

Historical Contributions

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T. A. Conrad's Calfpasture River Mussels (Bivalvia: Unionoida: Unionidae)

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ABSTRACT

The circumstances leading to T. A. Conrad's visit to Virginia in 1845, which resulted in historically important freshwater mussel collections, are reviewed in the context of the occupation of his host, Constant Newkirk, in iron smelting activities near Goshen, Virginia.

Key words: T. A. Conrad, Virginia, Calfpasture River, Rockbridge County, mollusks.

Along with his contemporaries C. S. Rafinesque, Thomas Say, and Isaac Lea, Timothy A. Conrad (Fig. 1) described a substantial number of the freshwater mollusks known to occur in eastern North America, and is the only one of that coterie known to have collected them in Virginia.

Conrad (1803-1877) was born in New Jersey and spent most of his life in Philadelphia, where he was actively associated with the Academy of Natural Sciences. Although he was very literate and a competent poet, his retiring, almost reclusive personality did not inspire much biographical information in the writings of his colleagues.

During the summer of 1845, Conrad was the guest of his friend Constant W. Newkirk, proprietor of an iron furnace near Goshen, on the headwaters of the Maury River in Rockbridge County, Virginia. While there, Conrad "... paid some attention to the Naiades and univalves of the vicinity" and in the following year (1846) published a short account of his discoveries as well as his impressions of that region. Since the stream investigated by Conrad was later apparently sterilized by chemical contamination, his observations provide a glimpse of the original freshwater mussel (unionid) diversity of the upper Maury River, now lost beyond hope of recovery. His short paper is printed below in its entirety to provide both the factual information and the opportunity to enjoy Conrad's picturesque writing style.

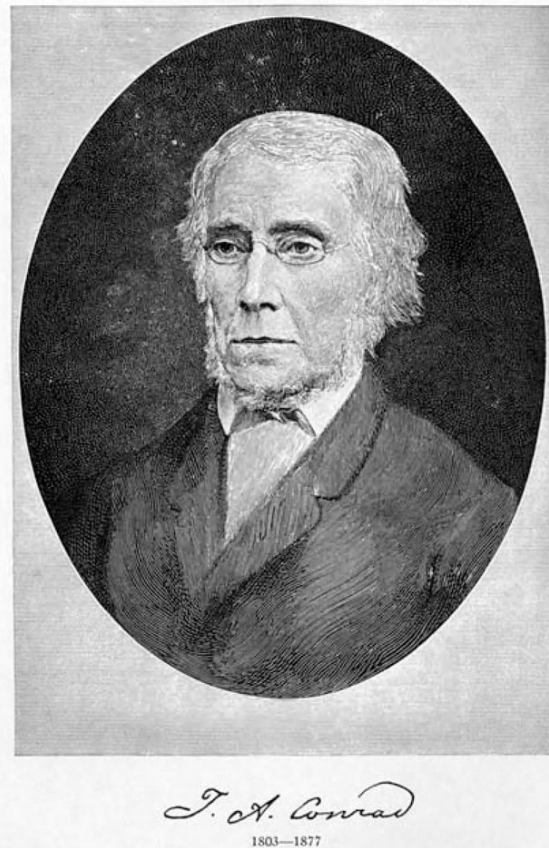


Fig. 1. Portrait of T. A. Conrad (from Wheeler, 1935).

Those familiar with the old literature on unionids may recall an earlier cameo appearance of Constant Newkirk, mentioned by Conrad (1836) as collector of the types of *Unio subplana* in the North River at Lexington, Virginia. Newkirk came from a Philadelphia (ex New Jersey) family, and presumably had met Conrad in that city prior to 1835 when he was a student at the then-Washington Academy, and was inspired to procure local bivalve specimens for him¹. He was the nephew of Eliza Newkirk Weaver, the wife of William Weaver, a well-known owner and operator of several iron furnaces in Rockbridge County. One of these was located on Buffalo Creek, and its name persists on many modern maps as Buffalo Forge, just north of Buena Vista. Others were founded on the upper North River (there called Calfpasture), in the intermontane valley where the main stream is confluent with the Little Calfpasture. One of these, called Bath Iron Works, was under Newkirk's management from 1843 until 1847, when he gave up that (perhaps onerous) responsibility and returned to Philadelphia. So Conrad's visit in 1845 was propitious: without his discoveries there the Calfpasture would surely not have come to the attention of Conrad's distinguished successor and *facile princeps* of American unionid studies, Arnold E. Ortmann.

Some six decades after Conrad's exploration, in 1912, Ortmann collected in the Calfpasture at Conrad's locality and farther downstream in the North River near its confluence with the James². Without specifying in which part of the river he found which species, Ortmann (1913) reported eight species of unionids, two of which (*Strophitus undulatus* and *Lasmigona subviridis*) were not mentioned by Conrad, but he failed to recover two others (*Alasmidonta varicosa* and *Pyganodon cataracta*) listed by Conrad. Conceding these exceptions as likely residents of the Calfpasture, Ortmann thus accounted ten unionids

¹A compilation of the alumni and faculty during the 1800s filed in the Special Documents section of the Leyburn Library at Washington & Lee University registers a "Constance W. Newkirk" as a student in 1835-1836. Despite the slight difference in spelling, the singularity of the name itself is assurance of the identity of the individual.

