Developmental Instability: Causes and Consequences.

Edited by Michal Polak. Oxford and New York: Oxford University Press. $95.00. xxiii + 459 p; ill.; taxonomic and subject indexes. ISBN: 0–19–514345–0. 2003.

Most biologists likely feel that their subject of study is extremely complicated, possessing messy biology, difficult experiments, and results that can often seem uninterpretable. One subject that truly possesses all of these difficulties is the study of developmental instability (DI). Why is it so complicated? There are a number of reasons. First, from the earliest studies there was disagreement as to what developmental stability represented. This is in a large part due to the fact that it developed from studies of intraindividual variation on the random differences between left and right sides of a trait in bilaterally symmetrical organisms, known as fluctuating asymmetry (FA). Only later was this metric given a plausible mechanistic explanation, and immediately it was compared and contrasted to canalization. Thus, the lack of a known biological mechanism to explain this variation has made biological interpretation difficult. Recent theoretical and statistical work on the relationship between fluctuating asymmetry and developmental stability has shown that FA may not be a suitable/good proxy for measuring DI, especially in terms of its genetic component.

As well, a great deal of literature over the last 15 years has demonstrated that measuring fluctuating asymmetry is fraught with peril, given that the biological differences are often subtle, and can easily be swamped out by measurement error. Finally, differences in levels of FA have been associated with numerous measures of fitness, and currently there is still debate about whether FA is a useful metric in this regard. Given all of these difficulties, and knowing how much most biologists love a good challenge (not to mention debate), it is a wonder that this subject does not have a larger research community.

This new edited volume certainly provides a wonderful entrance into the current concepts and controversies in the field. It provides excellent breadth in regard to the subject as a whole, and with respect to a number of subdisciplines a great deal of depth. Several chapters on the top of this list are devoted to methodological and statistical concerns with measuring and analyzing FA. I would personally recommend Chapter 17 (Palmer and Strobeck) as being required reading for those planning on embarking on experiments in this field. Chapter 11 (Fuller and Houle), while involved, presents one of the most important new meta-analyses on the heritability of DI. In general, each of the five parts (Origins; Genetic Causes; Fitness Consequences; Statistical Tools; and Environmental Stress and Applications) contains many excellent reviews of the literature, often from multiple viewpoints, which is a requirement of this field. Thus, I would definitely recommend this volume to graduate students (or anyone new to the field) who are considering studying questions relating to DI, FA, or canalization. The main complaint I have of this book is that there is not enough emphasis given on what the future holds. Given that we have so little empirical understanding of the mechanistic basis of DI and FA, a little less discussion of plausible (but untested) models may have been warranted. Although current areas of interest are described, no substantive discussion is presented on alternative approaches (i.e., the use of developmental genetic screens to study FA), or how to resolve outstanding controversies. These new approaches can (and should) be left up to the readers of this excellent volume.

Ian Dworkin, *Genetics, North Carolina State University, Raleigh, North Carolina*

Developmental Biology. *Seventh Edition.*

By Scott F Gilbert; with a chapter on Plant Development by Susan R Singer. Sunderland (Massachusetts): Sinauer Associates. $104.95. xvii + 838 p; ill.; author and subject indexes. ISBN: 0–87893–258–5. [Vade Mecum^2 CD-ROM included.] 2003.

If you liked the previous edition of this leading textbook, you will like the current version. Whereas the sixth edition represented a major structural reorganization and rewrite that made it much clearer and less cluttered, the new edition is about 90% identical to its predecessor, with chapters in the same order. Add some references and illustrations from the literature between 2001 and 2002 and recolorize some figures, and you will have an idea of what this volume looks like. Even the "new" chapter on medical applications of development contains much material that has migrated from several places in the previous edition. Such a minimal change may make instructors, who will barely have to alter their PowerPoint presentations, quite happy. Students interested in buying used copies from last year may be less enthusiastic. As in the previous edition, the writing is lucid and supplemental material is available for those who would like to venture beyond the text.

Dominic Poccia, *Biology, Amherst College, Amherst, Massachusetts*