

ISAAC LEA'S (1792–1886) SUBSTITUTIONS AND OTHER MODIFICATIONS OF HIS OWN NAMES OF MOLLUSCAN SPECIES

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ABSTRACT

The American conchologist Isaac Lea had a long and productive career during which he introduced more than 1,800 names of molluscan species between 1827 and 1874, the majority North American land and freshwater species. His idiosyncratic way of publishing, by describing new taxa multiple times in duplicated and variously modified journal papers as well as in retitled collections of extracts, has led to considerable difficulties in determining accurate dates of his original descriptions. He considered the reading and presentation of a manuscript before a “learned society” as the date of its original publication and therefore his own recorded dates must be approached with caution. The problem of interpreting Lea's names was compounded by the fact that Lea frequently modified his own new taxonomic names in his subsequent publications, and often without providing justification for the change. The various name versions were inconsistently applied by subsequent authors. The current paper analyses Lea's substitutions and other modifications of his own names of molluscan species and discusses 131 of his publications in this context, for which attempts at precise dating were made. The status of these “replacements” of Lea's taxonomic names were evaluated under the current ICZN Code (1999). A few additional cases of changes of Lea's names by other authors are included; these are instances in which Lea had missed a primary homonym or a secondary homonym was discovered later. While some of the names here discussed are currently resting in synonymy, others are of greater current relevance as they are in use as valid names for taxa of conservation/management concern, including IUCN and U.S.-federally listed species.

The following 98 discussions of often-complex name changes involve 348 species-group names and their subsequent spellings, 231 of which were introduced by Lea. Based on their current taxonomic status, the names belong to 4 bivalve and 11 gastropod families, with the vast majority concentrated in Unionidae and Pleuroceridae. Under the current ICZN Code, the investigated changes fall into many different categories, which impacts their nomenclatural availability: 35 names changed by Lea (plus 6 by other authors) are interpreted as substitute names for junior primary homonyms, 7 of which were unnecessary; 1 name (plus 6 by others) as substitute names for junior secondary homonyms, 1 of which was unnecessary; 13 names as justified emendations; 10 names (plus 1 by another) as unjustified emendations that have not entered prevailing usage; 1 name determined by his first reviser action; 37 names (plus many by others) as incorrect subsequent spellings that are not in prevailing usage; and 1 incorrect subsequent spelling that is shown to be in prevailing usage and thus considered a correct original spelling. The concept of “prevailing usage,” ill-defined under the current (1999) ICZN Code, is addressed in this context. The following names in current use are corrected as follows: *Helix balasteriana* I. Lea, 1840 (taxon *inquirendum*, ?Dyakiidae), *Lioplax cyclostomatiformis* (I. Lea, 1844), *Diplodon demararaensis* (I. Lea, 1859), *Iheringella isocardiodes* I. Lea, 1856, *Dilatata brongniartiana* (I. Lea, 1843), *Elliptio nasutidus* (I. Lea, 1863), *Elliptio pullata* (I. Lea, 1857), *Pleurocera picta* (I. Lea, 1841) [instead of *P. curta* (Halde-man, 1841), which is preoccupied] and *Beringiana youconensis* (I. Lea, 1847); many others are confirmed in their recently applied spellings. This work serves as an example that the basic endeavor of summarizing available and valid names from the published literature is not always a straightforward task.

Key words: Bivalvia, Gastropoda, ICZN Code, nomenclature, taxonomy.

INTRODUCTION

Isaac Lea (1792–1886), born in Wilmington, Delaware, was an American conchologist, geologist and publisher. His life and career were extensively chronicled by Scudder (1885). Between 1827 and 1874, Lea authored more than 1,800 molluscan species as well as numerous genus-group names, with approximately equal numbers of bivalves and gastropods. He had a particular research focus on living North American land and freshwater species (as previously discussed by Scudder, 1885; Johnson, 1974; A. Bogan & C. Bogan, 2002) but also contributed substantially to the paleontological literature (as discussed, e.g., by L. D. Campbell & S. C. Campbell, 1986).

Interpretation and dating of Lea's taxonomic names are complicated by the fact that the descriptions of his new species usually appeared several times in the literature, and mostly without cross-references. Many of his species were introduced with brief texts without illustrations in one scientific journal (initially the *Proceedings of the American Philosophical Society*, and from 1852 the *Proceedings of the Academy of Natural Sciences of Philadelphia*), and then followed by a more extensive treatment in another serial (initially the *Transactions of the American Philosophical Society*, from 1852 the *Journal of the Academy of Natural Sciences of Philadelphia*). Lea published profusely during his long career and tended to repackaging his work in various ways. As a prominent member of these scientific societies and their publication committees, and with the backing of his own publishing business, Lea knew how to reach his audience. This included distribution of individual offprints of his papers or the production of collections of extracts that he distributed with new wrappers in the form of pamphlets. Lea (1872: 6) explained that he usually had 250 extra copies printed of each journal-issued article, of which he would immediately distribute 150. More confusing to subsequent workers was his combining (and often repaginating) of previously published articles or parts thereof under new titles. Whereas these usually contained the same text as the original journal issue, Lea sometimes added novel data, such as a new introductory text, corrigenda and indexes. Although generally published after the formal journal article, in some cases it can be shown that the version "printed for the author" predates the supposed original publication by the journal.

The most well-known of Lea's repackaged publication series is a set of 13 volumes titled "Observations on the Genus *Unio* ..." [OGU herein] that was discussed in greater detail by A. Bogan & C. Bogan (2002). That series was published between 1829 and 1874 and often has been mistaken as the one containing the original description of a given taxon. Even within the OGU series is copious repetition and opportunity for confusion, as Lea released individual numbers before combining them into volumes. For instance, Lea's (1827a) article describing new species of *Unio* in volume 3 of the *Transactions of the American Philosophical Society* was also released as an offprint in 1827 (1827b), and then bundled into the first issue of OGU in 1829 (1829b), recombined in the second release of OGU in 1832, and once again newly packaged into a more extensive version ("Vol. I") of OGU in 1834 (1834b). In addition to frequently repaginating the recycled text portions, he sometimes also changed the article titles. An example is Lea's (1858a) journal article entitled "Description of exotic genera and species of the family Unionidæ", which he reproduced in OGU VI of the same year and relabeled "New freshwater and land shells" (1858b). Duplication of information also extends to another of Lea's published series, "Synopsis of the Family of Naïades" (and later, "... of Unionidæ"), with the second (1838b) edition of the four Synopses representing a repaginated copy of a partial article in the *Transactions* of the same year. Additional issues arose from the fact that some of Lea's articles or stand-alone nomenclatural actions published in the *Proceedings* of the two societies had no formal title but were introduced by the society's secretaries in narrative form (e.g., "Mr. Lea stated that having inadvertently used the specific term ... he now proposes..."), and were subsequently variously interpreted and cited.

All of this resulted in profound confusion as to the actual publication dates of new taxa introduced by Lea. The dates given by Lea himself must be approached with caution. He felt "the date of publication to be that when a paper was read before and deposited with the officers of a learned society, with a view to printing" (Lea, 1855: 237). Accordingly, his dated references to species descriptions frequently were to the day of oral presentation, not to the often much later date of available print copies. Lea's contemporaries such as Timothy A. Conrad (1853a), George W. Tryon (1861) and Wil-

liam G. Binney (1863) already struggled with attempting to determine the actual publication dates for Lea's works and taxa.

Conrad (1853a) compiled a synonymy of North American freshwater mussels and his opening sentence explained that "The present attempt to give a synonymy of the North American Naiades has originated from the absence of dates and references in Mr. Lea's memoirs" (1853a: 243). Conrad was not a neutral party in this endeavor – his at times inaccurate dating of Lea's taxa resulted in some of his own names gaining priority. Lea was deeply offended by Conrad's publication that had placed some of Lea's names in synonymy, declared others as "doubtful" and resurrected names by Constantin S. Rafinesque (1783–1840) that Lea had deemed unrecognizable. He immediately presented a lengthy rebuttal to the Academy of Natural Sciences that was published by Lea (1855) as his "*Rectification of Mr. T. A. Conrad's Synopsis ...*" To answer and correct Conrad's approach to dating his publications, he provided various evidence in this *Rectification*, such as the dates of letters when his correspondents had acknowledged receipt of printed materials. These published bits of forensic evidence later helped Scudder (1885) in his herculean task of attempting to catalog and date Lea's works and taxa. The bitter exchange with Conrad and the ensuing battle for priority influenced Lea's publication style. Instead of introducing his new species in monographic and well-illustrated descriptions, Lea rushed brief textual descriptions to print and followed up with more detailed works once the names had been claimed. As already discussed by A. Bogan & C. Bogan (2002: 366), Lea's more extensive follow-up papers often added specimens to the description and frequently caused confusion concerning type identities and localities. The conflict with Conrad also pushed him toward more detailed (but not necessarily more accurate) documentation of publication dates in his later career: In the indexes produced for OGU (1867c: 5 ff., 1869b: 4), Lea provided "the dates of the first publication of a new species". Unfortunately, many of the tabulated dates proved fictitious when checked against other sources and are not used in the present work. A single example will suffice: As will be shown below, Lea (1868a) described a species as *Anodonta jewettiana* (with its earliest possible publication date being 31 March 1868, the day the paper was "ordered to be published" by the society). He later (1868e) changed the

name's spelling to *Anodonta jewettii*, with print copies of that work available in December. Lea nevertheless claimed (1869b: 4) that his name *Anodonta jewettii* had to be dated from March 10th of 1868. In another attempt to settle the grievances, Lea (1876) published a *Catalogue of the Published Works of Isaac Lea, LL.D.*, because, as he stated in the introductory notice, he had "been induced to publish the correct catalogue of them." That list spans 223 items but, peculiarly in view of his long-standing fights for name-priority, the entries were poorly dated (e.g., a previously hotly debated article of 1827, for which he had provided dating evidence in his 1855 *Rectification*, now erroneously showed as having been published in 1830). Although eventually willing to provide dates of printing and distribution, Lea did not abandon his strong conviction that it was the wrong way to date a scientific publication. Lea's (1872) republication of the *Rectification*, reusing the earlier text but with copious additional remarks and added relevant correspondence with some of his contemporaries, continued to argue against Conrad's stance concerning publication dates. He warned that "if the day of issuing of printed copies be adopted, it will be impossible to fix the exact dates of an immense number of papers" as he was aware (as a long-term member of the publication committees of the American Philosophical Society and the Academy of Natural Science) that "there is no record of the issue of most of these numbers" (1872: 8).

Lea was also upset with William Binney, who in the first part of his *Bibliography of North American Conchology* (Binney, 1863) had tabulated Conrad's (1853a) work but had not contrasted it with Lea's (1855) *Rectification*. Binney (1863: 433) did refer to Lea's *Rectification* while discussing Lea's series of OGU volumes, but came to the conclusion that he could not verify the dates of Lea's publications in the serials of the Philosophical Society because, "as no separate dates are given, I am unable to do justice to Mr. Lea." Binney's work was published in the *Smithsonian Miscellaneous Collections*, and Lea promptly petitioned Joseph Henry, the Secretary of the Smithsonian Institution at the time, to induce Binney to modify his work in a future part of the series. Unsatisfied with Binney's resulting additions to the Appendix to Part II of his *Bibliography* (1864: 273, 274), Lea went back to "complaining to Prof. Henry of this second act of injustice by Mr. Binney" (Lea, 1872: 2),

which led to a reprinting of Lea's tables of his 1855 *Rectification* as Appendix IV to Binney's work in the *Smithsonian Miscellaneous Collections* (Lea, 1866b). Secretary Henry added a personal introduction, referring to "Mr. Lea having complained that full justice had not been done him by the omission in this work of certain explanations of the date of publication of some of his species of shells" (1866b: 289). It did not fully placate Lea – years later, he was still grousing in print that "it can never be of the same use to science as if it had been in its proper place in Part I" (1872: 2).

While confirming actual publication dates is of considerable nomenclatural importance (Lea published during a time of much active research and quite a few of his names compete in priority with those of contemporary authors such as Rafinesque and, of course, Conrad), there is an additional issue with Lea's strings of published descriptions concerning the same species-level taxon: Lea at times modified his own new taxonomic names in subsequent publications (and occasionally multiple times), but frequently without providing justification for the change. In some cases, these changes clearly were formal substitutions of names that he had recognized as being preoccupied by earlier uses by other authors of the same names. In others, he felt that the new name was a better fit to the species' morphology, or he introduced various spelling modifications (often referring to persons or localities) that may or may not have been intended as formal emendations. Subsequent authors sometimes overlooked the brief original introduction of the name (or a subsequent change that was cryptically made in a footnote or a corrigenda page) and thus variously accepted Lea's original or modified names for the same species-level taxon. Sometimes, Lea's still-unpublished name variants found their way prematurely into the hands of colleagues by means of specimen labels and this resulted in patronymic oddities such as the description of *Unio grayii* by Gray (in Griffith & Pidgeon, 1833), which Lea named as *Unio grayanus* a year later (see also Bogan & Do, 2011), and of *Limnophysa tryonii* by Tryon (1865b), which Lea subsequently introduced again as *Lymnaea tryoniana* I. Lea, 1866.

Whereas Lea's nomenclatural actions seem capricious from today's ICZN-regulated viewpoint, some are the result of him following different conventions at the time. For instance, Lea did not consider a junior homonym permanently invalid (even after he himself had introduced a replacement name for it) and

would return to using the junior homonym once he thought the senior name had fallen into synonymy (e.g., Lea, 1860g, reinstating *Schizostoma*). Lea had an excellent record of recognizing and replacing primary homonyms among his names, but he missed a few that were later addressed by other authors (and also are treated herein). His concept of homonymy might not have extended below the species level, as indicated by his duplication of a name that Conrad had already used at varietal rank (see *Unio ornatus*, below).

Many of Lea's name changes were listed or discussed in the subsequent literature, but usually the change was documented in neutral fashion (e.g., "name X was later changed by Lea to name Y"), or an emendation was assumed without providing clarification on whether the latter was justified or unjustified according to the ICZN (1999) *Code*, which is of relevance as it impacts attributed authorship and date of publication. In numerous cases, as will be shown below, a modified spelling of a name has been more widely used than Lea's original spelling. Whereas the current *Code* directs that names resulting from unjustified emendations or incorrect subsequent spellings are to be preserved when such a spelling "is in prevailing usage and is attributed to the publication of the original spelling," it provides no guidelines to determine the existence of prevailing usage. More importantly, declaring a spelling to be in prevailing usage is not a nomenclature act, so it has no standing and can be overturned by different future use – thus diminishing its usefulness as a tool for stabilization. As will be explained in more detail below, the approach adopted herein uses the same conditions for "prevailing usage" for cases of unjustified emendations or incorrect subsequent spellings as the current *Code* provides for "prevailing usage" in case of reversal of precedence.

In the context of an ongoing review of Isaac Lea's molluscan names for MolluscaBase (MolluscaBase eds., 2020), this article is intended to evaluate the status of these "replacements" of Lea's taxonomic names (and, where possible, to stabilize usage) under the current ICZN (1999) *Code*. Some of these names are currently resting in synonymy, from which some recently were resurrected in the context of revisionary work and molecular studies. Others are of great current relevance as they are in use as valid names for taxa of conservation/management concern, including IUCN and U.S.-federally listed species. While such

a review of the larger body of Lea's publications allows us to recognize certain patterns in the way he made subsequent changes, it must be noted that the ICZN Code requires the analysis of each name in the context of its original publication. That we know from subsequently provided context that an originally misspelled name was meant to honor a particular individual, or that Lea likely meant to use a species epithet in the same way as he did in combination with other genera in other publications, has no bearing on how the Code is to be applied in each case. At times, the result of such standardized application of a set of rules will be linguistically or "logically" grating but this cannot be helped. An example of this is the acceptance of *Unio nasutidus* (a name that has no Latin meaning and very likely was a misspelling for the proper Latin adjective *nasutulus*). This work serves as an example that the basic endeavor of summarizing available and valid names from the published literature is not always a straightforward task.

MATERIALS AND METHODS

Background

A vetted listing of North American land and freshwater molluscan species was compiled for the InvertEBase project (InvertEBase.org; a U.S. National Science Foundation-supported effort that develops an online biodiversity portal for museum collections). The initial versions of the land and freshwater files, compiled by InvertEBase contractor Dr. Stephanie Clark and in part based on the authority files of the collections database of the Field Museum of Natural History, provided the bases of record uploads for MolluscaBase where the names now are subject to ongoing editing and enhancement. The need for a closer look at Lea's names became obvious to me when numerous discrepancies and suspected homonymies were encountered during editing of Lea's taxa into MolluscaBase. The project was greatly aided by existing and tremendously useful online resources such the Biodiversity Heritage Library (BHL, biodiversitylibrary.org) and the MUSSEL Project (MUSSELp, Graf & Cummings, 2020), the latter providing an exhaustive database of all extant unionoid species and genera. Both MUSSELp and MolluscaBase are dynamic, continuously updated/edited databases. Herein, references are made preferably to traditionally "date-able" publications (that also often were

given as status source in these dynamic databases). Among the numerous print publications used as resources for the project, three stand out: Scudder's (1885) detailed listing of Lea's published writings and associated taxa, Fox's (1913) lists with publication dates of the *Journal and Proceedings of the Academy of Natural Sciences*, and Graf's (2001) aptly named "cleansing of the Augean Stables" concerning the nominal species of the Pleuroceridae.

Interpretation of Names

Lea's modifications and replacements of his earlier names, as here interpreted, fall into several categories. The distinctions among them is important as the attribution of authorship and date of the original names depends on the nature of the change (e.g., as a justified or unjustified emendation, or as a subsequent incorrect spelling), as well as on any subsequent acceptance of a secondary spellings into prevailing usage. Interpretation herein is guided by the ICZN (1999) Code and, where leeway for interpretation exists, by choosing a solution that promotes stability. As mentioned in the Introduction, one pathway for this is the Code's concept of "prevailing usage," which allows for acceptance of unjustified emendations or incorrect subsequent spellings. This is not a straightforward enterprise as the current Code provides no guidance the meaning of "prevailing" in this context (e.g., emphasizing a majority of all authors citing the name, a consensus among major taxonomic works, or by the majority of most-recent authors?). Some of Lea's names, for instance, were rarely cited or spent long periods in synonymy of other names, and so had little opportunity to enter prevailing usage. Some other spellings were widely used over long periods of time, but most-recent authors have switched to a different spelling and thus "prevailing" is no longer given. Even when a majority of authors clearly has settled on a particular secondary spelling, declaring it as being in "prevailing usage" does not provide stability because such a statement has no standing as a nomenclature act and subsequent authors remain free to prefer another spelling. In the absence of clear guidelines (which hopefully will be added to the forthcoming 5th edition of the Code), the approach adopted herein uses the same conditions for prevailing usages in cases of unjustified emendations or incorrect subsequent spellings as the current Code provides for prevailing usage in case of reversal of precedence (Art. 23.9.1.2), namely

that such a secondary spelling has been used as a “presumed valid name, in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years.”

