

the chapters (particularly the emphasis on Chesapeake Bay populations) and the researchers selected to author chapters in the book (by my count, of 36 authors, only five have spent considerable time researching the terrapins along the Gulf Coast). While I acknowledge that there is more history known and more research conducted on populations from the Atlantic coastline, the many and important differences between Atlantic and Gulf Coast regions (e.g., climate, human population density, fishery pressure, etc.)—and thus, terrapin biology—was lost in most (but not all) chapters. My second critique is that several of the chapters (e.g., 3, 8, 9, 12, 15) included levels of detail or complexity that would unnecessarily pose a challenge for those generally interested in terrapins, but lacking the technical background. I understand this is a difficult balance for authors, editors, and publishers who generally do not wish to narrow a book's readership, yet may have done so in this instance. However, these chapters will certainly satisfy the research specialists in the particular subdiscipline(s) covered by each chapter. My third critique is that the book had inconsistent editing and integration of the chapters. Several of the chapters could have been integrated into other chapters, some lacked content that seemed inexplicably missing (or some had too much content), some chapters seemed out of logical order, which disrupted the flow of the book, and some chapters were based on novel research, whereas others provided literature reviews and syntheses more typical of book chapters.

At about \$80 US dollars, this book was priced higher than average for a natural history title from Johns Hopkins Press, particularly in light of its length (277 pp.) and lack of color figures. I would consider it a much better value if offered at \$40–50 via a secondary bookselling website. Yet, despite my criticisms, I still am glad to have this resource on my bookshelf with all of the great studies cited therein. I think any terrapin researcher, coastal conservationist, or coastal manager should find a space on their bookshelf for this volume.

