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Rafinesque's names for western American mammals, including the earliest scientific name for the coyote (*Canis latrans* Say, 1822), based on the apocryphal journal of Charles Le Raye

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Abstract.—In 1817, the naturalist Constantine S. Rafinesque named nine new species of mammals from the American West, indicating the recently published journal of Charles Le Raye as the primary source for his descriptions. Le Raye was purported to be a French Canadian fur trader who, as a captive of the Sioux, had traveled across broad portions of the Missouri and Yellowstone river drainages a few years before the Lewis and Clark Expedition (1804–1806) traversed much of the same region. Le Raye's journal was relied upon by generations of scholars as a valuable source documenting the native peoples and natural history of the Upper Missouri River in the era just prior to European settlement. Subsequent research, however, has shown that Le Raye never existed, and his purported journal is fraudulent. Despite this, Rafinesque's creation of the names followed conventional and accepted practice at the time, and they are potentially available. Fortunately, much of the Le Raye journal was based on verifiable sources, such as Patrick Gass's published account of the Lewis and Clark Expedition. Identification of the original source materials makes it possible to establish the correct application of Rafinesque's names and to determine their current status. This process reveals that the earliest scientific name for the coyote (*Canis latrans* Say, 1822) was *Canis chlorops* Rafinesque, 1817; this name is now a *nomen oblitum*, however, and is no longer available.

Keywords: *Antilocapra americana*, *Antilope cervicapra*, cabree, *Cynomys ludovicianus*, *Gulo gulo*, Jervis Cutler, Lewis and Clark Expedition, *nomen dubium*, *Taxidea taxus*, *Vulpes velox*

In 1817, the American naturalist Constantine S. Rafinesque (1817b) published a short paper in which he named nine new species of mammals from the poorly known Louisiana Territory and suggested replacement names for ten other species (Table 1). In describing the new species, Rafinesque (1817b) indicated that the primary source for his descriptions was information contained within the purported first-person captivity narrative of Charles Le Raye that was published in 1812 as a section of the anonymously authored book, *A Topographical Description of the State of Ohio, Indiana Territory, and Louisiana* (henceforth, *A Topographical Description*). The book's author is now well established to have been Jervis Cutler (Hildreth 1852, Cutler & Cutler 1888, Woodman 2015). A member of a politically connected Massachusetts family, Cutler traveled to the Ohio frontier as a pioneer and there became

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Table 1.—List of new mammalian scientific names and name combinations coined by Rafinesque (1817b) based primarily on mammals described in Charles Le Raye's journal (Cutler 1812). The sequence follows Rafinesque (1817b). Current names are from Wilson & Reeder (2005).

Rafinesque's taxon	Current name and/or status
New species	
Corvus [sic][a] *macrourus*	*Odocoileus virginianus macrourus*
Canis chlorops	*nomen oblitum* [= *Canis latrans* Say, 1822]
Cervus hemionus	*Odocoileus hemionus hemionus*
Cervus melanurus	*nomen nudum* [= *Odocoileus hemionus columbianus* (Richardson, 1829)]
Melesium pratense	*Taxidea taxus* (Schreber, 1777)
Strepriceros [sic][b] *eriphos*	*Antilope cervicapra* (Linnaeus, 1758)
Felis fossor	*nomen dubium*
Felis misax[c]	*Gulo gulo* (Linnaeus, 1758)
Lynx aureus	*nomen dubium*
Modification or renaming of existing species	
Mazama ovina[d]	*Oreamnos americanus* (Blainville, 1816)
Mazama pudu[d]	*Pudu puda* (Molina, 1782)
Mazama caprina[d]	*Antilocapra americana* (Ord, 1815)
Cervus bifurcatus[d]	*Antilocapra americana* (Ord, 1815)
Lutrix Americana	*Lontra canadensis* (Schreber, 1777)
Taurus crinitus	*Bison bison* (Linnaeus, 1758)
Ursus ferox	*Ursus arctos* (Linnaeus, 1758)
[*Ursus*] *niger*	*Ursus americanus* (Pallas, 1780)
Lynx rufus?	*Lynx rufus* (Schreber, 1777)
[*Lynx*] *montanus*?[e]	*Lynx rufus* (Schreber, 1777)

[a] Misspelling of *Cervus*. [b] Misspelling of *Strepsiceros* Rafinesque, 1815. [c] Rafinesque (1832) subsequently renamed *Felis misax* as *Felis macrura*. [d] New name combination or replacement name mentioned in the description of "*Strepriceros*"[b] *eriphos*. Two other species, *Mazama pita* and *Mazama bira*, were described previously by Rafinesque (1817a:363). *Cervus bifurcatus* was renamed from *Antilope bifurcata* Smith (in Bigelow & Holley 1817; not *Antilope furcifer* Smith, 1821), a *nomen nudum* (see Bigelow & Holley 1817). [e] *Lynx montanus* was subsequently described by Rafinesque (1817c:46.).

engaged in the fur trade. He subsequently served for a short time as a captain in the U.S. Army and was stationed under the command of Major Zebulon M. Pike in New Orleans, where he came down with yellow fever. While recovering from the later stages of this illness in his parents' Massachusetts home, Cutler contracted his services as an engraver of woodcuts. It was also during this time that he produced *A Topographical Description* (Cutler & Cutler 1888, Woodman 2015).

In *A Topographical Description*, Cutler (1812) stated that Charles Le Raye was a French Canadian fur trader who presented him with a section of his journal while the two men were traveling downriver to New Orleans. The journal, which Cutler (1812:158–204) reproduced in his book, purports to provide a detailed, first-person account of Le Raye's experiences as a captive of the Sioux. Le Raye was taken prisoner by a war party in September 1801 while on a trading expedition along the Osage River in Missouri. For the next three years and five months, he traveled with his captors throughout much of the Upper Missouri River drainage and west along the Yellowstone River in Montana. He finally escaped in April 1805 and made his way to the French settlements along the lower Missouri. Le Raye's odyssey supposedly took place several years before the Lewis and Clark Expedition (1804–1806) explored much of the same region.