(1) Spellings that must be corrected under Art. 32.5 (especially “*If there is in the original publication itself, without recourse to any external source of information, clear evidence of an inadvertent error, such as a lapsus calami or a copyist's or printer's error, it must be corrected*”). For instance, there are a few instances in which Lea introduced a substitute name for a junior homonym and named the species for the author of the senior homonym, but the authors' names and associated patronyms were misspelled in the process (based on “*Brogniart*” for Brongniart, “*Meuke*” for Menke, and “*Keiner*” for Kiener). These original spellings are here treated as inadvertent errors under Art. 32.5 and the subsequent corrections are considered justified emendations under Art. 33.2.2; they retain authorship and date of the original name under Art. 19.2.

Under Art. 26, if the spelling of a scientific name is the same as a Greek or Latin word, it is deemed to be a word in that language. Several of Lea's names were in their original spelling Latin adjectives or participles, but unlike the other names introduced in the same works their endings were not in the nominative singular. Under Art. 11.9.1, if a species group name is a Latin adjective or participle, it must be or be treated in the nominative singular. Lea later changed such endings that likely had resulted from typesetting or other technical errors (e.g., *granulatis* to *granulatus*, *diminutis* to *diminutus*) and the revised spellings became widely used. It is here argued that there is evidence in the original publication, from the form of the word that a typographical error had occurred. Lea's subsequent modifications of such names are thus are considered justified emendations under Arts. 32.5 and 33.2.2.

(2) Substitute names (replacement of junior homonyms without synonyms) under Art. 60.3 (“*If the rejected junior homonym has no known available and potentially valid synonym it must be replaced by a new substitute name, with its own author and date; this name will then compete for priority with any synonym recognized later*”). Lea's actions in providing replacement names fall into three different groups. (A) There are numerous cases in which Lea acknowl-

edged that one of his newly introduced names was preoccupied by an earlier homonym and he replaced it with a new name. These actions addressing primary homonyms were usually taken in brief published notes or addressed as footnotes in subsequent papers (e.g., *Melania australis/manillaensis* as treated below). Most of these are straightforward substitutions covered under Art. 60. However, in some cases, the senior homonym that Lea intended to protect never existed, and he merely introduced an unnecessary synonym for his own name (e.g., *Unio wheatleyi*). (B) Various other primary homonyms were simply replaced by Lea when he reissued or expanded on his species descriptions, without explicitly pointing out the homonymy. Article 60.3 places few conditions on the matter in which substitute names are to be introduced and, consistent with the treatment by prior authors, Lea's names falling into this category are accepted as substitute names herein. Examples include *Melania dubia/dubiosa*. (C) Lea's replacements of secondary homonyms are more difficult to spot. By today's ICZN-governed standards, Lea had a casual way of changing names, and it is not always readily apparent why he did so. In some cases, he obviously or apparently introduced a new name to avoid secondary homonymy, which is supported by Art. 59.1 (“*A species-group name while a junior secondary homonym must be treated as invalid by anyone who considers that the two species-group taxa in question are congeneric*”). An example is *Goniobasis pulchella/gouldiana*. Because Lea generally did not point to the senior secondary homonym he had in mind, it is possible that some of his unexplained changes in name endings that herein are interpreted as incorrect subsequent spellings were also intended as replacements for perceived secondary homonyms.

(3) Emendations under Art. 33.2 (“*Any demonstrably intentional change in the original spelling of a name other than a mandatory change is an 'emendation', except as provided in Article 33.4*” [the latter referring to variant genitive endings]). The bar for a change to qualify as an emendation has been set high by the ICZN; Art. 33.2.1 stipulates “*A change in the original spelling of a name is only to be interpreted as 'demonstrably intentional' when in the work itself, or in an author's (or publisher's) corrigenda, there is an explicit statement of intention, or when both the original and the changed spelling are cited and the latter is*

adopted in place of the former, or when two or more names in the same work are treated in a similar way." An important distinction here is whether the emendation is justified under Art. 32.5 (see above; in which case the corrected name retains the authorship and date of the original spelling under Art. 19.2) or unjustified (in which case the emended name is available with its own author and date and is a junior objective synonym of the name in its original spelling following Art. 33.2.3). Art. 33.2.3.1 is of particular importance, as it stipulates that "*when an unjustified emendation is in prevailing usage and is attributed to the original author and date it is deemed to be a justified emendation.*" None of the unjustified emendations herein qualified as being in prevailing usage.

(4) Incorrect subsequent spellings under Art. 33.3 ("Any subsequent spelling of a name different from the correct original spelling, other than a mandatory change or an emendation, is an 'incorrect subsequent spelling' it is not an available name and, like an incorrect original spelling [Art. 32.4], it does not enter into homonymy and cannot be used as a substitute name"). Most of Lea's name changes were likely intended as corrections but do not fulfill the formal conditions of an emendation; they are therefore treated as incorrect subsequent spellings. Examples include Lea's shift from *Unio brumleyanus* to *U. brumbyanus*, in which case, while perfectly sensible, the change did not fulfill the strict conditions of the ICZN Code. Art. 33.3.1 is of particular importance here, as it stipulates that "*when an incorrect subsequent spelling is in prevailing usage and is attributed to the publication of the original spelling, the subsequent spelling and attribution are to be preserved and the spelling is deemed to be a correct original spelling.*" The frequently used name *Anodonta couperiana* is here preserved under this provision.

(5) Determination by the First Reviser under Art. 24.2.4 ("Original authors may be deemed to be First Revisers of spellings. When the author, or one of joint authors, of two different original spellings of the same name subsequently uses one of them as valid in a work (including the author's or publisher's corrigenda), and neither had previously been selected as the correct spelling by a First Reviser, the author is deemed to be the First Reviser, whether or not the author cites both spellings together (that used as valid becomes the cor-

rect original spelling)"). There are some cases in which Lea had used two different spellings of a new name in the original paper, for example, one in the text and another in the plate caption. *Unio sordidis/sordidus* is an example for which Art. 24.2.4 has been applied herein.

(6) Variant spellings of species-group names deemed to be identical under Art. 58 ("Species-group names established for different nominal taxa that differ in spelling only in any of the following respects and that are of the same derivation and meaning are deemed to be homonyms when the nominal taxa they denote are included in the same genus or collective group"). Homonyms are readily recognized when the species epithets have identical spellings. However, Art. 58 outlines fifteen additional situations for homonymy to exist. Examples in which Art. 58 has been applied herein include *Margaritana etowahensis* (Art. 58.6, aspiration or non-aspiration of a consonant), *Paludina cyclostomaformis* (Art. 58.12, use of different connecting vowels in compound words), and *Bulimus virgineus* (Art. 58.15, presence or absence of -i before a suffix or termination).

Treatment of Grey Literature

Many of the names were not widely cited in the published literature but were extensively covered in explicitly "unpublished" reports, such as inventories for endangered, threatened, and candidate-for-protective-status species submitted to the U.S. Fish & Wildlife Service (e.g., Alabama Natural Heritage Program, 1994). Such explicitly unpublished reports were used as additional guidance to determine "prevailing usage" of a name, but novel nomenclatural statements therein (e.g., concerning the validity of a name) were not.

Text Conventions

Any references to "Lea" in this text refer to Isaac Lea. His initial, "I." for Isaac, is given in all cases where the name is formally cited as a taxon author, to avoid confusion with his son Henry Charles Lea who also published on molluscan taxa at the time and appears in this treatment as "H. C. Lea".

When two author references are given for "current status", the first is in support of the stated synonymy and the second a recently published genus-group placement (with the

latter work often not addressing the synonymy, e.g., Williams et al., 2017).

The most extensive published listing of Lea's works is that of Scudder (1885) who provided information on 279 numbered entries. To allow comparison across works, the Literature Cited section herein notes these "Scudder numbers" for each of Lea's cited articles. Because of subsequent refinement of the publication dates, these Scudder numbers are no longer in strict chronological order.

RESULTS

Under current taxomic treatment (Mollusca-Base, 2020), Lea's names covered herein fall into four bivalve families and eleven gastropod families. In the following, the names are arranged by superfamily within the two molluscan classes.

BIVALVIA

Unionoidea

(here with Unionidae and Hyriidae)

ablatus/oblatus, *Unio*: Lea (1863e: 193) described a new species from North Carolina as *Unio ablatus*. Lea (1866e: 13, pl. 4, fig. 10; copied in 1867a: 17, pl. 4, fig. 10) changed the spelling to *Unio obesus*. Both names represent Latin words (meaning "taken away, stolen" vs. "exposed, unexpected"). While probably meant as a correction of the original spelling, Lea's (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. (Lea referenced the original publication but did not cite the original spelling) and is here considered an incorrect subsequent spelling. The nominal species was synonymized early, and the changed spelling has not entered prevailing usage. Among the few usages as a valid nominal species, besides Lea's own subsequent indexes, was "*Unio obesus*, Lea" of Preston (1912: 291), which however was in error for a different species, *Unio obesus* I. Lea, 1870. Simpson (1900: 730) interpreted the original spelling as a "typographical error, probably" and subsequently (1914: 730b) unequivocally adopted the changed spelling while citing both, which qualifies as an emendation under Art. 33.2.1. The latter is here considered an unjustified emendation and,

because not in prevailing usage, attributed as *Unio obesus* Simpson, 1914. Current status (Burch, 1975: 159; Williams et al., 2017: 37): a junior subjective synonym of *Elliptio icterina* (Conrad, 1834), Unionidae.

benedictensis, *Sympynota/benedictii*, *Anodontia*: Lea (1834a: 104, pl. 16, fig. 48; copied in 1834b: 216, pl. 16, fig. 48) described a new species from Lake Champlain as *Sympynota benedictensis*, as a patronym for "Professor Benedict." Lea (1866e: 26, 28; copied in 1867a: 30, 32), in the discussion of other species (*Anodontia leonensis* I. Lea, 1862 and *A. williamsii* I. Lea, 1862), referred to "[*Anodontia*] *Benedictii* (nobilis)," which is here interpreted as an incorrect subsequent spelling of *S. benedictensis*. In the following year, Lea (1867c: 61, errata et corrigenda) corrected the spelling of Lea's (1834b) usage by stating "for *Benedictensis* read *Benedictii*." The 1834b work is a copy of the original paper (1834a), and Lea's (1867c) name change is here interpreted as "demonstrably intentional" and thus an emendation under Art. 33.2.1 (Lea referenced the original publication and the original spelling). The emended spelling was used by Lea (1870; in the invalid combination *Margarion* (*Anodontia*) *benedictii*) and subsequent authors dated the name from that work (e.g., Parmalee & Bogan [1998: 206]). Few authors adopted the new spelling as valid, and the name did not enter prevailing usage. *Anodontia benedictii* I. Lea, 1867, an unjustified emendation, is a junior objective synonym of *Sympynota benedictensis* I. Lea, 1834. Current status (Frierson, 1927: 15; Williams et al., 2008: 638): a junior synonym of *Pyganodon grandis* (Say, 1829), Unionidae.

biangularis/biangularatus, *Unio*: Lea (1840c: 288) described a new species from Tennessee as *Unio biangularis*. Lea (1842a: 197, pl. 9, fig. 8; copied in 1842b: 35, pl. 9, fig. 8) changed the spelling without explanation to *Unio biangularatus*. While probably meant as a correction of the original spelling and interpreted as an unjustified emendation by Parmalee & Bogan (1998: 53) and Williams et al. (2008: 111), Lea's (1842) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. The secondary spelling was followed by various authors of the 19th Century (e.g., Küster, 1861: 189) but did not enter prevailing usage;

later authors such as Simpson (1914), Frierson (1927) and Haas (1969) used the original name. *Unio biangulatus* is here considered an incorrect subsequent spelling. Current status (Williams et al., 2008: 111, 2017: 36: a junior synonym of *Actinonaias pectorosa* (Conrad, 1834), Unionidae.

brumleyanus/brumbyanus, *Unio*: Lea (1841e: 82) described a new species from Alabama as *Unio brumleyanus*, with reference to "Prof. Brumley." Lea (1842a: 245, pl. 26, fig. 62), without reference to the original introduction or the earlier name, changed the spelling to *Unio brumbyanus*, now referring to "Prof. Brumby" (Richard Trapier Brumby [1804–1875; U.S.A.], see Abbott, 1973: 74, 75). While apparently intended as a correction of the original spelling, Lea's (1842) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. The spelling cannot be corrected under Art. 32.5 because the original publication does not provide enough information to infer the proper spelling. The secondary spelling was followed by subsequent authors before the name fell into synonymy (e.g., Conrad, 1853a: 245; H. Adams & A. Adams, 1857: 493; Lea, 1860h: 344; 1870: 49; Paetel, 1890: 146; Simpson, 1900: 760, 1914b: 784, in *Pleurobema*), but did not reach the level of prevailing usage adopted herein. *Unio brumbyanus* is here considered an incorrect spelling. Current status (Williams et al., 2008: 621): a junior synonym of *Ptychobranchus greenii* (Conrad, 1834), Unionidae.

cowperiana/couperiana, *Anodonta*: Lea (1840c: 289) described a new species from Georgia as *Anodonta cowperiana*, as a patronym for "J. H. Cowper, Esq." Lea (1842a: 227, 249, pl. 20, fig. 46; copied in 1842b: 65, 87, pl. 20, fig. 46), without reference to the original publication or its spelling, changed the spelling to *Anodonta couperiana*, now acknowledging "J. H. Couper," apparently referring to James Hamilton Couper (1794–1866), a 19th Century American malacologist (H. G. Lee, 1977). Williams et al. (2014: 151) interpreted this as a justified emendation. While obviously correcting the original spelling, Lea's (1842) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea did not cite the original spelling). The spelling cannot be corrected under Art. 32.5 because the original

publication does not provide enough information to infer the proper spelling. Haldeman (1842: 177), attempting to address a similar issue with another species introduced by Lea, discussed a perceived "error in the orthography" that Lea had made, and suggested that "the letter *u* should take the place of *w* in the *Unio Cowperianus* of Lea," which, however, had been introduced as *Unio cooperianus* I. Lea, 1834. Lea (1843c: 216) accordingly declined the correction and pointed out that it had been named for William Cooper of New York. In this context, Haldeman (1842: 177) also pointed to Lea's *Anodonta cooperiana* here under discussion, but did not provide an emendation ("which I do not correct, because I wish merely to discuss a principle"). Lea's secondary spelling *Anodonta cooperiana* was widely followed (e.g., Lea, 1863h: 87; 1870: 81; G. B. Sowerby II, 1867: pl. 11, fig. 32, in *Anodon*; Clessin, 1874: 148, pl. 50, figs 3, 4; Simpson, 1892: 433, 1914a: 399; Frierson, 1927: 17) and has entered prevailing usage in more than 25 works in the past 50 years (Johnson, 1972; Heard, 1975; Burch, 1975; Zingmark, 1978; Kat, 1983; Turgeon et al., 1988; Hoeh, 1990; Gordon & Hoeh, 1993; Williams et al., 1993; Lydeard et al., 1996; Vidrine, 1996; Turgeon et al., 1998; Turner et al., 2000; Bogan, 2002; Huang et al., 2002; Krebs et al., 2003; Lee, 2006; Zanatta et al., 2007; Graf & Cummings, 2007; Williams et al., 2009; Cummings & Graf, 2010; Williams et al., 2011; Haag, 2012; Williams et al., 2014; Williams et al., 2017; Smith et al., 2018). *Anodonta cooperiana* is here considered a correct original spelling under Art. 33.3.1. Current status (Williams et al., 2017): *Utterbackiana cooperiana* (I. Lea, 1840), Unionidae.

demararaensis, *Unio/demeraraensis*, *Margaron*: Lea (1859c: 152) described a new species as *Unio demararaensis* from "Demarara." Lea (1860a: 253, pl. 39, fig. 133; copied in 1860b, c: 71, pl. 39, fig. 133) changed the spelling to *Unio demeraraensis* for "Demerara," also listing the original description as if it had had the new spelling. While probably intending to correct the original spelling (Demerara was a common, and now is the proper, spelling for what was then a county of British Guiana and now is a part of Guyana), Lea's (1860a) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. The

original spelling cannot be corrected under Art. 32.5 because the Lea's original spelling of the region's name, Demarara, was also in contemporary usage. Lea (1870: viii, corrigenda) pointed to the spelling *demararaensis*, as used in the combination *Margaron* (*Unio*) in that work (1870: 36), as an error and formally replaced it with "demeraraensis", which qualifies as an emendation under Art. 33.2.1. The latter is here considered an unjustified emendation and dated as *Margaron demeraraensis* I. Lea, 1870. The incorrect subsequent spelling (and, later, unjustified emendation) was followed by subsequent authors (e.g., Reeve, 1865: pls. 22, species 99; Simpson (1914c: 1255, as *Diplodon*); Graf et al., 2015: 3, tables; da Cruz Santos-Neto et al., 2016: 150 ff, tables), but did not reach the level of prevailing usage adopted herein. Current status (da Cruz Santos-Neto et al., 2016; with spelling corrected herein): *Diplodon demararaensis* (I. Lea, 1859), Hyriidae. Treated as a junior synonym of *Diplodon suavidicus* (I. Lea, 1856) by Haas (1969) and Simone (2006; as Rhipidodontida).

diminutis/diminutus, *Unio*: Lea (1859c: 151) described a new species from East Africa as *Unio diminutis*. The epithet *diminutis* is a Latin word (but as a verb or dative/ablative participle) and apparently was a misspelling of *diminutus*. Lea (1860a: 254, pl. 39, fig. 134; copied in 1860b: 72, pl. 39, fig. 134) changed the spelling to *Unio diminutus* (a Latin word meaning "unusually small, diminutive"), also listing the original description as if it had had the changed spelling. While probably intended as a correction of the original spelling, Lea's (1860a) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. The secondary spelling was adopted by subsequent authors (e.g., Simpson [1900: 826, referring to the original spellings as "probably a typographical error"; 1914b: 583]; Lea, 1870: 31, 95; Jickeli, 1874: 280; Pilsbry & Bequaert, 1927: 380; Johnson, 1974: 46], but not at the level of prevailing usage adopted herein. It is here argued that there is evidence in the original publication, from the form of the word that a typographical error had occurred. Lea's change of 1860 is considered a justified emendation under Art. 32.5 and 33.2.2 and the name thus corrected retains the authorship and date of the original spelling, as *Unio diminutus* I. Lea, 1859. Current status

