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BOARD OF EDITORS { Mr. Horace E. Smith, Chief Clerk of Weather Bureau, Professors Henry A. Hazen, Thomas Russell, and Charles F. Marvin, and Mr. Edward B. Garriott, in charge of Review Room.

INTRODUCTION.

This REVIEW is based on reports for September, 1892, from 2,787 regular and voluntary observers. These reports are classified as follows: 162 reports from Weather Bureau stations; 46 reports from United States Army post surgeons; 1,869 monthly reports from state weather service and voluntary observers; 195 reports through the Central Pacific Railway Company; 485 marine reports through the co-operation of the Hydrographic Office, Navy Department; 30 reports from Canadian stations; marine reports through the "New York Herald Weather Service"; monthly reports from local services established in all states and territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR SEPTEMBER, 1892.

From the upper Missouri valley to New Mexico the month was the warmest, and on the west Gulf coast and in the middle Rocky Mountain region it was the driest September on record. Drought prevailed generally over the middle and southern plateau and middle Rocky Mountain regions. The month was also very dry in the middle and lower Missouri valleys and in parts of Wisconsin and eastern Kentucky. The coolest weather of the month between the Mississippi River and the Rocky Mountains was noted from the 11th to the 15th. On the 11th temperature below freezing and heavy frost were reported in Wyoming; on the 12th frost injured vegetation in New Mexico; and on the 14th the frost line was carried to Arkansas. During the advance of a cool wave from the plateau region to the Atlantic coast from the 23d to the 27th the frost line was carried to Tennessee, western North Carolina, and western Virginia. From the 27th to the 29th a cool wave advanced from the Northwest to the Atlantic coast, attended on the 29th by frost in eastern North Carolina.

TEMPERATURE.

The month was warmer than usual, except in the middle Atlantic and middle and east Gulf states, and over western California. The greatest excess in temperature was noted over the eastern plateau region, on the northeast slope of the Rocky Mountains, and in the valley of the Red River of the North, where it was 4° to 5°, and the most marked deficiency was reported in the interior of the middle Gulf states, where the month was 2° to 3° cooler than the average September.

PRECIPITATION.

The rainfall was generally deficient. Small areas of excess are shown on the south Atlantic, middle Gulf, and extreme north Pacific coasts, and in the central lake region. The most marked deficiency was noted on the Texas coast, where it was 4.00 to 6.00 inches, and the deficiency was 2.00 to 3.00 inches on the middle Atlantic coast, in western Florida, and the lower Missouri valley. The greatest excess in monthly precipitation, 4.00 to 6.00 inches, was reported on the south Atlantic and extreme north Pacific coasts.

Snow fell in the mountains of western Wyoming and northeastern Oregon on the 23d and at Middletown, Conn., on the 27th. At Mount Washington, N. H., snow was reported on the 6th, 7th, 26th, and 27th.

STORMS.

Exceptionally severe local storms were not reported. The occurrence of local storms was noted most frequently in New York, Michigan, Wisconsin, Iowa, and Missouri, where they were reported on three to four dates. The widest distribution of storms is shown on the 10th, 25th, and 26th. On the 10th local storms were noted in New York, Ohio, Illinois, Wisconsin, Iowa, Missouri, and Kansas; on the 25th in New York, New Jersey, Delaware, Pennsylvania, Kentucky, and Michigan; and on the 26th in New England, with northwest gales over the middle Atlantic states.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for September, 1892, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars.

The normal pressure for September is highest from the Atlantic coast between the 30th and 45th parallels westward to the middle Mississippi valley, where it is above 30.05, and it is above 30.00 on the north Pacific coast and over districts lying east of the middle and southern Rocky Mountain regions. The normal pressure is lowest in the lower Colorado valley, where it is below 29.85, and it is below 29.90 in the upper Saskatchewan valley and over the west part of the southern plateau region south of the 40th parallel.

In September there is usually an increase of pressure over the United States, except on the extreme north Pacific coast

and over the extreme southern part of the Florida Peninsula, where the normal values are slightly lower than for August. The greatest increase of pressure occurs over the northern Rocky Mountain and plateau regions, and from the middle Mississippi valley over the middle Atlantic and New England states, where the normal values are more than .05 higher than for August.

