

The Stephen H. Long Expedition (1819–1820), Titian R. Peale’s field illustrations, and the lost holotypes of the North American shrews *Sorex brevicaudus* Say and *Sorex parvus* Say (Mammalia: Soricidae) from the Philadelphia Museum

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Abstract.—While encamped for the winter of 1819–1820 at Engineer Cantonment along the Missouri River in present-day eastern Nebraska, members of Major Stephen Harriman Long’s Expedition to the Rocky Mountains collected a number of animals that were previously unknown. Among the mammals were two soricids that were subsequently described by Thomas Say as *Sorex brevicaudus* (Northern Short-tailed Shrew, *Blarina brevicauda*) and *Sorex parvus* (Least Shrew, *Cryptotis parvus*). The holotypes of these species were deposited and placed on public exhibit in the Philadelphia Museum, the predominant North American systematic collection of the early nineteenth century. Like most private museums of that era, the Philadelphia Museum eventually went out of business, and its collections were dispersed and, for the most part, lost. Fortunately, Titian R. Peale made a detailed field sketch of the two specimens soon after their capture and subsequently executed a watercolor based on that sketch. In addition, an engraving of the holotypes was published in the decade following the discovery of the two species. Illustrations of holotypes are taxonomically useful when they depict diagnostic characters of species. They take on added taxonomic significance in the absence of the holotypes. In the cases of *Sorex brevicaudus* and *Sorex parvus*, pictures provide strong confirmation of the taxonomic identities of these two species, as well as recording the early history of the specimens.

The Northern Short-tailed Shrew, *Blarina brevicauda*, and the Least Shrew, *Cryptotis parvus* (for this unfortunate name combination see ICZN 2006), are common small mammals in parts of the eastern and central United States. Both species were described by the naturalist Thomas Say (in James 1822) based on single specimens that were collected during Major Stephen Harriman Long’s Expedition to the Rocky Mountains. Since their original descriptions, there has been little reference to the holotypes

of these species in the published literature (e.g., Merriam 1895), and it is generally assumed that these specimens have been lost or destroyed—an assumption well-founded in light of the subsequent history of the collections made during the expedition. There is remaining evidence, however, of what the holotypes looked like. Archived in the Library of the American Philosophical Society (APS), Philadelphia, is a watercolor painted by Titian Ramsey Peale, who was officially attached to Long’s Expedition as Assistant

Naturalist. This painting was first published as a color plate in Benson (1988) under the descriptive title, "mole and vole." The subjects of the illustration are immediately recognizable, however, as two species of shrews, suggesting that they are likely representations of the holotypes of *B. brevicauda* and *C. parvus*. Subsequent investigation revealed an unpublished sketch of the same animals in the APS bearing a handwritten date and locality that confirms this identification. A few years after the expedition returned, John Godman (1826–1828) published a new engraving of the holotypes as they appeared on exhibit in the Philadelphia Museum.

While the aesthetic and historical value of illustrations of animals from Long's Expedition has been discussed (Haltman 1989, 2008), their taxonomic relevance has not. The objectives of this paper are to provide the historical background on the discovery and description of *B. brevicauda* and *C. parvus*; to trace the available history of the former collections of the Philadelphia Museum through the holotypes of these two species; to draw attention to the existence of the illustrations of these holotypes; and to show that these illustrations provide valuable confirmation that the scientific names for these two shrews are applied today as they were when the two species were originally described.

Long's Expedition to the Rocky Mountains

The operation that led to Long's Expedition began as a much larger undertaking involving thousands of men with goals that were more military than scientific in scope. In 1818–1819, the Missouri Expedition (also known as the Yellowstone Expedition—see Wesley 1931) of the U.S. Army slowly worked its way down the Ohio and up the Mississippi and Missouri rivers as part

