never separated (fig. 11.4, p. 174), they invariably lie either parallel or else relationally twisted (let the author refer to his own fig. 11.1(*b*), p. 171, borrowed from McLeish and Snoad). Indeed this is one of the very properties which enables the student to distinguish mitotic metaphase from second meiotic metaphase. Again figs. 12.5 and 12.6 (pp. 191-192) show bivalent configurations which could not possibly be generated by normal meiotic behaviour. It is also assumed " for the purpose of clarity . . . that the chromosome is duplicated by the end of leptotene so that it consists of two chromatids " and it is figured as such (fig. 12.3, p. 189). To anyone who has ever seen a decent meiosis—and the number of geneticists who haven't is growing geometrically—it is clear that clarity has little to do with this assumption; charity might be a better term.

The book suffers from two other kinds of defect. First, the general standard of line illustrations used is poor, especially in comparison with the many excellent photographs which the book contains. If a student produced figures of this sort in a practical class he would be castigated. Second, while there is a fine range of up-to-date references at the end of each chapter, it is regrettable that many of them are well in advance of the kind of student for whom the text is designed.

These faults should not, however, be allowed to obscure the obvious merits of the book for it is a noteworthy attempt to produce a contemporary account dealing with the cell in its entirety. And it summarises with considerable clarity and in a very readable form much of the current information and thought on the elements of cytology.

B. JOHN.

GENETICS FOR THE CLINICIAN. 2nd Edition. By C. A. Clarke. Oxford: Blackwell Scientific Publications. 1964. Pp. xiii+377. 50s.

It would be difficult to think of anyone better qualified to write this book than Dr Clarke. For many years he was (and still is) a practising consulting physician. At the same time his hobby has been the breeding of butterflies, a subject in which he has made notable genetic contributions. There will be many readers of this journal who will remember Dr Clarke hurrying from Conference meetings at which he had read a paper on medical genetics to give a paper to another section on the genetics of the lepidoptera. Some years ago he decided to devote the bulk of his energies to medical genetics, and with his colleagues has built up at Liverpool a school which has made many contributions of the first importance. Thanks to the generosity of the Nuffield Foundation and the full backing of the University, the Liverpool school of medical genetics seems assured of a brilliant future.

Dr Clarke writes with infectious enthusiasm; this book might in fact have been called " Genetics is Fun for the Clinician ". He is describing the things that have interested him, and is filled with confidence that many of his clinical colleagues ought to be, and will be, interested too. His confidence has been fully justified by the fact that a second edition has been called for within two years. The new edition has been greatly enlarged, with only a very trivial increase in price. It is sure to appeal even more strongly to the original audience. Dr Clarke has a fine gift for exposition, and many of his chapters and sections could be singled out as admirable explanations of recondite subjects. Thus, Chapter 15 deals with attempts

to develop methods for protecting against Rh hæmolytic disease. The work at Liverpool and, more recently, joint work in conjunction with colleagues at Johns Hopkins University, has thrown much light on the mechanism of Rh sensitisation and holds the promise that one day it may be possible to prevent sensitisation of Rh negative women having their first Rh positive baby.

In addition to its primary audience the book will have a useful place as a work of reference in the libraries of those engaged in research work on medical genetics; on many topics it would be difficult to find elsewhere a better summary of the present position and a better guide to the literature.

