the thermograph in the early hours; but this was not serious because the temperature at that time was, for the purpose, not used, and the consequent "cusp" in the curve afforded a record of the clearness of the sunrise.

The temperatures as observed at Mandeville are quite interesting. The highest temperature recorded during four years 1912–1916 was 89.2° F. The lowest recorded temperature was 56.1° F. On four days only did the thermometer fail to reach 70° F. The warmest night, August 12, 1915, the thermometer did not fall below 74.6° F. The mean daily variation from the normal for four years is 12.4°.

When the thermometer goes above 85° it is considered hot, and when it drops below 60° it is considered cold.

Wind.—Wind observations were not made automatically as no anemometer or wind recording apparatus was carried. General observations showed, however, that the prevailing wind comes from the ESE. While hurricanes occasionally pass near the station, the most severe was the one of November, 1912, when the maximum wind velocity was estimated at 55 miles per hour. It was believed that owing to the broken and hilly nature of the country about Mandeville, this figure is probably correct.

Rainfall.—Rainfall is very heavy. The mean of 28 years is 87.84 inches. The minima of the rainfall seem to occur in February and July. It always rains hard, and most generally comes in sharp, short showers. So sharp is the edge of a shower that it has rained on one side of the house and not at all on the other. On the average it rains 182 days each year. The heaviest rainfall recorded for 24 hours was 9.90 inches. Attention is called to the fact that the rainfall minima for the island seem to have a certain relation to the sunspot period. It was concluded that there was a diminishing of rainfall about 1.3 years after every sunspot maximum and minimum, although no attempt is made to trace the relation definitely.

Dew.—Dew is quite important in astronomical work and it was found to be so heavy that a desirable means of measuring it was sought. It was measured by the following device, consisting "of a square blackened funnel measuring 60 cm. on a side and 10 cm. in depth. It is supported in a wooden box at a height of 50 cm. above the ground, and is so arranged that fresh air can reach the under side of the funnel, which is also blackened. A bottle collects the precipitated moisture. While some of this is retained on the funnel, experiment shows that this is in a large part compensated by some which is precipitated on the under side of it." The maximum dewfall recorded was one standard gallon per hundred square feet of surface.

Clearness.—The clearness of the sky and the quality of the "seeing" are, of course, of paramount importance to the astronomer. Observations were made on sunshine and starlight as well as upon the clearness of the atmosphere, and it was found that the number of clear days and nights is unusually large. Also the sky seemed much clearer than in temperate zones. "The sky appears darker, possibly owing to the complete absence of any more or less permanent auroral illumination. The most noticeable effects are in the whiteness of the Moon as distinguished from its yellow color in the north, the brilliancy of the Milky Way, the distinctness of the Zodiacal Band at midnight and of the Gegenschein, which sometimes appears as early as 9 o'clock, and the brilliancy of comets' tails." In general, it is believed that good "seeing" does not associate itself with dry air, but the very contrary, for the best "seeing" at Mandeville seemed to come on very wet nights. This tends to disprove the contention that observatories should be built in deserts. The only advantage of such a location over that in Jamaica is that there might be a greater percentage of clear nights, although that is not necessarily true.—*C. L. M.*

THE RELATION BETWEEN WIND AND THE DISTRIBUTION OF PRESSURE.[1]

By H. JEFFREYS.

[Abstract reprinted from Nature (London), July 17, 1919, p. 398.]

A classification of some 600 wind observations over the North Sea, according to their velocities and directions, showed that the most striking feature of the resulting values was their asymmetrical frequency distribution. From the fact that this was noticeable in nearly every class, it was inferred that it could be produced only by variation in turbulence or systematic contortion of the isobars, on a scale too small to be recorded on the weather map. The latter cause, however, and also such variations in turbulence as keep the coefficient of eddy viscosity the same at all heights, would lead to strong correlations between S/G and α, which are not observed. Hence it is concluded that the principal cause of variation in the relation of the surface wind to the gradient is variation in the vertical distribution of turbulence; and it is shown that such variation could give the effects actually observed.

MOTION OF THE AIR IN LOWEST LAYERS OF THE ATMOSPHERE.[2]

By G. HELLMANN.

[Abstract reprinted from Science Abstracts, July, 1919, p. 311.]

The ground wind is investigated by measurements of wind velocity at five different heights between 5 and 200 cm. above unobstructed ground near Berlin, and it is found that in this lowest layer the mean wind velocities are proportional to the fourth roots of the corresponding heights.

The previous work of the author for heights varying from 200 cm. (2 m.) to 258 m. above the ground gave rise to a similar result, in which, however, the velocities were proportional to the fifth roots of the corresponding heights.—R. C.[3]

LOCAL WIND VARIATIONS.

[Reprinted from Meteorological Office Circular, Mar. 26, 1918, pp. 2-3.]

There is a natural tendency to assume that a single anemometer gives a fair representation of the wind over a large area. A study of the records from the two anemometric stations at Southport shows that the assumption is by no means always justified. At Hesketh Park, the climatological station to which all Southport observations, except those of wind, refer, the anemometer vane is 50 feet above ground, 20 feet above the tallest trees in the park, and 30 feet above those nearest it. The records of wind strength, given by an anemobiagraph, and of direction, given by a Baxendell anemoscope, show considerable gustiness under all conditions. At the Marshside wind station, about a mile

[1] Royal Society, London, June 26, 1919.
[2] Preuss. Akad. Wiss. Berlin, Ber. 22. pp. 404–416, 1919.
[3] Cf. Prof. notes No. 6, p. 572, above.