The publication of Le Raye's journal was thought to provide important insights regarding the geography and native peo-

ples of this mostly unexplored region (Dollar 1974, 1983), and many of the animals that Le Raye wrote about presumably were then new to the known fauna of North America. As explained by Rafinesque (1817b:435):

> Those excursions enabled him [Le Raye] to observe many of the new and rare Quadrupeds of those regions, and he appears to have been the first observer, who has noticed them with accuracy, and whose observations have been communicated to the public: Since such observations of Captains Lewis and Clarke, as relate to those parts, were only made between 1804 and 1806, and not published until 1814. Those circumstances will render Mr. Le Raye's observations particularly interesting. It is from intelligent travellers that naturalists derive their most correct and accurate materials: I consider those furnished by Mr. Le Raye as highly valuable, mostly new, and entitled to priority; wherefore they claim the attention of all those who shall feel any share of interest in the study of the animals of North America: and I have been induced to collect them together and illustrate them by appropriate notes or comments, hoping thereby to render them of more easy access and utility.

Rafinesque (1817b) reprinted (albeit inaccurately) passages from the Le Raye journal that described eight mammals and provided a summary of what he considered to be their distinguishing characteristics. Of these eight, Rafinesque considered seven to be new species and provided them with Latin binomials. In his descriptions, Rafinesque also coined binomials for two additional species not mentioned in the purported Le Raye journal. For one (*Felis fossor*), he clearly indicated a description by Meriwether Lewis et al. (1814). For the second species (*Cervus melanurus*), he provided neither description nor indication. Near the end of his paper, Rafinesque (1817b) listed other species reportedly encountered by Le Raye, usefully summarizing the mammal fauna reported in the journal. For many of the listed species, and for some other species mentioned in his descriptions, Rafinesque provided replacement scientific names or new generic and specific name combinations. Although not considered a legitimate practice today, it was common at the time for a person to be considered the author of a unique name combination that consisted of an existing specific epithet combined with a new or different genus. For example, the South American cervid *Capra puda* Molina (1782) was renamed *Ovis pudu* Gmelin (1788), which was then renamed *Mazama pudu* Rafinesque (1817b); it is now *Pudu puda* (Molina, 1782). In total, Rafinesque (1817b) proposed 19 new scientific names or name combinations for which he claimed authorship (Table 1).

Unbeknownst to Rafinesque and subsequent generations of historians, ethnographers, and natural historians, the trader Charles Le Raye was a fabrication, and his autobiographical journal has since been determined to be fraudulent. Nonetheless, careful study of historical, geographical, zoological, and ethnographical aspects of the purported Le Raye journal has verified that details from a variety of contemporary sources were appropriated, intermixed, and, in the case of some ethnographical details, completely muddled in the writing of the account (Dollar 1974, 1983; Woodman 2013). The probable perpetrator of this fraud was the author of *A Topographical Description*, Jervis Cutler, who had the opportunity, the access to sources, and the motivation to carry it out (Woodman 2015).

Neither Rafinesque nor his contemporaries suspected the fraudulent nature of the Le Raye journal. In fact, the journal is still referenced occasionally as though it were a legitimate first-person account (e.g., Farr 2003, Kent 2003, Hodge 2013). Fortunately, the writer of the Le Raye journal drew information from a variety of potentially identifiable contemporary sources, and tracing those sources helps to establish the origin of the animal descriptions that Rafinesque (1817b) used as the basis for his new species (Dollar 1974, 1983; Woodman 2013). For example, the descriptions of mule deer, purportedly taken by

the Sioux along the Little Sioux River in South Dakota, and of the Great Plains white-tail deer, hunted along the Wakarusa River in Kansas, were both derived from Patrick Gass's (1807) published account of deer obtained by the Lewis and Clark Expedition along the Missouri River in central South Dakota (Woodman 2013).

The existence of legitimate sources for the information in the Le Raye journal is particularly relevant because Rafinesque's (1817b) repeated indication of the journal as the source for his descriptions followed permissible descriptive practice at the time (International Code of Zoological Nomenclature 1999: Article 12.2 [ICZN 1999]). His names are therefore potentially available. Herein, I address the probable original sources for mammal descriptions in the Le Raye journal that were the basis for Rafinesque's (1817b) descriptions; clarify the application and status of Rafinesque's proposed names; and discuss the disappearance of many of Rafinesque's names for the Le Raye mammals from the taxonomic literature.

Rafinesque's Descriptions Based on the Putative Le Raye Journal

Rafinesque's (1817b) ten replacement names lacked descriptions or justifications, and they deservedly disappeared into obscurity (Table 1). Of the nine new species Rafinesque proposed based on the putative Le Raye journal, the background for his three new deer names (*Cervus hemionus*, *C. macrourus*, *C. melanurus*) has been addressed previously (see Woodman 2013). For the remaining six names, I here provide Rafinesque's (1817b) original descriptions of the mammals, each of which begins with the relevant passage from the Le Raye journal (quotation marks are from Rafinesque), followed by Rafinesque's own summary comments (i.e., beginning with the word "*Note*"). Because he was not careful in his copying, editing, or proofing, the passages quoted by Rafinesque (1817b) rarely are exactly as they appeared in the Le Raye journal (Cutler 1812). Most differences involve punctuation, but occasionally there are substantial changes. That these errors are attributable to inadvertent sloppiness is further exemplified by Rafinesque's initial misspelling of the genus *Cervus* as "*Corvus*" and by his twice misspelling *Strepsiceros* Rafinesque (1815) as "*Strepriceros*" (Table 1). Unfortunately, such lapses are common among his papers (e.g., Merrill 1949, Woodman 2012) and lend Rafinesque's work the sense of "looseness" and haste decried by his detractors (Harlan 1825, Jordan 1886). Following each of Rafinesque's original descriptions, I provide details, under *Remarks*, from the sources that the author of the Le Raye journal likely consulted. My presentation of the names generally follows their order in Rafinesque (1817b), which approximates the sequence in which the animals are mentioned in the putative Le Raye journal (Cutler 1812).

Canis chlorops Rafinesque (1817b:436).

