50–100 Binomial Tables

By Harry G. Romig. (Wiley Publications in Statistics.) Pp. xxvii+172. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1953.) 32*s*. net.

THIS book is concerned with the tabulation of the individual terms in the binomial expansion of $(q + p)^n$ where $q = 1 - p$, and with the cumulative sums of these terms. For each value of $x(< n)$, there are a corresponding term $\binom{n}{x} q^{n-x}p^x$ and a corresponding cumulative sum formed by the addition of all the terms up to and including this particular one. Clearly, all the sequences of cumulative sums are strictly increasing to the limit unity.

The tables provide for values of n lying between 50 and 100 (inclusive) in steps of 5, with p ranging from 0·01 to 0·50 at 0·01 intervals. For values of p between 0·51 and 0·99 we merely replace x by $n - x$ and interchange p and q. All the entries are to six decimal places, and the values of x thus cease in any particular expansion when the corresponding term in that expansion is zero to this order of approximation. For example, when $n = 75$ and $p = 0{\cdot}50$, the largest significant value of x is 59, and the smallest 16.

With the aid of these tables it is thus a matter of seconds to determine the probability of the occurrence of a given number of events (or of that number or less) in a sample of appropriate size. The usefulness of such a book in the field of quality control of manufactured products is thus assured, but (to quote the foreword) there will evidently be many uses for it outside this field.

The author, who was for many years engaged on quality control as a member of the technical staff of Bell Telephone Laboratories, has included a comprehensive introduction to the tables, describing their use and the methods of computation and interpolation used in their construction.

Les Fonctions Orthogonales dans les Problèmes aux Limites de la Physique Mathématique

(Monographies du Centre National de la Recherche Scientifique.) Par Théodore Vogel. Pp. 192+4. (Paris: Éditions du Centre National de la Recherche Scientifique, 1953.) 1200 francs.

MOST engineers and physicists are familiar with the simple but powerful method of solution of the differential equations which occur in problems of wave propagation, heat transmission, etc., and which is applicable in cases where the variables are separable and where consequently the solutions are expressible in series of orthogonal functions. However, a detailed mathematical discussion of these functions is rarely included in text-books of mathematical physics, and T. Vogel's monograph should therefore prove most useful. The mathematical treatment is direct and rigorous, but only as rigorous as is required for use in problems in applied physics.

The contents consist of three chapters. The first is devoted to a study of the general properties of orthogonal functions and differential systems including perturbed systems; the second to some particular closed series, for example, the Fourier series, and other series of orthogonal polynomials and Bessel, Legendre and Mathieu functions; and the third considers several applications to particular problems, including those involving the wave equation with boundary conditions, Laplace's equation in potential theory and in the theory of elasticity, the heat equation $c\rho \frac{d\theta}{dt} = Q + \text{div (grad } \theta)$ in heat and hydrodynamics, and examples of calculations in which perturbation and variational methods are most suitable. S. Weintroub

The Moon Puzzle

A Revived Classical Theory correlating the Origin of the Moon with many problems in Natural Science. By N. O. Bergquist. Pp. xiii+378. (Copenhagen: Grafisk Forlag, 1954.) n.p.

THE author of this book, who is a chemical engineer, believes that his theory forms a synthesis between the many puzzles confronting the geologist, palæontologist, geophysicist and astronomer. The main thesis of the book is that about 60 million years ago a planetoid struck the earth and lost so much energy by the collision that it fell into the sun; as a result of the impact a portion of the earth was torn off and afterwards formed the moon. The crust of the earth was given a sliding motion over the core which was tilted some degrees so that the rotational axis of the globe received a new inclination; before the collision there were no seasonal changes on the earth, "because the axis of the earth was not tilted against the ecliptic as it is now" (p. 292). So many changes are said to have occurred on the earth as a result of the collision that it is impossible to refer to all of them, but one in particular may be mentioned. Although the first flood-wave—the immediate consequence of the original impact and the quick acceleration of the earth's rotation—must have caused the death of vast numbers of saurians, the latter were not then completely exterminated. The expulsion of the material that formed the moon, followed by the creation of the Pacific and Indian Oceans and the successive flattening out of the earth, resulting from its increased rotational speed, was followed by the appearance of much dry land. This was unsuitable as breeding places for the saurians and, with other factors, was responsible for a swift end to their existence. Most of the book runs on similar lines, and in its compass of about 100,000 words little is left unexplained. It is doubtful if Mr. Bergquist's appeal to mathematicians to examine his theories will meet with any response. M. D.

Introduction à la Lecture des Cartes Géologiques

Par Antoine Bonté. Second edition. Pp. 278. (Paris: Masson et Cie., 1953.) 1660 francs.

THE subject-matter of M. A. Bonté's book can be roughly divided into those chapters which are primarily concerned with the interpretation of geological maps and structures, and those dealing with ancillary topics—mapping methods, block diagrams, aerial photography, and descriptions of French topographic and geological maps. The book opens with a brief outline of the principles of stratigraphy and correlation, and then goes on to describe tectonic structures in general. The numerous examples are unfortunately illustrated in plan or in section only; more block diagrams would help to remind the reader that geological structures are three-dimensional. Map interpretation proper begins with simple examples of superficial deposits, horizontal beds, V-ing into valleys, etc., and continues with examples taken from the 1 : 80,000 "Carte Géologique de France". Elementary graphical constructions—three-point problems, stratum contours, completion of outcrop, etc.—are explained with carefully drawn