The purpose of this paper is to consider the correlation between the protein content, weight per unit volume, and quality index of wheats grown in a series of districts throughout a period of years. The demonstration of the existence of significant values of such correlations is of considerable biological interest in that it demonstrates the influence of a complex of environmental conditions associated in a relatively permanent way with the individual districts. If significant correlations be demonstrated, and if it be shown that the varieties of wheat grown in the several districts are not sufficiently differentiated to account for the inter-relationships, the conclusion must be drawn that environmental factors peculiar to individual districts—that is, varying from district to district—determine the quality of the grain produced and that these factors are of a relatively permanent nature. That this is true in a broad way is of course known as a result of general experience in crop production. It is, however, desirable to know in quantitative terms just what the magnitude of the relationship is. An ultimate task is to differentiate these individual factors, and to measure their importance in determining the protein content and other properties of the grain. A first step, however, is to ascertain whether in any given region the several districts are so clearly differentiated that the properties of the grain produced are correlated from year to year.

From the practical side, this initial step in dealing with the influence of environmental factors on the quality of the grain is of rather large importance. It is obviously desirable to be able to predict the future protein content or other commercially important characteristics of the grain crop of a district from a limited period of experience in the district.

The establishment of equations for the prediction of the properties of a future crop, for example of protein content of wheat, from the records of the given properties during a period of years must depend upon the existence of correlations between the variables under consideration in the series of districts throughout a number of crop