

## HURRICANE AT BERMUDA, OCTOBER 22, 1926

W. H. Potter, of Bermuda, has sent the following account, to which we add a table of pressure and wind velocities taken from *The Royal Gazette* and *Colonist Daily*, Bermuda, for October 25, 1926.

The tropical disturbance which passed over Bermuda on October 22d, 1926, was unique in that it gave no preliminary warnings of its approach. Usually they do. The storm that passed near here on August 6th heralded its approach on the 2d by a very heavy swell on the south shore which kept increasing as the storm came nearer. If it had not been for the warnings issued by the Weather Bureau, no one would have considered the possibility of a hurricane until the storm broke; even with these warnings, it seemed doubtful.

On October 18th, 19th, and 20th the barometer, while rather low was steady, the weather clear and warm. Wind W., moderate, but light on the 20th, veering through NE. to SW. by the 21st. On the 21st the sky was overcast with alto-stratus, but not the uniform pall that precedes hurricanes, but of different thicknesses which grew heavier and lower as the day went on. The wind was SW., light, and the barometer fell very slowly. The symptoms were exactly those that obtain when an ordinary low passes to the north of us and the indications were, rain in the night followed by clearing with W. to NW. winds next day. It rained in the night hard.

At 7:30 a. m. of the 22d the barometer had taken a big drop, wind backed to SE. and rain was still falling and the graph seemed to be flattening out. This would indicate that the storm was passing to the north and had reached its climax. Suddenly at 7:45 the wind backed to ENE., increased with heavy gusts, the barometer began its rapid fall and then there was no doubt what we were in for, and from then on was a conventional hurricane.

The calm center was rather large, taking about 40 minutes to pass, the wind backing through NE. to NNW. The wind blew harder and all the damage was done in the second half and its velocity was at least 120 m. p. h. Apart from two houses, unoccupied, destroyed in Hamilton, the damage, while rather large in the aggregate, was for the most part small individually. The roofs of probably 40 per cent of the houses were more or less damaged. No one was killed and one slightly injured, and there was no damage to speak of to the small boats in the harbor. The telephone was hit hard, but the electric lights were on in Hamilton by 7 p. m. the 22d, and here across the harbor by the next evening.

Following is the barometer and wind table, prepared by Sergt. W. R. Green, R. A. M. C., the observer at Prospect.

Barometer		Wind		
Hour	Inches	Hour	Actual m. p. h.	Direction
8 a. m.	29.54	7:30-8:30 a. m.	28	SE.
		8:30-9:30 a. m.	45	Changeable between SE. and NE.
		9:30-10:30 a. m.	168	Do.
11 a. m.	28.58	10:30-11:30 a. m.	47	Do.
		11:30-12:30 p. m.	128	Do.
		12:30-1:30 p. m.	114	NW.
3 p. m.	29.59	1:30-2:30 p. m.		

<sup>1</sup> It blew at the rate of 95 miles per hour from 10 a. m. to 10:15 a. m.

<sup>2</sup> It blew at the rate of 8 miles per hour between 11:45 a. m. and 12 noon.

<sup>3</sup> No record taken after 1:30 p. m.

At 12 noon the direction of the wind changed to NW.  
Rainfall 4.50 inches.

The original barograph trace made at Paget, Bermuda, and kindly loaned to us by Mr. Potter, shows a finely developed deep V form: An uninterrupted and precipitous fall from (uncorrected) 29.75 inches at 7:45 a. m. to slightly below 28.75 inches shortly after noon, followed by a rise, not quite as rapid as the fall, beginning about 12:30 p. m. and reaching approximately 29.80 at about 6:30 p. m. The trace did not reach 30.00 inches until 7 a. m. the next day. Mr. Potter comments as follows upon this barogram:

"Unfortunately the pen was a bit sluggish. While it registered at 8. a. m. the 22d the same as the standard barometer at Prospect, it lacked 8 or 10 points of reaching the minimum at noon."