(Connolly, 1939: 608; Daget, 1998: 69, as *Cafferia*): a junior synonym of *Unio caffer* F. Krauss, 1848, Unionidae.

dolearis/doliaris, *Anodonta*: Lea (1863e: 193–194) described a new species from North Carolina as *Anodonta dolearis*. The epithet *dolearis* is a Latin word (if derived from dolere, to suffer or hurt) but the ending reflects a second person passive subjunctive and was likely in error. Lea (1863f: 393; copied in 1863h: 29) referred to an "*Anodonta doliaris* (my MSS.)" and later (1866e: 24, pl. 8, fig. 23, copied in 1867a: 28, pl. 8, fig. 23) it became clear that he was now using the spelling *Anodonta doliaris* (a Latin word meaning "like a barrel" and based on the Latin noun *dolium*) for the species originally introduced as *A. dolearis*. While probably intended as a correction of the original spelling, Lea's (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The spelling cannot be corrected under Art. 32.5 because the original publication does not provide enough information to infer the proper spelling. The secondary spelling was followed by some subsequent authors (e.g., Lea, 1870: 81, 105; G. B. Sowerby II, 1870: [index], in *Anodon*; Clessin, 1874: 130, pl. 42, figs. 1, 2; Simpson, 1900: 634; 1914a: 393) before the name fell into synonymy, but not at the level of prevailing usage adopted herein. *Anodonta doliaris* is here considered as an incorrect subsequent spelling. Scudder (1885: 145) erroneously referred to the original name as "*U[nio] dolearis*" (*Unio doliaris* I. Lea, 1865, is a different species). Current status (Frierson, 1927: 16; Williams et al., 2008: 633): a junior synonym of *Pyganodon cataracta* (Say, 1817), Unionidae.

estabrookianus/estabrookii, *Unio*: Lea (1845a: 164) described a new species from Tennessee as *Unio estabrookianus*, as a patronym for "President Estabrook", referring to Joseph Estabrook who was president of East Tennessee University at the time. Lea retained the name in subsequent papers (e.g., 1848a: 77, pl. 6, fig. 17; copied in 1848b: 77, pl. 6, fig. 17; 1862c: 66; 1869a: 27). Later, Lea (1868e: 317; copied in 1869a: 77) referred to a species of *Unio* as "*Estabrookii (nobis)*," which here is interpreted as an incorrect subsequent spelling of *Unio estabrookianus*. In the

following year, Lea (1869b: 22, errata et corrigenda) corrected the spelling of *estabrookii* as used in his 1869a work to *estabrookianus*, which confirmed the usage of the name *Unio estabrookii* as erroneous. Current status of *Unio estabrookianus* (Williams et al., 2008: 587): a junior synonym of *Pleuronaia barnesiana* (I. Lea, 1838), Unionidae.

etowahensis/georgiana, Margaritana: Lea (1858c: 138) described a new species from the Etowah River, Georgia, as *Margaritana etowahensis*. The following year, Lea (1859f: 280) pointed out that the “name had already been occupied” by one introduced by Conrad (1849).

The referenced name by Conrad (1849: 154), originally spelled *Margaritana etowaensis*, might have been misspelled as he rendered the name of the type locality also as “Etowah River.” Subsequent authors (Simpson, 1900: 670, 672; 1914a: 510; Frierson, 1927: 19; in *Alasmidonta*) changed the spelling of Conrad’s epithet to “etowahensis,” but their actions do not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. More recently, usage returned to the original spelling of Conrad’s name (Williams et al., 2008: 400; Haag, 2012: 72; Williams et al., 2017: 40; Smith et al., 2018: 51). In this context, Williams et al. (2008: 401) argued that “The specific name, *etowaensis*, was in reference to the Etowah River and has often been taken to represent an incorrect original spelling. However, Conrad (1853) specifically pointed out that the spelling in the original description, *etowaensis*, was correct.” In fact, Conrad’s note (1853b: 449) did not explicitly defend the spelling *etowaensis*; he pointed out that a subsequent spelling as “*Strophitus etowaosis*” (of Conrad 1853a: 263) was an error for it.

Lea (1859f: 280; also 1860c: errata; again in 1867c: errata et corrigenda) proposed a replacement name *Margaritana georgiana* for his earlier *M. etowahensis*. Lea’s introduction of *M. georgiana* to avoid homonymy with Conrad’s *M. etowaensis* was unnecessary under Art. 57.6 (one-letter difference). However, Art. 58.6 (aspiration or non-aspiration of a consonant) appears to apply, which makes the two names homonyms and *M. georgiana* a substitute name under Art. 60.3. The replacement name *M. georgiana* was adopted by some subsequent workers (e.g., Simpson, 1900: 670, 1914a: 503, 504; Stans-

bery, 1976: 43, in *Lasmigona*), but not others: for example, Campbell et al. (2005) used the name as “*Lasmigona holstonia etowahensis* (Lea, 1858).” Current status (Williams et al., 2008: 402): a junior subjective synonym of *Lasmigona etowaensis* (Conrad, 1849), Unionidae.

gracilior/gracillior, Unio: Lea (1857b: 262) described a new species from Georgia as *Unio gracilior*. Lea (1858d: 56) changed the spelling to *Unio gracillior* in a work that also changed the spelling of other *Unio* species (*U. pullatus*, *U. rostriformis*) that he had introduced earlier. However, these names were not “treated in a similar way” to satisfy Art. 33.2.1. The change of spelling from the proper Latin word “gracilior” is not demonstrably intentional under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The name change was likely in error as Lea did not make the change in the associated plate captions in the 1858 publication and returned to the original spelling in his later work (e.g., Lea, 1859d: 198; 1870: 45, 98). Although used by some subsequent authors (e.g., Johnson & Baker, 1973: 156; Johnson, 1974: 65, who overlooked the original spelling), the secondary spelling did not enter prevailing usage and is here considered an incorrect subsequent spelling. Current status (Watters, 2018: 10): a junior synonym of *Villosa vibex* (Conrad, 1834), Unionidae.

granulatis/granulatus, Unio: Lea (1861b: 60) described a new species from Alabama as *Unio granulatis*. The epithet *granulatis* is a Latin word (but as a dative/ablative participle) and apparently was a misspelling of *granulatus*. Lea (1866e: 48, pl. 16, fig. 46; copied in 1867a: 52, pl. 16, fig. 46) changed the spelling to *Unio granulatus*, a properly formed Latin adjective meaning “granular” or “granulated”. While probably intended as a correction of the original spelling, Lea’s (1866e) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Lea continued using the second spelling (1868e: 327; copied in 1869a: 87) for a brief period, but then (1870: 49) synonymized the nominal species himself by considering it “probably a marked variety of *germanus*, Lea” [*Unio germanus* I. Lea, 1861]. Initially, both spellings were

listed in synonymies (e.g., Simpson, 1914a: 155) but later the secondary spelling was assumed to date from 1861 (e.g., by Haas, 1969: 429, in synonymy of *Carunculina paula* (I. Lea, 1840) and by Williams et al. (2008: 711) who treated "*Unio granulatus* Lea, 1861" as an unresolved taxon belonging to genus *Toxolasma*. The latter spelling did not enter prevailing usage. It is here argued that there is evidence in the original publication, from the form of the word that a typographical error had occurred. Lea's change of 1866 is considered a justified emendation under Art. 32.5 and 33.2.2 and the name thus corrected retains the authorship and date of the original spelling, as *Unio granulatus* I. Lea, 1861. Current status: a taxon inquirendum in *Toxolasma* (Williams et al., 2008). Previously treated as a junior synonym of *Toxolasma paulum* (I. Lea, 1840), for example, by Haas (1969), Unionidae.

henryiana/henryana, Anodonta: Lea (1857g: 102) described a new species from Taumalipas, Mexico, as *Anodonta henryiana*. Lea (1860h: 373, 374, pl. 66, fig. 198; copied in 1862e: 55, pl. 66, fig. 198) changed the spelling to *Anodonta henryana* and explained that the name was honoring Professor Joseph Henry, then Secretary of the Smithsonian Institution. While perhaps intended as a correction of the original spelling, Lea's (1860h) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Various subsequent authors followed the secondary spelling (e.g., G. B. Sowerby II, 1870: plate 34, species 140, in *Anodon*; Lea, 1870: 81, 105; Clessin, 1874: 141, pl. 45, figs. 5, 6; Paetel, 1890: 180; Simpson, 1896: 334; Ortmann, 1912: 291; Simpson, 1900: 635, 1914a: 397; Baker, 1927: 222; Johnson 1974: 69; Heard, 1975: 83), but not at the level of prevailing usage adopted herein. Here, *Anodonta henryana* is considered an incorrect subsequent spelling (note that an unjustified emendation would have resulted in a junior homonym under Art. 58.15). Current status (Johnson, 1970: 363; Watters et al., 2009: 323): a junior synonym of *Utterbackia imbecillis* (Say, 1829), Unionidae.

indefinilus/indefinitus, Unio: Lea (1863e: 192) described a new species from North Carolina as *Unio indefinilus*, which has no Latin

meaning and likely was a lapsus calami. Lea (1866e: 15, pl. 4, fig. 12; copied in 1867a: 19, pl. 4, fig. 12) changed the spelling to *Unio indefinitus*, a Latin adjective meaning "indefinite". While probably intended as a correction of the original spelling, Lea's (1866e) action does not fulfill the requirements of a "demonstrably intentional" emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling) and his *Unio indefinitus* is considered an incorrect subsequent spelling. Following authors attributed the secondary spelling also to the original (1863e) introduction (e.g., Lea, 1870: 51, 98; Frierson, 1927: 31; Johnson & Baker, 1973: 158). Haas (1969: 235) formally emended the spelling by citing both spellings and declaring the original one an "error typographicus." Because the original publication does not provide enough information to justify such an emendation under the current Code, Haas's action is interpreted as having resulted in an unjustified emendation with its own author and date, *Unio indefinitus* Haas, 1969. Current status (Johnson, 1970): a junior synonym of *Elliptio complanata* (Lightfoot, 1786), Unionidae.

keinerianus/kienerianus, Unio: Lea (1852b: 281, pl. 23, fig. 40; copied in 1852e: 37, pl. 23, fig. 40; also listed in 1852f: 251) described a new species from Georgia as *Unio keinerianus*, as a patronym for "Mr. L. C. Keiner, the author of 'Spécies Général et Icon. Coquil. Vivantes'". Lea thus clearly identified the French malacologist Louis Charles Kiener (1799–1881) but had misspelled his name and the resulting patronym. Lea (1867c: 62, errata et corrigenda for 1852e) subsequently corrected the spelling ("for *Keinerianus* read *Kienerianus*"). As the original publication of the name contained evidence of a lapsus calami, here the original spelling *Unio keinerianus* is treated as an inadvertent error that must be corrected under Art. 32.5, and *Unio kienerianus* is considered a justified emendation under Art. 33.2.2. Current status (Williams, 2017: 37): *Cyclonaias kieneriana* (I. Lea, 1852), Unionidae.

lanceolata/contorta, Triquetra: Lea (1856b: 79) described a new species from "China?" as *Triquetra lanceolata*. Lea (1857c: 301) provided an unnecessary replacement name, *Triquetra contorta*, to better reflect the characters of the adult shell. *Triquetra contorta*

I. Lea, 1857, is an objective junior synonym of *Triquetra lanceolata* I. Lea, 1856. Current status (Huang et al., 2019): *Lanceolaria lanceolata* (I. Lea, 1856), Unionidae.

lenis/lenior, Unio: Lea (1840c: 286) described a new species from Tennessee as *Unio lenis*. The name is invalid as it is a junior primary homonym of *U. lenis* Conrad, 1838. Lea (1842a: 204, pl. 12, fig. 18; copied in 1842b: 42, pl. 12, fig. 18) provided a replacement name, *Unio lenior*, for his earlier name. The latter is a substitute name under Art. 60.3. Current status (Williams et al., 2017: 38): *Epioblasma lenior* (I. Lea, 1842), Unionidae.

lepidus, Unio/lepidior, Margaron: Lea (1860e: 91; described a new species from the Uruguay River as *Unio lepidus* (also 1863f: 380, 389, pl. 50, fig. 306; copied in 1863h: 16, 25, pl. 50, fig. 306). The name is invalid as it is a junior primary homonym of *U. lepidus* Gould, 1856. Lea continued using the name *U. lepidus* in the discussion of another species (1868e: 272; copied in 1869a: 32). He then (1869b: 10, footnote; p. 22, errata et corrigenda) cryptically corrected the name as used in his 1869a article by stating “*lepidior* Lea ... in error *lepidus* [p. 10]” and “*for lepidus read lepidior*” [p. 32]. His reference to an “error” instead of a homonym does not support the interpretation of his action as a formal introduction of a substitute name and his (1869b) action is here interpreted as introducing an incorrect subsequent spelling. However, a year later, now acknowledging the homonymy, Lea (1870: 53) formally replaced the name with *Margaron lepidior* [in the invalid combination *Margaron (Unio)*, which reversed the priority of the genus-group names]. The latter is a substitute name under Art. 60.3. Current status (Simone, 2006: 267): a junior synonym of *Rhipidodonta charruana* (d’Orbigny, 1835), Hyriidae.

linnaena/linnaeana/linneana, Anodonta: Lea (1852b: 289, 290, pl. 27, fig. 51; copied in 1852e: 45, 46, pl. 27, fig. 51) described a new species from Louisiana as *Anodonta linnaena* (written *Linnæna*), as a patronym for Linnaeus. Fifteen years later, Lea (1867c: 62, errata et corrigenda for page 45 of 1852e) corrected the name by stating “*for Linnæna read Linnæana*”. The corrected article of 1852e has the same contents as the original description of 1852b, and Lea’s

action is here interpreted a “demonstrably intentional” change and thus an emendation of the original name under Art. 33.2.1. This spelling had already appeared in Lea (1852a: 51) as a *nomen nudum*, *Margarion (Anodonta) linnaeana*, and was used in listings by H. Adams & A. Adams (1857: 502) and, later, Lea (1870: 81). However, other authors adopted a third spelling, *Anodonta linneana* (e.g., Conrad, 1853a: 264; Hanley, 1856: 387; G. B. Sowerby II, 1870: pl. 35, sp. 144, as *Anodon*; Simpson, 1900: 656, 1914a: 431; with these authors mostly listing also the 1852 publication as if it had had that spelling). Since *Anodonta linnaeana* is an acceptable name that does not require emendation under Art. 32.5 and *Anodonta linnaeana* is not in prevailing usage, the latter is here considered an unjustified emendation retaining its own author and date under Art. 33.2.3. *Anodonta linnaeana* I. Lea, 1867, is a junior objective synonym of *Anodonta linnaeana* I. Lea, 1852. *Anodonta linneana* is an incorrect subsequent spelling. Current status (Williams et al., 2008: 638): a junior synonym of *Pyganodon grandis* (Say, 1829), Unionidae.

lutens/luteus, Unio: Lea (1856c: 93) described a new species from “Burmah” (then British Burma, now Myanmar) as *Unio lutens*. Lea (1858a: 291 footnote, pl. 24, fig. 4; copied in 1858b and 1858g: 11, pl. 24, fig. 4) changed the spelling to *Unio luteus*, explaining the original spelling as a “typographical error”; the original description clearly referred to yellow [= *luteus*] coloration. Lea’s (1858) action is here accepted as a correction of an inadvertent error under Art. 32.5. As a justified emendation under Art. 33.2.2., it is attributed the original author and date, *Unio luteus* I. Lea, 1856. Current status (Simpson, 1914c: 1107; Subba Rao, 1998: 179): a junior synonym of *Parreysia corrugata* (O. F. Müller, 1774), Unionidae.

maestus/moestus, Unio: Lea (1841e: 82) described a new species from Tennessee as *Unio maestus* (originally spelled *mæstus*; also 1842a: 244, pl. 26, fig. 60; copied in 1842b: 82, pl. 26, fig. 60; and 1852a: 31). Lea (1867c), in the index for his 1842b paper (p. 11), listed the name with a changed ligature as *Unio moestus* (written *mœstus*) and in the errata et corrigenda section (p. 61) corrected the page-82 entry of his 1842b publication by

stating “for *moetus* read *moestus*”. This was in error as the original spelling had been “*mæstus*” not “*moetus*”. The original 1841 spelling was sometimes misinterpreted as “*moestus*” (e.g., by Frierson, 1927: 88; Watters et al., 2009: 299), probably because the æ and œ ligatures are very similar in the lowercase italicized font used in the publications of the *American Philosophical Society* (see *Melania clavaeformis* I. Lea, 1841 [1841b: 12] for another example). *Maestus/a/um* and *moestus/a/um* are both acceptable spellings for the Latin adjective meaning gloomy or sad, and there is no justification for an emendation of the original spelling. The incorrect subsequent spelling *Unio moestus* was adopted by various subsequent authors (e.g., Conrad, 1853a: 252; H. Adams & A. Adams, 1857: 494; Lea, 1870: 49, 124, in *Margaron*; Paetel, 1890: 159; Simpson, 1900: 565, 1914a: 156, in *Lampsilis*; Ortmann, 1921a: 89, 1924a: 100, 1924b: 44, as *Carunculina moesta*; Frierson, 1927: 88) but did not reach the level of prevailing usage adopted herein. Current status (Watters et al., 2009: 299; Williams et al., 2008: 721): a junior synonym of *Toxolasma lividum* (Rafinesque, 1831), Unionidae.

maryattiana/maryattana/marryatana, *Anodonta*: Lea (1840c: 289) described a new species from the “vicinity of Fort Winnebago,” Wisconsin, as *Anodonta maryattiana*, as a patronym for “Capt. Maryatt, R[oyal]. N[avy]”. Lea (1842a: 226, p. 20, fig. 45; copied in 1842b: 64, pl. 20, fig. 45) changed the spelling to *Anodonta maryattana*. This was likely in error (-ianus/a is a frequently used ending for patronyms in Lea’s works) and the replacement does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. (in contrast to the interpretation by Parmalee & Bogan, 1998: 206; note that an unjustified emendation would have resulted in a junior homonym under Art. 58.15). The species clearly was named for Captain of the British Royal Navy Frederick Marryat [note the correct spelling with two “r” and a single “t”] (1792–1848), who had traveled widely in the United States, including Fort Winnebago (e.g., Anonymous, 1925). Lea later (1867c: errata et corrigenda) formally emended the name by stating “for *Maryattana* read *Marryatana*”. Some subsequent authors followed “*maryatana*” (e.g., Clessin, 1873: 72, pl. 26, figs 3, 4; Walker, 1896: 99), or employed the

additional variant spelling, “*marryattana*” (e.g., Conrad, 1853a: 264; G. B. Sowerby II, 1870: pl. 28, species 111; Simpson, 1900: 642, in synonymy). Another misspelling is “*marryattiana*” as listed by Scudder (1885: 39) and Burch (1975: 166). None of the secondary spellings entered prevailing usage. As the original publication by Lea (1840) clearly identified, although misspelled, Captain Frederick Marryat as the individual to be honored by the name, Lea’s emendation of 1867 is here accepted as a justified emendation of an inadvertent error that must be corrected under Art. 32.5. As a justified emendation under Art. 33.2.2, it is attributed the original author and date, *Anodonta marryatana* I. Lea, 1840. Current status (Williams et al., 2008: 638): a junior synonym of *Pyganodon grandis* (Say, 1829), Unionidae.

