strive to take an intelligent interest in the achievements of sciences not our own, have so welcomed the help we have received from previous volumes of "Science in Progress". May we hope that their successors will not prove too hard for our understanding. J. A. CROWTHER

THE INSIDE STORY OF THE SKULL

Anthropoid and Human Endocranial Casts

By Pierre Hirschler. Pp. ix + 150 + 11 plates. (Amsterdam: N. V. Noord-Hollandsche Uitgeversmij., 1942.) n.p.

THE calvarium of the mammalian skull is moulded over the brain which it contains. Hence a cast of the inside of the skull reproduces in a general way the form of the brain itself. It is for this reason that the study of endocranial casts assumes some importance in palæontology, and particularly in the palæontology of man and the other primates. But it has also been the subject of an intermittent controversy which bursts out afresh with every new discovery of fossil man or ape.

The point at issue is simply this—how much really reliable information regarding the shape and convolutional pattern of the brain is it in fact possible to obtain from an endocranial cast? The enthusiastic anatomist studying a fossil human skull of primitive type is naturally eager to glean all the information possible from his material, and the danger is that in his eagerness he may exceed the bounds of objectivity. There can be no doubt that this danger has not infrequently been sufficiently realized, even by anatomists of considerable repute; to such an extent, indeed, that the study of endocranial casts has tended in the recent past to degenerate into a sort of neo-phrenology, in spite of the fact that careful studies of endocranial casts of modern man and apes compared with the actual brains have already shown that the casts reproduce but little more than the general form and proportions of the brains.

From the Central Institute for Brain Research in Amsterdam there has now appeared a detailed and comprehensive work by Dr. P. Hirschler on anthropoid and human endocranial casts. This monograph (which should be thoroughly digested by students of human palæontology) is introduced by a critical review of the literature of the subject.

The author is particularly (and, we think, rightly) outspoken about those anatomists who appear to assume that every unevenness of the surface of an endocranial cast must be a fissural imprint; who claim that the relative size of a localized eminence can be taken to signify the possession of such mental faculties as the power of speech; or who ignore the influence of membranes, subarachnoid cisterns and blood vessels in the determination of irregularities on the cast surface. So far as the large anthropoid apes are concerned, Hirschler finds that endocranial casts show extremely few fissural markings which can be identified with certainty, a conclusion which is the more striking since the casts studied were made from skulls specially selected because the walls of the intracranial cavity showed well-marked juga cerebralia. In casts made from human skulls fissural markings can be identified on the orbital surface of the frontal lobe, near the anterior border of the frontal lobe, and on the temporal lobe. Elsewhere they are usually not present in any recognizable form, though as a very unusual rarity (possibly the result of a pathologically high intracranial pressure) they may be abnormally distinct.

When the critically minded demur at the confidence with which some anatomist claims to be able to identify on the endocranial cast of a fossil skull most of the details of the convolutional pattern of the brain, they are commonly met by two rejoinders. The first is that, while such details may not be discernible in the case of modern man and apes, for some unknown reason they happen to be much more distinct in the particular fossil under discussion; the second is that only after an intensive examination of the cast over a period of weeks and months—scrutinizing it from all angles of light and shade and palpating it repeatedly with the finger-tips—is it possible to express a confident opinion. But it must be clear that conclusions based on such subjective evidence can by themselves have little scientific value.

There seems only one way of securing a true interpretation of a fossil endocranial cast, and that is to circulate duplicates of the cast to a number of neurological anatomists and to request each to make an independent assessment with special reference to the identification of sulcal markings. By collating the results of such a group study, it may be possible to eliminate those variables which are clearly of subjective origin and to secure agreement on those identifications which may be taken as reasonably certain. W. E. LE GROS CLARK

ADVANCES IN MEDICINE

The March of Medicine

(New York Academy of Medicine Lectures to the Laity, No. 9.) Pp. xiv+121. (New York: Columbia University Press; London: Oxford University Press, 1945.) 11*s.* 6*d.* net.

THIS volume contains six lectures, and represents the ninth series of "Lectures to the Laity" which have been given under the auspices of the New York Academy of Medicine. These lectures are well known, and a number of small volumes have already been produced which are of great interest to professional men and laymen alike. The general title of the present series is "War and the Expanding Frontiers of Medicine". While the lectures are all good, some will be of greater interest than others to medical men and scientific men generally. The lecture by Dr. Strecker was evidently delivered with the purpose of boosting national morale, but the need did not necessarily disappear with the cessation of hostilities. Dr. King's lecture on food and civilization is thoughtful, and also practical in that he recommends action, not only against contaminated food but also against food of poor quality. He quotes illuminating figures which emphasize the great extent of malnutrition in the United States. Dr. MacLeod gives a straightforward and admirable account of the development of chemotherapy. Sir Gerald Campbell lets his humour play impishly around the alleged benefits of science to mankind. While he does not doubt that these have actually been benefits, he is sceptical regarding the ability of the human race to use them properly. The final lecture is by Lieut.-Colonel Thomas T. Mackie, who presents a really excellent review of the interrelation between wars and epidemics. The volume is up to the high standard set by its predecessors.