Dean's Bibliography of Fishes and FishBase

Ichthyology, or the 'science of fish,' has a long history dating back to Ancient Greece (Ganias *et al.* 2017), with multiple illustrations in other Ancient (Jurgielewicz 2020) or more recent cultures (Moradi 2017; Wang 2023). If we go further back in time, one can also consider the naming of, and observation of fish by prehistoric peoples worldwide as the real start of ichthyology (see the over 330,000 common names of fish in 356 languages and their often highly informative etymology in the chapter NOMENCLATURE / The COMMON NAMES Table https://www.fishbase.org/manual/English/FishbaseThe_Common_Names_Table.htm).

Modern ichthyology is widely considered to have emerged in the mid-18th century based on the work by Peter Artedi (Wheeler 1987), as revamped by Linnaeus in a well-established classification and binomial nomenclature (see the chapter NOMENCLATURE / The SYNONYMS Table https://www.fishbase.org/manual/English/fishbasethe_SYNONYMS_table.htm).

In the mid-18th century, science, which was rapidly shedding its scholastic cobwebs, began to abandon Latin as its dominant medium of communication to rely instead on the vernacular languages of the countries where it was mainly practiced, i.e., French, German, English, Italian, etc. (Gordin 2015).

This led to a situation in which much of ichthyology—along with other subdisciplines of what was then called 'Natural Philosophy'—became fragmented and mainly inaccessible to scientists who did not understand 'foreign' languages.

Box 1. A call for collaboration.

At present, FishBase contains 2,000 (soon 6,000) of the 35,000 references included in the three volumes of 'A bibliography of Fishes' by Bashford Dean. It would be immensely helpful if colleagues volunteered to transpose more of these references into a format suitable for FishBase. This may start by someone taking over one letter, say A or part of A, from Volume I or L from Volume II. Likewise, one could select all references referring to certain countries or topics, as can be identified from the indices in Volume III.

The work will be done under the MS-Access database system. We will provide the PDF of the selected pages to be checked (e.g., 10 pages with about 200 references), and a data entry interface with the pre-corrected OCR text by us (to be kept unchanged for verification), the text to be corrected (pre-filled with the pre-corrected text), and pre-filled standardized information in the FishBase format to be checked. A guideline will be also provided, as well as some training online.

If you would like to take on this challenge, please get in touch with FishBase
(fishbase@q-quatics.org)

Nicolas Bailly

One way to overcome this barrier in the field of ichthyology was to compile this multilingual literature into a comprehensive bibliography of publications on fish, whose index would then point to the content of essential articles and papers, regardless of the language in which they were written.

'A Bibliography of Fishes', the Bashford Dean's monumental achievement (hereafter Dean's *Bibliography*) published in three volumes from 1916 to 1923, does this very well. Thus, modern scientists in the 21st century, who are now expected to understand articles written in English—whatever their native tongue—can access the bulk of the pre-WWI ichthyological literature.

Volume I, first published in 1916, comprises 718 pages of references to articles and books whose authors' last names start with letters A to K. Volume II, first published in 1917, catalogs, in 676 pages, the publications of authors whose last names begin with L to Z. Additionally, Vol. II contains 26 pages of references attributed to "Anonymous authors." Finally, Volume III, published in 1923, comprises 707 pages with the following sections: (*i*) Continuation of Anonymous titles contained in Vol. I and II, (*ii*) Addenda to Titles contained in Vols. I and II; (*iii*) Pre-Linnean publications – i.e., before 1758, (*iv*) General Bibliographies with references to fishes, (*v*) List of Periodicals relating to fish and fish-culture; (*vi*) Errata and Corrigenda of Vols. I and II; and (*vii*) a comprehensive Subject Index: 1) morpho-anatomy, biology, ecology and general ichthyology, 2) taxonomy and distribution, 3) overall alphabetical index (denomination of indexes are adapted).

