austrian.....	45 36	49 21	One berg.
13	S. S. Arizona.....	42 51	48 44	Three large bergs.
	Bk. Amora.....	42 28	49 50	
	S. S. Fulda.....	41 30	47 40	Two enormous bergs.
	S. S. Fulda.....	44 51	48 59	One large berg.
	S. S. Fulda.....	44 22	49 18	Do.
	S. S. Katie.....	43 44	52 30	One berg.
	S. S. Devonian.....	53 07	49 23	Two small bergs.
	S. S. Buenos Ayrean.....	43 03	48 18	One large berg.
	S. S. Sarmatian.....	46 02	51 54	One small berg and pieces.
14	S. S. Corean.....	47 29	48 36	One very large berg.
	S. S. Buenos Ayrean.....	Cape Race to Cape Saint Mary's.		Large bergs.
15	S. S. Corean.....	46 50	50 40	Two large bergs.
	S. S. Fulda.....	44 51	48 59	One large berg.
16	S. S. Gleniffer.....	43 24	49 00	Do.
	S. S. Washington City.....	46 50	50 40	Four very large bergs.
	S. S. Washington City.....	46 09	58 48	Large quantities of floating ice.
17	S. S. Schiedam.....	42 08	50 15	One large and one moderate berg.
	S. S. Celtic.....	42 20	50 33	Two medium bergs.
	S. S. Washington City.....	46 05	59 10	Vast quantities of field ice.
	S. S. Caspian.....	47 55	47 13	One large berg.
	S. S. Caspian.....	Off Saint John's.		Two bergs.
18	S. S. Saale.....	42 16	50 16	One small berg.
	S. S. Slavonia.....	42 05	50 22	One berg.
	S. S. Caspian.....	Off Saint John's Harbor.		Two large bergs.
19	S. S. Arabic.....	42 24	50 14	One small berg.
	S. S. Furnessia.....	42 25	50 30	One piece of ice.
	S. S. Etruria.....	43 14	47 57	One medium berg.
	S. S. Etruria.....	42 15	50 13	One small berg.
	S. S. Etruria.....	42 19	50 26	Do.
	S. S. Donau.....	43 16	47 38	One large berg.
	S. S. Donau.....	42 27	49 26	One small berg.

Icebergs and field ice—Continued.

Date.	Vessel.	Position.		Remarks.
		Lat. N.	Lon. W.	
20	S. S. Washington City	Off Cape	Breton coast.	Large quantities of floating ice.
	S. S. Amoor	39 35	46 00	Field ice.
21	S. S. Gothenburg City	46 40	48 00	One large berg.
		46 33	48 24	Do.
		42 57	49 18	Do.
22	S. S. Rotterdam	42 10	49 54	Do.
		42 39	51 15	Do.
	S. S. State of Georgia	42 55	50 05	Do.
23	S. S. Bavarian	42 40	50 30	Two large bergs.
	S. S. Scandinavian	42 41	50 05	One berg.
24	S. S. Aller	43 20	46 21	One large berg.
		42 23	49 36	One medium berg.
	S. S. Indian Prince	42 24	51 06	One large iceberg.
25	S. S. Washington City	Cape Breton coast.		Large fields.
	S. S. Suevia	42 34	50 41	Two bergs.
	S. S. Republic	43 27	48 53	One moderate berg.
	S. S. Aller	42 14	50 35	One medium berg.
28	S. S. Borderer	42 50	51 00	One berg.
	S. S. Sarnia	Off Cape Race		
29	S. S. Grecian	47 24	49 45	One small berg.
30	do	Off Cape Pine		One large berg.
	Bk. Adolph	do		Do.

FOG.

From the following reports it will be seen that fog-banks were encountered in the vicinity of the Banks of Newfoundland on sixteen dates, and in the trans-Atlantic routes to the westward of the sixtieth meridian on nineteen dates. In each of the thirty-four instances in which fog was observed in the vicinity of the Banks, the position of the reporting vessel was included within the eastern quadrants of an area of low barometric pressure. As regards fog observed to the westward of the sixtieth meridian, forty-one reports have been made, by which it is shown that fog was, as a rule, encountered in the western quadrants of areas of low pressure, or within areas of high barometer which succeeded the eastward passage of cyclonic areas.