> "An animal is found in these plains (on the Sioux river, north of the Missouri) called the Prairie chien, or meadow dog. It is smaller than the gray fox, and formed much like the dog. Its ears are pointed and stand erect, and the whole head very much resembles the dog. Its tail is long, slim, and of a dun colour. It digs holes and burrows in a light loamy soil, and in the same holes a small speckled snake takes shelter, which the Indians call the dog's guard. The Indians have many superstitious notions respecting these dogs. The Ay-oo-wars or *Nez percés* nation, have a tradition that the human race sprang from this dog and the beaver. All other nations hold them in great veneration."
>
> *Note*. A very imperfect description of this new species of fox, which I shall name *Canis chlorops*, (green eyed fox, or meadow fox) as it is probably the same species better described in Lewis and Clarke's travels, vol. i. p. 207. Its definition, drawn from both accounts, may be—tail elongated, strait and dun colour, ears long and pointed, eyes green, fur pale reddish brown.

Remarks.—Le Raye's description appears in his putative journal for a period

after 8 December 1801 (Cutler 1812:168), when he and his captors were in their winter camp along the Big Sioux River between Iowa and South Dakota (Dollar 1983). In the Le Raye journal, the animal is called, "le prairie chein [sic], or prairie dog" (Cutler 1812:168), rather than "the Prairie chien, or meadow dog" as written by Rafinesque, who was fluent in French. Based primarily on the animal's common name and its burrowing behavior, the species described in Le Raye's journal superficially appears to be the black-tailed prairie dog, *Cynomys ludovicianus* (Ord, 1815), which has generally been the interpretation of Le Raye's animal (Dollar 1974, 1983).

Nothing quite like Le Raye's description, however, appears in Gass (1807) or in other contemporary accounts of the black-tailed prairie dog. Gass (1807:37), for example, never mentioned the French name for the prairie dog, and he provided little information other than that its size was "about that of the smallest species of domestic dogs." In contrast, Captains Lewis and Clark compared the size and other characteristics of the prairie dog to a ground squirrel. In his journal, Lewis called the animal the "barking squirrel," and stated, "it's [sic] form is that of the squirrel," rather than comparing it to a dog (Moulton 1983–1999 [1993:75]). Unpublished journals of other members of the Lewis and Clark Expedition reveal no additional details (e.g., Moulton 1983–1999 [1995:55, 1997:70]), and Pike's (1810) description from his western expeditions also bears little similarity to Le Raye's. No known contemporary source mentions details of the ears, head, or tail that are noted in the Le Raye journal. These features may have been invented by Cutler (1812) or they may be derived from another source, perhaps the description of another animal. Aside from the common name, the description in the Le Raye journal could easily pertain to a very different mammal, the swift fox (*Vulpes velox* Say in James 1822). Never having seen the animal himself, Cutler (1812) may have associated characteristics of a swift fox with the name "prairie dog."

In his unpublished journal for 8 July 1805 (Moulton 1983–1999 [1987:366–367]), Lewis described a "small fox" from Montana that he considered distinct from the familiar "kit fox" (probably a variant of *V. velox* rather than *V. macrotis* Merriam, 1888):

> The party who were down with Capt. Clark also killed a small fox which they brought with them.... it is so much like the comm[on] small fox of this country commonly called the kit fox that I should have taken it for a young one of that species; however on closer examination it did ap[p]ear to differ somewhat; it's [sic] colour was of a lighter brown, it's years [ears] proportionably [sic] larger, and the tale [tail] not so large or the hair not so long which formed it. They are very delicately formed, exceedingly fleet, and not as large as the common domestic cat. their tallons [sic] appear longer than any species of fox I ever saw and seem therefore prepared more amply by nature for the purpose of burrowing.

A description of this individual did not appear in Lewis et al. (1814) or in Gass (1807:106), who simply stated that "a number of the party ... caught a small animal almost like a cat, of a light colour." Lewis's description also does not provide all of the features of Le Raye's "prairie chein." We can infer from this, however, that although the "kit fox" was unknown to science at the time, it was commonly known among western trappers (see also Burroughs 1995). Cutler (1812) may have learned of this animal from fur-traders or by seeing pelts of the animal when he was in New Orleans.

Rafinesque (1817b:436), on the other hand, specifically indicated that the animal detailed in the Le Raye journal "is probably the same species better described in Lewis and Clarke's travels" (i.e., Lewis et al. 1814). The account on page 207 that Rafinesque referenced, however, is for the "burrowing dog" (i.e., the coyote, *Canis*

latrans Say, 1822) rather than either the prairie dog or the swift fox:

> The wolves are also very abundant, and are of two species. First, the small wolf or burrowing dog of the prairies, which are found in almost all the open plains. It is of an intermediate size between the fox and dog, very delicately formed, fleet and active. The ears are large, erect, and pointed; the head long and pointed, like that of the fox; the tail long and bushy; the hair and fur of a pale reddish brown colour, though much coarser than that of the fox; the eye of a deep sea-green colour, small and piercing; the talons rather longer than those of the wolf of the Atlantic states, which animal as far as we can perceive is not to be found on this side of the river Platte. These wolves usually associate in bands of ten or twelve, and are rarely if ever seen alone, not being able singly to attack a deer or antelope. They live and rear their young in burrows, which they fix near some pass or spot much frequented by game, and sally out in a body against any animal which they think they can overpower, but on the slightest alarm retreat to their burrows making a noise exactly like that of a small dog (Lewis et al. 1814 [1:207]).

This published account closely follows a similar account in Lewis's unpublished journal for 5 May 1805 (Moulton 1983–1999 [1987]).

Rather than referring to a prairie dog (*Cynomys ludovicianus*), a sciurid rodent, Rafinesque's *prairie chien* is a conflation of Lewis's burrowing dog (*Canis latrans*) and Le Raye's "prairie chein," which, in turn, appears to be a misapplication of the common name "prairie dog" to *Vulpes velox*. Because Rafinesque clearly thought that he was naming a canid (1817b:436—"this new species of fox"), and because he clearly indicated that Lewis et al.'s (1814) account was "better" than the "imperfect description" by the fictitious Le Raye (Cutler 1812), *Canis chlorops* most aptly applies to *Canis latrans* rather than to either *Cynomys ludovicianus* or *Vulpes velox*. *Canis chlorops* Rafinesque (1817b) thus predates *Canis latrans* Say (in James 1822) by strict application of the principle of priority (ICZN 1999: Preamble); however, Rafinesque's taxon has had no usage beyond its original description, rendering it a *nomen oblitum* (ICZN 1999: Article 23.2). *Canis latrans*, therefore, remains the valid name for the coyote.

Melesium pratense Rafinesque (1817b: 436).

