

between the 20th meridian and the coast of Scotland, with the pressure at Iceland considerably below the normal, the barometer at Reykjavik reading as low as 28.39 inches on the 23d. Storm logs are as follows:

**British S. S. *Malvern Range*:**

Gale began on the 20th, wind S. Lowest barometer 29.58 inches at 3 a. m. on the 23d, wind WSW., 11; position, latitude 58° 20' N., longitude 16° W. End on the 23d, wind variable. Highest force of wind 11, WSW.; shifts S.-W.-SW.-SSE.-WSW., variable.

**British S. S. *Malvern Range*:**

Gale began on the 24th, wind NNW. Lowest barometer 29.91 inches at 4 a. m. on the 26th, wind WNW., 10; position, latitude 56° N., longitude 22° W. End of gale on the 26th, wind SW. Highest force of wind 11, W.; shifts NNW.-W.-WNW.-WSW.

On the 22d and 23d there was a well developed LOW, central near the center of the steamer lanes, the storm area extending from the 40th to 50th parallels, and from the 25th to 45th meridians. Storm logs follow:

**British S. S. *Canada*:**

Gale began on the 21st, wind SW. Lowest barometer 29.60 inches at 10 a. m. on the 22d; position, latitude 45° N., longitude 40° W. End of gale on the 23d, wind NW. Highest force of wind 10, SW.; shifts SW.-W.

**Belgian S. S. *Gothland*:**

Gale began on the 22d, wind SW. Lowest braometer 29.63 inches at 6 a. m. on the 23d, wind WNW.; position, latitude 45° 09' N., longitude 37° 02' W. End of gale on the 23d, wind NW. Highest force of wind 9, W. Shifts SW.-WNW.

The observer on the British S. S. *Canada* reports that at 6 a. m. March 24, near latitude 42° 37' N., longitude 52° 16' W., the vessel steamed through tide rips extending to the horizon in a northwesterly direction. Temperature of water on northerly side 29° F., and after passing through the line of ripples, 33° F.

A good example of the "zone of silence" is given by the observer on the British S. S. *Strathearn*, who states that on March 25, steering 182°, he heard Nantucket Shoal light vessel fog signal distant 5 miles, very faint ahead; it got louder until 2 miles away when signal ceased to be heard until on starboard beam one-half mile distant. The whistling buoy was heard at a distance of 2 miles and until well past the beam. Position checked by soundings and wireless direction stations.

On March 26 a moderate disturbance was central near latitude 40° N., longitude 42° W.

The storm log from the British S. S. *Caledonia* follows:

Gale began on the 25th, wind NE. Lowest barometer 29.90 inches at 4 p. m. on the 26th, wind N., 7; position, latitude 42° 11' N., longitude 45° 47' W. End of gale 4 a. m. on the 27th, wind ENE. Highest force of wind 8, NE.; shifts NE.-N.

On the 28th and 29th there was a disturbance some distance west of the coast of Scotland, although it was impossible to determine its center and extent accurately, on account of lack of observations.

Storm logs follow:

**British S. S. *Malvern Range*:**

Gale began on the 27th, wind NW. Lowest barometer 29.76 inches at 3 a. m. on the 28th, wind NW., 10; position, latitude 53° N., longitude 29° W. End of gale on the 29th, wind NW. Highest force of wind 10, NW.; steady from NW.

**American S. S. *Satartia*:**

Gale began on the 28th, wind W. Lowest barometer 29.83 inches at 2.45 p. m. on the 28th, wind NW.; position, latitude 47° 44' N., longitude 15° 28' W. End of gale on the 29th. Highest force of wind, 10, NW.; shifts W.-NW.

On the 29th there was a LOW central near Sydney, Nova Scotia, with moderate winds along the American coast north of the 40th parallel, while vessels between New York and Charleston encountered northerly and

northwesterly gales. This disturbance moved slowly eastward and on the 30th the center was about 200 miles southeast of St. John's N. F., and moderate to strong northerly gales prevailed near the 40th parallel, between the 50th meridian and the American coast, while a few vessels west of the Bermudas also reported heavy weather. During the next 24 hours the easterly movement of this LOW was very slight, although on the 31st the storm area was considerably east of its position on the previous day and was confined between the limits of 40th and 47th parallels, and the 37th and 50th meridians.

Storm logs follow:

**American S. S. *Pennsylvania*:**

Gale began on the 28th, wind NW. Lowest barometer 30 inches at 7 p. m. on the 28th, wind NW., 10; position, latitude 39° 20' N., longitude 74° 10' W. End of gale on the 29th, wind NW. Highest force of wind, 11, NW.; shifts SW.-NW.

