Book Reviews

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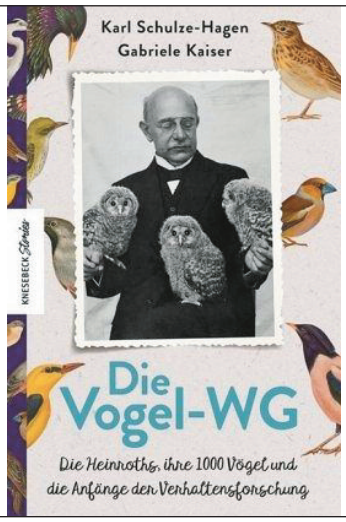
Schulze-Hagen K. & Kaiser G. 2020. Die Vogel-WG: Die Heinroths, ihre 1000 Vögel und die Anfänge der Verhaltensforschung. Knesebeck, München. Hardcover with bookmarker, 272 pp.
ISBN 978-3-95728-395-5. €27.14.



In the early 20th century, the chances were more than even that libraries of serious birdwatchers, professional and amateur alike, held the four-piece set of Die Vögel Mitteleuropas. Large format books, printed on high quality paper, lavishly illustrated with slightly more than 4000 photos on special sheets, and including 160 coloured plates made by the artist Erich Schröder. A monumental and unusual handbook, the result of 28 years of hard work by Magdalena Heinroth and her husband Oskar. This was no ordinary handbook. It described the growth, development and behaviour from egg to fledgling of 286 Central European bird species. All these birds were hand-raised, mostly by Magdalena, and photographed in standard postures in all states of their early life. Each year some 30 to 35 chicks were raised, usually from eggs taken from the wild and incubated by hens, pigeons or an incubator. Imagine the patience and time needed to care for tiny passerines like Goldcrest, as well as for slow-growing species like eagles, herons and cranes. Finding sufficient food of the right composition must have been a logistic nightmare, only partly solved via their connection with the Berlin Zoo, not to mention warming and feeding naked nestlings. Nights were consequently short and being allergic to dust from bird feathers Oskar was increasingly plagued by respiratory problems. Magdalena died just before the fourth volume – not anticipated when the project was started but deemed necessary to cover missing species or augment earlier volumes (such as Spoonbill, of which eggs were obtained from the Dutch nature reserve Zwanenwater in early July 1927, with permission of the conservation society Natuurmonumenten) – saw the light of day. Their publisher, Hugo Bermühler, took an enormous risk in publishing the monthly instalments (altogether 80, to be bound in book covers provided by the publisher after the project was finished), especially considering the worldwide economic crisis lasting from 1923 to 1929. Producing expensive books could not have been planned at a worst moment in time.

The in-depth study of the Heinroths was a standard reference for early bird students. In the words of Margaret Morse Nice (1979: 115–116): "Everywhere in European ornithological literature one finds the Heinroths quoted as the authorities on life-history matters." But their magnum opus has faded from the radar of present-day ornithologists and birdwatchers. In his search of the genesis of 'Die Vögel Mitteleuropas' Karl Schulze-Hagen accidentally stumbled upon the legacy of Oskar Heinroth in the state library of Berlin, consisting of personal notes and original photographs. This is nothing short of a miracle, as the belongings of the Heinroths – deposited in a cellar of the Berlin Zoo – had been ransacked several times during the last days of the Second World War. Some of this material had already been used for a biography of Oskar Heinroth by his second wife, Katharina Heinroth (1971). The present book provides new information and many never-before published photographs of the circumstances under which the birds were raised (including classics, like the Nightjar breeding on the carpet in the living room). Biographical sketches inform the reader of the background and execution of the project up to and including publication. Although Oskar was definitely interested in evolutionary and biological questions (e.g. moult strategies, behavioural development, life history strategies), he never formulated a framework to formalize his ideas (as was done by Konrad Lorenz and especially Niko Tinbergen, both indebted to Heinroth) nor did he establish a 'school' to propagate his science (as Tinbergen did). In fact, the nearest he came to wrestling general ideas from observations were his comparative studies on the biology and psychology of Anatidae (still quoted today, published in 'Berichte über den V. Internationalen Ornithologischen Kongress',

