The purpose of the Oxford Monographs is to 'provide handbooks relevant to particular specialisms'. This volume is intended primarily for the clinical psychiatrist, who is likely to find its scope wider than he needs. He will, however, be rewarded with a panoramic view of the models and methods of clinical genetics, and come across many examples of how the genetic approach affects the way of looking at clinical problems. Six chapters are devoted to the rare neurometabolic and autosomal anomalies causing severe mental and physical defect in children, and these will be invaluable for reference. So far, however, 'inborn errors' have not been demonstrated in the common forms of mental illness. Among the relatives of the rare genes causing subnormality in the homozygous state psychiatric disturbances are not more frequent than might occur by chance, and the psychotic states which may be seen in the early stages of Wilson's disease and Huntington's chorea, and in epilepsy, are asymptomatic and not genetically related to schizophrenia as it occurs in other families. Sex chromosome anomalies, however, now enter into reckoning in the psychopathic disorders, and to a less extent the psychoses, and this may lead to a better understanding of these conditions.

In contrast to the situation in severe subnormality, distinguishing physical characters are absent in the adult psychoses, and persisting metabolic anomalies have not yet been identified. The evidence from pedigree and twin studies is open to non-genetical interpretations, specially in schizophrenia. Here the authors take a hard line with purely psychogenic theories, on the grounds that they are vague and incapable of verification. They can cite the evidence from monozygotic pairs separated early in life, and from the adoption studies, in support of biologically rather than psychosocially transmitted factors. Concordance for schizophrenia in monozygotic twins is, however, not higher than 40%. Phenocopies of organic and perhaps even of psychogenic origin do occur, though only as a small proportion of the whole. Genetical models are discussed at length. Genetical heterogeneity is regarded as only quite probable. The hypothesis of a major gene, with a frequency of 0.03, full manifestation in all homozygotes and about one quarter of heterozygotes would fit most of the data well. As the authors say, it would be very desirable to be able to recognize the genotype apart from the psychosis, but in practice clinical acumen is baffled by the difficulty of defining the traits considered to be part of the 'schizophrenic spectrum'.

The remaining chapters deal with affective disorders, deviations of personality and neurotic reactions, senescence, senile and presenile dementia, epilepsy, and mental subnormality associated with normal variation in intelligence. Genetical studies do not give support to unitary hypotheses. Among the affective disorders, for instance, bipolar disorders, with swings into both mania and depression at different times, appear to be genetically distinct from unipolar disorders, where the swings are depressive only. 'Involuntary melancholia' probably corresponds mainly with the latter. Even in the neuroses, in which the type and severity of environmental stress is important, some degrees of genetical specificity exists, at least in the predisposition to anxiety and obsessional states. There are some interesting reflections about sex differences in alcoholism and delinquency, and about parental age and the sex-ratio of children and sibs in homosexuality. As for epilepsy, its genetical connections with psychiatric disorders seem to be surprisingly small.

Eventually, the genetics of mental illness may prove to be extremely complex, but in the meantime the authors' attitude, that the most economical hypotheses are heuristically the most valuable, seems sound. With modern techniques, numerous lines of research are open, and the would-be psychiatric geneticist should find many ideas in this highly informative book. The style is as lucid and the discussion as critical as is to be expected of the authors, and the production is excellent.

David W. K. Kay

Coefficients of Natural Selection. By L. M. Cook. (Pp. 207. £2.50; paperback £1.25.) London: Hutchinson. 1971.

The preface, which follows a dedication to E. B. Ford, begins with the words 'Population genetics is a field in which theory is much in advance of practical observation and experimentation'. The author starts from this premise that nature must follow art, and expounds an algebraic treatment of the robust prose and definitive observations with which we may term the Oxford-Liverpool group, the exponents of necessity and of big effects. The time seems opportune, for recently mathematical genetics has been dominated by chance, a concept more attractive to the theorist, since it provides unlimited scope for theory without the need for any contact
with data. Whether an algebraic commentary is to be seen as the nourishing root, the supporting trunk, the protective bark, the flower, or the fruit, is likely to depend on the reader’s background and established prejudices.

