551·524·31 (548·1)

DIURNAL RANGE OF TEMPERATURE AT COIMBATORE

The diurnal range of temperature is generally attributed to the excess of radiant energy received at earth's surface over the terrestrial radiation. Environment and season are mainly responsible for the amplitude of this variation (Geiger 1950). In consideration of the importance of diurnal range of temperature both from the meteorological and agricultural points of view, its study, with reference to Coimbatore conditions, is taken up in this note. Coimbatore (Lat. 10° 59′ N and Long. 76° 57′ E) is situated at an altitude of 1405 feet. It is surrounded by hills on three sides.

2. The data of daily maximum and minimum temperatures, as recorded in the Agricultural Meteorological Observatory at Coimbatore at a height of four feet above ground were compiled for ten years from 1949 to 1958. The data were classified under four periods of the year, each of seventeen intervals. These details are worked out on the scale, usually adopted for measuring bright sunshine as recorded by Campbell-Stokes recorders (Met. Office, London 1956). The mean diurnal range values and their standard deviations are given in Table 1. Six inter-period correlations were estimated and these are given in Table 2. The delineations of diurnal range of temperature and corresponding mean values of maximum and minimum temperatures are shown in Figs. 1(a) and 1(b).

3. In periods I, II and III, the range of variation is high to the proximity of the equinox and decreases away from equinox. In period IV, the fall tends to be towards equinox. The difference between the lowest and highest values of the mean diurnal range of temperature in the four different periods I to IV is 8·3°, 7·7°, 4·6° and 4·1°F respectively. Each period has its own characteristic limits of mean values of distribution. The regression coefficient in respect of periods I to III were ·42, ·40 and ·22 respectively which were significant at $P=·01$. The regression coefficient ·10 for period IV is not significant, indicating that the solar effects on weather are not distinct.

The inter-class correlations among the four periods show that period I is positively correlated with each of periods II and III and period II with period III at the level $P=0·05$. These significant correlations lend support to the method adopted in this study, namely, arranging the data on the basis of solar declination, in spite of the fact that period IV, is not significantly correlated with anyone of the other three periods.

The maximum temperature follows a regular trend, depending on the position of the sun in the year. In regard to minimum temperature, it is rather steady (Balasubramanian 1951) when the sun leans to the Tropic of Capricorn, *i.e.*, periods II and III. In the other two periods— *i.e.*, when the sun leans to the Tropic of Cancer, the minimum temperature shows a tendency to steep fall and fluctuation, perhaps due to absence of solar control on account of weather (Kendrew 1949).

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