In September, 1892, the mean pressure was highest over the middle Atlantic and southern New England states, where it was above 30.15, and the pressure was above 30.00 east of a line traced from Lake Superior to New Mexico, and along the Pacific coast between the 37th and 46th parallels. The mean pressure was lowest over the west part of the southern plateau region, where it was below 29.85, and the mean readings were below 29.90 in the upper Saskatchewan valley.

A comparison of the pressure chart for September with that of the preceding month shows an increase of pressure, except over the Florida Peninsula and on the Pacific coast north of the 40th parallel. The greatest increase of pressure occurred from the south New England and New Jersey coasts over eastern Pennsylvania, Maryland, and the interior of Virginia, where it was more than .15, and the most marked decrease was noted on the extreme north Pacific coast, where it was more than .10.

The mean pressure was above the normal, except from the north Pacific coast over the middle and northern plateau and northern Rocky Mountain regions, and over Lake Superior and the lower Saint Lawrence valley. The greatest departure above the normal pressure was noted on the southern New England and New Jersey coasts and at Lynchburg, Va., where it was .10, and the most marked departure below the normal pressure was reported in Washington, where it was .05.

HIGH AND LOW AREAS.

The paths of areas of high and low barometric pressure for September, 1892, are plotted on Charts IV and I, respectively, and some of the more prominent features of the areas are shown in the table at the end of this chapter.

HIGH AREAS.

Eight high areas appeared, the average number traced for September during the last 19 years being 6.5. Of the high areas traced for the current month, one, a continuation of high area VII for August, occupied the western lake region at the opening of the month, 5 appeared over the British Northwest Territory, and 2 advanced from the north Pacific coast. Three of the high areas from the British Northwest Territory moved southeastward over the central valleys, and 2 east-southeast over the northern lake region. All of the high areas, save one from the north Pacific coast, passed off the Atlantic coast between the 40th and 45th parallels. The average velocity of the high areas, 25 miles per hour, corresponded closely with the average velocity of high areas traced for September of preceding years. The following is a description of the high areas traced for the current month:

I.—Was a continuation of high area VII for August, 1892, and occupied the western lake region on the 1st, with pressure above 30.30. On that date the cool wave of the latter part of August extended over the Atlantic coast states, with a temperature fall of 5° to 15° from New England to the Gulf States, and light frost in Upper Michigan and western Lower Michigan. During the 2d the high area advanced over the middle Atlantic and New England states, the temperature fell more than 10° over northern New England and the Canadian Maritime Provinces, and light frost was reported in Lower Michigan, northern New England, and in the mountain regions of Pennsylvania. During the 3d the center of this high area passed off the New England coast.

II.—The pressure increased over the western Saskatchewan valley during the 2d, and the morning of the 3d this high area occupied the region north of western Montana, with pressure above 30.30. The night report of the 2d showed a fall in temperature of 10° to 20° over Montana and the western Dakotas. On the 3d the temperature fell 10° to 20° from Colorado to Minnesota, and the first light frost of the season was reported at Helena, Mont. During the 4th the center of the high area advanced over the Dakotas, and the temperature fell 5° to 12° from the southeast slope of the Rocky Mountains over the western lake region. During the 5th the center reached northern Missouri and the cool wave extended to the Alleghany Mountains, the first light frost was noted at Fort Buford, N. Dak., and the first heavy frost of the season was reported at Bismarck, N. Dak. Moving eastward to the Alleghany Mountain range by the 7th, the high area shifted position to the lower lakes by the evening of that date, and passed thence southeastward off the New England coast during the 8th, with pressure above 30.40.

III.—Apparently moved northward off the Pacific coast, and the evening of the 6th appeared central off the north Washington coast, with pressure above 30.20 and a temperature fall of 10° to 16° over the northern plateau region and on the northeast slope of the Rocky Mountains. During the 7th the high area moved over the northern plateau and the temperature fell 10° to 15° over the Dakotas and Montana. During the 8th it passed rapidly southeastward and disappeared by an increase of pressure over the middle Missouri valley, attended by a temperature fall of 10° to 20° on the middle-eastern slope of the Rocky Mountains, and the first light frost of the season at Lander, Wyo.

