is the smallest of any month of record with the exception of July, 1907, when the average was 0.4°." The prevailing wind was from the east, and the maximum velocity was at the rate of 28 miles an hour from the NE. on the 28th.

Vessels at sea reported gales off the west coast of Mexico on the 6th, 7th, and 9th, accompanied in each case by a slight to moderate depression of the barometer and a slight wind shift. On September 6 the American S. S. *Venezuela*, in 20° 50′ N., 107° W., encountered a SE. gale, force 9, pressure 29.87. The American S. S. *Edward Luckenbach*, San Pedro to Panama, experienced a gale from SSE., force 8, in 22° 48′ N., 109° 52′ W., on the 7th. The pressure dropped to 29.64 inches, and on the following day rose to 29.84. On the 9th her observed pressure fell to 29.79 in the course of an east gale, force 8, in 18° 05′ N., 103° 07′ W. In each instance the gale was experienced for about 10 hours.

In connection with these data it is interesting to present herewith two reports for which the Weather Bureau is indebted to Prof. P. Vasquez Schiaffino, chief of the Observatory of Mazatlan. The first of these deals with the tropical storm of September 2–8, which is considered to have originated near 10° N., 98° W., and to have died out near 27° N., 117½° W. The report follows:

The path of this cyclone is similar to that of October 29–November 2, 1920, but the storm was less intense. In 1920 the path recurved to northeast approximately at latitude 25° N., entering the United States in the vicinity of San Diego.

This is the path most frequently followed by cyclones on the western coast of Mexico.

The highest wind velocities are always recorded in the ports to the south of Cape Corrientes when the path takes the present direction, but the swell produced by the storm is very heavy and endangers navigation as far as to the north of Guaymas.

This cyclone produced violent winds from the southeast at Acapulco, Manzanillo, and Maria Madre Island, and strong winds from the same direction at San Blas, Mazatlan, and La Paz, but in none of these ports was there recorded any considerable damage.

The steamer *Chiapas* was overtaken by the storm shortly after its departure from Manzanillo for Mazatlan; it arrived at the latter port on the morning of September 6 after having had to lie off port for 48 hours on account of the heavy swell which prevented entrance to the anchoring ground.

The gunboat *Canonero*, however, was able to anchor at Mazatlan.

Professor Schiaffino's second report, relating to the storm which originated on the 6th near 10° N., 102½° W. and entered the coast between Acapulco and Mazanillo on the 9th, where it was experienced by the *Edward Luckenbach*, is here quoted:

This cyclone followed a somewhat unusual path, since it is very rare for a cyclone from the Pacific to cross the Mexican Republic as this one did. The cyclones that have previously passed to the Gulf of Mexico have crossed the Isthmus of Tehuantepec, but never to the west of the 100th meridian.

Generally, when the direction of the path is like that of the present storm, from southwest to northeast, the cyclone disappears on reaching the land and encountering the foothills of the Sierra Madre and only causes heavy rains and strong winds over a limited area.

This storm gave torrential rains from Acapulco to Mazatlan and copious rains over the greater part of the Mexican Republic. At Acapulco the depth of rainfall was more than 300 mm. (11.80 inches) in 54 hours. At this port the wind attained violent velocities, shifting from northeast to southeast, south, and west. At Mazatlan the wind blew strongly from northwest, shifting to west, and southwest.

On passing to the Gulf of Mexico the storm produced heavy rains and strong winds on the coasts of the States of Tamaulipas and Vera Cruz.

No damage to shipping was reported on the Pacific coast. On the railway in the State of Colima there were numerous washouts due to heavy rains.

Of the two depressions occurring west of Midway Island, that of the 19th is the only one known to have produced gale winds. The American S. S. *Dickenson* reported this, recording a steady south wind for some hours, highest force 8, lowest pressure 29.64, in 28° 20′ N., 176° 10′ W.

