

## WEATHER OF NORTH AMERICA AND ADJACENT OCEANS.

## NORTH ATLANTIC OCEAN.

By F. A. YOUNG.

The average pressure for the month was near the normal at land stations on the Atlantic coasts of Canada and the United States, as well as in the British Isles. It was considerably higher than usual in the Bermudas and Azores, and after the 8th the North Atlantic high-pressure area was unusually well developed, as during the last two decades of the month the barometer at Horta ranged from 30.24 to 30.46 inches.

The number of days on which fog was reported was considerably above the normal, especially over the western section of the ocean. In the 5-degree square between latitude 40° to 45° N. and longitude 65° to 70° W. fog was observed on 19 days during the month, and over the Grand Banks on from 8 to 12 days. It was also reported frequently over the eastern part of the steamer lanes, although comparatively rare in the immediate vicinity of the British Isles.

The number of days with winds of gale force in August is ordinarily slightly greater than in July. According to the Pilot Chart, the maximum normal for August is 6 per cent, or about 2 days during the month on which gales can be expected in the 5-degree squares in the eastern section of the ocean, between the 50th and 55th parallels and 15th and 25th meridians. During the month under discussion the number of days on which gales were reported in this locality was about normal, although in the region immediately to the south, as well as off the coast of Nova Scotia, gales occurred somewhat more frequently than usual.

From the 1st to the 4th nearly normal conditions prevailed over the entire ocean, except that on the former date a moderate gale of limited extent and short duration was reported by a vessel in midocean. On the 5th there was a fairly well developed disturbance off the coast of Nova Scotia. Storm log:

*British S. S. Valacia:*

Gale began on the 5th, wind SW. Lowest barometer 29.86 inches at 5 p. m. on the 5th, wind SW., 8, in latitude 41° 11' N, longitude 55° 28' W. End on the 6th, wind WNW. Highest force 8; shifts SW.-WNW.

At 2:45 p. m. on the 6th the observer on board the American S. S. *Emergency Aid* reported a large waterspout in latitude 35° N, longitude 68° W. It extended toward the water from the base of mountainous cumulonimbus clouds, describing a part of a circle with the concave side toward the wind and lasted 12 minutes. At 4 p. m. on the same day another spout was observed, which was smaller than the first and only lasted 2 minutes.

On the 8th and 9th there was a moderate disturbance between the 30th and 40th parallels, west of the 60th meridian. Storm log:

*French S. S. Britannia:*

Gale began on the 7th, wind SW. Lowest barometer 29.93 inches at 4 a. m. on the 9th, wind WNW., 7, in latitude 39° N, longitude 66° 20' W. End, 8 a. m. on the 9th, wind WSW. Highest force 9; shifts S.-WSW.

On the 10th and 11th waterspouts were again observed as shown by following reports.

*American S. S. Charles Pratt:*

August 10, 6 p. m. in latitude 31° 10' N, longitude 79° 10' W, at the turn of the Gulf Stream to the NE. came into close proximity to 10 large waterspouts. They were traveling in a line North and South and about a quarter of a mile apart. Wind at the time of this formation

NW, very heavy nimbus clouds. As the ship was only about a quarter of a mile away it was plainly seen how the water was taken up. Under each spout was formed a large hollow where the water swirled around left handed and with great rapidity. This left handed circular motion continued into the cloud. Photographs were taken. Wind changed to NE. and they were broken up. Heavy rain followed.

*American S. S. Shenandoah:*

At 4:30 a. m. August 11, a heavy waterspout passed about 1 mile astern of the ship in a southeasterly direction, then turned about ENE. and finally disappeared in a heavy rain squall. Greenwich mean noon position on the 11th, latitude 23° 30' N., longitude 88° 32' W.

From the 10th to the 14th moderate weather prevailed over the entire ocean, although the Northeast trades appeared to be considerably stronger than usual, especially in the vicinity of the Canaries. From the 15th to 18th there was a disturbance of varying intensity over the middle section of the steamer lanes. Storm logs:

*Swedish S. S. Carlsholm:*

Gale began on the 15th, wind SW. Lowest barometer 29.73 inches at 9 a. m. on the 18th, wind WNW., 8, in latitude 52° 20' N., longitude 41° 02' W. End on the 19th, wind W. Highest force 11, WSW.; shifts WNW.-W.

*American S. S. Sapinero:*

Gale began on the 15th, wind SW. Lowest barometer 29.80 inches at noon on the 16th, wind NW., 7, in latitude 49° 08' N., longitude 16° 47' W. End on the 19th, wind NW. Highest force 8; steady from NW.

On the 21st the American S. S. *Limon* encountered a northerly gale off the coast of northern Florida. Daily journal:

21st. Day begins fine. 10 a. m. began to blow hard from north. Noon increased to force of 8 with very heavy sea. 2 p. m. wind hauled to the NE. Greenwich mean noon position, latitude 28° 53' N., longitude 79° 42' W.