of an effort to establish a series of American military posts along the nation's northwestern frontier. This military presence was determined necessary by the United States government in order to check British influence in the region, establish diplomatic ties with the Native American tribes there, and provide a secure foundation for the continued growth of the American fur trade. The original goal of the Missouri Expedition was to establish a permanent fort either at the mouth of the Yellowstone River or at the Mandan Villages in present-day North Dakota. The slow progress of the expedition, resulting from problems with the government contractor responsible for transporting the troops and provisions, fueled political wrangling between the House of Representatives and the Senate in Washington, D.C. The extended debate prevented the appropriation of sufficient funds to support the military mission after the second year, and the scope of the expedition was greatly reduced. Instead, a post was established at Cantonment Missouri on the west bank of the Missouri River in present-day eastern Nebraska, where the military force over-wintered in 1819–1820 (Chittenden 1902, Godwin 1917, Wesley 1931). A small party of topographers and naturalists attached to the Missouri Expedition and under the leadership of Major Stephen Harriman Long of the Army Engineers encamped a short distance downriver at Engineer Cantonment from 19 September 1819, until 6 June 1820. This latter team included Thomas Say as the expedition's zoologist and Titian Ramsey Peale as Assistant Naturalist. The scientific party was authorized by Secretary of War John C. Calhoun to document the natural resources, physical geography, and Native American tribes of the upper Missouri River region. When funding for the Missouri Expedition was cut, the charge of the scientific survey changed as well. Their new goal, which

resulted in what commonly became known as Long's Expedition to the Rocky Mountains, was to explore the Platte River to its source in the Rocky Mountains, work south to the headwaters of the Arkansas and Red Rivers, and then explore those rivers to their confluence with the Mississippi River. Although great discoveries were expected as the party set out for the Rocky Mountains, the funding cuts by Congress left the expedition ill-supplied for its long trek, and ultimately they did not achieve many of their primary exploratory goals (Everett 1823, Chittendon 1902). Moreover, much of the collected scientific data was lost when three enlisted men deserted near the end of the expedition, taking with them the three best remaining horses and much of the personal baggage, including all of Thomas Say's written scientific observations and descriptions of animals made since leaving Engineer Cantonment (James 1822).

Despite the numerous set-backs endured by Long's Expedition, the scientists in the party made a substantial number of important biological contributions. The first American printing of the official published record of the expedition, *Account of an Expedition from Pittsburgh to the Rocky Mountains* (James 1822), included descriptions of 39 new vertebrate, four invertebrate, and 11 fossil species by Say and ten species of plants by Edwin James scattered as footnotes through the two textual volumes of the work. Additional specimens brought back by the expedition provided material for the subsequent description of 157 new insects by Say (Evans 1997) and 140 new plants by James and other botanists (Goodman & Lawson 1995, Evans 1997). The scientific team also completed what Genoways & Ratcliffe (2008) contend was the first published biodiversity survey in North America, providing a comprehensive list of mammals, birds, reptiles, amphibians, insects, snails, and plants

discovered in the vicinity of Engineer Cantonment. A large body of work, however, did not make it into the *Account* and was never published in its original context. This includes the majority of the illustrations produced by the two trained artists associated with the expedition, Titian R. Peale and Samuel Seymour. In addition to sketches and paintings recording landscapes, events, and meetings with Native Americans, Peale in particular recorded in graphic detail many of the specimens of animals and plants obtained by the expedition. Many of these specimens did not survive the journey, and some became the basis for the description of new species. Although some of these illustrations have appeared in the literature on American history (Benson 1988) or art history (Haltman 2008), few of the visual representations of vertebrates have ever been published in their original context as natural history illustrations (see Evans 1997 for some exceptions).

Two New Species of Shrews

Among the 13 species of mammals discovered by Long's Expedition were two soricids, *Sorex brevicaudus* (Northern Short-tailed Shrew, *Blarina brevicauda*) and *Sorex parvus* (Least Shrew, *Cryptotis parvus*), that were described in the same footnote in the *Account* (Say in James 1822, 1:163–164). Both species descriptions were based on single specimens obtained while the scientific expedition was encamped for the winter of 1819–1820 at Engineer Cantonment, a temporary encampment that only recently was precisely relocated in southeastern Washington County, Nebraska (Carleson et al. 2004, Genoways & Ratcliffe 2008). James (1822, 1:163–164) wrote that the two shrews were “taken near our cabins.” Regarding the *Sorex parvus*, Say (in James 1822, 1:164) wryly added that “Mr. Peale caught this animal in a pitfall, which he had dug for the purpose of



