SOME SIMPLE DEVELOPMENTS IN THE USE OF THE COEFFICIENT OF STABILITY

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Some time ago the writer proposed[1] a coefficient of stability C_s to be used to measure the stability of a statistical series, where that coefficient is defined by the relation

$$C_s = \frac{\sigma^2}{M} \tag{1}$$

where M denotes the arithmetic mean and σ^2 the square of the dispersion of the terms of the series. It was proposed to regard series as unstable (Lexian) for which the value of the coefficient exceeded unity, and stable otherwise. The only essential way in which such a procedure differs *in results* from the traditional method is that it includes as stable those series for which the value of the coefficient lies between unity and q the probability of failure of the event under investigation—series which would be classed as unstable according to the traditional method. Stable series—according to either standard—are found so rarely in practice and therefore so many series are accepted as fairly stable which come anywhere near meeting the requirements that replacing q by unity as the line of demarcation affects the classification of no known series but adds to the effectiveness of the avowed purpose and use of the proposed coefficient—to avoid the round-about work of computing values of probabilities. Another merit of the use of the coefficient is that it enables one to measure and therefore *compare* the stability of several series—a feature which we shall illustrate later.

In brief, such a coefficient provides a means of introducing the whole Lexian theory into Federal publications such as those on vital statistics, since a comparison of the values of the coefficient for, say different communities or countries, would be readily grasped by any reader, whereas the traditional method would prove too subtle and laborious, and allow no ready comparison of results.

For purpose of orientation let us illustrate the situation by analyzing a simple series both ways—the traditional way and by the use of the coefficient of stability. As an example, let us consider the death rates of white infants under one year of age for 1919 (considered on page 89 of the Handbook) for those states whose frequencies of births are comparable or which vary little from

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[1] Journal of the American Statistical Association, June, 1932.

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