Berlin 1910: 589–702) and the relationship between bird and egg mass and incubation time (1922, J. Ornithol. 70: 172–285). In contrast, 'Die Vögel Mitteleuropas' is essentially descriptive and partly quantitative with weights and measurements from hatching till after fledging summarized in tables. The well-chosen extracts from the species texts provided in the second part of 'Die Vogel-WG' illustrate the point. The love for the birds in their care is plain to see, although many ended up in the cooking pot or as a specimen in the museum's collection, either as skin or part of the menagerie. But also the stress and failures are detailed, the adventures, the bird's step-by-step growth and development (hence the long subtitle of the handbook: 'in allen Lebens- und Entwicklungsstufen photographisch aufgenommen und in ihrem Seelenleben bei der Aufzucht vom Ei an beobachtet'), field observations even, romantic asides and the occasional reference to homologies between species. As the work progressed under an extremely tight schedule, the narrative style is unpolished, even rambling in places. This may deter some readers, but it also adds a special flavour to something that is already special in itself. Quotes and anecdotes from 'Die Vögel Mitteleuropas' inevitably pop up when watching bird behaviour in the field, a reminder of the impressionistic style of the stories.

The Heinroths's opus magnum was, and still is, compulsory reading for anyone interested in the life-history of birds, just as it was for Stresemann, Kortlandt, Tinbergen, Lorenz, Morse Nice, Verwey and all those pioneers in ornithology, especially in behavioural ecology (then named ethology or animal psychology). The good news is: the first edition probably amounted to 5000 copies and an exact reprint was published in 1966–1968 by Edition Leipzig. There is no scarcity of copies in the used-books circuit. And German not part of your curriculum? Another reason to start learning German pronto. 'Die Vogel-WG' can be used as an attractive appetizer.

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Morse Nice M. 1979. Research is a passion with me. Consolidated Amethyst Communications Inc., Toronto.

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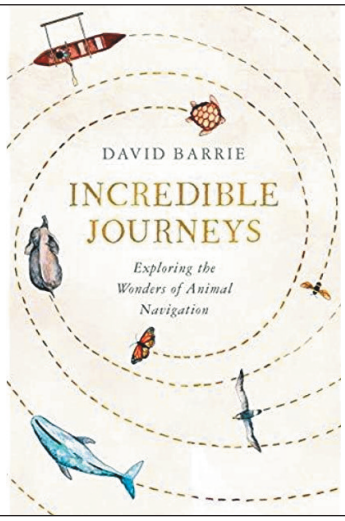
Barrie D. 2020. Incredible journeys. Exploring the wonders of animal navigation. Hodder & Stoughton, London. 323 pp. ISBN 9781473656857. €15. (Published separately in the USA as 'Supernavigators. Exploring the wonders of how animals find their way'. The Experiment, New York.)



The phenomena of animals displaying a sense of direction (orientation), and successfully travelling between locations that matter to them (navigation), take place at all spatial scales on offer on Earth. Orientation and navigation involve a bewildering variety of sensory and processing mechanisms; they represent a huge research field with advanced and sophisticated specialisms, another reason for bewilderment. Inspired by a lifelong fascination with oceanic navigation-without-GPS, sailor-scientist-storyteller David Barrie takes us on a fantastic journey into animal navigation, easing some of the perplexity along the way.

Taking his examples from all walks of animal life, not just birds, Barrie presents his case in three sections, with respectively 17, 8 and 2 chapters each. Every chapter is capped by a natural history story, introducing many examples of the surprising ways and capacities of moving animals, ranging from a homing sheepdog to dragonflies migrating across the northern Indian Ocean. Each of the chapters has a focus on a phenomenon, and several are enlivened by travel stories to reach navigation scientists at work in the field or in the lab. This brings in a range of personal perspectives.