IV.—The pressure was high over the western Saskatchewan valley during the 9th, and the morning of the 10th this high area was central over Alberta, with pressure above 30.40. By the evening of the 10th the high area had moved southeastward over eastern Wyoming, and the temperature had fallen 10° to 24° from the middle Missouri valley to the middle-eastern slope of the Rocky Mountains. During the 11th and 12th the center remained nearly stationary on the middle-eastern slope of the Rocky Mountains. During the 11th the cool wave occupied the region between the western lake region and Texas, the temperature fell more than 20° in southern Missouri, the lowest temperature of the month was noted in the middle and southern Rocky Mountain regions, and the first heavy frost occurred at Lander, Wyo. During the 12th the cooler condition extended eastward over the Lake region and central valleys, the lowest temperature of the month occurred on the middle and southern Rocky Mountain slopes, and the first heavy frost was noted at Fort Stanton, N. Mex. By the morning of the 13th this high area had united with high area IV*a*, which had advanced from the Northwest.

IV*a*.—Appeared north of Montana the morning of the 12th with pressure 30.30, passed thence to South Dakota by the morning of the 13th, with a marked decrease of pressure, and reached Nebraska in the evening. On that date the lowest temperature of the month was noted in the Dakotas, and the first heavy frost of the season was reported at Fort Buford, N. Dak. The morning report of the 14th showed high pressure over the middle-western and southwestern states, with two centers of higher pressure, one over southeastern Nebraska and the other near Fort Smith, Ark. By the evening report of the 14th the pressure was highest at Memphis, Tenn. On this date the temperature fell 10° or more from the Great Lakes to the Gulf of Mexico, the lowest temperature of the month occurred in the middle and lower Missouri valleys, and the first heavy frost of the season was noted at points in the Dakotas and Nebraska. During the 15th the high area moved slowly eastward to the mountain regions of Tennessee, the Carolinas, and Virginia, where it remained nearly stationary until the night of the 16th, with the lowest temperature of the month in the Gulf States. By the

morning of the 17th this high area had united with number V, which had advanced from the Northwest.

V.—Appeared north of eastern Montana the evening of the 14th, with pressure above 30.00, and a temperature fall of 10° to 20° in the Saskatchewan Valley, moved thence to the middle Missouri valley by the evening of the 15th, and united over western Pennsylvania with high area IV*a* the morning of the 17th. On that date the center passed off the New Jersey coast, with pressure above 30.30. A slight fall in temperature only was noted in the central valleys and Lake region attending the advance of this high area.

VI.—Appeared over the eastern Saskatchewan valley the morning of the 18th, with pressure above 30.20, and reached southern Manitoba by the night report of that date, with a temperature fall of 10° to 20° over the Dakotas and northern Minnesota. During the 19th the center moved eastward over northern Lake Superior, and the temperature fell 10° to 24° over the Lake region and northern New England. On the 20th the high area advanced over northwestern New England, with pressure above 30.30, the first heavy frost of the season was reported at Alpena, Mich., and the temperature fell 10° to 20° in the middle Atlantic and south New England states. During the 21st the center passed southeastward off the New England coast.

VII.—Appeared off the middle Pacific coast on the 24th, with pressure 30.20 at Eureka, Cal., and a temperature fall of more than 20° in the Dakotas by the evening report. Moving rapidly eastward the center reached Nebraska the evening of the 25th, and the temperature fell 20° to 30° in the Lake Superior region. During the 26th this high area occupied the central valleys, and the cool wave extended over the middle Atlantic and New England states. Passing southeastward over Kentucky during the 27th the high area reached the middle Alleghany Mountains where it remained during the 28th, from which region it moved northward and united with high area VIII by the morning of the 29th.

VIII.—Appeared north of Montana the morning of the 27th, with pressure above 30.10, and passed rapidly southeastward over the upper lake region during the 28th, attended by a temperature fall of 10° to 20° over the upper lakes. On the 29th the center passed southeastward over western New England, with pressure above 30.30, and a fall in temperature of more than 10° along the New Jersey and New England coasts. By the morning of the 30th the center was central off the New Jersey coast, with pressure above 30.40, from which position it apparently settled southward off the Virginia and North Carolina coasts.

LOW AREAS.

The low barometer areas for September usually follow more regular paths than those traced for August. The principal path east of the Rocky Mountains is between the 45th and 50th parallels. Less frequented paths are shown from the Saskatchewan Valley and the middle slope of the Rocky Mountains to the upper lakes. An average of less than one low area per month crosses districts south of the 40th parallel. The average velocity of September low areas, 26 miles per hour, is the same as the average velocity for August.

