

LETTER TO THE EDITOR

Reply to Rao and Desai

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My replies to Rao & Desai's criticism of my paper entitled "On the instantaneous distribution of vertical velocity in the monsoon field and structure of the monsoon circulation", published in *Tellus* 20, No. 4, 1968, pp. 601-620 are as follows:

(a) Regarding the appropriateness of basing a model of normal monsoon circulation on a single day's computations, it may be pointed out that the computation was carried out at five degree grid points and at a given map time to obtain broad features of the monsoon circulation. The Asian summer monsoon circulation covers nearly one-fifth of the globe's surface and lasts for nearly 4 months. It is unlikely that day-to-day local fluctuations of sub-synoptic scale of the type pointed out by Rao & Desai indicate any large-scale changes in the broad sub-planetary-scale monsoon circulation. This aspect has already been considered in my paper.

(b) In my computations, vertical velocity at the lower boundary was put to zero. Hence it cannot reveal the effect of orography.

(c) The continuity equation was used to obtain vertical velocity at different levels on the basis of mean convergence/divergence in different layers. In view of this, Rao & Desai's contention that "vertical velocity computations would not appear to explain rainfall as satisfactorily as convergence zones between different airmasses at different levels" is not understood.

(d) Rao & Desai approach the problem of vertical velocity solely from airmass considerations and in a qualitative manner. Moreover, they seem to ignore the fact that confluence of two airmasses need not always produce convergence. It is felt that an undiluted and qualitative application of airmass concept to deduce convergence zones and vertical velocity in the tropics especially during summer monsoon season may lead to many difficulties.