It is therefore appropriate that a text aimed at providing the range of genetics needed for livestock improvement should span the sections of this book: 'I: Genetics at the level of the individual', which is mainly Mendelism; 'II: Genetics at the level of the population', the longest section, on population and quantitative genetics and their application to animal breeding; 'III: Genetics at the level of the cell', on chromosomal inheritance and basic molecular biology; and 'IV: Genetic engineering', a single short chapter. This seems to me to be an appropriate structure, but the depth of coverage varies substantially; for example, the chapter on mitosis and meiosis spans 35 pages, and there is a further chapter on chromosome number, while that on prediction and measurement of response to selection is of 20 pages, with selection indices being covered separately.

The editor, A. B. Chapman, contributes no chapters himself. Over half (9 out of 16) are by W. D. Hohenboken, who covers most of of the quantitative genetics and related animal breeding theory, to which I shall return. There is a nice introductory chapter by J. F. Crow, setting a standard of clarity the rest find hard to maintain. D. L. Zartman describes mitosis and meiosis, but this is just boring textbook material, written for potential students of chromosomal analysis not future animal breeders. Chromosome numbers and aberrations in domestic animals are discussed in a more useful and critical manner by N. S. Fechheimer, who also considers the propects for genetic engineering in the final chapter. The problem with this last chapter, and to a somewhat lesser extent in what is an excellent review by M. A. J. Ansay and R. H. Hanset on molecular genetics and function of protein molecules, is that the chapters appear to have been written by 1981 although the book was not published until 1985. This puts the genetic engineering discussion into the pre-giant-mice era. Following Palmiter and Brinster's transgenic work it is clear that genes can be brought in from other species and expressed in a useful manner, but the problem of what genes to transfer is, as Fechheimer discusses, a major, if not insuperable problem.

The quantitative genetics and animal breeding of Hohenboken is generally sound and clear. The lack of depth is an advantage in that complicated mathematics can be avoided, but it is rather limited in that the author's knowledge and examples come mainly from beef-cattle breeding. Thus we see little considerations of long-term response, such as a poultry breeder might worry about, and the arguments are rarely very firmly based on quantitative genetic principles – for example, the consequences of artificial selection at the single-gene level. I was also surprised not to find the classical response formula $R = ir\sigma_A/L$ for selection of intensity i, accuracy r, genetic standard deviation σ_A and generation interval L derived and used. There are also a few minor errors: for example, three methods of estimating heritability of all-or-none traits are described (pp. 108–109), but two are essentially the same – the analysis of variance of zeros and ones, which is dismissed as analysis of non-normal data, and Robertson and Lerner's 1949 method, which is considered acceptable.

A greater mathematical understanding is required for Ronningen and Van Vleck's chapter on selection indices and best linear unbiased prediction. This is an admirably comprehensive and clear account. The remaining chapter, on inbreeding, is by Pirchner, who, along with Hohenboken on a number of topics, gives useful tables of statistics on different species.

The student of animal genetics and animal breeding will find this a useful volume, except for the material that has become dated during the publication process, while the research worker is unlikely to find enough depth. The price tag is $92.50, however, so we have the anomaly of a student's book at a price few students can afford, and research libraries are reluctant to buy non-specialist material.

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An Introduction to Medical Genetics, 8th edition. By J. A. FRASER ROBERTS and MARCUS E. PEMBREY. Oxford University Press. 1985. 394 pages. £11.95. ISBN 0 19 261409 6.

For a textbook in the rapidly advancing field of medical genetics to go into eight editions spread over a period of 45 years (1940–85) is a remarkable achievement by the authors – Dr Fraser Roberts, who wrote the first six editions, and Dr Marcus Pembrey, who helped him with the seventh and is mainly responsible for the eighth edition – and they are to be congratulated. So fast has recent progress been in the genetic study of man that there is now a special field, aptly named 'clinical genetics', which concentrates on human diseases and biochemical and anatomical abnormalities which have (or may have) a genetic basis, sometimes multifactorial, and on the complex problems of genetic counselling. Medical students, physicians, nurses and a variety of medical scientists all have an increasing need to understand Mendelian principles and their applications in a wide range of medical problems, and this textbook aims to fill their need and to indicate where they can go for more detailed information.

The book is simply and clearly written, assumes no knowledge of genetics in the reader, and avoids all but the simplest mathematics. After a short explanation of chromosomes and genes and their segregation behaviour, and the nature of the genetic code, we are given a number of detailed examples of defects due to dominant inheritance, recessive inheritance and *X*-linked inheritance. Chapters follow on molecular genetics and the haemoglobinopathies, the genetics of the blood groups and tissue types, genetic linkage,

genetic engineering, chromosome abnormalities, the gene in action and the role of multifactorial inheritance in the causation of common diseases. Two final chapters discuss genetic counselling and prenatal diagnosis.