The tracks of ten areas of low barometric pressure are traced for September, 1892, this number corresponding with the average number noted for September during the last 19 years. The average velocity, 26 miles per hour, also corresponded with the average velocity of low areas for September. Of the low areas traced for the current month at least three advanced from the Pacific coast north of the 50th parallel, six appeared in the Saskatchewan Valley, and one moved northeastward from the Gulf of Mexico. The low areas from the Pacific coast and the British Northwest Territory moved eastward north of the Lake region, and one of the Pacific coast low areas reached the Gulf of Saint Lawrence. Several subsidiary developments appeared between the Mississippi River and the Rocky Mountains. The following is a description of the low areas traced:

I.—This low area extended from the eastern Saskatchewan valley over western North Dakota and eastern Montana at the opening of the month, with pressure below 29.80. By the evening report the center had shifted position slightly to the southeastward, light rain had fallen in the eastern Saskatchewan valley, and high southeast winds occurred in the middle Missouri and upper Red River of the North valleys. Reports of the 2d showed the formation of a trough of low pressure extending from Minnesota to Arizona, with two cyclonic centers, one over the eastern Dakotas and the other over eastern Colorado. On that date rain fell throughout the extreme northwest, high winds were reported over Nebraska and the eastern Dakotas, and the temperature rose 10° to 15° over the Ohio Valley and the western Lake region. On the 3d the trough of low pressure was divided by high area II which was advancing from the Northwest, one part, low area I, passing to the Lake Superior region and the other, low area I*a*, moving southward to eastern New Mexico, rain fell in large areas between the Mississippi River and the Rocky Mountains, heavy thunderstorms were reported in western Kansas during the afternoon and evening, and a marked rise in temperature occurred from the Ohio Valley over the Saint Lawrence Valley.

During the 4th the center of disturbance passed north of Lake Huron with an appreciable loss of strength, the rain area extended over the western Lake region and the lower Ohio and middle and lower Mississippi valleys, and the highest temperature of the month, 85° to 87°, was noted at points in the upper Ohio valley and the lower lake region. By the evening of the 5th the center had reached northern New England, and the rain area had reached the middle Atlantic and New England coasts. During the 6th the center of disturbance advanced over the northern part of the Gulf of Saint Lawrence, and rain was followed by clearing weather over the middle Atlantic and New England states.

II.—Appeared over Alberta on the 5th, with pressure 29.70 at the evening report, and passed thence to South Dakota by the evening of the 6th, with heavy thunderstorms in central North Dakota. During the next 24 hours the storm-center moved to Kansas, where it was apparently dissipated by an increase of pressure the night of the 7th, its passage being attended by rain and fresh southeast winds from the upper Mississippi valley over the southwestern lake region, thunderstorms in Wisconsin, and a temperature rise of 10° to 15° from the upper Mississippi valley over the Dakotas.

III.—Appeared over Alberta the evening of the 8th, with pressure below 29.80, and moved thence rapidly southeastward to eastern South Dakota by the evening of the 9th, with rain from the western lake region and the upper Mississippi valley over eastern Nebraska and the Dakotas, thunderstorms from northern Indiana and northern Illinois over Iowa, Wisconsin, and Minnesota, and a rise in temperature of 10° to 16° from the middle Rocky Mountain region over the middle Missouri valley.

On the 10th the low area was central over Upper Michigan, the rain area extended over the Lake region and northern Ohio valley, and thunderstorms were reported in Missouri, Iowa, Wisconsin, northern Illinois, northern Ohio, and western New York. During the 11th and 12th the center of disturbance remained in the Lake Superior region. On the 11th rain fell from the western lake region to Texas. During the 12th the pressure decreased over the central valleys. The morning of the 13th a trough of low pressure extended from the Great Lakes to the east Gulf coast, low area III had lost its identity, and low area IV dominated the weather conditions from the Great Lakes to the Gulf and middle and south Atlantic coasts.

