Quirks of Human Anatomy - An Evo-Devo Look at the Human Body
by Lewis I. Held, Jr., 2009, Cambridge Univ. Press, 152 pages of text
Review by Larry Flammer, ENSI Webmaster

The only book I have ever read that features many more questions than it answers! For anyone who thinks that science has solved nearly all the great problems, or the college student looking for challenging questions to research - this is the book to read. Likewise, for anyone who believes that we are the perfected product of an intelligent designer - this will set you straight. For example, in chapter 6, the author samples about 30 of the many more "quirks," flaws and other examples of terrible engineering in our anatomy. Some are stupid, some are silly, and many are actually dangerous or disabling. These "make-do" contrivances that make up our bodies are clearly the result of opportunistic tinkering, changing the functions of existing structures (preadaptations, or exaptations). See our lesson: Blocks & Screws - Contrivances.

In addition to pointing out these many problems, the author suggests (where we have some answers) the likely proximal causes in terms of what we do know now - from the Evo-Devo field - about the genetic control mechanisms that influence our development. Where we don't know, he tells us that, too. Equally amazing is how much we have learned about the striking similarities of genetic control between people and other creatures - especially fruit flies and other very different anatomies.

Throughout the book, the author shares some of the many remarkable insights of Charles Darwin into the likely mechanisms associated with the development of many of our features, and behaviors - as well as the likely path of evolution for those features. His prescience was amazing - a real testament to his powers of observation, his profound ability to gather tidbits of arcane information from people all over the world, and then to mold all of that into a compelling explanation for the emergence of new species.

For graduate students looking for meaningful questions in the biological sciences to investigate, this book will provide an outstanding collection of many such questions, and provide some hints of where to start, with nearly half the book providing appropriate references - places to start the search, all neatly linked to their presentation in the text.

Interesting topics in the Evo-Devo genetic control of development, beginning with an excellent opening background chapter, graphically discussing the evolutionary dorso-ventral inversion early in the chordate line) and the early branchings of different major phyletic groups (protostome-deuterostome branching from the Ur-bilaterians, ecdyzoan-lophotrochozoan branching of the protostomes, and all of this relative to landmass changes over the past 600 millions of years (page 12). Also very helpful graphic metaphors for different evolutionary pathways (p. 8).

The chapter on symmetry and asymmetry relate the molecular levels to gross anatomy, and every level in between. Explains why fingerprints and blood vessels are examples that violate mirror symmetry, and discusses examples of external asymmetry in animals (e.g., the narwhale and flounder).

Mysteries of the Midline address the optic chiasma and other midline features, moving into the origin of twins, and the likely origins of various kinds of conjoined twins. The Chapter on Merism and Modularity addresses thumbs, toes, tails, variations in teeth, arms and legs. The suggested causes of the many sexual dimorphisms are equally fascinating, as are those of the mind and the brain. How humans acquired intelligence involves a graphic summary linking the many environmental, behavioral and anatomical features that were likely involved.

All in all, a fascinating read, presented with delightful humor, many helpful graphic aids, and a great variety related topics.

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