At this writing (October 31) the report of typhoons for September has not been received from the Philippine Weather Bureau, but our information points to at least two typhoons in the waters of the Far East. The first seems to have originated west-northwest of Guam on the 1st or 2d and to have moved northwest to the China coast, which it entered on the 7th (local time).

The American S. S. *West Faralon*, Hongkong to San Francisco, came under its influence on the 5th and 6th and changed her course to avoid the approaching center. She was in 27° 30′ N., 123° 40′ E., early on the 6th when her barometer read the lowest, 29.52. The highest wind force was 8, shifting from N. through E. to SE.

The second typhoon affected Japan from the 12th to the 16th. Many parts of the Empire were flooded, owing to the heavy rains. In Tokyo alone 40,000 houses were said to have been partly submerged. A number of casualties resulted from wind and water. In this severe storm the American S. S. *President Lincoln*, Shanghai to Kobe, reported a gale from NE. by E. force 11, in 32° 34′ N., 126° 55′ E. on the 14th. She also encountered a whole NE. gale during much of the 15th, on which date at G. M. N. she was in 32° 59′ N., 127° 21′ E. Her lowest observed pressure was only 29.49 inches. During the 15th and 16th the American S. S. *Wheatland Montana* experienced strong NE. winds in the Japan Sea.

While gales increased in frequency over the northern half of the ocean—and they were reported on 21 days of the month—few of them rose to a strength exceeding force 9. Of these few a WNW. gale, force 10, was observed on the afternoon of the 11th by the American S. S. *Java Arrow*, pressure 29.37, in 46° 17′ N., 149° 09′ W., during a surge of the Aleutian cyclone into the Gulf of Alaska. A westerly gale, force 10, was observed by the American S. S. *President Jackson* on the 24th, in 49° 49′ N., 172° 07′ W., lowest pressure 28.93. This occurred while the Aleutian LOW was at its most intense stage for September, and on this day the lowest observed pressure of the month, 28.64, was recorded at St. Paul, in Bering Sea.

On September 30 three centers of activity lay over the northern part of the ocean east of 180°. One covered a good part of Alaska and Bering Sea, another was central south of Dutch Harbor, and a third was moving into the eastern part of the Gulf of Alaska. The last two caused gales in their respective areas, but the more western, although not especially deep, gave the highest wind force noted outside of the typhoon area. This was recorded by the American S. S. *West Nilus*—N. 11, lowest pressure 29.38—in 44° 16′ N., 170° 41′ W.

CYCLONIC DISTURBANCES IN SOUTHERN OCEANS

By ALBERT J. MCCURDY, Jr.

South Pacific Ocean.—Weather reports thus far received from vessels traversing the shipping routes of the South Pacific Ocean in September, 1924, indicate only two disturbances of any consequence.

The first, a northwesterly gale accompanied by high seas, was experienced on the 6th and 7th by the British S. S. *Corinthic*, Capt. Frank Hart, Wellington to Montevideo, while rounding Cape Horn. Mr. F. G. Rogers, fifth officer, reports that the lowest pressure observed

was 29.38 inches (uncorrected), occurring at 7:35 a. m. on the 7th in 55° 51′ S., 66° 12′ W. The wind at the time was NW., force 8.

A report of the second gale was received from the British S. S. *Waikawa*, Suva, Fiji, to Vancouver. The observer, Mr. J. Haultain, states that a fresh gale began on the 12th, accompanied by a heavy confused sea and rain squalls. The lowest barometer recorded was 29.78 inches (uncorrected), this occurring at 3:15 a. m. on the 13th in 13° 37′ S., 177° 5′ W. The wind at this time was ESE., force 8. This gale lasted throughout the evening of the 13th and during that time the wind increased to force 9, with shifts from the SE., ESE., E., and ESE.

