References

BOX, J. F. 1978. *R. A. Fisher: The Life of a Scientist.* John Wiley and Sons, New York.
FISHER, R. A. 1930. The distribution of gene ratios for rare mutations. *Proc. Roy. Soc. Edinb.*, *50*, 205–220.
HALDANE, J. B. S. 1924. A mathematical theory of natural and artificial selection. Part I. *Trans. Camb. Phil. Soc.*, *23*, 19–41.
HALDANE, J. B. S. 1938. *Heredity and Politics.* George Allen and Unwin, London.
MULLER, H. J. 1936. *Out of the Night.* Victor Gollancz, London.

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

be better if future meetings in this series were smaller and more focussed. Easier said than done, however; on reading through this volume, and considering what has happened since the meeting, it is still far from clear where this fascinating field is going.

D. J. WEATHERALL
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