#### LITERATURE CITED

- Anderson, J. A., and A. B. Alford.** 2014. Ghost fishing activity in derelict Blue Crab traps in Louisiana. *Marine Pollution Bulletin* 79:261–267.
- Butler, J. A., G. L. Heinrich, and R. A. Seigel.** 2006. Third workshop on the ecology, status, and conservation of Diamondback Terrapins (*Malaclemys terrapin*): results and recommendations. *Chelonian Conservation and Biology* 5: 331–334.
- Carr, A.** 1952. *Handbook of Turtles: The Turtles of the United States, Canada, and Baja California*. Cornell University Press, Ithaca, New York.
- Crawford, B. A., J. C. Maerz, N. P. Nibbelink, K. A. Buhlmann, and T. M. Norton.** 2014a. Estimating the consequences of multiple threats and management strategies for semi-aquatic turtles. *Journal of Applied Ecology* 51:359–366.
- Crawford, B. A., J. C. Maerz, N. P. Nibbelink, K. A. Buhlmann, T. M. Norton, and S. E. Albeke.** 2014b. Hot spots and hot moments of Diamondback Terrapin road-crossing activity. *Journal of Applied Ecology* 51:367–375.
- Davenport, J., A. F. Glasspool, and L. Kitson.** 2005. Occurrence of diamondback terrapins, *Malaclemys terrapin*, on Bermuda: native or introduced? *Chelonian Conservation and Biology* 4:956–959.
- Davis, F.** 1973. Tale of the terrapin. *Louisiana Conservationist* 1973 (May–June):4–9.
- Guillory, V., A. McMillen-Jackson, L. Hartman, H. Perry, T. Floyd, T. Wagner, and G. Graham.** 2001. Blue crab derelict traps and trap removal programs. Gulf States Marine Fisheries Commission, Publication No. 88, Ocean Springs, Mississippi.
- Hart, K. M., M. E. Hunter, and T. L. King.** 2014. Regional differentiation among populations of the Diamond-backed Terrapin (*Malaclemys terrapin*). *Conservation Genetics* 15: 593–603.
- Parham, J. F., M. E. Outerbridge, B. L. Stuart, D. B. Wingate, H. Erlenkeuser, and T. J. Papenfuss.** 2008. Introduced delicacy or native species? A natural origin of Bermudian terrapins supported by fossil and genetic data. *Biology Letters* 4:216–219.
- Will Selman, Department of Biology, Millsaps College, Jackson, Mississippi 39210; Email: will.selman@millsaps.edu.
- 
- Francis Hamilton's *Gangetic Fishes in Colour*.** R. Britz. 2019. The Ray Society, London. ISBN 9780903874526. 689 p. £150 (hardcover).—Ichthyological exploration in India traces its origin to the 1794 arrival in the Subcontinent of Francis Hamilton (formerly Buchanan), a Scottish surgeon in the employ of the Honourable East India Company. Between that year and his return to England in 1815, Hamilton was involved in a number of zoological and botanical projects, culminating with his appointment to superintendent of the Kolkata Royal Botanic Garden in 1814. By 1797, the fishes of India had captured Hamilton's interest: "I have given my old painter a gold mohur a month and have him employed on fishes. I am attempting to make him do the outlines with some degree of accuracy; when he succeeds in that I shall begin to colour" (Hamilton, as quoted in Prain, 1905: 11). Hamilton's artist, known simply as the Bengal youth Haludar (a name commemorated in the cyprinid generic name *Haludaria*; Pethiyagoda, 2013), was instructed by Hamilton to draw in color (from live or freshly dead specimens) 225 species of mostly freshwater fishes, almost all of them from the vast Ganges (=Ganga) basin of British India, including parts of modern-day Bangladesh, India, and Nepal.
- These drawings were the foundation for Hamilton's 1822 monographic work: *An Account of the Fishes Found in the River Ganges and Its Branches* (abbreviated *Gangetic Fishes* henceforth). In *Gangetic Fishes*, Hamilton provided English and brief Latin descriptions for 272 species, 259 of which he considered to be new species, ~180 of which are presently considered valid. In the words of Georges Cuvier, *Gangetic Fishes* was "the finest contribution to ichthyology ever received from a distant land."
- For all its pioneering value, however, *Gangetic Fishes* was deficient in that only 97 out of 225 of Haludar's beautiful drawings were reproduced and only as black and white line drawings. Though a handful of the unpublished illustrations were published subsequently by other authors (e.g., M'Clelland, 1839; Hora, 1929), the majority have remained unpublished. Given Hamilton's all too brief descriptions of the fishes, the lack of color illustrations greatly diminished the utility of *Gangetic Fishes*. Additionally, Hamilton did not



**Fig. 1.** Plate 42 from *Francis Hamilton's Gangetic Fishes in Colour* featuring watercolor illustration and associated line drawing of *Channa barca*.

provide precise locality information for the fishes he described (e.g., 'Ponds in Bengal'), which has been the source of headache for many subsequent researchers who have been faced with the difficult task of designating a neotype for species described by Hamilton in *Gangetic Fishes*.

These and other shortcomings have been elegantly and comprehensively addressed by Ralf Britz in *Francis Hamilton's Gangetic Fishes in Colour*, a greatly augmented, meticulously annotated, and carefully revised second edition of Hamilton's masterpiece. A major selling point of the new edition is the re-appearance of almost all of the color images that were intended to be published in *Gangetic Fishes* (221 of 225). But this is much more than a simple reproduction of the original with a few additional plates tacked on. *Francis Hamilton's Gangetic Fishes in Colour* is hefty (~10 lb.) and printed on a combination of high-quality gloss (the newly added material, including the plates) and matte paper (the reprint of *Gangetic Fishes* that sits at the core of the book). The volume is bound in red linen with gilt lettering on the spine and sheathed in a high-quality dust jacket decorated with Haludar's illustration of the snakehead *Channa barca*, perhaps the most striking of his illustrations (Fig. 1). The volume begins with a 34-page section by Britz, including an introduction to *Gangetic Fishes*, a biography of Hamilton, and an account of his contributions to ichthyology. This summarizes the various sources of the illustrations that were utilized to create the new edition (see below), and a 10-page table that serves as a useful guide to all 272 species that are treated in *Gangetic Fishes*. As one would expect from Britz, the introduction and commentary on Hamilton are supported by a wealth of visuals, including a figure that elegantly compares the style of Hamilton's illustrations with those of contemporary ichthyologists, particularly M. E. Bloch who, unlike Hamilton, illustrated only preserved specimens. Multiple high-quality reproductions of excerpts from letters written by Hamilton and pages from his unpublished field notes in the archives of the Linnean Society of London or the British Library, respectively, further embellish the commentary.

