

Book Reviews

Freshwater Mussels of Alabama & the Mobile Basin in Georgia, Mississippi & Tennessee

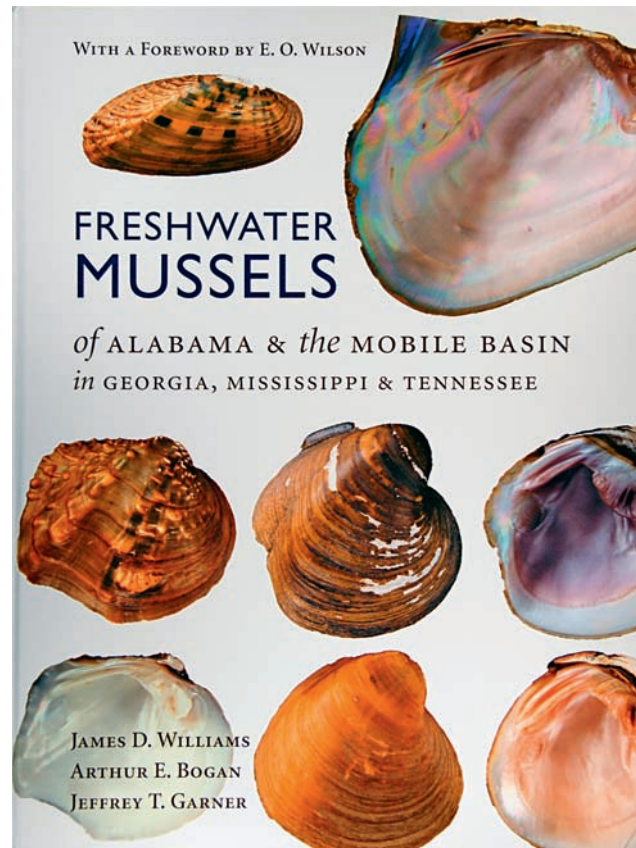
Williams, James D., Arthur E. Bogan, and Jeffrey T. Garner. 2008. *Freshwater Mussels of Alabama & the Mobile Basin in Georgia, Mississippi & Tennessee*. University of Alabama Press, Tuscaloosa, xv + 1–908, including numerous text figures and maps, many in color. ISBN-13: 978-0-8173-1613-6 (cloth: alk. paper); ISBN-10: 0-8173-1613-6 (alk. paper) 9 × 11.5 inches. Hardback; 10 lbs. \$70.00 from publisher and several booksellers; possibly less on eBay.

Over the last decade or two the awareness of the American populace and its policy-makers with the country's indigenous flora and fauna has been stirred to an unprecedented degree. Government has responded to a new culture of concern over environmental change and the conservation of natural communities, and one of the most important consequences of riding this *zeitgeist* has been the commissioning of scientists to elucidate the current state of our biota. Conspicuous among the products of this “green revolution” is a watershed of works treating the naiad fauna of either a political unit (e.g. state) or a major river system. Except possibly for Constantine Rafinesque's epiphany on the banks of la Rivière Ohio has there been such a celebration of this natural resource!

Preceded by recent works treating the biology of pearly freshwater mussels of several eastern American regions, most conspicuously the state of Tennessee and the Appalachian River system (Georgia, Alabama, Florida), Williams, Bogan, and Garner have tackled the most extensive fauna yet considered, that of Alabama and the entire Mobile Basin, but, based on other works of this contemporary genre, as we shall see, the treatment of those 178 species-level taxa, were it by traditional measure, only partially accounts for the prodigious metrics (e.g. weight) captioned above.

The work is organized into a foreword, acknowledgements, institutional abbreviations, 16 chapters, an appendix (North American naiad type catalogues), a glossary, bibliography, and index. Certain observations can be made as one moves through the work.

Introductory comments place Alabama and its mussel fauna in a broader context and present the grim reality of habitat degradation, resource depletion, extirpation, and extinction. No less than 23 reviewers are acknowledged for vetting this opus; workers in over 30 museums on other institutions were cited as collaborators, and dozens of field workers contributed their labors. Thanks are also offered to molecular geneticists, whose work underpinned many of the taxonomic innovations mentioned later.



There follows an historical review of naiad work in the state. The contributions of the feuding Quakers Isaac Lea and Timothy Conrad, of C. T. Simpson, H. H. Smith, and H. D. Athearn, the latter two being the dedicatees of the book, and many others are presented briefly.

Chapter 3 spans 25 pages and presents an analysis of the inland waters of Alabama and the Mobile Basin, which support more aquatic biodiversity than any other area of comparable size on the continent. The geography, geology, hydrology, and, regrettable degradation of these waterways (damming, canalization, etc.) is discussed in detail. The use of archival maps and photographs along with present-day images provides a starkly heuristic backdrop.

Short chapters basically tabulate mussel taxa by constituent watercourse in the post-European and archaeological record. A section on the commercial use of mussels and their pearls is nicely illustrated and again reinforces the theme of resource depletion. Chapter 7 is an historical review of naiad conservation efforts in the state, which have been rather extensive, particularly in the last decade; it concludes with a tabulation of the 48 Alabama species listed as endangered or threatened as

of January, 2006, under provisions of the federal Endangered Species Act.

