The cost of reproduction in albatrosses

Evolution favours individuals that produce more offspring during their lifetime. Among birds, there is strong selection on clutch size, breeding frequency and longevity. As a result, one seldom finds two closely related species with very different reproductive strategies living in the same habitat. Grey-headed and Black-browed albatrosses are one such example: they are similar-sized congeners that breed together in dense, cliffside colonies at many sub-Antarctic islands. In the 1960s, however, research into their breeding biology found that although both species only lay a single egg each year, most Black-browed Albatrosses attempt to breed annually, whereas Grey-headed Albatrosses that successfully raised chicks very seldom attempt to breed the following year. The two species became typecast as annual and biennial breeders respectively.

Several studies have been undertaken to explain why such similar birds have markedly different breeding strategies. Grey-headed Albatrosses have a breeding season about one month longer than that of Black-browed Albatrosses, largely as a result of slower chick growth. While it is often assumed that this extended breeding season allows too little time for successful breeders to moult and replenish their body reserves in time to return to breed again the following season, Buller's, Waved and Laysan albatrosses take even longer to rear their chicks, yet still manage to breed annually. It seems that the inability of Grey-headed Albatrosses to breed each year is governed as much by conditions at sea outside the breeding season as it is by the actual duration of the interbreeding interval.

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Grey-headed Albatrosses breed more frequently at Marion Island than those at South Georgia, probably because food is easier to find.

What has tended to be overlooked is that Grey-headed Albatrosses are not obligate biennial breeders. At Bird Island, one per cent of pairs do attempt to breed again immediately after raising a chick, and the proportion is slightly higher at Campbell Island, New Zealand. No one has looked at the circumstances surrounding these events, partly because they are rare, and partly because most attempts fail, often early in the season. However, annual monitoring of albatrosses breeding at Marion Island has revealed that more than five per cent of them breed annually. A recent paper in *Ibis* by researchers from the Fitztitute and the British Antarctic Survey attempts to explain the differences in breeding frequency between islands.

Breeding annually can significantly raise the reproductive output of some birds. At Marion, one male managed to raise five chicks in five successive years, four with the same partner and one with another bird. But it may be a risky strategy and, in extreme cases, a bird's life may be at stake. Both adults found dead in the colony during the past 10 years were birds attempting to breed annually. A more subtle cost may be the disruption of existing pair bonds: albatrosses are monogamous, usually retaining the same partner in successive years, and changing partners often comes with a cost in terms of reduced breeding success. Many annual attempts are opportunistic, with only one partner being ready to breed and forming a temporary bond with a new partner. This can lead to confusion in subsequent years, when both the old and new partners are present.

The higher proportion of annual breeding at Marion Island suggests that conditions are more favourable there than at South Georgia. This is supported by higher average breeding success and shorter lags following both successful and failed breeding attempts at Marion. Two factors probably favour reproduction at Marion. The population of Grey-headed Albatrosses is more than 10 times larger at South Georgia, resulting in increased intra-specific competition. Also, birds from Marion may have a more predictable food supply. All of which is good news for the conservation status of the population at Marion and Prince Edward islands. The population breeding there has remained stable over the past few decades, despite the deaths of about 1 000 adults in the toothfish fishery around the islands in the late 1990s. □

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