


THE JOURNAL OF SPELEAN HISTORY



MYSTIC CAVERNS

St. Paul's Underground Wonderland

See the Beautiful Silver-Cave and the Rainbow Shower of 2,000 Mirrors. DINE, DRINK and DANCE to the rhythmic tunes of JACK FOSTER'S TEN CAVEMEN. CONNIE RALLIS will meet you with a Smile. No Cover Charge at Anytime—No Minimum Week Days or Sunday (Saturday Minimum \$1.50 per person). Moderate prices. PHONE RIVERVIEW 1200 FOR RESERVATIONS OR PARTICULARS. X Marks the Spot.

Directions: Cross the Wabasha Street Bridge at the new St. Paul Courthouse. Travel two blocks—turn to the right—travel up the river road under the High Bridge to the huge Neon Skull and Crossbones. Watch for our signs.

The Journal of Spelean History

Official Publication
American Spelean History Association
History Section
National Speleological Society

Volume 41, No. 1, Issue 131

January-June 2007

The Association

The American Spelean History Association (ASHA) is an Internal Organization of the National Speleological Society and exists for the study, dissemination, and interpretation of spelean history, and related purposes. All persons who are interested in these goals are cordially invited to become members. Dues are \$2 per issue of the *Journal of Spelean History*. Dues can be paid for up to 20 issues (\$40). Checks should be made payable to "ASHA" and mailed to the treasurer.

The Journal

The Journal of Spelean History (JSH) is the Association's publication and is mailed to all members. JSH includes articles covering a wide variety of topics relating to man's use of caves, including historical cave explorations, saltpeter and other mineral extraction, and show cave development. All members are strongly encouraged to contribute material and to comment on published material. ASHA assumes no responsibility for statements made by contributors.

Authors are strongly encouraged to submit electronic copies in Microsoft Word, with minimal formatting, by email. Images should be saved as jpg. Photos and illustrations will be returned upon request. ASHA cannot publish copyrighted material without permission. Contributors are themselves responsible

for determining whether material is copyrighted and securing the appropriate permissions.

Back Issues

JSH began publication in 1968 and copies of all back issues are available, although many early issues are reprints. The cost (postage included) is \$2.50 per copy for a single copy, \$2 per copy for 2-3 copies, \$1.50 per copy for 4-7 copies, or \$1 per copy for 8 or more copies. Order back issues from the Treasurer.

A complete index to JSH is available at the ASHA website, www.cavehistory.org.

Officers

President: Dean Snyder, 3213 Fairland Drive, Schnecksville, PA 18078

Vice-President: Carolyn E. Cronk, 1595 Blueberry Hills Road, Monument, CO 80132

Secretary-Treasurer: Bob Hoke, 6304 Kaybro Street, Laurel, MD 20707
bob@hoke.net

Editor: Greg Brick, 1001 Front Avenue, Saint Paul, Minnesota, 55103
Aplustre@msn.com

Trustees: Larry E. Matthews, Marion O. Smith, Gary K. Soule, Jack Speece

CONTENTS

Notes on a Revolutionary War Era Niter Cave in Maryland	<i>Donald B. Ball</i>	4
Nahum Ward's 1816 Account of Mammoth Cave	<i>Paul T. Riggs</i>	6
Annotated Bibliography of Nahum Ward's Publications about Mammoth Cave	<i>Paul T. Riggs</i>	14
The Discovery of the First Cuban Blind Cave Fish: The Untold Story	<i>Aldemaro Romero</i>	16
“Charon Trimmed His Lamp”: Carver's Cave and the Definition of a Show Cave	<i>Greg A. Brick</i>	23
Dancing in the Cool of a Cave: Historic Social Use of the American Underground	<i>Joseph C. Douglas</i>	27
Cave Clippings.....		35
Reprint Section.....		36
Book Review.....		37

Front Cover: Mystic Caverns advertisement from the *St. Paul Daily News*, April 14, 1933.
See Joe Douglas's article on dancing caves in this issue.

Notes on a Revolutionary War Era Niter Cave in Maryland

Donald B. Ball
312 Iowa Avenue
Louisville, KY 40208

Among the underappreciated resources available on the Internet is the *Archives of Maryland* website accessible at <http://www.mdarchives.state.md.us/megafile/msa/speccol/sc2900/sc2908/html/index.html>. To date, this site has made readily available over 471,000 historical documents relating to one of the thirteen colonies which initially formed the United States. The numerous volumes of the *Archives of Maryland*, an ongoing series inaugurated in 1883 chronicling the state's legislative history, constitute a significant portion of these online materials. Many of these volumes are dedicated to preserving the correspondence of those individuals within the state which were coordinating their activities with representatives from the other colonies during the War for Independence. Thankfully, it may be noted that this important and extensive site is word searchable. In the process of examining this site for information relating to niter production and gunpowder manufacturing activities during this era of American history, but a single reference was encountered concerning niter mining in a cave within the state.

As recorded by Browne (1893:314-315), this piece of correspondence (retaining original spelling and punctuation) dated October 1, 1776, observes:

[pg. 314] [Wiesenthal to Tilghman.]

Sir, I was by the former Convention ordered to examine the salt petre earth on the South branch of Potowmack of which I produced a sample. The Convention having adjourned before my return I now take the liberty to make a report thereof. The place is on Patterson's Creek about 12 or 14 [pg. 315] miles from the South Branch near Colonel Hights: it is a perpendicular rock, in the middle of which is a Cavern and which was formd from the stones composing the rock decaying and tumbling down carrying along with them a good quantity of

rich mould, which contains the Saltpetre, and as the Cavern is so deep that no rain can come in, the Saltpetre is not washed off. If stones are broke off or lifted up, there is sometimes a good quantity of real Saltpetre in its white colour found, which can be scrap'd off out of the Interstices where it collects. As for its formation there is a similarity with old cellars which are known to contain often according to their age great quantities, with this difference only, that the collection of nitre in these Caverns may be from thousands of years which accounts for their richness. From the situation and causes I had reason to suppose that the mountains must contain a great many such Caverns and accordingly informed the inhabitants with my notion, who have since searched and discovered about 3 miles further another such Cavern equally rich, and as I have received a sample of Saltpetre from the Ohio which was found and scraped off from interstices of stones in a cavern, which I hereby send for the inspection of Convention, it is evident that our mountains contain every where such caverns full of Saltpetre as to furnish the Colonies with that desirable article to the fullest extent at reasonable rates. I attempted a Trial to make some Saltpetre out of the mould, and took 2 bushels thereof from which I extracted between 2 and 3 pounds, but am sure that it would have produced considerable more, if I had the necessary utensils on the spot, a sample of the nitre I have brought to the Council of Safety. This Saltpetre was exceeding strong and in very large Cristales.

