

SECTION III.—FORECASTS.

STORMS AND WARNINGS FOR MARCH.

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NORTHERN HEMISPHERE PRESSURE.

Alaska.—For the month, as a whole, pressure averaged above normal, being continuously so during the latter half. One of the most persistent high-pressure areas noted since the beginning of observations from the Aleutian Islands obtained over that region from the 23d through the end of the month, not once during the period mentioned did the pressure fall below 30.50 inches. Lows occurred about the 3d, 8th, and 14th; and highs about the 5th–6th, 9th–11th, 16th–17th, 19th–20th, 24th, 27th, 29th, and last day of the month.

Honolulu.—Pressure averaged below normal for the month. Highs occurred from 1st to 4th and during the 12th and 13th, while during the remainder of the month pressure was below normal. Lows occurred on the 8th–9th, 17th, 21st–22d, 24th–25th, and on the 29th. Pressure conditions over this area were the reverse of conditions over Alaska, all the larger fluctuations of pressure in one area showing as inversions in the other.

Iceland.—Pressure averaged below normal, being continuously below from the 2d to 7th, 12th to 21st, and during the 23d and 24th. The only marked high area of the month prevailed from the 26th to 31st, its crest occurring on the 28th, with a pressure reading of 30.40 inches. Lows occurred on the 2d–3d, 4th–5th, 6th, 12th–13th, 15th, 17th–18th, 20th, and 24th; and highs on the 8th, 10th–11th, 21st–22d, and 28th. Over the British Isles and western Europe pressure was decidedly low during almost the entire month, especially from the 15th to 27th. On the 14th heavy gales caused considerable damage to property and shipping in Ireland and during the 17th and 18th telegraph service in France and Germany suffered a good deal of interruption due to high winds.

Azores.—Pressure was decidedly above the seasonal average, being continuously above except during the 8th and the last six days of the month. Lows occurred on the 8th, 12th, 27th, and 29th–30th; and highs on the 1st–4th, 10th, 14th–17th, and 20th–21st.

Siberia.—During the greater part of the month fluctuations of pressure were moderate in character. Over the southern portion of this area pressure was slightly below the seasonal average, while over the remainder of the territory pressure averaged slightly above the normal. The most important lows occurred about the 3d–5th, 15th–16th, 18th, 20th–21st, and during the last week of the month. At Odessa and Astrakhan pressure was decidedly below the average on the 14th and during the last six days of the month. According to newspaper dispatches the storm of the 14th caused considerable damage in the region around Astrakhan due to the high winds and heavy rains.

PRESSURE OVER THE UNITED STATES.

In the United States the month opened with a severe storm off the North Carolina coast which was causing winds of moderate character in Coast States and severe gales off the middle Atlantic coast as indicated in the following vessel reports: In latitude 33° , longitude $72\frac{1}{2}^{\circ}$, one vessel reported 74 miles per hour from the west; and in latitude 36° , longitude $72\frac{1}{2}^{\circ}$, another vessel reported 64 miles per hour from the southeast. By the evening of the 1st the storm had advanced to the western end of Long Island with the lowest pressure reading at New Haven, Conn., of 28.25 inches, one of the lowest ever reported in the United States. Winds had increased to storm force along the middle and north Atlantic coasts, a maximum velocity of 85 miles per hour being reported from Nantucket. During the succeeding 12 hours the storm remained nearly stationary and pressure rose slightly at its center. On the morning of the 3d the center was off the Maine coast and on the following morning over the Grand Banks. The high winds did not moderate until the 4th. This storm was one of the most severe from the standpoint of wind velocity that has visited the Atlantic seaboard for years, the persistence of the high winds for a period of about three days being most unusual. Heavy snows were reported in connection with this disturbance in eastern Pennsylvania, New Jersey and eastern New York, causing serious delays to railway traffic and to telephone and telegraph communication. Southeast storm warnings were issued on the evening of February 28 from Fortress Monroe to Eastport, with the information that fresh shifting gales were to be expected along the middle Atlantic and New England coasts Sunday morning (Mar. 1). On the morning of March 1 the following message was disseminated to Atlantic coast ports:

Storm of marked intensity off Hatteras moving north. High shifting winds will become northwest gales to-night with probably rain turning to snow and much colder weather. Advise shipping to remain in port.

The warnings for gales were again repeated on the 2d.

The high pressure area that was over the eastern Plains States at the beginning of the month advanced slowly eastward to the Ohio Valley with decreasing intensity after which it disintegrated. It caused frosts and freezing temperatures in the East Gulf, portions of the South Atlantic States and in Florida on the 3d, the occurrence of which in the main were successfully forecast. This high caused sweeping changes to colder weather throughout the East Gulf and South Atlantic States, a number of low temperature records in Virginia, the Carolinas and Georgia for the month of March being broken.

