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Book Reviews

Fisheries science: The view from Lowestoft. Reviews of three books by D. H. Cushing

By D. Pauly[a]

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Dr. DAVID CUSHING, FRS, is, among the contemporary authors of books in fishery biology, the one who writes about fishery *Science;* the others tend to limit themselves to more limited tasks, such as "stock assessment" or fisheries "management". And this is right so because, as it seems, only he has the breadth of vision necessary to integrate into a coherent whole all the miscellaneous bits that fisheries scientists should be concerned with. And because ours is a fragmented science (see GARFIELD 1980, for quantitative proof) we should not hold against Dr. CUSHING that his vision is in fact – as another reviewer put it – "the view from Lowestoft". We all write about what we know best – the reviewer mentioned above for example writes mainly about pacific salmon and complained therefore that Dr. CUSHING doesn't know all about salmon.

I write about tropical fisheries and could complain that Dr. CUSHING doesn't write about these. But I won't, because the point is that he writes well about what he knows – and that is the North Atlantic and its various fisheries, the upwelling systems and theirs, and the basic mechanism underlying the dynamics of fish populations.

[a] International Center for Living Aquatic Resources Management, MCC P. O. Box 1501, Makati, Metro Manila, Philippines

Fisheries biology: A study in population dynamics (2nd edition, University of Wisconsin Press (1981) Madison, 295 p. US $ 18.50) is a remake of a very successful text to which nothing special was added. "All" that was done was to incorporate results of recent researches. Dr. CUSHING managed to actualize his classic book without losing any of the balance that characterized the first edition. All aspects of fishery biology are treated – ranging from the mortality of plaice larvae to the management of cod stocks. I realize these are very generalized comments, and thus, to show that I've read the book carefully, I shall mention that on p. 186, Fig. 80 the yield curve labelled "M = 0.50" should be labelled M = 0.05, and inversely for the curve labelled "M = 0.05".

The back matters, notably the comprehensive "list of symbols and definitions" are excellent, and contribute considerably to tying the book together.

Climate and fisheries (1982, Academic Press, 373 p. £ 33.00) has the potential of a classic. It is the first serious attempt to integrate into a the available information on this topic – which is likely to increase in interest, given that we can now monitor the climate better than even before, and that we might end up even being able to influence it (e. g., through CO_2 emissions and the subsequent rise in temperature).

The following items are covered (1 per chapter): nature of fisheries, biology of fish populations, changes in the fisheries during historical times, climatic changes relevant to fisheries, recent period of warming, short-term changes in fish populations, the North Sea, effect of cold winters in North-West Europe, changes in the Baltic Sea during the 20th century, effects of El Niño upon the Peruvian Anchoveta stock, biological mechanisms, effect of climatic changes upon management and effect of climate upon the fisheries.

The book should help knock out the notion, already severely beaten, that fish stocks are in equilibrium with anything. Yet when reading the book, I couldn't help asking myself what will be done on the practical side with all this accumulated knowledge, except to provide illustrations for ecology textbooks on how everything is influenced by everything else.

Climate and fisheries – although it doesn't give special emphasis to this topic – will certainly encourage the compilation of long series of catch data and their subsequent analysis through time-series analysis, the particularly powerful branch of statistics that is so well-suited to the identification of climatic effects on fish stocks.

Europe alone has, at present, the type of historical records (some of them going back to the 10th century!) which allows identification of long-term trend of fish catches and abundances. *Climate and fisheries* makes exhaustive use of such records, and it is likely that this book will remain unique in this respect, unless sufficient ancient Chinese or Japanese records are found, along with fishery scientists to help interpret them.

For other parts of the world, indirect measures of changes of climate and resource abundance (dendrochronology, sedimentary fish scale deposits) will have to be applied more widely, and new indices developed.

Climate and fisheries shows that such work is scientifically rewarding, although, as mentioned above, the usefulness of all this for fishery management purposes is not obvious inspite of one chapter being devoted to this topic.

