etc.), and seems to have forgotten to use his eyes. There is little in modern descriptive clinical medicine which was not known a century ago; it is only the interpretation of the phenomena which has changed. I myself once 'discovered' a sign of diagnostic importance in certain cases of syphilis, but was chagrined later to find that Alfred Fournier had made the same observation nearly a hundred years before.

There is little choice for the author of a general history of medicine in the manner of presentation of his subject, and this book could be described as a collection of short biographies in chronological order, suitably correlated. The progress of medicine is followed in this way through all the ages to the present day.

The compression of an enormous subject into four hundred small pages has been achieved without omission of any important figure or event. It is the fault, not of the author but of space and subject, that, in parts, the book reads more like a work of reference than a coherent story. Most of those who are interested in medical history have to be content, for want of time, to devote themselves to a special subject. Such people cannot expect to find this book complete in detail; but adequate references for further reading are included for anyone who is moved to enthusiasm by any particular personality or branch of medicine.

Apart from the broad survey, Dr. Guthrie has rounded off his work with chapters on military and naval surgery and tropical diseases, the rise of specialism and of preventive medicine, and on medical journalism and bibliography. There is a comprehensive classified bibliography of medical history. The illustrations are interesting, but suffer by being printed in an unattractive colour.

No notice of this book would be complete without a reference to Mr. Bernard Shaw's review (*Observer*, October 14, 1945). Mr. Shaw's views on modern medicine are unorthodox, severely critical, and very amusing, but they are, as expected, so well stated that Dr. Guthrie would do well to reprint the whole article in his next edition. Indeed, I would suggest an appendix on Shavian medicine with notes on Mr. Shaw's medical friends.

I concur with Mr. Shaw in recommending this book, which I enjoyed reading and which will provide me afterwards with a valuable work of reference.

J. MARSHALL.

VERTEBRATE PALÆONTOLOGY

Vertebrate Paleontology

By Prof. Alfred Sherwood Romer. Pp. ix+687. (Chicago: University of Chicago Press; London: Cambridge University Press, 1945.)

THE study of fossil vertebrates is a form of scholarship the importance of which is more fully realized in other countries than in Britain. We have about a dozen workers, while in the United States there are two hundred and fifty; and the provision of laboratories and technical assistance in the two countries is at least equally disproportionate.

An adequate treatment of fossil bones is difficult because it demands from the student a very wide range of knowledge and techniques. The basis of all palæontology is an accurate relative chronology, and as fossil vertebrates can only be interpreted on a

world-wide basis this means a familiarity with the correlation of sediments in all the continents, depending largely on invertebrate animals and plants. As the interpretation of a vertebrate skeleton always demands a consideration of its mode of life, it is necessary to consider the conditions of deposition of the sediments in which it was found, which takes one to palæogeography and its basis in tectonics.

But these things are ancillary to the main purpose of the investigation, the determination of the animal's structure and place in classification. Such anatomical studies have become more and more rigorous until the student of fossil fish is required to become so familiar, by dissection and study of serial sections, with the anatomy of recent fish that he can interpret the foramina and other markings on a skull in terms of soft parts which were related to them. But this increased precision, which has characterized recent work on all groups, has greatly enhanced the value of fossil vertebrates, for it enables us to take full advantage of the extreme complexity of structure which they present. In general, it may be held that the greater the complexity, the more are the independent or quasi-independent characters which are available for the establishment of relationships and the tracing of evolutionary changes. As a final judgment must be made on a totality of characters, it seems that the evidence behind an evolutionary series of vertebrates must be much greater, and capable of much more critical examination, than that presented by a comparable series of Lamellibranch shells.

The interpretation of such series has as its ultimate aim not only an understanding of the course of evolution but also an inquiry into the mechanism which has brought it about. It is a fundamental condition of such a study that nothing must be postulated which cannot be shown to be consonant with conditions to-day. For example, it is idle to suggest a widespread occurrence of interspecific crosses occurring in Nature, for such conditions seem not now to exist, and by contrast to the appearances among plants, where they are common, seem never to have played any important part in animal evolution.

Evolutionary series of vertebrates have another great advantage in that, as much knowledge of the soft structures may be derived from the skeleton, it is often possible to discover the functional significance of evolutionary changes, to determine whether they are consequential to other modifications or themselves help to fit an animal more adequately for some specific mode of life. Unfortunately the individuals of the only group of invertebrates which would offer comparable possibilities, the Echinodermata, are so strictly tied down to precise ecological niches that they have as yet given us few evolutionary series other than those short stories to be found in the chalk.

Another great advantage of vertebrates is that they may give good evidence of the time and direction of migrations from one continent to another, a matter of much general interest. Thus the study of fossil vertebrates is of importance, for it gives us more fully than any other a history of life on the earth.

It is therefore very satisfactory that Prof. Romer has been able to publish a new, enlarged and admirable edition of his text-book. From it a student can learn much about the present position of the science in all its variety; and understand its significance both to biologists and geologists.

D. M. S. WATSON.