

Frequency of days of thunder in India

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ABSTRACT. The monthly and annual frequency of days of thunder in India are presented in the form of charts with brief descriptions. The most thundery areas in the country are Assam (extreme northeastern Assam with the highest annual frequency exceeding 100 days), Bengal, Orissa and the adjoining areas of Bihar. The least frequency (less than 10) occurs in western Saurashtra and Kutch. Kendrew's remarks on the frequency of thunder in India have been discussed.

1. Introduction

The first series of published charts of monthly frequency of days of thunder in India and neighbourhood based on data for a short period are contained in the *Climatological Atlas for Airmen* (1943). The average monthly and annual frequency of days of thunder for all Indian and neighbouring stations are given in the *Climatological Tables of Observatories in India* (1953). The limitations of the average frequencies have been specifically referred to in the tables. The latest published average frequencies of thunder have been given in the WMO publication on *World distribution of thunderstorm days* (1953). These averages are based on data for a uniform period of 15 years. Subsequently, the frequencies have been revised by adding data of five more years. Besides, frequency of days of thunder for west coast stations have been examined by considering data upto 1959. The present paper is based on a study of all these data.

The definition of a day of thunder adopted for the purpose is that it is a day on which thunder is heard. The day is reckoned from midnight to midnight. Even when a number of peals of thunder are heard in a day, these are counted as one only for purposes of frequency.

A point for special mention is about the reliability of the data. Observations of days of thunder are recorded in the monthly meteorological registers of the different

observatories. As there are a large number of stations manned by part-time observers it is possible that some of the minor peals of thunder may often have escaped recording; significant differences between records from a station manned by part-time staff and another in its neighbourhood a few miles away, with full time staff have been noticed. Two examples are given in Table 1.

2. Charts of frequency of thunder

Based on the data mentioned in para 1 of Introduction, charts showing monthly and annual frequency of days of thunder have been drawn (Figs. 1 to 13). A few characteristic features brought out are briefly described:

January and February—The country is markedly free of thundery activity. Punjab, Himachal Pradesh, Uttar Pradesh, east Rajasthan, Madhya Pradesh, east Assam and southern portions of Kerala have an average of only 2 days.

March—There is considerable increase in thundery activity all over the country. In northeast Assam (Dibrugarh area) and Trivandrum area (Kerala) the frequency is nearly one in three days. The average exceeds 2 over most of the country.

April and May—The chief areas of most frequent thundery activity are Assam, Bengal, Orissa, portions of Bihar, Kerala, south Mysore and adjoining portions of Madras. In south Kerala and Mysore and

TABLE 1

1955	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
DIBRUGARH													
Part-time	1	0	10	6	11	8	7	3	8	8	0	1	63
Aerodrome	2	3	12	14	12	6	9	15	15	10	0	2	100
GAUHATI													
Part-time	0	0	6	11	9	4	7	5	9	2	0	0	53
Aerodrome	0	0	14	15	20	22	11	14	22	5	1	3	126

eastern areas of Assam the frequency is highest. Another noteworthy feature is almost the total absence of thundery activity in Gujarat, Saurashtra and Kutch. The coastal area of Madras has an average of four increasing southwards to 12 around Cape Comorin area.

June—Thundery activity decreases in this month in Kerala, south Mysore and adjoining Madras to less than a third, though there is a slight increase along Konkan coast associated with the onset of the southwest monsoon. There is marked thundery activity in the area to the east of a line joining Delhi to Hyderabad. The average exceeds 8 and in east Assam, West Bengal (plains) and adjoining areas of Orissa and Chota Nagpur plateau the frequency is over 12 days.

July and August—There is practically no thundery activity along the west coast, in Deccan, Mysore and Kerala. The entire area of the country east of Delhi-Bhopal and north of Raipur-Cuttack has an average exceeding 8.

September—There is increase in thundery activity in Madras State. The average for Madras and neighbourhood is higher than 8. Bengal, Orissa, Assam and Bihar continue to be areas of marked activity.