The people on the spot now make Saltpetre and make use of it partly in gunpowder, and partly for salting meat, that being a scarce article there, and no doubt squander away great quantities, not being sufficiently skilld to make it to advantage. I have the honor to be Sir Your most obed^t & Hble Serv^t

Baltimore Town Octob 1st 1776. C. F. Wiesenthal.

The author of this letter appears to be Dr. Charles Frederick Wiesenthal (1726-1789), a Prussian born and trained physician who came to reside in Baltimore in 1755, was naturalized in 1771 (Semmes, ed. 1946:281-282), and served as a military surgeon to the colonial forces (cf. Crodell 1900). To his

credit, he has been called the “Father of the Medical Profession in Baltimore.” James Tilghman [Jr.] (1748-1796), the likely recipient, was a member of the Maryland legislature and would later be one of the Maryland delegates who ratified the state’s acceptance of the United States constitution on April 28, 1788.

Although the *Archives of Maryland* series contains a number of other period references to the expedient method of producing niter from the soil beneath barns, outbuildings, etc., no further discussion appeared referable to obtaining this invaluable resource from caves within the state. It has not yet been ascertained if the cave discussed by Wiesenthal is further identified in Davies (1950). A preliminary search for Patterson Creek on the Geographic Names Information System (GNIS) website maintained by the U.S. Geological Survey (accessible at: <<http://www.asu.edu/lib/hayden/govdocs/maps/geogname.htm#us>>) revealed no stream currently known by this name within the state of Maryland although it may be presumed that the location of the cave

described by Wiesenthal is in the western portion of the state.

In the process of reviewing a rather sizable mass of literature regarding niter production from the colonial era through the end of the nineteenth century (cf. Ball and O’Dell 2001), but one other reference to Revolutionary War era niter mining was encountered. Hauer (1971) discusses likely niter mining efforts during this formative era of the nation’s history at Saltpeter Cave in Bedford County, Pennsylvania, and emphasizes that this appears to have been the only known instance of obtaining saltpeter from a cave within that state at that time. Hauer (ibid.:72) also observes that two caves were mined for niter in Maryland, these being John Friends Cave in Garrett County and Busheys Cave in Washington County, though he does not specifically elaborate on them having been mined during the Revolutionary War. While it is likely—and, indeed, probable—that other instances of this cave-related activity existed during the Revolutionary War, it is reasonable to observe that they were certainly far and few between.

LITERATURE CITED

- Ball, Donald B. and Gary A. O’Dell, 2001. Bibliography of Niter Mining and Gunpowder Manufacture. *Ohio Valley Historical Archaeology* 16:1-128 (OVHA Monograph No. 1).
- Browne, William Hand (editor), 1893. *Journal and Correspondence of the Maryland Council of Safety, July 7-December 31, 1776*. Archives of Maryland series Vol. 12. Maryland Historical Society, Baltimore.
- Crodell, Eugene Fauntleroy, 1900. *Charles Frederick Wiesenthal: Medicinæ Practicus, the Father of the Medical Profession of Baltimore*. The Johns Hopkins Press, Baltimore.
- Davies, William E, 1950. *The Caves of Maryland*. Maryland Department of Geology, Mines, and Mineral Resources Bulletin 7, Baltimore (revised in 1952, reprinted in 1961).
- Hauer, Peter M., 1971. Pennsylvania’s Only Saltpeter Cave: A Background Study. *The Journal of Spelean History* 4(4):70-74.
- Semmes, Raphael (editor), 1946. *Proceedings and Acts of the General Assembly of Maryland, 1771 to June-July, 1773*. Archives of Maryland series Vol. 63. Maryland Historical Society, Baltimore.

Nahum Ward's 1816 Account of Mammoth Cave

Dr. Paul T. Riggs
Department of History
Valdosta State University
Valdosta, GA 31698

Nahum Ward's 1816 account is well-known to historians of Mammoth Cave. It was published widely in the 19th century and has been cited frequently in publications about the history and archeology of the cave and its mummies. Given the importance of Ward's account and the fact that it has not appeared in print since 1873, it is made available here to those interested in Mammoth Cave and its history.

Nahum Ward (1785-1860) grew up in a prominent family in Shrewsbury, Massachusetts.¹ Ward's grandfather (Artemas Ward) was a general in the American Revolution who also served in the Continental Congress, Massachusetts legislature, and U.S. House of Representatives. Nahum attended school before starting his commercial education as a store clerk. In 1807, his father financed the establishment of his own store, which he operated for about two years. In July 1809, at the age of 23, he first traveled to Marietta, Ohio, which had been established by New Englanders in 1788 and where he would eventually marry (1817) and settle permanently. Returning after this initial exploration of Ohio, Ward lived in Worcester and began buying shares of the Ohio Company, accumulating several thousand acres from Massachusetts investors. In 1811, he returned to Marietta and expanded his holdings to 37,000 acres. As his biographer notes, a total of over 100,000 acres probably passed through his hands, and Ward "was more largely identified with the landed interests of southeastern Ohio than any other one man." Indeed, his career appears to have been successful since the 1850 census lists the value of his real estate at \$198,400, a considerable sum at the time.² Careful analysis by Lee Soltow of 1810 tax records has revealed the overall pattern land-holding in Ohio: "At the top of the land scale stood about a dozen great landowners who monopolized many thousands of acres." Although Ward was not yet on the scene in 1810, his 37,000 acres from a few years later would have ranked him third among the 15,750 Ohio landowners surveyed.³ Soltow also examined changes in land-holding between 1810 and 1825, concluding that the earlier pattern of inequality persisted to 1825.⁴ Men like Ward, in other words, remained at the top of Ohio's economy. It is not surprising to find that Ward Township in Hocking County was named for him or that he was elected mayor of Marietta in 1845.⁵

