

synonyms have been inserted as cross-references to their modern scientific names. Abbreviations have been used in order to compress data into a small handy volume and a list of these has been included for ready reference. When a number of plants belonging to the same genus is discussed, the name of the family to which the plants belong is supplied with the scientific name of the genus. Important vernacular names commonly used in different regions of India have been given, and an index of these names has been provided at the end. The diseases for which the particular plant is used are also briefly described.

A special feature, which will not fail to attract attention, is the inclusion of brief accounts of the active principles of plants so far as they have been worked out. An index of chemical constituents is provided. Under the name of each plant, there are abundant references to scientific journals and books.

S. B. CHALLEN

Cloud Study

A Pictorial Guide. By F. H. Ludlam and Dr. R. S. Scorer. Pp. 80. (London: John Murray (Publishers), Ltd., 1957.) 12s. 6d. net.

THE basis of this book is a selection, preceded and accompanied by explanatory text, of seventy-three photographs with a frontispiece in colour, from the fine collection of the Royal Meteorological Society, the files of its monthly magazine *Weather* and other sources, including the private collections of the authors themselves who have added much to our knowledge of clouds. All the familiar types of cloud are well represented, but possibly the most commanding picture shows the stupendous wall of cumulo-nimbus cloud surrounding the clear 'eye' of a Western Pacific typhoon. From this, one can well believe the statement that a tropical cyclone is an "organized system of cumulo-nimbus clouds". A useful inclusion for purposes of identification is the photograph of the seldom seen but peculiarly beautiful cirriform noctilucent clouds probably consisting of small dust particles instead of water droplets. These form high up in the stratosphere at altitudes of about 80 km. and may be seen in the higher northern latitudes on summer nights between May and August. The authors explain very clearly the fairly well-known physical transformation of large cumulus clouds into showery cumulo-nimbus. Yet one feels there is more to learn about the great cumulus clouds. What is the critical factor which gives them their sharp outlines and rock-like solidity of aspect notably when piled on the horizon like a mighty range of mountains? Ruskin used to expatiate upon this a hundred years ago.

L. C. W. BONACINA

The Physics and Chemistry of Life

(A *Scientific American* Book.) Pp. xi+270. (London: G. Bell and Sons, Ltd., 1957.) 13s. 6d. net.

THESE eighteen short essays first appeared in the magazine *Scientific American*. The book begins with a discussion of the origin of life and ends with an article on the electrical activity of the brain. Most of the writers are recognized leaders in the field of work which they have chosen to describe. The subjects include photosynthesis, nitrogen fixation, the structure of proteins in general and of insulin in particular, the nature of genes, enzymes, viruses and nucleic acids, the mechanisms of cell division and differentiation, and the properties of muscle and nerve. The standard of 'popularity' varies a good deal from one

essay to another. Some of the authors have assumed that their readers will have an elementary knowledge of organic chemistry; others might have been wiser to have made this assumption: for example, it is not easy to give a clear account of the modern view of fatty acid oxidation without using any structural formulae.

The article by G. Beadle on the genes of moulds and man shows the way in which the study of the bread mould *Neurospora crassa* has helped to explain how genes act. It may perhaps be selected as an example of popular scientific writing at its best.

Taken as a whole, these essays give a broad picture of some of the more exciting topics of present-day biological research. Considering the very reasonable price of the book it would perhaps be ungenerous to complain of the poor standard of production of some of the diagrams.

D. C. HARRISON

Tables of the Non-Central t-Distribution

Density Function, Cumulative Distribution Function, and Percentage Points. By George J. Resnikoff and Gerald J. Leiberman. (Stanford Studies in Mathematics and Statistics, Vol. 1.) Pp. x+389. (Stanford, Calif.: Stanford University Press; London: Oxford University Press, 1957.) 100s. net.

THE quantity known as 'Student's *t*' is widely used in statistics to test the significance of a mean; it is, in effect, the ratio z/s , where z is a normal variable with zero mean and unit standard deviation and s^2 is an independent variance estimator distributed as χ^2/ν with ν degrees of freedom. The quantity called 'non-central' *t* is the quantity $(z + \delta)/s$, where δ is some given constant. Its distribution requires tabulation by triple entry, according to t , ν and δ . Originally, it was required for the power function of tests based on 'Student's *t*', but more recently has found application in a number of other fields.

These tables present the frequency, the distribution function and the percentage points of non-central *t* to four decimal places for $\nu = (1)24(5)49$; with standardized argument $t/\sqrt{\nu}$; and for values of δ determined as $\sqrt{(\nu + 1)K_p}$, where K_p is a standardized random normal deviate with probability integral $1 - p$. The tables were computed on an IBM card programmed computer and are legibly reproduced from photographed typescript. Statisticians will be grateful to the authors and to the Stanford University Press for making this work, which was done under a Naval research contract, available for general use.

Modern Computing Methods

Department of Scientific and Industrial Research: National Physical Laboratory. Notes on Applied Science, No. 16. Pp. vi+129. (London: H.M. Stationery Office, 1957.) 10s. 6d. net.

THIS work is based on lectures delivered by various members of the staff of the Mathematics Division of the Laboratory during a vacation course on "Computers for Electrical Engineering Problems". It gives a brief account of those computing methods which are likely to be of general use, and its emphasis is essentially practical. There are twelve chapters, the first four of which deal with algebraic problems including the determination of the real and complex roots of polynomial equations, the inversion of matrices and the determination of their latent roots and vectors, and the solution of simultaneous linear algebraic equations. Chapter 5 introduces the theory of finite differences which is used in the following two