mutation, their genetic transmission to future generations, their deleterious and lethal effects and their persistence in human populations. The deleterious effects on domestic plants and animals are also discussed.

The hazards are great, but so also are other aspects of our modern civilisation—automobiles, air pollution and the stress of urban life. An atomic war could wipe out the human race, but the highly resistant viruses and bacteria and the plants and animals with small chromosomes would survive. Might they not provide the foundation for a new evolutionary cycle which eventually would produce a more rational human population less likely to destroy itself by its own inventions?

KARL SAX.

RECENT ADVANCES IN HUMAN GENETICS. Edited by L. S. Penrose and Helen Lang Brown. J. A. Churchill, London. 1961. Pp. 194. 27s. 6d.

The " Recent Advances " series so well known in medicine offer unique opportunities to authors. They need only write about subjects with which they are familiar and they may assume that their readers know at least the rudiments of their subject. Subjects can be selected where real advances have been made and an authoritative review is timely. This little volume makes good use of these advantages.

L. S. Penrose, the editor, contributes the chapter on mutation, reviewing the rationale of estimates in man and tabulating a selection of estimates. Possibly some of the paragraph headings suggest that more is known than the contents merit, as for example, the one entitled " The Incidence of Spontaneous Chromosomal Aberrations in Man ". Only for mongolism are data available which enable more than a shrewd guess at frequency to be made. There is a mistake in table 7 in the section which considers the association of paternal age with mutation. The figures for Northern Ireland are not those given by the author quoted.

Penrose has also contributed the chapter on " Genetics of Growth and Development of the Foetus " which reviews the evidence for the inherited influences on gestation time, birth weight and peri-natal mortality although most of this work is not new. He also mentions briefly some aspects of the factors related to the ætiology of congenital malformations in man. Table 19, page 68, has suffered some malformation which makes it unintelligible.

D. G. Harnden has managed to compress into twenty pages a remarkably comprehensive review of the developments of work on human chromosomes in the last few years. Some of the priorities for first reporting of abnormal karyotypes given here may be disputed by other workers but this is just the chapter to be enjoyed by those interested, even if not involved, in chromosome work.

O. J. Miller's chapter on " Developmental Sex Anomalies " is too compressed to permit of adequate clinical descriptions and perhaps tends to present an over-simplified picture of a very complex subject. " The Abnormal Hæmoglobins " by P. S. Gerald, " The Inheritance of Dermal Ridge Patterns " by Sarah B. Holt and C. A. B. Smith's contribution on statistical methods are all authoritative and stimulating.

Many human geneticists will be very grateful for Renwick's chapter on " Elucidation of Gene Order " (perhaps a rather grandiose term). Particularly useful is the discussion of the criteria of efficiency of markers and

the evaluation of those at present available. The unsuspecting may not realise the immense amount of computing required by the numerical methods described, but then they may not suspect either the hundreds of miles to travel and the night and week-end work needed in visiting families, examining patients and relatives and collecting specimens. As a rough guide, for each large family with segregating dominant traits, allow two months' work.

It is to be hoped that new editions of this book will appear not too infrequently. There is a real need for such excellent up-to-date reviews.

ALAN CARTH STEVENSON.

DIE GESCHICHTE DES MENSCHEN. By G. H. R. Koenigswald. Springer, Berlin. 1960. Pp. 148, 88 figures. DM 8.80.

Forty years ago the palaeontologist fitting human remains into an evolutionary series had a task with which he could deal almost alone. Stratigraphical dating was often uncertain; cultural dating was often absent. But since 1864 each find could be given a Latin name representing a species, a discontinuous entity in space and even in time. And with only one exception, *Eoanthropus*, the whole series could be arranged in unquestionable linear orders of progress and descent. To the geneticist the picture revealed by human fossils was not so satisfying. He expected continuity rather than discontinuity of variation. He expected continuity in time and sometimes even in space. He also expected evidence of hybridisation as well as of extinction. To him the simplicity of the record was merely evidence of its imperfection.

To-day the picture has changed in a genetically understandable direction. Some gaps have been filled but only to reveal far more new gaps. Now the author of this little book is Professor of Palaeontology in the University of Utrecht and is well known for his discoveries in Java. For him these results are puzzling: " beinahe jeder neue Fund gibt uns neue Rätsel auf " (p. 110).

To solve these riddles, it is clear, new methods are needed: several disciplines need to co-operate. We want general discussion. The purpose of this book, in a series of " Verständliche Wissenschaft ", might have been to propound the riddles as a basis of such discussion. This, however, Professor Koenigswald does not seriously attempt to do. For the general reader his illustrations, photographic and diagrammatic, offer an excellent documentary record of fossil human bones. But his text is a summary for the expert with an emphasis on stratigraphical detail. When he leaves the lower mammals behind, he plunges into a cataract of tricky detail which will take most readers out of their depth. This, it may be said, is no fault of the author. But in such circumstances everything depends on the author's success in discovering and explaining some bases of certainty.

What are these bases of certainty ? They stand at the two ends of the argument. At the beginning the basis would be a list of important fossil finds together with a map of their distribution and a suggested chronology. The technical validity of these finds is fundamental but it must not be discussed along with the conclusions to be drawn from them. At the end the other basis would be a statement about variation among living men. To assume the existence only of an average " moderner Mensch " or