> "A species of the badger, called prarow, inhabits these plains, (those of the Sioux river.) Its head much resembles the dog; legs short and very thick in proportion to its body, armed with long, sharp claws, well adapted to digging. The size of the body somewhat exceeds the ground hog; hair of a dark brown colour, and tail visibly resembling that of a ground hog. It burrows and hedges in the ground."
>
> *Note*. By this notice, the animal might be a marmot or *Arctomys* instead of a badger, but as it is called such by Le Raye, I will consider it as a new species of badger, which may be named and characterized as follows—*Melesium pratense* (meadow badger,) entirely of a dark brown, tail bushy, long claws.

Remarks.—Like the description of the *prairie chien*, the description of the "prarow" appears in Le Raye's journal (Cutler 1812:168–169) when he was supposedly in the 1801–1802 winter camp of the Sioux along the Big Sioux River (Dollar 1983). Although Lewis provided an extensive description of this animal (as "braro") in his journal for Wednesday, 26 February 1806 (Moulton 1983–1999 [1990]), none of that information was incorporated into the Le Raye account of the animal. Based on the description and the spelling of the common name, the primary source for Le Raye's description was Gass's (1807:25) entry for Monday, 30 July 1804, when the expedition was at Council Bluff in Washington Co., Nebraska:

> Two of our hunters went out and killed an animal, called a prarow, about the size of a ground hog and nearly of the same colour. It has a head similar to that of a dog, short legs and large claws on its fore feet; some of the claws are an inch and an half long.

"Prarow" was Gass's (1807) unique spelling of the French word *blaireau*

("badger"), which he likely heard as filtered through the pronunciation of the French Canadian *voyageurs* engaged by the Lewis and Clark Expedition. At least ten other spellings were used by members of the expedition (Coues 1877, 1893) and by Pike (1810); in all but a single case the initial letter is a "b." Only Gass (1807) and Le Raye (Cutler 1812) used the spelling "prarow." One would expect that an otherwise literate French fur trader, such as Le Raye was purported to be, would have a better acquaintance with the French name for the animal. Rafinesque, despite his fluency in French, does not appear to have made the connection between "prarow" and *blaireau*.

Because Gass (1807) was the original source of the information upon which Rafinesque based his description, *Melesium pratense* is identifiable as the badger, *Taxidea taxus taxus* (Schreber, 1777) and warrants recognition as a junior synonym of that taxon. The genus *Melesium* Rafinesque (1815) was created as a replacement name for *Taxus* Geoffroy Saint-Hilaire & Cuvier (1795) and is an acknowledged synonym of *Meles* Brisson (1762), a genus of Eurasian badgers (Wozencraft 2005).

"*Strepriceros*" *eriphos* Rafinesque (1817b: 437).

> "We only hunted the buffalo, mountain sheep and *Cabree*. A party was sent to gain the summit of a ridge, so as to pass over the other side, while the rest of us crawled up, surrounding them on every side, excepting towards the river. As soon as the signal was given, by those who had ascended and gained the opposite side, we all raised a sudden yell, and sprang out of the grass, and the affrighted animals instantly fled from us, pitched over the precipice, and were dashed against the stones at the bottom, where we killed sixty-one. Some of them fell nearly two hundred feet; but some of them which were near the bottom made their escape. It took us several days to dress and cure the meat, which is cut in thin slices, and dried in the sun or by a slow fire." With a figure of the Cabree or Missouri antelope.
>
> *Note*. The Cabree is not described, but is figured and is said in another part of the work, page 118, to inhabit also the country of the Osage. It appears that several animals of the antelope tribe, or allied thereto, are found in the western parts of North America, four of which I have already ascertained, including this. 1. The *Mazama ovina*, Raf. (or *Ovis montana* of Ord. 1st number of the Journal of the Academy of Natural Sciences of Philadelphia) which belongs to an extensive new genus of animals of the western continent, where it is the substitute of the antelope tribe of the eastern continent, the *M. pita*. Raf. *M. bira*, Raf. *M. pudu*. Raf. (*Ovis pudu Gmelin*,) &c. belonging to it, and probably many more species. 2. The *Mazama caprina*, Raf. or Pudu of North America, of Blainville. 3. The *Cervus bifurcatus*, Raf. (or *Antelope bifurcata*, of Smith,) which is a real species of buck, since it has divided horns. 4. The *Strepriceros eriphos*, or the Cabree of Leraye, and ibex, or antelope of some other travellers, which by the figure appears to possess the following characters; horns compressed, double the length of the head, tail long and bushy.—My genus *Strepriceros* includes the species of goats and antelopes with spiral horns.

Remarks.—Le Raye's journal first mentioned the "cabree" in the entry for 27 November 1801, when he and his captors would have been a little north of the Platte River in Nebraska (Cutler 1812:166, Dollar 1974). As stated by Rafinesque, Le Raye did not describe this animal, and the long passage that Rafinesque quoted provides little useful information, as it could pertain to "the buffalo," "mountain sheep," and/or the "Cabree." Instead, Rafinesque (1817b:437) explicitly based his description of "*Strepriceros*" *eriphos* on an accompanying woodcut of the "Cabree *or Missouri Antelope*" as rendered by Cutler (1812; see Fig. 1): "which by the figure appears to possess the following characters."

"Cabree" is Le Raye's spelling of *cabri*, the formal French word for a "kid" (i.e., a young goat) and the term used by the French *voyageurs* on the Great Plains for the pronghorn, *Antilocapra americana* (Ord, 1815). Members of the Lewis and Clark Expedition interchangeably used the terms "antelope," "goat," and at least five alternate spellings of "cabree" in their journals to refer to this species (Gass

