

### Lost City of the Incas

The Story of Machu Picchu and its Builders. By Hiram Bingham. Pp. 224+59 plates. (London: Phoenix House, Ltd., 1951.) 21s. net.

IN the face of great physical difficulties, Dr. Hiram Bingham opened up the magnificent ruins of the late Inca city of Machu Picchu and made them generally known some forty years ago. He published a full account of his work shortly afterwards; but it is now out of print. He recently revisited the site, and this has impelled him to write a shortened popular account of it and of his work there. This is quite pleasant reading, and the photographs are good; but it would be easier to follow if the map had covered the whole of the area described and a plan of the ruins themselves had been provided.

In his original publication, Dr. Bingham put forward the theory that Machu Picchu was Tampu Tocco, the legendary ancestral home of the Incas, and suggested that it was reoccupied in late Inca times after being abandoned for many years. The reasons given for the earlier occupation were flimsy, and the archaeological evidence pointed strongly to the late date of the site. No new evidence for an early occupation has come to light since, but Dr. Bingham again advances it in his new book. In general, this book betrays a neglect of recent archaeological work in Peru, and a bad fault is the improper use of the term Inca to cover the whole span of ancient Peruvian civilization, which is calculated to give the impression that Machu Picchu is older than it really is.

### Synthesis of Electronic Computing and Control Circuits

By the Staff of the Computation Laboratory. (Annals of the Computation Laboratory of Harvard University, Vol. 27.) Pp. ix+278. (Cambridge, Mass.: Harvard University Press; London: Oxford University Press, 1951.) 52s. net.

THE first part of this book is concerned with the procedure to be followed in the design of electronic circuits for performing complex binary switching operations such as are required in a digital computer. The principal problem is to arrive at a design which uses the minimum number of components. In 1938 C. E. Shannon showed how Boolean algebra could be applied to the analogous problem of the design of relay switching circuits. The present authors use a closely related method depending on ordinary algebraic manipulation to discuss the design of circuits using diodes, triodes and pentodes.

Tables are given which enable economical designs to be obtained in the case of circuits with up to four binary inputs, and one binary output. Advice is given as to how to proceed in more complicated cases, but, although the authors have clarified the problem to a considerable extent, it cannot be said that the advances they have made are fundamental in character.

The second part of the book contains an interesting chapter on the choice of a binary code to represent the ten decimal digits in a digital computer working in the scale of ten. Later chapters deal with the design of decimal adders, accumulators, multipliers, etc.

The book runs to more than two hundred pages (excluding tables), and the detailed discussion given, together with the large number of examples incorporated in the text, make it difficult on occasion to

follow the main trend of the argument. The lack of an index is also a handicap. While everyone concerned with the design of binary switching-circuits should undoubtedly study this book, the reviewer feels that the authors would have made better propaganda for the use of their methods by publishing one or two separate papers in which the important features were explained concisely. The attention of readers may be directed to a group of papers published recently by Kalin, Burkhart and other members of the Harvard Computation Laboratory who were closely associated with the preparation of the book ("Proc. Assoc. for Computing Machinery, Pittsburgh Meeting": Richard Rimbach Associates, Pittsburgh, Pa., 1952).  
M. V. WILKES

### Cooperation among Animals

With Human Implications. A revised and amplified edition of "The Social Life of Animals". By Prof. W. C. Allee. Pp. xv+233. (London: Sir Isaac Pitman and Sons, Ltd., 1951.) 21s. net.

THIS is a revised edition of a popular book on biology which is deservedly well known and highly appreciated in the United States. The main section of the work, which is much the same as in previous editions, does not require comment now; but the two last chapters, dealing with some implications of biology for human relations, contain much that is new. Here the author deals with the lessons biology has to teach mankind in connexion with such problems as population growth, food supplies and war. Such applications of biological knowledge to human problems are beset with pitfalls, as so many of the past *ex cathedra* statements of biologists have shown. Prof. W. C. Allee is sufficiently level-headed and critical never to fall into the error of assuming that human beings are just animals or that we can expect studies of *Drosophila*, white rats or chimpanzees to be directly applicable to human societies. His wise humanity and deep understanding of the nature of war and of some of the problems of human population and growth should do much to suppress those wild and muddle-headed theorizings which the less well-read biologist, however technically competent he may be, sometimes tries to convey to the long-suffering public.  
W. H. THORPE

### New Biology, 13

Edited by M. L. Johnson and Michael Abercrombie. Pp. 128+19 plates. (Harmondsworth: Penguin Books, Ltd., 1952.) 2s.

IN the thirteenth issue of "New Biology", which ably maintains the high standard of its fore-runners, Prof. R. C. Oldfield contributes an interesting article in which he describes investigations into human skill which have been carried out at Cambridge and elsewhere during the past ten years. Another article, by H. Spurway, suggests that animals in captivity are not really at all representative of the wild populations from which they were originally drawn but are on the road to domestication. In an article on polyploidy and plant breeding, Dr. M. S. Swaminatham discusses some of the means of improving plants by multiplying the number of chromosomes they possess. Prof. E. J. W. Barrington's article on problems of thyroid function in vertebrates is an argument for a broad basis of comparison of different organisms as an aid to the understanding of any one. Dr. C. G. Johnson examines the bed-bug in its ecological relations to human beings.