It seems to the reviewer that the book is open to criticism in some matters of detail, but it is really very mild criticism. One point is the question of balance. Dr Clarke has concentrated on what interests him. Bearing in mind the aim of the book the reader can have little complaint if a subject which especially interests him is discussed in a few lines, or may not perhaps be mentioned at all, whereas many pages are devoted to topics which to him personally are of little interest. Nor, judging from the great success of the first edition, has the book met with this criticism. But it is otherwise when one comes to look at the balance of emphasis *within* some of the chapters and sections. Thus, in the chapter " Heredity and the Gastro-intestinal Tract ", six pages are devoted to duodenal and gastric ulcer. There are very brief introductory comments, but no statistics on resemblances between relatives. Thus, Doll and Buch's well-known study might have been quoted; this showed that the incidence of duodenal ulceration amongst the brothers of affected men was 2·7 times greater than amongst suitably matched controls. Instead, Dr Clarke proceeds straight to a consideration of associations with the ABO and secretor genes, a subject to which the Liverpool school has made very important contributions. This occupies almost the whole of the space and the reader might be forgiven if he concluded that this was the crux of the genetic problem in peptic ulceration. Yet, it can readily be shown that the tendency of brothers to resemble each other in ABO blood group and in secretor status accounts for no more than 3-4 per cent. of the resemblance of brothers in susceptibility to duodenal ulceration as estimated by Doll and Buch. A section on pp. 121-122 is headed " Carcinoma of the œsophagus ". Dr Clarke correctly reports that two extensive surveys failed to show any familial concentration at all. But this is done in half a dozen lines and is followed by a long description of the two remarkable Liverpool families in which tylosis of the palms and soles, transmitted in dominant fashion, is almost inevitably associated with cancer of the œsophagus, should the subject live long enough. These families remain unique and may derive from a single mutation. They have little bearing on the general question of heredity and cancer of the œsophagus, which is the subject suggested by the sectional heading.

Many will not agree with the view which seems implicit on page 47, namely, that the importance of multifactorial inheritance in human disease lies primarily in the determination of penetrance of major genes, and would usually prefer not to invoke any major genes at all. The short section on mental deficiency in the chapter " The Heredity Clinic " is somewhat misleading. The table quoted dates from 1939, and refers to work in which low and high grade deficiency were not separated. Hence the prediction of mental deficiency in relatives is much too high if applied to low grade deficiency, which is the type of case presenting at a heredity clinic.

Dr Clarke courageously sets out to explain elementary statistical methods. This is disarmingly described as an attempt by an " O " Level mathematician to explain statistical concepts to others of similar level. In general it is a very good attempt, but there are a few small points which may prove misleading. Thus, the example chosen to illustrate the ordinary test for four-fold tables includes an expectation of only 2·9 in one cell. The result is a χ^2 corresponding to a probability of 0·005. If Yates's adjustment is used, however, the probability is increased to 0·013, and the exact test gives 0·010. It is a pity that the example selected should be one in which such refinements do make a real difference. Again, the exact test for four-fold tables is described in terms of a two-tailed test, which must be very unusual compared with its much commoner application as a one-tailed test.

These minor criticisms are only made because it seems certain that a third edition will soon be called for. The book is a fine and stimulating introduction for those many medical men who would like to know what genetics has to offer in the clinical field.

J. A. Fraser Roberts.

BOOKS RECEIVED

GENETICS CITATION INDEX. E. Garfield and I. H. Scher. Institute for Scientific Information, Philadelphia. 1963. $100.

THE LIFE OF THE CELL. J. A. V. Butler. George Allen and Unwin Ltd., London. 1964. Pp. 167. 30s.

POPULATION, EVOLUTION AND BIRTH CONTROL. G. Hardin (Ed.). Freeman & Co. Ltd., London. 1964. Pp. xviii+341. 12s. 6d.

PARENTHOOD AND HEREDITY. S. C. Reed. J. Wiley & Son, London. 2nd Edition. 1964. Pp. 277. 14s.

FREE AND UNEQUAL. R. J. Williams. J. Wiley & Son, London. 1964. Pp. 215. 14s.

THE GENETIC CODE. I. Astimov. J. Murray, London. 1964. Pp. xiv+161. 16s.

BULETIN DE INFORMARE STIINTIFICA. Vol. 1, parts 1-3. Academia Republicii Populare Romine Central de Documentare Stiintifica. 1964. Pp. 218.

CLINICAL ORTHOPÆDICS AND RELATED RESEARCH, Vol. 33. Genetics of Congenital Deformity. A. F. De Palma (Ed.). Pitman Medical Publishing Co. Ltd., London. 1964. Pp. viii+252. 6s. 9d.