purpose, intelligent direction and plan, the essentials of real creativity. In order to account for heterogeneous variations, it is necessary to assume an absolutely perfect cause; in essence, a creative will. This conclusion, which is in line with the Hindu notion of change as illusory, brings us into the field of metaphysics. But the discussion of the various conceptions of causality is a valuable addition to the critique of scientific method and of its implications.

T. G.

Charles Peirce's Empiricism

By Dr. Justus Buchler. (International Library of Psychology, Philosophy and Scientific Method.) Pp. xvii+275. (London: Kegan Paul and Co., Ltd., 1939.) 12*s*. 6*d*. net.

DR. BUCHLER'S clear presentation of Peirce's empiricism is extremely welcome. Peirce was a fertile and original thinker of no mean order; his work is too little known in Great Britain, but Dr. Buchler's book should introduce it to English readers. The task could not have been easy. Peirce was unsystematic in his thinking and fragmentary in his writings. Nevertheless, he is worth the labour of piecing together his disjointed reflections. His contributions to symbolic logic are of permanent value, and his conception of methods of inquiry and of establishing beliefs forestall much of the work that we associate with the names of Carnap and Wittgenstein. This is a book to be recommended.

Statistics

Statistical Mathematics

By Dr. A. C. Aitken. (University Mathematical Texts.) Pp. vii+153. (Edinburgh and London: Oliver and Boyd, 1939.) 4*s*. 6*d*. net.

THE recent appearance of several works on probability and statistics within a short time may suggest that they must overlap and that the subject is receiving undue attention. But on the contrary, while they are a sign of widespread interest, they differ sufficiently in aim and treatment to make them supplementary in a genuine sense. The subject can be approached from different points of view, and it has enough vitality to make the day far distant when a single text-book will be found satisfying.

This little book is so excellent and at the same time so inexpensive that it should be added to their collections by all who are interested in the methods of probability. It is a marvel of compression, but it must be understood that this result is due partly to a judicious choice of topics and partly to the consistent use of a general method. Its leading feature, in fact, is the introduction of the generating function in its several most important forms. By this means Dr. Aitken has succeeded in combining elegance and brevity without sacrifice of lucidity, though the less instructed reader may still find a more leisurely and pedestrian line of approach more congenial at an early stage. The book is naturally devoted mainly to the principles of statistics, but space is found for numerical examples fully worked and even for some explanation of modern statistical technique.

Statistical Methods

For Medical and Biological Students. By Prof. Gunnar Dahlberg. Pp. 232. (London: George Allen and Unwin, Ltd., 1940.) 10*s*. 6*d*. net.

G. DAHLBERG'S new book will be a disappointment to those who appreciated his excellent book on twins (1926). Its aim, to present statistical methods in a form calling for no special knowledge of mathematics, but at the same time to give some idea of the concepts on which these methods are based, is practically the same as D. Mainland's "The Treatment of Laboratory and Clinical Data"; but, whereas Mainland gives detailed explanations of the tests of significance most frequently used, even the *t* test finds no place in Dahlberg's book. It is puzzling that it should be published in 1940. R. A. F.

Tables of Random Sampling Numbers

By M. G. Kendall and B. Babington Smith. (Tracts for Computers, No. 24.) Pp. x+60. (Cambridge: At the University Press, 1939.) 3*s*. 9*d*.

AN early publication of the Department of Statistics, University College, was Tippett's series of random sampling numbers (1927), regarded by many at first as a most eccentric sort of publication. With the introduction of randomization as an experimental precaution, this table was soon found to save a great deal of time, and many laboratories provided themselves, for their own use, with additional random series. The recent "Tract for Computers" contains a hundred thousand new numbers.

R. A. F.

Tests of Significance

What they Mean and How to Use Them. By John H. Smith. Pp. ix+90. (Chicago: University of Chicago Press; London: Cambridge University Press, 1939.) 6*s*. net.

J. H. SMITH'S pamphlet is an indication that the teachers of business administration, like those of psychology and education, are becoming aware of the modern movements of statistical thought. The treatment seems clear and sound, and the ground covered is no more than that needed by all students of statistics. R. A. F.

A Bibliography of the Statistical and Other Writings of Karl Pearson

Compiled by G. M. Morant, with the assistance of B. L. Welch. (Issued by the *Biometrika* Office, University College, London.) Pp. viii+119. (Cambridge: At the University Press, 1939.)

MORANT'S bibliography of Karl Pearson covers 648 items from 1879 to 1935. Short annotations are given in some cases, but for the student of the history of statistics these are too colourless to be helpful. The work is an unsparing labour of love.

R. A. F.

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