

CONTENTS

List of contributors	ix
Preface	xi
1 Efficiency, effectiveness, perfection, optimization: their use in understanding vertebrate evolution C. GANS	1
2 On the efficiency of energy transformations in cells and animals R.W. BLAKE	13
3 Adapting skeletal muscle to be efficient C. J. PENNYCUICK	33
4 Efficiency and other criteria for evaluating the quality of structural biomaterials J. M. GOSLINE	43
5 Efficiency and optimization in the design of skeletal support systems A. A. BIEWENER and J. E. A. BERTRAM	65
6 Efficiency in aquatic locomotion: limitations from single cells to animals T. L. DANIEL	83
7 The concepts of efficiency and economy in land locomotion R. J. FULL	97

8	Respiration in air breathing vertebrates: optimization and efficiency in design and function W. K. MILSOM	133
9	Cardiac energetics and the design of vertebrate arterial systems D. R. JONES	159
10	An evolutionary perspective on the concept of efficiency: how does function evolve? G. V. LAUDER	169
	Index	185