The following table shows the limits of fog-areas on the north Atlantic Ocean during May, 1887, as reported by shipmasters:

Date.	Vessel.	Entered.			Cleared.		
		Lat. N.	Lon. W.	Time.	Lat. N.	Lon. W.	Time.
1	S. S. Waesland	42 59	41 41		42 51	42 02	
3	S. S. Lessing	42 02	50 20		42 02	50 30	
3	S. S. State of Indiana	41 57	51 34		41 49	53 26	
3-4	S. S. Adriatic	41 45	51 47		41 41	53 56	
3-5	S. S. Baltic	43 12	48 52		42 09	55 47	
4	S. S. State of Indiana	45 56	45 12		42 34	54 11	
4	S. S. Waesland	40 59	64 30		40 57	64 50	
4	S. S. Waesland	40 10	64 22		40 15	66 27	
5	S. S. Lessing	41 40	64 15		40 49	64 36	
5	S. S. Umbria	40 52	65 40		40 59	65 55	
		43 15	47 02		42 10	50 06	
		42 02	51 00		42 00	51 20	

Limits of fog areas—Continued.

Date.	Vessel	Entered.			Cleared.		
		Lat. N.	Lon. W.	Time.	Lat. N.	Lon. W.	Time.
5	S. S. Waesland	40 28	69 23		40 28	69 39	
7	S. S. Eider	41 23	65 15		Sandy Hook.		
7-8	S. S. New Orleans	Lower Bay, N. Y.			Tillamook.		
8	S. S. Elysia	39 55	67 57		Scotland light-ship.		
8	S. S. Aurania	Sandy Hook			40 10	65 44	
8-9-10	S. S. Denmark	Dense fog continued off Sandy Hook.			40 21	66 31	
9	S. S. British Princess	New York.			39 23	66 14	
9	S. S. Britannic	39 12	69 41		46 30	43 45	
10-11	S. S. City of Augusta	40 53	42 31		37 50	75 00	
12	S. S. British Princess	40 00	74 00		40 51	48 22	
14	S. S. Washington City	40 46	48 44		46 09	58 00	
15	S. S. Gleniff	45 56	50 29	9 a. m. to 3 p. m.			
16-17	do	44 40	45 30		42 36	51 40	
16	S. S. LaBretagne	44 00	47 30		42 18	50 20	
16-17	S. S. Schiedam	43 45	45 45		42 10	50 05	
16-20	S. S. Washington City	44 50	43 30		Scutari, C. B.		
16-17	S. S. Celtic	46 09	59 00	9:35 p. m.	42 35	50 33	4:45 p. m.
16	S. S. Riialto	44 52	45 11		39 58	47 40	
16-17	S. S. Pavonia	40 00	47 10	4:55 p. m.	41 55	49 47	6:19 a. m.
16-17	S. S. British King	42 27	40 45		43 34	40 55	
10-23	S. S. Toledo	44 00	39 50		39 20	74 10	
17	S. S. Denmark	46 58	42 12		40 23	65 27	
17-19	S. S. Santiago	40 25	67 44		Boston		
17	S. S. Elder	41 35	63 00		42 38	47 41	
17	S. S. Sualo	41 39	50 08		42 20	50 00	
17	S. S. Bonalder	42 40	47 15		40 20	65 00	
17	S. S. Rhaetia	40 20	67 50		43 10	43 15	
17	S. S. British King	44 10	41 05		43 00	43 15	
17-18	S. S. Weser	42 42	43 00		43 00	43 15	
17-18	S. S. Wyoming	39 20	66 14	5:35 a. m.	37 40	74 03	9 a. m.
17-18	S. S. Letimbro	40 28	73 00	8 p. m.	41 10	63 00	8 a. m.
18	S. S. City of Montreal	37 41	72 45		38 30	73 08	
18	Schr. C. B. Church	41 00	65 10		Fire Island.		
19	S. S. Trave	43 20	70 03		42 35	70 15	
19	S. S. Edith Godden	40 30	70 31		40 16	64 40	
19	S. S. Schiedam	38 26	74 18		38 57	74 15	
19	S. S. Schiedam	41 20	61 00		40 55	65 00	
19-20	S. S. Schiedam	41 40	61 34		41 00	66 14	
19-20	S. S. Celtic	40 20	63 00		40 25	66 30	
19-20	S. S. Marengo	41 11	63 15	8:10 a. m.	40 44	66 56	7:20 a. m.
19-20	S. S. Rhaetia	40 28	64 56	8 p. m.	40 38	60 50	7:30 a. m.
20	S. S. Rhaetia	41 30	58 28		41 28	58 44	
