

To most biologists, however, the chief interest of this correspondence will be the light it throws on Darwin's work on the species question. It is known from other sources that Darwin opened his first notebook on the transmutation of species in July 1837, that he read Malthus' essay during September 1838 and that he wrote the pencil sketch of his species theory whilst staying at Maer and Shrewsbury in the summer of 1842. There is no doubt, therefore, that throughout virtually the entire period covered by the correspondence published in the present volume, Darwin was actively working on the species question. Those readers who anticipate that there are many letters in this book that provide direct and unequivocal evidence of Darwin's thinking about this question will, however, be disappointed. The alert reader will, nevertheless, spot some important clues, the earliest of which occurs in a letter to Lyell written on 14 September 1838 in which Darwin says that "I have lately been sadly tempted to be idle, that is as far as pure geology is concerned, by the delightful number of new views, which have been coming in, thick and steadily, on the classification and affinities and instincts of animals—bearing on the question of species—notebook, after notebook has been filled, with facts, which begin to group themselves *clearly* under sub-laws". Other clues can be found in letters to, among others, Henslow (September 1839) and his cousin Fox (January 1841). But, perhaps, the most important evidence is to be found in correspondence with Herbert (April 1839) on the effects of hybridisation in plants; with Waterhouse (July–August 1843) on the principles of classification; and a questionnaire about the effects of crossing in animals that Darwin had printed and distributed early in 1839 to a number of animal breeders (Appendix V), two replies to which are included in this correspondence.

There is much else besides scientific correspondence in this volume, among which that between the members of Darwin's family and his Wedgwood cousins, including, of course, Emma, is fascinating for the close and warm relationships, and the social life of the times, it reveals. In short, this edition is a major work of scholarship which is impossible to praise too highly and which will serve as a rich treasure house for scientists and historians alike for many years to come.

MICHAEL LAWRENCE
Department of Genetics
University of Birmingham

Population genetics and molecular evolution. Tomoko Ohta and Kenichi Aoki (eds). Japan Scientific Societies Press, Tokyo and Springer-Verlag, Berlin. 1985. Pp. xvii + 503. Price DM 118. ISBN 3 540 15584 8.

This collection of papers is based on contributions to a Seminar commemorating Kimura's sixtieth birthday. The Master himself is in fine form; a somewhat deceptive

start, suggesting a routine exercise in diffusion methods, gradually works up to a most interesting discussion on coupled amino acid substitutions during the evolution of a given protein. He also contributes an autobiographical memoir; further biographical notes are given by James Crow. The remaining 27 papers, which range from very readable to severely technical, cover a wide range of topics in population genetics and evolution, mainly at the molecular level. While many of the authors are not unreservedly neutralist, a contribution from the extreme selectionist school would have helped the book to be, as the editors hope, an interesting guide to modern population genetics. The papers are, in nearly all cases, of a high standard. Those who are happiest with experiments will particularly enjoy the paper by Hartl and Dykhuizen, summarising their work on enzyme variants in *E. coli*. One may guess, with confidence, that Kimura enjoyed the Seminar. Many happy returns!

J. S. GALE
Department of Genetics
University of Birmingham

The evolution of DNA sequences. B. C. Clarke, A. Robertson and A. J. Jeffreys (eds). The Royal Society, London. 1986. Pp. 354. Price £29.00 (U.K. addresses), £31.00 (overseas addresses). ISBN 0 85403 262 2.

The volume of literature dealing with DNA sequence data is so large that any book on the subject that contains less than 170 leaves is to be welcomed. Thus this volume retains its appeal despite the passage of 2 years since the symposium was held. It contains a collection of articles, of a generally high standard, on areas of current interest in molecular evolution. The articles fall into two categories—those which survey a field of work and those which concentrate on one particular aspect.

Thus, in the first category Kimura provides a useful supplement to his excellent book; Bostock discusses DNA amplification Brookfield, transposable elements and Avise gives a fascinating review of the population genetics of mitochondrial DNA. Hartl and his colleagues deal with plasmids in bacterial populations and Engels assesses our state of knowledge about the phenomena which have come to be known as "hybrid dysgenesis" in *Drosophila*. Engels shows that while we may know much about the elements responsible, there is a lot we still do not understand about the phenomena they cause. In particular, we have no clear idea why there are strains of *D. melanogaster* which lack P elements completely, or rather, in Engels' words: "we have reached . . . the paradoxical conclusion that all possible explanations should be discarded".

The other contributors to this volume take the second approach, concentrating more on one particular component of their field. Fitch discusses methods of analysis of nucleotide sequence data which allow for different