Ward's letters are full of complaints about the difficulty of selling the land he had accumulated.⁶ In

1815, Ward went to Massachusetts and advertised "20,000 Acres in Ohio," which he offered in parcels ranging from 100 to 4,000 acres for sale or trade for "Farms in this part of the country."⁷ In 1822, Ward went to greater lengths to find buyers: all the way to Glasgow, Scotland, where he and several Scottish investors formed the Glasgow Ohio Company to encourage migration through offers of subsidized transportation and land on credit.⁸ Ward arrived in November 1822, basing his operations in Glasgow but also recruiting in Perth, Dundee, and Edinburgh. He published a pamphlet in Scotland that described Ohio's potential for agriculture and trade: "All classes of society who are virtuous and well disposed, and capable of doing something for themselves, cannot fail to do well in Ohio, and as the country is filling up rapidly, every class of labourers are in great demand." He emphasized the democratic form of government, freedom from tithes, and opportunities for education. He added that slavery was not allowed in Ohio, providing "a strong stimulous to virtuous men, both in the Atlantic States and among foreigners, about emigrating, to locate themselves within her borders."⁹ He also printed one-page advertisements (or "broadsides") for distribution in Scotland; several examples survive in the holdings of the National Library of Scotland¹⁰ and Marietta College.¹¹

Ward spent several months in Scotland, returning in 1823 with four Scottish investors, who reported that the land was better than advertised and began clearing land on the river-front site. A group of about 175 emigrants arrived in Marietta from Scotland during the summer of 1823. Unfortunately, they arrived during an epidemic in the region, and many died in temporary lodgings provided by Ward. In the end, the town of Stirling (or Sterling) that Ward had surveyed into lots and streets, was never built and was eventually partially overlaid by the town of Portland (Meigs County). The opening of the Erie Canal along with canals linking Cincinnati with the Great Lakes created "a significant shift of axis in trade" and "towns with high hopes sank into a gentle obscurity."¹² Ward did not give up on emigration schemes. In 1834, he laid out another village, which he named "Bonn" and designed to attract German silk-workers. Like Stirling, the village was a commercial failure, although German immigration eventually made an impact on the region, and the village of Bonn, Ohio survives today with the name given to it by Nahum Ward.¹³

During his trip to Scotland in 1822-23, Ward also traveled to France, where he visited the Marquis de Lafayette, the French hero of the American Revolution. The nature of Ward's connection with Lafayette is unknown. Perhaps there was a connection through Ward's grandfather Artemas, who probably knew Lafayette during the Revolution. Ward's daughter later claimed that Lafayette presented Ward with a cane during this visit.¹⁴ When Lafayette made his public tour of the United States in 1824-25, he ascended the Ohio River as far as Wheeling. On May 23, 1825, Lafayette's party stopped in Marietta and was entertained at Ward's home. Ward's biographer probably is incorrect in asserting that Lafayette's tour "was largely the result of Mr. Ward's solicitation and his representations of the deep interest that the people of the United States felt in him."¹⁵ Lafayette had been invited, after all, by President Monroe and Congress and visited a number of important friends, including John Adams and Thomas Jefferson. Still, Ward was the local connection in Marietta and probably explains Lafayette's stop there, where he was conducted to Ward's home to receive visitors for an hour or two before returning to the wharf and continuing his journey up the Ohio.

Ward was an enthusiastic member of the local Unitarian congregation, donating \$25,000 for the building of a Unitarian church in Marietta in 1855, and was known for distributing religious tracts. In 1815, Ward joined the board of trustees of the Muskingum Academy, the forerunner of Marietta College. Although he later left the board, he remained a benefactor of the college, contributing to a building project in 1845.¹⁶ Ward died in Marietta on April 4, 1860 at the age of 74. Because he died before June 1, he does not appear in the body of the 1860 census itself but in the mortality schedule, where his occupation was listed as "Land Agent" and cause of death "Paralysis" or stroke.¹⁷ He married twice. His first wife (Catherine Skinner, m. 1817) died in 1844 after bearing and raising five daughters and two sons born between 1819 and 1830. In 1848, Ward remarried at the age of 63 but had no further children.

Having examined Ward's life and career, we now return to 1815 and his visit to Mammoth Cave. The precise date of his visit remains unknown, although Angelo George's research in Ward's correspondence has narrowed it down to the month of November 1815.¹⁸ There is also some question about when and where the account was first published.¹⁹ In his *Bibliography of Mammoth Cave*, Willard Rouse Jillson – a noted Kentucky geologist and bibliographer – states that the account first appeared on April 4, 1816, in the *Western Citizen*, a weekly paper published in Paris, Kentucky: "This is the first printing of this celebrated article." That Jillson worked from actual sources, as opposed to citations, is suggested by annotations about other versions of Ward's account: "Reported reprinted

in Boston in September [1816], but not seen."²⁰ On the other hand, Jillson appears to have been mistaken about the date of the article because the *Western Citizen* was a weekly, always appearing on Wednesday. Unfortunately, many of the editions of the paper from this period have not survived, making it hazardous to say anything conclusive. We do know, however, that the edition for Wednesday, April 3 still exists (but without Ward's account), making Jillson's April 4 date unlikely. We also know that the *Western Citizen* eventually printed the account on September 25, 1816. Consequently, it seems clear that the first publication was in Ward's hometown newspaper, the *Massachusetts Spy*, where it appeared in three installments on May 8, May 15, and May 29, 1816. This conclusion is strengthened by the fact that Ward had returned to Massachusetts with the mummy from Mammoth Cave around the time of publication.

