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THE BIRDS OF NORTHERN MELANESIA

By Ernst Mayr and Jared Diamond

Illustrated by H. Douglas Pratt

2001. Oxford University Press, Oxford.

This book may come to be regarded as the single most important publication on evolutionary biology since Darwin's (1859) momentous treatise *On the Origin of Species* by

Means of Natural Selection. Two of the most powerful intellects in zoology today, Mayr and Diamond, have collaborated to produce an exceptional book of far-reaching importance. This work greatly extends our understanding of the processes of avian biogeography and evolution. Here at last we have a holistic study of an entire avian community that provides a template for all future studies. Furthermore, it underscores the value of faunistic studies, which unfortunately have become increasingly unfashionable.

Birds of Northern Melanesia had a 42-year gestation and brings together the two authors' various strengths: evolutionary biology, systematics and speciation (EM) and ecology and biogeography (JD), each with their different but convergent perspectives. Both authors will be familiar to most, if not all, readers for their substantial and prolific contributions in their respective fields of ornithology but with especial emphasis on reporting and interpreting the results of their extensive and ongoing field research, particularly in New Guinea and Melanesia. And that is what makes this book so exceptional. Both Mayr and Diamond have an unrivalled experience of Melanesian birds, both in the field and museum. Consequently, this is not just a theoretical book written from the safety of the laboratory or armchair. These guys really know their subject.

While birders may have hoped that *Birds of Northern Melanesia* was the much-needed field guide to the birds of the Bismarck Archipelago and Solomon Islands, they will be disappointed as its function is clearly not that of a field guide. Ironically, we still lack a field guide of any sort to the Bismarcks and a good one to the Solomon Islands. What, then, is *Birds of Northern Melanesia*? In essence it is an analysis of the processes of bird speciation in the best-studied area anywhere in the tropics. The foundation upon which Mayr and Diamond make their analyses includes a comprehensive range of subjects, clearly and elegantly broken into a series of chapters that are made even more accessible by being gathered into several related parts. These include: a summary of the physical and biological environment in which Northern Melanesia's birds have evolved; the history of human occupation of these islands, from man's first arrival approximately 30 000 years ago to the present day; an assessment of the impact of man upon Northern Melanesian birds, including determining what is the susceptibility of Northern Melanesian birds to extinction and the implications that not-yet-recognised extinctions may have had on distorting the analysis. Part III then addresses, directly, the Northern Melanesian avifauna including: a comparison between the source avifauna that is New Guinea and Northern Melanesia and an examination of the disproportions between these two avifaunas; determinants of island species number; levels of endemism, habitat preference and abundance of each species; a detailed assessment of the dispersal ability of each species over water; and finally each species' distributional

ecology. Part IV analyses the colonisation routes by which birds reached Northern Melanesia and includes a discussion of the ultimate origins of the Northern Melanesia avifauna.

The real guts of the book, however, lies in Parts V and VI. This is by far the longest section of the book and presents the authors' analysis of speciation by species and by island. For example, they categorise each species according to its stage in speciation within Northern Melanesia. Such data are, in turn, used to address questions such as whether ecological segregation usually develops in allopatry or in sympatry. Part VI places the islands under the microscope and carefully asks why some islands have highly differentiated avifaunas whereas others have no endemic species, and why have some water gaps been more effective than others at promoting differentiation. Part VII then synthesises their conclusions. If nothing else, their conclusion, as one might expect from these authors, emphasises the efficacy of the Biological Species Concept. Notwithstanding, of the 195 Northern Melanesian bird species addressed, delineating species is so unequivocal that the application of BSC is straightforward and only three species-groups presented any uncertainties.

Chapter 34, 'Conclusions about Speciation', is masterly in its clarity and lucidity and should be required reading for anyone with even a remote interest in evolution and speciation. However, I found the next chapter on the evolution of dispersal especially fascinating and this leads very neatly to the final chapter on 'Promising Directions for Future Research'. There is enough material in this book alone to occupy several institutions for many, many years to come. And the authors have made it easy by laying out some of the most interesting and pressing questions. All of this is beautifully brought to life by Doug Pratt's delightful plates that illustrate classic examples of speciation within such groups as the white-eyes (Zosteropidae), the Golden Whistler complex (Pachycephalidae) and three groups of monarch flycatchers. In addition, 50 black-and-white maps clearly illustrate related species' distributional patterns and provide an invaluable aid in gaining familiarity with the authors' various discussions, particularly for those not familiar with the geography/biogeography of this region.

Finally, a series of seven appendices is presented that includes a very useful and detailed systematic list of the breeding land and freshwater birds of Northern Melanesia. The latter is invaluable in its own right, although I'm sure there will be quibbles over the lumping of several 'perfectly good species'. Other appendices include a tabulation of the attributes of each bird species and the distributions and origins of Northern Melanesian birds. If you ever had even a momentary doubt about the reality of evolution then this book will lay all your questions to rest.

K. David Bishop

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