IV.—The presence of an area of low pressure of tropical origin over the central part of the Gulf of Mexico was indicated by reports of the 11th. On that date the 12-hour decrease of pressure was more than .10 inch from the lower lakes to the east Gulf coast, and heavy rain fell at points along the Gulf coast. Morning reports of the 12th showed a 24-hour decrease of pressure of .10 to .20 inch over the east Gulf states, and during the 12 hours ending 8 p. m. the pressure decreased .10 to .18 inch from the middle Gulf coast to New England. At the evening report of the 12th the storm was central near New Orleans, La., and high wind and heavy rains were noted on that date along the Gulf coast. The morning of the 13th the disturbance was central over Kentucky, with pressure below 29.60, and at the evening report the center had passed to eastern Lake Erie, with pressure below 29.40. On that date rain fell generally east of the Mississippi River, severe local storms occurred from the lower lakes and New York over the Carolinas, and heavy gales, reaching a velocity of 54 miles per hour from the northwest at Cleveland, Ohio, prevailed over the central and eastern lake regions.

At the morning report of the 14th the center was near Parry Sound, Ont., and during the day it moved slowly northeastward, with an apparent loss of energy. Heavy wind continued over the lower lakes, and strong gales prevailed over Long Island Sound. The rain area contracted over the northeastern part of the country, and high area IV, which had remained nearly stationary over the Western States from the 11th to the 14th, passed southeastward to the middle Mississippi valley. Moving slowly north of east this low area disappeared north of the Gulf of Saint Lawrence during the 16th.

V.—Apparently advanced from the Pacific coast and the evening of the 12th was central north of Washington, with pressure below 29.80. Moving eastward north of the Lake region this low area apparently united with low area IV by the evening of the 14th, its passage being unattended by noteworthy features.

VI.—Was central over the upper Saskatchewan valley the evening of the 16th, and moved thence over Manitoba during the 17th, with temperature rising above 90° in North Dakota. On the 18th the center reached the lower Saint Lawrence valley, and by the evening of the 19th had passed south of east over Nova Scotia. No rain attended this low area until the 19th, when showers occurred from the lower lakes over New England, and thunderstorms were reported in extreme northwestern Pennsylvania.

VII.—The pressure was low over the Saskatchewan Valley on the 18th, and the night of the 19th this low area was central over northern Alberta, with pressure below 29.50, and rain over the northern plateau region. During the 20th and 21st the center moved slowly eastward, with pressure falling below 29.30. The morning of the 22d the pressure was low from Minnesota to the middle Rocky Mountain region, a subsidiary development of slight energy appeared central over Kansas, and the maximum temperature rose above 90° in the lower Missouri valley during the afternoon. The night of the 22d this low area had apparently united with low area VIII which had advanced eastward over Alberta. No marked disturbances or extensive rain areas attended this low area. A destructive local storm was, however, reported at Manistee, Mich., and thunderstorms were reported in northern Iowa on the 22d.