South Atlantic Ocean.—Of the cyclonic disturbances occurring in the South Atlantic Ocean during September, only one of any significance has been reported. This was a depression which appeared on the 14th off the coast of Uruguay and which until the 16th occasioned moderate to whole gales with heavy rain squalls and rough seas. The Danish S. S. *Oregon*, Capt. W. Muhldorff, Cardiff to Bahia Blanca, came within its influence on the 14th. Mr. L. Olsen, second officer, reports that the lowest pressure was 29.84 inches, occurring at 4 p. m. on the 15th in 33° 59′ S., 51° 40′ W. The wind which at this time was NNE., force 8, later shifted to E. and increased to force 9–10.

On the 16th the Dutch S. S. *Alchiba*, Capt. K. E. Dik, Rotterdam to Buenos Aires, encountered the same gale in 34° 30′ S., 53° 14′ W., reporting conditions similar to those experienced by the *Oregon*. Mr. J. P. Nieman, observer, states that the lowest barometer, 29.80 inches, was recorded at 8:28 a. m. on the 16th. The wind at this time was NW., force 7–8.

DETAILS OF THE WEATHER IN THE UNITED STATES

551.506 (73)

GENERAL CONDITIONS

ALFRED J. HENRY

The month may be characterized as cool east of the Rocky Mountains, warm west; heavy rains on the closing days in Atlantic coast districts, severe drought in Louisiana, parts of Texas and Mississippi, and deficient precipitation generally in the Rocky Mountain, and plateau regions, also in California, Nevada, eastern Washington, and eastern Oregon.

The usual details follow:

CYCLONES AND ANTICYCLONES

By W. P. DAY

The month was dominated by high-pressure areas, not of the swiftly moving cool-wave types, but areas of relatively high pressure generally moving in from the Pacific, becoming greatly enlarged and very persistent through frequent reinforcement from the Canadian interior. This condition was most noticeable during the second and third decades and the movement of LOWS was affected by it. That is, the polar-equatorial interchange of air was more north-south, the HIGHS being so frequently revived that they interfered with the normal easterly drift and the warm air of the Tropics moved northward between such high pressure systems in troughs or in more temporary formations of a definite cyclonic nature.

Two fully developed hurricanes were charted during the month. The first had been followed during the last days of August as it passed northwestward over the Leeward and Virgin Islands, but was not definitely located again until the 2d of September when it was about 400 miles southwest of Bermuda. Lack of reports again prevented a full knowledge of its movements until it reached the steamer lanes south of Halifax on the morning of the 4th and the south coast of Newfoundland the same evening. The second hurricane developed over the eastern portion of the Gulf of Mexico and had attained considerable intensity when it struck a small section of the Florida coast near Appalachicola.

FREE-AIR SUMMARY

By L. T. SAMUELS, Assistant Meteorologist

It is found from kite observations that the negative temperature departures at the surface for the month over the country east of the Rocky Mountains either decreased in magnitude or changed to positive with increase in elevation above the ground. The northern and eastern stations showed the strongest tendency toward maintaining relatively low mean temperatures in the upper levels. Notwithstanding this fact, the resultant winds for the month as determined from kite observations at Ellendale and Royal Center, two of the stations referred to above, had a larger southerly component and at Due West a smaller northerly component than the normal. This appears paradoxical unless we consider the relatively small resultant velocities usually obtained during a month where the ordinary procession of HIGHS and LOWS causes a continuous succession of northerly and southerly winds. As a rule the resultant winds for a month as determined from pilot-balloon observations agree closely with those found by kites. However, when the observations are not similarly distributed, as occurred this month at Due West, large differences are frequently found. For example, at the 1,500-m. level at this station the resultant wind determined from pilot-balloon observations was N. 73° W. 3.8, whereas that from kite observations was S. 84° E. 3.2, almost diametrically opposite, and yet of significant velocities. The cause of this difference is at once apparent when we learn that balloon and kite observations were possible on the same day only five times during the month, weather conditions prohibiting either one or the other or both on the remaining days.

The effects of the increasingly longer nights, especially at the more northern stations, become apparent at this season of the year in the temperature lapse-rates above the earth's surface. It is interesting to note the lati-