The first British publication, in the April 1816 issue of the *Monthly Magazine*, is also puzzling. How could this London journal publish the account a month before the *Massachusetts Spy*? The editor of the *Monthly Magazine* must have fallen behind schedule, and the issue nominally dated "April" must have actually appeared weeks or months later, especially in view of the length of the journey. In addition, it is clear enough that the *Monthly Magazine* cited the "Worc. Spy" as its source. The account appeared again in December 1816 in the *Scots Magazine*, published in Edinburgh. Finally, the account was printed and sold as a single-sheet broadside on at least two occasions in 1817, including in Liverpool, England. Other periodical and broadside versions from this period are possible, especially considering Harold Meloy's statement that the account appeared in Baltimore, Pittsburgh, and Boston – and in Britain in 1823.²¹ And Angelo George cites two more printings of the account in Kentucky in August and September 1816.²²

The next phase in the publishing life of the account took place in 1818 and 1819. In 1818, an English translation of a French text, entitled *The Interesting History of Atala, the Beautiful Indian of the Mississippi*, appeared in New York. From comments in the preface that imply a British translator, we know that Ward was not the translator, but his account of Mammoth is included as an appendix. Since the Atala story was a tragedy about the death and burial of an Indian woman, the Ward text was included because of some interesting and suggestive similarities. Ward's account also appeared in 1818 in the *Methodist Magazine* published in London under the title "The Works of God Displayed." The New York version of the *Methodist Magazine* carried Ward's piece under a similar title in 1819. Although the British versions were edited to conform to British spelling and punctuation conventions, the accounts published from 1816 to 1819 vary little, and their faithfulness to the original version

is noteworthy given the technology of the time and the distance separating the locations of its publication.

Ward's account is remarkable on many levels. Modern cavers, of course, will note that he violated sound caving practices by looting the cave of artifacts and geologic samples, deliberately disturbing bats, and marking the cave with arrows. Some cavers will also recognize his nervous sleeplessness the night before the trip, his exhaustion near the end of his trip, and his experience of regaining the surface after nineteen hours underground. In addition, his account contains details of the saltpeter workings and of the New Madrid earthquake of 1812 which have been of interest to historians.²³

Ward's role in the archeology of Mammoth Cave was assured when he removed the desiccated remains of a Native American female from the cave. Because there have been a number of desiccated cave burials discovered in the region, it is perhaps useful to point out that this particular specimen eventually came to be known as Fawn Hoof. The details of Fawn Hoof's discovery and subsequent career as a traveling exhibit have been examined carefully by Angelo George, whose version of events is followed here.²⁴

Contrary to Ward's statement in the account that the burial had been discovered in Mammoth, Fawn Hoof was found in Short Cave in 1811 and was directed to be moved to Mammoth by the owner Charles Wilkins, who was interested in preserving the mummy. As the account states, one of Ward's guides removed the mummy from the cave at the end of Ward's trip, but it is now apparent that the mummy was then redeposited in the cave before being sent to Wilkins in Lexington. Wilkins exhibited the mummy there, where it was damaged, before sending it to Ward in Marietta with the understanding that Ward (who frequently traveled east) would find a suitable museum. In 1816, Ward traveled to Massachusetts with the mummy and entered into negotiations with the American Antiquarian Society in Worcester. In the meantime, Ward exhibited the mummy in several towns, including Worcester, where an advertisement announced its arrival in September 1816: "It is presumed that she, together with the articles found with her, is one of the greatest curiosities ever exhibited to the American world." Admittance was 25 cents.²⁵ Facing criticism from Wilkins and others for the exhibitions, Ward later defended his actions, arguing that the exhibitions were intended to defray transportation costs and that he also gave exhibition proceeds to charity. A good example of this criticism can be found in the *Massachusetts Spy*. As the mummy was on its tour, the paper printed an anonymous poem, "Peter addresseth the Mummy" – a portion of which is quoted here:

Within thy cavern demurely sitting,

Surrounded by thy musick-books and knitting,
'Twas rather ungenteel, I fear thou'lt think it,
For gentlemen uncourteous to intrude
Upon thy peaceful solitude,
Stealing away each pretty little trinket.

'Twas rather ungenteel, I must allow;
Yet, madam Mummy, it was *such* a sight!
No wonder if ye both had got a fright –
'Twould make poor Peter bellow out, I vow.

Poor thing! much, much I wonder at thy fate,
And watch with care th' events which still await
Thy early resurrection from the grave!
They say thou art coming hither, ducky,
To leave thy native clime, Kentucky,
And see no more thy fam'd salt-petre cave.

'Tis true thou'lt meet with more *attentions* here,
For beaux will flock wherever you appear:
And though *incog*, that is, without a name,
You travel, I will warrant thee a world of fame.²⁶

After much misunderstanding between Ward and Wilkins, the mummy eventually found its way to the American Antiquarian Society in Worcester in 1817. The Smithsonian acquired the mummy in 1876, where it remains today, although not in its original state since it was defleshed in 1914.²⁷ Although it is still possible to submit samples from the mummy for radiocarbon dating, no date has ever been determined.

What is the historical significance of Ward's account? Jillson, as we have seen, called it a "celebrated article," and later scholars have credited Ward with making Mammoth Cave famous.²⁸ These assertions seem plausible. But it should be remembered that the account was published in truly ephemeral media – newspapers, magazines, and broadsides – and the magnitude of the account's impact should really be seen as an open question. What do we really know about how the account was read and received in 1816 and beyond? How much influence did it exert on tourists and later writers? The timeline is roughly suggestive: the cave became famous in the decades after Ward's account. But there were other writers on the scene by then, and improved transportation was probably the most crucial factor in the growing popularity of the cave around mid-century. Still, Ward had a fascinating career, many details of which could not be included here. And his interesting account, which flashed into print for a few years before almost disappearing, is now available for modern readers.

The text of the account is taken from the May 1816 *Massachusetts Spy* version, which is the earliest confirmed. Editorial notes are included as required. Distances in rods have been converted to feet (a rod measures 16.5 feet) and inserted in brackets.