The next disturbance to cross the country developed over the southern Rocky Mountain region on the 2d in the trough of a Canadian Northwest low that was central at Edmonton on the morning of the 1st. The Rocky Mountain storm passed thence southeastward to the mouth of the Rio Grande by the evening of the 3d, the

showers attending it being confined to the west Gulf States. From the Texas coast it moved across the Gulf States and up the Atlantic coast with increasing intensity causing showers in Gulf and Atlantic coast States. On the morning of the 6th storm warnings were ordered for the New England coast and high winds occurred as indicated.

On the evening of the 3d a disturbance appeared in the Province of Alberta and passed slowly southeastward to the Ohio Valley by the morning of the 7th, causing scattered showers over the Plains States, the middle and upper Mississippi Valley, the Ohio Valley and the Lake region. On the morning of the 3d storm warnings were issued for the north Pacific coast and high winds occurred as forecast in the advices.

On the north Pacific coast pressure remained high from the 1st to 5th and on the morning of the 6th an offshoot from this high pressure area was central over Texas, the northern center however was central over Idaho. The latter passed over the northern route with decreasing intensity, while the Texas center moved eastward across the Gulf States causing frosts on the 8th in the Gulf States, on the 9th in the East Gulf and portions of the South Atlantic States, and in Florida, and on the 10th in portions of Florida and the South Atlantic States. Most of the frosts mentioned were foretold in advices issued previously to their occurrence.

The next disturbance to cross the country appeared in the Canadian Northwest on the morning of the 8th, and passed thence south-southeastward to the Texas Panhandle by the 10th. From this point it passed eastward across the Gulf States to the Atlantic Ocean causing showers over the South Atlantic and Gulf States and high winds on the west Gulf coast, warnings of which were issued on the evening of the 10th.

This disturbance was followed by a high pressure area that made its appearance over Alberta on the morning of the 9th and passed south-southeastward following much the same course as the low immediately preceding it, and causing heavy and killing frosts over portions of the West Gulf States on the 12th and over the Gulf and South Atlantic States again on the 13th and 14th. It had passed off the South Atlantic coast by the morning of the 15th leaving however a slight high pressure area over Georgia on that morning, frosts being again reported in the East Gulf and South Atlantic States. With the exception of the frosts on the 15th, their occurrence was successfully indicated.

At Turks Island, West Indies, on the morning of the 14th the pressure was 0.02 inch lower than on the previous observation and the weather had become cloudy. On the following morning the wind had shifted from an easterly quarter to westerly and the pressure had fallen to 29.90 inches indicating the existence of a disturbance to the northward or northeastward. On the morning of the 16th the pressure at Turks Island had risen to 29.94 inches and the wind was north, while at Hamilton, Bermuda, the pressure had fallen 0.34 inch to 29.90 with the wind northeast and raining. At the evening observation of that date the barometer reading at Bermuda was 29.40 inches, wind southeast and weather raining. On the following morning the pressure had risen 0.36 inch and the wind had shifted to south. From these facts it may reasonably be supposed that the storm developed somewhere northeast of Turks Island and passed northward on a course that carried it near and to the west of the Bermudas and then probably recurved to the northeastward, as no evidence of it was observable on the North

Atlantic coast nor along the coasts of the Canadian Maritime Provinces.

A disturbance appeared over northern Saskatchewan on the evening of the 14th, and passed over a northern course to the St. Lawrence Valley by the morning of the 17th, causing light showers in the northern Lake region and high winds in the northern upper Lake region. An offshoot from this storm appeared on the 17th over northern Lake Michigan and on the evening of that date two centers were noted, one over Lake Erie and the other over northwestern South Carolina. On the evening of the 17th storm warnings were issued for the middle Atlantic and New England coasts and were continued from Sandy Hook to Eastport on the following day. High winds occurred as forecast. The South Carolina disturbance developed increased energy and passing up the coast was central on the morning of the 19th over northern Maine, with pressure reading 29.34 inches at Greenville, high winds being reported from Delaware Breakwater northward. The storm thence passed northeastward to Newfoundland by the morning of the 21st, with lowest pressure reading at St. Johns, 28.82 inches.

A high pressure area appeared over Saskatchewan on the morning of the 17th and by the following morning had moved to Manitoba, with a tongue of high pressure extending southward through the Mississippi Valley. This tongue of high pressure swung eastward following the passage up the Atlantic coast of the low immediately before mentioned causing light frosts on the 19th in the South Atlantic States. The main portion of the high seemed to lag and was later augmented by another high that came from the northwest Canadian Provinces on the 18th.

During the retardation of this high and preceding the coming of the second high a low appeared over northern Wyoming on the evening of the 17th which during the 36 hours following passed to the west Gulf coast, causing rain and snows from the Rocky Mountains through the Plains, southern Slope and West Gulf States. By the morning of the 20th it was over the coast line of North Carolina, whence it passed east-northeastward to the ocean. Precipitation was quite general from the Mississippi Valley eastward, except in northern districts. From the 17th to 19th, the highest temperatures recorded in the month of March were reported from points in California.

