settles too easily on the organism as the unit of selection, without adequate discussion of evidence to the contrary or of alternative points of view. More pluralistic attitudes (as taken, for example, by Price, Hamilton, or Wade) emphasize that selection can have simultaneous impact on several levels, with varying intensities, in a manner that depends both on the way in which genetic variation is partitioned among levels and units and on the degree of differential survival and reproduction of units on each level.

Parsons uses the framework of *r*- and *K*-selection to organize much of his discussion. As has been repeatedly pointed out in the literature, there are many problems with this scheme. Parsons clearly regards it as a provisional system and acknowledges its difficulties, but then proceeds to use it for classification because of its convenience. This creates the potential that readers will draw misleading conclusions about what causes the evolution of life-history traits. Parsons also makes repeated comparisons between predictable and unpredictable and stable and fluctuating habitats. Such dichotomies are not useful. The concrete mechanisms that mediate selection are, first, extrinsic age- and size-specific shifts in mortality rates that interact with, second, the intrinsic constraints and potentials of organisms. These are known to differ among lineages. Such interactions are complex and multidimensional, and to present them in terms of simple dichotomies seriously prejudices the analysis.

The selection of material and topics is uneven and not clearly justified. Much of the material concerns a single genus, *Drosophila*, mostly as it has been studied in Australia. The book provides a good summary of this work, much of which is important and should be drawn to the attention of a wider audience than just the *Drosophila* researchers. However, the subject matter covered is much more specialized than the title promises.

The central chapters were written uncritically; the material is not well digested. Not enough emphasis is placed on providing an overall structure that ties the chapters together and shows the reader clearly why the work discussed is important, where it fits, and what it means.

In summary, this book is a mixed bag. I suspect that a good book on the evolutionary ecology of Australian *Drosophila* has been compromised by the author's understandable desire to generalize.

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Contributions to Microscopy

History of Staining. GEORGE CLARK and FREDERICK H. KASTEN. Third edition. Williams and Wilkins, Baltimore, 1983. x, 304 pp., illus. $29.95.

The great advances made during the second half of the 19th century in the microscopic examination of animal, plant, and microbial cells were in part a consequence of the work of organic chemists in the synthesis of artificial dyes for the textile industry. Natural coloring materials (carmine, hematoxylin) had been used by biologists before and continued to be used later, but the availability of the many new synthetic dyes produced by a burgeoning chemical industry (especially in Germany) greatly broadened the scope of stain technology. In the hands of a series of notable investigators, among them Paul Ehrlich, Walther Flemming, and Rudolph Heidenhain, these new dyes not only revealed the presence of structural elements of cells (for example, chromosomes) but also laid the cytological groundwork for the study of cell dynamics in heredity and embryonic development.

The book under review summarizes this story and brings it up to date until recent times. The first edition, prepared by Harold J. Conn (1886–1975), appeared 50 years ago; a second edition was published in 1948. This edition was begun by Ralph D. Lillie (1896–1979), and the opening chapter (34 pp.) provides a biographical memoir of Lillie, with a full list of his publications. The organization of the material in the remainder of the book follows closely that used by Conn, except for the addition of new chapters on the staining of connective and nerve tissue, on immunological staining, on fluorescence techniques, and on the histochemistry of proteins and nucleic acids, which make the new edition more then twice the size of the first.

As in the first edition, among the chapters dealing with particular staining methods are interspersed brief biographical sketches of several contributors to the field, from the 18th-century botanist John Hill to Frank B. Mallory (1862–1941). In addition biographical material about other scientists (for example, Robert Feulgen) is included in the chapters written for this edition. There is an extensive bibliography and an adequate index.

Perhaps because the authors of the third edition wished to retain material from the earlier ones, there is some looseness of organization that might have been corrected by more drastic revision of Conn's editions. For example, the new chapter on protein and nucleic acid histochemistry contains a much better account of the development of synthetic dyes (pp. 203–217) than that presented in an earlier chapter on aniline dyes in histology. Also, in this new chapter more attention is given to the biological problems whose study was affected by advances in staining techniques.

This volume provides the most useful historical summary now available in English of the development of stain technology.

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