Key papers on fish populations (1983 edited by D. H. CUSHING, IRL Press, Oxford, 405 p., £ 21) is not as good as the other two books, probably because it is the one into which Dr. CUSHING put least work.

The idea of compiling into one volume the key papers on fish population was an excellent one – for which Dr. CUSHING acknowledges a Prof. N. A. MITCHINSON, FRS. Obviously, such papers, covering half a century, do need to be introduced to the contemporary reader, and the editor did write introductions to the papers he selected. That he stopped at this reduces the value of the book considerably, however. Thus, there are no back matter after the 15 papers, no index, no footnotes, nothing to help neophyte readers translate the concepts and the notation of one author into that of the others.

Two of the papers included in the collection (SCHAEFER 1954, and GULLAND & BOEREMA 1973) are presented in the form of extracts only. The references cited in those extracts are not included. Readers are thus advised not to throw away their photocopies of these articles when they get their copies of "*key papers*".

The choice of what "key" papers on fishery population are is obviously something about which fishery biologists will all have different opinions. Yet, even if one acknowledges that Lowestoft was (or even still is) the leading fishery research laboratory in the world – it is hard to accept as representative that 9 of the 15 senior authors (60%) of "key papers on fish populations" should have been scientists working at Lowestoft.

Among the important pioneers whose work was not considered were C. G. J. PETERSEN, who first developed numerous approaches still used today, and especially F. I. BARANOV, whose theory of fishing was so much in advance of his time that he could not have been successful when his key papers were published (from 1914 to 1927), even if they had been published in German (the leading scientific language then) or in French or English.

That Dr. CUSHING is so reluctant to acknowledge BARANOV's primacy is strange – yet the reluctance is real. He writes in the introduction to *key papers* "In the western world, BARANOV's (1918) work remained unknown until it was translated by RUSSEL in 1938. It had no influence then because of the advent of the second world war. It had not after that war because a better formulation of the yield equation had been reached by HULME, BEVERTON and HOLT (1947). There is no evidence that BARANOV's work had any influence at all in his own country". Yet, W. E. RICKER identified F. I. BARANOV as the author of most basic concepts in fish population dynamics (see RICKER 1975).

Besides, the whole line of CUSHING's argument is strange – nobody questions the major contributions of HENRY CAVENDISH or GREGOR MENDEL because most of what they discovered was rediscovered before it became influential. Giants are giants, even if one doesn't stand on their shoulder!

And still: "*key paper*" is a good buy; I have bought several copies to give colleagues who don't have access to well-stocked libraries.

References

BARANOV, F. I., 1918: On the question of the biological basis of fisheries. Nauchni issledovatelskii ikhtiologicheski Institut Isvesti 1: 81–128 (originally published in Russian, available in translation, along with his other work, in a 3 volume edition from Israel Program of Scientific Translation, Jerusalem).

GULLAND, J. K.; BOEREMA, L. K., 1973: Scientific advice on catch levels. Fish Bull. (U. S.) 71: 325–335.

GARFIELD, E., 1980: The literature of marine biology. Biol. Morya (3): 3–20 (Transl. from Russian by Plenum Corp., 1982).

HULME, H. R.; BEVERTON, R. J. H.; HOLT, S. J., 1947: Population studies in fisheries biology. Nature 159: 714–715.

RICKER, W. E., 1975: Computation and interpretation of biological statistics of fish populations. Bull. Fish. Res. Board Can. (191). 382 p.

SCHAEFER, M. B., 1954: Some aspects of the dynamics of population important to the management of the commercial marine fisheries. Inter. Am. Trop. Tuna Comm. Bull. 1 (2): 27–56.

MÜLLER, H.; MÜLLER, P.: **Fische Europas.** Stuttgart: Ferdinand Enke Verlag 1983. 320 S. DM 24,80.