mouhotii/mouhotiana, *Monocondylaea*: Lea (1863d: 190) described a new species from “Laos Mountains, Cambodia, Siam” as *Monocondyloea [sic] mouhoti*, naming it for “Monsieur Mouhot.” Lea (1866e: 65, pl. 21, fig. 62; copied in 1867a: 69, pl. 21, fig. 62) changed the spelling to *Monocondylaea mouhotiana*, now using his preferred ending for patronyms at the time. While likely an intentional modification of the original spelling, Lea’s (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. (Lea referenced the original publication but did not cite the original spelling). Peculiarly, Lea (1867c: 24) returned to the original spelling when indexing the 1867a work. Some subsequent authors (e.g., Clessin, 1876: 261, pl. 82, figs 1, 2, in *Microcondylaea* [also citing the original 1863 publication with this spelling]; G. B. Sowerby II, 1868: pl. 92, species 503; Morelet, 1875: 339, in *Pseudodon*) adopted the secondary spelling. Later workers returned to the original spelling (e.g., Simpson, 1900: 839, 1914c: 1097; Zieritz et al., 2018: online resource 1). The secondary spelling is not in prevailing usage and *Monocondylaea mouhotiana* is here considered an incorrect subsequent spelling. Current status (Konopleva et al., 2019: 29): *Bineurus mouhotii* (I. Lea, 1863), Unionidae.

nashvillianus/nashvillensis/nashvilleensis, *Unio/nashvilliensis*, *Margaron*: Lea (1834a: 100, pl. 14, fig. 43; copied in 1834b 21: 212, pl. 14, fig. 43) described a new species as

Unio nashvillianus from the Cumberland and Ohio rivers. Lea continued using the original spelling in his subsequent work (1838a: 7, copied in 1836c: 7; 1848a: 80, copied in 1848b: 54; 1852b: 269, copied in 1852e: 25; 1858e: 80, copied in 1858g: 80). Later, Lea (1862c: 67, copied in 1862d: 71) referred to a species of *Unio* as “*nashvillensis* [...] (nobis),” which here is interpreted as an incorrect subsequent spelling of *Unio nashvillianus*. Lea maintained that secondary spelling in later years (1862k: 200; 1863b: 22; 1863g: 439; 1863h: 75; 1870: 45, 99 [the latter in *Margaron (Unio)*]). In the index of the latter publication, Lea (1870: 124) spelled the name as *Margaron nashvilliensis*, a variant that was erroneously assigned to Lea's entire 1870 work by some subsequent workers (e.g., Simpson, 1900: 547) and considered an emendation by Parmalee & Bogan (1998: 154) and Williams et al. (2008: 431). None of these uses by Lea fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. (Lea referenced the original publication in his 1863g/1863h and 1870 works but did not cite the original spelling). A few years later, Lea (1874c: 68, pl. 21, fig. 1, copied in 1874: 72, pl. 21, fig. 1) changed the spelling a third time, to *Unio nashvilleensis*, thereby introducing yet another incorrect subsequent spelling that was not adopted into prevailing usage. Current status of *Unio nashvillianus* I. Lea, 1834 (Watters, 2018): a synonym of *Sagittunio subrostratus* (Say, 1831), Unionidae.

nasutidus/nasutulus/nasutilus, *Unio*: Lea (1863e: 192) described a new species from North Carolina as *Unio nasutidus*. The epithet has no meaning in Latin and probably was a typographical error. Lea (1866e: 12, pl. 3, fig. 9; copied in 1867a: 16, pl. 3, fig. 9) changed the spelling to *U. nasutulus* (a diminutive of the Latin adjective meaning “long-nosed”). While likely an intentional correction of a typesetting error, Lea's (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Much later, Simpson (1900: 735) referred to Lea's name as “*Unio nasutilus* Lea. (Emend.)” and described the original spelling as “no doubt a typographical error”. Simpson's action does not qualify as an emendation because he erroneously stated that the original name to be replaced

was *Unio nasutulus* [sic], a mistake repeated by Simpson (1914b: 691, 692) and followed by later workers (e.g., Johnson, 1970: 334, who [in 1974, p. 96] added to the confusion by stating that Lea [1866] had changed the name to *U. nasululus* [sic]). Simpson was later attributed authorship of the name *U. nasutulus* by some workers (e.g., Bogan & Ashton, 2016: 35), but the name was clearly an incorrect subsequent spelling. The original spelling *U. nasutidus* fell in disuse and Lea's secondary spelling *U. nasutulus* was initially followed by subsequent authors (e.g., Lea, 1870: 99, 125; Wright, 1888: 15; Simpson, 1914b: 691, 692; Frierson, 1927: 30). More recently, however, usage shifted to the variant spelling *Unio nasutulus* (e.g., Burch, 1975: 167; Bogan, 2017: 9; Perkins et al., 2017: 752; Inoue et al., 2018: table S2). None of the subsequent spellings rose to the level of prevailing usage. *Unio nasutulus*, *U. nasutulus*, and *U. nasululus* are considered incorrect subsequent spellings. Current status: Traditionally (e.g., Haas, 1969: 231) considered a junior synonym of *Elliptio producta* (Conrad, 1836). Treated as valid species *Elliptio nasutulus* [sic] (I. Lea, 1863) by Perkins et al. (2017: 752), Unionidae.

newcombianus/newcombi, *Unio*: Lea (1856e: 103) described a new species from Nicaragua as *Unio newcombianus*, as a patronym for “W. Newcomb, M. D.” Lea used the spelling in subsequent work (1858a: 312, pl. 30, fig. 27; copied in 1858g: 32, pl. 30, fig. 27; 1868a: 95). Later, Lea (1868d: 295; copied in 1869a: 55) referred to a species of *Unio* as “*Newcombi* (nobis),” which here is interpreted as an incorrect subsequent spelling of *Unio newcombianus*. In the following year, Lea (1869b: 22, errata et corrigenda) corrected the spelling of *newcombi* as used in his 1869a work to *newcombianus*, which confirmed the usage of the name *Unio newcombi* as erroneous. Current status of *Unio newcombianus* (Frierson, 1927: 92; Graf & Cummings, 2007: 305): a junior synonym of *Arotonaia cyrenoides* (Philippi, 1847), Unionidae.

nocturnis/nocturnus, *Unio*: Lea (1860e: 91) described a new species from the Uruguay River as *Unio nocturnis*. The epithet *nocturnis* is a Latin word (but as a dative/ablative participle) and apparently was a misspelling of *nocturnus*. Lea (1863f: 380, pl. 42, fig. 288;

copied in 1863h: 16, pl. 42, fig. 288) changed the spelling without explanation to *Unio nocturnus*, a Latin adjective meaning “of the night, nocturnal”. While likely an intentional change of the original spelling, Lea’s (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. The species was synonymized very early (e.g., G. B. Sowerby II, 1867: pl. 57, species 290) and the original spelling was subsequently overlooked or ignored. In later discussions, Lea (1860) was usually credited as having already used the spelling “*nocturnus*” (e.g., Simpson, 1900: 887, 1914c: 1285, in *Diplodon*; Johnson, 1974: 99). The secondary spelling was used by other some additional authors (e.g., Ortmann, 1921b: 542, in synonymy), but did not reach the level of prevailing usage as adopted herein. It is argued that there is evidence in the original publication, from the form of the word that a typographical error had occurred. Lea’s change of 1863 is considered a justified emendation under Art. 32.5 and 33.2.2 and the name thus corrected retains the authorship and date of the original spelling, as *Unio nocturnus* I. Lea, 1860. Current status (Simone, 2006: 267): a junior synonym of *Rhipidodonta funebralis* (I. Lea, 1860), Hyriidae.

ornatus, *Unio*: Lea (1861a: 41) described a new species from “Alabama?” as *Unio ornatus*. Lea added a more extensive description in 1862c: 85, pl. 11, fig. 234; copied in 1862d and 1862e: 89, pl. 11, fig. 234) and subsequent authors treated the species as valid (e.g., Simpson, 1914b: 746, in *Pleuronema*). The name is invalid as it is a junior primary homonym of *Unio ovatus* var. *ornatus* Conrad, 1835 (p. 4, from South Alabama). Originally introduced at the rank of variety, the Conrad’s name is currently treated as a valid species, *Lampsilis ornata* (Conrad, 1835) (e.g., Williams et al., 2008: 367; 2017: 40). Lea’s name apparently has never been replaced. Current status of the taxon represented by the invalid name *Unio ornatus* I. Lea, 1861 (Williams et al., 2008: 588; 2017: 42): a junior synonym of *Pleuronaia barnesiiana* (I. Lea, 1838), Unionidae.

pullatis/pullatus, *Unio*: Lea (1857b: 262) described a new species from Georgia as *Unio pullatis*. The epithet *pullatis* is a Latin word (but as a dative/ablative participle) and ap-

parently was a misspelling of *pullatus*. Lea (1858e: 57, 76, pl. 8, fig. 39; copied in 1858g: 57, 76, pl. 8, fig. 39) changed the spelling to *Unio pullatus*. Lea (1858) modified three of his own names (to *U. gracillior*, *U. pullatus*, *U. rostriformis*) in this work but they were not “treated in a similar way” to satisfy Art. 33.2.1. The change to the proper Latin word *pullatus* (an adjective meaning darkly or dirtyly clothed) is not demonstrably intentional under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Lea continued using the secondary spelling (e.g., 1860h: 329; 1862c: 54) and *Unio pullatus* was adopted by several authors (e.g., Küster, 1861: 247, listing also the original publication with the secondary spelling; Frierson, 1927: 32, in *Elliptio*; Williams et al., 2008: 205, 2014: 217, 2017: 38; Campbell & Lydeard, 2012: 21; Perkins et al., 2017: 750) but did not reach the level of prevailing usage. It is here argued that there is evidence in the original publication, from the form of the word that a typographical error had occurred. Lea’s change of 1858 is considered a justified emendation under Art. 32.5 and 33.2.2 and the name thus corrected retains the authorship and date of the original spelling, as *Unio pullatus* I. Lea, 1857. Current status (Williams et al., 2017; date corrected herein): *Elliptio pullata* (I. Lea, 1857), Unionidae.

rostraformis/rostriformis, *Unio*: Lea (1857b: 262) described a new species from Georgia as *Unio rostraformis*. Lea (1858e: 64, pl. 10, fig. 46; copied in 1858g: 64, pl. 10, fig. 46) changed connecting vowels, now spelling the name as *Unio rostriformis*. While likely an intentional change of the original spelling, Lea’s (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Lea (1858) modified three of his own names (to *U. gracillior*, *U. pullatus*, *U. rostriformis*) in this work but they were not “treated in a similar way” to satisfy Art. 33.2.1. Although subsequently used by Lea (e.g., 1862c: 58; 1866e: 13; 1870: 60, 100), the secondary spelling did not find wider acceptance (e.g., Simpson [1900: 736; 1914b: 695, 696] cited both and maintained the original spelling as valid; Frierson [1927: 33] used the name as valid species *Elliptio rostraformis*] and is here considered an incorrect subsequent spelling. Current sta-

tus: Considered a junior synonym of *Elliptio lanceolata* (I. Lea, 1828) by Johnson (1970: 333). Considered a junior synonym of *Elliptio producta* (Conrad, 1836) (A. Bogan, citing forthcoming work by G. Dinkins, pers. comm. 28 Oct 2020), Unionidae.

schoolcraftensis, *Unio/schoolcraftii*, *Margaron*: Lea (1834a: 37, pl. 3, fig. 9; copied in 1834b: 149, pl. 3, fig. 9) described a new species from the Fox River (Wisconsin) as *Unio schoolcraftensis*, as a patronym for "Mr. Schoolcraft." Lea (1838a: 123, 147, copied in 1838b: 15, 39 and in 1838c: 123, 141; 1852b: 281, copied in 1852e: 37; 1862k: 196, copied in 1863b: 18) continued using that name. Lea (1870: 33, 132 [in the invalid combination *Margaron (Unio)*]) changed the name to *Margaron schoolcraftii* without explanation. Lea's (1870) action was considered an unjustified emendation by Parmalee & Bogan (1998: 219) and Williams et al. (2008: 677) but it does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The secondary spelling was adopted by some subsequent authors (e.g., Call, 1895: 43, 65, pls 12–14) but did not enter prevailing usage. *Margaron schoolcraftii* is here considered an incorrect subsequent spelling. Current status (Williams et al., 2008: 677; Lopes-Lima et al., 2019: 315): a junior synonym of *Cyclonaias pustulosa* (I. Lea, 1831), Unionidae.

shaefferiana/shafferiana, *Anodonta*: Lea (1852b: 288, pl. 26, fig. 50; copied in 1852e: 44, pl. 26, fig. 50; also 1852f: 252) described a new species from Tennessee as *Anodonta shaefferiana*, as a patronym for "Mr. Shaef-fer". The name had already been mentioned, as a *nomen nudum*, by Lea (1852a: 51, as *Margaron*). Much later, Lea (1867c: 62, errata et corrigenda for page 44 of his 1852e publication) modified the name by stating "for Shaefferiana read Shafferiana", without further explanation. The corrected 1852e article is identical to the original description of 1852b, and Lea's 1867 correction is here interpreted "demonstrably intentional" and thus an emendation of the original name under Art. 33.2.1. Although it is possible that Lea (1867c) considered Mr. Shaeffer's name misspelled in the original, there is no clear indication of an inadvertent error that must be corrected under Art. 32.5 and

the emendation is deemed unjustified, with *Anodonta shafferiana* I. Lea, 1867, being a junior objective synonym of *A. shaefferiana* I. Lea, 1852. Subsequent authors treated the names in various ways, with some introducing ligatures as "shæfferiana" (Conrad, 1853a: 263, in *Strophitus*; H. Adams & A. Adams, 1857: 503, misspelled as "schæfferiana") or "shœfferianus" (G. B. Sowerby II, 1870: pl. 35, fig. 143, in *Anodon*). Others followed the emended spelling (e.g., Lea, 1870: 81, as *Margaron*; Clessin, 1873: 243, pl. 17, figs. 5–7; Call, 1895: 60; and Frier-son, 1927: 23, in synonymy). The name faded into synonymy and prevailing usage of the emended form of the name was not established – for instance, Wright & Walker (1902: 12, in synonymy) and Burch (1975: 172) referred only to the original spelling, *shaefferiana*. Current status (Williams et al., 2008: 709): a junior synonym of *Strophitus undulatus* (Say, 1817), Unionidae.

sordidis/sordidus, *Unio*: Lea's text portion of his article (1852b: 254; copied in 1852e: 10) described a species from South Carolina as *Unio sordidis*. The associated plates (pl. 12, fig. 1 in both cases) and the index page of 1852e showed the name as *Unio sordidus* (a Latin adjective meaning dirty, unclean). Lea (1852a: 33, 76) had previously used the latter name, as a *nomen nudum*. Subsequent authors (e.g., Conrad, 1853a: 257; H. Adams & A. Adams, 1857: 493) adopted the secondary spelling without citing the original and thus did not act as First Revisers as defined by Art. 24.2. Lea (1867c: 62, errata et corrigenda for page 10 of 1852e, which is a copy of the original description) stated "for *sordidis* read *sordidus*" and, acting as First Reviser under Art. 24.2.4, fixed *Unio sordidus* as the correct original spelling. Current status (Johnson, 1970: 308; Williams et al., 2017: 37): a junior synonym of *Elliptio congareae* (I. Lea, 1831), Unionidae.