October—There is a clear change in the pattern of thundery activity with a very considerable decrease in the activity in north India. The areas of marked activity cover

Kerala, southern Mysore and adjoining areas of Madras. Also there is increase of activity along the west coast.

November—Activity is confined to the southern portions of the Peninsula, the maximum being south of Cochin.

December—There is practically no activity outside south Kerala where the average is about 3.

Annual—Highest thunderstorm activity occurs over Assam, Bengal, parts of south Bihar and Orissa. The annual average in these areas exceeds 75 days. Northeast Assam, the most thundery area in India has an average exceeding 100 days. The other active centres are Kerala, southern portions of Mysore and adjoining Madras with an average exceeding 50. The areas of least thundery activity are north Konkan, Gujarat, Saurashtra and Kutch. West Saurashtra and Kutch have the lowest annual average of less than 10 days.

3. Comments on Kendrew's remarks

Kendrew in his book *Climatology* (1957) has remarked that for a humid tropical land, India is remarkably free from thunder with only about 25 days in a year. He has further remarked that in monsoon climates the tendency is to a pronounced maximum in the transition months at the beginning and end of the summer monsoon and little during the height of the monsoon. According to him this is strongly marked in India. It will be seen

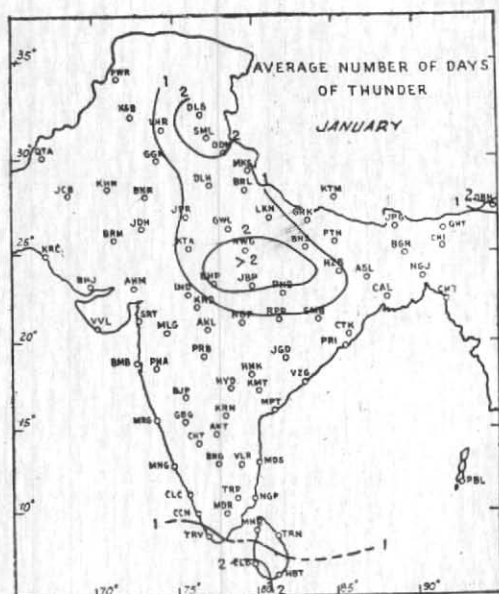


Fig. 1

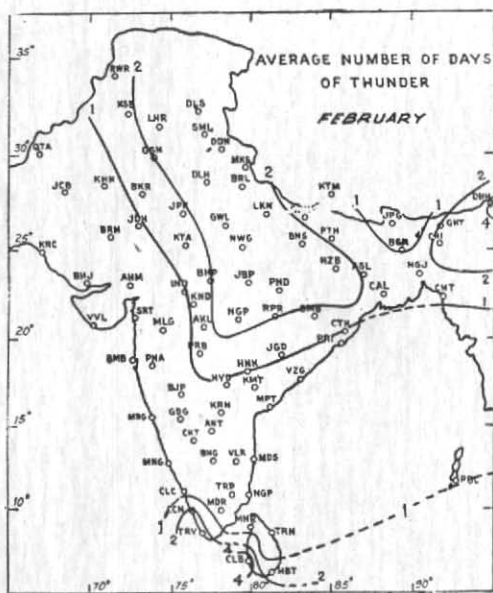


Fig. 2

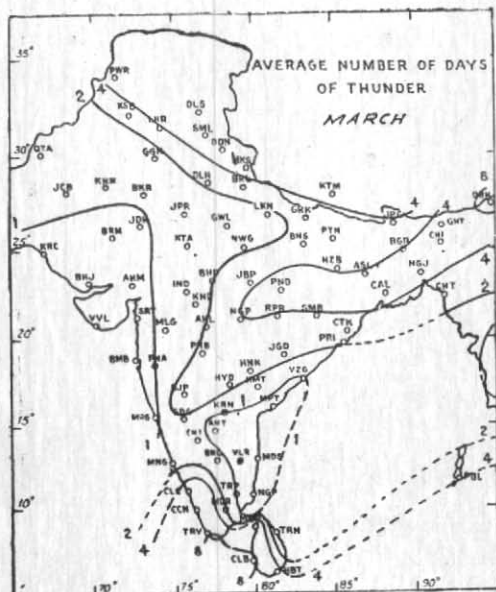


Fig. 3

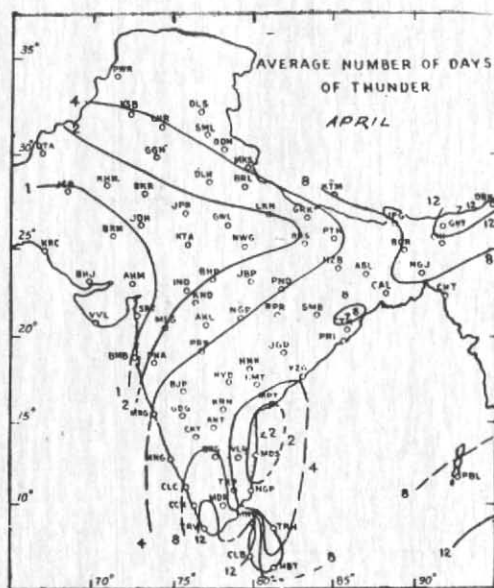


Fig. 4

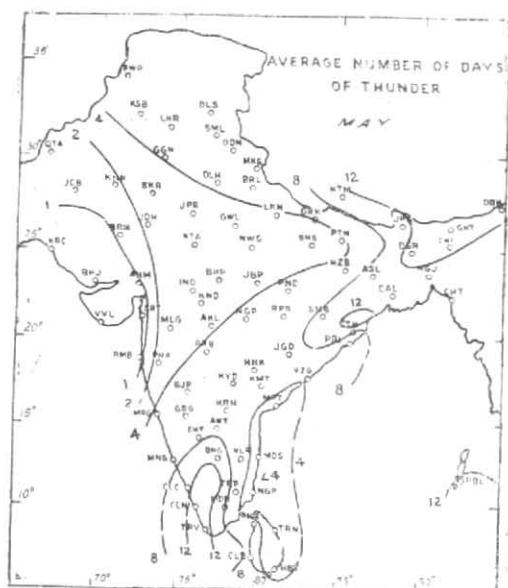


Fig. 5

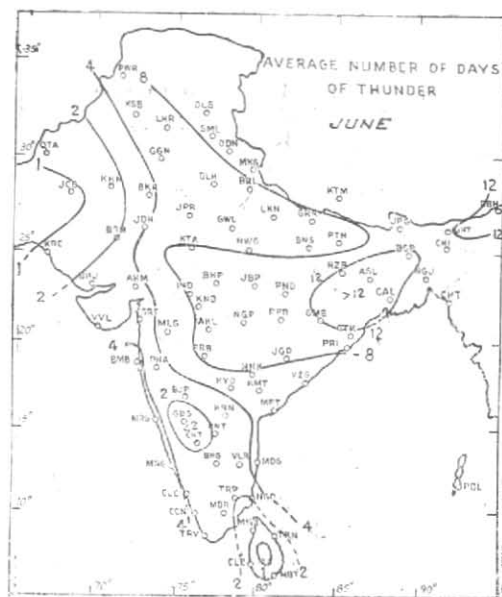


