Population Genetics

Gale, J. S.


Dr. Gale has produced an attractive book about population genetics. It is not a standard textbook covering all subjects in population genetics but a book concerned mainly with the current controversy over the neutralist vs. selectionist views of evolution, though some topics such as selfing, evolution of dominance and altruism, etc., are also discussed. In treating this controversy he presents a fair amount of mathematical theories of population genetics as well as experimental data. Therefore, the readers can learn the basic principle of population genetics as well. Particularly for those who are not acquainted with higher mathematics, this book will be useful, because Gale explains the advanced mathematical theory of population genetics at an elementary level, often using verbal arguments.

As is well known, the current controversy over the neutral mutation theory is not for morphological evolution, which Gale also discusses in this book, but for molecular evolution. His discussion on this problem is somewhat similar to that of R. C. Lewontin in his book 'The Genetic Basis of Evolutionary Change'. He presents both the neutralist's and selectionist's views quite objectively and tries to let the reader decide his opinion. Unlike Lewontin, however, he hesitantly presents his own tentative conclusion: 'It would appear that natural selection is the prime mover of the process of evolution'. Yet he does not propose any specific form of selection.

There are some deficiencies in this book. The most serious one is the lack of recent knowledge about the evolutionary changes of genes and genomes. It gives the impression that time stopped in 1976. During the last five years the concept of gene has undergone a substantial change and the studies of evolutionary changes of coding and noncoding regions of genes, multigene families, pseudogenes, etc., have had direct impacts on the neutralism vs. selectionism controversy. Of course, I cannot blame the author for not including all these new developments, because some of the developments clearly occurred after he finished the manuscript. Another deficiency is that although he realise the importance of examining the consistency of the rate of molecular evolution and the extent of protein polymorphism in the study of evolution he has neglected most of the recent literature on this subject. In my view, population genetics is no longer just for studying the genetic variability of present populations but has to deal with the long-term evolution of all kinds of organisms. If one proposes any form of evolutionary mechanism, he must be able to explain both polymorphism and long-term evolution by the same principle.

Despite these deficiencies, however, I think this is a stimulating and good introductory book.

M. Nei