

CORRESPONDENCE

Temperature advection and pressure changes

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In the October 1949 issue of the JOURNAL, Mr. Austin has published under the above title some interesting correlations between the pressure tendencies observed in the center of sea-level isallobaric highs and lows and the instantaneous temperature advection vertically above these centers. Especially the correlation between the surface pressure tendency at the centers of the isallobaric systems and the temperature advection in the lowest atmospheric layers is quite pronounced. As Mr. Austin states, this correlation indicates a verification of a formula for the pressure tendency used by Kibel in his first approximation to a quantitative method of preparing prognostic pressure charts. In view of a previous investigation¹ which showed that Kibel's method gives rather unsatisfactory prognostic charts, it is worth while to point out that this verification is strictly limited to the quoted formula and does not extend to the forecasting method as a whole. In the first place, the verification applies only to selected points on the weather map, *viz.* the central points of isallobaric highs and lows; when the investigation is extended to other points the correlation is reduced considerably, as shown by Mr. Austin.

¹ B. Haurwitz, "An investigation of Kibel's method of forecasting," *Bull. Amer. meteor. Soc.*, 27, 499-508, 1946.

Further, Kibel's formula and its verification refer merely to the instantaneous values of surface tendency and advection. When an extrapolation is made over a forecast interval of 12 or 24 hours, the verification of the formula and, consequently, of the prognostic charts constructed on this basis can be expected to be much poorer, and this expectation is unfortunately borne out by the results of my previous investigation.¹ In this connection, reference may also be made to another paper in which an attempt was made to forecast pressure changes merely from a consideration of advection.² Even though in this latter paper density advection was considered rather than temperature advection, as by Mr. Austin, the parallel is sufficiently close to surmise that an attempt to forecast pressure changes on the basis of temperature advection would not be successful. This limitation, of course, detracts in no way from the possible importance which the correlations of Mr. Austin's may acquire for our understanding of the mechanism of pressure changes.

In correspondence with the writer, Mr. Austin emphasized that his paper does not make reference to a possible use of his correlations for forecasting and does only discuss the verification of a specific formula by Kibel, but not his forecasting method as a whole. Nevertheless, both Mr. Austin and I feel that the foregoing comments on his paper would be desirable in order to clarify the meaning of the correlations found by him.

² B. Haurwitz and collab., "Advection of air and the forecasting of pressure changes," *J. Meteor.*, 2, 83-93, 1945.