From the 20th to the 22d a number of vessels reported heavy weather over the region between the 40th parallel and the south coast of Newfoundland. Storm logs:

*German S. S. Hansa:*

Gale began on the 20th, wind S. Lowest barometer 29.56 inches at 8 p. m. on the 20th, wind S., 10, in latitude 41° N., longitude 63° 08' W. End on the 20th, wind NW. Highest force 10, S.; shifts S.-SW.-W.

*Dutch S. S. Veendijk:*

Gale began on the 20th, wind S. Lowest barometer 29.30 inches at 9 p. m. on the 20th, wind SSW., 9, in latitude 41° 44' N., longitude 62° W. End on the 20th, wind WNW. Highest force 9; shifts S.-SSW.-WNW.

*American S. S. Mongolia:*

Gale began at 6 p. m. on the 20th, wind WSW. Lowest barometer 29.52 inches at 10 p. m. on the 20th, wind W., 8, in latitude 40° 52' N., longitude 62° 49' W. End on the 21st, wind WNW. Highest force 8, W., shifts WSW.-W.

*British S. S. Verentia:*

Gale began on the 20th, wind S. Lowest barometer 29.68 inches at 8 a. m. on the 21st, wind SW., 7, in latitude 40° 03' N., longitude 55° 26' W. End on the 22d, wind WNW. Highest force 8, SW., shifts SW.-WSW.

At 2:30 p. m. on the 22d the observer on board the American S. S. *Minnequa* sighted a large waterspout in front of a passing rain squall.

On the 23d there was a low-pressure area over the North Sea and northerly winds of gale force were reported from land stations in the British Isles, as well as from the Danish S. S. *Dania*, as follows:

Gale began on the 23d, wind WNW. Lowest barometer 29.82 inches at 6 p. m. on the 23d, wind WNW., 7, in latitude 53° 46' N., longitude 26° 50' W. End on the 24th, wind N., 6. Highest force 10; shifts WNW.-NW.

On the 24th vessels in the northern steamer lanes experienced NW. winds of gale force. Storm logs:

British S. S. *Vardulia*:

Gale began on the 24th, wind SW. Lowest barometer 29.73 inches at 9 a. m. on the 24th, wind SW., 7, in latitude 50° 42' N., longitude 44° 38' W. End on the 25th, wind NW. Highest force 8; shifts SW.-NW.

British S. S. *Ilford*:

Gale began on the 24th, wind NW. Lowest barometer 29.59 inches at 8 a. m. on the 24th, wind NW., 8, in latitude 54° 45' N., longitude 21° 45' W. End on the 27th, wind NW. Highest force 8; shifts W.-NW.-N.-SW.

Charts VIII and IX show the conditions on August 25 and 26, respectively, when stormy weather prevailed over the eastern section of the steamer lanes. Storm logs:

British S. S. *Manchester Spinner*:

Gale began on the 24th, wind NW. Lowest barometer 30.02 inches at 3 a. m. on the 25th, wind NNW., 7, in latitude 48° 32' N., longitude 37° 39' W. End on the 25th, wind N. Highest force 7, steady NNW.

British S. S. *Belgian*:

Gale began on the 26th, wind NNW. Lowest barometer 30.04 inches at 10.16 a. m. on the 26th, wind NNW., 7, in latitude 49° 03' N., longitude 26° 04' W. End on the 26th, wind N. Highest force 7, steady NNW.

American S. S. *Bayon Chico*:

Gale began on the 26th, wind WSW. Lowest barometer 29.79 inches at 2 a. m. on the 27th, wind WNW., 9, in latitude 50° 25' N., longitude 16° 24' W. End on the 27th, wind N. Highest force 9; shifts WSW.-WNW.

In the afternoon of the 27th, while off the west coast of Cuba, the American S. S. *Hiberias* encountered a SE. wind, force 7, with rough sea, heavy SSE. swell, and frequent heavy rain squalls.

The observer on board the Danish S. S. *Dania* observed an unusually brilliant aurora borealis off the north coast of Scotland on the 27th, that was visible from 8 to 9:30 p. m. when fog shut in.

On the 28th and 29th stormy weather prevailed over the eastern section of the ocean north of the 40th parallel. Storm logs:

British S. S. *Rathlin Head*:

Gale began on the 29th, wind NW. Lowest barometer 29.77 inches at 4 p. m. on the 29th, wind NW., 7, in latitude 50° 23' N., longitude 24° 35' W. End on the 30th, wind NW. Highest force 8, NNW.; shifts NW.-NNW.

British S. S. *Norfolk Range*:

Gale began on the 28th, wind S. Lowest barometer 29.17 inches at 8:50 a. m. on the 29th, wind NW., 7, in latitude 46° 42' N., longitude 39° 26' W. End on the 30th, wind NW. Highest force 8, shifts S.-W.-NW.