**American S. S. *Halsey*:**

Gale began on the 29th, wind NE. Lowest barometer 30.05 inches at 10 a. m. on the 29th, wind NE., 7; position, latitude 35° M., longitude, 75° W. End of gale at 10 p. m. on the 29th, wind NE. Highest force of wind 9, NE.; shifts S.-W.-NE.

**American S. S. *Henry Steers*:**

Gale began on the 30th, wind SW. Lowest barometer 29.51 inches at 6 a. m. on the 30th, wind NW., 9; position, latitude 40° 47' N., longitude 51° 20' W. End of gale on the 31st, wind NW. Highest force of wind 10, NNW.; shifts SW.-NW.

**American S. S. *Montana*:**

Gale began on the 29th, wind N. Lowest barometer 29.61 inches at 8 a. m. on the 29th, wind N., 9; position, latitude 41° 08' N., longitude 59° 30' W. End of gale on the 30th, wind NNW. Highest force of wind 10, N.; shifts SW.-N.-NNW.

**Dutch S. S. *Kroonland*:**

Gale began on the 30th, wind SSW. Lowest barometer 29.71 inches at 2 p. m. on the 30th, wind SSW., 8; position, latitude 45° 31' N., longitude 36° 30' W. End of gale on April 1, wind NW. Highest force of wind 9, WSW.; steady from WSW.

557.506 (265.2)

NORTH PACIFIC OCEAN.

By F. G. TINGLEY.

At Midway Island pressure was above normal from the 1st to the 4th, below from the 6th to the 19th, except the 12th, and above from the 20th to the end of the month, except on the 25th. In amount the departures were moderate. At Honolulu pressure was below normal generally during the first and third decades, and below during the second decade. Here, also, the departures were moderate in amount. At Dutch Harbor pressure was almost continuously above normal, the average daily excess amounting to about 0.18 inch.

The number of gales reported was about the same as in 1919 and 1920, but they were of greater intensity. They occurred principally during the second and third decades, the weather of the first ten days of the month being relatively quiet so far as shown by the reports that have been received.

The principal disturbance of the month appears to have been one that developed to the east of Japan during the 13th and 14th through the merging of several small depressions which formed in the western part of the east China Sea and over central China on the 11th. On the 12th these cyclonic centers were disposed so as to form a trough-like depression covering the area from the northern Philippines to central Japan.

A number of vessels were involved in this disturbance, and experienced gales on several days, the wind at time

reaching hurricane force. Typical storm logs are as follows:

American S. S. *Imlay*, Capt. H. Warrer, Shanghai (Mar. 10) for San Francisco; observer, T. Olson. Gale began on the 13th; lowest barometer, 29.45 inches, at 3 p. m. of the 14th in latitude 37° 25' N., longitude 145° E.; highest force of wind and direction, 10, W.; gale ended on the 18th; shifts, NW. to W.

British S. S. *Tachee*, Capt. I. D. Llewellyn, San Francisco (Mar. 1) for Hongkong; observer, T. Gore, third officer. Gale began and ended on 15th; lowest barometer, 29.57 inches, at 7.45 a. m., in latitude 33° 34' W., longitude 144° 06' E.; highest force of wind and direction, 10, W.; shifts, SW.-W.-WNW.-NW.

The *Tachee* also experienced heavy weather on the 13th and 14th.

The Japanese S. S. *Mexico Maru*, Capt. N. Yanagi, Los Angeles for Yokohama (Mar. 15), came under the influence of this depression on the 12th, being at Greenwich Mean Noon of that date in latitude 34° 35' N., longitude 147° 23' E. On this date there was a moderate SSE. gale and high sea, causing the vessel to labor heavily and ship water both fore and aft. The sea continued rough on the 13th with a long southwesterly swell. On the 14th there was a strong westerly gale with very high sea.

This depression apparently moved in the direction of Bering Sea as according to reports at hand it did not noticeably affect shipping east of the 165th meridian, east longitude.

About the 25th another depression of considerable intensity developed to the east of Japan, involving a number of vessels in the western part of the steamer lanes. The following storm logs show the character of this depression:

American S. S. *Montague*, Capt. G. H. Whitehead, Observer F. R. Gillan, second officer, Columbia River (Mar. 13) for Yokohama. Gale began on 26th, wind SE., 8; lowest barometer 28.20 inches (uncorrected), at 10 a. m. of 27th, in latitude 44° N., longitude 157° 20' E.; gale ended on 27th, wind NW. by W.; highest force and direction, 11, SW.; shifts, SE.-SW.-WNW.