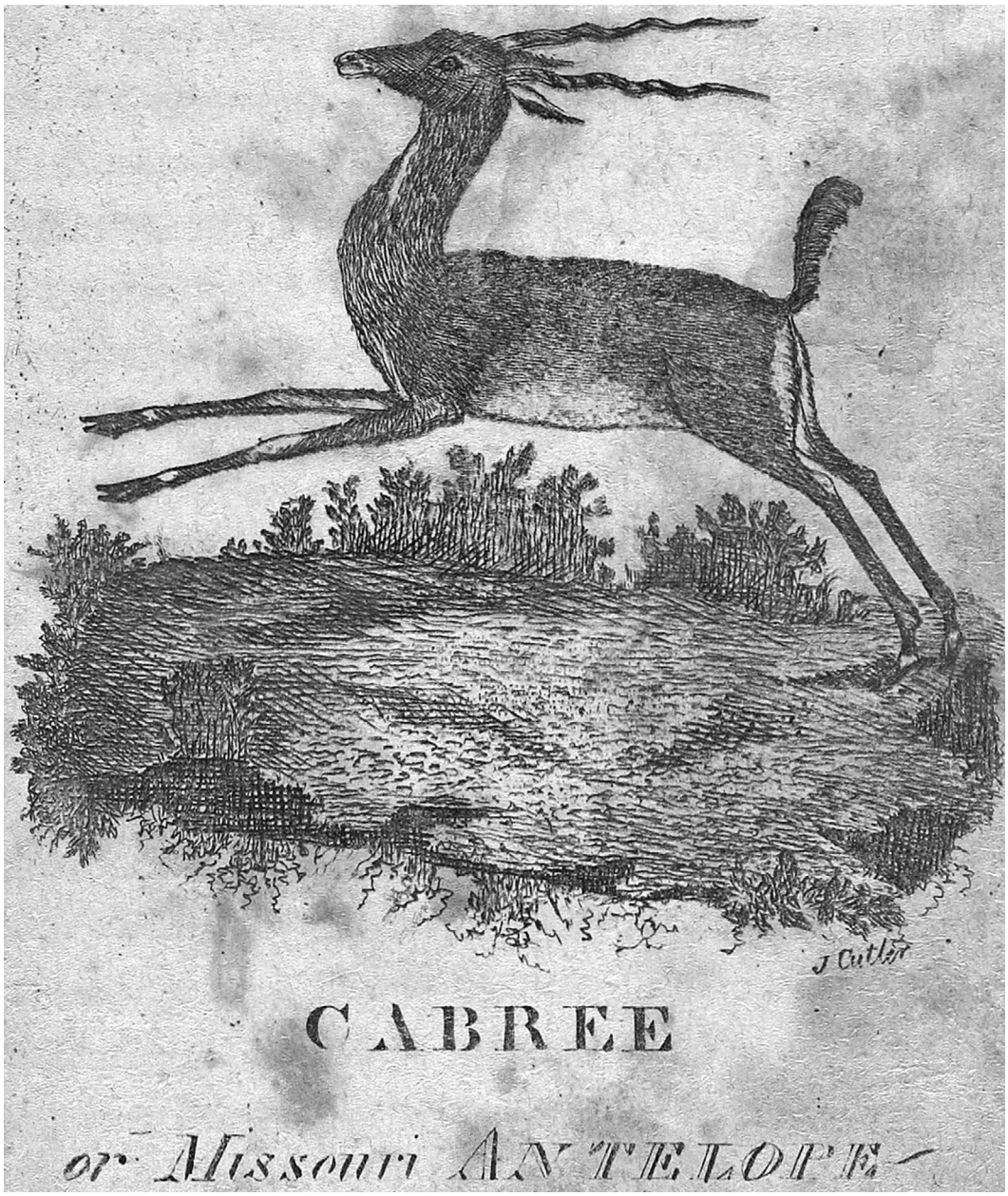

Fig. 1. Woodcut print of the "Cabree *or Missouri Antelope*," as rendered by Cutler (1812: opposite page 109), that served as the basis for "*Strepriceros*" *eriphos* Rafinesque (1817b). Cutler probably modeled his engraving on an illustration of *Antilope cervicapra* (see Fig. 2). Original image is 68 × 66 mm. Reproduced with permission of the Joseph F. Cullman 3rd Library of Natural History, Smithsonian Institution Libraries, Washington, D.C.

1807:36, 78; Moulton 1983–1999). Contemporary understanding of the affinities of this animal was encapsulated by Gass (1807:40), who stated, "The wild goat in this country differ from the common tame goat, and is supposed to be the real antelope." Accordingly, when Ord (1815:292) described and named the

pronghorn for science, he originally placed it in the genus *Antilope* Pallas (1766).

Having never seen a pronghorn and lacking any definite description from Gass (1807) or other sources, Cutler (1812) logically followed Gass's statement and depicted a "real antelope." Rather than a pronghorn, with its characteristic two-pronged horns, laterally-flattened with medially-curved tips, Cutler's (1812) woodcut of the "Cabree *or Missouri Antelope*" (Fig. 1) illustrates a male blackbuck, *Antilope cervicapra* (Linnaeus, 1758), a species with diverging, unbranched horns that spiral tightly around a linear axis. Cutler's image was plausibly modeled on a woodcut of a "common antelope" (Fig. 2), as so labeled and illustrated in one of the many editions of either Goldsmith's *History of the Earth and Animated Nature* or Bewick's (1792) *A General History of Quadrupeds*, both of which had been recently republished in Philadelphia (e.g., Bewick & Anderson 1804, Goldsmith & Pilkington 1804). While recovering from yellow fever and working on his book in Massachusetts, Cutler would have had access to one of these works, whether in his father's library or a library in Cambridge or Boston (Cutler & Cutler 1888).

Therefore, "*Strepriceros*" *eriphos* Rafinesque (1817b) becomes a junior synonym of *Antilope cervicapra* (Linnaeus, 1758). In referring this animal to "my genus *Strepriceros*," Rafinesque twice misspelled *Strepsiceros* Rafinesque (1815).

Felis misax Rafinesque (1817b:437).

> "We killed a wild cat (near the Yellow Stone river) which resembled the domestic cat, and was about the same size. It was of a sallow colour, and had a tail nearly of the length of the body. This little animal is very fierce, and often kills Cabree and sheep by jumping on their neck, and eating away the sinews and arteries until they fall, and then sucks the blood."
>
> *Note*. This short notice refers probably to a new species of cat, very similar to the cat seen by captain Lewis, but not killed, (see Travels, page 266), which I call *Felis fossor*, and likewise to the *Felis concolor*. This species I shall call *Felis misax*, and characterize thus:—Tail nearly as long as the body, which is entirely sallow and unspotted.