20	S. S. City of Augusta	41 30	75 00		36 30	75 20	
21	S. S. Rhaetia	41 17	62 42		41 17	63 30	
21-22	S. S. British King	39 15	70 30		109 W. of 5-ft Hook		hom light-ship.
22-23	S. S. Gleniff	39 50	69 50		39 30	72 10	
22	S. S. Riialto	40 30	72 00		Sandy Hook		
22-23	S. S. Albers	38 59	72 38		40 07	73 25	
23	Schr. C. B. Church	39 41	71 53		39 40	74 10	
23	S. S. Rotterdam	40 28	71 30		40 28	71 25	
24-26	do	40 28	67 00		40 34	64 00	
24-26	S. S. Arabic	41 43	62 54		44 11	44 29	At inter-val.
25	S. S. La Bourgogne	40 56	62 33		Montauk.		
25	S. S. Rotterdam	40 51	69 09		40 26	72 56	
25	S. S. Suevia	42 20	53 13		42 17	53 30	
26-27	S. S. Aurania	44 00	46 00		42 30	50 00	
27-28	S. S. British Prince	41 43	46 55		41 02	48 13	
28	S. S. Suevia	41 12	63 45		40 50	70 00	
28	S. S. Westernland	41 40	46 47		40 50	48 37	
28-30	S. S. Vaderland	41 30	46 04		40 25	48 54	
29	S. S. Canada	42 53	40 15		41 00	48 30	
29	S. S. Gallio	40 32	66 42		40 32	68 13	
29	S. S. Aurania	41 12	63 43		41 00	66 12	
30	S. S. Polynesia	40 30	44 09		41 19	44 44	
30	do	40 38	46 33		40 31	47 15	
30-31	S. S. Emu	45 05	41 59		42 13	51 02	
30-31	S. S. British Princess	43 47	41 19		43 24	42 09	

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

The distribution of mean temperature over the United States and Canada for May, 1887, is exhibited on chart ii by the dotted isothermal lines. In the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service, and in the figures opposite the names of the geographical districts in the column for mean temperature, precipitation, and departures 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 for the district when the departure is below the normal, and subtracting when above. On chart iv the departures from the normal are illustrated by lines connecting stations of normal or equal abnormal values.

In northern California, western Montana, New Mexico, along the immediate Gulf coast, and on the south Atlantic coast

below Charleston, S. C., including the Florida Peninsula, the month of May, 1887, was slightly colder than the average, the most marked deficiency in the mean temperature occurring at Key West, Fla. With the exception of the comparatively small areas above mentioned, the month was warmer than the average throughout the United States. For the entire country north of the thirty-fifth parallel, the excess in the mean temperature amounted to 2°, or more, with the exception of the Pacific coast, northern New England, and the Maritime Provinces of Canada; to the northward of the parallel mentioned the departures increase to 6°, or more, over portions of the Lake region, Saint Lawrence, upper Mississippi, and lower Missouri valleys, while the area over which the excess amounts to 4° embraces all territory from Dakota and Nebraska eastward to Maine.

RANGES OF TEMPERATURE.

The monthly, and the greatest and least daily, ranges of