In the first section on 'Navigating without maps', Barrie introduces the principles of reconstruction, by the summed lengths and orientation of step-lengths, of one's position relative to the starting point of a journey. This technique is called 'dead-reckoning' and may

derive from 'deduced reckoning', but as the term dates from the 17th century, the author reckons "it was coined by an Elizabethan sailor with a dark sense of humour". Dead-reckoning was notoriously imprecise. In the first section he also reviews the ways by which animals orient themselves in space on the basis of information in the sky (Sun, stars, Moon and polarization patterns), the air (smells and sounds) and in the 'ether' (magnetism).

The second section is on 'The holy grail', bringing together the evidence that birds, sea turtles and some other animals do actually possess (programmed in the genes?) or acquire (by targeted learning in the course of their lifetimes?) maps of a kind. The section rounds up with a discussion on the mysteries of arguably the biggest contender for providing the base of maps, the magnetic sense (Mouritsen 2018). How does it work, where is it located, what are its brain equivalents, and what does it all mean for the human animal? Perdeck's (1958) Starling *Sturnus vulgaris* displacement story in Ardea, as so often, plays a leading part, and is granted a figure with the schematic map of key findings. Barrie is not alone (see Piersma *et al.* 2020) in repeating the misunderstanding that Perdeck himself concluded, on the basis of the different recovery locations of juvenile and adult starlings displaced from The Netherlands to Switzerland during autumn migration, that "the capacity for 'map and compass' navigation was innate". The confusing issue of whether behavioural traits are 'possessed at birth' (i.e. one possible definition of 'innate'), or 'acquired during a lifetime', underlies several of the accounts in the book, but is not made explicit. Will this fundamental biological problem, along with the mechanistic basis of a, or several, magnetic sense(s), be revealed in the years to come? Are Cuckoos *Cuculus canorus* really the lone migrants born with inherited geo-referenced maps – as they are portrayed in this book as much as in the scientific literature (e.g. Thorup *et al.* 2020)?

The final section is called 'Why does navigation matter?'. It laments the loss of navigational capacities in humans growing up with GPS-based navigation tools. Barrie not only points out the sheer fragility of GPS-like systems, but is also worried by the lack of navigational schooling in modern humans now that everybody is using a phone that is so much more than a phone. Our 'common sense' of the world around us, and the interpretive abilities to help us navigate, have generally become lost. Indeed, the Polynesian seafarers sailing the entirety of the Pacific, had 20 years of apprenticeship before being considered skilled navigators (Crowe 2018). In the final chapter 'So where are we going', Barrie cannot help but formulate his apprehensions about the state of our global ecology - from herbicides compromising the navigational abilities of honeybees to migratory shorebirds rapidly losing staging areas in coastal China. His last words: "In researching and writing this book, I have again and again been struck dumb with admiration by the extraordinary skills of the animal navigators that are its stars. Even if our own lives did not depend on the health and vitality of the planet we inhabit, the preservation of the almost infinitely complex web of life from which such wonders emerge is surely an ethical imperative."

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Macdonald B. 2019. Rebirding: rewilding Britain and its birds. Pelagic Publishing, Exeter. Hardback with dust wrapper, XII + 275 pp.
ISBN Hardback 978-1-78427-187-9
(also available as ePub and PDF). €21.99.

Something strange is going on in nature conservation. Not a century ago conservationists were few and far between, often voluntary or under-paid, day and night busy with saving bits of land from rampant destruction and trying to influence legislation in favour of nature protection. This is a far cry from present-day conservation, which has multiplied and diversified to such an extent that it has become an industry, involving huge amounts of money and providing job security for a veritable army of – mostly desk-hugging and paper-loving – people. These people know exactly what's wrong with today's nature, and equally know how to set nature straight. 'Rebirding' is a typical example. Rebirding is, of course, an allusion to rewilding, the present plaything of the nature industry.