Notwithstanding the stated aim of a simple account for the non-mathematical biologist, the reader needs either knowledge of integrals, exponentials, differential equations, and matrices, or a willingness to take these on trust. Sometimes the formulations are needlessly complex, as in handling the symmetrical relationship of dominance and recessivity without using both \( p \) and \( q \) when \( p + q = 1 \). This complexity has led to a misleading and erroneous crossover of the lines on figure 1.3. Some other graphs are difficult to follow, and rather roughly drawn. A computation leading to negative gene frequencies could have been omitted, or explained in more than three lines (p. 181).

The book provides a useful numerical \textit{taba mociu} to an extensive anthology of observations and experiments, mainly on butterflies, moths, and snails, and discusses various parameters of selection. However, due to the force and lucidity of E. B. Ford’s ‘Ecological genetics’, the author has attempted a difficult task, and a calculus which restricts organisms to one locus, two alleles, and a large drift-free population undisturbed by inbreeding may seem of more value as a deductive than as a descriptive system. The author’s scope is further limited by the nature of big effects for, by definition, these can be captured without weaving gossamer traps from differentials and variances. The use of gene, allele, and locus as synonyms adds a further simplification at the cost of reality.

One serious logical trap into which Dr Cook invites further victims is the carrying out of significance tests to see if an effect is ‘real’, followed by an estimation procedure to see how big it is (chapter 9). This is following in distinguished footsteps, but is nevertheless a most serious and evident source of bias, guaranteed to make big effects bigger. The evidence for substantial selective forces hardly needs the help of concordant sampling errors.

The production is good; the paperback good value, and, however difficult the challenge, a numerical treatment of a field rich in prose, intuition, and data is to be welcomed. The more advanced mathematical treatments are rarely germinal to the ideas, and can be bypassed without making the book useless to those biologists who prefer to restrict themselves to methods they can understand. For those who feel more secure with numbers than words, the book provides a good introduction well integrated with reliable data. There is a useful genetic and numerical glossary.

J. H. Edwards

**Molecular Genetics. An Introductory Narrative.**

By Gunther S. Stent. (Pp. xii+650; 282 figs. £5.10.) Reading: W. H. Freeman. 1971.

This very readable book is the result of 16 years’ lecturing at the University of California, stretching over the whole period of the rapid development of molecular genetics. It is neither a finished didactic text, like Watson’s ‘Molecular biology of the gene’ nor a scholarly history of the discoveries of the last 25 years, but a narrative, proceeding logically step by step from problem to problem and including just enough biographic and collateral material to prevent readers’ fatigue. A happy medium is also struck in the description of experiments, which is neither too detailed for an introductory book, nor on the other hand too superficial. The references are mostly to books and review articles.

Present molecular genetics has been developed by men trained in chemistry and physics working on such prokaryotypes as plagues, viruses, and bacteria and only little by work on protein in structures of eukaryotes, including mammals and man. The text is accordingly predominantly concerned with experiments on lower organisms. In the last, 21st, chapter entitled ‘Ramiﬁcations’ an attempt is made to redress this bias. But though the 34 pages devoted to the exercise are more adequate than 8 pages, which an earlier book by a molecular biologist devoted to the same purpose, this last chapter is by far the weakest part of the book.

However, hardly anybody, least of all a medical geneticist will read the book for the sake of this epilogue. For him the preceeding 20 chapters are indeed an excellent introduction to the kind of general genetics, which must form the basis of his man-directed studies and work.

H. KALMUS

**Probability Models and Statistical Models in Genetics.** By Regina C. Elandt-Johnson. (Pp. xviii+592; tables. £11.75.) Chichester: John Wiley and Sons. 1971.

This is not a book for the clinician or the biologist, but it should provide a useful reference work on statistical methods and their application for the statistical geneticist. It presents most of the conventional topics of quantitative genetics in a rather formalized mathematical manner, with definitions and theorems—and with an average of more than two formulae per page. The presentation of each topic is thorough with the assumptions, details, and steps all well explained so that the methods are easy to follow and understand. The methods of deriving the results, and the generality of the methods used, are stressed rather than using the shortest derivation for the simple case and accepting the generalization. The book differs in this respect from the book of Crow and Kimura (1970)—which covers much of the same ground—and in the fact that the biological implications of the results are less well developed and discussed.

The book has 19 chapters, 7 of which are essentially on statistical methodology but with genetic examples and 12 chapters developing mathematical theory on genetics. There are two short appendices; on matrices and on maximization. The subject index is divided