


ment of their way of life.

Studies of molecular biology (especially comparisons of the thermal behaviour of strands of DNA taken from representative species and mixed in pair-wise comparisons) have revolutionised the study of bird taxonomic relationships. Among the new findings is the remarkable and unsuspected notion that the world's songbirds fall into two major groups: the corvids (Parvorder Corvida) which originated in the Australian region, and the passerids (Parvorder Passerida) which arose elsewhere. The grey warbler is a corvid and the Old World warblers are passerids. Their similar bill-shapes have arisen independently as a result of 'convergence', not by descent from a common ancestor. They do not belong in the same taxonomic group.

The origin of the corvid songbirds presumably goes back some 90 million years to the Cretaceous when the Australian region (including New Zealand) broke away from Antarctica and drifted north. The ancestral species that gave rise to the Corvida probably reached Australia from Asia 55–60 million years ago. There was an 'adaptive radiation' of these birds into many different forms with shapes and sizes that now resemble those of their northern hemisphere counterparts because they move and feed in similar ways.

The endemic songbird groups of the Australasian region result from adaptive radiation within the area, not from a series of invasions from Asia.

The crows, magpies and jays (corvine birds, family Corvidae) that are now such familiar, everyday birds in Asia, Europe and North America, represent an interesting twist to this story. When Australia got closer to south-east Asia, a successful crow-like species must have crossed the gap from Australia and spread far and wide to give rise to the northern hemisphere corvines — the new evidence suggests that these birds have Australian ancestry. We are so used to the idea that animals spread from the north to our remote part of the world that the reverse process seems surprising.

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Characteristics of the New Zealand Avifauna

New Zealand's bird fauna is dominated by three main elements: the unique land birds, the tube-nosed seabirds and the migratory waders. For examples, see kiwi at left, northern royal albatross at centre, and godwits, right. The members of the first group are the product of isolation, but this has been no impediment to the seabirds and waders.

New Zealand is a mecca and refuge for the oceanic seabirds (albatrosses, petrels and other procellariiforms) which range widely at sea to feed but must find land on which to nest. Approximately two-thirds of the world's species of tube-nosed seabirds are found in Australian and New Zealand waters. New Zealand has a greater diversity of these birds than any other country of a similar size, and the numbers of individuals are astounding. About 2.8 million pairs of sooty shearwaters breed at the tiny Snares Islands, 300 km south of Invercargill. This is said to be more procellariiforms than nest in all the British Isles (partly reflecting the relative unimportance of these birds in Britain as in many other northern hemisphere countries).

Similarly, isolation has been irrelevant for the charadriiform wading birds, many of which are long-distance migrants. Numerous species of waders breed in the northern hemisphere and spend the northern winter benefiting from New Zealand's summertime abundance of food. Certain of these trans-equatorial migrants arrive in such great numbers that they are ecologically important. Some of our waders migrate shorter distances across the Tasman Sea or within New Zealand, and a few are sedentary.