This article offers a new nomogram for the tetrachoric correlation coefficient, together with a correcting table. The development of the nomogram is described and directions for its use are included.

It is unnecessary here to enter into a discussion on the advantages and limitations of the tetrachoric correlation coefficient, as this has been frequently done before. In spite of the criticisms of the statisticians, it remains one of the most frequently used coefficients of association in psychological research. Because it is so difficult to compute, Karl Pearson published tables (5) to aid in its calculation, but they are little used because of the elaborate interpolation required. As the tables are unnecessarily accurate for practical purposes, a number of graphical aids have been designed to assist the computer. The earliest of these is the *abac* of Burt (1), which consisted of a family of curves on one diagram. They were actually computed for the colligation coefficient, but Vernon's (unpublished) Admiralty notes (6) have four of Burt's diagrams, computed for the tetrachoric correlation coefficient for dichotomies of 50, 34.5, 21.2 and 10%. These effectively cover the range, but interpolation between graphs is nearly always needed. The most popular of such aids are the computing diagrams of Thurstone et al (2). They are simple to read when working with data calculated to two decimal places, but this can occasionally give rise to some inaccuracy; working to three places requires two readings from each of two pairs of diagrams and interpolating between the pairs, a very time-consuming process. Other types of diagrams have been designed, although less well known, and each has its special advantages. One of the most recent is the set designed by Hayes (3). (It may be added that the description of the Hayes diagrams also includes a very good review of the uses, limitations, etc., of the tetrachoric correlation coefficient.) In general, it may be said that the two main disadvantages of most of the graphic methods are the need for interpolating arithmetically between pairs of diagrams, and sometimes the need to have some knowledge of the final result in order to know which diagrams to choose.
It was considered desirable to attempt the construction of a nomogram for the tetrachoric correlation coefficient which would have the advantage of being easy to read and of being contained in only one diagram. The true formula for the coefficient is impracticable for this purpose, but it was found that the empirical formula proposed by Karl Pearson himself was eminently satisfactory (4). This formula is rarely mentioned in current standard works on statistics applied to psychology, but it was used by Burt (1), who came to the conclusion that it was rather inaccurate, and particularly when the position of the dichotomy is in the tail of the normal distribution curve, beyond the 90%-10% point. The formula states that the tetrachoric correlation coefficient is obtained from the coefficient of colligation by multiplying the latter by ninety degrees and taking the sine of the angle so formed. With the four-fold table arranged as follows:

\[
\begin{array}{ccc}
 & - & + \\
+ & a & b & a + b \\
- & c & d & c + d \\
+ & a + c & b + d & N
\end{array}
\]

Pearson's formula is therefore

\[
r_{tet.} = \sin \left( \frac{\pi \cdot \sqrt{bc} - \sqrt{ad}}{2 \cdot \sqrt{bc} + \sqrt{ad}} \right),
\]

where \(a, b, c,\) and \(d\) are the cell frequencies. This can be converted easily into

\[
r_{tet.} = \cos \left( \pi \cdot \frac{\sqrt{ad}}{\sqrt{bc} + \sqrt{ad}} \right).
\]

If \(r\) be read in degrees (which are re-scaled into cosines in the nomogram), the equation can be manipulated into

\[
\sqrt{bc} = \sqrt{ad} \cdot \frac{(180 - r^\circ)}{r^\circ}.
\]

Although apparently suitable for the construction of a nomogram it was found in actual practice to be impossible. The reason for this is