The high-pressure area before referred to as being augmented by a high-pressure area from the northwest Canadian Provinces during the 18th was central on the morning of the 19th over the Plains States. Cold-wave warnings were issued on the 18th for Kansas, western South Dakota, southern Wyoming, and northeastern Colorado. On the morning of the 20th the high extended from the upper Lake region to the West Gulf States, killing frosts and freezing temperatures being reported in the northern portion of the latter district. By the morning of the 22d the high had passed off the Middle Atlantic coast. The frosts in the West Gulf States above mentioned were indicated in warnings issued on the 19th. The passage of this high was attended by temperatures much below the seasonal average, particularly in the region from the Mississippi Valley to the Rocky Mountains.

Following the passage of this high-pressure area there was a slight reaction to lower pressure, but readings below 30.00 inches were not reported until the morning of the 22d, when there was a weak disturbance off Hatteras with pressure reading at that station of 29.90 inches and another over Minnesota with pressure reading at Duluth of 29.88 inches. The Hatteras low passed rapidly up the

coast with increased intensity, while the Minnesota disturbance passed east-southeastward to the Ohio Valley with decreasing intensity by the morning of the 23d.

A pressure reading of 30.94 inches was reported at Edmonton, Alberta, on the morning of the 20th, with temperature readings near 0° F. in the Canadian Northwest and cold-wave warnings were disseminated for portions of the Plains and southern Slope States. The high passed thence southward to the West Gulf States by the morning of the 22d, causing frosts on that morning over the West Gulf and portions of the East Gulf States. On the morning of the 23d it had advanced to northwestern Florida, and frosts were reported throughout the Gulf and South Atlantic States, warnings of which were previously issued. On the 24th the high was central over North Carolina and frosts were again reported in the South Atlantic and East Gulf States. The high-pressure area passed northeastward to the ocean.

The next disturbance to cross the country was undoubtedly of north Pacific origin. It first appeared as a definite center over Idaho on the evening of the 22d, passing southeastward to Colorado by the 24th and thence northeastward during the following two days to the St. Lawrence Valley. It caused showers and thunderstorms over an area extending from Kansas and Nebraska northeastward to the St. Lawrence Valley. Another low followed, being central near Edmonton, on the morning of the 24th, and passing thence southeastward to Colorado during the next 36 hours. A secondary storm that was over New Mexico on the evening of the 25th passed eastward and up the Ohio Valley until on the morning of the 28th it was central over southwestern Pennsylvania. It was thence forced southward to North Carolina on the evening of that date by a high-pressure area to the northward and, later developing intensity, passed northeastward up the Atlantic coast, being central at the last of the month over the Canadian Maritime Provinces. These two storms caused scattered showers and thunderstorms over most of the country from the Plains States eastward. On the evening of the 28th storm warnings were issued for the Atlantic coast from Delaware Breakwater to Nantucket and continued on the morning of the 29th from Nantucket to Bridgeport, Conn., and high winds occurred over the areas indicated.

On the 26th pressure became high over Saskatchewan and on the following morning a high center was over

western Ontario with temperatures below zero from Saskatchewan to western Ontario. By the morning of the 28th the high area was over eastern Ontario, whence it passed eastward to the ocean during the next 48 hours. Another high area appeared over eastern Manitoba on the 29th and on the morning of the last day of the month was over Ontario and by the evening of that date on the southern New England coast.

Lows of minor character continued to develop over the southern Rocky Mountain Region, which caused showers and thunderstorms as they advanced eastward to the Ohio Valley. At the last of the month low-pressure areas were over Oklahoma, the mouth of the Rio Grande, and Saskatchewan, and pressure was high over New England and the Middle Atlantic coast.

Pressure was below normal on the extreme north Pacific coast from the evening of the 25th until the 28th, on the morning of which latter date pressure readings showed a fall from the preceding observation, and storm warnings were issued for the north Pacific coast. These warnings were continued on the 29th and 30th and high winds occurred over the districts indicated in the warnings.

SOLAR INFLUENCES?

There is a familiar authority, formerly very active in Virginia, who taught the truth of the text in the Book of Joshua: "Sun, stand thou still! * * * And the sun stood still," whereas, in the ancient scripture this phrase is a quotation from a bit of sublime poetry, equal in its impressiveness to the blank verse of Milton's "Paradise Lost."

Most modern writers accept the fact that the ancient authors were writing poetry, not science, whereas the modern author of "The central law of the weather" seems to accept this quotation from Holy Scripture as the basis of his system of local weather forecasts.

Of course, the study of the solar atmosphere and its phenomena is a very important part of modern astronomy, and we may believe that it is related to the study of modern meteorology, but we have not as yet seen that any meteorologists have been able to forecast at long range coming weather changes on the earth by means of the spots on the sun. Nor is it apparent that there is any physical reason why we should expect to be able to do so.—[C. A.]