
Animal species show great diversity in design as a result of their adaptation to different life conditions. Is their design optimized? Are animals built economically, with no more structure than that needed to perform their functions, as the principle of symmorphosis predicts? There is considerable scientific controversy surrounding these questions because, although there is much evidence suggesting that animals are indeed well designed, evolutionary biology tells us that animals are not "engineered" but result from evolution by natural selection.

In this book these highly controversial questions are debated by eminent experts on the basis of a wealth of evidence ranging from the molecular biology and biochemistry of enzyme systems through the study of bone and muscle to the design and function of integrated systems of energy supply and the nervous system. They are discussed from the point of view of physiology and morphology, as well as from that of evolutionary biology.

The authors have made a special effort to present the chapters in a form that is accessible to a broad readership of biologists interested in basic principles. Their intention is to challenge the thinking of many biologists and to present new research on the principles by which organisms are made.

A broad range of biologists interested in functional morphology, whether they are biochemists, physiologists, zoologists, or evolutionary biologists, will find this book a fascinating addition to the literature.

Cover illustration: Three arrays of branching vessels. Top: the small airways of a human lung; middle coronary arteries of human heart; bottom: the astrophorizae imprinted on the inner surface of fossil stromatoporoids, an invertebrate group of uncertain affinities. The bottom illustration is courtesy of M. LaBarbera.

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