Fig. 1. Pencil sketch of *Sorex brevicaudus* (upper left) and *Sorex parvus* (lower right) by Titian Ramsey Peale (Titian Ramsay Peale Sketches, American Philosophical Society, Philadelphia, PA).

catching a wolf.” He does not state how the specimen of *S. brevicaudus* was captured, but it is likely that it was also found in Peale’s wolf trap. The exact date that the specimens were obtained is not mentioned by James or Say. Major Long’s party arrived at Engineer Cantonment on September 19th, and the group’s cabins, near where the two shrews were captured, were completed “early in October,” prior to Long’s departure for the East Coast on October 11th (James 1822, 1:163–164). Based on the chronological location of the descriptions of the shrews and the wolf trapping operations in the *Account*, the specimens appear to have been obtained soon afterwards in the same month.

In addition to being trained as a naturalist, Titian Peale was a talented artist like his father Charles Willson Peale, his uncle James Peale, his half-brothers Raphaele, Rembrandt, and Rubens Peale, and other members of his family (Miller 1996). He produced 214 known drawings and paintings during

Long’s Expedition (Haltman 1989), including at least 123 depictions of animals and plants that were invoiced in the Philadelphia Museum’s *Memorandum* book (Philadelphia Historical Society: Peale Family. Papers, 1794–1854). Among these works is a pencil sketch of two small mammals, in the lower left corner of which is written “N 22, Oct 18th 1819, Engin^r. Cant^t.” (Fig. 1), indicating both by its date and the abbreviated locality that it was executed during the expedition’s sojourn at Engineer Cantonment. Although identified previously as a “mole and vole” (Benson 1988), to a mammalogist the two animals in the sketch are immediately recognizable as soricids based on their long, pointed rostra; cylindrical bodies; relatively unspecialized feet positioned under the body; and small, hidden eyes. Their short tails and reduced pinnae completely hidden by the surrounding fur mark them as members of the Blarinini, which includes only the two genera *Blarina* and *Cryptotis*. The larger body size and the



Fig. 2. Watercolor and ink of *Sorex brevicaudus* (upper left) and *Sorex parvus* (lower right) by Titian R. Peale (Titian Ramsay Peale Sketches, American Philosophical Society, Philadelphia, PA).

long fore claws of the individual in the center of the sketch identify it as a *Blarina brevicauda*, whereas the smaller individual on the lower right with relatively short fore claws is clearly a *Cryptotis parvus*. The date on the illustration and the fact that no other shrews were encountered by the expedition indicate that this is a picture of the holotypes of *Sorex brevicaudus* and *Sorex parvus*. Peale also produced an ink and watercolor illustration of the two shrews based on his sketch that shows the original pelage colors of the specimens (Fig. 2). The darker, more blackish-brown pelage of the larger shrew and the paler, brown to grayish-olive coloration of the smaller shrew support their identifications as *B. brevicauda* and *C. parvus*, respectively. The painting has the year “1819” written in the lower left corner. Like many of Peale’s paintings from Long’s Expedition, however, it may

not have been completed until after Peale returned to Philadelphia (Haltman 2008).

Both of Peale’s illustrations depict the two animals in life-like poses. In particular, their slightly elevated heads and the digitigrade stance of the hind feet suggest that one or both animals are likely to have been observed alive. In general, soricids are considered to be plantigrade (Vaughan et al. 2000), but they typically assume a more digitigrade posture of the hind feet when running, and they may maintain this position when they pause momentarily (Woodman & Morgan 2005). Given the difficulties in keeping soricids in captivity and the rapidity with which they begin to decompose after death, the two specimens probably were sketched and painted soon after their capture, and the date on the sketch is likely a close approximation of when they were caught (i.e., 18 October 1819).

