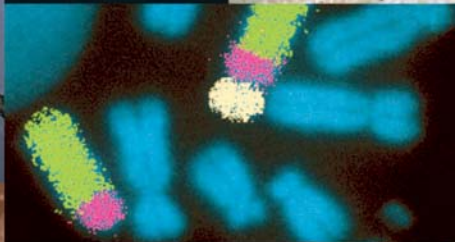


LIFE OF MARSUPIALS

HUGH TYNDALE-BISCOE



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Front cover (clockwise from top left):

Gray four-eyed opossum (Hugh Tyndale-Biscoe); Stages in tammar wallaby development: the unattached vesicle (Ivan Fox) and a newborn tammar (LA Hinds); Chromosome painting (JAM Graves); Feathertail glider (Ederic Slater); Julia Creek dunnart with 60-day-old litter (PA Woolley and D Walsh).

Spine:

Yellow-footed rock wallaby (Esther Beaton).

Back cover:

Male honey possum on Banksia inflorescence (PA Woolley and D Walsh).

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Preface

When the first edition of this book was written in 1970, the old debate about the inferior status of marsupials, compared to other mammals, was still active. The work reviewed then on a few species of marsupial in Australia and North America was beginning to dispel this idea but it still prevailed in other countries, particularly in the Northern Hemisphere. Thirty-five years later it is no longer an issue of importance. Now, much more is known about the past history and the present relationships of marsupials in Australia, New Guinea and South and Central America, so that the long evolution of this separate line of mammals is becoming much clearer. As well as this, there are now detailed studies on the physiology, reproduction, ecology and behaviour of representatives of all the main families of marsupials, so that comparisons and generalisations can be made with much more confidence.

In the first edition of this book it was also still possible to cover the whole literature on marsupials. That is no longer possible and a small book now must be selective in its coverage and its acknowledgement of sources. However, for most topics and for most groups of marsupials there are now excellent monographs or reviews that enable the interested reader to follow any topic further.

Several themes about marsupials have developed among the people who have studied them during the past 35 years and these resonate through all the work that is described here. The oldest of these themes is the remarkable convergence of adaptations seen in Australasian marsupials and mammals on other continents. When first seen by European explorers these similarities were thought to indicate close relationship but deeper understanding soon showed that these were two independent evolutionary lines responding to similar external imperatives. As well as these large convergences we can now recognise convergences between marsupials from Australasia and those from South America. Within the Australasian marsupials there are also convergences to similar food sources, such as the leaf eating koala, possums and ringtails, or the nectar-eating marsupials from four separate families. However, the most interesting outcome of the new work on marsupials has been a much greater appreciation of how marsupials have adapted to the special conditions of the Australian environment, its unpredictable climate, low fertility soils and unpalatable plants. It is an important and interesting aspect of the adaptive radiation of marsupials in Australia and raises the question how marsupials came to prevail in Australia but shared South America with other kinds of mammals: it also tells us how we must adapt to the land if we wish to live here in the long term, and what we must do to let these long time residents continue to live here also.

Because it is not possible for one person to command a knowledge of so many fields as this book covers, I have depended on the expert advice of colleagues in several fields: while taking full responsibility for what is written, I am deeply grateful for the generous help of Ken Aplin, Bill Foley, Jennifer Graves, Brian Green, Stephen Ho, Peter Janssens, John Kirsch, the late Richard Mark, Lauren Marotte, Jim Merchant, David Ride, Phil Waite, Mike Westerman and Patricia Woolley. For each reading several chapters as a non-expert and thereby helping me to express things more clearly than I otherwise would have, I sincerely thank Meredith McKinney and Nicola Tyndale-Biscoe.

I am also very pleased to acknowledge CSIRO: this great organisation has supported research on Australasian marsupials since 1950 and my own research for more than 40 years, so that much that is discussed in this book stems directly from that support. Then, when I began this book Brian Walker, Chief of CSIRO Wildlife and Ecology, offered me generous and stimulating hospitality to prepare it, and his successors in CSIRO Sustainable Ecosystems have graciously continued to do so, to its completion. At CSIRO Sustainable Ecosystems I have been wonderfully

well supported by many people and I especially thank Alice Kenney for preparing the figures; Margaret Hindley, Trish Kelly, Megan Edwards and Inge Newman for tracking down difficult or unusual references with speed and efficiency; and Andrew Bishop, Brian Davis and Yechiam Marks for leading me courteously through the complexities of information technology. At CSIRO Publishing I thank Paul Reekie for great patience as deadlines passed and Nick Alexander and Briana Elwood for producing the finished work with diligence and despatch. I also thank Alexa Cloud for superb copy editing.

Finally, I thank Marina, who read and commented on every chapter in draft and then read the proofs, and has sustained me throughout the whole saga as one year passed into another and the end remained a mirage too far away: thank you for everything.

Hugh Tyndale-Biscoe
January 2005