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A 'JET STREAM' OVER NORTHERN INDIA AS REVEALED BY A 'COMET' DEBRIEFING REPORT

A comet debriefing report for Calcutta-Delhi route relating to the period 1025 to 1252 GMT on 28 December 1952 indicated that a wind speed of 150 knots and severe turbulence were experienced for about 25 minutes during cruise. The data of radiosonde ascents made at about 1500 GMT at all stations in India on the day in question were analysed with a view to find out whether any 'Jet Stream' prevailed in the region where strong wind and severe turbulence were reported by the aircraft.

An extract from the clear air turbulence report for this flight received subsequently from the commander of the aircraft is given in Appendix 1 (p. 279). In Fig. 1 is given the meridional cross-section roughly along longitude 84°E for 28 December 1952 constructed in the usual way using radiosonde data for 850, 700, 500, 400, 300 and 200-mb levels. The cross-section on longitude 84°E was chosen as it was approximately over this meridian in the upper troposphere that the 'COMET' aircraft encountered exceptionally strong winds and also severe turbulence. The vertical plane of the cross-section is limited to 200-mb level only as the ascents at stations in northern India did not reach greater heights on that day.

It is seen from the cross-section that there is a concentration of wind velocities into narrow jet above 300-mb level north of latitude 25°N. It may be mentioned that it was near this region that the aircraft experienced a wind speed of 170 knots (westerly component 155 knots or 80 mps). Other characteristics of 'Jet Streams', *viz.*, steep horizontal temperature gradient and well marked horizontal and vertical wind shear are also seen in the cross-section.

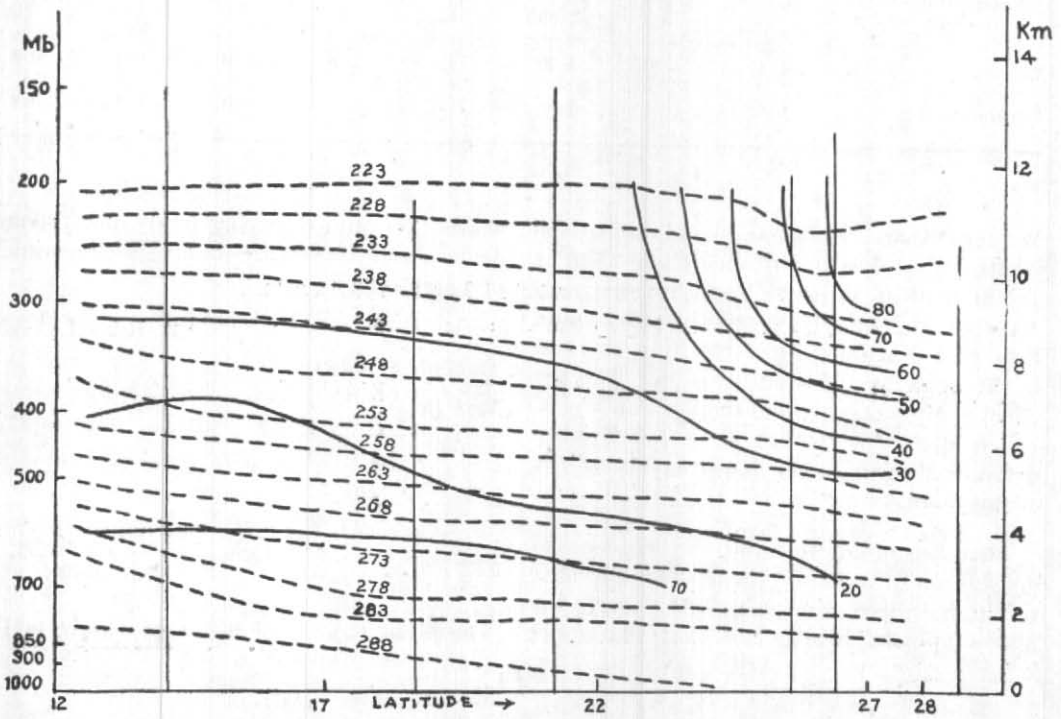

Fig. 1. Cross-section at 1500 GMT on 28 December 1952 along Long. 84° E

Vertical lines : Heights upto which ascents have reached ;
Thick contour lines : West components of wind velocity in mps ; Broken lines : Temperature (°A)