## AN EARLY MORNING TORNADO AT BERMUDA

B. M. V.

It is rare indeed for six barographs to be grouped within a very few hundred yards of a tornado, two of them recording its passage in unmistakable form. This happened at Bermuda on December 12, 1925, as reported in *The Marine Observer* for December, 1926. The barographs were variously located on ships in Ireland Island Dock Yard, or in the office buildings of the yard. The two barographs which, at 5:25 a. m., registered sharp drops in pressure were: One in an office on one side of the whirl; another on board H. M. S. *Ormonde* on the other side. The one in the office, apparently nearest the center, recorded an instantaneous drop of some 6 mb.; that on the *Ormonde* a similar drop of about 4 mb. (Reproductions of these in the journal cited.) To quote from the account:

*Ormonde's* quartermaster reported that the wind was only audible for some 15 seconds before it burst upon the ship, and its duration was approximately 30 seconds, which did not enable him to get a reading of the anemometer—the ship heeled violently over to starboard, brought up against the wires and then heeled over, about 15° to port.

Many buildings were damaged in some way or another, tiles ripped off, small sheds capsized, and fences blown down. A whaler belonging to *Capetown* on the chocks at the boat slip was shifted 12 feet and badly holed. The 10-ton crane abreast *Ormonde's* bridge was swung right round and a cart close to it turned over \* \* \*.

It was also said that a dock-yard policeman had a stormy passage up the jetty and was only saved from a ducking by fetching up against a bollard.

The breadth of the path of tornado is estimated to be about 300 yards.

551.509 (83)

## THE WEATHER FORECAST SERVICE AT THE OBSERVATORIO DEL SALTO, SANTIAGO, CHILE

The following excerpts are taken from a bulletin prepared by the director of the Observatorio del Salto.

## SHORT-RANGE FORECASTING

\* \* \* The Government maintains throughout the length of the country a complete net of meteorological stations extending from Arica to Punta Arenas \* \* \*. The observations are telegraphed to Santiago. Though there is really an excess of stations, in our forecasting we use only the observations from the most important ones \* \* \*.

The following stations are taken as a basis for the construction of our meteorological charts: *In Chile*: Arica, Iquique, Antofagasta, Calta, Coquimbo, Los Andes, Valparaiso, Santiago, San Fernando, Curico, Talca, Chillan, Concepcion, Traiguen, Temuco, Valdivia, and Puerto Montt. We receive also twice a day by radio observations from the following remote stations: Coquimbo, Isla Juan Fernandez, Punta Tumbes, Isla Mocha, Isla Huafu, Cabo Raper, and Punta Arenas. *Bolivia*: From Bolivia there is a special telegraphic transmission of observations made at La Paz and Sucre, which are furnished also to the Observatory of San Calixto. *The Argentine*: Mendoza, Cordoba, San Luis, Buenos Aires, Bahia Blanca, Patagones de Rio Negro, Chosmalal, Las Lajas, Cipolletti, Puerto Madryn, and Bariloche. After all the observations have been assembled we construct a meteorological chart for all of southern South America, including Bolivia, Chile, and Argentina \* \* \*. In our daily forecasting we use with most satisfactory results the methods of Guilbert, which permit us to foretell the occurrence of the various isobaric types \* \* \*.

The forecasts are broadcast throughout the country daily. At 10 a. m. the morning bulletin is issued, which is broadcast by radiophone and published in the afternoon papers. At 4 p. m. a bulletin is wired to the provincial dailies. At 10 p. m. a general bulletin is issued to the press and broadcast from three radiophone stations.

We publish weekly in the press a verification of the daily forecasts. The weather that was forecast and the weather which occurred appear in parallel columns. In this way there is a rigid check upon the forecasts. The results obtained are highly satisfactory; during the first half of 1926 the percentage of hits did not as a rule fall below 80, and occasionally exceeded 95.

## WEEKLY FORECASTS

El Salto Observatory established in 1925 a weekly forecast service, based upon computations of the solar radiation \* \* \*. The observatory includes a special solar station equipped with a rotating metallic dome, an equatorial Mailhat telescope, a pyrheliometer for measuring solar radiation, astrophysical cameras, etc. Daily observations are made of the sunspots and faculae, of which a diagram is prepared, attached to which are the photographic evidences; this is sent to the forecast office. Observations of solar radiation are sent daily to the observatory by wire from the Montezuma Observatory of the Smithsonian Institution \* \* \*.

In calculating our weekly forecasts we use Clayton's method, based on the relations which exist between solar phenomena and solar radiation. In addition, Mr. William Hoxmark, in charge of weekly forecasts at the Argentine Meteorological Office wires us daily from Buenos Aires his calculations on the variations of temperature and rainfall in the region of the Plata River. With these data we complete our forecasts.

