

Airborne fallout measurements in India

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Studies on the radioactive contamination of the surface air by fallout from the testing of nuclear weapons have been carried out in India at the Atomic Energy Establishment, Trombay, since early 1956. These studies have been found to provide a general indication of the intensity of world-wide fallout in India following the different series of bomb testing. The variations in the fallout content of the surface air depend not only on the pattern of bomb testing but also on the meteorological factors such as rainfall, winds etc. This report presents seasonal variations as well as monthly variations in the airborne fallout activity at the different sampling stations. The geographical details of the sampling stations are given in Table 1.

The samples of airborne dust are collected on filter papers by sucking air for 24 hours at suction rates of 30 to 50 litres per minute. The details of the method of measurement have been reported earlier (Vohra *et al.* 1956, 1958).

Figs. 1 to 7 show the monthly average concentrations of fission products in the air at Bangalore, Bombay, Calcutta, Delhi, Nagpur, Ootacamund and Srinagar respectively for the period 1956 to 1959. Figs. 8 and 9 give the data for Bombay and Delhi respectively showing the average levels of activity during the winter (October to February), spring

(February to June) and summer monsoon (June to October) seasons.

The marked features of the airborne fallout data, shown in the graphs, are—

- (a) The monthly average levels of activity show large variations; which can be explained to be due to the variations in meteorological factors and intermittent testing of weapons.
- (b) At Bombay and Delhi the maximum activity is observed during the spring season of each year (February to May); which may be due to the fact that several test series have been conducted during the spring season of each year.
- (c) The lowest levels of activity are observed during the rainy months, *e.g.*, June to September at Bombay; due to the scavenging of airborne radioactive particles by rain.
- (d) Between November 1958 and April 1959, peaks in activity are seen at all the stations, followed by a significant decline after April 1959. The peaks in activity followed the large scale testing of weapons during autumn, 1958. The decline in activity is due to the cessation of tests.

TABLE 1

Station	Altitude (above msl)	Latitude	Longitude
Bangalore	922 metres	12° 57' N	77° 30' E
Bombay	Sea level	18° 57' N	72° 55' E
Calcutta	Sea level	22° 34' N	88° 25' E
Delhi	219 metres	28° 45' N	77° 20' E
Nagpur	314 metres	21° 12' N	79° 04' E
Ootacamund	2235 metres	11° 23' N	76° 40' E
Srinagar	1598 metres	34° 05' N	74° 55' E

REFERENCES

- Vohra, K. G. *et al.* 1956 Procedures used in India for collection of Fallout Samples and Some Data on Fallout Recorded in 1956. Report No. A/AC.82/G/R.32 presented to the U.N. Scientific Committee on the Effects of Atomic Radiation.
- Vohra, K. G., Shirvaikar, V. V. and Rangarajan, C. 1958 *Indian J. Met. Geophys.*, **9**, 4, p. 333.