*substriatus/subtriatu*s, *Unio*: Lea (1856c: 93) described a species from Siam [Thailand] as *Unio substriatus*. Lea (1858a: 300) changed the name to *Unio subtriatu*s. This change from the properly formed Latin adjective appears to have been a misspelling as indicated by the fact that Lea maintained the original spelling on the associated plate (1858a: pl. 26, fig. 14). The error was caught and Lea (1858g: 20), in what otherwise is a repagi-

nated copy of the 1858a article, returned to the original spelling. Subsequent authors did not follow the secondary spelling and *Unio substriatus* is here considered an incorrect subsequent spelling. Current status (Brandt, 1974): *Indonaia substriata* (I. Lea, 1856), Unionidae. Placed in *Radiatula* by Zieritz et al. (2018: online resource 1), but other authors (e.g., Bolotov et al., 2017; Bolotov et al., 2019) recognized *Indonaia* as distinct from *Radiatula*.

sumatrensis, *Unio/dimotus*, *Margaron*: Lea (1859c: 153) described a new species from Sumatra as *Unio sumatrensis*. The name is invalid as it is a junior primary homonym of *Unio sumatrensis* Dunker, 1852. Lea (1870: 30, 116) recognized the homonymy and provided a replacement, *Margaron dimotus* [in the invalid combination *Margaron (Unio)*], for his earlier name. *Margaron dimotus* I. Lea, 1870, is a substitute name under Art. 60.3. Current status (Brandt, 1974: 289 [as *Uniandra*]; Zieritz et al., 2018: online resource 1 [as *Contradens*], Pfeiffer et al., 2020): a junior synonym of *Lens contradens* (I. Lea, 1838), Unionidae.

texasiensis/texasensis, *Unio*: Lea (1857e: 84) described a new species from Texas as *Unio texasiensis*. Lea (1860h: 357, 359, 362, pl. 61, fig. 184; copied in 1862e: 39, 41, 44, pl. 61, fig. 184) changed the spelling to *Unio texasensis*, but this did not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Many subsequent authors appear to have overlooked the original spelling and occasionally associated the secondary spelling with the original pagination (e.g., Johnson, 1974: 145). The changed spelling was adopted very widely (e.g., Lea, 1870: 81; Simpson, 1900: 563, in *Lampsilis*; Ortmann, 1915: 141, as *Carunculina*; Walker, 1918: 180; Frierson, 1927: 87, in *Carunculina*; Strecker, 1931: 45, in *Carunculina*; Burch, 1975: 174; Williams et al., 1993: 14, 2014: 337, in *Toxolasma*; Vidrine, 1996: 220; Howells et al., 1996: 133; Parmalee & Bogan, 1998: 233; Lee, 2006: 6; Haag, 2012: 70; Marshall et al., 2018: 44 ff.). However, other authors reverted to the original spelling (e.g., Turgeon et al., 1998: 37; Graf & Cummings, 2007: 306; Williams et al., 2017: 53), and the secondary spelling did not rise to the

level of prevailing usage as adopted herein. *Unio texensis* is an incorrect subsequent spelling (note that the two spellings, if treated as available names, would be homonyms under Art. 58.15). Current status (Williams et al., 2017): *Toxolasma texasiensis* Lea, 1857, Unionidae.

thwaitsii/thwaitesii, *Unio*: Lea (1859c: 152) described a new species from Ceylon (now Sri Lanka) as *Unio thwaitsii*, stated to honor "Mr. Thwaites." Lea apparently was referring to George Henry Kendrick Thwaites, who was the director of the botanical gardens at Peradeniya, Ceylon, during that period (Thwaites, 1858–1864). The species epithet was clearly misspelled, and Lea (1860a: 246, pl. 37, fig. 125; copied in 1860c: 64, pl. 37, fig. 125) changed the name to *Unio thwaitesii*, now matching the spelling of the person's name to honored, while citing the original introduction as if it had had the corrected spelling. Subsequent authors adopted the corrected spelling. As the original publication of the name contained clear evidence of a lapsus calami, here the original spelling *Unio thwaitsii* is treated as an inadvertent error that must be corrected under Art. 32.5, and *Unio thwaitesii* is considered a justified emendation under Art. 33.2.2 and dated from 1859. Current status (Preston, 1915: 179, as "thwaitesii"; Ramakrishna & Dey, 2007: 288): a junior synonym of *Lamellidens marginalis* (Lamarck, 1819), Unionidae.

tombecbeensis/tombigbeensis, *Margaritana*: Lea (1858c: 138) described a new species as *Margaritana tombecbeensis*, with reference to the “Tombecbee River, near Columbus, Mississippi.” Lea apparently referred to the name of the French Fort Tombecbe (or Tombecbee) on the Tombigbee River. Lea (1862c: 107, pl. 18, fig. 255; copied in 1862e: 111, pl. 18, fig. 255) changed the locality name to “Tombigbee River” and the species name to *Margaritana tombigbeensis* (original spelling: “Tombigbéensis”). While likely meant as a name correction to match the emended spelling of the type locality, Lea’s (1862) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The secondary spelling was followed by various subsequent workers (e.g., Clessin, 1876: 268, pl. 81, figs. 3, 4, in

Margaritana; Lea, 1870: 68, in *Margaron*; Simpson, 1896: 310; 1900: 619; 1914a: 353, 354, in *Strophitus*) before the name fell into synonymy (Ortmann, 1923: 132); it did not reach the level of prevailing usage adopted herein. *Margaritana tombigbeensis* is here considered an incorrect subsequent spelling. Current status (Williams et al., 2008: 705; Smith et al., 2018: table 1): a junior synonym of *Pseudodontoideus subvexus* (Conrad, 1834), Unionidae.

troostensis/troostii, *Unio*: Lea (1834a: 71, pl. 10, fig. 30; copied in 1834b: 183, pl. 10, fig. 30) described a new species from Tennessee as *Unio troostensis*, as a patronym for "Professor Troost". Lea continued using that spelling in subsequent works, but later (1867c: 15, 61, errata et corrigenda) changed the name to *Unio troostii*. He specifically applied his statement "for *Troostensis* read *Troostii*" to page 183 of his article of 1834b, which is a direct copy of the original description of 1834a; his name change is interpreted as "demonstrably intentional" under Art. 33.2.1 and interpreted as an emendation. It is an unjustified emendation and thus dated as *Unio troostii* I. Lea, 1867 (Art. 33.2.3). Lea (e.g., 1870: 39, 135, in *Margaron*) kept using his emended name, but subsequent authors did not follow it. *Unio troostii* I. Lea, 1867, is a junior objective synonym of *Unio troostensis* I. Lea, 1834. Current status (Lane et al., 2016; Williams et al., 2017: 44): *Venustaconcha troostensis* (I. Lea, 1834), Unionidae.

umbrosus/umbrans, *Unio*: Lea (1857d: 32) described a new species from Georgia as *Unio umbrosus*. The name is invalid as it is a junior primary homonym of his own earlier *U. umbrosus* I. Lea, 1856, described from Mexico (1856c: 95). Lea (1857i: 104) acknowledged the homonymy and provided a replacement name, *Unio umbrans*, for the junior homonym. The latter is a substitute name under Art. 60.3. Current status (Watters, 2018: 33, 44): *Leaunio umbrans* (I. Lea, 1857), Unionidae.

vanuxemensis/vanuxemii, *Unio*: Lea (1838a: 28, 36, 127, pl. 11 fig. 31; copied in 1838c) described a new species as *Unio vanuxemensis* from the Cumberland River in Tennessee (an earlier mention by Lea, 1836: 26, as *Margarita (Unio) vanuxemensis*, is a *nomen nudum*). Lea continued using the name for

a while (1848a: 69, copied in 1848b: 69). Later, Lea (1858e: 83–84, copied in 1858g: 83–84) referred to *Unio "Vanuxemii (nobilis)"*, which here is interpreted as an incorrect subsequent spelling of *U. vanuxemensis*. Parmalee & Bogan (1998: 254) and Williams et al. (2008: 793–794) treated Lea's (1858e) name change as an unjustified emendation, but it did not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea did not cite the original spelling). Lea (1862c: 67, copied in 1862e: 71; 1866e: 47, copied in 1867a: 51) maintained the secondary spelling. Lea (1867c: 61) then formally changed the name ("for *Vanuxemensis* read *Vanuxemii*") in the published corrections to his 1838c publication. The latter is a copy of the original description of 1838a, and Lea's action is accepted as a demonstrably intentional emendation under Art. 33.2. The emended spelling was adopted in some subsequent works (e.g., Lea, 1870: 102, 136; Call, 1885: 55) but did not enter prevailing usage. *Unio vanuxemii* I. Lea, 1867, is an unjustified emendation of *Unio vanuxemensis* I. Lea, 1838. Current status (Watters, 2018): *Leaunio vanuxemensis* (I. Lea, 1838), Unionidae.

verreauianus/verreauxianus, *Unio*: Lea (1856c: 94) described a new species from the Cape of Good Hope, South Africa as *Unio verreauianus*, stated to honor "Mr. E. Verreaux." Lea (1858a: 301, 302, pl. 27, fig. 16; copied in 1858b: 21, pl. 27, fig. 16) stated that the name was dedicated to "Mr. E. Verreaux, [...] naturalist, of Paris," but in contrast to the situation of his *Melania verreauiana* (see below), he did not adjust the spelling of the species epithet at this time. Much later, Lea (1867c: errata et corrigenda for the 1858b work) corrected the spelling by stating "for *Verreauianus* read *Verreauxianus*," which here is interpreted as "demonstrably intentional" under Art. 33.2.1 and thus an emendation. This emendation is here considered unjustified as the spelling cannot be corrected under Art. 32.5. because the original (1856) publication does not provide enough information to infer the proper spelling. The emended spelling was followed in some subsequent works (e.g., Lea, 1870: 36, 136; Paetel, 1890: 171; Kobelt, 1910: 85) but did not enter prevailing usage. For instance, G. B. Sowerby II (1868: pl. 69, species 352) treated this in another variant spelling as "*Unio verrauianus*", and

Johnson (1974: 153) cited also Lea's 1856 publication with the original spelling. Daget (1998: 70) erroneously interpreted *Unio verreauianus* I. Lea, 1856, as a "modification orthographique subséquente" of *Unio verrauxi* Küster, 1856, introduced in the same year and also from South Africa, but Lea had made no reference to Küster's work. The unjustified emendation retains its own author and date under Art. 33.2.3, as *Unio verreauxianus* I. Lea, 1867. Current status (Connolly, 1939: 605; Daget, 1998: 68, as *Cafferia*): a junior synonym of *Unio caffer* F. Krauss, 1848, Unionidae.

wheatleyi/catawbensis, Unio: Lea (1857f: 85), in a paper that was first orally presented to the Academy of Natural Sciences of Philadelphia on March 10, 1857, described a new species from the Catawba River in North Carolina as *Unio wheatleyi*. Lea (1857i: 104) explained that he had "inadvertently repeated [the name] in his papers of Feb. 17 and March 10, 1857" and introduced *Unio catawbensis* as a replacement, which qualifies as a substitute name under Art. 60.3. However, the earlier paper (1857d), first orally presented on February 17, 1857) focused on new species from Georgia and did not include such a homonym. In his subsequent work, Lea (1862c: 54, pl. 1, fig. 200; copied in 1862e: 58, pl. 1, fig. 200) reiterated that he had "changed to *Catawbensis*, the name of *Wheatleyi* being preoccupied." The replacement name was used by some subsequent authors (e.g., Simpson, 1900: 725; Frierson, 1927: 32) but did not enter prevailing usage. Haas (1969: 239), for instance, maintained *wheatleyi* as a valid subspecies (of *Elliptio violaceus*), and Johnson & Baker (1973: 174) and Johnson (1974: 157) referred to it as erroneously thought preoccupied by Lea. *Unio catawbensis* I. Lea, 1857, is an unnecessary replacement name and junior objective synonym of *U. wheatleyi*. Current status (Frierson, 1927, as *catawbensis*; Williams et al., 2017: 37): a junior synonym of *Elliptio complanata* (Lightfoot, 1786), Unionidae.

woodwardius/woodwardianus, Unio: Lea (1857j: 170) described a new species from Georgia as *Unio woodwardius*. In the following year, Lea (1858d: 45, 47, pl. 5, fig. 16; copied in 1858f: 45, 47, pl. 5, fig. 16) described anatomical features and the embryonic shell morphology of a species

referred to as *Unio woodwardianus*. Although Lea (1858d) neglected to mark the latter name with his customary "(nobis)" indicating his previously introduced taxa, it is here assumed to represent an incorrect subsequent spelling of his earlier *Unio woodwardius*. Subsequently, Lea (1859d: 191, 199, 200, 219, pl. 23, fig. 82, pl. 29, fig. 103, copied in 1859e and in 1860c: 9, 17, 37, pl. 23, fig. 82, pl. 29, fig. 103) linked a more extensive description of this *Unio woodwardianus* to the original introduction of *U. woodwardius* and thus confirmed that the two names referred to the same taxon. The original introduction of the senior name was largely overlooked by subsequent workers, for example, by Reeve (1864: pl. 16, fig. 74), who attributed the junior synonym to the 1857 publication, and by Frierson (1927: 65), who attributed the name *Unio woodwardius* to a much later publication by Lea (1870). Williams et al. (2008: 617) treated the secondary spelling as a "new name," but Lea's (1859d) action did not amount to an emendation or substitution (Lea cited the original publication but not the original name). The nominal species fell into synonymy very early and the incorrect subsequent spelling did not enter prevailing usage. Current status (Simpson, 1914a: 337; Williams et al., 2008: 617): a junior synonym of *Ptychobranchus foremanianus* (I. Lea, 1842), Unionidae.

youconensis/youcanensis/youkanensis, Anodonta: Lea (1867b: 81) described a new species as *Anodonta youconensis* from the "headwaters of the Youcon." Lea (1867c: [63, appendix]) listed the spelling of the original description as *A. youcanensis*. In the following year, Lea (1868d: 287, pl. 40, fig. 99; copied in 1869a: 47, pl. 40, fig. 99; also Lea, 1869b: 6) changed the spelling again, this time to *A. youkanensis* for the "Youkan River." Youcon, Youkan, Youcan, and Youkon were all spellings in contemporary use for what it now called the Yukon River of Alaska and Canada (e.g., Anderson, 1863; Russel, 1869; Whymper, 1869), and Art. 32.5 (spellings that must be corrected) does not apply. While likely an intentional correction of the original spelling, Lea's (1868) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. Lea (1869b: 23, in the Appendix to his index volume of 1867c) stated "For *An. Youcanensis* read *An. Youkanensis*", but this was a cor-

rection of his secondary spelling of 1867c, not an emendation of the original spelling of 1867b. Although some authors followed the third spelling, *youkanensis*, (e.g., Clessin, 1884: 133, who apparently had overlooked the original spelling and applied the changed name also to the page citation of the original description), there has been no consistent acceptance of either of Lea's secondary spellings. In fact, subsequent authors referred to Lea's taxon variously also as "youkamensis" (G. B. Sowerby II, 1870: [index]), "youkonensis" (e.g., Simpson, 1893: 356), "yukonensis" (e.g., Simpson, 1896: 328), or, adopting Lea's second spelling, "youcanensis" (e.g., Paetel, 1890: 186). Here, Lea's (1867) "youcanensis" and (1868) "youkanensis" are considered incorrect subsequent spellings. Current status (Bolotov et al., 2020: supplementary information: 26): a synonym of *Beringiana beringiana* (Middendorff, 1851). Considered a valid species, *Beringiana youconensis*, by Vinarski & Kantor (2016: 51), Unionidae.

Etherioidea
(here with Mycetopodidae)

isocardioides/isocardioides, *Plagiodon*: Lea (1856a: 79) described a new species from the Rio Plata, South America, as *Plagiodon isocardioides* (*Plagiodon* was stated to be a subgenus but no genus was given, which is in unresolved violation of Art. 11.9.3). Lea (1858a: 318, p. 32, fig. 32; copied in 1858b: 38, pl. 32, fig. 32) changed the spelling to *Plagiodon isocardioides* in the text but maintained the original spelling in the plate caption. In the errata sheet of the latter article he corrected the spelling on the plates from "isocardioides" to "isocardioides" (repeated in 1867c: errata et corrigenda), which is here accepted as "demonstrably intentional" and an emendation under Art. 33.2.1. The secondary spelling, and later emendation, *Plagiodon* (later, *Iheringella*) *isocardioides* was adopted by subsequent authors (e.g., Küster, 1862: 292, also citing the 1856 publication as if it had had the changed spelling; G. B. Sowerby II, 1868: pl. 90, species 484; Lee, 1870: 71, 104; Fischer, 1886: 1001; Simpson, 1896: 324; Simpson, 1910: 913, referring to the original spelling as a "typographical error, probably", Simpson, 1914c: 1394; Haas, 1969: 550, 551; Graf & Cummings, 2007: 314; Simone, 2006: 294), but did not reach the level of prevailing usage

adopted herein. As an unjustified emendation, *Plagiodon isocardioides* I. Lea, 1858, retains its own author and date. "*Ihringella isocardioides*" of Rumi et al. (2008) is another incorrect subsequent spelling. Current status (Graf & Cummings, 2007; with spelling corrected herein): *Iheringella isocardioides* (I. Lea, 1856), Mycetopodidae.

jewettiana/jewettii, *Anodonta*: Lea (1868a: 95) described a new species from Lake Nicaragua as *Anodonta jewettiana*, as a patronym for "Col. E. Jewett." Lea (1868d: 289, pl. 41, fig. 101; copied in 1869a: 49, pl. 12, fig. 101) changed the spelling to *Anodonta jewettii*. While perhaps an intentional change of the original spelling, Lea's (1868d) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The secondary spelling was used by authors mostly in the 19th century (e.g., G. B. Sowerby II, 1870: [index]; Lea, 1870: 81, 105; Clessin, 1874: 135, also citing that name for the original publication; Martens, 1900: 536) but later usage shifted back to the original spelling (e.g., Simpson, 1914c: 1437, 1438; in *Anodontites*). Both names were variously misspelled (e.g., Frierson, 1927: 97; as both "Anodonta jewettiana" and "Anodonta jewettii" in synonymy of *Leila nicaragua* Philippi, 1848). The secondary spelling is not in prevailing usage and is here considered an incorrect subsequent spelling. Current status (Haas, 1969: 569; Torres et al., 2018: 3): a junior synonym of *Anodontites trapesialis* (Lamarck, 1819), Mycetopodidae.

Megatrigonioidea
(fossil; here with Pterotrigoniidae)

tocaimana/tocaimaana, *Trigonia*: Lea (1840b: 226) described a new fossil species as *Trigonia tocaimana*, from the Oolite Formation of New Granada in a region that is now part of present-day Colombia. The name was not explained in the original description, although Lea described another species on the same page as *Ammonites tocaimaensis*, thereby more clearly referencing Tocaima, a city and municipality of the region. Lea (1841a: 253, 256, pl. 9, fig. 8) consistently spelled the name as *Trigonia tocaimaana* and now described a type locality as "between Tocaima and La Messa, New Granada." While likely

an intentional change of the original spelling, Lea's (1841a) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea did not cite the original spelling). The original species epithet *tocaimana* was acceptably formed and thus does not require emendation under the *Code*. The secondary spelling was recorded (e.g., by Scudder, 1885: 228, who also referenced the original publication with that spelling) but did not enter prevailing usage. More recently, authors used the original spelling (e.g., Peterson et al., 1975: 177; Rivera, 1979: 23; Alleman Haeghebaert, 2016: 181). *Trigonia tocaimana* is here considered an incorrect subsequent spelling. Current status (Alleman Haeghebaert, 2016): *Pterotrigonia tocaimana* (I. Lea, 1840), Pterotrigoniidae.