²The nomenclature of this stream is a little ambiguous. The main stem was called the North River as far as the west portal of Goshen Pass where, at its confluence with the Little Calfpasture, the name changed arbitrarily to Calfpasture, thence to its source near Deerfield, some 30 miles to the north in Augusta County. In an attempt to humanize this already well-named stream, its name was changed from North to Maury to commemorate the oceanographer Mathew Fontaine Maury (who was said to be so fond of Goshen Pass that he requested to be driven through it, postmortem, on the way to his interment).

as native to the river, a substantial number for an upland stream in the Atlantic drainage. According to the map provided in Weaver's biography (Dew, 1994), Bath Iron Works was situated near the confluence of Guys Run, at the present Route 601 bridge. Whether Ortmann was able to localize his efforts that precisely is unknown.

Another eminent malacologist was drawn to Conrad's site. Joseph P. E. Morrison was in the river on 24 July 1937, 25 years after Ortmann's visit, and obtained specimens of *Villosa constricta* [USNM]. His label specifies "upper end of Goshen Pass" which would be about two miles downstream from the Bath Iron Works site.

On 10 July 1988, I waded the Calfpasture at a point just below the Brattons Run confluence, some two miles upstream of the Bath site. In over an hour of visual and tactile search, I could not find a single unionid, even a dead valve. Although personal surveys conducted subsequently in the river at Goshen have been consistently negative, Michael and Elizabeth Lipford found three male and one female living specimens of *Villosa constricta* (VMNH 289) further upstream: near the intersection of Routes 600 and 614, on 14 September 1989 (ca. 4 miles north of Goshen, in Rockbridge County).

Desiring a more recent impression, I returned to the Calfpasture on 13 October 2008, and waded for about an hour in a reach of the river somewhat closer to the iron works site. My findings were curiously contradictory: the stream bed looked clean and healthy, with numerous colonies of an *Elodea* (?*canadensis*) and a *Potamogeton* (?*nodosus*). Many small fish (apparently *Rhinichthys atratulus*) were seen, as well as a large gravel mound piled up earlier in the season by spawning cyprinids. Mollusks were represented by astronomical numbers of a pleurocerid snail (*Mudalia* sp.), all of which were either immature or depauperate — less than 8 mm in height. With respect to bivalves, however, this search was essentially a rerun of 1988: no trace of unionids could be found. A new element however was detected: several small, separated, worn valves of the exotic Asian clam (*Corbicula fluminea*), none more than about 10 mm long, perhaps remnants of a much earlier, unsuccessful, invasion.

A factor present in both 1988 and 2008 is a wood processing plant located at the intersection of State Route 39 with Route 780, two miles west of Goshen. The primary product appears to be railroad cross-ties, which requires infusion of the wood with creosote, an infamous agent of mass destruction. Although the diversity of aquatic organisms immediately downstream, in both years, did not reflect any recent contamination, in a less regulated earlier time, creosote leakages could easily have sterilized the Calfpasture/Maury River all the way to its

confluence with the James. Recolonization from feeder stream populations rarely reconstitutes the original mussel fauna in such situations.

Files of the Goshen Public Library contain extensive historical materials relating to the former iron industry of that region. Several sources placed the Bath Iron Works on the Calfpasture about half a mile upstream of its confluence with the Little Calfpasture. One old map even indicated the exact location as being a few hundred yards west of the present State Route 39 bridge over Guys Run. I walked over the site and found no trace of any former activity. The Bath Iron Works site was abandoned and demolished in 1850, and more recently, during improvement of State Route 39 by the Virginia Department of Transportation, even the foundations were broken up and utilized in the new construction.

Although there appear to be no extant populations of unionids in the entire length of the river downstream of Goshen, a thriving, albeit very localized, community consisting of several unionid species has been found near the headwaters of Mill Creek (D. H. Stansbery and W. J. Clench, unpub. data; specimens collected 2 October 1970 are deposited in the Ohio State University collection; recent observations at same site by M. A. McGregor and B. T. Watson, pers. comm.), a major tributary confluent with the Calfpasture at Goshen, so further exploration and protection of the region is certainly desirable.

While the location of Newkirk's residence, vis-à-vis the furnace, is unknown (and could even be as distant as Goshen itself), it seems probable that a view upstream from the Route 601 bridge would show one of the very reaches of the Calfpasture investigated by Conrad. He also mentioned collecting at millponds, of which there are none presently extant in that vicinity, although tautologically one obviously must have existed on Mill Creek itself, and perhaps others were on the Little Calfpasture.

Ortmann's mussel collections are in the Carnegie Museum, and perhaps Conrad's specimens may exist in the Academy of Natural Sciences of Philadelphia, although I did not find any during a visit there in 1989.

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