What Were They Thinking? Is Population Ecology a Science?

Author: Gowaty, Patricia Adair

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between-individual, and individual—and how their conclusions converge. It is hard to put this book aside without being convinced you have seen competition in the wild as a reality.

The book addresses data from bird studies in particular. The reader must, however, be aware that "birds" in this context is largely equivalent to tit and titmice species (genus *Parus* before it was recently split into several genera). As early as page 4, the author exclaims "Tits come to rescue." Other species do come in, but it is abundantly evident that André Dhondt primarily thinks in terms of tits and titmice. The selection of material may seem narrow given the title, but this is no coincidence. In fact, the concentration on this genus is due to the fact that no other bird genus is likely to have been studied more intensively on different levels of organization in the field. Several *Parus* species that differ in many aspects of their ecology have a long history of study. To a large extent, this book is an excursion in behavioral ecology from a tit's perspective. Overall, a focus on the tits—and, in particular, the quality and diversity of data from these studies—allows a coherent approach to the role of competition, and it comes out more as a strength than a limitation of the book. The combined weight of these data makes it possible to link processes governing inter-individual relations on different organizational levels.

The book's title promises to address interspecific competition, but this is treated with great latitude. Interspecific effects do get their share. We are, for instance, presented with the unique long-term data on how the Great Tit and the Blue Tit mutually affect each other's numbers. Yet considerable attention is equally given to within-species competition and individual behavior, and this allows the treatment of competition to be more than an excursion in the theory of mutual influence on numbers. Dhondt can dissect in incisive detail how the presence of competitors profoundly governs how individuals go about securing their survival and how they invest in reproduction. In this he can draw heavily on the emergence of behavioral ecology as a separate field of study. Dhondt is exceptionally well placed to draw together this information with his own *Parus* studies, which straddle population biology and behavioral ecology. The book relies on the progression of approaches to competition in studies of bird populations in the wild. Competition studies were initially based on population census data aimed at detecting density dependence, reflecting the influence of David Lack. With the emergence of behavioral ecology, the census data were complemented with studies of social organization and strategies on an individual level. Here, Dhondt goes beyond the idiosyncrasies of the single studies to show their relevance for population dynamics and community structures.

André Dhondt has done us a great service in bringing all this information between two covers. If there is any weakness of the book, it is a Northern Hemisphere bias. Extrapolating conditions from the largely temperate and boreal environments of the Northern Hemisphere to the largely tropical and subtropical environments of the Southern Hemisphere requires a leap of faith. The author cannot be blamed for this, for it reflects the state of the art. The limited geographic distribution of population studies of birds in general, and of *Parus* species in particular, should serve as an incentive for future studies. This book provides a rich source of ideas and should serve as inspiration for any young biologist who aspires to study population biology in the wild. In particular, it is successful in managing to express in plain terms how the presence of competitors is manifested in the everyday life of an individual. It has a natural place on the desk of any biologist interested in the role of competition as a structuring force in nature.—Jan Ekman, *Department of Ecology and Genetics, Evolutionary Biology Centre, 752 36 Uppsala University, Sweden, Norbyv. 18d, 752 36 Uppsala, Sweden. E-mail: jan.ekman@ebc.uu.se.*

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What Were They Thinking? Is Population Ecology A Science?—Bertram G. Murray, Jr. 2011. Infinity Publishing, West Conshohocken, Pennsylvania. xiv + 289. ISBN 0741463938. Paperback, $16.95.—I admit that I love a good argument, not to mention a portrait of courage, and we get both in Bert's last book. In life Bertram G. Murray, Jr., was always challenging: I cannot remember a meeting or a phone conversation we had in which he did not have an intellectual ax to grind. He was singularly creative and demanding, and now all readers of the posthumously published *What Were They Thinking?* can take a look at some of the remaining questions from Bert's perspective. From the grave Bert's words appear, offering us a hand, speaking to those of us who ignored or failed to comprehend his work. So what if his tone is defensive—he had the courage to tell us what he thought. He reaches out to those of us who were not fair to his work and those who failed to *openly* criticize it. As Bert was dying, he resolved to speak after death even to those who dismissed his work as if it had not been done. Great credit for helping Bert achieve his goal goes to Joanna Burger and Joseph R. Jehl, Jr., who saw this book to publication months after Bert died.

I found Bert's papers, his rebuttals to anonymous critiques, and his philosophy demanding, just as he was in life, but also insightful: I learned a lot. By making sure that even his rejected papers were published, Bert showed his faith in the social, ethological aspects of science. You know: science is cooperative, and if our work remains unpublished, it's not science. I, for one, am sorrier than ever that I did not take more opportunities to know Bert's work while our colleague lived. He pleads with us to enter the fray of discussion and explain his errors: "My intention is to advance my science by having my views about ecological theory readily available for others to judge" (preface, p. *viii*).

