This contrast between the science and its public face continues into the final section of the book which considers in more detail the prospects for the control and treatment of inherited disorders. The editor points out the arrogance of believing that the new molecular technology will be any more successful than more conventional approaches. He discusses the areas in which molecular manipulations might be appropriate, those in which more conventional medical methods might be more applicable and also the possible dangers of attempting direct gene substitution. With the more recent publication of the effects of translocation on the expression of some oncogenes, his warnings on the dangers inherent in the random insertion of functional coding sequences into the genome are perhaps more apposite now than they were two years ago. Chapter 4 discloses a disconcerting tendency towards scientific imperialism which seems to have been growing among some members of the molecular genetics fraternity over the last few years. Having convinced themselves, and in some cases the holders of the research grant purse-strings, that all aspects of biology are subordinate to the biochemistry of the gene, moves towards the takeover of medicine are now under way. The argument runs something like this. Successful infection by an infectious agent, *e.g.*, a virus or bacterium, requires that the agent recognises and exploits some component of host biochemistry. Since this component must ultimately be under the control of genes, all infectious disease is genetic in origin, Q.E.D.

The overt concentration on scientific issues has brought out some aspects of the new technology which will do little to please the many single issue pressure groups with which medical and biological research is afflicted at the moment. For example, the need for better animal models and the possibility that abortion could become more frequent as ante-natal diagnostic methods become more accurate.

Although I feel that this book will fail in its primary objective of reaching the general public, I do think that it would be a useful book for undergraduate teaching. It could form an invaluable basis for seminars or tutorials in genetics and pre-clinical courses, when the absence of any appreciable discussion of the moral and ethical issues presented by the new technology could be turned to advantage. Overall, this is a thought-provoking and attractively priced book.

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NATURAL SELECTION, HEREDITY AND EUGENICS. Edited with an introduction by J. H. Bennett. 1983. Oxford University Press. Pp. x+306. Price: £17.50 H/B.

This book comprises a selection from R. A. Fisher's correspondence, especially with Leonard Darwin, on the topics given in the title. It is unfortunate that in many cases the writing of one of the correspondents (Fisher's for the earliest period) is unavailable. However, with the aid of the editor's very helpful notes, one can follow the correspondence without much difficulty. Also included are three of Fisher's reviews (one previously

unpublished), three of his unpublished papers and an introduction by the editor.

Probably this book will appeal mainly to those with a special interest in Fisher and in the development of his thinking. For example, in a letter to Wright, dated 1929, we find: "I am not sure that I agree with you as to the magnitude of the population number *n*. To reduce it to the number in a district requires that there shall be *no* diffusions even over the number of generations considered. For the relevant purpose I believe *n* must usually be the total population on the planet, enumerated at sexual maturity, and at the minimum of the annual or other periodic fluctuation". This remarkable statement, anticipating so much of the modern theory of population subdivision, throws much light on the controversy with Wright on this topic and on Fisher's tendency to think in terms of very large populations. On a more personal note, Fisher's most happy relationship, both intellectual and personal, with Leonard Darwin is very well documented. This book, then, is a welcome complement to Joan Box's fine biography.

However, the book raises issues of a very much more general kind, namely the factors which influence a particular individual to work in a particular area. Obviously, no certainty is possible here. Nevertheless, your reviewer wholeheartedly agrees with Professor Bennett when, in his introduction, he takes issue with those historians who consider Fisher's interest in eugenics to be the prime motivator of his work in biometrical and evolutionary genetics. Bennett quotes one historian as saying, in connection with the neo-Darwinian synthesis: "Fisher's decision to become involved in this sort of work has remained somewhat mysterious". It is here that the introduction is so helpful, in reminding us of the truly regrettable state to which evolutionary theory had fallen by the early 1920s, with many biologists sympathetic to, or at least non-committal on, Lamarckism, mutationism or even orthogenesis. It is clear, as Haldane stated explicitly in 1924, that a quantitative treatment was essential if the role in evolution of natural selection was to be elucidated. That a biologist so well equipped to undertake such a treatment should in fact do so is hardly mysterious. It is possible that our historian regarded Fisher as primarily a mathematician, with only an amateur interest in biology. If this is so, both Box's biography and the present book should provide a corrective, in showing the depth of Fisher's interest in biology, dating from his boyhood, and the intensity of his wish to put evolutionary theory on a sound basis. Further, since Fisher's admiration for Leonard Darwin and his acknowledgement of the debt he owed to him have been taken as evidence for the primacy of eugenics in Fisher's thinking, it is worth pointing out the very wide range of biological topics upon which these authors corresponded. Finally, attempts to attribute Fisher's enthusiasm for eugenics to his ultra-conservative political opinions will really not do. As late as 1938, Haldane, in his famous critique of eugenics, pointed out that the topic cut right across the usual political divisions; this may easily be confirmed by reading Muller (1936).

The publication of this correspondence should, therefore, as Fisher (1930) put it when correcting a mistake of his own, "minimise the confusion which every error is liable to cause".

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GLOBIN GENE EXPRESSION AND HEMATOPOIETIC DIFFERENTIATION. G. Stamatoyannapoulos & A. W. Nienhuis (eds). (Progress in Clinical and Biological Research Vol. 134) Alan R. Liss Inc, New York, USA, 1983. Pp. 560. Price: £91.

This beautifully produced volume contains a series of papers which were given at the third Conference on Hemoglobin Switching which was held on Orcas Island in Puget Sound in September 1982. Its seven major sections deal with subjects ranging from gene expression systems to the regulation of haematopoiesis and experimental manipulations of haemoglobin switching. In a sense, the remarkable diversity of subjects covered in this short meeting reflects a lack of genuine progress in this important field. This is also reflected in the unusually subdued introductory section by the editors. The first meeting in this series was held in a mood of great optimism at a time when the structure of the globin genes had just been worked out and when information about the molecular basis for some of the mutations which change the pattern of haemoglobin switching was just starting to appear. Now the dust has settled it is apparent that these structural studies have told us less than we hoped about the regulation of globin gene function and very little about the way the different globin genes are switched on and off during foetal development.

Nobody is quite sure where the gold is in haemoglobin switching. Should we be concentrating on the fine structure of the genome, developing better systems for studying haemopoietic cells *in vitro*, or attempting to analyse and modify the expression of the globin genes *in vitro* or *in vivo*? All these approaches, and more, are covered in this book. Each of them throws up a few tantalising clues; none provided a clear indication of where to go next. Take for example the extensive section on the experimental manipulation of haemoglobin switching, which contains no less than five papers on the modification of globin gene expression by 5-azacytidine. Clearly, there was heated debate about the mechanism of the reactivation of the γ globin genes by this agent. Two sides evolved; the demethylation and the perturbation-of-haemopoiesis camps. Although it is now nearly 18 months since the meeting, we are no nearer to an answer; indeed it now looks like honours even with equal evidence for both mechanisms!

Despite these difficulties, the editors have done a very important service for the globin regulation field by organising these meetings and bringing together such a diverse group of experts in fields which still could provide useful models for studying what is by far the most interesting question left in haemoglobin genetics. Although some of it is already out of date, this book is still of great value to everyone working on the regulation of haemoglobin genes, or on gene expression in other systems. Perhaps it might