Dean's *Bibliography* includes some 35,000 entries (Jordan 1924) in total, which every ichthyologist or person interested in fish should have access to. In fact, its success was such that a short-lived attempt was made by Atz (1971, 1973) to revive it, and whose first volume contained 3,501 references to documents published in 1968 (McAllister 1971). Clearly, this flood of papers required a new approach, which, fortunately, we now have (the Internet).

However, given the constraints of pre-Internet days, the original Dean's *Bibliography* was reprinted in 1962 by the New York publisher Russell and Russell, but only in 350 copies of 3 volumes of 350 pages. The Dean's *Bibliography* is also available from Biodiversity Heritage Library (see https://www.biodiversitylibrary.org/bibliography/55121).

In 2023, we decided to make the contents of the Dean's *Bibliography* available through FishBase, if only gradually. Currently, the following extracts are available (see the update of this statistics after each FishBase update on the web at https://www.fishbase.ca/references/ReferencesList.php under 'Description of volumes':

1) References describing new fish species;
2) References to work authored by Pieter Bleeker;
3) References by Anonymous authors from Vol. III, p. 4-20;
4) References concerning respiration from the Index in Vol. III, p. 582-584;
5) References to sturgeons, as documented by Pauly and Pauly (2022).
6) Addenda, in Vol. III, of titles missing from Vols. I and II; about 4,000 references added in April 2025.

Technical Details

The three volumes of the bibliography were downloaded as PDF (images + OCR) from the Biodiversity Heritage Library (BHL: https://www.biodiversitylibrary.org/bibliography/55121).

The BHL OCR files were not corrected yet (as of May 2024), and contained many misinterpreted characters, particularly all the accented letters. But the OCR text presented quality and structure enough to be improved without reading through it entirely as a preliminary step. Under MS-Word, using the regular expressions (wild cards in MS-Word vocabulary), a first treatment was performed:

- Reconstructing one paragraph per reference, mainly based on capital letters starting a line. This also includes suppressing the hyphens in the words spread in two different lines.
- Research and correction of words commonly featuring accents in French, German, Spanish, Portuguese, and Scandinavian languages.
- Research and correction of some patterns of letters often misinterpreted by OCRs, e.g., nn → rm, 11 → ll, years, etc.
- When the quality of the document appeared to be correct enough, the references were split into 'Authorship,' 'Year,' 'Title,' 'Source,' 'Dean's number,' 'Also as comments,' and 'Other comments' via iterations between treatments in MS-Word and in MS-Excel, until the columns were perfectly aligned.
- The file was imported into an MS-Access table with each reference as a record.

A second treatment was performed then. Besides the 7 columns/fields above, were added fields corresponding to the Reference Management System of FishBase. Some could be filled up using queries, e.g., language that can be detected by searching language-specific articles and nouns such as 'poisson,' 'Fisch,' 'fish,' 'fisk,' etc., and other words specific to ichthyology; and reference type by searching thesis, report, etc.

The third and last treatment was done via an MS-Access form over the table above. The references were reviewed one by one for final corrections and addition of a link to the reference if existed (mainly in BHL). The amended OCR at the end of the first treatment was kept for each reference. The volume and the page in Dean's *Bibliography* were also recorded to facilitate final quality control procedures.

The first author reviewed all these references from the online version and checked and located (where possible) their availability online, after the second author transferred the OCR text in MS-Access. Subsequently, the third author corrected the typographical errors in the original or in the OCR text for French, German and English references. Given the paucity of errors in the printed version of Dean's *Bibliography* in these three languages, we assume that the references in other languages also contain few errors, but we could not verify this ourselves.

Important remark: The first author's names and the Dean's reference numbers, which consist of the publication year and a sequence number for each author in a year, were used as publication identifiers for in the index provided in Vol. III, e.g., 'Bleeker 1865.12'.

Web site

On the Internet, you can search references from the Dean's *Bibliography* in the References section at the bottom of the search page:

- Select the radio button "Dean's Bibliography only".
- Enter criteria in the various search boxes as usual.
- Click the Search button.
- Currently, we do not allow listing all the references; at least one search criterion must be provided.

References

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