Remarks.—The description of the wild cat to which Rafinesque applied the name *Felis misax* appears in Le Raye's journal for the period of 4–25 August 1802, when Le Raye was supposedly with a Sioux hunting party along the Powder River in the foothills of the Big Horn Mountains of Wyoming (Dollar 1974, 1983). There is nothing quite like Le Raye's wild cat described in Gass (1807) or in the Lewis and Clark journals (Moulton 1983–1999). The depiction of its long tail and predatory behavior, however, are reminiscent of early fur-trader's descriptions (Carver 1779:420–421) of the *carcajou*:

> This creature, which is of the cat kind, is a terrible enemy to the preceding four species of beasts [i.e., "deer", "elk", "moose", "carrabou"]. He either comes upon them from some concealment unperceived, or climbs up into a tree, and taking his station on some of the branches, waits till one of them, driven by an extreme of heat or cold, takes shelter under it; when he fastens upon his neck, and opening the jugular vein, soon brings his prey to the ground. This he is enabled to do by his long tail, with which he encircles the body of his adversary; and the only means they have to shun their fate, is by flying immediately to the water, by this method, as the carcajou has a great dislike to that element, he is sometimes got rid of before he can effect his purpose.

Carcajou is the French Canadian name (derived from Algonquian) for the wolverine, *Gulo gulo* (Linnaeus, 1758). Although Warden (1819:200–201) described the tail of the wolverine, "which is known in Canada by the name of Carcajou, and the *Beaver Eater*," as only 6–7 inches long, he depicted a similar hunting behavior: "When the deer and other animals retire to the shade of rocks and trees, he leaps upon their necks, and destroys them by tearing the jugular vein."

Apparently forgetting that he had already described *Felis misax*, Rafinesque

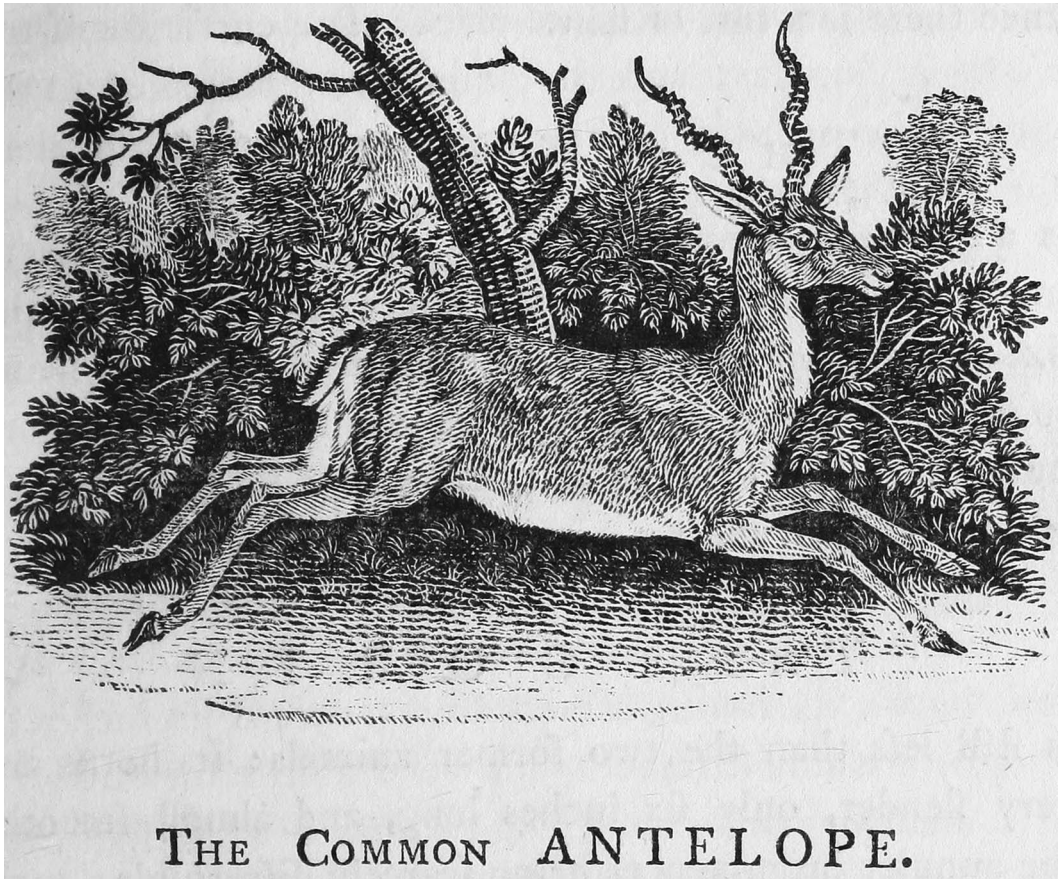

Fig. 2. Woodcut print of "The Common Antelope" from Bewick (1792). This or a similar image (e.g., Goldsmith & Pilkington 1807) likely served as the model for Cutler's (1812) woodcut of the "Cabree *or Missouri Antelope*" (Fig. 1). In the 1804 American edition *A General History of Quadrupeds* (Bewick & Anderson 1804) and the 1807 London edition of *Goldsmith's History of the Earth and Animated Nature* (Goldsmith & Pilkington 1807), the figure is reversed such that the animal is leaping toward the left, as depicted in Cutler's woodcut. Original image is 80 × 55 mm. Reproduced with permission of the Joseph F. Cullman 3rd Library of Natural History, Smithsonian Institution Libraries, Washington, D.C.

(1832:62–63) subsequently named a second species of "wild cat," *Felis macrura*, based on the same description from Le Raye's journal:

> I find in Leraye's travels that a smaller animal, nearly similar in color [to "the Pennsylvania or … Alleghany Couguar"], but not larger than a cat is found east of the Oregon mountains, which is very fierce, and often kills large animals, wild sheep and goats by jumping on their necks and cutting the flesh and arteries, until they fall. Is it a new species?
>
> *Felis macrura*, Raf. Entirely of a sallow color, tail as long as the body, which is from 1 to 2 feet long only.

Rafinesque's (1817b, 1832) physical descriptions of *Felis misax* and *Felis macrura* superficially resemble the cougar, *Puma concolor* (Linnaeus, 1771). Both publications, however, indicate the Le Raye account and, based on the characteristic hunting behavior, ultimately derive from an early description of a *carcajou*. Hence, *Felis misax* Rafinesque (1817b) and *Felis macrura* Rafinesque

(1832) are junior synonyms of *Gulo gulo* (Linnaeus, 1758).