“Mammoth Cave. Description of the Great Cave in Warren County, Kentucky. Extract of a letter from a gentleman resident in the Western Country to his friend in this County, giving an account of an excursion into Kentucky in the fall of last year – dated Marietta, (Ohio) April 4, 1816.”²⁹

The country for a considerable distance round the cave is not mountainous, yet broken and rolling.—It was seven in the evening when I reached the hospitable mansion of Mr. Miller (the overseer of Messrs. Wilkins and Gratz, in whose lands the cave opens) who met me at the gate, and, as he anticipated my object, bade me welcome to all his house afforded.³⁰

During the evening, Mr. Miller made arrangements for my visiting the cave next morning, by procuring me two guides, lamps, etc. I could hardly rest during the night, so much had my curiosity been excited by my host’s account of the “*regular confusion*” in this subterraneous world.

At eight in the morning, I left the house in company with my guides, taking with us two large lamps, a compass, and something for refreshment; and entered the cave about 60 rods [990 feet] from the house, down through a pit 40 feet deep, and 120 in circumference, at the bottom of which is a fine spring of water. When at the bottom of this pit, you are at the entrance of the cave, which opens to the north, and is from 40 to 50 feet high, and about 30 in width, for upwards of 40 rods [660 feet], when it is not more than 10 feet wide and 5 feet high. However, this continues but a short distance, when it expands to 30 or 40 feet in width, and is about 20 in height for about one mile, until you come to the *first hoppers*, where salt-petre is manufactured. Thence it is about 40 feet in width and 60 in height to the *second hoppers*, two miles from the entrance. The loose lime-stone has been laid up into handsome walls, on either side, almost the whole distance from the entrance to the *second hoppers*. The road is hard, and as smooth as a flag pavement. The walls of the cavern are perpendicular in every passage that I traversed; the arches are regular in every part, and have bid defiance even to earthquakes. One of my guides informed me, he was at the *second hoppers*, in 1812, with several workmen, when those heavy shocks came on which were so severely felt in this country.³¹ He said that about five minutes before the shock, a heavy rumbling noise was heard coming out of the cave like a mighty wind; that when that ceased, the rocks cracked, and all appeared to be going in a moment to final destruction. However, no one was injured, although large rocks fell in some parts of the cave.³²

As you advance into the cave, the avenue leads from the *second hoppers*, west, one mile; then S.W. to the “chief city,” which is six miles from the entrance. This avenue is from 60 to 100 feet in height, and about the same in width, the whole distance, after you leave the *second hoppers*, until you come to the cross roads, or

chief city, and is nearly upon a level; the floor or bottom being covered with loose lime-stone and salt-petre earth. When I reached this immense area, (chief city,) which contains upwards of *eight acres*, without a single pillar to support the arch, which is entire over the whole, I was struck dumb with astonishment.

I can give you but a faint idea of this *chief city*. Nothing under heaven can be more sublimely grand than this place, covered with one solid arch at least 100 feet high, and to all appearances entire.

After entering the *chief city*, I perceived five large avenues leading out of it, from 60 to 100 feet in width, and from 40 to 80 in height. The walls (all of stone) are arched, and are from 40 to 80 feet perpendicular height, before the arch commences.

The first which I traversed, after cutting arrows on the stones under our feet, pointing to the mouth of the cave, (in fact we did this at the entrance of every avenue, that we should not be at any loss for the way out on our return) was one that led us in a southerly direction for more than two miles. We then left it, and took another, that led us east, then north, for more than two miles further; and at last, in our windings, were brought out by another avenue into the *chief city* again, after traversing different avenues for more than five miles.

We rested ourselves for a few minutes on some lime-stone slabs near the centre of this gloomy area, and after having refreshed us and trimmed our lamps, we took our departure a second time, through an avenue almost north, and parallel with the avenue leading from the chief city to the mouth of the cave, which we continued for upwards of two miles, when we entered the *second city*. This is covered with one arch, nearly 200 feet high in the centre, and very similar to the *chief city*, except in the number of avenues leading from it—this having but two.

We passed through it over a very considerable rise in the centre, and descended through an avenue which bore to the east about 300 rods [4,950 feet], when we came upon a third area, about 200 feet square, and 50 in height, which had a pure and delightful stream of water issuing from the side of the wall about 30 feet high, and which fell upon some broken stone, and was afterwards entirely lost to our view. After passing this beautiful sheet of water a few yards, we came to the end of this passage.

We then returned about 100 yards, and entered a small avenue (over a considerable mass of stone) to our right, which carried us south, through an uncommonly black avenue, something more than a

mile, when we ascended a very steep hill about 60 yards, which carried us within the walls of the *fourth city*, which is not inferior to the *second*, having an arch that covers at least six acres. In this last avenue, the further end of which must be four miles from the *chief city*, and ten from the mouth of the cave, are upwards of twenty large piles of salt-petre earth on one side of the avenue, and broken lime-stone heaped up on the other, evidently the work of human hands.

I had expected from the course of my needle, that this avenue would have carried us round to the *chief city*; but was sadly disappointed when I found the end a few hundred yards from the *fourth city*, which caused us to retrace our steps; and, not having been so particular in marking the entrances of the different avenues as I ought, we were very much bewildered, and once completely lost for fifteen or twenty minutes.

At length we found our way, and, weary and faint, entered the *chief city* at 10 at night. However, as much fatigued as I was, I determined to explore the cave as long as my lights held out.³³

We now entered the fifth and last avenue from the *chief city*, which carried us southeast about 900 yards, when we entered the *fifth city*, whose arch covers upwards of four acres of level ground strewn with broken lime-stone. Fire beds of uncommon size, with brands of cane lying around them, are interspersed throughout this city.

We crossed over to the opposite side, and entered an avenue that carried us east about 250 rods [412.5 feet], when, finding nothing interesting in this passage, we turned back, and crossed a massy pile of stone in the mouth of a large avenue, which I noticed but a few yards from this last-mentioned city, as we came out of it. After some difficulty in passing over this mass of lime-stone, we entered a large avenue, whose walls were the most perfect of any that I saw, running almost due south for 500 rods [8,250 feet], and very level and straight, with an elegant arch.—When at the end of this avenue, and while I was sketching a plan of the cave, one of my guides, who had been some time groping among the broken stone, called out, requesting me to follow him.

