

while the northern regions belonged to another and distinct province which included the early stone-age cultures of Burma and south-east Asia. Most of the worthwhile investigations have, until recently, been undertaken by non-Indians, but nowadays highly trained investigators like Dr. Sankalia and his colleagues have come into the field and are making important explorations. But there is so much to be done in the field that there is little opportunity for these investigators to stand back, as it were, and give a general report of what has so far been pieced together of the ancient history of their fascinating land. It is here that Colonel Gordon steps in.

Gordon has served, travelled and explored in India for thirty-two years and himself has undertaken not a few investigations, and he knows as much about the rock-shelter paintings of the Central Provinces as any man alive. But in the volume under review he has set himself the task of attempting to see the archaeology of India as a whole and to make available for students the latest ideas on the subject. Geographically, India is a large and varied country, and just as the cultures are not, and never have been, uniform throughout, so the climate differs in different areas and has differed greatly in past ages. A brief study of climate changes must necessarily be considered first, and then the earliest stone age cultures can come under review. The later stone age cultures are next dealt with, and here it must not be forgotten that in some regions these seem to have continued until quite a late date; indeed some of the Megalithic tombs and polished stone axes have been dated as late as the third century B.C. A chapter on the peasant potters of Makran, Baluchistan and Sind follows, and this naturally leads on to a discussion of the civilization of the Indus valley. Thanks to Sir John Marshall's work and the excavations at Mohenjo-Daro and other sites, a great deal has come to light of recent years, and this fascinating civilization has become comparatively well known. The period of invasions and the rock paintings and engravings are then dealt with, and in conclusion there are chapters on the 'Dark Age' stone and copper cultures, leading to a chapter which carries on the story to the threshold of history and to the use of iron.

Colonel Gordon has done his job well. It must not be expected that in one small volume the student will find detailed studies of the archaeology of the whole of India. But the selections made are judicious and the result does give a connected picture of the past. There are a number of full-page illustrations at the end of the volume and plenty of maps, tables and text figures.

M. C. BURKITT

FLUID SYSTEMS

Chemical Engineering Practice

Edited by Herbert W. Cremer and Trevor Davies.
Vol. 6: Fluid Systems II. Pp. vii + 600 + xx.
(London: Butterworths Scientific Publications;
New York: Academic Press, Inc., 1958.) 95s.;
13.30 dollars.

THE latest volume in this series covers a very wide range of chemical engineering operations, although for convenience the editors have labelled the volume "Fluid Systems II". There are fifteen chapters covering gas absorption, fluidization, liquefaction and fractionation of gases, adsorption, leaching, crystallization, colloids, filtration, sublimation and the practice of evaporation. Dr. Norman and his

colleagues from Manchester have written two chapters on the principles of gas absorption and the characteristics of packed-column absorption towers. The first chapter is excellent, not only for those in universities and technical colleges but also for all who are concerned with gas absorption. The second chapter, though good, lacks a little of the practical touch one would have liked. The chapter on evaporation practice by Mr. Watkins from King's College, London, assisted by Mr. Macmurray from Scott and Son and Mr. Forker from the Dupont Company, is very readable and covers the usual types of units. More attention might have been given to the actual size of units and some of the practical problems associated with operating evaporators would have been appreciated.

The chapters on fluidization by Dr. Botterell from Birmingham and Mr. Turner from British Petroleum are excellent, and will be looked at very much as indicating the position with this relatively new technique, which offers so much promise of further development. In the same way the chapters by Dr. Gardner of British Oxygen Co., Ltd., and by Mr. Pasteur of J. and E. Hall are welcomed as showing the real problems and successes of low-temperature technology. Low-temperature gas separation is still a new technique but most challenging as a technical process.

Prof. Donald has given an interesting account of leaching, including one or two references to history which are lacking from the other chapters. One is left with the idea that operations of such long standing are not yet carried out with very elegant equipment and there must be room for improvement here. The chapter on the principles of filtration is also written by Prof. Donald.

Dr. Mullin from University College, London, has written the chapters on crystallization, centrifuges, and colloid science. These are all difficult subjects and one would certainly have liked more on the practical difficulties of continuous crystallizers. We cannot learn from these chapters the physical size of units for definite capacities and there are many unresolved problems in the production of true regular crystals.

Mr. Salter, from Dorr-Oliver, and Mr. Hosking, from L. A. Mitchell, have given a clear statement of the variety of filters and the method of selection of equipment. Their section on accessories such as pumps and blowers for vacuum filters is a real attempt to size up these important auxiliaries. One cannot help feeling that some of these units have had their day and are a bit crude; some pruning of variety might have been suggested by these specialized authors.

This book enables one to see the range of processing problems which are now regarded as the province of the chemical engineer. It is not surprising that in his relatively short history there are many untidy edges to his work. Apart from selecting the right type of unit there is a definite degree of uncertainty as to the ability of the engineer to scale-up such plant satisfactorily.

The book will be welcomed particularly as it provides a discussion of the work in quite a number of fields which have not been adequately covered before in the British literature.

Mr. Cremer has written a foreword to the volume in which he refers to the untimely death of the former managing editor, Mr. Trevor Davies. Mr. S. B. Watkins, head of the Chemical Engineering Department at King's College, London, has taken up the work.

J. M. COULSON