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Imaginal Discs: The Genetic and Cellular Logic of Pattern Formation

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BOOK REVIEW

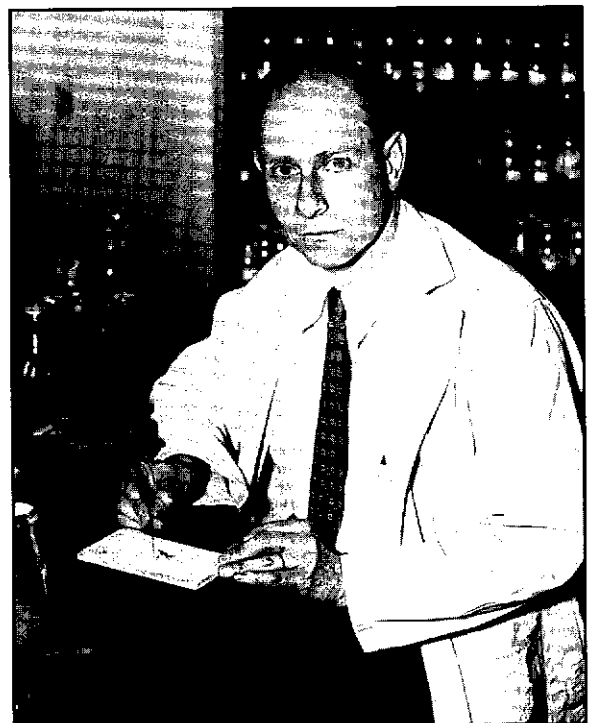
Imaginal Discs: The Genetic and Cellular Logic of Pattern Formation
Lewis I. Held, Jr.. Cambridge University Press, 2002. (xv+476 pp.)

by: Michael R. Dietrich
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It may seem unusual to include a review of a new biology text in the *Mendel Newsletter*, but this is an unusual book with much to say to historians of genetics. Although this is a technical treatment of *Drosophila* development and genetics, Held is particularly sensitive to the history of his field. Held's readable and somewhat light-hearted approach to his topic weaves together the latest models of developmental genetics with surveys of past paradigms, puzzles, and paradoxes.

Imaginal discs are pockets of cells in *Drosophila* larva that will become the body wall and appendages of the adult fly. They have long been recognized as developmentally and genetically significant structures. Held structures his book around the adult structures determined by the discs; i.e., bristle patterns, legs, wings, and eyes. Each chapter provides a detailed overview of the contemporary science, which may put off the usually intrepid historian who is not accustomed to the jargon of molecular genetics. Embedded within each chapter, however, are lucid descriptions of the problems and models that characterized the preceding 90 years of research. Held's chapter on Bristle Patterns, for instance, includes a captivating chronology beginning with Calvin Bridges' initial description of scute mutations and ending with the contemporary work of Sean Carroll's lab. The intervening history includes H. J. Muller's well known work on scute mutants, but more significantly it traces the rise and fall of N. P. Dubinin's "Subgene Hypothesis" during the 1930s as well as Curt Stern's influential Prepattern Hypothesis from the 1950s. Held's chronology is not a well developed history nor is it intended to be. However, Held's chronology reveals the richness of the discussion in developmental genetics throughout the twentieth century. Indeed, Held's book discusses over 75 different models deployed in *Drosophila* developmental genetics and has an exhaustive bibliography with almost 5000 entries.

For the historian interested in developmental genetics, Held's book is an invitation to further research. Held's perspective on his field provides valuable insight into the formulation of spatial models of gene expression and regulation and into their eventual molecularization. As a student of Curt Stern's, Held does an admirable job of placing Stern's work in an historical trajectory. Despite the marvelously complete set of papers left by Stern in the APS archives, Held's account is the best we have of Stern's important work on developmental genetics and pattern formation. Indeed, Held's *Imaginal Discs* is reminiscent of Stern's historical and scientific overview, *Genetic Mosaics and Other Essays*, published in 1968. If nothing else, hopefully Held's account of his field will inspire historians to revisit Stern's ideas of genetic mosaics and the careful path he attempted to trace between the views of A. H. Sturtevant and Richard Goldschmidt.



Curt Stern in his laboratory, May 1947