VIII.—Apparently advanced from the north Pacific coast over Alberta during the 22d, with pressure below 29.20 at the evening report. On that date heavy rain fell on the Washington coast and light rain in eastern Washington, and the wind reached a velocity of 60 miles per hour from the south at Fort Canby, Wash. On the 23d the center moved eastward over the upper Saskatchewan valley, without an appreciable loss of energy. On that date the influence of the low area extended over the Lake region and the central valleys, although rain fell in small areas only in the Lake region. The highest temperature of the month occurred in the upper Mississippi and middle Missouri valleys, a reading of 98° being noted at Huron, S. Dak. By the evening of the 24th the center of disturbance had reached the region north of Lake Superior, and a trough of low pressure extended thence to northern New Mexico, rain had fallen in small areas from the western lake region to the Rocky Mountains, the highest temperature of the month was recorded at points in the western lake region, and brisk southwesterly winds prevailed over Lake Superior.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.		Duration.	Velocity per hour.	Maximum pressure change in 12 hours, maximum abnormal temperature change in 12 hours, and maximum wind velocity.									
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.			Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.
High areas.		°	°	°	°	*Days.*	*Miles.*		*Inch.*			°					
I	1	44	88	42	66	2.5	19	Father Point, Quebec	.44	1	Atlantic City, N. J	8	1	Block Island, R. I	ne.	34	2
II	3	51	115	42	69	6.0	22	Pierre, S. Dak	.28	3	Miles City, Mont	22	2	Bismarck, N. Dak	nw.	30	4
III	6	48	126	42	98	2.0	31	Walla Walla, Wash	.28	6	Helena, Mont Cheyenne, Wyo	16 16	6 7	Fort Canby, Wash	s.	36	6
IV	10	49	113	43	100	3.0	18	Medicine Hat, N. W. T	.28	10	Denver, Colo	16	10	Pueblo, Colo	ne.	30	10
IV *a*	12	51	110	35	90	2.5	25	Louisville, Ky	.22	13	Concordia, Kans	17	13	Bismarck, N. Dak	nw.	28	12
IV *b*	14	34	96	41	80	3.0	22	Charlotte, N. C	.22	15	San Antonio, Tex	13	14	Amarillo, Tex	s.	16	14
V	14	50	105	40	73	3.0	28	Prince Albert, N. W. T	.52	14	Huron, S. Dak	18	15	Chicago, Ill	n.	20	16
VI	18	51	104	40	71	3.0	24	Minnedosa, Man	.56	18	Minnedosa, Man	29	18	Block Island, R. I	ne.	40	20
VII	24	41	125	45	77	4.5	32	St. Paul, Minn	.34	25	Helena, Mont	26	23	Moorhead, Minn	nw.	28	25
VIII	27	51	111	40	71	3.0	32	Swift Current, N. W. T	.48	27	Swift Current, N. W. T	22	27	Block Island, R. I	ne.	36	29
Mean						3.2	25		.36			19				30	
Low areas.									Fall.			Rise.					
I	1	49	104	49	64	5.0	19	Halifax, N. S	.30	5	Cheyenne, Wyo	18	1	Huron, S. Dak do	se. se.	42 42	1 2
II	5	52	115	39	97	2.0	28	Medicine Hat, N. W. T	.36	5	Calgary, N. W. T	19	4	do	ne.	48	7
III	8	52	113	49	88	4.0	20	Calgary, N. W. T	.36	8	Spokane, Wash	16	8	Chicago, Ill	sw.	38	10
IV	12	30	90	51	65	3.5	24	Toronto, Ont	.42	13	Father Point, Quebec	8	14	Cleveland, Ohio	nw.	54	13
V	12	53	120	52	100	1.5	25	Calgary, N. W. T	.46	12	Huron, S. Dak	30	14	Winnipeg, Man	n.	24	14
VI	16	54	115	46	55	3.5	34	do	.30	15	Moorhead, Minn	18	16	Marquette, Mich	sw.	36	17
VII	19	54	113	53	98	2.0	14	do	.44	18	Minnedosa, Man	17	19	Valentine, Nebr Sioux City, Iowa	w. w.	48 48	21 21
VIII	22	53	121	50	66	5.0	23	Edmonton, N. W. T	.42	22	North Platte, Nebr	20	22	Fort Canby, Wash	s.	60	22
IX	25	53	112	49	90	1.5	29	Calgary, N. W. T	.42	25	Havre, Mont	25	25	Buffalo, N. Y	sw.	48*	27
X	26	52	120	50	67	2.5	39	Prince Albert, N. W. T	.54	28	do	25	28	Huron, S. Dak	s.	48	29
Mean						3.1	26		.40			20				45	

* Mount Washington, N. H., 100, nw., 27th.

During the 25th the low area moved north of the lower lake region, rain generally fell in the Lake region and the Ohio Valley, local storms were reported in western New York, western Pennsylvania and Michigan, and brisk southwest winds prevailed over the lower lakes. During the 26th the center passed to the lower Saint Lawrence valley, with a marked increase in energy, the rain area contracted over New England, severe thunderstorms occurred throughout New England, New York, and in northeastern Pennsylvania, and wind velocities of 52 and 51 miles per hour were reported at Woods Holl, Mass., and Oswego, N. Y., respectively. On the 27th, when low area VIII was probably central near the mouth of the Saint Lawrence River, a wind velocity of 100 miles per hour from the northwest was noted at Mount Washington, N. H.

IX.—Appeared over the middle Saskatchewan valley the night of the 25th, with pressure below 29.70, and rain and high winds on the Washington coast. Moving south of east the center reached Manitoba the night of the 26th, with pressure below 29.60, and during the 27th apparently passed rapidly eastward and united with low area VII over the northern part of the Gulf of Saint Lawrence, its passage being unattended by rain or notable disturbances.

X.—The advance of this low area over the Pacific coast north of Washington was shown by reports of the 27th, and the morning of the 28th the center occupied the region north of Washington, with pressure 29.50. By the evening of the 28th the center of disturbance had moved eastward over the Saskatchewan Valley, with pressure below 29.30, and during the 29th passed over Manitoba with an apparent loss of strength. The night report of the 30th showed this low area central over the lower Saint Lawrence valley. The passage of this area of low pressure from the Pacific Ocean to the Gulf of Saint Lawrence was unattended by precipitation. Unusually high temperatures were reached from the northern plateau region over the northern districts. In Montana the maximum varied from 89° to 93°, and in the Dakotas from 90° to 97° on the 28th.