It is surprising that Rafinesque would return to the purported Le Raye journal after his seemingly comprehensive summary of its reported mammal fauna 15 years earlier (i.e., Rafinesque 1817b). This short note increased the number of names inspired by the fraudulent Le Raye journal to 20.

Felis fossor Rafinesque (1817b:437).

Remarks.—In the process of naming and describing *Felis misax* (see above), Rafinesque confusingly named and indicated a second species of "cat," *Felis fossor*, based on a mammal encountered by Meriwether Lewis along the Sun River in Montana on 14 June 1805. The original account indicated by Rafinesque reads (Lewis et al. 1814:226):

> After examining Medicine river, captain Lewis set out at half after six o'clock in the evening on his return towards the camp, which he estimated at the distance of twelve miles. In going through the low grounds on Medicine river he met an animal which at a distance he thought was a wolf, but on coming within sixty paces, it proved to be some brownish yellow animal standing near its burrow, which, when he came nigh, crouched and seemed as if about to spring on him. Captain Lewis fired and the beast disappeared in its burrow. From the track and the general appearance of the animal he supposed it to be of the tiger kind.

In his journal, Lewis wrote that he was "convinced it was of the tiger kind" (Moulton 1983–1999 [1987:294]). "Tiger cat" was the term Lewis and Clark used to reference the Oregon bobcat, *Lynx rufus fasciatus* Rafinesque (1817c), in contrast to "wild cat" for the more familiar bobcat, *Lynx rufus rufus* (Schreber, 1777) and other subspecies east of the Rocky Mountains. They adopted the vernaculars "louservia" for the Canada lynx, *Lynx canadensis* (Kerr, 1792), and "panther" for the mountain lion, *Puma concolor* (Linnaeus, 1771) (Moulton 1983–1999, Burroughs 1995).

If Lewis accurately judged that the animal he shot at was a bobcat, then *Felis fossor* Rafinesque (1817b) predates *Lynx fasciatus* Rafinesque (1817c), and by the principle of priority (ICZN 1999: Preamble), it would have had precedence as the name for the Oregon subspecies of bobcat. *Felis fossor*, however, has never been used after its original description, rendering it a *nomen oblitum* (ICZN 1999: Article 23.2). On the other hand, Thwaites (1904:158) thought that the animal Lewis encountered was a wolverine, as did Moulton (1983–1999 [1987:296]). A third interpretation was offered by Burroughs (1995:83), who stated that the description of the animal in Lewis's account is inadequate for accurate identification, rendering *Felis fossor* Rafinesque (1817b) a *nomen dubium*, "a name of unknown or doubtful application" (ICZN 1999: Glossary). By either nomenclatural rationale, *Lynx rufus fasciatus* Rafinesque (1817c) remains the valid name for the Oregon bobcat.

Lynx aureus Rafinesque (1817b:437).

> "One of the Indians killed (near the Yellow Stone river) a beautiful wild cat, about one half larger than the house cat. Its fur was long and exceedingly fine, covered with black and white spots on a bright yellow ground. Its belly was pale yellow, and its tail about two inches long. It is the richest looking skin I ever saw."
>
> *Note*. All the wild cats with short tails and only three grinders on each side of each jaw, form the genus *Lynx*: This beautiful genus, of which only four have been recorded, has been increased by me to nearly fifteen, in a monography of it, several of which belong to North America, and among them Leraye's species shall be distinguished as follows: *Lynx aureus*—Bright yellow with black and white spots, belly pale yellow unspotted, tail and ears without tufts.

Remarks.—The account of this wild cat appears in Le Raye's journal when the Sioux hunting party with which he was purportedly traveling was camped at a large fork of the Powder River in the Big Horn Mountains, Wyoming, 25–28 Au-

gust 1802 (Dollar 1974, 1983). Nothing in Gass (1807) or in any of the extant journals from the Lewis and Clark Expedition matches this description. The leopard-like coloration of the animal may have been inspired by an extract from the 1796–1797 journal of John Evans that appeared in the journal of James McKay (McKay & Evans 1806, McKay et al. 1916). Both men were explorers and traders with the Commercial Company for the Discovery of the Nations of the Upper Missouri, based in St. Louis, Missouri. Evans wrote about a Rocky Mountain "species of wild cat, whose skin is of great beauty, and spotted like that of the leopard" (McKay & Evans 1806:35). Most likely, Le Raye's wild cat is based on an account of *Lynx rufus*, but lacking adequate evidence of a specific literature source and geographic location for its description, *Lynx aureus* Rafinesque (1817b) is best treated as a *nomen dubium*.

Discussion

Subsequent history of Rafinesque's names for the Le Raye mammals.—Rafinesque's (1817b) nine new species from the Louisiana Territory would have increased the number of known North American mammals by nearly 8% compared with Ord's (1815) authoritative *Zoology of North America*. Ord's synthesis was the first comprehensive list of North American terrestrial vertebrates to be published by an American. Rafinesque's ten replacement names further emphasized what he viewed as the distinctiveness of the western fauna (Table 1).

Rafinesque's taxa were proposed in an era when North American science was still quite young. The Academy of Natural Sciences of Philadelphia was only five years old in 1817, the first year when the Academy published its now venerable *Journal* (Stroud 1995). Natural historians in the United States were anxious to establish their work as worthy of the respect of their European counterparts but had the added burden of showing that the local fauna and flora warranted serious study (Semonin 2000). Buffon (1761) argued in his theory of New World degeneracy that—as a result of inferior climate and soils—plants, animals, and humans in the Americas were but smaller, less fertile versions of Old World species. Although Buffon (1780) later partially repudiated his theory, the idea continued to influence thinking, resurfacing as late as Darwin's (1839) report on the scientific discoveries made during the voyage of the *H. M. S. Beagle*. American natural historians attempted to counter this view, in part to establish their credentials as serious scholars and in part as a point of nationalist pride. In documenting the richness and uniqueness of New World plants and animals, the study of natural history—particularly the discovery of new species unknown in Europe—was seen as biologically distinguishing North America from the Old World and thereby underscoring the legitimacy of the United States' independence from the European empires (Semonin 2000).