The discovery of two species of shrews at Engineer Cantonment would have been significant to the naturalists Say and Peale, because the diversity and distribution of soricids in North America was poorly known at the time. None appeared in Forster's (1771) catalog of North American animals, and the French naturalist Cuvier doubted the very existence of shrews in the New World (related by Bachman 1837). Just prior to the expedition, Philadelphia naturalist George Ord's comprehensive listing of the known species of North American terrestrial animals appeared in the 2nd American edition of *Guthrie's Geography* (Ord 1815). He indicated six species of "*Sorex*" for the continent, of which one was later shown to be a Mexican geomyid, three to be talpids, and the remaining two were identified as European species of shrews, which at the time were thought to possibly have a broader distribution (Rhoads 1894). While this diversity partly reflects the broad concept of "*Sorex*" at that time, it also indicates how poorly species of North American wildlife were known. Harlan (1825) and Godman (1826–1828) provided more detailed accountings of North American mammals that included species discovered by Long's Expedition. Harlan (1825) recognized four species of shrews, and Godman (1826–1828) recognized only three, including the newly-described *S. brevicaudus* and *S. parvus*. A decade later, the list had grown to 13 North American species, although in his monograph on North American shrews the Charleston natural historian John Bachman (1837) remarked the continuing difficulty in obtaining sufficient specimens to differentiate species adequately and confirm their taxonomic validity. In contrast, today there are 17 species of shrews recognized in North America east of the Rocky Mountains and north of the Red River (Hutterer 2005), physiographic features that marked the effective western and south-

western limits of knowledge of North American animals at that time. Within this context, Say's (in James 1822) short descriptions of *S. brevicaudus* and *S. parvus* were adequate to differentiate the two shrews from all other known species of mammals. Given the greater diversity of shrews recognized today, Peale's illustrations, while not critical, are useful for correctly matching the taxonomic names with the animals.

Peale's sketch and watercolor of the shrews found at Engineer Cantonment probably are the first illustrations executed of *Cryptotis parvus*, but not of *Blarina brevicauda*. In his description of *Sorex brevicaudus*, Thomas Say (in James 1822: 164) noted

May not this be the animal mentioned by the late professor Barton in his Medical and Physical Journal, for March 1816 [sic], which, he says, 'may be called the black shrew?' I do not know that the black shrew has ever received any further notice, unless it is the same species to which Mr. Ord has applied the name of *Sorex niger*.

Benjamin S. Barton's "black shrew" is not the same species listed by Ord (1815). Ord's *Sorex niger* is a nomen nudum that probably was applied to a talpid (see Rhoads 1894), whereas Barton almost certainly was referring to a soricid. The report to which Say refers, in its entirety, reads (Barton 1806:67):

A new species of *Sorex* has been discovered in the vicinity of Philadelphia. It may be called the Black Shrew, and, like some of the other species of the genus, emits an extremely fetid odour from its body.

That this might be *Blarina brevicauda* is not immediately obvious from Barton's account, although his characterization of its odor is suggestive. Barton, however, also produced a black and white copperplate engraving of a dark, short-tailed shrew that is now preserved in the library of the APS (Fig. 3). It seems likely that this is his "Black Shrew," which, from the description of the color and the represen-

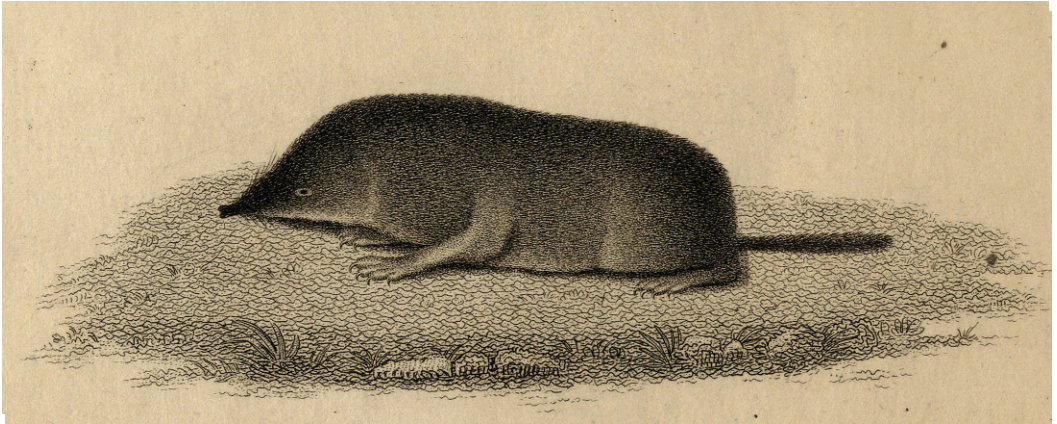


Fig. 3. Engraving of a shrew by Benjamin Smith Barton (Benjamin Smith Barton Papers, American Philosophical Society, Philadelphia, PA).

tation of the length of the tail and relative size of the paws, almost certainly represents *Blarina brevicauda*. The engraving is undated, but obviously predates Barton's death in December 1815 and was most likely produced about 1806 when he announced his discovery of this animal.