GASTROPODA

Cerithioidea

(here with Pachychiliidae, Pleuroceridae, and Thiaridae)

australis/manillaensis, *Melania*: Lea (1857a: 145) described a new species from "Manilla" [now Manila, the Philippines] as *Melania australis*. The name is invalid as it is a junior primary homonym of his own *M. australis* I. Lea & H. C. Lea, 1851, from the Victoria River [Northern Territory], Australia. Acknowledging this homonymy, Lea (1866f: 126, pl. 22, fig. 24; copied in 1867a: 82, pl. 22, fig. 24) provided a replacement name, *Melania manillaensis*. However, Lea (1866) overlooked that Brot (1862: 48) had already replaced the name with *Melania duplex*; *Melania manillaensis* I. Lea, 1866, is a junior objective synonym of *Melania duplex* Brot, 1862. Brot (1862: 55) considered *Melania australis* of Reeve (1859) as a newly introduced name and replaced it with *Melania decussata*. Brot (1868: 34, 35, footnote) later reconsidered that Reeve had merely referenced "Lea's" (I. Lea & H. C. Lea, 1851) earlier species and that providing a new name for it had been in error. However, Reeve's (1859, pl. 8, species 82) use, although redescribing the same nominal species based on overlapping material, did not mention Lea, and attributed the name to himself in the index of the work. *Melania australis* Reeve, 1859 is a junior primary homonym and synonym of *M. australis* I. Lea & H. C. Lea, 1851; its

replacement name, *Melania decussata* Brot, 1862, is a junior subjective synonym of *M. australis* I. Lea & H. C. Lea, 1851. Current status of *M. australis* I. Lea & H. C. Lea, 1851 (= *M. australis* Reeve, 1859 [invalid] = *M. decussata* Brot, 1862) (Glaubrecht et al., 2009: 215): "*Thiara*" *australis* I. Lea & H. C. Lea, 1851. Current status of *Melania australis* I. Lea, 1857 ([invalid] = *M. duplex* Brot, 1862 = *M. manillaensis* I. Lea, 1866): a taxon inquirendum, Thiariidae.

binneyiana/binneyana, *Goniobasis*: Lea (1862h: 266) described a new species from Alabama as *Goniobasis binneyiana*, likely as a patronym for either Amos Binney (1803–1847) and/or his son William G. Binney (1833–1909), both notable American malacologists. Lea (1863a: 310, pl. 37, fig. 152; copied in 1863b: 132, pl. 37, fig. 152) changed the spelling without explanation to *Goniobasis binneyana*. While perhaps meant as a correction of the original spelling, Lea's (1863) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. A few authors adopted the secondary spelling (e.g., Tryon, 1873: 241), but the nominal species was mostly treated as a junior synonym and the secondary spelling did not enter prevailing usage. *Goniobasis binneyana* is here considered an incorrect subsequent spelling (note that the two spellings, if treated as available names, would be homonyms under Art. 58.15). Current status (Thompson, 2000: 34): a junior synonym of *Elimia leontiana decorata* (J. G. Anthony, 1860), Pleuroceridae.

blanda, *Melania-versa*, *Goniobasis*: Lea (1861c: 122) described a species from Alabama as *Melania blanda* (which he subsequently transferred to *Goniobasis* [Lea, 1866f: 137]). The name is invalid as it is a junior primary homonym of his own *Melania blanda* I. Lea, 1841, described from Tennessee. Acknowledging this homonymy, Lea (1864a: 3, footnote; repeated in 1866f: 137; 1867a: 93; 1867c: errata et corrigenda) provided a replacement name, *Goniobasis versa*, which is a substitute name under Art. 60.3. Tryon (1873: 163) overlooked Lea's (1864) substitution and provided an additional replacement name for *Melania blanda* I. Lea, 1861, *Goniobasis leai* Tryon, 1873, the latter a junior objective synonym of *G. versa* I. Lea, 1863. Current status (Goodrich,

1936: 44–45; Johnson et al., 2013: 280): a junior synonym of *Elimia laeta* (Jay, 1839), Pleuroceridae.

catenaria/catenoides, *Melania*: Lea (1840c: 289) described a new species from Georgia as *Melania catenaria*. The name is invalid as it is a junior primary homonym of *Melania catenaria* Say, 1822. Lea (1842a: 228, pl. 6, fig. 60; copied in 1842b: 66, pl. 6, fig. 60) changed the name to *Melania catenoides*. The latter is a substitute name under Art. 60.3. Current status (Johnson et al., 2013: 279): *Elimia catenoides* (I. Lea, 1842), Pleuroceridae.

corrugata/rugosa, *Melania*: Lea (1841b: 13) described a new species from Tennessee as *Melania corrugata*. The name is invalid as it is a junior primary homonym of *M. corrugata* Lamarck, 1804. Lea (1842a: corrigenda page following p. 250; copied in 1842b: corrigenda page; published again in 1843a: 237; and in 1867c: errata et corrigenda) acknowledged the homonymy and provided a replacement name, *Melania rugosa* I. Lea, 1842, but that name also is invalid as it is a junior primary homonym of *Melania rugosa* Rafinesque, 1831, and a junior secondary homonym of *Melanopsis rugosa* Matheron, 1842 (see Neubauer, 2016: 254, for details on the latter). Current status (Goodrich, 1940: 16; Johnson et al., 2013: 280): a junior synonym of *Elimia edgariana* (I. Lea, 1841), Pleuroceridae.

cumberlandensis/cumberlandensis, *Goniobasis*: Lea (1863c: 155) described a new species, named for the Cumberland Mountains, as *Goniobasis cumberlandensis*. Lea (1866f: 132, pl. 23, fig. 35; copied in 1867a: 88, pl. 23, fig. 35) changed the spelling to *Goniobasis cumberlandensis*. While perhaps meant as a correction of the original spelling, Lea's (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The modified spelling was adopted by some authors, for instance by Walker (1918: 157), who apparently had overlooked the original spelling and stated that Tryon (1873) "erroneously quotes this as *G. cumberlandensis*". The species entered synonymy early and Lea's (1866) modified spelling did not enter prevailing usage. It is here treated as an incorrect subsequent

spelling (note that the two spellings, if treated as available names, would be homonyms under Art. 58.15). Current status (Goodrich, 1940: 17; Johnson et al., 2013: 279): a junior synonym of *Elimia clavaeformis* (Lea, 1841), Pleuroceridae.

cumingii, *Pachychilus/cumingii*, *Melania*: Isaac Lea & H. C. Lea (1851a: 179) described a species from Copan, Central America, as *Pachychilus cumingii*. In the same publication, I. Lea & H. C. Lea (1851a: 191) described another species from Siquijor, Philippines, as *Melania cumingii*. Reeve (1860: pl. 21, fig. 149) treated a species as *Melania cumingii* and in this context clearly referenced the description of the Central American *Pachychilus cumingii*. Brot (1862: 43) recognized the secondary homonymy and replaced the name *Pachychilus cumingii* with a new name, *Melania renovata*. That substitute name is not in use, the relevant taxa are no longer considered congeneric and, under Art. 59.3, the junior homonym is not to be rejected. Current status of *Pachychilus cumingii* I. Lea & H. C. Lea, 1851 [= *Melania renovata* Brot, 1862] (Gomez-Berning et al., 2012: 9; with date corrected herein): *Pachychilus cumingii* I. Lea & H. C. Lea, 1851, Pachychilidae. Current status of *Melania cumingii* I. Lea & H. C. Lea, 1851: a taxon inquirendum, Thiaridae.

currierianum/currierianum, *Trypanostoma*: Lea (1863c: 155) described a new species from Alabama as *Trypanostoma currierianum*. Lea (1866f: 147, pl. 23, fig. 61; copied in 1867a: 103, pl. 23, fig. 61) changed the spelling to *Trypanostoma currierianum* and provided an explanation for the name by mentioning that a part of the studied material was in the "cabinet of A. O. Currier." While probably meant as a correction of the original spelling (-ianum is a frequently used ending for patronyms in Lea's works), Lea's (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The secondary spelling was followed by various authors (e.g., Tryon, 1873: 93; Walker, 1918: 152; Goodrich, 1940: 11; Burch & Tottenham, 1980: 164; Burch, 1982a: 46; in *Pleurocera*), but did not reach the level of prevailing usage adopted herein. *Trypanostoma currierianum* is here considered as an incorrect subsequent spelling (note that the two spellings,

if treated as available names, would be homonyms under Art. 58.15). Current status (Burch, 1982b: 273): likely a junior synonym of *Pleurocera brumbyi* (I. Lea, 1852), Pleuroceridae.

dubia/dubiosa, *Melania*: Lea (1841b: 11) described a new species from Tennessee as *Melania dubia*. The name is invalid as it is a junior primary homonym of *M. dubia* Lamarck, 1804. Lea (1842a: 166, pl. 5, fig. 6; copied in 1842b: 4, pl. 5, fig. 6) changed the name to *Melania dubiosa*. The latter is a substitute name under Art. 60.3. Current status (Goodrich, 1940: 18; Graf, 2001: 38; Johnson et al., 2013: 280): a junior synonym of *Elimia ebenum* (I. Lea, 1841), Pleuroceridae.

etowahensis/canbyi, *Goniobasis*: Lea (1862h: 264) described a new species as *Goniobasis etowahensis* from the Etowah River in Georgia. In the same work (1862h: 271), he also introduced *Goniobasis canbyi* Lea, 1862, based on specimens from Lake Monroe, Florida, and the Etowah and Tennessee rivers, Georgia. However, Reeve (1861: pl. 55, species 426) had already introduced the name *Melania etowahensis*, based on "Lea, MS", for the same species that Lea later (1862) named *G. canbyi*. Tryon (1864: 26) accordingly placed *G. canbyi* Lea, 1862, in synonymy of *G. etowahensis* (Reeve, 1861). Lea (1864: 3, footnote), in an unorthodox attempt to preserve his name *G. canbyi*, wrote: "Mr. Reeve having published [...] *Melania (Goniobasis) Canbyi* (nobis) under the name of 'Etowahensis, Lea' prior to my publication of it, the name of *Etowahensis* must be retained for that species. I therefore transfer the name of *Canbyi* to the species I subsequently published as *Etowahensis*". Transferring the existing name *Goniobasis canbyi* Lea, 1862, to another taxon (with separate type material, see also Graf, 2001: 20, 41) in this fashion is not possible, so Lea's action is interpreted as the introduction of a new substitute name, *G. canbyi* I. Lea, 1864, for *G. etowahensis* I. Lea, 1862, to resolve secondary homonymy with *M. etowahensis* Reeve, 1861 (Art. 57.3). Tryon (1873: 260, footnote) apparently overlooked Lea's (1864) note and repeated the name switch ("G. *Etowahensis*, Lea, being preoccupied by Mr. Reeve, who described and figured *G. Canbyi*, Lea under that name in advance of Mr. Lea's description, we apply the latter's name to this

species") and introduced "*G. canbyi*, Tryon" to replace *Goniobasis etowahensis* I. Lea, 1862. As junior primary homonyms of *G. canbyi* I. Lea, 1862, both names are invalid under Art. 52.3. Current status of *G. etowahensis* I. Lea, 1862 [invalid under Art. 57.3] (= *G. canbyi* I. Lea, 1864 [invalid] = *G. canbyi* Tryon, 1873 [invalid]): a junior synonym of *Elimia modesta* (I. Lea, 1845) (Thompson, 2000: 16). Current status of *M. etowahensis* Reeve, 1861 (= *G. canbyi* I. Lea, 1862) (Chambers, 1990: 243; Johnson et al., 2013: 280): a junior synonym of *Elimia floridensis* (Reeve, 1860), Pleuroceridae.

exarata/arata, *Melania*: Lea (1841b: 14) described a new species from Tennessee as *Melania exarata*. The name is invalid as it is a junior primary homonym of *M. exarata* Menke, 1828. Lea (1843b: 242) acknowledged the homonymy and provided a replacement name, *Melania arata*, for his earlier name (and repeated that action in 1844 (p. 24, footnote); also 1867c: errata et corrigenda). *Melania arata* I. Lea, 1843, is a substitute name under Art. 60.3. Note that *Goniobasis arata* I. Lea, 1868, is a different species. Current status (Goodrich, 1940: 12; Johnson et al., 2013: 282): a junior synonym of *Pleurocera canaliculata* (Say, 1821), Pleuroceridae.

gracilior, *Melania/ellipsoides*, *Goniobasis*: Lea (1861c: 118) described a new species from Alabama as *Melania gracilior*. The name is invalid as it is a junior primary homonym of *M. gracilior* Anthony, 1854 (p. 130), which is itself a replacement name for *Melania gracilis* "Anthony" as used by Haldeman (1841b, wrapper), non *Melania gracilis* Lea, 1841 [1841b: 12]. Acknowledging this homonymy, Lea (1863a: 234, 235, 300, pl. 34, fig. 31; copied in 1863b: 56, 57, 122, pl. 34, fig. 31) changed the name to *Goniobasis ellipsoides*. The latter is a substitute name under Art. 60.3. Current status (Goodrich, 1941b: 4, 5; Johnson et al., 2013: 279): a junior synonym of *Elimia bullula* (I. Lea, 1861), Pleuroceridae.

hartmaniana, *Melania/hartmanii*, *Goniobasis*: Lea (1861c: 117) described a new species from Alabama as *Melania hartmaniana*. Lea (1863a: 218, 233, pl. 34, fig. 1; copied in 1863b: 40, 55, pl. 34, fig. 1) changed the spelling to *Goniobasis hartmanii*. As he cited both the original and the changed spelling in this context, his action qualifies as a

demonstrably intentional emendation under Art. 33.2. That unjustified emendation, *Goniobasis hartmannii* Lea, 1863, was not adopted into prevailing usage by later authors, and is a junior objective synonym. *Goniobasis hartmannii* (e.g., of Scudder, 1885: 192) is an incorrect spelling. Current status (Johnson et al., 2013: 280): *Elimia hartmaniana* (I. Lea, 1861), Pleuroceridae.

laevigata/laevis, Melania: Lea (1841b: 11) described a new species from the Alabama River as *Melania laevigata*. The name is invalid as it is a secondary homonym of *Melanopsis laevigata* Lamarck, 1816. Lea (1842a: corrigenda page after p. 250; copied in 1842b: corrigenda page; repeated in 1843a: 237) acknowledged the homonymy and provided a replacement name, *Melania laevis*, for his earlier name, but that name also is invalid as it is a junior primary homonym of *Melania laevis* Gray, 1833, and it was subsequently replaced by *Melania leaii* Brot, 1862. Current status (Goodrich, 1942a: 5; Johnson et al., 2013: 281): a junior synonym of *Elimia taitiana* (I. Lea, 1841), Pleuroceridae.

lawrencii/lawrencei, Goniobasis: Lea (1869c: 125) described a new species from Arkansas as *Goniobasis lawrencii*, as a patronym for "Dr. Lawrence." Lea (1874c: 62, pl. 21, fig. 17; copied in 1874d: 66, pl. 21, fig. 17) changed the spelling to *G. lawrencei*. While perhaps an intentional change of the original spelling, Lea's (1874) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The original spelling cannot be corrected under Art. 32.5 because Lea's original spelling can be interpreted as having Latinized the name ending. Only occasionally used as a valid species (e.g., by Walker, 1918: 158), the secondary spelling did not enter prevailing usage (e.g., Goodrich [1927: 6] used *G. lawrenci* [sic]) and is here considered an incorrect subsequent spelling. Current status (Goodrich, 1939: 2; Johnson et al., 2013: 282; with date corrected herein): a junior synonym of *Pleurocera acuta* Blainville, 1824, Pleuroceridae.

lithasioides/lithasioides, Goniobasis: Lea (1863c: 154) described a new species from Ohio as *Goniobasis lithasioides*. Lea (1866f: 133, pl. 23, fig. 37; copied in 1867a: 89, pl.

23, fig. 37) changed the spelling to *G. lithasioides*. While likely an intentional change of the original spelling, Lea's (1874) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Lea's original spelling "*lithasioides*" was used by Goodrich (1924: 44, 1939: 4; 1945: 32, in synonymy) and Graf (2001: 64) erroneously assumed it to be an error introduced by Goodrich (1945). The secondary spelling *G. lithasioides* was adopted by a few authors, for example, by Tryon (1873: 255, who did not modify it to *G. "lithasioides"* as stated by Graf [2001: 64]), as well as by Hinkley (1903: 33) and Sterki (1907: 386). It did not enter prevailing usage and is here considered an incorrect subsequent spelling. Current status (Goodrich, 1945: 32; Johnson et al., 2013: 280): a junior synonym of *Elimia livescens* (Menke, 1830), Pleuroceridae.

moriformi/moriforme, Trypanostoma: Lea (1862g: 172) described a new species from several locations, including the Tennessee River, as *Trypanostoma moriformi*. The epithet *moriformi* is a compound Latin word (but with its suffix in dative/ablative form) and apparently was a misspelling of *moriforme*. Lea (1863a: 284, 289; copied in 1863b: 106, 111) repeated that name, but in the same work (1863a: 290, pl. 36, fig. 118; copied in 1863b: 112, pl. 36, fig. 118; also as such in 1866f: 142, copied in 1867a: 98) changed the spelling to *Trypanostoma moriforme*, now using a standard neuter ending of the species epithet meaning "having the shape or form of a mulberry". While likely an intentional change of the original spelling, Lea's (1863) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). Later, Lea (1869b: supplementary errata et corrigenda, specifically for pages 106 and 111 in 1863b) corrected the spelling by stating "for *moriformi* read *moriforme*" but did not refer to the original (1862) introduction of the name. Lea's name change was "demonstrably intentional" and thus an emendation under Art. 33.2.1. The emendation was adopted by subsequent authors (e.g., Tryon, 1873: 70, who also cited the original 1862 introduction with this name; Hinkley, 1906: 41, in *Pleurocera*; Goodrich, 1940: 10; 1941b: 8, in synonymy;

Burch & Tottenham, 1980: 164; Burch, 1982a: 46), but did not reach the level of prevailing usage adopted herein. It is here argued that there is evidence in the original publication, from the form of the word that a typographical error had occurred. Lea's change of 1863 is considered a justified emendation under Art. 32.5 and 33.2.2 and the name thus corrected retains the authorship and date of the original spelling, as *Trypanostoma moriforme* I. Lea, 1862. Current status (Goodrich, 1941a: 8; Johnson et al., 2013: 282): a junior synonym of *Pleurocera showalterii* (I. Lea, 1862), Pleuroceridae.

nitida/nitens, *Melania*: Lea (1841b: 14) described a new species from Tennessee as *Melania nitida*. The name is invalid as it is a junior primary homonym of *M. nitida* Lamarck, 1804. Lea (1842a: 182, pl. 6, fig. 40; copied in 1842b: 20, pl. 4, fig. 40) changed the name to *Melania nitens*. The latter is a substitute name under Art. 60.3. Current status (Goodrich, 1940: 14; Johnson et al., 2013: 280): a junior synonym of *Elimia laqueata* (Say, 1829), Pleuroceridae.

ohiensis/ohioensis, *Goniobasis*: Lea (1862h: 265) described a new species from Ohio as *Goniobasis ohiensis*. Lea (1863a: 306, 307, pl. 37, fig. 144; copied in 1863b: 128, 129, pl. 37, fig. 144) changed the spelling to *Goniobasis ohioensis*. While perhaps an intentional change of the original spelling, Lea's (1863) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The original name was acceptably formed; the final vowel is frequently dropped in name formation and the epithet "ohiense" for the Ohio River (or Valley) is in wide use (e.g., *Anodonta ohiensis* Rafinesque, 1820). The original spelling was largely overlooked or ignored by subsequent authors, who used the secondary spelling "ohioensis" (e.g., Tryon, 1864: 45, also citing the original description with that spelling; 1873: 276; Hinkley, 1903: 33; Sterki, 1907: 386 [in synonymy]; Goodrich, 1940: 18 [in synonymy]; La Roque, 1968: 425 [after Goodrich]), but did not reach the level of prevailing usage as adopted herein. *Goniobasis ohioensis* is considered an incorrect subsequent spelling. Current status (Goodrich, 1940: 18, in *Goniobasis*; Johnson et al., 2013: 280): a

junior synonym of *Elimia semicarinata* (Say, 1829), Pleuroceridae.

