

lated throughout into terms of consequent changes in genetic means and variances. In all of this the trait receiving prime attention is, appropriately, Darwinian fitness. Numerous special topics are covered; examples are the components of genetic variance, effective population number, correlations between relatives, the cost of natural selection, genetic loads, probability of fixation of mutant alleles, and the number of neutral alleles maintained in finite populations.

There are some important things that might have been, but are not, found in this book. Available theory is presented, but not much in the way of perspective concerning its adequacy is provided. In general the authors have not offered judgments concerning the sufficiency of present theory or the areas in which further theoretical developments are most needed. Similarly, there is little discussion of how theory presented can be employed for inference concerning the genetic state of real populations or the actual shape of the genetic details (such as dominance, epistasis, selective values) that modify theoretical expectations. In a slightly different vein, it is worth noting that this book concentrates on the problems of single populations as opposed to those that arise from the interplay between species. For example, the fact that, while Darwinian fitness can only be increased by natural selection (that is what Fisher's fundamental theorem is about), species may, and often have, become numerically smaller (or extinct) is recognized by the authors but is not examined with the same quantitative rigor that they bring to the subject of gene frequency changes.

Lucid presentation of mathematical deductive theory with emphasis on derivations and underlying assumptions was the obvious objective of the authors. They have given us an effectively organized and integrated presentation of a substantial portion of the significant, currently available theory concerning single populations (to which, incidentally, they have both made their own substantial contributions). The book is written for students and in a manner designed to facilitate their understanding of both the derivations presented and the procedures by which theory is developed. The bibliography is extensive and will certainly be appreciated by many readers. In my opinion this book will be

very useful to many of us and should be kept within easy reach by all serious students of population genetics, population biology, and biomathematics.

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## Neuroscience

**Short-Term Changes in Neural Activity and Behaviour.** A conference, Cambridge, England, July 1969. GABRIEL HORN and ROBERT A. HINDE, Eds. Cambridge University Press, New York, 1970. viii, 606 pp., illus. \$28.50.

The major topic of the conference represented by this volume was the neural basis of habituation, the term "habituation" referring to behavioral response decrement occurring as a result of repeated or continuous stimulation. The selection of habituation as the focal point of the conference stemmed from the hope that it might be "a relatively simple type of behavioural change in which units are phenomenologically similar at lower levels of analysis." The papers on behavioral and physiological aspects of habituation effectively dispose of this hope. It seems likely that the processes underlying habituation are no more similar than are, for example, the processes underlying behavioral "inhibition" or "extinction of conditioned reflexes." The wide diversity of mechanisms mediating behavioral habituation does not lessen the value of this volume, however, for its papers are thorough and scholarly and have the mark of being written expressly for this publication rather than pieced together from previous works. Indeed, the organizers of the conference have been extraordinarily successful in enlisting the cooperation of participants so as to achieve complete coverage of the general problem areas under consideration.

The volume is divided into three sections: Neural Basis of Habituation, Neural Basis of Plastic Changes Other than Habituation, and a section on Behavioural Considerations relevant to the first two topics. Given the 600 rather large pages of which this book consists, the 19 separate chapters, and the 27 eminent participants, it is obviously impossible to review the contents of the volume in detail. But there

are a few generalities that emerge. First, the authors have written thorough and highly readable reviews, as well as covered their own research efforts. These papers extend well beyond the topic of habituation per se, covering subjects classified in the volume as "neural basis of plastic changes other than habituation." These reviews deal with a wide range of topics, from the insect central nervous system to neurochemical correlates of learning in the mammalian brain.

In essence, though the conference may have failed to come up with support for the hope that habituation might be a key to unlock the secret of a neural basis for behavioral plasticity, the individual contributors have prepared a series of papers of remarkably high quality.

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## Predation

**Searching Image in Carrion Crows.** Hunting Strategy in a Predator and Some Anti-Predator Devices in Camouflaged Prey. HARVEY CROZE. Parey, Berlin, 1970. 88 pp., illus. \$12.10.

We are accustomed to a high quality in the reports from N. Tinbergen's laboratory. The questions he asks are significant, and the answers reflect both a high degree of ingenuity and diligence. Whether studying "pecking responses" or "predation," Tinbergen and his group provide grist for the mills of both those who are interested in behavioral mechanisms and those who attend to the ecological and evolutionary aspects of behavior. Croze, in *Searching Image in Carrion Crows*, continues in this laudable tradition. His booklet is especially useful at this time because the concept of searching image has become overused (and abused) of late, this reflecting the embarrassing fact that it has rarely been the subject of careful study, despite its age. The concept of "searching image" was introduced by Lukas Tinbergen (brother of Niko) to explain certain discrepancies between the abundance of a prey organism and the numbers actually taken by its avian predators. At low densities, a new species of insect prey may be altogether overlooked at first, only to suddenly become especially esteemed. This was assumed to result from the fact that birds