Japanese S. S. *Choyo Maru*:

Gale began on the 30th, wind NW. Lowest barometer 29.74 inches at 6 a. m. on the 30th, wind N., 8, in latitude 47° 05' N., longitude 19° 40' W. End on the 30th, wind NNW. Highest force 8; steady N.

On the evening of the 31st the American S. S. *Coazet* encountered a sudden squall near latitude 42° N., longitude 43° W. Report follows:

9 to 10 p. m. August 31. Very heavy squall, thick, rain. Wind previously SSW., 6; light cumulus clouds from SSW. Squall came from W. (true) in arch formation similar to China Sea. Wind W., 8, backing to SW., 6 and clearing in an hour, then conditions as before.

NORTH PACIFIC OCEAN.

By WILLIS E. HURD.

The one occurrence of deep interest drawn from the records of the weather over the North Pacific Ocean

during August—one that will be remembered in history on account of the disaster it occasioned—was that of the so-called Swatow typhoon. This storm was first observed as a slight depression in the neighborhood of the Caroline Islands on the 27th of July. During the following four days the depression, gradually gaining in intensity, moved west-northwestward, until on the 31st it was over extreme northern Luzon, whence it took a more northerly turn and entered the Chinese coast at Swatow on the night of August 2-3. The enormous tidal wave accompanying the storm crossed the mud flats before the city and in conjunction with the hurricane wind caused a loss finally estimated at upwards of 50,000 lives out of a population of some 65,000 to the unfortunate city.

The following interesting narration concerning this storm was received by the Weather Bureau from the second officer, D. Lammers van Toorenburg, of the Dutch S. S. *Van Overstraten*:

PARTICULARS ABOUT THE TYPHOON OF JULY 31 TO AUGUST 3, 1922.

On the 31st of July a typhoon was signaled within 60 miles of 17° N. and 124° E. moving westward, while on the 1st of August the typhoon appeared to be within 60 miles of 18° N. and 122° E. moving WNW. S. S. *Van Overstraten* was laying at Hongkong, and being bound for Amoy, awaited on the 2d of August for the typhoon warning to be changed. The red cone (local warning No. 1) was up and at 10 a. m. the typhoon appeared to be at 22° N. 118° E. moving NW., while another report said that the center was about 23° N. and 117° 10' E., moving NW. and threatening Swatow. In the afternoon at about 2 p. m. the local signal No. 1 was lowered and S. S. *Van Overstraten* started on her voyage. As soon as the ship came outside the harbor we felt a heavy and long swell from the ESE., while the sea was smooth and the clouds were slowly working up from the south.

The wind was NW., force 4-5 (Sc. of Beauf.), and the barometer showed a heavy fall. At 12 noon the mercury barometer was 743.3; at 4 o'clock, 745.1. The barometer kept falling till about midnight, when the barograph showed a nearly vertical line. The wind had increased considerably and was gradually turning to the south. As this steady fall showed that the ship was moving towards the center of the typhoon and the sky had a most threatening aspect, the captain turned the ship on her trail and, heading westward, the barometer stopped falling and showed a slight inclination to rise. This was a good sign. The sea was very rough by this time and heavy rollers continually shook the ship in all her beams. The wind had increased to hurricane force, while the rain was pouring down, and heavy gales made matters worse. Anyhow, as the wind showed about 3 a. m. that the center was passed, we returned to the old course, east. In the morning, between 3 and 10 a. m., the rain was heaviest and big seas made it impossible to keep to the course. So the ship heaved to, and it was not until about 9 a. m. that the course east could be followed again. Though the rain kept falling during the whole morning and afternoon, the weather cleared up considerably and also the sea diminished. Around the whole horizon a thick veil of rain had settled, and it was impossible to get any bearings, which condition caused uneasiness. Arrived that night at Amoy, where it was stated that the weather had been very bad the last 36 hours.

The next day we heard that the typhoon was north of Canton City and apparently filling up.

The S. S. *Astuba Maru* wired that she met the typhoon at 22° 5' N. and 115° 26' E. moving WNW. This is about the same position we were in at that time, and the above wire should be considered to be a little too rash, as we only struck the outside of the lower semicircle. The typhoon barometer showed the ship to be in the vicinity of about 60 miles.

On arriving at Hongkong we heard that big damage was done to Swatow and about 5,000 people perished.

A preliminary report of the typhoon<sup>1</sup> has been forwarded by Capt. G. St. M. Stocker, of the pilot station on Double Island, in the Han River, a short distance below Swatow, which itself is but 5 miles from the river's mouth. He says:

August 2. Cloudy and threatening with variable light airs till 2:30 p. m. (local time), then moderate to strong NE. breeze, increasing

<sup>1</sup> A further account of this storm may be found elsewhere in this issue of the REVIEW.