

mechanical aspects, including formulæ and calculations for poles and conductors, and concluding with some useful information on cables. Electrical characteristics are next treated, including voltage-drop calculations and descriptions of system arrangements and voltage-regulation methods and apparatus. In this connexion it is interesting to note the wide use made in the United States of single-phase three-wire supply, a system practically unknown in Britain. The use of capacitors for the improvement of the power factor is given most of a chapter to itself, while another one is devoted to protection, including examples of short-circuit calculations. Another chapter is devoted to load characteristics. Diversity and coincidence, problems of varying load, and planning for possible future load-expansion are all dealt with adequately.

Apart from the distribution aspect, there is a short section on transmission, in which overhead lines and cables are described with some useful figures and much practical information. Included also are accounts, mainly descriptive, of transmission switch-gear and miscellaneous apparatus—rectifiers, frequency changers, etc.—together with a section on street lighting which makes interesting reading on account of the wide use of the series system in the United States.

The book can be recommended to those interested in the supply industry on the distribution side, and for general reading to university engineering and advanced technical students. G. H. PLATT

CINEMATOGRAPHY IN SCIENTIFIC RESEARCH

Research Films in Biology, Anthropology, Psychology and Medicine

By Anthony R. Michaelis. Pp. xvi+490. (New York: Academic Press, Inc.; London: Academic Books, Ltd., 1955.) 10 dollars.

CINEMATOGRAPHY has been, and is, used by scientists for a number of different purposes. First, a film may be used as a method of illustration in teaching; secondly, it may be used for recording and demonstrating methods and techniques used in research; and thirdly, cinematography can be used as a research method in its own right. Obviously, such a classification cannot be hard and fast, for a fact discovered by cinematography often finds its way into a teaching film; indeed, it would be strange if it did not. But it is primarily with the last of the three categories of film just mentioned that Dr. Michaelis treats.

In this most comprehensive book are reviewed the origin and development of cinematographic methods used in the study of the sciences listed in its title. In this wide field it is not surprising that the number of techniques is large and that the descriptions of them are widely scattered, both in journals devoted to scientific photography and in the journals of the various specialities. Dr. Michaelis, himself a scientific cinematographer of distinction, has set out to review this field and to provide those who are interested in the subject with an authoritative survey.

The large amount of information which Dr. Michaelis has gathered presents its own problems when it comes to be marshalled for the instruction

of the reader. The author's method has been to give a general introduction dealing with definitions of cinematography and research films, with the early history of research films, and then to deal with those points which may be considered as general to all the sciences under review. These sciences are then considered in turn, being divided into biological, human and medical science. In each section Dr. Michaelis explains how cinematography can best be used in that subject and goes on to describe the relevant special methods and concludes with a review of the use to which the research film has been put. In some instances he makes suggestions as to further research by such methods.

This book, therefore, is of value not only as presenting a summary of the methods of cinematography in research, but also as a history of research films.

It is possible to suggest that perhaps these two aspects of history and method have not been sufficiently separated to enable the reader primarily interested in methods to refer to them without having to read a rather too large amount of history also. To this it might well be replied that the development of methods is a matter of history and also that, in order to judge whether any one method is likely to be useful, it is as well to know the kind of result that has already been obtained by its use. However, the reader who wishes to use this book mainly as a source of methods is well catered for with an adequate subject index and also an author and reference index which includes some 1,490 entries.

Dr. Michaelis is to be congratulated on having produced a book which is a significant contribution to the history of cinematography and which also can be confidently recommended for the library of any laboratory in which studies using cinematographic methods are likely to be undertaken. It is well produced, and the misprints which seem inevitable in first editions are few. G. E. H. FOXON

THE FUTURE OF MANKIND

Two Ears of Corn, Two Blades of Grass

By D. H. Killeffer. Pp. x+139+36 plates. (New York: D. Van Nostrand Company, Inc.; London: Macmillan and Co., Ltd., 1955.) 30s. net.

ABOUT a hundred and fifty years ago Malthus saw, in his own village, that the limit to the increase in population was determined by the quantity of food available. He suggested that life would be easier if man could adjust his rate of increase to the amount of food available. But the industrial revolution, with improvements in agriculture and transport by land and sea, made it so much easier to obtain food that during the next hundred years the population of Britain increased fourfold and there seemed to be no limit to our food supply. The difficulties of obtaining food during world wars have, however, made us think again about this problem of population and food supply.

Sir Charles Darwin in "The Next Million Years" (1953) concluded that "In the very long run of a million years the general course of future history is, most of the time, likely to be what it has been for most of past time, a continual pressure of population on its means of subsistence—with a margin of the population unable to survive".