theoretical and empirical studies of human populations. For any such attempt Dronamraju's book provides a valuable starting point.

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Origins of Mendelism (2nd edition). Robert Olby. University of Chicago Press, Chicago. 1985. Pp. xv+310. Price £12.75 PB.

For two decades, Robert Olby's *Origins of Mendelism* has been a standard guide to the cluster of experiments, observations, speculations and hypotheses surrounding Mendel's classic 1866 paper. Although the Moravian monk obviously occupies centre stage, Mendelism rather than Mendel was Olby's primary concern. This concern led him to the early plant hybridists such as Koelreuter and Gaertner, to mid-nineteenth-century notions of blending and non-blending heredity (Darwin, Naudin and Galton), ideas of sexual and asexual reproduction, and the rediscovery of Mendel's work at the turn of the century.

This second edition of Olby's monograph keeps the same basic format, with only the final chapter, on the rediscovery of Mendel, undergoing a complete rewrite. For the rest, Olby incorporates only minor changes and updates the bibliography and suggested further readings. In addition, he has considerably expanded the appendices (which occupy half the book), which contain generous extracts from the relevant primary sources analysed in the main body of the text, and selections from Olby's more recent research papers on Mendel and Mendelism.

Geneticists will find much of interest in Olby's book, particularly in his careful expositions of the ideas of his principal characters, many of whom wrote in German, French or Latin. He makes good use of modern knowledge in interpreting what these early naturalists saw and in understanding the difficulties they faced in understanding hybridism and its relation to traditional notions of the constancy of species. He is aware, however, that historians of science no longer hold the comfortable positivistic preconceptions which were common when the first edition of his work was published. Accordingly, he has, he tells us, adopted a "constructivist view in which knowledge is seen as underdetermined by the facts, their meaning being dependent, to an important extent, upon the theoretical presuppositions of the observer" (p. xiv). Thus, he argues that Galton's hereditarian ideas were influenced by his early travels in Africa, where he observed "inferior" races, and that Koelreuter's hybridisation work can be understood only in the context of his theological and alchemical beliefs. Despite these occasional glimpses of more recent modes of historical analysis, Olby's book retains its essential intellectual orientation and if there is an evolution between the two editions, it is one of gradualism rather than saltation.

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Molecular biology and crop improvement: a case study of wheat, oilseed rape and faba beans. R. B. Austin with R. B. Flavell, I. E. Henson and H. J. B. Lowe. Cambridge University Press, Cambridge. 1986. Pp. 114. Price £17.50, $29.95 US.

There can be no doubting that recent developments in molecular biology have been most exciting and challenging. In the context of this book, molecular biology has been defined as the study of genes (DNA) their primary products (messenger RNAs) and their secondary products (proteins). The authors state that molecular biology complements "Classical" biochemistry which includes the study of tertiary gene products, that is, molecules made or transformed by enzymes. The 64,000 dollar question is whether molecular biology complements "classical" plant breeding or whether it might even replace it?

The sophistication and precision of present-day molecular biological techniques will not be questioned, neither will the "spin-off" in terms of scientific knowledge and the overall contribution to biological technology. In the long term, such research must surely benefit many related branches of science and have a positive impact on man's well-being. In the short-term, funding agencies as well as sceptical observers, are asking whether there is, or likely to be, a return on the huge investment. This is the question to which Dr Austin and his colleagues addressed themselves in a project sponsored by the E.E.C. or, more precisely, the Commission of the European Communities (Division for Genetics and Biotechnology). The book is their report.

The Division had called for an assessment of the opportunities for the application of molecular biology to the improvement of three crop species, wheat, oilseed rape and faba beans and each of these species is considered in detail in separate chapters. The book's first chapter discusses crop improvement by conventional breeding and provides an easy-to-read, concise yet comprehensive coverage of existing breeding technology and the approaches to improving characteristics of quality, yield potential and resistance to pests and diseases. This is logically followed by a chapter on molecular biology and plant breeding and is as good a review of the potential, practicalities and problems as I have read. The authors are quite objective in their comments although their style often gives the impression of an approach lacking something in overall confidence. If the section on disease resistance is taken as an example, much of the writing is in the conditional—"cDNA probes would be constructed"—"active strains might be developed". However, it is fair to say that none of the speculation is fantasy and the objectives are certainly attainable on a short-term time-scale.

One possible criticism of the book is that statements of scientific fact, especially those relevant to biotechnology, are not accompanied by references. The authors acknowledge this with the excuse that a list of further reading is included at the end of the book. This style certainly makes the text highly readable for the superficially interested but rather frustrating for the researcher with specific interests and is out of character with the authors' normal, highly professional, writing.

The reviewer also needs to be objective. The book represents essential reading for all plant breeders and molecular biologists, the latter often suffering from being highly expert in one particular aspect of biotechnology and would benefit from the exposure to the more general approach afforded by this text. The book represents a major review of the topic as defined in the title and the authors outline the conclusions of their value-judgement in a detailed preface. Of these, perhaps the most important, and perhaps most revealing, is that they consider that conventional plant breeding will not be replaced.

Given the stated quality and merit of the book, is it then churlish to ask the E.E.C. why such a report, it is a very thin book of only 114 pages after all, with no illustrations and more importantly no index, is allowed to be placed on sale at the ridiculously high price of £17.50? Surely, this report deserves as wide a circulation as possible and, if the cost of production necessitates such a price penalty, the Commission should drop the glossy, hard-back approach and adopt the cheapest form of publication? After all, if there is to be a long-term future in molecular biology in crop improvement, the present book has a very short useful "shelf-life" in this fast-moving subject.

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Essential genetics: A course book. Lynn Burnet. Cambridge University Press, Cambridge. 1986. Pp vi+146. Price £4.95 PB. ISBN 0 521 31380 5

Lynn Burnet has written her book primarily for A-level biology students and for undergraduates and practical breeders who require a knowledge of basic genetics. The book adopts a familiar format, beginning with descriptions of Mendel's experiments, then broadening the text with additional examples of mono- and dihybrid inheritance, this leads into sex-linkage and linkage, and the final chapter is on population genetics.

The subject matter is long established and at this level of presentation is already well covered with many examples. Hence, it is not a comfortable position to consider a new presentation of well-tried material. My reading of Chapter 1 left me in no doubt that it would lead to much confusion for the new student. I did not find "character" and "trait" explained in table 1 as the text states; the repeated changes in the characteristics used to illustrate monohybrid inheritance considerably upset my line of thinking (pp. 2-4); the introduction of statistical ratios occurs too early (p. 3), with the 3:1 expected F2-ratio in figure 1 illustrated with a 5:2 approximation; on p. 5 I concluded that Mendel's First Law is "the idea of particulate inheritance", though this misconception is corrected somewhat later on the same page.

With so many hurdles erected so early in the book, I was not surprised by the long list of criticisms I accumulated against the rest of the text.

In favour of the book, I liked the inclusion of test questions at various parts of the book (though several opportunities were missed), of the numerous problems at the end of each chapter, and of tests at the end of the book: answers are provided to all of these. The wide range of examples is good in some respects, I am now better informed about the genetics of budgerigars, but from my experience, human examples appeal more to students.

A couple of errors I noted, p. 98 allele frequencies "p" and "q" are referred to as genotype frequencies; p. 107 the illustration is given a "Table" heading.

I cannot recommend this book as a clear exposition of the principles of inheritance. Is there really a need for a specialist book for one section of the A-level syllabus?

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