

Wave Forms of Atmospheric at Madras

MR. C. V. RAJAM, writing from the Presidency College, Madras, reports observations on the wave-form of atmospheric received in Madras (13° N. 80° E.) made in the first months of a year's programme. The apparatus used is based on that of Appleton, Watson Watt and Herd, and their eye-

100–700 μ secs. Next in prominence are negative quasi-periodics with a short negative peak of about 0.15 v./m. followed by a rounded positive portion of about 0.05 v./m. peak value; the total duration is 800–1,500 μ sec. The most prominent positive type is quasi-periodic, with a brief positive peak followed by a longer rounded negative half-cycle. Here the total duration is 2,000–5,000 μ sec., intensity 0.1–0.28 v./m., peak ratio about 6. A small percentage with three half cycles have total durations 4,000–8,000 μ sec., intensities 0.2–0.35 v./m.

On 90 per cent of observed forms are found high-frequency ripples of 10–40 per cent relative amplitude; ripple periods range from 25 to 120 μ sec., corresponding to frequencies of 8,000–40,000 cycles per sec. A rippled atmospheric produces a jarring click while a ripple-free atmospheric of the same gross form produces a mild click tolerable to the ear.

The "frying" types occur generally in the evening hours, persisting to about 10 p.m., and again before sunrise. They occur in quickly succeeding groups; the group duration is 100–700 μ sec., intensity 0.03–0.75 v./m.

With distant visible lightning come the far-off lightning types, rows IV and V. These consist of a close succession of 3–10 impulses of normal type. The most prominent and frequent type (x in row IV) has a steep negative rise followed by further impulses on the negative side of the base line. Total durations are 1,500–8,000 μ sec., intensities 0.2–0.5 v./m.; 10 per cent show ripple structure of 30–100 per cent relative amplitude and ripple-frequency 8,000–15,000 cycles per sec.

Local lightning types, associated with audible thunder, are shown in row VI. These have durations of 1/25–1/10 sec., intensities 0.7–2 v./m.

The diurnal variation in atmospheric activity on a normal day runs as under. From 1 a.m. to 5 a.m. activity is low, with occasional negative aperiodics. Just before sunrise there is a slight rise, and "frying" type atmospheric appear; just after sunrise there is a marked fall and "frying" ceases. From 8 a.m. to 12 noon activity is very low; until 2 p.m. this state is modified only by the intrusion of low-intensity negative aperiodics and quasi-periodics. From 3 p.m. there is a slow rise to a maximum about 5.30 p.m., with frequent atmospheric. This maximum persists through 6 p.m., with slight decrease to 9 p.m., and an accelerated decrease from 10 p.m. to a midnight minimum.

The work is continuing, and apparatus for automatic recording of wave-forms is under construction.

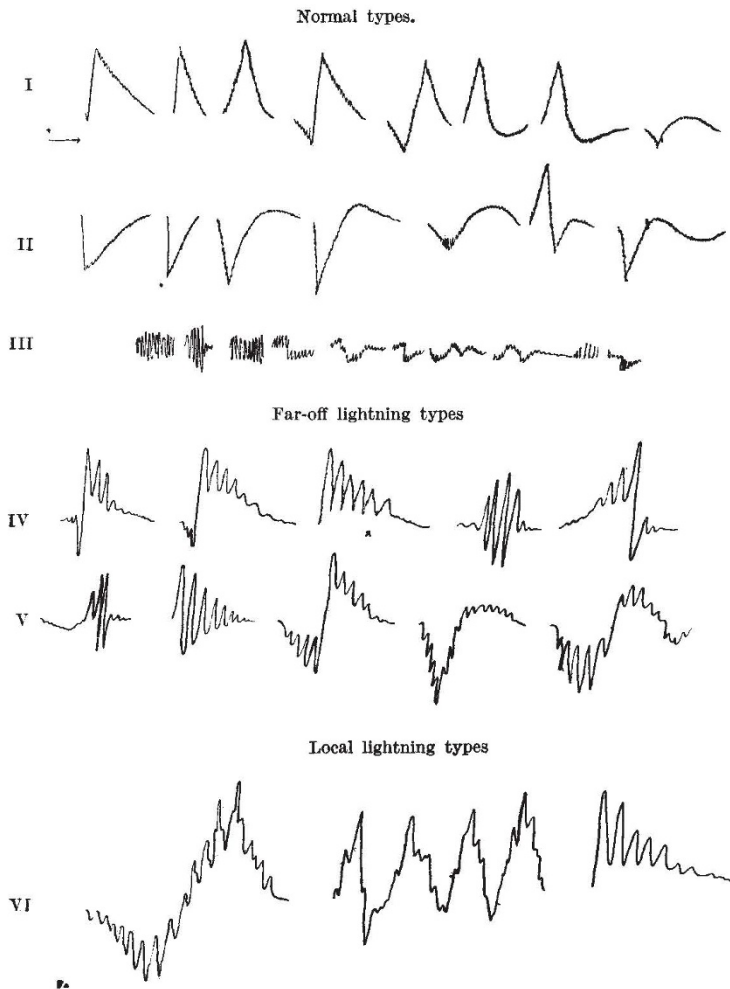


FIG. 1.

and-hand method [now superseded by photography] is used. We are unable to find space to print the report in full, but the following account brings out the principal points.

Mr. Rajam divides the observed types into three, the normal, the far-off lightning and the local lightning types. These are illustrated in the accompanying figure (Fig. 1). The types shown in rows I and II produce clicks; low-intensity atmospheric of the complicated forms shown in row III produce sustained "frying" sounds. Aperiodic clicks are predominantly negative on 60 per cent of normal days; durations lie between 1,000 and 4,000 μ sec. and intensities between 0.1 and 0.3 volts/metre. Short aperiodics of similar intensity have a decay time of