Fig. 6

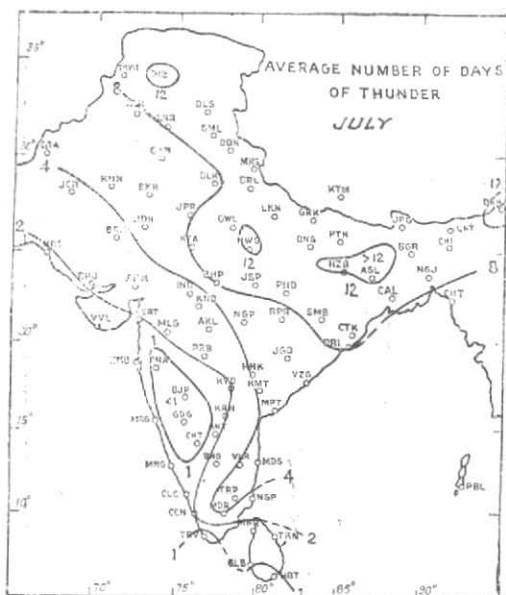


Fig. 7

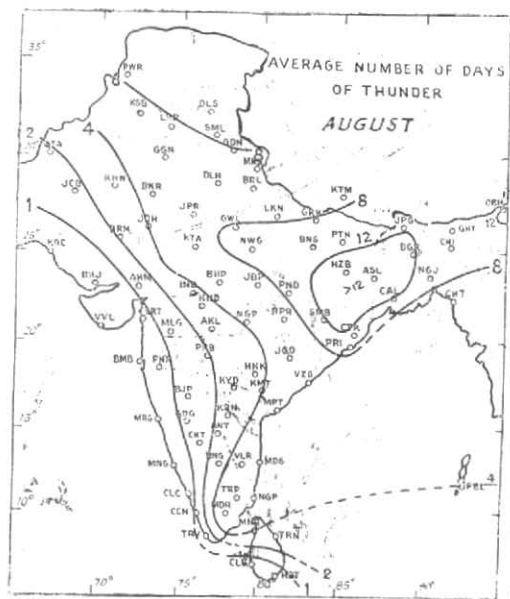


Fig. 8

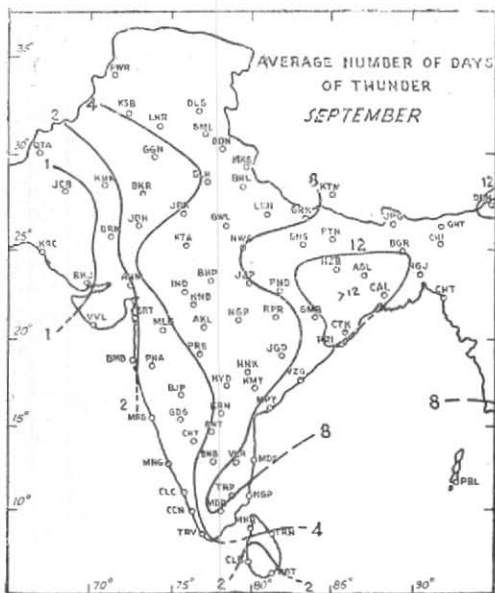


Fig. 9

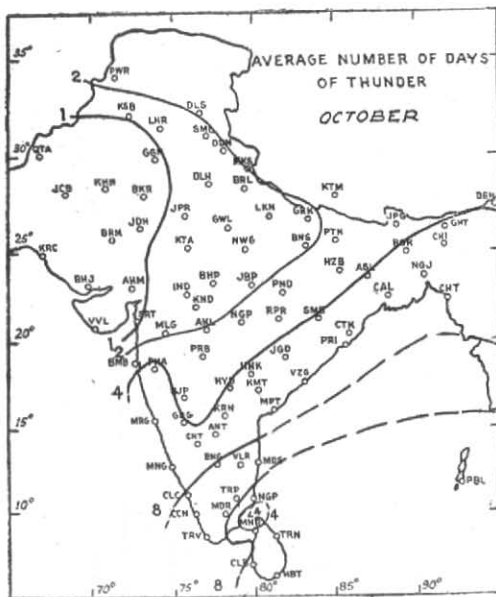


Fig. 10

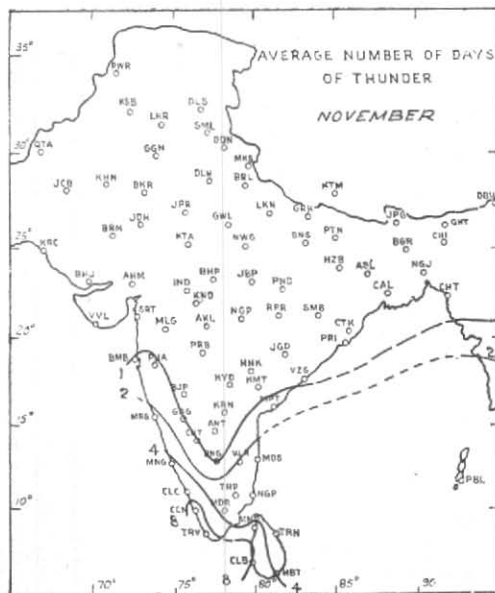


Fig. 11

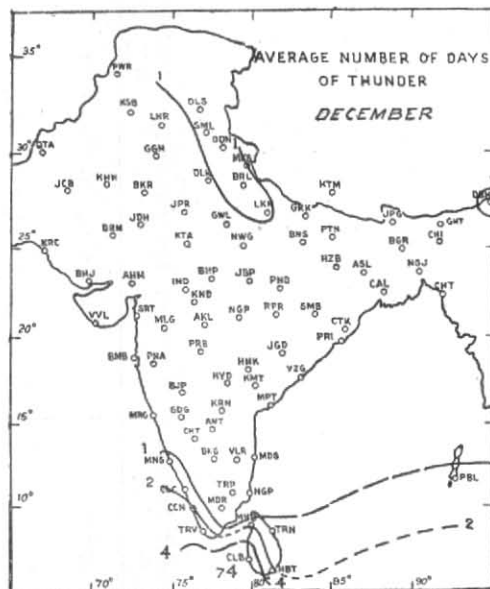


Fig. 12

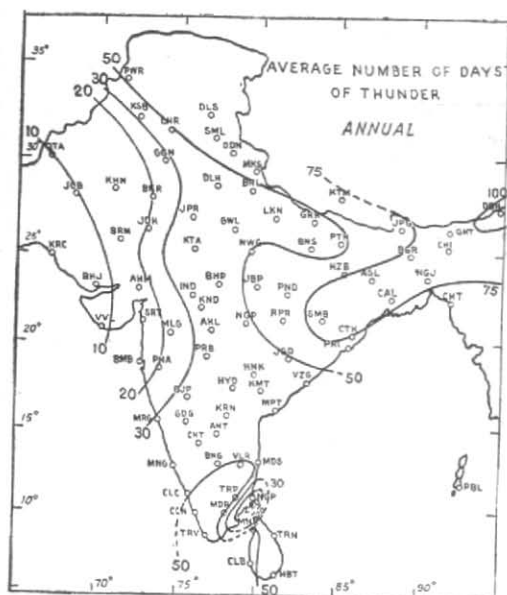


Fig. 13

from Fig. 13 that in the area to the east of Long. 73°E , the average annual frequency of days of thunder ranges from 30 to over 100 in the northeastern portions of Assam. Most of the Peninsula south of Lat. 13°N has an annual average of over 50. The average for

the whole country is of the order of 40 to 45 days even by including the northwest portions of the country.

Again, from Figs. 6 to 9 one will see that the monsoon season (June to September) is also a season of widespread thundery activity in central, northern and eastern portions of India. The frequency is a maximum in these areas in the monsoon months and the seasonal total ranges from 30 to 50. There is no tendency to a pronounced maximum in the transition months. However it is seen that the area with the least thundery activity in this season is the west coast and western half of the Peninsula.

In the premonsoon season, the areas of maximum activity are both in the southern and eastern parts of the country whereas in October the maximum is confined only to the Peninsula south of 13°N .

The remarks regarding maximum thundery activity are thus mainly applicable to Kerala, south Mysore and neighbouring areas of Madras.

In view of the above the views expressed by Kendrew are perhaps not applicable to India as a whole.

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