Twenty pages are devoted to the ecology and life history of the naiads. The topics are treated with thoroughness and involve aspects of habitat (and its degradation), feeding, predation, competition, parasitism, and the unique reproductive and larval strategies of these mollusks—including anatomic and behavioral contrivances to optimize host fish infestation. Much recent work is brought to bear on these topics.

Shell morphology and higher (ordinal, suprafamilial, familial) classification are dealt with succinctly; the latter with the most current systematic insights.

Chapter 11 explains the format of the accounts in the taxonomic section. These headings are uniform and clearly indicated: Scientific and Common Name (each epithet initiated in upper case!); Illustrations; Description of Shell, Soft Anatomy, Glochidium, Similar Species; General Distribution; Alabama and Mobile Basin Distribution (a map appears at the end of each entry and is marked with black dot for each recorded occurrence); Ecology and Biology; Current Conservation Status and Protection; Remarks; and Synonymy. The latter includes a caveat indicating that this is far from a chresonymy, being limited to the first usage of a species-level epithet (generic reassignment not considered) considered in synonymy. On the other hand, it is generously, almost exhaustively, illuminated with type figures, in color when available.

The over 700-odd pages devoted to the treatment of two Unionoidean families, 43 genera, and 178 species-level taxa plus short vignettes on five species of hypothetical occurrence, six non-naiad clams (Sphaeriidae is not parsed) including the two non-natives *Corbicula fluminea* and *Dreissena polymorpha*, and finally a newly-diagnosed identity for the spuriously recorded (mislocalized) *Unio decumbens* I. Lea, 1861 [*Trapezoides exollescens* Gould, 1843] of southeast Asia].

The bibliography contains over 1000 titles, and the index is inclusive with all topics, terms, person- and place-names, and genus-species, species-genus entries, and the same reciprocation for the common names.

A stunning feature of this work is the photography of Richard Bryant, who captures the shells of each species-level taxon in large format, with crispness and color accuracy. The specimens are almost all of the highest quality, sometimes apparently requiring the use of extralimital material. The shells are scrupulously posed with the adductor scar axis horizontal, posterior to the left (as was the custom of the prolific naiadologist-publisher Isaac Lea). Such conventions make it easy on the diagnostic eye.

The marshalling of information in the taxonomic portion, particularly in Ecology and Biology and in the Remarks is staggering and probably indicates a strong collaboration among the authors of this work. Other features such as the thousands of locality indicators, the lifting of hundreds of type figures from classic works, give a dimension to this work that is unprecedented, especially informative, and indicative of a lot of hard careful work.

There are taxonomic initiatives exercised in this work. A major one of these is dealing with the “*Pleurobema* problem.” Tabulations of pages 501–504 indicate the profusion of available names for Mobile Basin and other Alabama species and the synonymies of four prior monographers and in the present work, which has a relatively conservative perception of the diversity. Williams et al. pare the list of Turgeon, Quinn, et al. (1998) by seven species while adding three classic and one post-1998 species. Likewise three *Elliptio* species. are resuscitated from synonymy as are a half dozen other species in five genera. There are three un-named taxa included in the work, *Anodonta* sp., *Epioblasma* sp. cf. *capsaeformis*, and *Toxolasma* sp. Each is, however, provided with vernacular names—a convenient machination.

Although installed in the literature over the last decade, reassignments of long-recognized species to the resurrected *Pleurobema* Frierson, 1927, and the newly-ordained *Hamiota* Roe and Hartfield, 2005, may surprise the reader. There are another half dozen generic reassignments necessitated by molecular genetic study, perhaps the most surprising of which is the Pistolgrip, *Quadrula verrucosa* (placing *Tritogonia* in synonymy).

Implausible as it may appear in context, there are two rather minor detractions which warrant brief mention. If I had my say in the creation of this *magnum opus*, I would have asked for a discussion of the geological history that provided the state with the isolation of the Mobile Basin system, without which its present naiad diversity would have never reached the unassailable present-day mark. I see no reference to the Tertiary calamity that diverted the Tennessee River from its ancient course southwest past Lookout Mt. and into the heart of Alabama and thence to the Gulf of Mexico. The classic paper by Simpson (1900) on the evolution of the relevant naiad faunas and the geological evidence in support of it (Johnson, 1905a, 1905b; Adams, 1928) seem appropriate for the beginning of Chapter 3. The other little vexation is the persistence of gender-bending binomina in the naiad literature. It is not entirely clear how “*Pleurobema stabilis*” and “*Ptychobranchnus subtentum*” became entrenched, but the Code and the original descriptions indicate they should be rendered *Pl. stabile* and *Pt. subtentus*.

Williams, Bogan, and Garner have produced a holistic and exhaustive work, carefully executed and seductively constructed. The taxonomic scope is unprecedented in recent years, covering some 60 percent of the American fauna. Aside from being a precious asset to the malacological community, it will advance the understanding of biodiversity, ecology, and conservation in a much wider audience. To quote from Edward Osborne Wilson’s Foreword: “People do care about species of wildlife, however, if they see a picture of it, know its name, and read what is known of its distribution and natural history. In addition to their contribution in mussel biology, this is what the authors have given us.”

We applaud Williams, Bogan, and Garner, and we commend the Alabama Department of Conservation,

Game and Fish Division as well as Auburn University, whose commitment has helped assure that this prodigious work will be affordable to a wider readership.

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