The *Montague* had previously experienced gales on the 19th, in longitude 174° W.; on the 20th, in longitude 178° 45' W.; and early on the 23d, in longitude 174° 45' E. In the afternoon of the 23d the wind increased to a strong gale. Following the storm of the 27th another storm was encountered on the 29th, in longitude 149° 50' E. The barometer fell to 28.68 (uncorrected) at 10 a. m. of

that date and the wind attained force 11, NW. by W. In the storm of the 26th-27th the barometer fell at the rate of 0.15 inch an hour and rose at the rate of 0.15 to 0.20 inch an hour.

Japanese S. S. *Africa Maru*, Capt. M. Ohyama, observer, second officer, S. Kichuchi, Yokohama (Mar. 24) for Victoria. Gale began 26th, wind ESE.; lowest barometer 28.65 inches at 10.36 p. m. of 27th in latitude 44° 21' N., longitude 159° 45' E.; highest force of wind and direction, 11, W., end of gale on 31st, wind W.; shifts of wind, 6 points.

On the 16th and 17th the Norwegian M. S. *Theodore Roosevelt*, Capt. Eric Thomle, Astoria (Mar. 4) for Panama, experienced a strong gale accompanied by a high sea off the Central American coast. According to Observer Sverre Sandahl, the gale began at ENE.; lowest barometer 29.96 inches at 5 a. m. of 17th in latitude 10° 50' N., longitude 86° 45' W.; highest force and direction, 10, WSW.

A report for March that possesses unusual interest is that of the Dutch S. S. *Baarn*, Capt. J. van Rijnbach, Valparaiso for Punta Arenas, thence toward Boston. Observer J. J. Ch. de Lange states that on March 14, before entering the strait, the weather was rainy with fresh to strong NW. breeze and some hail. When passing through the strait on the 15th there was a moderate NW. gale, with heavy rain and hail. Many tide rips were observed. The *Baarn* left Punta Arenas on the 29th with rainy weather. More tide rips were observed. On the 30th the weather was stormy, with a wild sea; wind NNW., force 9. The weather continued stormy until April 4.

During the voyage of the American S. S. *Northwestern*, Capt. Wm. Jensen, from Seattle to southwestern Alaskan ports and return, March 12-24, an exceptionally large display of northern lights was seen nearly every night while in Alaskan waters. Observer P. Christiansen states that these were probably due to the long period of clear and cold weather. This in turn may be associated with the continuously high pressure at Dutch Harbor, previously mentioned.

On March 1, at 9.45 p. m. in latitude 5° 34' S., longitude 81° 30' W., a large meteor was observed from the American M. S. *Sierra*, Capt. Olaf A. Janson, San Francisco for Callao. Observer John Behrsin states that its brightness surpassed that of the moon.

#### NOTES ON WEATHER IN OTHER PARTS OF THE WORLD.

*Newfoundland.*—The Newfoundland sealing fleet which went out on the 10th was unable to find the herds, owing to heavy ice.<sup>1</sup>

*British Isles and western Europe.*—As in the two preceding months, there was a marked absence of severe wintry weather over western Europe generally, and even in Sweden there was little frost after the 9th. Brief incursions of polar air were accompanied by snow in the northern districts of the British Isles at times in the first week, and in the western districts on the night of the 28th, but milder weather followed at once in every case.<sup>1</sup>

*British Isles.*—The general rainfall expressed as a percentage of the average was: England and Wales, 101; Scotland, 170; Ireland, 129; \* \* \*.

In London (Camden Square) the mean temperature was 46.8° F., or 4.6° F. above the average. \* \* \*

*France.*—Paris, March 10.—All eastern and southern France is beginning to suffer from very unusual drought for this time of the year. Since the middle of January very little rain has fallen, even in the mountain districts. \* \* \*

The result has been that the rivers are lower than at any time for 20 years at this season, and are fast approaching the lowest summer record. \* \* \* In some parts of France authorities have had to post notices urging economy of water, as many wells have gone dry. \* \* \*—*New York Times*, March 11, 1921.

*Switzerland.*—Paris, March 15.—The extraordinary drought which is causing grave damage to French farmers has also brought heavy loss to the winter sports industry in Switzerland. The bright sunshine has melted the snow at St. Moritz and other resorts until it is now necessary to mount to an altitude of 4,500 feet to find slides. \* \* \*

Lake Geneva has almost gone dry [?] \* \* \* Not for 90 years has it been so dry in Switzerland. Cities which depend upon hydraulic production of electricity have had to ration themselves.—*New York Times*, March 16, 1921.

*India.*—A telegram dated March 18 stated that famine had been declared in parts of the Bellary and Anantapur districts of the Madras Presidency.<sup>1</sup>

*Hawaii.*—Honolulu, April 16.—All islands during the month of March experienced subnormal precipitation,

<sup>1</sup> *The Meteorological Magazine*, April, 1921, pp. 77, 79, and 84.