The new edition has been substantially revised and expanded without altering its basic structure, and also has some visual improvements which I like. These include slightly heavier print, bold lower case instead of expanded upper case lettering for section headings, and better designed figures of pedigrees, all of which make for easier reading. There are also a number of new illustrations, and the omission of figure 62 of the 7th edition – I don't think this can ever have helped a reader to understand 'the control of polypeptide formation in the cell'. Figure 111, giving the standard band numbering of the human chromosomes, is taken over from the 7th edition, but should have been printed at twice the size so that one can read the band numbers without using a magnifying glass. An extraordinary statement on page 182, to the effect that restriction enzymes are so named because they are the product from one strain of bacteria that restricts the subsequent growth of certain other bacteria on the same medium, should have been replaced by a definition slightly nearer the truth. However, these and the occasional misprint (plasma for plasmid, nubmers for numbers) are very minor blemishes in the new edition, and I hope it will remain an essential textbook in the training of medical students.

This book is, of course, only an introduction to a continually expanding branch of applied genetics, but I think it should prove of interest to most students of biology. The cautious approach to genetic knowledge through collection of pedigrees of possibly genetic abnormalities, bedevilled by the problem of different genes giving the same syndrome, is well illustrated by many examples, and makes a striking contrast to the experimental approach in other branches of genetics. To take one example, achondroplastic dwarfism is well known as a dominant genetic defect. The mutation rate based on a very extensive Danish survey was given in the seventh edition as 1 in 20000 gametes, but was reduced to 1 in 1000000 gametes in the eighth edition. The difference arises from the discovery that a proportion of such dwarfs who die very early are actually recessive homozygotes for another gene or genes, whose inclusion as dominants biases the analysis. Another point of interest is that it needed the development of caesarian section to enable achondroplastic women to produce children. As a result, marriages of affected by affected have occurred, and these produced a mixture of normal achondroplastic and much more severely affected children in roughly Mendelian proportions. The last group can clearly be assumed to be affected homozygotes. A comparable example is Apert's syndrome, a severe congenital malformation of sporadic occurrence, whose causation was unknown. Surgical treatment has been developed which relieves the cranial abnormality and consequent mental retardation; and as a result several affected persons have produced children. A proportion of these had the same abnormality, thus proving that Apert's syndrome is, in fact, a dominant genetic defect. These are two examples out of many.

I enjoyed reading this new edition, and think it worth recommending to a wide biologically oriented public. Non-medical readers may have trouble with the names of many of the hereditary conditions discussed, but the actual syndromes are generally briefly summarized.

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The Life and Work of J. B. S. Haldane. By KRISHNA R. DRONAMRAJU. Aberdeen: Aberdeen University Press. 1985. 211 pages. £14.90. ISBN 0 08 0324363.

The lives of scientists rarely make good subjects for the biographer: they usually live a rather sheltered life, and argue about esoteric topics which would baffle even scientists in other disciplines and will lose interest as scientific progress marches on. If scientists appear in public they are likely to be incomprehensible unless a television crew has been at work on them, and on politics they are no more trustworthy than professional politicians. Most of them maintain a very low profile except among their colleagues, with whom they quarrel in a rather refined way. So novels and plays about scientists (excluding science fiction, Galileo and Darwin) are rare and not then very exciting.

J. B. S. Haldane (1892–1964) was a remarkable, even unique, exception to this generalization. He seems to have received, and needed, very little training in any branch of science apart from a few terms at school and what he learned as his father's physiological guinea-pig. He went to Oxford with a mathematical scholarship, changed after a year to 'Greats' (a mixture of Classics and the Humanities really designed for making top civil servants), and obtained a first-class degree which was announced on 4 August 1914.

After surviving a more than eventful war which he seems to have thoroughly enjoyed, Haldane became first a lecturer in Physiology at Oxford and then in Biochemistry at Cambridge (without having a degree in either subject). At the same time he was making a variety of important contributions to genetics, particularly in the development of a mathematical theory of evolution, was writing the best of all articles on popular science, and was becoming a dedicated Marxist, which eventually embroiled him in the Lysenko controversy.

In 1957 he and his wife Helen Spurway rather ostentatiously shook the dust of England from their feet, after a minor incident involving Helen and a Police dog's tail, and retired to India, where their life did not remain altogether peaceful. Clearly here is ideal