Each chapter of Bert's last book is about something he was passionate about. The first chapter, "Philosophy," is an introduction to what I consider exciting stuff. Here we glimpse the trailings of Bert's intensely intellectual life: it is a distilled primer of the great philosophers of science, particularly Popper, with whom all scientists should be familiar. I welcomed too the discussion of inductive and deductive hypotheses, and their conceptual differences and efficiencies that few of my new graduate students readily grasp. Could it be we're not teaching undergraduates the logic of scientific discovery? This chapter could

be useful to those students. The second chapter, "Population Dynamics without Regulation: A New Equation," reviews work from Murray's 1979 book and shows many results generated by a single, versatile equation that goes beyond the predictions of S-shaped population growth. The premise of Chapter 3, "Life-history Tables and Life-history Theories," is that "life-history tables provide a foundational structure for testing life-history hypotheses" (p. 71), and from this came the study of clutch size in Prairie Warblers (*Setophaga discolor*; Murray and Nolan 1989) with its handy equation that uses other demographic parameters to predict clutch size. This equation, number 9, came out of Bert's "third law of evolution":

> Selection favors those females that lay as few eggs or bear as few young as are consistent with replacement because they have the highest probability of surviving to breed again, their young have the highest probability of surviving or both. (p. 99)

For me this law rings familiar because my own "compensation hypothesis" (2008, Journal of Evolutionary Biology doi:10.1111/j.1420-9101.2008.01559.x) says that females facultatively increase clutch sizes at an energy cost whenever their offspring are likely to suffer lower viability than other females' offspring. No, I didn't know about Bert's work. Like most readers, I was not familiar with his third law of evolution when I crafted my hypothesis. Nevertheless, the similarities make it easy for me to understand why Bert had pushback about his law claiming that females are going for replacement rather than maxed-out reproductive success. For some readers it is a counterintuitive idea. But both our ideas are testable using methods of experimental evolution in tractable model animals like *Drosophila* or even in birds, as he did with a population of Prairie Warblers. I believe Bert would be happy to know that a test of the predictions of his idea and an alternative is possible. Chapter 4 predicts the "Demography and Population Biology of Ivory-Billed Woodpeckers," rejected from *The Auk* in 2006 and first published in this book. I cannot imagine why anyone would not be interested in a theoretical treatment of the life history of a potentially near-extinct species, for therein resides a "bold conjecture," otherwise known as an "educated guess," about the likelihood of their survival, and the news was not all bad. Chapter 5, "Clutch Size and the Length of the Breeding Season," explains how his analytical solution to the problem of clutch size comes to predict what we frequently observe, namely that clutch sizes of passerine birds are smaller in the Southern Hemisphere than in the Northern Hemisphere. Chapter 6 takes up the math of the Mayfield method and Bert's responses to his critics. I have been interested for a long time in the lack of care and collegiality of reviewers in the face of "outside the box" authors. Here lies fodder for the historians of ornithology. Chapter 7 is a further discussion of the logic of scientific discovery. Henceforth, I will ask my graduate students to be familiar with it. Chapter 8 is about weighty issues of "mass" and "weight," and this too our graduate students should read, and act accordingly.

With this review I invite you to read Bert's last book. All of us who take his advice and read him seriously will stand on Bert's scientific shoulders, and we will see farther than before.—Patricia Adair Gowaty, *Ecology and Evolutionary Biology and Institute of Environment and Sustainability, University of California, Los Angeles, California 90095, USA. E-mail: gowaty@eeb.ucla.edu.*

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Seabird Breeding Atlas of the Lesser Antilles.—Katharine Lowrie, David Lowrie, and Natalia Collier. 2012. CreateSpace/EPIC, Charleston, North Carolina. 221 pp., 78 tables, 48 text figures, and four appendices. ISBN 1466204379. Paperback, $48.00.—It would be difficult to write a better review of this book than the exuberant and well-deserved words of BirdLife International's David Wege in the foreword (p. *xi*). This atlas is an excellent supplement to the previous work by Bradley and Norton (2009), reviewed previously in *The Auk* (Schaffner 2010), and the prior descriptions of the seabird populations of the Caribbean (van Halewijn and Norton 1984, Schreiber and Lee 2000). This work, however, has a very specific focus on the Lesser Antilles, beyond the Puerto Rico Bank (excluding the U.S. and British Virgin Islands), in the region we often call "down island," from Anguilla in the north, southward to Grenada.

This book is a contribution of EPIC (Environmental Protection in the Caribbean; www.epicislands.org/home), and the field studies were led by Katherine and David Lowrie based from their sailboat, the *Lista Light* (www.listalight.co.uk), which itself is operated as a nongovernmental organization. Natalia Collier collaborated in all aspects of the planning and field protocols, and in data analysis and final writing of the manuscript.

Land- and water-based surveys for all breeding seabirds and invasive predators were conducted in areas where there were gaps in the recent literature. Surveys were conducted for over two years, with one survey in winter and one in spring–summer for each site to account for varied breeding seasons. Local media, technical training, and presentations were used to raise awareness of seabird and marine conservation issues, and volunteers were incorporated in the field work. Local partnerships were an essential component to the success of this effort, and the results were provided to participating island governments and nonprofit agencies as well as regional bodies. All islands were surveyed directly, except for the French-speaking islands, in which case the authors relied on government information and the literature. The authors surveyed more than 200 islands and cays and actually landed on at least 150 of them.

By systematically documenting the breeding seabirds of the rapidly developing Lesser Antilles, the authors created the first comprehensive regional perspective on seabird populations using a consistent methodology during a discrete period. The authors used the "*K*-values" and the "peak time multiplier" concepts of Chardine (2002) to standardize their results for some situations, particularly in cliff-nesting Red-billed Tropicbirds (*Phaethon aethereus*