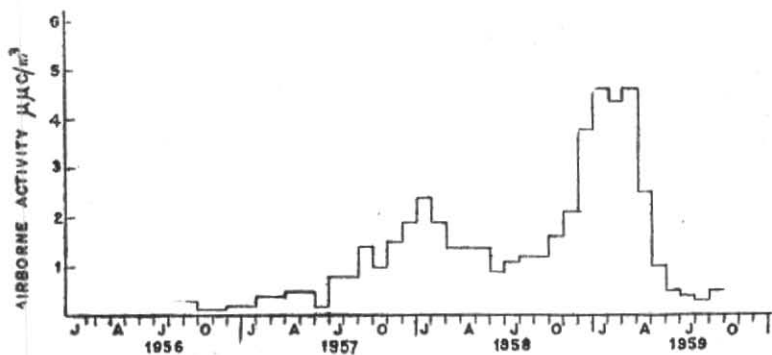


Fig. 1. Airborne fallout activity during 1956-59 at Bangalore

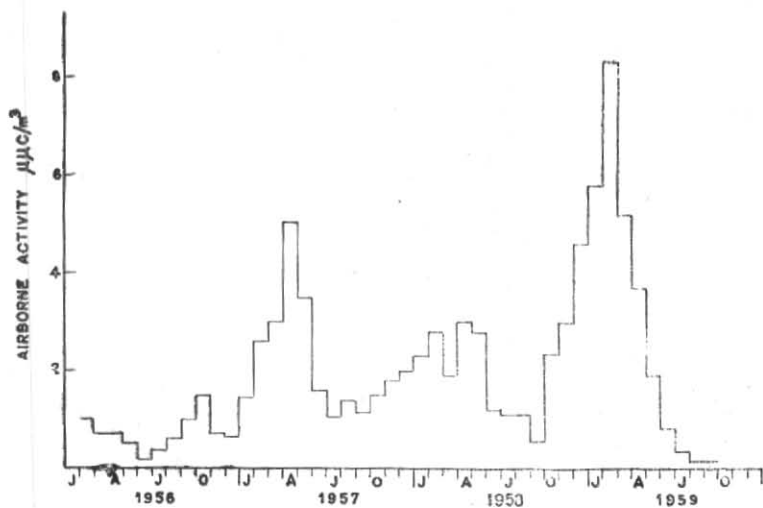


Fig. 2. Airborne fallout activity during 1956-59 at Bombay

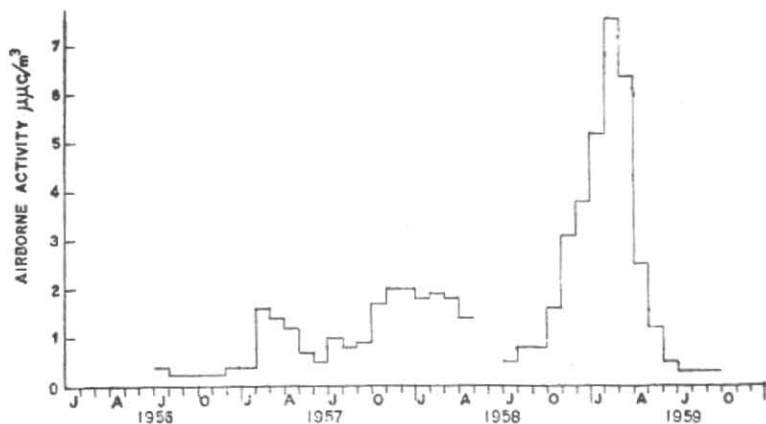


Fig. 3. Airborne fallout activity during 1956-59 at Calcutta

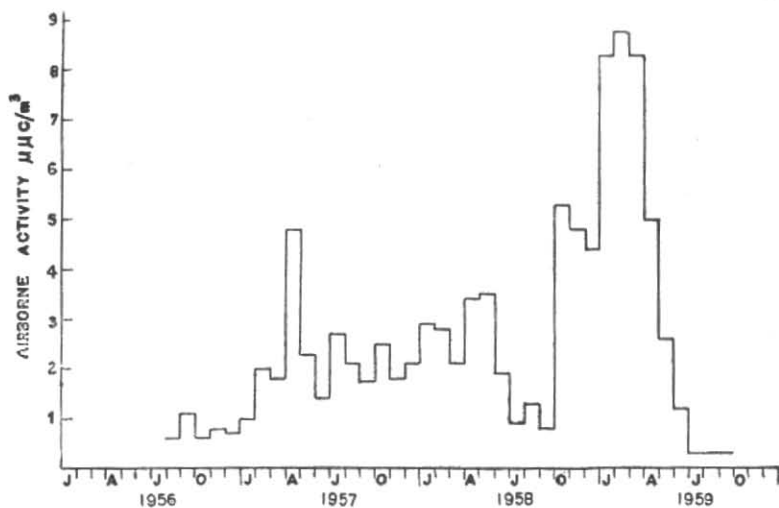


Fig. 4. Airborne fallout activity during 1956-59 at Delhi

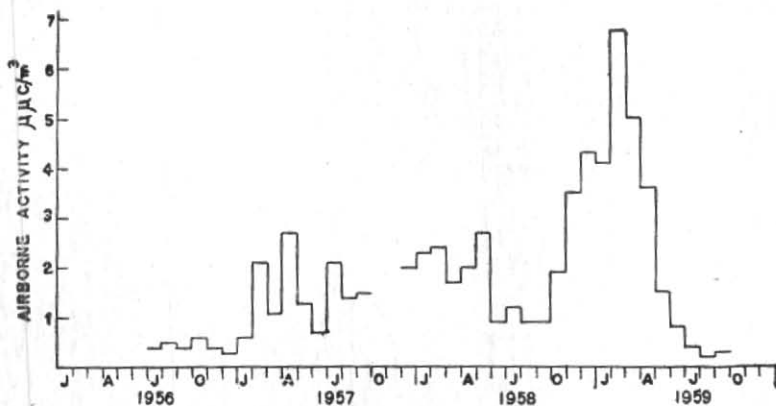


