Book Reviews

Population Genetics

Computer Models in Genetics. ALEX FRASER and DONALD BURNELL. McGraw-Hill, New York, 1970. vi, 206 pp., illus. $9.95.

There have been two main trends in mathematical population genetics since the pioneering work of Wright, Haldane, and Fisher. The first has been to the more complex analytic models of the type developed by Kimura and Karlin and the second has been to the computer simulations of genetics models as carried out by Fraser, Lewontin, and many others. This book is the first on the latter approach to population genetics and as such has a special obligation to provide an introduction to the subject for the nonspecialist. Unfortunately the book falls short of this goal and is unlikely to be understandable to someone not already familiar with both population genetics and the rudiments of computer function. Nonetheless, the authors have gathered a number of interesting computer models of single and multiple locus systems and have presented them in sufficient detail that the examples are useful without further references. There is a large variety in the models discussed, and whenever possible the results are compared with specific biological experiments.

From the examples in this book, it appears that there is a direct correlation between the simplicity of a computer model and its utility. In light of the fact that there are no limits on the complexity of a computer model except those imposed by storage space and operating funds, it would seem appropriate for the authors to discuss the purpose of such models. A discussion of this issue would help put the subject matter in the proper perspective. In many cases, for example the models of inversion polymorphisms in *Drosophila* and of the *t* allele in *Mus*, the models were developed in response to particular biological problems. In other cases, simulations have been performed to examine the effect of well-known genetic mechanisms. However, there is the lingering feeling that some computer studies are carried out without any hope of relating the results to any problems of biological interest. There seems to be a danger that the study of computer models in genetics will become unrelated to the subject from which it arose.

The book is well balanced in its choice of examples, and the authors have resisted the temptation to let their own work dominate the contents. However, one has the impression that the book was written in a great hurry; several important terms are never defined and some others, such as "random walk" and "disruptive selection," are used imprecisely. These minor problems, coupled with a somewhat cramped format for tables and figures, make it difficult to follow some of the explanations. Still, much of the material is unavailable in any but the original sources, and for anyone with an interest in the subject this book will make a useful supplement to any of the several recent texts in population genetics.

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The Sense of Hearing

Foundations of Modern Auditory Theory. Vol. 1. JERRY V. TOBIAS, Ed. Academic Press, New York, 1970. xviii, 466 pp., illus. $22.50.

The science of the sense of hearing, not unlike the science of the other sense modalities, is characterized by an uncomfortable proliferation of data and ad hoc hypotheses on one side and by a dearth of broad, synthesizing theories on the other. The inscrutable jungle of articles on hearing, which are scattered over many psychological, physiological, medical, engineering, and other journals, makes it often impractical to look for the solution of a problem in the literature. It may be less time-consuming to find it directly, through a laboratory experiment. This, of course, exacerbates the situation, since every experiment, even if not new, tends to lead to an additional article.

The need for introducing some clarity into the state of our knowledge of auditory functions and processes seems to have prompted J. V. Tobias to edit *Foundations of Modern Auditory Theory*. His intent has to be applauded, since no reasonably exhaustive text on the psychology and physiology of hearing has been published for many years. The lack of such a text is felt particularly strongly in the teaching of graduate courses.

Unfortunately, the quality of execution lags considerably behind the worthiness of the goal for at least two reasons. First of all, auditory science is currently quite fluid, and even partial synthesis is extremely difficult. Experimental outcomes often lead to conflicting conclusions, many old concepts have fallen or are in the process of doing so, and new focal points have just begun to emerge. Second, the editor has apparently had some difficulties in gathering a sufficient number of contributors who could cover the field in sufficient breadth and depth. The result is a sketchy book with an uneven level of contributions. According to the editor's preface, no effort was made to cover all subjects, but only to fill gaps in the reference literature. For this reason, no chapter on loudness sensation was included. Frankly, I am not aware of any extensive review in English of the recent publications on loudness. The number of such publications is substantial, since loudness has been one of the principal subjects of auditory research during the last 20 years. The editor also states that his "book is not designed to fill gaps that don't exist." However, we find a chapter by G. v. Békésy the material of which has appeared in at least three other books.

More important, the title of the book is misleading and presumptuous. Much of its text is written as a routine review of the literature, of the kind found in annual reviews. Only a few attempts have been made at organizing the material around unifying, empirically well-founded concepts. Perhaps the most outstanding in this respect is the chapter "Critical bands," although the chapter "Periodicity pitch" also develops its central theme in a systematic and convincing manner. Another chapter, "Cochlear mechanics and hydro-dy-