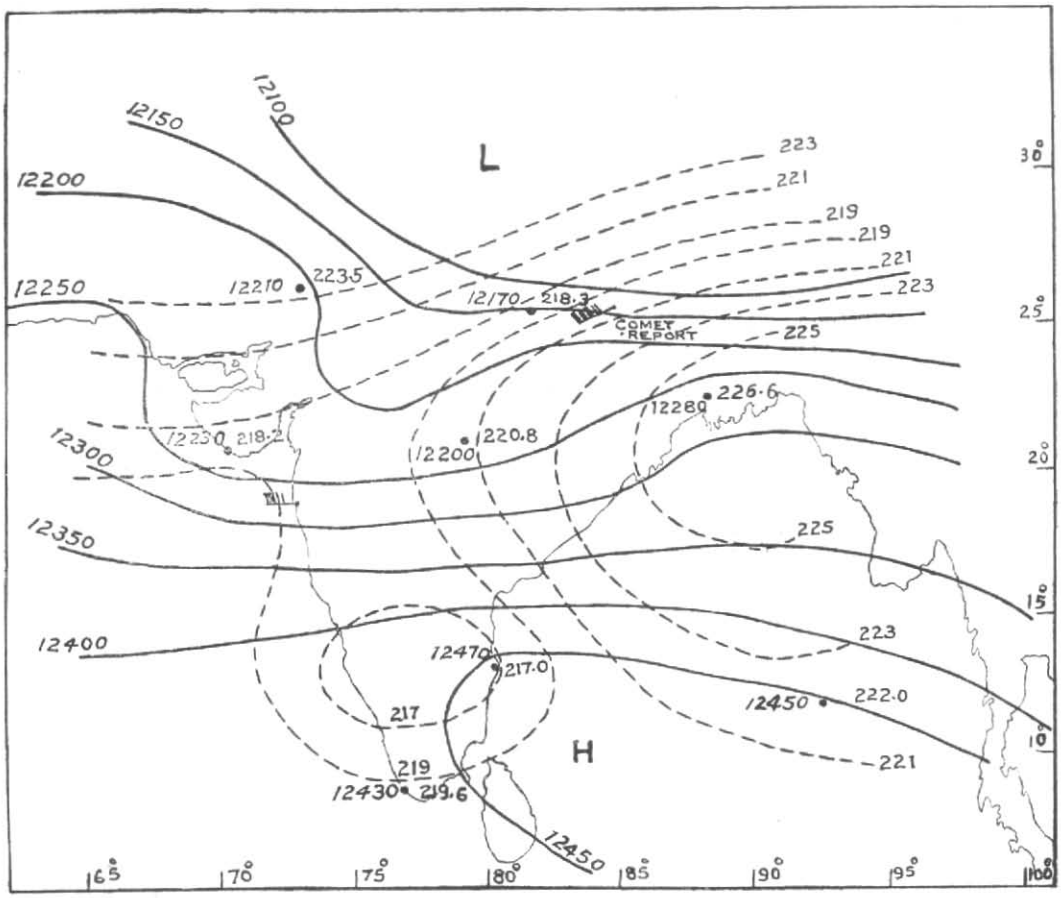

Fig. 2. 200-mb contour chart at 1500 GMT on 28 December 1952

Full lines : Contours in geopotential metre ; Broken lines : Isotherms (°A)

Fig. 2 gives the constant pressure chart for 28 December 1952 for the 200-mb surface. The contours have been drawn at intervals of 50 geopotential metres and the isotherms for every 2°A. The concentration of isotherms and the contour lines can be seen between the latitudes 24° and 27°N indicating the position of the 'Jet Stream' at this level. It is interesting to note from the clear air turbulence report that a wind of 170 knots and moderate turbulence was felt between latitudes 24°35'N and 26°30'N at about an altitude of 36,500 ft. The turbulence experienced by the aircraft has been described by the pilot as a 'typical cobble stone effect'. The aircraft was then apparently flying through the lower portion of the 'Jet Stream'.

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