Fig. 5. Airborne fallout activity during 1956-59 at Nagpur

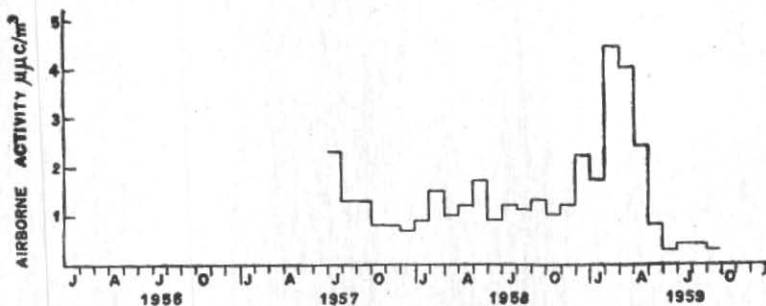


Fig. 6. Airborne fallout activity during 1957-59 at Ootacamund

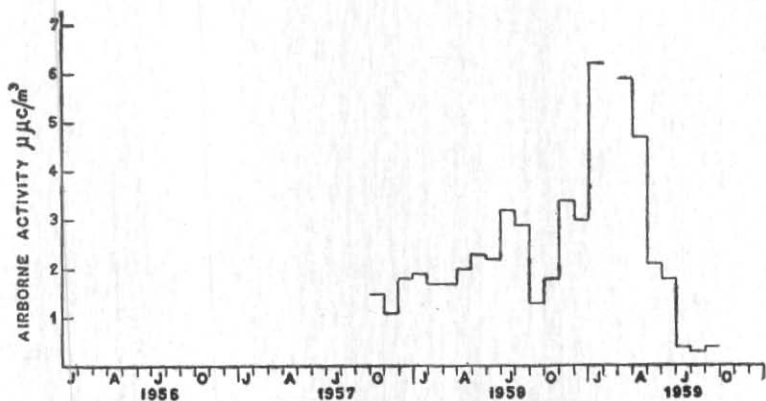


Fig. 7. Airborne fallout activity during 1957-59 at Srinagar

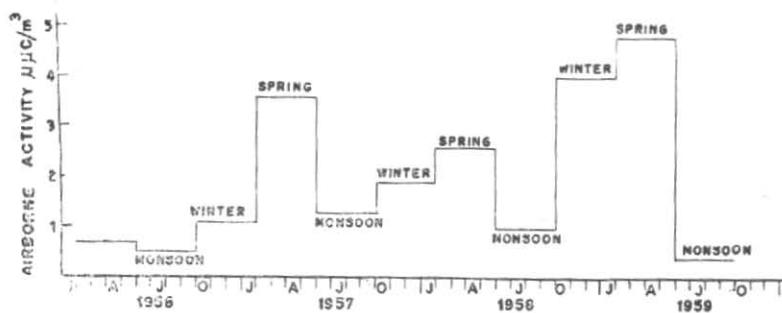


Fig. 8. Seasonal averages of airborne activity at Bombay

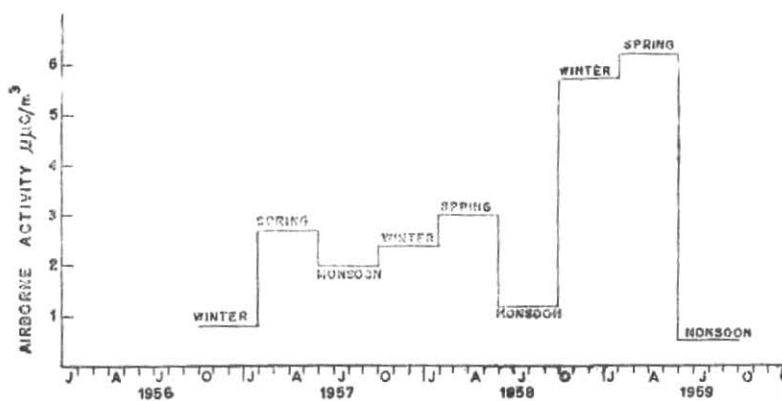


Fig. 9. Seasonal averages of airborne activity at Delhi