Macdonald sets out to show the desperate state nature – or more particular: the avian section of nature – is in. And indeed, this is not a heart-lifting story, especially when the past is taken as a reference. Not surprisingly, the non-existing Anthropocene pops up as part of the problem. This is particularly convenient, as it allows conservationists to 'correct' human-caused destruction, for example by 'rebirding'. Hence the conservation industry. Massive amounts of money are wasted by producing paperwork on how to introduce or reintroduce missing or lost species. These species are mostly feathery or furry, as well as large or high profile. Public and government can only be coerced into spending money on attractive species, hence the love for pelicans, cranes, bustards, grouse, raptors and the like. High profile species are often put forward as 'keystones' for entire ecosystems: the benefits of saving such species trickle down the trophic ladder, and lo and behold, the ecosystem restored, despite the fact that no scientific evidence supports such a view (the few papers stating otherwise are based on tiny parts of the living world).

The reasoning for another kind of nature conservation in 'Rebirding' is not always easy to follow. Why reintroductions or restoration should commence, and with what means, is enthusiastically related (even to the point that it is stated that "we know what works", a bit overconfident to say the least), but on the other hand the 'targets' set by nature conservation bodies are – justly, I must say – described as "fearfully controlled management that thwarts any exiting future". Nature conservationists nowadays are mainly acting on hope (as Macdonald also proclaims), pro forma covered by fragmented science. In fact, nobody can tell (or even bothers) what specific bird protection (say: managing reserves for Black-tailed Godwits) means for the unknown multitude of other life.

In his enthusiasm Macdonald is prone to be gullible and/or selective. One of his cases to show a "remarkable resurgence of birds" is the Oostvaardersplassen. Having first-hand experience with this small nature reserve myself, albeit only in the dry zone, it was surprising indeed to see all the myths and fables surrounding Oostvaardersplassen repeated, and enhanced with wrong factual information and analogies. The propaganda about Wolves, Boar, species richness and diversity, proxy animals, open mosaics and similar nonsense is literally repeated. This takes hilarious forms when contrasting Oostvaardersplassen with British nature reserves, up to the point that Oostvaardersplassen is stated to have "more tree-dwelling birds species than in most British woodlands". Remember: trees have all but vanished from the dry zone, and the loss of trees resulted in the near-loss of tree-dwelling bird species (only 26 pairs of Chaffinches in 2012, for example, on 2000 ha, and zero (0) Tree Pipits, Robins, Lesser Spotted Woodpeckers and Goshawks, although the latter two are specifically mentioned by Macdonald), and so on. The fact is: the distinction between real life and virtual life disappears when ideologists take over, and this is exacerbated by journalists not doing their homework. This may also explain why Macdonald states that The Netherlands is now home to 40 breeding pairs of White-tailed Eagles – with the unspoken suggestion that Oostvaardersplassen played a key role – whereas in reality 19 pairs were

recorded in 2019 (of which 12 nested; Werkgroep Zeearend Nederland).

Overall, 'Rebirding' is one of many well-intentioned pleas to start taking nature conservation seriously. As such, it is a good read which should, however, not be taken too seriously. Good reasoning is alternated with nonsense, facts not always discriminated from fiction (hence, readers should check the original sources, and search for óther sources as biology is riddled with poor and contradictory science). And, perhaps even most importantly, it should be borne in mind that the book is about birds, i.e. a tiny part of all life. To base nature conservation on birds alone is ludicrous, to do so on just some birds even more so.

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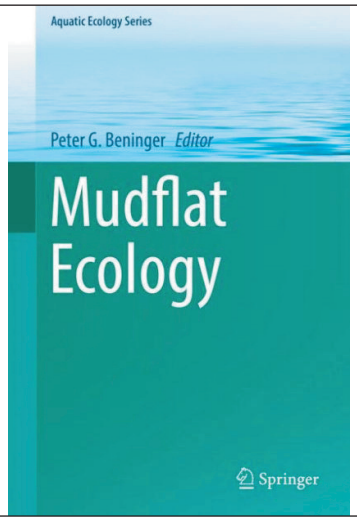
Beninger P.G. (ed.) Mudflat Ecology. Springer Nature, Switzerland. Hardback, 429 pp.
ISBN 978-3-319-99192-4. €174.39.