*Gangetic Fishes* was some 472 pages long, including 413 pages of text and 59 black-and-white plates. The new

edition compiled by Britz is more than 200 pages longer. The introduction and commentary aside, much of the difference in length between the original and the new version relates, of course, to the color plates. In *Gangetic Fishes*, each plate contained multiple line drawings, which in many cases represented multiple species (sometimes as many as four on each plate). These plates were organized to save space (in some cases obviously so; e.g., plate 15, on which the illustration of the dorsal outline of *Rasbora daniconius* is presented at an awkward head-up/tail-down angle so that it could be nestled into the space between the body and the curved tail in the adjacent and much larger illustration of *Plotosus caninus*). This quest to save space caused the order of first appearance of species in the text and the plates to be mismatched in the original version (e.g., the third species to be described in the text does not appear until plate 30). In the new edition, there is no attempt to skimp on space: the plates are presented in an order that is probably close to that which Hamilton had originally intended. Each plate is now devoted to a single species, and the order of the plates now follows the order with which species are organized in the text.

How did Britz manage to get hold of so many of Hamilton's (or Haludar's) color illustrations? Most of Hamilton's original plates were retained in India on his departure in 1815, and they have not been made public in the post-colonial period. Fortunately, numerous copies of the originals were made during Hamilton's lifetime, and these were tracked down by Britz in the archives of London's Natural History Museum, the British Library, the Linnean Society of London, and the Zoological Society of London, all of whom permitted their reproduction in *Francis Hamilton's Gangetic Fishes in Colour*. In the end, Britz brings together material from eight different sources to illustrate the 225 species Hamilton had originally intended to illustrate (221 in color and four in black and white).

In order to further increase the utility of the new edition, Britz has also incorporated new geographic information from Hamilton's unpublished field notes and published botanical notes, facilitating the identification of type localities. This new information is summarized by Britz in multiple formats: pictorially as full-spread map of the routes taken by Hamilton; as one of the columns of the ten-page table; and, finally, in the captions to the plates. To coincide with the release of Britz's updated version of *Gangetic Fishes*, the British Library has also made a digitized copy of Hamilton's field notes freely available online.

This is, despite the \$200 price tag, definitely a book for anyone with an interest in South Asian fishes or aficionados of 19<sup>th</sup> century ichthyology, in addition to being a must-have for those interested in scientific illustration or natural history exploration.

In summary, Britz has brought new life into *Gangetic Fishes*, and *Francis Hamilton's Gangetic Fishes in Colour* is arguably the most valuable contribution to South Asian ichthyology in the past century.

#### LITERATURE CITED

- Hamilton, F.** 1822. An Account of the Fishes Found in the River Ganges and Its Branches. Constable, Edinburgh.  
**Hora, S. L.** 1929. An aid to the study of Hamilton Buchanan's "Gangetic Fishes." Memoirs of the Indian Museum 9:169–192.

**M'Clelland, J.** 1839. Indian Cyprinidae. Asiatic Researches, Calcutta 19:217–471.

**Pethiyagoda, R.** 2013. *Haludaria*, a replacement name for *Dravidia* (Teleostei: Cyprinidae). Zootaxa 3646:199.

**Prain, D.** 1905. A Sketch of the Life of Francis Hamilton (Once Buchanan), Sometime Superintendent of the Hon-

ourable Company's Botanic Garden, Calcutta. Bengal Secretariat Press, Calcutta.

Kevin W. Conway, Department of Ecology and Conservation Biology and Biodiversity Research and Teaching Collections, Texas A&M University, College Station, Texas 77843-2258; Email: kevin.conway@tamu.edu.