Fates of the Holotypes

The final disposition of the holotypes of *Sorex brevicaudus* and *S. parvus* remains obscure, but some insight can be gained by understanding the subsequent history of the collections from Long's Expedition. By order of the Secretary of War, the repository for most of the natural history specimens collected by Long's Expedition was the Philadelphia Museum. Situated in the cultural and scientific heart of the nascent United States during the first half of the 19th century, the Philadelphia Museum acted as a *de facto* national repository for scientific specimens and historical and cultural artifacts (Weiss and Zeigler 1931, Appel 1980). It was, however, a private family enterprise, founded in 1786 by Charles Willson Peale, the father of Titian R. Peale, with the dual aims of financial gain and popular education in natural history, American history, and the arts (Appel 1980, Sellers 1980b). By 1804, the

Philadelphia Museum displayed 760 species of birds, as well as 190 mammals and 4000 insects (Anonymous 1804). It received donations from such public figures as Benjamin Franklin, Thomas Jefferson, and George Washington, and it was a major repository for specimens from the Lewis and Clark [1804–1806] and Zebulon M. Pike [1806–1807] expeditions. The Peales' correspondents included Joseph Banks, Georges Cuvier, Jean-Baptiste Lamarck, and Etienne Geoffroy Saint-Hilaire, and the Philadelphia Museum exchanged specimens with institutions and collectors in England, France, Germany, the Netherlands, Spain, and Sweden. The collection eventually included holotypes for species described by Charles Lucien Bonaparte, John D. Godman, Richard Harlan, George Ord, Thomas Say, and Alexander Wilson. Later, by order of the Secretary of the Navy, it was the primary, if temporary, repository for specimens from Captain Charles Wilkes' United States Exploring Expedition of 1838–1842, specimens that eventually helped form the nucleus of the collection of the Smithsonian Institution (Goode 1901, Faxon 1915, Appel 1980, Sellers 1980a, b; Miller 1988). At the time, in the absence of a formal federal repository (the short-lived National Institute for the Promotion of Science was not established

until 1840, and the Smithsonian Institution was not founded until 1846), the Philadelphia Museum was the obvious choice for receiving the specimens collected as part of Long's Expedition.

Natural history specimens from Long's Expedition arrived in Philadelphia by ship via New Orleans by mid-February 1821 (Nichols & Halley 1980). They were invoiced by Titian Peale on 20 March 1821, and officially entered into the Philadelphia Museum's *Memoranda* book on 23 March 1821, by his brother, Rubens Peale, then manager of the museum (Philadelphia Historical Society: Peale Family. Papers, 1794–1854). The specimens of *Sorex brevicaudus* and *Sorex parvus* probably were among the items in the "Box of small animals" listed on the invoice. Along with the list of specimens is a list of "drawings," including two of "Shrews" described as "unfinished."

The two early nineteenth-century monographs on North American mammals (north of Mexico) were published by the Philadelphia natural historians and scientific rivals Richard Harlan (1825) and John Godman (1826–1828) shortly after Long's Expedition returned. Although both authors relied heavily on Say's original descriptions in their accounts of western species, sometimes paraphrasing or even quoting Say at length, they also made extensive use of the collections of the Philadelphia Museum, and they provide clear evidence that the original specimens of *S. brevicaudus* and *S. parvus* were present in the museum at that time. In his account for *Sorex brevicaudus* in the *Fauna Americana*, Harlan (1825:30) specifically noted "the skull in the Philadelphia Museum." Most of his description of the species is taken directly from Say (in James 1822), but he also provided a more in-depth characterization of the dentition than Say. Intriguingly, the particulars of the teeth were based, not on Say's type in the Philadelphia Museum, but on a different speci-