picta, *Melania*: Lea (1841e: 82) described a new species from Tennessee as *Melania picta*, and cited it in subsequent work (e.g., 1844: 19, 25). Reeve (1860, pl. 40, species 290), apparently overlooking Lea's earlier introduction, described a species with the same name, *Melania picta*, from the "United States" and reference to "Lea, MS." in London's Cuming collection. Because Reeve based his description on what he stated to be a manuscript name (in the same work, Reeve clearly referenced the original introductions of other species names by Lea), it is here viewed as a novel introduction. In the errata section of the same work, Reeve (1861: *Melania* index p. vi, errata), acknowledged the homonymy with *Melania picta* Hinds, 1844, and introduced a replacement name, "*M. picturata*, Reeve," referring to "Pl. XL, Sp. 290. For *M. picta*, Lea (not of Hinds)". Subsequent authors (e.g., Tryon, 1865a: 21; Graf, 2001: 80) interpreted this as a replacement of the senior [sic] name *M. picta* Lea, 1841, but in fact the new name replaced the later *M. picta* "Lea" Reeve, 1860. *Melania picta* Lea, 1841, is the senior homonym for the invalid names *M. picta* Hinds, 1844, *M. picta* Philippi, 1849 (replaced by *M. philippii* H. Adams & H. Adams, 1854a: 302, with reference to *M. picta* of Hinds), and *M. picta* Reeve, 1860 (replaced by *M. picturata* Reeve, 1861). *Melania picta* I. Lea, 1841, has long been considered a synonym of *Melania curta* Haldeman, 1841 (e.g., Goodrich, 1940: 8), and the species has been treated as *Pleurocera curta* (Haldeman, 1841) in the recent literature (e.g., Johnson et al., 2013: 282). Haldeman's name was stated as having been published on 13 March 1841 and indeed predates Lea's *Melania picta*, which was published on or before 16 November 1841. However, *Melania curta* Haldeman, 1841, is invalid because it is a junior primary homonym of *Melania curta* Menke, 1828. Current status (herein): *Pleurocera picta* (I. Lea, 1841), Pleuroceridae.

plicata/meukiana/menkiana, *Melania*: Lea (1838a: 20, pl. 23, fig. 95) described a new species from "Bengal?" as *Melania plicata*. The name is invalid as it is a junior primary homonym of *M. plicata* Menke, 1828. Lea (1843b: 242) provided a replacement name, spelled *Melania meukiana* [sic], for his earlier

name. He clearly intended to honor Menke, the author of the older homonym, and later (1844: 24, footnote; reprinted in 1848b: 24; also in 1867c: errata et corrigenda) repeated the substitution (without reference to the earlier one), now with a corrected spelling, *M. menkiana*. That spelling was followed by subsequent authors (e.g., Brot, 1862: 46; 1871: 280). Later, Brot (1875: 86, 90, 91 ff.) changed the spelling to *M. menkeana*. Köhler & Glaubrecht (2001: 295) erroneously stated that the name "was changed to *M. menkeana* by Lea (1842 [1843]) himself" and later (2006: 176) interpreted Brot's (1874) modified spelling as a "replacement name for *M. menkiana* Lea, 1842". However, Brot (1874: 91) had erroneously credited Lea's work of 1848 (a reprinting of the 1844 paper that introduced the spelling "menkiana") with the spelling "Melania menkeana" and had included the spelling "Melania menkiana" only from the usage of Hanley & Theobald (1874: 45, pl. 110, fig. 6), a situation already discussed by Nevill (1885: 260). Brot's (1874) usage of "menkeana" therefore does not qualify as an emendation or the introduction of a substitute name. Nevill (1885: 260) then formally emended the name from "menkiana" to "menkeana" and used it in the combination *Melania (Melanoides) variabilis menkeana*. Some later authors (e.g., Yen, 1939: 59, pl. 5, fig. 14, in *Brotia*) adopted the spelling of "menkeana". As the original publication of the substitute name contained clear evidence of a lapsus calami, here the original spelling *Melania meukiana* is treated as an inadvertent error that must be corrected under Art. 32.5, and Lea's (1844) correction to *M. menkiana* is considered a justified emendation under Art. 33.2.2; with the corrected name, *Melania menkiana* I. Lea, 1843, retaining the authorship and date of the original spelling under Art. 19.2. Lea had opted to drop the final "e" in Menke's name when he combined it with the patronymic ending "-iana". The additional emendation by Nevill (1885) to "menkeana" is here considered unjustified, making *Melania menkeana* Nevill, 1885, a junior objective synonym of *Melania menkiana* I. Lea, 1843. Current status (Köhler & Glaubrecht, 2006: 176): a junior synonym of *Brotia costula* (Rafinesque, 1833), Pachychilidae.

plicatula/deshayesiana/deshaysiana, Melania: Lea (1841b: 14) described a new species from Tennessee as *Melania plicatula*. The

name is invalid as it is a junior primary homonym of *M. plicatula* Deshayes, 1825. Lea (1843b: 242) acknowledged the homonymy and provided a replacement name, *M. deshayesiana*, for his earlier name (repeated in 1844 (p. 24, footnote); also in 1867c: errata et corrigenda). *Melania deshayesiana* I. Lea, 1843, is a substitute name under Art. 60.3. Lea subsequently (e.g., 1863a: 313–315, 317–319, 323, 324, 345; copied in 1863b: 135 ff.) changed the spelling of his own replacement name to *Melania deshaysiana*, an incorrect subsequent spelling that he corrected in 1869b: supplementary errata et corrigenda). Reeve (1861: plate 39, species 278) described a species with the same name, also from for Tennessee, without reference to Lea's earlier name. *Melania deshayesiana* Reeve, 1861, was recognized as a junior homonym and replaced by Brot (1862: 37) as *Melania mutata* Brot, 1862, a nominal species now considered a synonym of *Elimia laqueata* (Say, 1829). Current status (Goodrich, 1940: 14 [as *Goniobasis*]; Johnson et al., 2013: 280): a junior synonym of *Elimia laqueata* (Say, 1829), Pleuroceridae.

propria, Melania/levida, Goniobasis: Lea (1861c: 123) described a new species from Yellowleaf Creek, Shelby County, Alabama as *Melania propria*. The name is invalid as it is a junior primary homonym of another *M. propria* I. Lea, 1861 (described in the same paper on p. 118 from an unspecified locality in Alabama). Lea (1863a: 227–228, pl. 34, fig. 17; copied in 1863b: 49–50, pl. 34, fig. 17) referred to the original description as "Melania propria, which was repeated in this paper in error" and provided a replacement name, *Goniobasis lepida*, for his nominal species from Yellowleaf Creek (1861: 123). The latter is a substitute name under Art. 60.3. Current status of *Melania propria* I. Lea, 1861 (Goodrich, 1936: 28, Johnson et al., 2013: 279): a junior synonym of *Elimia bullula* (I. Lea, 1861), Pleuroceridae. Current status of *Goniobasis lepida* I. Lea, 1863 (= *Melania propria* I. Lea, 1861 [invalid]) (Goodrich, 1936: 39, Johnson et al., 2013: 279): a junior synonym of *Elimia bellula* (I. Lea, 1861), Pleuroceridae.

pulchella/gouldiana, Goniobasis: Lea (1868b: 151) described a new species from Alabama as *Goniobasis pulchella*. Lea, 1868e: 332, footnote, pl. 54, fig. 9; copied in 1869a: 92, pl.

54, fig. 9) changed the name to *Goniobasis gouldiana*, "having unintentionally used Dr. Gould's name, *pulchella*". Lea apparently referred to secondary homonymy with *Melania pulchella* Gould, 1851, sometimes placed in *Goniobasis*. Walker (1918: 158) referred to the latter taxon as "*pulchella* Anth. (1850)" and Graf (2001: 85) to "*pulchella* 'Anthony' Gould"; Gould's (1851: 361) original description had been drafted at the request of J. G. Anthony. *Goniobasis gouldiana* I. Lea, 1868, is a substitute name under Art. 60.3. Current status (Goodrich, 1940: 15; Burch, 1982a: 37): possibly a junior synonym of *Elimia pybasii* (I. Lea, 1862), Pleuroceridae.

rufa/rufescens, Melania: Lea (1841b: 12) described a new species from Tennessee as *Melania rufa*. The name is invalid as it is a junior primary homonym of *Melania rufa* Philippi, 1836. Lea (1842a: corrigenda page after p. 250; copied in 1842b: corrigenda page; repeated in 1843a: 237; and in 1867c: 61: errata et corrigenda) acknowledged the homonymy and provided a replacement name *Melania rufescens*. *Melania rufescens* I. Lea, 1842, is a substitute name under Art. 60.3. Current status (Goodrich, 1940: 14 [as *Goniobasis*]; Johnson et al., 2013: 281): a junior synonym of *Elimia teres* (I. Lea, 1841), Pleuroceridae.

showalterii, Lithasia/showalterii, Melania: Lea (1860g: 188) described a species from Alabama as *Lithasia showalterii*, as a patronym for "E. R. Showalter, M. D." The following year, Lea (1861c: 120) described another species from Alabama as *Melania showalterii*. Both of Lea's species epithets originally ended on -ii; the frequently used spelling "showalteri" are incorrect subsequent spellings in either case. Goodrich (1927: 58) placed both species in *Goniobasis* and provided *Goniobasis pilsbryi* Goodrich, 1927, as a replacement name for the junior secondary homonym *Melania showalterii* I. Lea, 1861. Current status of *Lithasia showalterii* (see Johnson et al., 2013: 280): *Elimia showalterii* (I. Lea, 1860). Current status of *Melania showalterii* [= *Goniobasis pilsbryi*] (Goodrich, 1927: 58; Johnson et al., 2013: 280): *Elimia pilsbryi* (Goodrich, 1927), Pleuroceridae.

showalterii, Schizochilus/showalterii, Schizostoma: Lea (1860f: 93; reissued in 1862b) described a new species from the Coosa River, Alabama, as *Schizochilus showalterii*

I. Lea, 1860. Lea (1863a: 246, pl. 35, fig. 49; copied in 1863b: 68, pl. 35, fig. 49) changed the generic combination to *Schizostoma showalterii* and cited the original (1860) description as if it had already used that genus. Lea (1863) shifted the generic placement from *Schizochilus* to *Schizostoma*, although he himself had earlier (1852b: 295 footnote) replaced the junior homonym *Schizostoma* I. Lea, 1842 (non *Schizostoma* Bronn, 1834; Gastropoda: Euomphalidae) with *Schizochilus* I. Lea, 1852 [itself a junior homonym of *Schizochilus* Gray, 1832; Coleoptera]. Lea's return to *Schizostoma* was explained in a later article (1860g: 186, copied in 1862b), in which he argued that Bronn's senior homonym was now considered a synonym [of *Euomphalus*], which "evidently liberates my own name." Lea then (1864c: 112, 114; also 1866f: 149, pl. 23, fig. 56), copied in 1867a: 105, pl. 23, fig. 56) described another new species, also from the Coosa River, Alabama, and also named it *Schizostoma showalterii*, apparently being unaware of the secondary homonymy. Both of Lea's species epithets originally ended on -ii; the frequently used spellings "showalteri" in this context are incorrect subsequent spellings in either case. Tryon (1873: 353) placed "*Schizostoma* [sic] *showalterii* I. Lea, 1860" in synonymy of *Schizostoma cariniferum* (Anthony, 1860). In the same work, Tryon (1873: 375) replaced the junior homonym, *Schizostoma showalterii* I. Lea, 1864, with *Schizostoma showalteriana* Tryon, 1873: "The specific name *Showalterii* having become a synonyme, it cannot be revived by the same author for another species in the same genus. To obviate all difficulty, I have slightly changed the termination of the latter." Subsequent authors placed both species in *Gyrotoma* (e.g., Hannibal, 1912: 181, 182, who had Lea's name of 1860 in synonymy of *Gyrotoma olivula excisa* (I. Lea, 1843) and Lea's name of 1864 in synonymy of *Gyrotoma laeta incisa* (I. Lea, 1843), in both cases misspelling the species epithets as "showaltherii"). Current status of both nominal species, *Schizochilus showalterii* I. Lea, 1860, and *Schizostoma showalterii* I. Lea 1864 [= *Schizostoma showalteriana* Tryon, 1873] (Graf, 2001: 94; Johnson et al., 2013: 281): junior synonyms of *Gyrotoma excisa* (I. Lea, 1843), Pleuroceridae.

striata/striatula, Melania: Lea (1841b: 15) described a new species from Tennessee as *Melania striata*. The name is invalid as

it is a junior primary homonym of *M. striata* J. Sowerby, 1814. Lea (1842a: corrigenda page after p. 250; copied in 1842b: corrigenda page; repeated in 1843a: 237; also 1867c: errata et corrigenda) acknowledged the homonymy and provided a replacement name, *Melania striatula*, for his earlier name. *Melania striatula* I. Lea, 1842, is a substitute name under Art. 60.3. Current status (Johnson et al., 2013: 280): *Elimia striatula* (I. Lea, 1842), Pleuroceridae.

tenebrosa/whitfieldensis, *Goniobasis*: Lea (1868b: 151) described a new species from Georgia as *Goniobasis tenebrosa*. Lea (1868e: 330, pl. 54, fig. 6) introduced a replacement name *Goniobasis whitfieldensis* ("Changed from *tenebrosa* which name is preoccupied"; copied in 1869a: 90, pl. 54, fig. 6; also 1869b: 22, errata et corrigenda). The senior homonym was not identified in this context, but Lea likely addressed a secondary homonymy with his own earlier *Melania tenebrosa* Lea, 1841, which he had cited as *Melania (Goniobasis) tenebrosa* in 1863a (p. 335) and subsequent works. *Goniobasis whitfieldensis* I. Lea, 1868, is a substitute name under Art. 60.3. Current status (Goodrich, 1941a: 5; Thompson, 2000: 33–34; Johnson et al., 2013: 280): a junior synonym of *Elimia lecontiana* (I. Lea, 1841), Pleuroceridae.

thortoni/thorntonii, *Goniobasis*: Lea (1862h: 268) described a new species from Alabama as *Goniobasis thortoni*, as a patronym for "L. B. Thornton, Esq." Lea (1863a: 320, pl. 38, fig. 168; copied in 1863b: 320, pl. 38, fig. 168), with reference to the original publication (but not the original name) changed the spelling of the epithet to *G. thorntonii*, now matching the spelling of the person's name to be honored. The species was infrequently cited before it fell into synonymy, but authors followed the emended spelling (e.g., Tryon, 1873: 199; Hinkley, 1906: 42; Hannibal, 1912: 177; Goodrich 1940: 15, in synonymy). As the original publication of the name contained clear evidence of a lapsus calami, here the original spelling *Goniobasis thortoni* is treated as an inadvertent error that must be corrected under Art. 32.5, and *Goniobasis thorntonii* is considered a justified emendation under Art. 33.2.2 and dated from 1862. Current status (Goodrich, 1940; Johnson et al., 2013: 280): a junior synonym of *Elimia pybasi* (I. Lea, 1862), Pleuroceridae.

thortoni/thorntonii, *Trypanostoma*: Lea (1862g: 170–171) described a new species from Alabama and Tennessee as *Trypanostoma thortoni*, stated to honor "L. B. Thorton, Esq." Lea (1863a: 284, 286, pl. 36, fig. 106; copied in 1863b: 106, 108, pl. 36, fig. 106) changed the spelling to *T. thorntonii*, now referring to "L. B. Thornton, Esq." Standing on its own, *Trypanostoma thorntonii* would have to be considered an incorrect subsequent spelling – in contrast to the situation of *Goniobasis thorntonii* described above, in which the honored person's name was spelled correctly in the original publication. However, the fact that Lea (1863a) corrected both names in the same work allows application of Art. 33.2.1 ("when two or more names in the same work are treated in a similar way") and *Trypanostoma thorntonii* is likewise considered a justified emendation and dated from 1862. Subsequent authors followed the emended spelling before the taxon fell into synonymy (e.g., Tryon, 1863: 311; Hinkley, 1906: 41, in *Pleurocera*; Goodrich, 1940: 9, in synonymy). Current status (Goodrich, 1940; Johnson et al., 2013: 282): a junior synonym of *Pleurocera canaliculata undulata* (Say, 1829), Pleuroceridae.

torta, *Melania/tortum*, *Trypanostoma*: Lea (1845a: 165) described a species from Tennessee as *Melania torta*. Lea (1862g: 174) described another new species from Georgia as *Trypanostoma tortum*. Tryon (1873: 84, 177) placed both species in the genus *Pleurocera*. In the errata issued with the same work, Tryon (1873: 427) acknowledged the secondary homonymy and provided a new name for *Trypanostoma tortum* I. Lea, 1862: "This species may be called *P. Parkeri*, nob., after Mr. Charles F. Parker, a conchologist of Camden, New Jersey." Tryon's species epithet *parkeri* was spelled with a single -i, the modification to *parkerii* (e.g., Hannibal, 1912: 171; Graf, 2001: 78, 105) is an incorrect subsequent spelling. Current status of *Melania torta* (Goodrich, 1940: 15, as *Goniobasis laqueata tortum*; Johnson et al., 2013: 280): synonym of *Elimia laqueata* (Say, 1829). Current status of *Trypanostoma tortum* [= *Pleurocera parkeri*] (Goodrich, 1942: 4, as *Goniobasis boykiniana viennaensis*; Johnson et al., 2013: 280): synonym of *Elimia viennaensis* (I. Lea, 1862), Pleuroceridae.

tuberculata/spixiana, *Melania*: Lea (1831a: 101, pl. 15, figs. 31a, b; copied in 1832) de-

scribed a new species from the Tennessee River as *Melania tuberculata*. The name is invalid as it is a junior primary homonym of *M. tuberculata* Spix, 1827. Lea (1838a: 93; copied in 1838c) acknowledged the homonymy and replaced his name with *Melania spixiana*. The latter is a substitute name under Art. 60.3. Reeve (1861: pl. 54, species 422) apparently overlooked Lea's (1838) substitution and introduced another name, *Melania nodata*, for the species. In this context, Reeve did not point to the primary homonymy with Spix's species but aimed to avoid a secondary homonymy with *Nerita tuberculata* O. F. Müller, 1774, then placed in *Melania*. *Melania nodata* Reeve, 1861, is a junior synonym of *M. spixiana* Lea, 1838. Current status (Goodrich, 1940: 3; Johnson et al., 2013: 281): a junior synonym of *Lithasia armigera* (Say, 1821), Pleuroceridae.

