HELD, LEWIS I., JR. 2002. Imaginal discs. The genetic and cellular logic of pattern formation. Cambridge Univ. Press; New York. 476 pp. ISBN 0-521-58445-0. Hardback. $140.

Imaginal discs, of which there are 19 in the larva of *Drosophila melanogaster*, are hollow sacs of cells that are responsible for forming adult structures during metamorphosis, including bristles, compound eyes, wings, legs, etc. Imaginal discs have been used to study the genetic mechanisms that guide cell differentiation and their ultimate fate within the developing organism. For many of us entomologists, now aging memories of our first encounter with genetics are associated with the rancid smell of fruit fly diet and the bizarre mutants that inhabited and still perfume many an academic basement laboratory. If someone had sat me down as a student in the 1970s and explained, through prescient insight, the impending explosive expansion of information that would occur as a result of the genomic revolution, I just might have overcome my aversion to ether and become an insect geneticist. As it is, we can be grateful to works such as this for providing a view of how fly genetics and specifically the study of imaginal discs have contributed to understanding cellular development. Lewis I. Held, Associate Professor of Developmental Genetics at Texas Tech University, has done an admirable job of summarizing the work of a multitude of researchers over decades to decipher the genetic code of the lowly fruit fly, laying out the various conundrums that have been generated by this research, and tracing the evolution of scientific thought and insight. This is not a primer but rather an attempt to tackle the higher order questions of pattern formation, intercellular signaling, and cell lineage. As the author notes in his preface, the book seeks to ". . . understand cellular "epistemology" (what do cells know?) and "psychology" (how do they think?)."

The book begins by recounting the elucidation of the nonclonal nature of cell development in the fly and, in contrast to nematodes, the rarity of rigid cell pedigrees in disc development. There follow chapters on development of the bristle and bristle pattern formation, and development of the leg, wing, and eye. The final chapter examines the genetic circuitry involved in homeosis and ponders how development resembles a computer program wherein the repertoire of genes and *cis*-enhancers accumulated over evolutionary time represent the genomic "hardware", and the links among these, being more labile, correspond to the "software".

The extensive appendices include a glossary of protein domains, an inventory of ideas and concepts guiding genetics, catalogues of characterized genes affecting development, signal transduction pathways, and a helpful set of commentaries on the more complex figures that occur throughout the text. The bibliography cites 4900 references. The explanations are clearly stated and include schematic diagrams to aid the reader in understanding complex issues. While not for the novice, this work is an excellent reference for those entering the field, and for those already knee-deep in research on imaginal discs.

Stephen L. Lapointe
Research Entomologist
USDA, ARS, USHRL
2001 South Rock Road
Fort Pierce, FL 34945