"Mud is beauty in the making". With this phrase, after a poem of R.W. Service, 'Mudflat ecology' sets the tone for an appraisal of intertidal mudflats. Mudflats, as the various authors ("the mud club"!) in this monograph passionately argue, are not wastelands, but are highly-productive marine habitats, providing important ecosystem services. Moreover, mudflats are ecosystems with intriguing interacting physical, chemical and biological processes, worth studying. With the conviction that scientists of various disciplines should work together to make progress, this 429-page book covers a large variety of topics, including chapters on geology, microbiota, meia- and macrofauna, sedimentary processes, parasites, fisheries (but interestingly not fish) and, of course, shorebirds.

The shorebird chapter is written by Kimberly Mathot, Theunis Piersma and Robert Elner. In line with the scope of the book, together with a plea to redirect from the strong ornithological focus prevailing in shorebird science, the chapter highlights the integrating role that shorebirds play in mudflat food webs. Taking the morphology, physiology and behaviour (i.e. foraging mode) as a starting point, the authors discuss how shorebirds occupy a central place in mudflat trophic webs. Continuing on this line they illustrate, with examples from various mudflats, how shorebirds have a major predatory impact on their benthic prey populations (although quantifying this impact remains challenging) and benthic communities. They discuss how shorebirds may alter mudflat biogeochemistry and benthic communities and how shorebirds can have chemical impact on mudflats by defecation. The second part of the chapter focuses on how shorebirds integrate information on multiple fitness-relevant parameters (food and safety) when selecting intertidal habitat. Examples of how anthropogenically-disturbed mudflats in the Yellow Sea have various (although primarily negative) effects on shorebird populations and how climate change in the Arctic may have (cascading) consequences for mudflats and shorebirds are also discussed.

The most original aspect of the shorebird chapter is the focus on biofilm grazing. Only recently, it has been shown that shorebirds directly 'graze' the biofilm (the thin, matrix-enclosed community of microphytobenthos; Kuwea *et al.* 2008). It means that shorebirds are not only secondary consumers, they are also primary consumers, adding increasing levels of complexity to system understanding. Also, potentially this foraging mode could dramatically alter the physical structure of mudflats. Biofilm feeding appears most prevalent in small shorebirds ('peeps'), but all shorebirds appear

functionally able, and likely, to graze biofilm. Peeps, and biofilm grazing shorebirds, mainly occur in the American flyways. The authors hypothesise that small shorebirds are less abundant in the African-Eurasian flyways because they face high competition with other biofilm grazers.

Because all shorebirds, directly or indirectly rely on biofilm as a food source, the authors argue that biofilm is a critical component of habitat quality. Conservation planning needs to include protection of underlying processes shaping biofilm communities, and future work on shorebirds should focus on identifying and modelling the links between food web complexity and ecosystem resilience. Note that the authors take up their own challenge; they show for instance in a recent publication that the timing of migration of Western Sandpipers *Calidris mauri* coincides with a peak in biofilm (Schnurr *et al.* 2020).

The main goal of 'Mudflat ecology', published within Springers' Aquatic Ecology Series, is to establish mudflat ecology as a true, diverse, yet intrinsically and necessarily coherent, field of study. I think the various authors have made a good attempt at establishing a comprehensive synthesis on mudflat ecology, on the processes at lower trophic levels. I liked the emphasis throughout the book on the relationships between various components of mud, i.e. that physical processes and biological processes interact in a complex manner with the hydrodynamic regime. The book radiates a passion for mud, but given the often detailed and in-depth information on the large variety of topics it remains a book for scientists. The text often requires quite a bit of existing knowledge and should be read with attention. Unfortunately, to my taste, the figures and layout are not particularly appealing and add to the book's 'ivory tower' flavour.

The book ends with an appreciation of 'classical' fieldwork and descriptive studies, "which remain key to move science forward and deserve our consideration and respect". The authors state that "unfortunately, this glaring, fundamental truth will (….) be ignored by blinkered (…) journal editors". As an editor of Ardea I cannot agree more (see Bijlsma *et al.* 2014).

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