vanuxemii/prestoniana, *Goniobasis*: Lea (1862h: 265) described a new species from Virginia as *Goniobasis vanuxemii*, a patronym for "Prof. L. Vanuxem." Lea (1864a: 3, footnote) pointed to a homonymy ("having used [the name] before as *Melaniae*, which now come under the genus *Goniobasis*, I propose to change [...] *Vanuxemii* into *Prestoniana*"). Lea (1866f: 137 footnote; copied in 1867a: 93) repeated the text of the replacement; also 1867c: errata et corrigenda). However, no such published earlier description of *Melania vanuxemii* by Lea was located (see also Graf, 2001: 84), and the substitution appears to have been unnecessary. *Goniobasis prestoniana* I. Lea, 1864, is a junior objective synonym of *G. vanuxemii* I. Lea, 1862. Current status (Goodrich, 1940: 17; Johnson et al., 2013: 280): a junior synonym of *Elimia simplex* (Say, 1825), Pleuroceridae.

verreaiana/verreauxiana, *Melania*: Lea (1857a: 144) described a new species from the Hawaiian Islands as *Melania verreaiana*, stated to honor "M. E. Verreaux, Paris." Lea (1866f: 127, 128, pl. 22, fig. 27; copied in 1867a: 83, 84, pl. 22, fig. 27) changed the spelling to *Melania verreauxiana*, now referring to "Edward Verreaux" of Paris, "who collected it during one of his long voyages to the Pacific." While probably meant as a correction of the original spelling and intended to honor the French ornithologist and natural history specimen dealer Jean Baptiste Édouard Verreaux (1810–1868;

see Coan & Kabat, 2020), Lea's (1866) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The secondary spelling was followed by various authors (e.g., Brot, 1868: 5; 1871: 277; 1874: 32, pl. 4, fig. 2; Pease, 1870: 6; Fischer & Crosse, 1892: 365; Sykes, 1900: 395), but did not reach the level of prevailing usage as adopted herein. Cowie et al. (1995: 26) returned to the original spelling. *Melania verreauxiana* is here considered an incorrect subsequent spelling. Current placement (Cowie et al., 1995): *Thiara verreaiana* (I. Lea, 1857), Thiaridae.

viridostriatis/viridistriata, *Goniobasis*: Lea (1864a: 4) described a new species from Georgia as *Goniobasis viridostriatis*. Lea (1866f: 140, 141, pl. 23, fig. 48; copied in 1867a: 96, 97, pl. 23, fig. 48) changed both the connecting vowel and the ending of the epithet to *Goniobasis viridistriata*. While likely intended to correct the original spelling, these actions do not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. Lea referenced the original publication but did not cite the original spelling. The changed name did not enter prevailing usage; some authors (e.g., Walker, 1918: 162) cited the secondary spelling also for the original description, whereas others (e.g., Chambers, 1990: 254, in synonymy) treated the 1866 publication as if it had used the original name. *Goniobasis viridistriata* is here considered an incorrect subsequent spelling. Current status (Chambers, 1990: 254; Johnson et al., 2013: 279): a junior synonym of *Elimia boykiniana* (I. Lea, 1840), Pleuroceridae.

viridula, *Io*: Lea (1862a: 394, reissued as part of 1862b; also 1863a: 349, pl. 39, fig. 218, copied in 1863b: 171, pl. 39, fig. 218) described a new species from Alabama as *Io viridula*. Tryon (1873: 102, 103) placed *Io viridula* in *Pleurocera* and replaced the name with *Pleurocera leaii* ("The name *viridula* being preoccupied by Mr. Anthony"), referring to a secondary homonymy with *Melania viridula* Anthony, 1854, which Tryon (1873: 125) likewise placed in *Pleurocera*. Current status (Goodrich, 1941a: 8; Johnson et al., 2013: 282): a junior synonym of *Pleurocera prasinata* (Conrad, 1834), Pleuroceridae.

wheatleyi, *Lithasia/wheatleyi*, *Goniobasis*: Lea (1866d: 133, reissued in 1868c; also in 1868e: 341, pl. 54, fig. 25; copied in 1869a: 101, pl. 54, fig. 25) described a species from the Cahaba River, Alabama, as *Lithasia wheatleyi*, as a patronym for "Mr. C. M. Wheatley." Lea (1868b: 151, reissued in 1868c; also in 1868e: 328, pl. 54, fig. 1; copied in 1869a: 88, pl. 54, fig. 1) described another species from the Coosa River, Alabama, as *Goniobasis wheatleyi*. Goodrich (1936: 31) placed both species in *Goniobasis* and replaced the junior secondary homonym, *Goniobasis wheatleyi* I. Lea, 1868, with the new name *Goniobasis jonesi*. Both nominal species are currently classified in *Elimia* and the secondary homonymy persists. Current status of *Lithasia wheatleyi* (Goodrich, 1941a: 19; Johnson et al., 2013: 279): a junior synonym of *Elimia clara* (J. G. Anthony, 1854). Current status of *Goniobasis wheatleyi* [= *Goniobasis jonesi*] (Goodrich, 1936: 31; Johnson et al., 2013: 280): *Elimia jonesi* (Goodrich, 1936), Pleuroceridae.

Truncatelloidea
(here with Emmericiidae)

obtusa, *Paludina*: Lea (1841d: 34) described a new species from Ohio as *Paludina obtusa*. The name is invalid as it is a junior primary homonym of *Paludina obtusa* Troschel, 1837 (1837: 167), described from India. Recognizing that homonymy, Hannibal (1912: 190, footnote) replaced Lea's junior name with *Cincinnatia binneyana* Hannibal, 1912. The latter is a substitute name under Art. 60.3. Current status of *Paludina obtusa* I. Lea, 1842 [invalid; = *Cincinnatia binneyana* Hannibal, 1912] (Burch, 1982a: 30, 196; Hershler, 1996: 126): a potential synonym of *Fontigens nickliniana* (I. Lea, 1838), Emmericiidae.

Viviparoidea
(here with Viviparidae)

chinensis/orientalis, *Paludina*: Lea (1856f: 110) described a new species from China as *Paludina chinensis*. The name is invalid as it is a junior primary homonym of *Paludina chinensis* Gray in Griffith & Pidgeon, 1833. Acknowledging this homonymy, Lea (1866f: 115, pl. 22, fig. 5; copied in 1867a: 71–72, pl. 22, fig. 5) changed the name of his species to *P. orientalis*. The latter is a substitute name under Art. 60.3. Current status (Yen, 1943:

126, in *Bellamya*; Pace, 1973: 30): a junior synonym of *Sinotaia quadrata* (Benson, 1842), Viviparidae.

cyclostomaformis/cyclostomatiformis, *Paludina*: Lea (1841e: 83) described a new species from Alabama as *Paludina cyclostomaformis*. Lea (1844: 23; copied in 1848b: 23) changed the spelling to *Paludina cyclostomatiformis*, likely to avoid homonymy with the similarly spelled *Paludina cyclostomaformis* C. d'Orbigny, 1837, a fossil species currently considered valid as *Hydrobia cyclostomatiformis* (C. d'Orbigny, 1837). Whereas 19th and early 20th Century authors followed the name change (e.g., Binney, 1865: 56; Vanatta, 1935: 67; in *Lioplax*), the majority of later authors (e.g., Clench & Turner, 1955: 14; Burch & Tottenham, 1980: 90; Burch, 1982a: 18; Bogan, 1996 [IUCN Red List]; Turgeon et al., 1998: 63; Johnson et al., 2013: 272; also U.S. Fish & Wildlife Service, 1994, 2005; in genus *Lioplax*) returned to the original spelling. However, under Art. 58.12 (use of different connecting vowels in compound words), the homonymy with d'Orbigny's earlier name does exist and *Paludina cyclostomatiformis* I. Lea, 1844, is here accepted as a substitute name under Art. 60.3. Current status [herein]: *Lioplax cyclostomatiformis* (I. Lea, 1844), Viviparidae.

Lymnaeoidea
(here with Lymnaeidae, Physidae, and Planorbidae)

buchananensis/buchananii, *Planorbis*: Lea (1841d: 32) described a new species from Ohio as *Planorbis buchanensis*, as a patronym for "R. Buchanan." The nominal species was also treated in Lea (1844: 6; copied in 1848b: 6). Much later, Lea, 1867c: errata et corrigenda) corrected Lea's usage of 1848b to *Planorbis buchananii* ("for *Buchananensis* read *Buchananii*"), without reference to the original publication of 1841. Lea's correction is here accepted as an "explicit statement of intention" and thus an emendation of the name under Art. 33.2.1. Because the honored person's name "Buchanan" was correctly rendered in the original publication, Lea's emendation to *Planorbis buchananii* is here interpreted as a justified emendation under Art. 33.2.2 and retains, as *Planorbis buchananii* I. Lea, 1841, the authorship and date of the original spelling. Current status (Burch,

1982a: 202; Johnson et al., 2013: 270, as *Micromenetus*, with generic allocation here corrected; *Dilatata* Clessin, 1885, is a senior objective synonym of *Micromenetus* F. C. Baker, 1945; a junior synonym of *Dilatata dilatata* (Gould, 1841), Planorbidae.

lens/brogniartianus/brogniartianus/lenticularis, *Planorbis*: Lea (1838a: 68, pl. 23, fig. 83) described a new species from Ohio as *Planorbis lens*. The name is invalid as it is a junior primary homonym of *P. lens* Brongniart, 1810. Lea (1843b: 242) provided a substitute name, *Planorbis brogniartianus* [sic], and repeated the substitution with the same spelling in Lea (1844: 6, 24, footnotes; copied in 1848b: 6, 24, footnotes). He clearly intended to honor Brongniart, the author of the senior homonym, but misspelled his name "Brogniart". Subsequent authors either corrected the spelling to *Planorbis brongniartianus* (e.g., Taylor, 1975: 213, as *Micromenetus*) or maintained the original (e.g., Baker, 1945: 190; Burch, 1982a: 276; Turgeon et al., 1998: 135, Johnson et al., 2013: 270; in *Micromenetus*). As the original publication of the substitute name contained clear evidence of a lapsus calami, here the original spelling *Planorbis brogniartianus* is treated as an inadvertent error that must be corrected under Art. 32.5, and *Planorbis brongniartianus* I. Lea, 1843, is considered a justified emendation under Art. 33.2.2. Apparently having forgotten that he had replaced the name before, Lea (1844: 6, footnote; repeated in 1867c: errata et corrigenda) introduced a second substitute name for *Planorbis lens* I. Lea, 1838, as *P. lenticularis* I. Lea, 1844, making the latter a junior primary synonym of *P. brongniartianus* I. Lea, 1843. Current status (Johnson et al., 2013: 270, as *Micromenetus*; with spelling and generic allocation corrected herein; note that *Dilatata* Clessin, 1885 is an objective senior synonym of *Micromenetus* F. C. Baker, 1945): *Dilatata brongniartiana* (I. Lea, 1843), Planorbidae.

striata/dorbigniana, *Physa*: Lea (1864e: 115) described a new species from California as *Physa striata*. The name is invalid as it is a junior primary homonym of both *Physa striata* Menke, 1828, and *Physa striata* d'Orbigny, 1841. Lea (1866f: 166, pl. 24, fig. 85; copied in 1867a: 122, pl. 24, fig. 85) recognized the homonymy with d'Orbigny's name and replaced his own name with *Physa dorigni-*

ana. The latter is a substitute name under Art. 60.3. Current status (Taylor, 2003: 133, as *Haitia*; Johnson et al., 2003: 270): a junior synonym of *Physella mexicana* (Philippi in Küster, 1841), Physidae.

traskii/tryoniana, *Lymnaea/tryonii*, *Limnophysa*: Lea (1864d: 113) described a new species from California as *Lymnaea traskii*, as a patronym for "John B. Trask, M. D." The name is invalid as it is a junior primary homonym of *Lymnaea traskii* Tryon, 1863 [described as "Limnaea"], also from California, currently treated as a valid species (e.g., Johnson et al., 2013: 269, listed it as "Stagnicola traskii [sic]"). Lea (1866f: 162 footnote, pl. 24, fig. 78; copied in 1867a: 118, pl. 24, fig. 78) acknowledged the homonymy and changed the name of his species to *Lymnaea tryoniana*. Lea's new name was adopted by some subsequent authors (e.g., Carlton, 1870: 51; Cooper, 1870: 96) who overlooked an earlier replacement name by Tryon (1865b: 251). Tryon had replaced *L. traskii* of Lea with *Limnophysa tryonii*; a substitute name under Art. 60.3. Tryon had credited the name to "Lea.—MSS" and subsequent authors often credited Lea with its authorship (e.g., Baker, 1911: 365, 367, as "Galba tryonii (Lea)"). *Lymnaea tryoniana* Lea, 1866, is a junior objective synonym of *Limnophysa tryonii* Tryon, 1865. Current status (Hubendick, 1951: 206, in *Lymnaea*): probably a junior synonym of *Stagnicola palustris* (O. F. Müller, 1774), Lymnaeidae. Note that this is a different taxon from *Physa traskii* I. Lea, 1864, also described from California, which Taylor (2003: 133) treated as a synonym of *Haitia mexicana* (Philippi, 1841) and Johnson et al. (2013: 270) considered a valid species in *Physella*, Physidae.

troostensis/troostiana, *Physa*: Lea (1841d: 32) described a new species from Tennessee as *Physa troostensis*, as a patronym for "Dr. Troost." Lea (1844: 7; copied in 1848b: 7) changed the spelling without explanation to *Physa troostiana*, now employing his preferred -iana ending for patronyms during that period. Lea (1844) did not refer to the original name and his action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (in contrast to Taylor, 2003: 185). The secondary spelling was adopted by subsequent authors (e.g., Binney, 1865: viii, 93, 94 [citing also Lea's

1841 work as if it had used the new spelling]; Lea, 1866f: 177; Clessin, 1885: 277, in synonymy; Hinkley, 1906: 40; Taylor, 1975: 213, in synonymy) but did not reach the level of prevailing usage adopted herein. *Physa troostiana* is here considered an incorrect subsequent spelling. Current status (Taylor, 2003: 185; Johnson et al., 2013: 269): a junior synonym of *Physella gyrina* (Say, 1821), Physidae. Considered a junior synonym of *Physa acuta* Draparnaud, 1805, by Latini et al. (2016: 238).

Helicoidea
(here with Camaenidae)

virgineus/virginieus, *Bulimus*: Lea (1840a: 174) described a new species from the Philippine Islands as *Bulimus virgineus*. The name is invalid as it is a junior primary homonym of *Bulimus virgineus* Bruguière, 1789. Lea (1841c: 456) switched to the spelling *Bulimus virginieus*, which – in view of his often-cryptic style of introducing replacement names – could be interpreted as a substitute name for his earlier *B. virgineus*. However, under Art. 58.15 (presence or absence of -i before a suffix or termination), *B. virginieus* would also be a junior homonym of Bruguière's name and likewise invalid. The name change is here interpreted as an incorrect subsequent spelling, a view supported by the fact that Lea maintained the original spelling *virgineus* on the associated plate (1841c: 11, fig. 3). Current status: *taxon inquirendum*. Pfeiffer (1868: 7) placed the nominal species in synonymy of *Bulimus bullula* Broderip, 1841 [= *Bulinus bullula* Broderip, 1841], with the latter considered a junior synonym of *Helicostyla albina* (Grateloup, 1840) by Richardson (1983: 179), Camaenidae. Note that Richardson (1983: 184) used Lea's invalid name for a species he considered valid, *Helicostyla* (*Opalliotyla*) *virginea* (I. Lea, 1840).

Succinoidea
(here with Succinidae)

haleana/halei, *Succinea*: Lea (1864b: 109) described a new species from Louisiana as *Succinea haleana*, as a patronym for "J. Hale, M. D." Lea (1866f: 180, pl. 24, fig. 110; copied in 1867a: 136, pl. 24, fig. 110) used a different ending for the epithet, changing the spelling to *Succinea halei*. While perhaps intended as a correction of the original spell-

ing, Lea's (1866f) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2 (Lea referenced the original publication but did not cite the original spelling). The changed spelling did not enter prevailing usage and *Succinea halei* is here considered an incorrect subsequent spelling. Current status (Pilsbry, 1948: 833; Leonard, 1959: 146): a junior synonym of *Succinea concordialis* Gould, 1848, Succineidae.

Trochomorphoidea
(here with Dyakiidae)

balasteriana/balestieriana/balesteriana, *Helix*: Lea (1840a: 175) described a new species from the Philippine Islands as *Helix balasteriana*, as a patronym for "Mr. Balastier [sic]". Lea (1841c: 460) changed the spelling to *Helix balestieriana*, now referencing Mr. J. Balestier of Singapore and apparently referring to Joseph Balestier (1788–1858), the United States consul in Singapore at the time. The associated figure caption (1841c: pl. 12, fig. 10) introduced a third spelling, *Helix balesteriana*, which again misspelled Balestier's name. While attempting to correct the original spelling, Lea's (1841) action does not fulfill the requirements of a demonstrably intentional emendation under Art. 33.2. The spelling cannot be corrected under Art. 32.5. because the original publication does not provide enough information to infer the proper spelling. The original spelling fell into disuse and some subsequent authors (e.g., Gude, 1903: 49) followed the secondary spelling "balestieriana", but usually only while placing it in synonymy of other nominal species of what is now considered genus *Dyakia* (Dyakiidae). More recently, Sutcharit et al. (2012: 285) treated the species as potentially valid. The authors used the third spelling, *Helix balesteriana*, in this context. That erroneous spelling had previously also been used by Pfeiffer (1847: 88), Gray (1855: 146), Martens (1867: 221) and Maassen (2001: 105) in synonymy of other nominal species. Neither of Lea's secondary spellings is in prevailing usage, and Art. 33.2.3.1 cannot be applied. *Helix balestieriana* and *H. balesteriana* are interpreted as incorrect subsequent spellings. Current status of *Helix balasteriana* I. Lea, 1840 (teste Sutcharit et al., 2012; with spelling corrected herein): a *nomen inquirendum*, Dyakiidae.

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molluscs, from Darien and Honduras; Remarks on some Unionidæ; Descriptions of seven new species of *Margaritanæ* and four *Anodontæ*; Descriptions of twelve new species of uniones, and other fresh-water shells of the United States; Remarks on the Green Sand formation of New Jersey. Merrihew & Thompson Printers, Philadelphia, 26 pp. [Dated as 1859 on cover; dated by Scudder (1885: 83) as of 1858, but the final included article (1859a) was likely published in early 1859 (also dated as 1859 by Bogan & Bogan, 2002: 371); Scudder no. 146.]

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