Birdsong: A Natural History by Don Stap

Following one of the world's experts on birdsong from the woods of Martha's Vineyard to the tropical forests of Central America, Don Stap brings to life the quest to unravel an ancient mystery: Why do birds sing and what do their songs mean? We quickly discover that one question leads to another. Why does the chestnut-sided warbler sing one song before dawn and another after sunrise? Why does the brown thrasher have a repertoire of two thousand songs when the chipping sparrow has only one? And how is the hermit thrush able to sing a duet with itself, producing two sounds simultaneously to create its beautiful, flutelike melody?

Stap's lucid prose distills the complexities of the study of birdsong and unveils a remarkable discovery that sheds light on the mystery of mysteries: why young birds in the suborder oscines -- the true songbirds -- learn their songs but the closely related suboscines are born with their songs genetically encoded. As the story unfolds, Stap contemplates our enduring fascination with birdsong, from ancient pictographs and early Greek soothsayers, who knew that bird calls represented the voices of the gods, to the story of Mozart's pet starling. In a modern, noisy world, it is increasingly difficult to hear those voices of the gods. Exploring birdsong takes us to that rare place -- in danger of disappearing forever -- where one hears only the planet's oldest music.

My Personal Review:

_Birdsong_ by Don Stap is an introduction to the amazing world of how and why birds sing the way they do, often centering on the author following world-renown birdsong expert University of Massachusetts professor of biology Don Kroodsma around the country and in the rain forest of Central America. Also covered are the history and science of the study of birdsong (part of a field called bioacoustics), the invention of the audiospectrograph or sonograph, and details of the first birdsong laboratory studies.

Songs are "typically an elaborate series of notes, often musical to our ear" and are almost exclusively delivered by the male of a species,
usually repeatedly for long periods of time. In contrast calls are simple, brief vocalizations made by both sexes to "influence behavior in particular contexts" (whether it be nestlings begging for food or geese honking in flight to coordinate flock movement).

Singing birds are all members of the order Passeriformes, which accounts for roughly 5,500 of the world's 9,000 species of birds. Specifically, "songbirds" are of one of the two suborders of Passeriformes and are collectively called oscines, a group of 4,500-plus species that includes many familiar species such as jays, tanagers, orioles, thrushes, vireos, and warblers. What separates the oscines from every other bird (and indeed, just about every animal on the planet except for some cetaceans) is that most creatures are born with their vocalizations genetically encoded. Essentially, even if they were born deaf they would still vocalize as other members of their species would. Oscines though learn to sing in a manner not unlike how children learn to speak. They listen to adults and practice what they hear until they can repeat it.

Research has shown that songbirds learn their songs in stages. Young birds hear their species song(s) while still in the nest and memorize it an early age even though they make no immediate attempts to vocalize themselves. Experiments in the lab have shown that songbirds are born with an "innate species song template;" they understand instinctively which sounds to memorize and ignore the songs of other bird species.

Soon after a bird is fledged, its first attempts at producing sound amount to little more than "incoherent babbling," a type of vocalization called a subsong, which contains many of the proper sounds of their species song, just not in the right order and likely incomplete. Birds generally stop their subsongs by the end of the summer of the bird's first year, remaining silent until late winter when it resumes practicing once again, producing what is called a plastic song, a rough version of its species song. By spring this has been perfected into the full song. Some species continue to learn variations of their species' song, adopting elements from other birds they encounter, while mimics like mockingbirds and starlings go on learning their entire lives.

Birdsongs and singing behavior can vary in one of two ways, in terms of dialect and repertoire. A bird's repertoire is how many different songs it sings, while dialects are geographically-based variations that occur among individuals of the same species.

The numbers of songs a species has varies considerably. Many species such as chipping sparrows, indigo buntings, and black-capped chickadees sing only one song. The American redstart can sing anywhere from 1 to 8 songs, the eastern towhee 3 to 8, and the cardinal 8 to 12. Some species have huge repertoires; the wood thrush, 20 songs; the Carolina wren, 40; the robin, 100 or more; the sedge wren, 300 to 400 songs; and the brown thrasher, 2,000 or more. Generally among species
with repertoires, one song is sung most frequently and the others are sung with varying degrees of frequency, often in varying order.

Geographic variation in oscine species song can be quite sharp, as with the white-crowned sparrow, which has strong variations in its species song in populations only a kilometer apart, though more commonly it is gradual, as with the Carolina wren, whose song gradually slows over its range south from Ohio to Florida. Dialects are a result of a young bird learning elements of its song from the birds in the area where it establishes itself as an adult. While it learned the basics of its song from its father, the bird makes adjustments after listening to adults in the area it has chosen.

Interestingly, researchers have speculated that among many species there appears to be little or no gene flow across dialect boundaries, trapping birds "on vocal desert islands," with birds of one dialect only breeding with each other, a fact that may promote speciation and explain why songbirds are the most diverse and numerous birds on the planet.

Kroodsma has been a pioneer in studying birdsong in suboscines, a group of birds that is much neglected in the field of bioacoustics. They are the other suborder of Passeriformes and comprise about a thousand species, represented in North America by only a few species of flycatchers but much more common in the tropical Americas, comprising nearly a thousand species of flycatchers, antbirds, antwrens, woodcreepers, and others.

In contrast to oscines, their innate songs are the same from one area to the next; the alder flycatcher's song is the same from the Atlantic to the Pacific. Once early research showed that their generally simple and unmusical songs were genetically encoded and not learned, they were not much researched. Kroodsma felt them unfairly neglected, in large part because the difficulties of fieldwork in tropical forests were a huge disincentive, as well as the fact that far fewer biologists worked in the tropics and there was a language barrier to contend with.

Stap covered in detail Kroodsma's studies of the three-wattled bellbird in Central America, a brilliantly-colored suboscine with a distinctive song. First coming across anecdotal evidence that the bellbird had not only three different dialects but that it also in fact learned its songs, which, if confirmed, would be an amazing discovery; Kroodsma undertook a study of these birds.

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