I gathered up my papers and compass, and after giving my guide, who sat with me, orders to remain where he was until we returned, and, moreover to keep his lamp in good order, I followed after the first, who had entered a *vertical* passage just large enough to admit his body. We continued stepping from one stone to another, until at last, after much difficulty from the smallness of the passage, which is about 40 feet in height, we entered upon the side of a chamber, at least 1800 feet in circumference, and whose arch is about 150 feet high in the centre. After having marked arrows (pointing downwards) upon the slabstones around the little passage through which we had

ascended, we walked forward nearly to the center of this area.

It was past midnight when I entered this chamber of eternal darkness, “where all things are hush’d, and nature’s self lies dead.” I must acknowledge I felt a shivering horror at my situation, when I looked back upon the different avenues through which I had passed since I entered the cave at eight in the morning; and at that “time o’ night, when church-yards groan,” to be buried several miles in the dark recesses of this awful cavern—the grave, perhaps, of thousands of human beings—gave me no very pleasant sensations. With the guide who was now with me, I took the only avenue leading from this chamber, and traversed it for the distance of a mile in a southerly direction, when my lamps forbid my going further, as they were nearly exhausted. The avenue, or passage, was as large as any that we had entered, and how far we might have travelled, had our lights held out, is unknown.—It is supposed by all who have any knowledge of this cave that Green River, a stream navigable several hundred miles, passes over three branches of this cave.

It was nearly one o’clock at night when we descended “*the passage of the chimney*,” as it is called, to the guide whom I left seated on the rocks. He was quite alarmed at our long absence, and was heard by us a long time before we reached the passage to descend to him, halloing with all his might, fearing that we had lost our track in the ruins above.

Very near the vertical passage, and not far from where I had left my guide sitting, I found some very beautiful specimens of soda, which I brought out with me.

We returned over piles of salt-petre earth and firebeds, out of one avenue into another, until at last, with great fatigue and a dim light, we entered the walls of the *chief city*, where, for the last time, we trimmed our lamps, and entered the spacious avenue that carried us to the *second hoppers*.

I found, when in the last-mentioned large avenue or upper chamber, many curiosities, such as Glauber salts, Epsom salts, flint, yellow ochre, spar of different kinds, and some petrifications; which I brought out, together with the mummy which was found at the *second hoppers*. We happily arrived at the mouth of the cave about three in the morning, nearly exhausted and worn down with nineteen hours’ continued fatigue.

I was near fainting on leaving the cave and inhaling the vapid air of the atmosphere, after having so long breathed the pure air which is occasioned by the nitre of the cave. The pulse beat stronger when in the cave, but not so fast as when upon the surface.

I have described to you hardly one half of the cave, as the avenues between the mouth of the cave and the *second hoppers* have not been named. There is a passage in the main avenue, about 60 rods [990 feet]

from the entrance, like that of a trap door. By sliding aside a large flat stone, you can descend 16 or 18 feet in a very narrow defile, where the passage comes upon a level, and winds about in such a manner as to pass under the main passage without having any communication with it: and at last opens into the main cave by two large passages just beyond the *second hoppers*. It is called the "*Glauber-salt room*," from salts of that kind being found there. There is also the *sick room*, the *bat room*, and the *flint room*—all of which are large, and some of them quite long. The last that I shall mention is, a very winding avenue, which branches off at the *second hoppers*, and runs west and southwest, for more than two miles. This is called the "*haunted chamber*," from the echo of the sound made in it. The arch of this avenue is very beautifully incrustured with limestone *spar*; and in many places the columns of *spar* are truly elegant, extending from the ceiling to the floor. I discovered in this avenue a very high dome, in or near the centre of the arch, apparently 50 feet high, hung in rich drapery, festooned in the most fanciful manner, for 6 or 8 feet from the hangings, and in colours the most rich and brilliant.

The columns of *spar* and the stalactites in this chamber are extremely romantick in their appearance, with the reflection of one or two lights. There is a chair formed of this *spar*, called, "*Wilkins's armed-chair*," which is very large, and stands in the centre of the avenue, and is encircled with many smaller ones. Columns of *spar*, fluted and studded with knobs of *spar* and stalactites; drapery of various colours superbly festooned, and hung in the most graceful manner; are shown with the greatest brilliancy from the reflection of lamps.³⁴

A part of the "*haunted chamber*," is directly over the *Bat room*, which passes under the "*haunted chamber*," without having any connexion with it. My guide led me into a very narrow defile on the left side of this chamber, and about 100 yards from "*Wilkins's armed chair*," over the side of a smooth lime-stone rock, 10 or 12 feet which we passed with much precaution; for, had we slipped from our hold, we had gone to "that bourne whence no traveller returns," if I may judge from a cataract of water, whose dismal sound we heard at a very considerable distance in this pit, and nearly under us. However, we crossed in safety, clinging fast to the wall, and winding down under the "*haunted chamber*," and through a very narrow passage for 30 or 40 yards, when our course was west, and the passage 20 or 30 feet in width, and from 10 to 18 high, for more than a mile. The air was pure and delightful in this as well as in other parts of the cave. At the further part of this avenue, we came upon a reservoir of water very clear and delightful to the taste, apparently having neither inlet nor outlet.

Within a few yards of this reservoir of water on the right hand of the cave, there is an avenue, which

leads to the north-west. We had entered it but about 40 feet, when we came to several columns of the most brilliant *spar*, 60 or 70 feet in height, and almost perpendicular, which stand in basins of water, that comes trickling down their sides, then passes off silently from the basins and enters the cavities of stone without being seen again. These columns of *spar*, and the basins they rest in, for splendour and beauty, surpass every similar work of art I ever saw. We passed by these columns and entered a small but beautiful chamber, whose walls were about 20 feet apart, and the arch not more than 7 feet high, white as white-wash could have made it: the floor was level as far as I explored it, which was not a great distance, as I found many pitholes in my path, that appeared to have been lately sunk, and which induced me to return.

