

JOINT COLLOQUIA

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The Meso-structure of Dry Cold Fronts over Featureless Terrain

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Mr. Clarke of the Division of Meteorological Physics, C.S.I.R.O. Aspendale, stated that frontal structure had been investigated by means of pilot-balloon ascents, radiosondes and aircraft observations. Sections with temperature, wind, streamlines and moisture content were shown as slides.

Interesting features of the relative flow pattern were the considerable motions "through the isentropes", indicating either unsteady conditions or heating of the cold air near the leading edge. The latter could be evaluated, and was mainly due to convergence of turbulent heat flux, from evaluations of which transfer coefficients could be estimated, but only for the best documented case. These indicated considerable turbulence in the warm air immediately above the frontal zone, and relatively little below it.

Attention was drawn to the waves and convolutions in the flow pattern revealed by the sections, and the factors theoretically determining the wavelength were briefly discussed.

Some consideration was given to the analogy between frontal phenomena and hydraulic friction heads, in which vertical and horizontal dimensions are similar, but the extent to which Reynolds number effects vitiate the analogy is not known.

Pressure jumps in the four cases observed were shown to be adequately explained by low level advection effects. Conditions responsible for the development of intense circulations, squall lines, multiple fronts and pressure jumps were suggested.