

Flights of the season

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Bird Migration. By Thomas Alerstam. Cambridge University Press: 1991. Pp.420. £55, \$105.

MORE than anything else, the ability to fly characterizes birds. It imposes on them severe anatomical, physiological and ecological constraints. But it also gives them freedom — not just in a physical sense but ecologically, for they are able to exploit dispersed, patchy and variable resources in a way quite impossible for us earthbound mammals. Starlings clear one bird table and move on to the next; in the countryside they move from field to field, sometimes completely changing the direction in which they fly out from their roosts on successive days, as birds that encountered diminishing food supplies the day before follow their more successful fellows. In winters when their food supplies fail, the seed-eating birds of the northern forests, redpolls, crossbills, nutcrackers and waxwings, move far outside their normal ranges in search of food. Ptarmigan, breeding high in the mountains in summer, move down the slopes as winter advances. In Africa, queleas follow behind the moving rainbelts, so that they can feed on the flush of seeds produced in the few months after rain has fallen.

Virtually all bird migrations are seasonal. As Thomas Alerstam puts it in *Bird Migration*, "Birds migrate because we are tilted at 23.5°." He explains lucidly how this tilt and other aspects of the Earth's yearly round produce both the seasonal and geographical changes in temperature and rainfall that are at the root of migrations and the great wind belts that are so important in determining how particular journeys are made.

The journeys are often stupendous. Arctic warblers from southeast Asia, weighing under 10 grams, move 9,000 kilometres north to breed in the short summer of northern Scandinavia, much of their flight over the scarcely welcoming terrain of central Asia. Each autumn, thousands of millions of birds flood into subsaharan Africa from Europe and Asia. Typically, those from Europe cross the Mediterranean, North Africa and the Sahara in one hop of 50–70 flying hours. North Africa is too dry in autumn for it to be worthwhile stopping and the Saharan oases too few and too tiny. There is even evidence that sedge warblers fly directly to West Africa from southern England, a 70–90-hour journey at 50–60 kilometres per hour. They are generally boosted by favourable tail-winds but even so need to lay down so much fat and extra muscle that their weight at the start of the journey may be almost double its normal value. The winds are largely unchanged, and therefore adverse, in

the spring but North Africa is now verdant, allowing the journey to be made in two stages. Similar journeys, but entirely over water, occur in the Americas. Columbus encountered large flocks of land birds midway between Bermuda and Puerto Rico, part of the great migration across the west Atlantic, which includes some small birds flying non-stop the 4,300 kilometres from Nova Scotia to Venezuela.

The exodus of many species, especially insectivores, from arctic, boreal and even temperate regions at the end of the summer is easily — perhaps too easily — explicable in terms of deteriorating food supplies and physical conditions. But why should they ever move north in the first place? If Africa can support them for part of the year, why not for the whole year? Does the answer simply lie in the otherwise unexploited abundant insect populations of the northern summer?

Turning to the journeys themselves, Alerstam gives a clear exposition of the ways in which birds fly and of how these influence migration strategies. The absence of thermals over water presents us with the great migration spectacles of thousands of soaring birds concentrating at narrow sea crossings at Gibraltar, the Bosphorus and elsewhere. He explains why birds use fat as fuel and how their varying abilities to store and use it determine the length and form of their journeys. He gives a detailed and fascinating account of how birds cope with vagaries of wind and weather, not just choosing under what conditions to migrate but responding during their flight to changing conditions and adaptively varying the altitude at which they fly. But even birds are not perfect and many are driven off course by adverse winds, to delight rarity-hunting birdwatchers.

There are other hazards too. Migrants

Ardea

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Come fly away — flocks of waders setting out from Kent.

Or is competition with African residents important? (And is competition with the migrants a reason for the low densities of some African residents?) Alerstam touches on these ecological questions largely on a case-by-case basis, in a long section in which he considers the migrations of individual species, grouped according to habitat and food. The details and diversity are fascinating, the anecdotes inspiring. Perhaps the diversity is too great for many broad principles to be extracted but one is left longing for a more synthetic treatment of the ecological factors that shape migration. Alerstam, not unreasonably, concentrates on the birds breeding in northwest Europe that he knows so well but one wonders if more ecological insights might emerge if one was to think of them not as northern birds that winter in the south but as southern species that spend a brief period of the year breeding in the north.

crossing the Mediterranean have to run the gauntlet of Eleonora's Falcons, their own breeding delayed so that they can exploit the full potential of the huge autumn food supply. And some just get lost. Alerstam gives a fairly brief (though comprehensive and balanced) account of how birds orientate and navigate. The relatively low emphasis on this aspect is fortunate, for this is a fast-moving area of research and the book has been translated with minimal updating from the Swedish original, published in 1982. That it is somewhat out of date is a disadvantage but it remains useful. It presents both the basic principles and the fascinating natural history — and it does so in a style that preserves the wonder and magic of its subject. □

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