Das Buch, das hauptsächlich die Bestimmung europäischer Süßwasserfische und der Fische aus küstennahen europäischen Meeresregionen zum Gegenstand hat, informiert u. a. auch über den Bau und die Funktion des Fischkörpers, über die Lebensweise, die Biotope sowie über die Verbreitungsgebiete der Fische. 400 farbige Zeichnungen erleichtern die Bestimmung von 300 europäischen Fischarten, die systematisch gegliedert nach Kennzeichen und Lebensweise besprochen werden. Allerdings ist die auf Seite 79–87 gegebene systematische Übersicht insofern zu kritisieren, als nach der gegenwärtigen Taxonomie die Agnatha und die Gnathostomata nicht den Rang von Stämmen einnehmen. Die Cyclostomata stellen eine Unterklasse der Agnatha (Klasse) dar und die Pisces werden nicht als Klasse geführt, allenfalls als Reihe den Tetrapoda gegenübergestellt. Des weiteren sind die Condrichthyes und die Osteichthyes als Klassen und nicht als »Zweige« zu definieren. Abgesehen von diesen zoologisch-systematischen Details, gibt das handliche Taschenbuch allen ichthyologisch Interessierten wertvolle Informationen über die Fische Europas und dient insbesondere als naturkundlicher Führer der Anleitung zum Beobachten und Bestimmen der wichtigsten Süßwasserfische und der Fische küstennaher Meeresregionen.

AHNE, München

Australian Freshwater Fishes. Biology and Management. Edited by JOHN R. MERRICK and GÜNTHER E. SCHMIDA. Published by J. R. MERRICK, School of Biological Sciences, Macquarie University, North Ryde, N. S. W. 2113, Australia, 1984, pp. 409, coloured illustrations, hard back cover, 35 $ (Australian dollars).

180 fish species in 39 families sections are listed in a unique combination of up-to-date comprehensive information of Australian freshwater fishes. Each family section includes main recognition features and history. Habitats and fish species described in sections of native and introduced fishes are shown in 280 colour figures. The book contains sufficient details on size, recognition features, range, feeding habits, migrations, mating behaviour, spawning, development, growth rates and parasites of Australian fresh water fishes. In addition recent systematic and currently accepted scientific names of fishes are given. The scientific value of this book is also documented by more than 30 pages of references. The reader will be additionally informed about collecting, care and photography, a glossary explains technical terms used. The book is of great significance for exploring the Australian fresh water fishes and it is of value to the ichthyologists, biologists as well as to everyone interested in fishes.

AHNE, München

MÖLLER, H.; ANDERS, K.: **Krankheiten und Parasiten der Meeresfische.** Im Eigenverlag, Kiel 1985. 258 S., 147 Abb., 27 Tab., 56 Farbt. DM 38,-.

Mit diesem Werk haben die Verfasser eine Übersicht über die häufigsten Erkrankungen der Fische aus Nord- und Ostsee vorgelegt. Sie gliedern das Werk in die einzelnen Ursachen – Umweltschäden, Infektionen, Parasitosen –. Das Kapitel über die Umweltschäden ist besonders akut und bringt einen Einblick in die vielfältigen Ursachen dieser ökologisch bedingten Erkrankungen. Die toxikologischen Verhältnisse sollten in einer weiteren Auflage mehr präzisiert werden.

Die Farbtafeln sind sehr hilfreich, wenn auch manche Aufnahme einen Krankheitskomplex darstellen dürfte.

Für jeden Meeresichthyologen und Meeresbiologen ist das Buch eine große Hilfe.

REICHENBACH-KLINKE, München

NEW BOOKS:

Exploitation of Marine Communities. R. M. MAY ed.: Dahlem Workshop Report, Berlin 1984. In: Life Sciences Vol. 32, 367 pp. Berlin, Heidelberg, New York, Tokyo: Springer-Verlag 1984. DM 48,-.