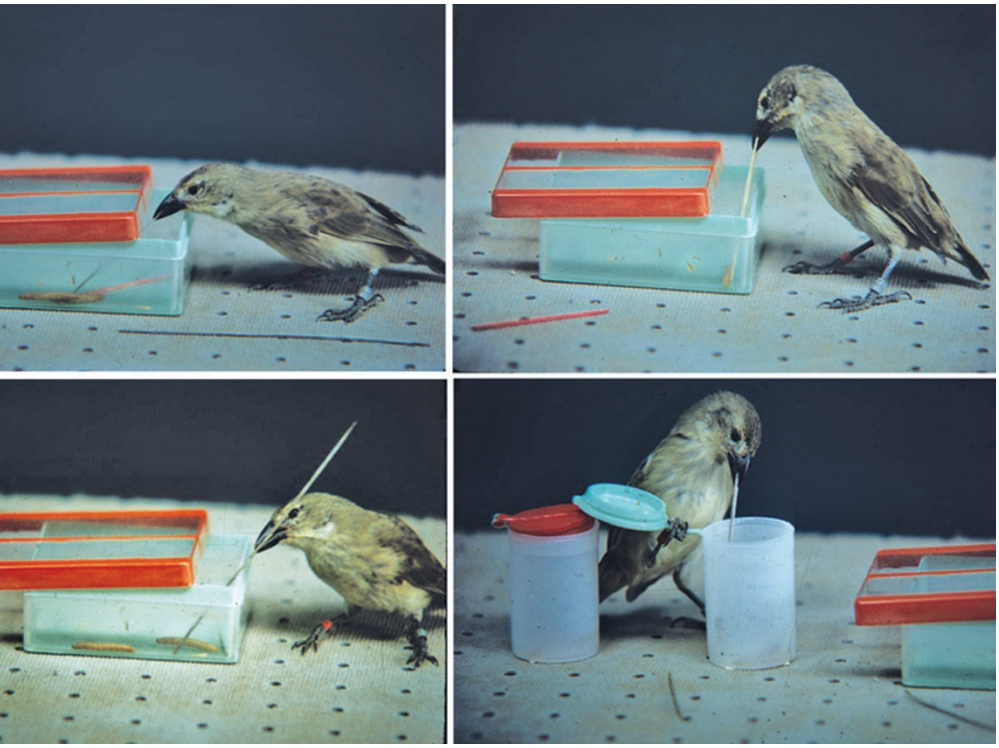

CALIFORNIA ACADEMY OF SCIENCES

Studies of birds such as the woodpecker finch (*Camarhynchus pallidus*) have aided a range of fields.

ORNITHOLOGY

Under their wing

Ben Sheldon relishes a study of the broad-ranging impact of ornithology on modern biology.

The study of wild birds has had a disproportionate impact on the birth and evolution of several branches of science. Thus argue Tim Birkhead, Jo Wimpenny and Bob Montgomerie in *Ten Thousand Birds*.

In chronicling the development of ornithology over the past 150 years, the authors face the challenge of encapsulating a broad and diffuse field. Just how broad can be seen in the questions it tackles today, which span global-scale macroecology of all birds, detailed individual-level behavioural variation, the physiology of migration and the genomics of speciation. Birkhead and his colleagues — all behavioural ecologists — eschew both the obvious chronological approach and the option of presenting potted scientific biographies of 'great ornithologists'. Instead they pick, from the 380,000 papers on birds put out since Charles Darwin published *On the Origin of Species*, 11 areas in which avian research has illuminated broader questions in biology.

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Ten Thousand Birds: Ornithology Since Darwin
TIM BIRKHEAD, JO WIMPENNY AND BOB MONTGOMERIE
Princeton University Press: 2014.

Birkhead, Wimpenny and Montgomerie hope to stimulate debate over which areas ornithology has contributed to most, but the ones they have chosen will surely appear on most lists. They range from palaeontology, speciation and systematics to physiology and comparative anatomy, by way of ethology, behavioural ecology and conservation.

Research on wild birds has been key to understanding population dynamics, thanks to the ease of marking and identifying individuals. Swedish ecologist Malte Andersson's 1980s field experiments on the long-tailed widowbird (*Euplectes progne*) — in which longer tails in males were found to endow increased breeding success — ushered in a new phase of research into sexual selection. Similarly, birds have been inspirational subjects for studies of natural selection ever since US biologist Hermon Bumpus found a link between morphology and individual survival in a flock of sparrows caught in an 1898 Rhode Island snowstorm. Even research on phenomena found only in birds offers general scientific insights: for instance, the elucidation of the mechanism behind the magnetic sense in avian navigation serves as a model for sensory physiology.

This is a serious book that manages to be compulsively readable. The authors are at their most vivid when offering vignettes of individuals or specific events from the modern history of ornithology: pivotal moments of discovery or the presentation of new ideas. Some are familiar. We have British evolutionary biologists David Lack and then Peter and Rosemary Grant successively exploring the evolution of Darwin's finches from the 1940s to the present, and the explosion in discoveries of fossil birds in China since the 1990s. Such cases act as scene-setters in each chapter, and are supplemented by wonderful, less well-known examples. We meet, for instance, the wealthy Hungarian palaeontologist Franz Nopcsa von Felsö-Szilvás (whose theories on early bird flight were influential), who in 1907 crossed Albanian rivers disguised as a shepherd and using an inflated goat's bladder as a flotation device. There is a fine description of ornithologist Charles Sibley striding arrogantly into a 1986 conference bearing a tapestry-sized poster illustrating his revolutionary new avian phylogeny. The book is beautifully illustrated, and also contains charmingly candid autobiographical sketches contributed by more than 20 of today's leading ornithologists.

How did ornithology come to have such a large impact on other areas? The answer seems to lie in the fact that young people with an interest in the natural world are attracted to observing birds, and the ease of studying them. With this in mind, two themes could have been developed further. The first is the importance of birdwatching in the early lives of many scientists who went on to excel in other areas, such as James Watson, co-discoverer of DNA's double helix, and evolutionary biologist Ernst Mayr. The second, which could fill another book, is the huge contribution of non-professionals. From the pigeon fanciers who influenced Darwin to today's army of digitally empowered citizen scientists collecting swathes of distributional and abundance data, amateur ornithologists have built the foundations of the modern science, and enabled its impact in so many other fields. ■

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