We returned by the beautiful pool of water, which is called the "*pool of Clitorius*," after the "*Fono Clitorius*" of the classicks, which was so pure and delightful to the taste, that after drinking of it, a person had no longer a taste for wine. On our way back to the narrow defile, I had some difficulty in keeping my lights, for the Bats were so numerous, and continually in our faces, that it was next to impossible to get along in safety. I brought this trouble on myself by my own want of forethought; for as we were moving on, I noticed a large number of these Bats hanging by their hind legs to the arch which was not above 12 inches higher than my head. I took my cane and gave a sweep, the whole length of it, when down they fell; but soon, like so many imps, they tormented us till we reached the narrow defile, when they left us. We returned by "*Wilkins's armed chair*," and back to the *second hoppers*. It was at this place, I found the *Mummy* which I before alluded to, where it had been placed by Mr. Wilkins, from another part of the cave, for preservation. It is a female, about 6 feet in height, and so perfectly dried as to weigh but 20 pounds when I found it—the hair on the back part of the head is rather short, and of a sandy hue—the top of the head is bald—the eyes are sunk in the head—the nose, or that part which is cartilaginous, is dried down to the bones of the face—the lips are dried away, and discovered a fine set of teeth, white as ivory. The hands and feet are perfect even to the nails, and very delicate like those of a young person; but the *teeth* are worn as much as a person's at the age of fifty.

She must have been some personage of high distinction, if we may judge from the order in which she was buried. Mr. Wilkins informed me, she was first found by some labourers, while digging salt-petre earth, in a part of the cave about 3 miles from the entrance, buried 8 feet deep between four lime-stone slabs, and in the posture she is exhibited in the drawing I sent you. [Seated, the knees brought close to the body, which is erect, the hands clasped and laid upon the stomach, the head upright.] She was muffled up, and covered with a number of garments made of a species

of wild hemp and the bark of a willow, which formerly grew in Kentucky. The cloth is of a curious texture and fabrick, made up in the form of blankets or winding-sheets, with very handsome borders.—Bags of different sizes were found by her side, made of the same cloth, in which were deposited her *jewels*, beads, trinkets, and implements of industry, all which are very great curiosities, being different from any thing of the Indian kind ever found in this country. Among the

articles was a musical instrument, made of two pieces of cane, put together something like the double flageolet, and curiously interwoven with elegant feathers—she had likewise by her side a bowl of uncommon workmanship, and a vandyke made of feathers, very beautiful.

My friend, Mr. Wilkins, gave me the Mummy, which I brought away, together with her apparel, *jewels*, musick, etc.

NOTES

1. Unless otherwise noted, biographical details drawn from Larry Busch, “Nahum Ward – A Biographical Sketch,” *Journal of Spelean History* 6 (1973), 66-69, which is reprinted from H.Z. Williams, *History of Washington County, Ohio* (Cleveland: H. Z. Williams, 1881). See also Nahum Ward biographical information (1819?), Ward-Rolston Papers, Marietta College Library.
2. 1850 U.S. Census (Marietta, Washington County, Ohio).
3. Lee Soltow, “Inequality Amidst Abundance: Land Ownership in Early Nineteenth Century Ohio,” *Ohio History* 88 (1979), 133-151.
4. Lee Soltow, “Progress and Mobility among Ohio Propertyholders, 1810-1825,” *Social Science History* 7 (1983), 405-426.
5. *History of the Hocking Valley, Ohio* (Chicago: Inter-State Publishing Co., 1883), 1013.
6. Kim Gruenwald, *River of Enterprise: The Commercial Origins of Regional Identity in the Ohio Valley, 1790-1850* (Bloomington: Indiana University Press, 2002), 112-113.
7. “20,000 Acres in Ohio,” *Massachusetts Spy* (April 26, 1815). The advertisement was dated “Shrewsbury, April 24, 1815” and also ran on May 3 and May 10. Ward indicated that he would be available “until the last of June, when he has it in contemplation to leave this for the Western Country.” Just a few months after returning to Marietta, he took his trip to Mammoth Cave.
8. Andrew Gibb, “A Scottish Venture in the United States: The Glasgow Ohio Company 1824,” *Scottish Historical Review* 63 (1984), 50-58.
9. Nahum Ward, *A Brief Sketch of the State of Ohio, One of the United States in North America* (Glasgow: J. Niven, 1822), 10, 14.
10. Nahum Ward, “Eisdibh! [Listen!] Eisdibh! Eisdibh! Radhadh dhoibh-san d’am miann a dhol a dh’Ohio ann America,” (Sribhlinn [Stirling]: C. Munro, 1822). Also held by Marietta College.
11. “Who Will Go to the That Beautiful Country, Ohio, In North America?” (Stirling: C. Munro, 1822); “To Emigrants. Ohio, One of the States in America,” (Stirling: C. Munro, 1823).
12. Gibb, “Scottish Venture,” 58.
13. Wayne Jordan, “The People of Ohio’s First County,” *Ohio State Archaeological and Historical Quarterly* 49 (1940), 18-19.
14. C.B. Galbreath, “Lafayette’s Visit to Ohio Valley States,” *Ohio Archaeological and Historical Quarterly* 29 (1920), 263.
15. Busch, “Nahum Ward,” 69.
16. Wayne Jordan, “Marietta College and the Ohio Company,” *Ohio State Archaeological and Historical Quarterly* 44 (1935), 292, 297.

