

reached in the story of man's achievement. The epilogue—"Technology and Progress"—though brief is apt. The limitations of science are recognized, the essential unity of mankind is stressed and the author concludes: "No world can be built on the basis of material progress alone. We must supplement our material gains with a deeper understanding of the mind and spirit. Using the science of matter to implement the science of man is the task of present and future generations."

The numerous plates and illustrations, together with a good bibliography, add to the value of this informative and readable book.

H. D. ANTHONY

PREHISTORIC METALLURGY OF COPPER AND BRONZE

Notes on the Prehistoric Metallurgy of Copper and Bronze in the Old World

By H. H. Coghlan. (Pitt Rivers Museum, University of Oxford. Occasional Papers on Technology, 4.) Pp. 131+16 plates. (Oxford: Pitt Rivers Museum, 1951.) 15s.

THOUGH doubtless the last word has not been said on the prehistoric metallurgy of copper and bronze in the Old World, this work by H. H. Coghlan is certainly the most important treatise on the problem that has been published for many a long day. In the Tripos examination at the University of Cambridge the question, "Starting with the appropriate ores, how would Bronze Age man proceed to fashion a palstave?" has once or twice appeared; I venture to think that few of our older archaeologists would have been able to obtain an 'alpha plus' on this question, which yet is fundamental to the subject. However, the publication of this book now renders any excuse untenable.

What makes the book authoritative is the fact that Mr. Coghlan had had years of metallurgical experience before he became curator of the Newbury Museum. It is thus written by a man who has knowledge, not by an archaeologist who has merely read about smelting. The work opens with chapters on native copper and non-ferrous ores and their discovery in antiquity. Chapter 3 deals with the sequence of the metals and the results of analysis. There follow chapters on the mechanical properties of copper and bronze and the different methods of casting. An important chapter describes the various implements known to have been used by the prehistoric metallurgist, such as tongs, drills, files, etc. Later in the book the methods of soldering and welding are outlined. The work concludes with several chapters on the results of metallurgical examinations of a number of ancient examples of the metal-worker's art.

Mr. Coghlan does not think it possible that Bronze Age man could have obtained his copper from the abundant copper sulphide ores. Here one may perhaps hesitate to agree. Bronze Age man was a skilled metallurgist. Everything seems to point to the fact that he was perfectly aware of what he was doing. It was not all mere chance. The speed with which the knowledge spread that copper with 10 per cent tin and without other ingredients was the most suitable alloy is impressive. It argues that the development of metal-working took place in a

limited geographical area, that the men themselves were consciously experimenting and that they knew what they were trying to do. Sulphide ores require the prior process of roasting before reduction; but the abundance of these ores would surely have interested the Bronze Age metal workers, and they were quite capable of finding out how to utilize them to obtain the needed pure copper.

M. C. BURKITT

BRITISH VARIETIES OF CEREALS

Cereal Varieties in Great Britain

By R. A. Peachey. Pp. 202. (London: Crosby Lockwood and Son, Ltd., 1951.) 21s. net.

DURING the past fifty years there has been an endless interest in the subject of cereal varieties, largely due to the increased demand for agricultural produce of definite quality for specific purposes, such as is required in the processes of baking and malting. With the great increase in agricultural production in Great Britain and indeed throughout the world since 1939, the interest in cereals has been accentuated still more. This is partly due to differences in their yielding capacity; but recent advances in the mechanization of harvest operations have shown the greater suitability of some varieties of cereals to the changes required by this development. In "Cereal Varieties in Great Britain", the author has brought together in a most available manner the information of a general nature regarding the principal varieties of wheat, oats and barley in cultivation throughout this country.

This book is in reality a photographic record of the varieties of cereals grown in Great Britain at the present time. It is obvious on looking at the illustrations that each specimen ear has been selected with great care to show so far as possible the distinguishing botanical features of each variety. On the whole the illustrations are very faithful to the living specimens. The book illustrates and describes sixty-seven varieties of wheat, sixty-one varieties of oats and eighteen varieties of barley—that is to say, nearly all the varieties which could possibly be found growing as field-crops in the British Isles. The selection of the varieties is on a wide scale and not confined to those varieties the superiority of which in some or other direction has been demonstrated by authoritative field trials and qualitative determinations.

Particular attention has been paid to the origin of a variety. Wherever possible the parentage of the variety, and the breeder or introducer, as well as the date of introduction into commerce, are given.

The book is of outstanding importance to all concerned with the cultivation and identification of cereals. With the aid of the descriptions of the young plant, ear, glume, grain and straw and the series of exceptionally good illustrations, the identification of any unknown cereal should offer few difficulties. Methods of harvesting and the factors which are important in considering the suitability of varieties to certain conditions of soil, climate, etc., are also dealt with. This part should appeal to the practical man. Seedsmen and crop inspectors especially will find it a most useful guide and reference book.

J. S. L. WALDIE