British Rainfall 1946

The Eighty-sixth Annual Volume of the British Rainfall Organisation. Report on the Distribution of Rain in Space and Time over Great Britain and Northern Ireland during the Year 1946 as recorded by about 5000 Observers. (Air Ministry, Meteorological Office, M.O.495.) Pp. v+214. (London: H.M. Stationery Office, 1948.) 21*s.* net.

"BRITISH RAINFALL" makes a welcome reappearance after a gap of six years, the latest preceding volume being that for 1939. There are some changes of format, and a number of the maps are missing; but the essential features, so necessary in planning the best use of water, remain. These include, besides the distribution of monthly, seasonal and annual rainfall and raindays, chapters on dry and wet spells, duration of rainfall, heavy falls, evaporation and percolation; all are plentifully illustrated by tables, and there are still a good many maps. It is pleasing that the coloured chart of rainfall as a percentage of normal remains. But the text is necessarily curtailed, and well over half the volume consists of the "General Table" giving the annual totals of rain and raindays, and the long-period average rainfall for about 5,000 stations.

The introduction emphasizes that such a vast fund of information is only made possible by the enthusiasm of a large body of voluntary observers, some of whom have maintained their records for many decades. The volume records the deaths of two observers—Sir John Eldon Bankes and the Mackinnon of Mackinnon—of seventy years standing, and seventeen others of more than thirty years. Unfortunately, the "General Table" lacks the records from Eire, which has now its own meteorological service. The data for 1940–45 are to be published shortly in two three-yearly volumes.

New Syllabus Algebra

By C. O. Tuckey and W. Armistead. Pp. viii+201. (Cambridge: At the University Press, 1948.) 5*s.* net; without Answers, 4*s.* 6*d.* net.

THIS is a really modern book on algebra, designed to cover those parts of the subject which are of special interest and importance. It is based largely upon the recommendations suggested in a report issued in 1944 by a representative conference of examining bodies and teachers. In this report it is stated that "The transition from static mathematics of the formula, which enables one quantity to be calculated when another is known, to the dynamic mathematics of the function, which considers how one thing changes with another, is one of the chief ways in which mathematics has adapted itself to the consideration of practical problems". As the authors point out in the preface, this course of algebra has been "arranged according to the types of function to which various processes are applied instead of the customary division according to types of manipulation". A feeling is thus created for functionality which can be developed at an early age.

The book is divided into three parts: the beginnings; proportion and linear functions; squares, areas and quadratics. The new method for factors, given on p. 142, was taught by the reviewer for many years. Its logical conciseness renders it particularly interesting to pupils, and any legitimate method which serves to stimulate interest is manifestly worth while. The method may easily be extended to include cases where the coefficient of x is other than unity. A fundamental place is given to the pupil's concept of functionality by introducing ideas of the gradient and of the derivative of quadratic functions.

The whole course is thoroughly sound and skilfully written, a special feature being the last few pages devoted to topics of algebraical interest, for these will bear out "the desire to bring mathematics more closely into relation with the life and experience of the pupil". Answers are provided, and there is a single-page index. F. G. W. BROWN

The Essential Oils

By Dr. Ernest Guenther. Vol. 1: History, Origin in Plants, Production, Analysis. Pp. xvi+427. (New York: D. Van Nostrand Co., Inc.; London: Macmillan and Co., Ltd., 1948.) 33*s.* net.

THIS collaborative work has behind it the resources and experience of Fritzsche Brothers of New York, well known as producers of essential oils. Dr. E. Guenther, a vice-president of the firm, discusses the technique of essential oil distillation, from the broadest principles of the binary distillation diagram down to such details as the effect of pressure differential within the still in liberating the oil from the plant cells. Enfleurage and solvent extraction, and the preparation of terpeneless oils, are illustrated from Messrs. Fritzsche's practice and also from that followed in Grasse and elsewhere. Mr. E. E. Langenau, director of the firm's analytical laboratories, describes in working detail the determination of the analytical characters of essential oils, and the estimation of impurities, adulterants, and constituents of particular importance such as cineole and stearoptene. A director of the American Institute of the History of Pharmacy (Dr. George Urdang) sketches the history of the industry; and a professor of bio-organic chemistry (Dr. Haagen-Smit) discusses the pure chemistry of the chain- and ring-systems encountered, and the plant physiology of their formation. The section on the functions of the oils in plants offers, perhaps, too many tentative solutions of this question for any of them to seem very satisfying; analogously to the famous theologian in meditation on the cosmos, the reader may begin to feel that he has learned every possible thing about essential oils except why God created them. The scope outlined for future volumes of the work, however, suggests that even this uncertainty will, in due time, be resolved.

Rhenium

Dvi-Manganese, the Element of Atomic Number 75. By Dr. J. G. F. Druce. Pp. viii+92. (Cambridge: At the University Press, 1948.) 10*s.* 6*d.* net.

THE discovery of rhenium in 1925 was quickly followed by widespread and intensive research on its properties, so that, within seven or eight years, sufficient information had become available to enable several authors to produce monographs on the element. Since then, a considerable amount of further knowledge has been accumulated, so that a new publication is to be welcomed. Dr. J. G. F. Druce should be well qualified to undertake this task, for he has been actively interested in rhenium throughout its history. His monograph covers the subject fairly well and provides a useful summary of the chemistry of the metal and its compounds. Unfortunately, however, it gives the impression of having been hurriedly written. For example, on page 14 a description is given of the systems tungsten–rhenium and phosphorus–rhenium, and this is again repeated on page 66. Furthermore, in describing potassium perrhenate the statement is made (p. 40), "Its density is about