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978-0-521-10630-6 - Comparative Physiology: Primitive Mammals

Edited by Knut Schmidt-Nielsen, Liana Bolis and C. Richard Taylor

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EDITORIAL PREFACE

The papers contained in this volume were presented at the Fourth International Conference on Comparative Physiology, held at Crans-sur-Sierre in June 1978 and organized through the untiring efforts of Liana Bolis. It brought together scientists from various fields, who, from the perspective of comparative physiology, discussed the widely scattered information on primitive mammals.

What is meant by “primitive” mammals? Most of us think of marsupials and monotremes and perhaps an assortment of insectivores and prosimian primates that have retained certain morphological traits possessed by the early mammals evolving from reptilian ancestors. The first chapter in this book helps reconstruct a picture of what the earliest mammals were like, and subsequent chapters bring together our knowledge of the physiology of many living primitive mammals.

In ordinary language the word “primitive” often implies simple and perhaps even inadequate or inferior. How wrong this is in the context of mammalian physiology! The implication that primitive should mean simple certainly cannot stand close scrutiny. For example, marsupials have modes of reproduction that in many ways are more sophisticated than those of eutherian placentals, and, although marsupials tend to have a somewhat lower body temperature than eutherians, they use the same mechanisms for temperature regulation and use them just as effectively.

To avoid the unwarranted implication of inferiority or superiority, it is better to refer to “conservative” as opposed to more evolved or “derived” traits. The fact that an animal displays certain conservative traits in no way guarantees that in other respects it is not highly advanced. More important, conservative traits do not imply inferiority or inadequacy. On the contrary, the long persistence of conservative traits in animal evolution assures us that they are quite adequate for survival, and their persistence may in fact indicate some superiority of these traits.

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This is the first book that attempts to give a common perspective to a wide variety of functional information pertaining to these problems. The result appears to be that the mere possession of some conservative morphological traits has little bearing on how complex or advanced the animal's functional characteristics are.

Knut Schmidt-Nielsen