The weekly forecast is issued to the press of the whole country at 4 p. m. on Saturday and is printed on Sunday and Monday. The results obtained have been most satisfactory, especially in the forecasting of rainy periods and of temperature changes. The percentage of hits varies between 75 and 80.

## CONCLUSION

In addition to our daily and weekly forecast services the observatory prepares each month for agricultural interests the general indications as to temperature probabilities deduced from the periodic variations of solar radiation in the 11, 17, and 28 day cycles. These forecasts, which are much less detailed in character than the others, will naturally be further perfected in future.

Moreover, in our work upon "Solar Radiation and Rainfall in the Central Zone of Chile, 1850-1925," we have succeeded in establishing a clear relation between the 11-year period in solar activity and rainfall. This will permit us in future to indicate on a scientific basis the periods of dry years and wet years.

All our forecasts are carefully checked, since we carry on simultaneously both verification and scientific investigation. We construct monthly graphic comparisons of the variations of solar radiation and the different meteorological elements over the country. The conclusions so far arrived at confirm in a gratifying way the results obtained by Clayton and other investigators.

We hope that this new method of weather forecasting, based on short-period variations of solar radiation, marks the initial phase of a new development in the progress of meteorology.—*Translation by B. M. V.*

## METEOROLOGICAL SUMMARY FOR SOUTHERN SOUTH AMERICA, SEPTEMBER, 1926

By Sr. J. B. NAVARETTE, Director

[Observatorio del Salto, Santiago, Chile]

During September the atmospheric circulation over the southern region was active, while off the central zone an anticyclonic régime was dominant almost continuously, with highest pressure at the island of Juan Fernandez. Under these conditions the weather in the central zone was dry and cloudy; but, on the contrary, there were rather more frequent rains in the southern region.

On the 1st a depression affected the far south, giving heavy showers as far north as Concepcion. At Valdivia 61 mm. fell. On the 2d and 3d the pressure rose, and then on the 4th a new depression caused rain up to

Valdivia and Cautin. Unsettled weather followed until the 6th, relatively low pressure lying off Punta Tumbes and causing rain in the central zone, and rain on the 7th from Coquimbo to Concepcion. On the 9th another depression crossed the southern region, giving showers as far north as Llanquihue. Bad weather lasted in the south until the 15th.

During nearly the whole of the second decade the dominating influence was the center of high pressure at the island of Juan Fernandez, the barometer becoming variable toward the south. On the 18th, 23d, and 26th-30th important depressions crossed the far south, causing bad weather and rains there.—*Transl. B. M. V.*

## METEOROLOGICAL SUMMARY FOR BRAZIL, 1926

By FRANCISCO SOUSA, Acting Director

[Directoria de Meteorologia, Rio de Janeiro]

During this month the circulation of the lower atmospheric strata was rather active, for six anticyclones invaded the southern part of the continent, in addition to which the continental depressions of higher latitudes were very active, principally in the last decade, when strong gales occurred in the southern regions and to some extent also in the center of the country.

Rains recorded in the northern zone reached but a scant total; this was 15 mm. below normal. In the central zone rainfall was still further below normal, the deficiency being 35.2 mm. Rainfall in the southern zone was irregular, but came to 44.9 mm. above the normal. In Rio Grand do Sul the total was very high, reaching an average value of 156.4 mm. above normal. By virtue of excessive rains which occurred in the basins of the Gravatahy, Jacuhy, and Guahyba Rivers, the city of Porto Alegre, capital of Rio Grand do Sul, suffered one of the most devastating floods in its history, comparable only to the flood of 1873.

The harvest of cotton in northern Brazil will be small, owing to reduction of the cultivated area. The coffee plantations are in fine condition, and promise excellent yield. The sugar-cane crop promises a good yield, especially in the States of Pernambuco, Rio, Minas Geraes, and Sao Paulo; in the States of Santa Catharina and Sao Paulo the fields are already being prepared for planting.

The weather at Rio was generally unsettled, with light rains which were, however, somewhat heavier in the first two decades. The rainfall record shows a small total. The temperature was a little high for the time of year, the monthly mean being 1.5° C. above normal. The nights were less cool than in the preceding month, the mean minimum being 2.6 above normal. The absolute maximum occurred on the 5th, with 33.3° C.

On the 1st, 19th, 21st, and 22d gales from southerly directions occurred, with maximum velocities varying from 16 to 20 m. p. s.—*Transl. W. W. R. and B. M. V.*