men: "Mr. G. Ord presented me with a skull [sic] of a *Sorex* from the neighborhood of Philadelphia, which has served the purpose of the above details of the teeth" (Harlan 1825:30). Harlan makes no mention of seeing the specimen of *Sorex parvus* in the Philadelphia Museum. The following year, John Godman published the first two volumes of his three-volume treatise, *American Natural History* (Godman 1826–1828), which similarly relied upon the Philadelphia Museum collections. Unlike Harlan's tome, *American Natural History*, included illustrations of many of the mammals based on specimens on exhibit in the museum (Sterling 1974). One engraving includes images of *S. brevicaudus* ("Short Tail Shrew") and *S. parvus* ("Small Shrew") with *Scalops canadensis* ("Shrew Mole" = *Scalopus aquaticus*) that appear to be mounted on a common base (Fig. 4). Unlike in Peale's illustrations (Figs. 1, 2), the two animals are shown flat-footed (i.e., plantigrade). This illustration indicates that the two specimens were extant and on exhibit in the museum during this period. Unlike the standard museum practices of today, it was common practice in the early and middle nineteenth century for most of the natural history collections of an institution to be on display, most especially holotypes. For example, the bird collection of the Academy of Natural Sciences of Philadelphia numbered ca. 31,000 specimens in January 1860, of which "not less than 27,000 are displayed in the cases, to which number yearly additions are made" (Slack 1862:97). In this context, it would have been remarkable if Say's holotypes had not been available for exhibit in the Philadelphia Museum. Godman's (1826–1828) engraving also clearly shows the first upper and lower incisors protruding from the mouth of the mounted *S. brevicaudus*, which may answer the question of why Harlan (1825) did not use the skull of the holotype in his description of



1 Short Tail Shrew. 2 Small Shrew. 3 Shrew Mole.

Fig. 4. Engraving of the “Short Tail Shrew” (*Sorex brevicaudus*), “Small Shrew” (*Sorex parvus*), and “Shrew Mole” (*Scalops canadensis*) from John D. Godman’s (1826–1828) *American Natural History*. Drawn by Alexander Rider and engraved by G. B. Ellis (Smithsonian Institution Libraries, Joseph F. Cullman 3rd Library of Natural History, Washington, DC).

the teeth. The skull probably was inaccessible because it had been left in the skin, as was the standard practice when preparing mounted specimens of quadrupeds in the Philadelphia Museum (C. W. Peale 1787, in Miller 1983; C. W. Peale 1809, in Miller 1988).

After this time, the histories of individual specimens in the Philadelphia Museum are difficult to trace, although what happened to the body of the collection is mostly recorded. The fates of the holotypes of *S. brevicaudus* and *S. parvus*—whether they were ultimately discarded, consumed by insects, destroyed by fire, or simply mislaid—are a mystery. As a commercial venture, the Philadelphia Museum enjoyed early success and wide renown, but ultimately it failed (Sellers 1980b). Facing low attendance, a lean economy, and strong competition from Phineas Taylor Barnum, who leased the neighboring Swaim’s Museum specifically to compete with the Peale Family enterprise, the Philadelphia Museum stumbled financially in 1845 and just avoided a

sheriff’s auction in 1848. Among the many items in the sheriff’s sale catalogue for that year is a “Case of 28 bats, rats and mice” (in Sellers 1980b:315), which may have included the types of *S. brevicaudus* and *S. parvus*, if they still existed. The Philadelphia Museum finally shut down permanently in the summer of 1849, and the remaining collections were auctioned off in 1850 (Faxon 1915, Sellers 1980b). Barnum purchased the bulk of the collection for \$5000 or \$6000 on behalf of himself and his associate Moses Kimball, who ran the Boston Museum. In addition, part of the Philadelphia Museum collection was obtained either from the museum or from Barnum by Montroville Wilson Dickeson for his City Museum Theatre in Philadelphia. In 1868, the City Museum Theatre burned, although some of its collection apparently was rescued and sold the following year. Barnum’s purchase was divided among Kimball’s Boston Museum, Swain’s Museum, and Barnum’s American Museum in New York City. Barnum sold his