NORTH ATLANTIC STORMS FOR SEPTEMBER, 1892.

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

The paths of storms that appeared over the west part of the north Atlantic Ocean during September, 1892, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

The north Atlantic normal pressure for September is above 30.10 (764) from the northwest coast of Africa westward over the middle-eastern districts of the United States. The normal pressure is lowest from mid-ocean in latitude north 60° over Iceland, Spitzbergen, and eastern Greenland, where it is below 29.70 (754). There is usually a decrease of pressure over the north Atlantic in September, except in the middle latitudes and over the eastern part of the ocean south of the 55th parallel. The most marked decrease occurs north of the 60th parallel, and in an area extending northeastward from the eastern West Indies to the Azores, where it is more than .05. The greatest increase is shown from the Atlantic coast between the 35th and 50th parallels over the Banks of Newfoundland, where it exceeds .05.

The storms of September usually pass east-northeast from Newfoundland to the region north of Scotland, a limited number, averaging less than two per month, advancing over the British Isles. The average velocity of the storms in the middle latitudes is 19 statute miles per hour. An average of two storms per month traverse the ocean from the American to the European coasts in September. Well-defined and destructive September cyclones have averaged about 2 per month over the West Indies. These storms generally move westward from the region of the Windward Islands and recurve northward over the Gulf of Mexico. About one in five of the storms of this class reach the European coast, one in five have no easterly component, one in ten disappear over Mexico, and the balance dissipate over the eastern part of the United States or over the Atlantic Ocean.

No storms of marked severity were reported on the north Atlantic Ocean in September, 1892. At the opening of the month low area VIII for August, 1892, was central near the mouth of the Saint Lawrence River. This storm apparently crossed the ocean. The morning of the 2d it had advanced north of Newfoundland, and on the 3d was central north of the Grand Banks, from which region it moved north-northeast and passed north of the British Isles during the 7th, its passage being attended on the 5th and 6th by westerly gales of force 8 to 9 over the eastern part of the ocean. On the 1st the pressure was low northwest of the British Isles, and on the 2d a storm was central north of Ireland. The night of the 2–3d this storm apparently moved eastward over the northern part of the British Isles.

On the 6th low area I moved eastward over the northern part of the Gulf of Saint Lawrence, and the morning of the 7th was central off the Labrador coast, with pressure below 29.60 (752). From that position the center moved rapidly northeastward and disappeared in the direction of Iceland on the 8th. The morning of the 11th a storm was apparently central to the southward of Bermuda, and from midnight of the 11th to 4 a. m. of the 12th a thunderstorm, with high wind and rain, prevailed over the Bermuda Islands. Moving rapidly northeastward, this storm passed east of the Grand Banks during the 13th, with pressure about 29.70 (754) and north gales of force 8 to 9, and reached mid-ocean in latitude about 50° on the 14th, with pressure about 29.30 (744) and westerly gales of force 8 to 10. During the 15th this storm passed over or north of the British Isles.

On the 11th reports about the British Isles indicated the approach of a storm from the northwest, and on the 12th the disturbance was apparently central over Ireland, with pressure below 29.70 (754) and gales of force 10 east of the 20th meridian. By the 13th this storm had apparently passed over the North Sea. On the 16th low area IV passed north of the Gulf of Saint Lawrence, and on the 17th was central off the Labrador coast, where the barometer continued low until the 19th. By the 20th this storm had moved over mid-ocean in high latitudes, where the pressure continued low until the 22d, after which the area of low pressure apparently moved eastward.

On the 20th low area VI was central south of Newfoundland, from which region the center moved rapidly northeastward and joined the area of low pressure central over mid-ocean, attended by north gales of force 10, and pressure below 29.70 (754) between the 30th and 40th meridians. With the advance of this storm over mid-ocean the pressure decreased northwest of the British Isles and fresh gales were reported over the eastern part of the ocean on the 24th and 25th. On the 26th the pressure was below 29.40 (747) near the 20th meridian, and westerly gales of force 8 were encountered in that region. By the 27th the center of disturbance had passed eastward over the British Isles. The morning of the 28th