is evanescent as the number of measurements increases. One of the most comprehensive and far-reaching treatments along this line is that of R. von Mises,* whose results, expressible with k-dimensional vectors, are of great generality.

Deltheil does to some extent disentangle his treatment from Bayes' Theorem in subsequent chapters. Error-risk is introduced and *linear* functions of the measurements (p. 101) are considered. It is, indeed, possible to prove rigorously that under the Gaussian Law the arithmetic mean has a probability greater than that of any other linear function or *weighted mean*, in case the "precision" is constant, and to prove the analogous theorem for measurements of unequal precision. So long as we make comparisons only among linear functions, we can move on safe ground.

The subject of least squares, as a practical tool for adjustment of measurements in geodesy and kindred sciences, has a rather well-defined content. Deltheil treats in an admirable manner the topics generally required, giving numerical illustrations in considerable detail. He also sketches a few other topics such as the Gram-Charlier development in Hermite polynomials (pp. 87–90) and Poincaré's method of successive approximations (pp. 94–96). A five-place table of the probability integral concludes the volume.

E. L. DODD

Methoden der Mathematischen Physik. Bd. I, zweite verbesserte Auflage. By R. Courant and D. Hilbert. Berlin, Springer, 1931. xiv+469 pp.

The first edition (1924) of this important and useful book has been already reviewed in a very detailed manner by E. Hille (this Bulletin, vol. 31 (1925), pp. 456–459) and besides is so well known that we may restrict ourselves here to a few remarks. Although the number of pages has not increased considerably (xiii+450 in the first edition) the number of changes is large. Practically all the chapters and sections contain modifications, in exposition as well as in the order of the material. Among the most important additions the following should be mentioned separately: proof of the completeness of the sets of Laguerre's and Hermite's polynomials (Chapter II, 9.6); transformations of problems of the calculus of variations (Chapter IV, 9) where, on the basis of a recent paper by K. Friedrichs (Göttinger Nachrichten, 1929, pp. 13–29) it is shown that in many cases a minimum problem can be transformed into an equivalent maximum problem, with the same value of the extremum in question. The occurrence of a continuous spectrum in problems of mathematical physics is illustrated, of course, by the example of Schrödinger's equation (Chapter V, 12.4). In Chapter VI, 5, a generalized Schrödinger equation is treated from the point of view of the calculus of variations. However, no satisfactory treatment of the continuous spectrum is obtained in this fashion.

The bibliographical references are a little more complete in the present edition than in the first one. In this connection the reference to an unpublished paper by R. G. D. Richardson should be welcomed (p. 404). This paper was

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* *Fundamentalsätze der Wahrscheinlichkeitsrechnung*, Mathematische Zeitschrift, vol. 4 (1919), pp. 1–97.