

# Contents

|                                                                                                               |     |
|---------------------------------------------------------------------------------------------------------------|-----|
| Contributors .....                                                                                            | vii |
| Foreword                                                                                                      |     |
| Hilary Koprowski .....                                                                                        | ix  |
| Preface                                                                                                       |     |
| Leonard Warren .....                                                                                          | xi  |
| Introduction: An Overview of Current Evolutionary Biology                                                     |     |
| Ernst Mayr .....                                                                                              | 1   |
| <b>EVOLUTIONARY PERSPECTIVES IN SOVIET RUSSIA</b>                                                             |     |
| Mechanistic and Dialectical Materialism in 20th Century Evolutionary Theory: The Work of Ivan I. Schmalhausen |     |
| Garland E. Allen .....                                                                                        | 15  |
| Through the Looking Glass: The Evolution of Soviet Darwinism                                                  |     |
| Mark B. Adams .....                                                                                           | 37  |
| Current State of Evolutionary Theory in the USSR                                                              |     |
| Nikolai N. Vorontsov .....                                                                                    | 65  |
| <b>INTERPLAY OF ORGANISMS AND ENVIRONMENT</b>                                                                 |     |
| Environmental Context of Evolutionary Change: An Example From the End of the Proterozoic Eon                  |     |
| Andrew H. Knoll .....                                                                                         | 77  |
| The Species as a Unit of Large-Scale Evolution                                                                |     |
| Steven M. Stanley .....                                                                                       | 87  |
| Parallelism and Convergence in the Horse Limb: The Internal-External Dichotomy                                |     |
| Keith Stewart Thomson .....                                                                                   | 101 |
| <b>IMPACT OF RECENT ADVANCES IN MOLECULAR BIOLOGY, I</b>                                                      |     |
| New Perspectives on the Molecular Evolution of Genes and Genomes                                              |     |
| Daniel L. Hartl .....                                                                                         | 123 |
| Evolution of Transposable Elements in <i>Drosophila</i>                                                       |     |
| Margaret G. Kidwell and Kenneth R. Peterson .....                                                             | 139 |
| Gene Structure and Evolutionary Theory                                                                        |     |
| Walter Gilbert .....                                                                                          | 155 |

|                                                                                                                                                                                   |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>New Perspectives on Evolution Provided by Protein Sequences</b>                                                                                                                |            |
| Russell F. Doolittle.....                                                                                                                                                         | 165        |
| <b>IMPACT OF RECENT ADVANCES IN MOLECULAR BIOLOGY, II</b>                                                                                                                         |            |
| <b>The Phylogenetic Significance of Sequence Diversity and Length Variations<br/>in Eukaryotic Small Subunit Ribosomal RNA Coding Regions</b>                                     |            |
| Mitchell L. Sogin .....                                                                                                                                                           | 175        |
| <b>Implications of Radical Evolutionary Changes in Early Development for<br/>Concepts of Developmental Constraint</b>                                                             |            |
| Rudolf A. Raff, Gregory A. Wray, and Jonathan J. Henry.....                                                                                                                       | 189        |
| <b>Our Recent African Past: New Mitochondrial Perspectives on Human<br/>Evolution</b>                                                                                             |            |
| Rebecca L. Cann.....                                                                                                                                                              | 209        |
| <b>Molecular Biology and Evolutionary Theory: The Giant Panda's Closest<br/>Relatives</b>                                                                                         |            |
| Stephen J. O'Brien, Raoul E. Benveniste, William G. Nash, Janice S. Martenson,<br>Mary A. Eichelberger, David E. Wildt, Mitchell Bush, Robert K. Wayne, and<br>David Goldman..... | 225        |
| <b>Index .....</b>                                                                                                                                                                | <b>251</b> |