is reasonable, and it is to be hoped that the book will be generally available outside Germany. Is it too much to ask for the monograph to be supplied in stiff covers? This would, of course, raise the price somewhat, but would be worth while as a protection against inevitable wear and tear. An English translation would undoubtedly widen its appeal. This book will be found invaluable by all, whether experienced or not in the subject, and Dr. Cramer and the publishers are to be congratulated on the production of an attractive text-book of outstanding importance.

R. CONSDEN

[1] Durrum, E. L., *J. Amer. Chem. Soc.*, **72**, 2943 (1950).
[2] Martin, A. J. P., Biochem. Soc. Sym., **3**, 4 (1949).

ARCHÆOLOGY IN ECUADOR

The Archæology of the Santa Elena Peninsula in South-west Ecuador

By G. H. S. Bushnell. (Occasional Publications of the Cambridge University Museum of Archæology and Ethnology.) Pp. xv+155+5 plates. (Cambridge: At the University Press, 1951.) 42*s*. net.

THIS volume presents the results of Dr. G. H. S. Bushnell's field-work in an area until now practically unknown archæologically, together with a discussion of the small corpus of relevant comparative material, mainly the work of Spanish archæologists.

Dr. Bushnell's excavations indicate the presence on the Santa Elena Peninsula of three separate cultures: Guangala, Engoroy and Manteño. They were nowhere found in stratification, but there is some evidence indicating this sequence. Manteño, previously known from Manabí as probably the last period before the Spanish Conquest, the author considers to be intrusive in the Peninsula. He is rightly cautious about dating, but produces some comparative material suggesting that Guangala, the earliest found, is later than A.D. 900.

Detailed descriptions of these three cultures are given. There is also a brief chapter on a possible pre-Guangala culture (now being further investigated by E. N. Ferdon, jun.), and another on an early post-Conquest cemetery at La Libertad, partly excavated by the author.

Besides much characteristic pottery, sites belonging to all three cultures yielded tools of stone and shell. In Guangala and Manteño sites metal tools and ornaments were found; the single Engoroy site produced no metal. Among Manteño objects were two celts. That these at least were of local manufacture is indicated by the close correspondence of one of them to a clay mould excavated at La Libertad by Mr. A. J. R. Murray in 1923–24 (now in the Pitt Rivers Museum, Oxford). A metallurgical report by the British Non-ferrous Metals Research Association on some of the metal objects (Appendix *A*) shows them to be of copper and not of bronze.

Most of the human remains were either calcined or in very poor condition. In Appendix *B*, Dr. W. L. H. Duckworth reports on the seven skulls of the Guangala period which were capable of preservation. They show artificial deformation at the occiput such as is characteristic of Peruvian skulls, which they resemble in other details also.

In culture, however, Dr. Bushnell thinks that the Guangala period may prove to owe more to Central America than to Peru. For Engoroy he can suggest no outside relationship. He agrees with the view held by Saville from his work at Manabí that the Manteño culture shows "a considerable degree of independence of outside influence".

Although many problems remain unsolved, Dr. Bushnell's work has put into place a piece of the jig-saw puzzle which will eventually be completed to produce a picture of the archæology of coastal Ecuador. The book is well illustrated, with maps and plans, numerous line-drawings, photographs, and an excellent colour plate of Guangala pottery types. It should give a good start to the welcome new series which it inaugurates.

B. M. BLACKWOOD

PHYSIOLOGY OF MITOSIS

The Mitotic Cycle

The Cytoplasm and Nucleus during Interphase and Mitosis. By Dr. Arthur Hughes. Pp. viii+232+16 plates. (London: Butterworths Scientific Publications, Ltd., 1952.) 35*s*. net.

IT is rightly emphasized on the dust-cover of this valuable monograph that the process of cell division presents one of the most difficult problems the experimental biologist has yet attempted to solve, and, if this present account of the mitotic cycle is not an easily flowing and well-balanced narrative, the reflexion is not on the author but on the present state of our knowledge of the subject. There is a large and widely scattered literature of unequal relevance and of uneven quality. The lines of advance have been largely dictated by considerations of the materials and techniques available, and a strong medical bias is also evident. Thus we now have an extensive knowledge of the early cleavage of a certain few eggs, of the growth in culture media of a certain few tissues, of the methods of induction of cancerous growths, and of the methods of mitotic inhibition by a multitude of diverse substances. The obvious questions posed by the mitotic activity of normal animal and plant tissues have been almost entirely neglected, although very recently a start has been made towards their solution.

The book gives an extensive survey of this patchy subject, and it will for many years remain a valuable tool in the hands of those who are working in or around this field of research. Chapters are devoted in turn to the nucleic acids, to the cytoplasm and nucleus in interphase and in division, and to the experimental methods of analysis of the problems presented. Sections are contributed by Dr. M. M. Swann on the spindle, and by Dr. C. Waymouth on the nature of the stimulus to mitosis.

Because this is such an extensive review, the few gaps that are left unfilled appear all the more obvious. In particular, it has to be noted that the short section on hormones and mitosis gives a surprisingly inadequate account of our present fairly extensive knowledge. Another lesser criticism which may also be offered is that the long reference lists are arranged in order of mention and not, as is more customary in biological works, in alphabetical order. This is particularly regrettable, since these lists are one of the most valuable features of the book.

Such criticisms do not, however, invalidate the final judgment that this is certainly the best review of the difficult subject of cell division yet to be published, and its appearance will be warmly welcomed.

W. S. BULLOUGH