In this "bio-nationalistic" climate, the discovery of nine new species from a poorly explored region of the continent should have attracted considerable interest. Yet, of the 19 new names Rafinesque (1817b) introduced, only two are currently in use in any form. Most of the remaining names have not been seen again in print, omitted even from comprehensive synonymies. One of the two names still in use is that of the mule deer, *Odocoileus hemionus* (Rafinesque, 1817b), now recognized as an iconic large mammal of the American West. A second viable name is used for a Great Plains subspecies of whitetail deer, *Odocoileus virginianus macrourus* (Rafinesque, 1817b). Even these two names were almost lost, overlooked for more than a generation until rediscovered around the turn of the nineteenth century and their taxonomic availability reestablished

(Mearns 1897, Lydekker 1898, Merriam 1898, Allen 1902). Rafinesque's (1817b) wild cat, *Lynx aureus*, initially received recognition and was noted by a number of contemporary authors (Desmarest 1820, Harlan 1825, Stark 1828, Fischer 1829, Wagner 1841, Audubon & Bachman 1854). Sometime after Godman (1826) synonymized the name with *L. rufus*, however, *L. aureus* Rafinesque also disappeared from the scientific literature.

Why many of Rafinesque's names were ignored.—Rafinesque was described by several contemporaries as acute, gifted, and industrious, as the most learned naturalist in America (Boewe 2011). He was a prolific writer who published in French, Italian, and English. Recognizing the need for American natural historians to take an active lead in the study and description of New World diversity, he played a sincere and enthusiastic role in forwarding this agenda. Rafinesque's primary interests included botany, malacology, and ichthyology; he is credited with describing about 2700 genera and 6700 species of plants alone (Merrill 1949). His role in mammalogy is smaller, having named only slightly more than 150 genera (Boewe 1988). In this context, the absence of most of Rafinesque's names for the Le Raye mammals, whether as recognized species or even in contemporary synonymies, initially seems surprising. This neglect ultimately had more to do with Rafinesque himself—his work habits, eccentric personality, and antagonistic relationship with the American scholarly community—and little to do with their origin from a fraudulent captivity narrative.

An enthusiastic explorer and traveler (Rafinesque 1836), Pennell (1942) ranked Rafinesque as the best field botanist of his generation. Unfortunately, Rafinesque lacked both a formal, focused training in natural history and the personal assiduousness to be an effective systematist. In this regard, Jordan (1886:214) noted that "a peculiar, restless, impatient enthusiasm is characteristic of all his writings, the ardor of the explorer without the patience of the investigator." Boewe (1988:50) suggested that Rafinesque "viewed himself as an explorer first, a naturalist second." As a consequence of his personal temperament and lack of professional training, his species descriptions were often brief, hastily drawn accounts that lacked specificity or thoroughness (Harlan 1825, Jordan 1886, Call 1895, Pennell 1942, Merrill 1949, Cain 1990). Many of Rafinesque's new species of plants and animals were described by indication to descriptions in the written works of others (Haldeman 1842, Boewe 2011, Woodman 2013) and occasionally in oral accounts (Petit 1985, Markle 1997). While this was acceptable taxonomic practice at the time (ICZN 1999: Article 12.2), Rafinesque could be naively credulous, "which led him to believe the exaggerated accounts of the vulgar; and to write essays and found 'species,' upon grounds which should be beneath the notice of any naturalist" (Haldeman 1842:281). Rafinesque's custom of indicating the work of others also meant that there were few type specimens to document his taxa. These work habits caused one frustrated botanist to note "that in taxonomy and nomenclature we would have been infinitely better off today had Rafinesque never written or published anything appertaining to the subject" (Merrill 1949:196).

Rafinesque's eccentric, temperamental, solitary personality (Call 1895), coupled with an unsophisticated sense of scientific etiquette, did not foster collegial interactions with his contemporaries. He alienated many colleagues by being overly critical of their publications while being extremely sensitive to criticisms leveled at his own work (Boewe 1987, 2011). He unnecessarily proposed "better" scientific names for established species, a practice based on guidelines proposed by Linnaeus (1751; Cain 1990), but one that he criticized in

others (Call 1895, Merrill 1949, Boewe 2003). Rafinesque also complained that his fellow naturalists ignored many new names that he proposed for species and higher-level taxa (Boewe 2011). Paradoxically, Rafinesque appeared to ignore much of his own work, rarely mentioning the species of mammals that he himself had described. One exception appeared in the issue of *American Monthly Magazine* that immediately followed the one in which he named the Le Raye mammals; in that later volume, Rafinesque (1817c) described seven "new" genera of North American mammals and there listed *Lynx aureus* Rafinesque, 1817b, as one of six species comprising *Lynx* Rafinesque, 1815 (not *Lynx* Kerr, 1792). Afterwards, he never again mentioned in print any of the new species described in his paper on the Le Raye mammals (Rafinesque 1817b). When Rafinesque referred to taxa he had described, he sometimes modified their names, whether intentionally or unintentionally (e.g., "*Strepriceros*" for *Strepsiceros*; see also Woodman 2012). He also occasionally forgot his own earlier descriptions entirely, such as when he redescribed the "wild cat," *Felis misax* Rafinesque (1817b), as *Felis macrura* Rafinesque (1832).

The cursory quality of Rafinesque's scientific writings, and probably of more relevance, his poor professional relationships, eventually led to his manuscripts being rejected for publication in leading American scientific journals. He first turned to European publications, and he eventually self-published several short-lived journals of limited distribution (Boewe 1987, 1988). The resulting obscurity of Rafinesque's publications reinforced the sense among both contemporary natural historians and later generations of biologists that his work was not worth consulting, let alone citing (Boewe 1988; see e.g., Preble 1899:10–12). This opinion regrettably ignored the principle of priority, a long-recognized cornerstone of taxonomic nomenclature (ICZN 1999) and effectively led to suppression of many of Rafinesque's tangible contributions without meaningful critical review. Rafinesque's taxonomic names remain relevant because they help track early nineteenth century understanding of the North American fauna and are a reminder of the evolution in the philosophy and the practice of taxonomy and natural history at the time. In that pre-*Origin-of-Species* era, when many natural historians still viewed species as fixed types, Rafinesque embraced the mutability of species and the consequential natural origin of new species (Boewe 2011). Hence, these names provide insight into an early evolutionist's view of biodiversity and the natural processes potentially responsible for variation and the derivation of new species.

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