

Preface and acknowledgments

The idea for this book emerged in the late 1980s when I attempted to find an interesting Darwin quote to add to a volume I was then editing on the impact of El Niño on Peruvian fishes and fisheries. I remembered from earlier readings that Darwin had been in Peru, where he collected specimens of the species which Leonard Jenyns later described as *Engraulis ringens*, the Peruvian anchoveta.

But I did not find any suitable quote: the indexes of books by, or about, Darwin that I consulted all covered 'finches' but not 'fishes'. Still, the pun was obvious, and I decided to write a short essay on Darwin's work on fishes, to be titled *Darwin's Fishes*, if only to get it out of my system.

However, caught in the iron grip of the Law of Unintended Consequences, I ended up writing a book-size chrestomathy. Fortunately, I had the help of Darwin (who contributed about 45 000 of his words, i.e. almost one third of the entire book) and, as we shall see, the help of friends who provided relevant information and helped verify facts.

The book now completed, I will attempt to cover my tracks, and pretend that this was written to fill the 'major gap in scholarship' that is usually recruited in such cases. Thus, I refer to Gruber (1981, p. xix), who, in an influential review of Darwin's work, pointed out that "[w]e need to fill many gaps in our knowledge of detail, and we need new approaches to synthesis. The details wanting are by no means fussy bits. They are, rather, organized chunks or even macro-chunks – for example, a longitudinal and critical reconstruction of Darwin's half-century of work on earthworms." I shall leave the subterranean task of working through *Darwin's Grubs* to my vermiphile colleagues: it is *Darwin's Fishes* that I herewith offer as a latitudinal 'macro-chunk' and 'critical reconstruction'.

This reconstruction of Darwin's work on fishes (and other aquatic organisms interacting with fishes) is 'critical' in that I checked Darwin's work at three levels: (a) within the body of Darwin's formal publications and other writings, by following the development of his ideas and use of the supporting facts, and probing these for internal consistency; (b) with regard to Darwin's use of source material, by accessing the references he cited and appraising his interpretation of the information therein; and (c) by evaluating Darwin's hypotheses in light of present knowledge.

No continuous narrative would have allowed presentation of this multi-layered material in coherent fashion (I did try, and the section below, on 'Darwin and ichthyology' builds on such an earlier attempt), and hence the decision to present it in the form of two lists: (i) 478 alphabetized entries, forming the bulk of this book, and (ii) 958 (mostly) annotated references, used to present Darwin's marginalia and his other comments on publications he had read, and to put his ecologically oriented work in the taxonomy-dominated context of the ichthyology of his time. This enabled the writing up of this material in the form of small, hopefully digestible items (Gruber may have called them 'micro-chunks'), liberally cross-referenced. Moreover, this allowed the book to become largely self-referential, i.e. it enabled me to create entries for explanatory items normally tucked away, in the form of endnotes or glossaries, into the back matters of a book. The price paid for this convenience of access is that Darwin's own narrative had to be 'chunked' into pieces, especially when he illustrated a topic – e.g. **sexual selection** – through a series of examples, referring to different fish species, as in *Descent of Man*. Here, all I can suggest to the reader interested in these topics is to access the original texts, which is a good thing to do anyway.

Another part of the price paid for attempting to include and reference, in agonizing detail, all I could find which Darwin ever wrote about fishes, is that many sections of this book read like laundry lists. I have attempted to cover this up, mainly through levity, the result being that this book will probably irritate serious scholars, but still bore students to tears. This is aggravated by the fact that I have been unable to resist the frequent use of inordinately long, or otherwise difficult words (e.g. 'chrestomathy'), and smuggling some of my pet ideas into this book, e.g., on oxygen's role in fish growth, even if their link to the specifics of Darwin's writings may be seen as tenuous. The cavillers will have a field day, especially among the historians, to whom the natural scientists' easy judgments ('X was wrong about that!') is anathema, given their difficulty in conceiving of a craft that would legitimately reach that way into times past.

On the other hand, Charles Darwin (CD) passed the tests put to him with flying colours, and even passed the anachronical hurdle in (c) above. (I have emphasized the few errors I found, both because CD is such a worthy target, and because without such emphasis, this book may be perceived as a hagiography.) Thus, my overall conclusion is that CD's writings on fishes reflect a generally judicious selection, correct citation and interpretation of his sources, and based thereon, the formulation of hypotheses that have largely withstood the test of time. Moreover, in the process of digging through the literature of Darwin's time and reading his voluminous *Correspondence*, I discovered a person different from most of his contemporaries – even within his social class – and, as well, from the unimaginative compiler of facts that many, often misled by his own *Autobiography*, still see in Darwin. My impression now is that, like Michelangelo, Darwin so well perceived the best thoughts of his time that they enabled him to see glimpses of the future.

Another impression I now have is that the 'taxon-centred' approach used here would lead to many new insights if applied to other large groups, such as insects or

mammals, and to biologists other than CD (e.g. Linnaeus or Huxley), whose work, like his, covered a wide range of taxa.

Now, all that is left to do is to thank the friends and colleagues who helped me with *Darwin's Fishes*. Foremost among these is the team, led by Rainer Froese, that created *FishBase*, the computerized encyclopedia of fishes. Rainer was forced – as I was – by the nature of his project to move into areas he had never dreamt of getting into. In this case, the Law of Unintended Consequences turned him into an expert on fish nomenclature. Whatever nomenclatural consistency this book has is due in part (50%) to Rainer Froese. The other 50% are for William Eschmeyer of the California Academy of Sciences, and an honorary member of the *FishBase* Team. I could not have done without his extraordinary *Catalog of Fishes*, now incorporated in *FishBase*, and his answers to my queries.

Thanks also to Jacqueline McGlade, for contributing her transcription of *Fish in Spirits of Wine* to this effort, and to Adrian Friday for a list of the fishes collected by CD still in the University Museum of Zoology, Cambridge. As well, thanks are due to Ms Aque Atanacio, the *FishBase* artist, who processed all the graphs, while Amy Poon, with the assistance of Ms Elsie Wollaston and her staff at the UBC Library, dug up a huge chunk of the ancient references cited here. Thanks also to the students of my *Darwin's Fishes* course, given since 1995 at the University of British Columbia (lately as 'Bio 445'), and in which many of the epistemological and ethical issues touched upon here are further developed.

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