

The synoptic situation was favourable for the development of thunderstorms at and near Nagpur on that day. A line of *Cb* clouds developed by about 1500 IST towards the south and gradually spread towards the west and the station experienced thunderstorms with light showers from 1518 to 1610 and again from 1745 to 1900 IST.

The 1430 IST radar observation indicated moderate echoes towards the south and southwest. The 1730 IST observation indicated weak echoes towards the southwest and west and extending from the station to a distance of 95 km.

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A RADIOSONDE ASCENT IN THUNDER
CLOUDS AT NAGPUR

During a radiosonde flight at Nagpur on 19 July 1964 the balloon happened to traverse a series of *Cb* cells. A study of this flight revealed that there was an abrupt change in the direction of movement of the balloon when it entered *Cb* cells and that the balloon descended slowly twice due to the accumulation of snow on its fabric.

At 1644 IST when the F-type radiosonde was released, *Cb* clouds were observed towards the south, 5 to 8 km away. The instrument gave continuous signals upto the first 18 minutes. Signals were again received from 31½ to 35 minute and from 52¾ to 55th minute.

The Rawin transmitter gave continuous signals upto the 35th minute and the signals faded thereafter. The trajectory (with a break between 18th and 32nd minute) is

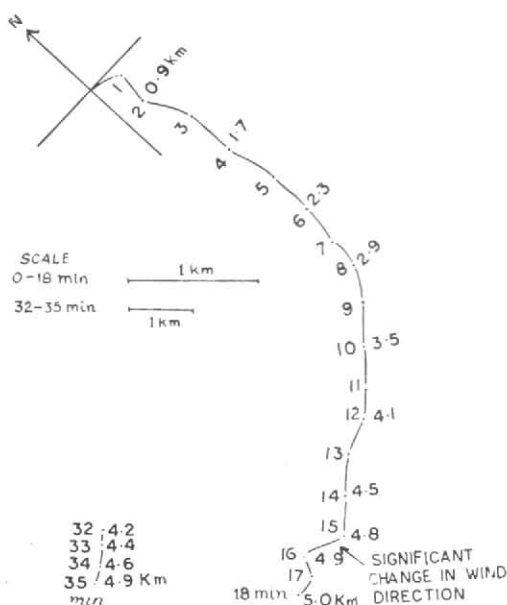


Fig. 1

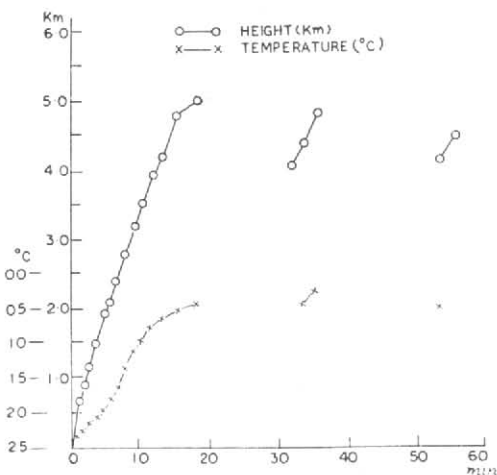


Fig. 2

shown in Fig. 1. It is clear from the trajectory that there was an abrupt change in the wind direction to the extent of 60 degrees between the 15th and 16th minutes. At the 15th minute, the balloon was about 4.0 km away towards the south of the station in the region of *Cb* clouds.

The variation of height and temperature with time is shown in Fig. 2. There was a significant drop in the rate of ascent of the balloon between the 15th and 18th minutes. The abrupt change in the direction of movement of the balloon after the 15th minute and the observed drop in the rate of ascent indicate that the balloon entered *Cb* clouds and perhaps an area of precipitation at the 15th minute. The drop in the rate of ascent might be due to the accumulation of water on the balloon fabric.

As no signals were received from the 18th to 31 $\frac{1}{2}$ th minutes when the balloon slowly descended 0.9 km and also from 35th to 52 $\frac{3}{4}$ th minute when it descended 0.6 km, the descent must be due to ice accretion on the balloon fabric, as established by Venkiteswaran and Tilakan (1952). The rates of descent during these periods were 4.1 and 2.1 km/hour respectively which are in conformity with those obtained by Kachare *et al.* (1957).

It is quite natural to expect sudden changes in the direction of movement of balloons when they enter into areas of precipitation, downdrafts etc in *Cb* clouds and this inference has been clearly revealed in the present case with the help of the available Rawin observation.

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REFERENCES

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- Kachare, N.R., Anna Mani, Venkataraman, C. N. and Venkiteswaran, S.P. 1957 *Ibid.*, 8, pp. 218-221.