holdings in Swaim's Museum in 1851, and on December 30th of that year, a fire destroyed the building and most of the collection (Sellers 1980b). On 13 July 1865, Barnum's American Museum and most of the collection burned (*New York Times* 1865, Sellers 1980a, b). Barnum established a new museum in New York City, but in 1868 that building also burned along with most of the collection (*New York Times* 1868). The portion of the Peale Collection in Boston, including a large number of holotypes of birds described by Alexander Wilson, fared somewhat better. Kimball's interest in natural history eventually declined in favor of more purely entertaining pursuits, and, in 1893, a large part of his collection was transferred to the Boston Society of Natural History (BSNH). He died in 1895, and in 1899, the upper story of the Boston Museum was damaged by fire (Faxon 1915, Sellers 1980b). The remaining natural history specimens went to the BSNH and the archeological and ethnological collection to the Peabody Museum of Archeology and Ethnology (Sellers 1980b). Additional destruction and damage attended the collection in the possession of the BSNH, and the remaining specimens, including a number of Wilson's types, were obtained for the Museum of Comparative Zoology (MCZ), Cambridge, in 1914 (Faxon 1915, Sellers 1980b). Other known surviving natural history specimens from the Philadelphia Museum include four bird eggs collected by Alexander Wilson that were obtained from Kimball by Thomas M. Brewer in 1850 and transferred to MCZ in 1880; a bird holotype at the American Museum of Natural History, New York (previously at Vassar College, New York; Faxon 1915); and holotypes of two birds and possibly a fluid-preserved snake in the collection of the Academy of Natural Sciences of Philadelphia. Of specimens from Long's Expedition, as many as five specimens of three

species of birds may now reside at MCZ (Faxon 1915, Poesch 1961, Spamer et al. 2000, Prince 2003). No other vertebrate specimens from Long's Expedition, however, are known to survive.

“Typical Specimens”

When Thomas Say named *Sorex brevicaudus* and *Sorex parvus*, he based his descriptions on specimens that he and Titian Peale collected on Long's Expedition and that were subsequently deposited and displayed in Peale's Philadelphia Museum. In the first half of the nineteenth century, natural historians were still under the influence of the Aristotelian type-concept of the static (rather than variable) biological species (Mayr 1969). Because species generally were considered immutable, type specimens (i.e., holotypes, co-types, and paratypes; Thomas 1893) bore less significance than they do today. It was recognized at the time that a specimen or series of specimens was necessary for recognizing, differentiating, and describing a new species, and authors typically would mention a particular specimen or series (e.g., Merriam 1886) they had inspected (e.g., Say in James 1822) and even sometimes note specifically the collection in which it was to be found (e.g., Harlan 1831). Afterwards, however, these specimens generally were not treated any differently than other specimens. They often lacked labels and were readily placed on public display (Godman 1826–1828, Slack 1862). At that time the concept of the “type specimen” or holotype as the single name-bearing specimen for a nominal species was still in its early formative stage. Although some scientists recognized relatively early on the inherent value of holotypes and the need to preserve them (Agassiz 1853, Baird 1860), the taxonomic definitions of the various classes of specimens considered to be “type specimens” or “typical speci-

mens” was not yet fixed, and the terms were oftentimes applied broadly, sometimes to include specimens never seen by the author of a particular species. The first attempts to formalize the concept of the type specimen were not made until the latter part of the century (Thomas 1893, Schuchert 1897).

The holotypes of *Blarina brevicauda* and *Cryptotis parvus* have long been lost, but illustrations of the types survive (Figs. 1, 2, 4). These depictions provide valuable insight into the perceptions of these species by the naturalists who first observed them, and they preserve important external characters that are useful for confirming the identities of these two species. The illustrations of *B. brevicauda* or *C. parvus* do not, however, replace the holotypes, nor can illustrations be designated as name-bearing types (ICZN 1999: Art. 74.4). As currently understood, *B. brevicauda* and *C. parvus* are widespread and morphologically well-defined species. Neotypes (i.e., replacement type specimens) have never been designated for the two species, nor has such action been warranted, because type specimens have not been deemed necessary to objectively define either of these taxa (ICZN 1999: Art. 75.1–3). In the absence of the original specimens, the taxonomic importance of the illustrations is that they provide an informative record of the morphological characteristics of the holotypes, and thereby, the species as they were perceived by the naturalists who originally collected, preserved, and described them. Perhaps more important, they confirm that the animals to which these names are applied today are the same as those to which they were originally applied.

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