

# Revolutionary zeal

Daniel H. Janzen

**Plant Ecology.** Edited by Michael J. Crawley. *Blackwell Scientific*: 1986. Pp.496. Hbk £35, \$55; pbk £16.50, \$29.95.

MICHAEL Crawley set out to put together a plant ecology text for the undergraduate, a text that would haul itself out of the musty bog of old world descriptive and aggregate plant ecology and into the chaos of new world evolutionary and ecological biology of plants as individuals and populations. He was generally successful. However, about half of the (very competent) contributors did not fully share or appreciate Crawley's legitimate zeal for this revolution in the way plant ecology is taught in English universities. Many seem to have taken the task on as an "assignment" or as a chance to get a fat review manuscript into print. Were I an undergraduate discovering plant ecology through this book, I think I would be mostly bored. Give the Crawleys of the world the time and resources to write such texts straight through, with a pedagogical, as well as a factual, goal in mind.

The book is built on summary statements, with occasional examples. However, the authors are sometimes not familiar enough with the biology of the examples to avoid over-generalizing. After being told that in animal ecology "the individuals are assumed to blunder about at random", we are informed that "plants compete strongly with only the six or so individuals in their immediate vicinity" (p.253) — someone forgot about competition for pollinators and dispersal agents. And we are told that "strictly speaking, no animals are adapted for pollination" (p.187), when hundreds of species of fig wasp (Agaonidae) are unambiguously adapted for pollination of figs, by any definition of either "adapted" or "pollination".

Again, it is stated that "theory predicts that maximal species richness should occur in moderately resource-poor habitats, habitats that have just enough resources for species survival in the absence of interspecific competition" (p.59). Such a theory is incompatible with the decreasing gradients in plant species richness up the sides of tropical mountains. An entire chapter is based on the concept that "factors causing major reproductive deficits or imposing significant mortality are bound to have evolutionary consequences when there is genotype variation in their effects" (p.336). It would seem that both disruptive selection and phylogenetic inertia were forgotten.

The evolutionary philosophy running through the book is that where there is a selective pressure it is responded to; plant

traits are maintained through selection; and those selective pressures are present in the environment of the plant today. All three suppositions are highly suspect in many aspects of field biology. As the preface notes, "Throughout the book we are at pains to stress that our ultimate objective is to measure the impact of the processes we describe on the *fitness* of individual phenotypes" (p.xi). Given that objective, the book would have benefited from an introductory chapter examining why or whether the concept of fitness should be used as the primary point of reference for the plant's interactions with the world. A single phenotype may have extraordinarily different fitnesses in the variety of habitats it occupies and continues to occupy

generation after generation. Even when variation appears in the genetic background for that single phenotype, the result *need* not be any realized selection or evolution (though of course it may be — p.251).

*Plant Ecology* is not horrendously long, and will certainly serve as a good foil for an alert teacher working with well-motivated students. But this kind of teaching, so common in English universities, is rarer in the United States. That leads me to worry about how the book might be used indiscriminately in the New World. □

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# Flying and fishing

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**Seabird Ecology.** By R.W. Furness and P. Monaghan. *Blackie/Chapman & Hall*: 1986. Pp.164. Hbk £19.95, \$45; pbk £9.95, \$23.

FURNESS and Monaghan begin their book with an exhilarating, free-style swim through the seas of seabird ecology. Mating systems, colonial breeding, deferred breeding, clutch and brood-size and much else are polished off in a mere 19 pages. It is a tribute to the authors' lucid style and grasp of their material that they nevertheless convey the essentials of the subject (it was presumably a slip to exclude the Sulidae from the families of the Pelecaniformes in the first table). I would have welcomed fuller discussion of social behaviour in relation to breeding ecology, more on the assessment of mate quality (what is the evidence that courtship displays are to assess mate quality?) and something on synchrony, the phenomenon of intra-specific interference in breeding colonies and on non-breeders. But one can't have everything in a short account.

At the core of the book are the twin themes of seabird feeding and the interactions of man and seabirds. Almost one third of the contents is devoted to seabirds and fisheries. This selectivity provides a richer texture to the book than a uniform précis, though one does notice the change in writing style from that appropriate to a scientific paper to that used in textbooks. As an adjunct to the emphasis on food and fisheries the authors devote much space to bioenergetics. This, too, is defensible, for this relatively new field generates important computations of the amount of energy which seabird populations take out of the marine environment. Throughout, however, the authors are duly mindful of the pitfalls of using these equation-generated quantities to predict fishery

matters. Marine systems are highly complex, involving many interacting species at different trophic levels, and the changes which occur in them will seldom be even qualitatively predictable.

The short review of theories of population regulation is admirable and comes down, in the main, on the side of density-dependent regulation (Wynne-Edwards's new book on group-selection appeared too recently to be mentioned). I myself believe that the regulation of many seabird populations is not density dependent, and the authors, too, include appropriate reservations. Both with regard to population regulation and to the interactions of fishermen and seabirds, the Peruvian anchovy fishery receives much attention. Here I failed to understand how the numbers of the birds concerned could have been unregulated a century ago (p. 45). Niño years have been occurring for much longer than this and were in themselves regulatory. Only once do the authors appear to claim (p.79) that the increase in Peruvian seabirds following a huge, natural reduction was due to the decreased competition for food. Surely, until the relatively recent overfishing by man, the seabirds climbed rapidly back to high numbers because food, irrespective of seabird demands on it, was superabundant?

The section on monitoring the marine environment is timely and comprehensive, dealing with plastics (ingested by seabirds), oil, PCBs, organochlorines and heavy metals. The technique which allows the estimation of mercury levels in feathers could be especially useful because, when extended to museum specimens, it makes historical comparisons possible.

I enjoyed and learnt much from this excellent book. Students, and indeed their teachers, as well as fishery scientists and serious seabird buffs should go out and buy it. □

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