

Preface

February 2009 marked the 200th anniversary of the birth of Charles Darwin, a scientist who changed not only his own world, but how we have viewed it ever since. The fundamental importance of Darwin's ideas, not only for scientists, but for society, religion and the arts is demonstrated by the wealth of international events that took place in 2009 to mark this anniversary. In the southern hemisphere a large conference (Evolution – the Experience) was held in Melbourne, Australia, to celebrate Darwin's legacy and as part of this event a special symposium sponsored by Deakin University focussed on the importance of evolutionary theory for our understanding of avian biodiversity. Contributors to the symposium came from the UK, Canada and France, as well as from within Australia. What follows in this issue is a series of five papers documenting central contributions to the symposium.

In Darwin's day mating systems were regarded as traditional monogamous engagements with the offspring representing the joint reproductive fitness of the pair. Nowadays with the advent of molecular techniques we understand how wrong these traditional Victorian views can be, with different bird species showing a range of reproductive strategies. Griffith (pp. 1–9) highlights this in his paper and points out how important an understanding of the true mating system is for assessing the potential for sympatric speciation in combination with genetic compatibility effects. The gaudy colours of birds inspired Darwin to begin to formulate his theories of sexual selection; speculation on the purpose of such colours is the focus of Berg and Bennett (pp. 10–20), who address the evolution of plumage colours in parrots. This class of birds is unusual in showing a combination of bright colouration, but often lacks strong sexual dimorphism and possesses a unique type of

plumage pigment. The central importance of the Australasian region for avian evolution, particularly the songbird group, is highlighted by Christidis and Norman (pp. 21–31). Analyses of the genetic sequence variation across the region demonstrate evidence for mechanisms of speciation originally suggested by Darwin, confirming the importance of geographical barriers and archipelagos for altering patterns of gene flow. In *The Origin of Species*, the arms race between avian host and brood parasite was central to the evidence for evolutionary change presented by Darwin. Langmore and Kilner (pp. 32–38) focus on a relationship examined by Darwin himself in documenting the adaptations and counter-adaptations of the Superb Fairy-wren and the Horsfield's Bronze-Cuckoo in the race to maximise their fitness returns. Herrel *et al.* (pp. 39–47) address the classic avian example of evolutionary adaptation by testing the functional significance of changes in beak morphology in Darwin's finches. The paper confirms the mechanical benefits of adapting skull shape and form, in terms of providing efficient foraging. Darwin would most certainly have been fascinated by the results!

Together, these papers document the fundamental importance of evolutionary theory for our understanding of avian morphology, behaviour and reproduction. On the 200th anniversary of Darwin's birth and the 150th anniversary of the publication of *The Origin of Species*, collectively these papers demonstrate that the field of evolutionary biology continues to reveal fascinating new information on the origins of avian biodiversity.

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