17. 1860 U.S. Census, Mortality Schedule (Marietta, Washington County, Ohio).
18. Angelo George, *Mummies, Catacombs, and Mammoth Cave* (Louisville, KY: George Publishing Co., 1994), 84.
19. For a summary of the account's publishing history and full citations, please see my Annotated Bibliography in this issue of JSH.
20. Willard Rouse Jillson, *A Bibliography of Mammoth Cave, 1798-1949* (Frankfort, KY: Roberts Printing Co., 1953), 12.
21. Harold Meloy, *The Mummies of Mammoth Cave* (Shelbyville, IL: Harold Meloy, 1967), 30; Meloy, "Introduction to the Reprint Edition," in *Rambles in Mammoth Cave during the Year 1844* (New York: Johnson Reprint, 1973), vii.
22. George, *Mummies*, 144, notes 28 and 29.
23. Burton Faust, *Saltpetre Mining in Mammoth Cave, Kentucky* (Louisville, KY: Filson Club: 1967); Angelo George and Gary O'Dell, "The Saltpeter Works at Mammoth Cave and the New Madrid Earthquake," *Filson Club Historical Quarterly* 66 (1992), 5-22.
24. George, *Mummies*, 81-97.
25. "Great Natural Curiosity," *Massachusetts Spy* (September 18, 1816). The notice also ran on September 25 and indicated that the mummy would be exhibited until September 28.
26. Pindarus, "Peter addresseth the Mummy," *Massachusetts Spy* (August 7, 1816).
27. Louise M. Robbins, "Prehistoric People of the Mammoth Cave Area," in *Archeology of the Mammoth Cave Area*, ed. Patty Jo Watson (New York: Academic Press, 1974), 144-145. See also Patty Jo Watson, "Salts Cave (and Related Material in East Coast Museum Collections)," in *Archeology of the Mammoth Cave Area*, 167-180.
28. John Sears, *Sacred Places: American Tourist Attractions in the Nineteenth Century* (New York: Oxford University Press, 1989); Katie Algeo, "Mammoth Cave and the Making of Place," *Southeastern Geographer* 44 (2004), 27-47.
29. The boundaries of Kentucky counties have shifted since 1815. The cave entrance now lies in Edmondson County. It is unclear why Ward would have been given the title "Dr." since there is no evidence that Ward ever attended college.
30. Wilkins and Gratz owned the cave and extracted saltpeter. Miller was their overseer.
31. This was the famous New Madrid earthquake of February 7, 1812, which would have measured about 8.0 on our modern Richter Scale.
32. The earthquake interrupted saltpeter mining by damaging equipment and by frightening the workers, who refused to work in the cave for some time. See George and O'Dell, "Saltpeter Works at Mammoth Cave," 5-22.
33. This marks the end of the portion of the account published on May 8, 1816. The next paragraph marks the beginning of the section published on May 15.
34. This marks the end of the portion of the account published on May 15, 1816. The next paragraph marks the beginning of the section published on May 29.

Annotated Bibliography of Nahum Ward's Publications about Mammoth Cave

Dr. Paul T. Riggs

1. "Mammoth Cave. Description of the Great Cave in Warren County, Kentucky. Extract of a letter from a gentleman resident in the Western Country to his friend in this County giving an account of an excursion into Kentucky in the fall of last year – dated Marietta, (Ohio) April 4, 1816." *Massachusetts Spy* [Worcester, MA] (May 8, 15, and 29, 1816).

This is the earliest surviving publication of the account that could be located. Printed in three installments.

2. "Description of the Great Cave in Warren County, Kentucky. Extract of a Letter from Dr Nahum Ward, formerly of Shrewsbury, Massachusetts, now resident in the Western Country to his friend in Worcester, giving an account of an excursion into Kentucky in the fall of last year; dated Marietta, Apr. 4, 1816." *Monthly Magazine* [London] 41 (April 1816): 286-288.

First British printing. Appears in a section entitled: "American Literary and Philosophical Intelligence." Indicates that this was derived from the *Massachusetts Spy*.

3. "Plan and Description of the Great and Wonderful Cave in Warren County, Kentucky." *Massachusetts Spy* [Worcester, MA] (June or July, 1816).

Not seen. Cited in Jillson, Willard Rouse. *A Bibliography of Mammoth Cave, 1798-1949*. Frankfort, KY: Roberts, 1953: 12.

4. "Plan of the Great Cave in Warren County, Kentucky." *Monthly Magazine* [London] (July 1816): 577.

Sketch map of Mammoth Cave. The plan is marked with capital letters that correspond to notes by Ward. There is also a small sketch of the mummy.

5. "Kentucky Mammoth Cave." *Georgetown Patriot* [Georgetown, KY] (August 24, 1816).

Not seen. Cited in George, Angelo, *Mummies, Catacombs, and Mammoth Cave*. Louisville, KY: George Publishing, 1994: 144, n. 29.

6. "Wonders of Nature." *Kentucky Gazette* [Lexington, Kentucky] (September 9, 1816).

Not seen. Cited in George, Angelo, *Mummies, Catacombs, and Mammoth Cave*. Louisville, KY: George Publishing, 1994: 144, n. 28.

7. "Mammoth Cave: Description of the Great Cave in Warren County, Kentucky. Written by Dr. Nahum Ward, late of Shrewsbury. Extract of a letter from a gentleman resident in the Western Country, giving an account of an excursion into Kentucky in the fall of last year – dated Marietta, (Ohio) April 4, 1816." *Western Citizen* [Paris, KY] (September 25, 1816).

Although Jillson claims that this article appeared on April 4, in fact it was September 25.

8. "Description of the great Cave in Warren County, Kentucky, in a Letter from Dr Nahum Ward, dated at Marietta (Ohio), April 4, 1816" *Scots Magazine and Edinburgh Literary Miscellany* [Edinburgh, Scotland] (December 1816): 909-914.

Reprinted from the *Monthly Magazine*.

9. "Plan and description of the great and wonderful cave in Warren County, Kentucky." (n.p.: 1817).

Not seen. Broadside held by the Lilly Library of Indiana University.

10. "The Wonderful Mammoth Cave in Kentucky." Liverpool, England: E. Smith, 1817.

Broadside. Held by Western Kentucky University Library special collections department. Reprints account along with map and sketch of the mummy.

11. "Western Wonder." In Francois Chateaubriand, *The Interesting History of Atala, The Beautiful Indian of the Mississippi*. New York: Oram and Mott, 1818: 136-144.

Printed as an appendix to an English translation of Chateaubriand's tale. The preface clearly implies a British translator, ruling out Ward. The Atala narrative is about an Indian maiden who died young and was buried by her lover. Other Indians appear in the story carrying the bones of their ancestors. Ward's account bears some superficial similarities.

12. *The Wonders of the World: Comprising Man, Quadrupeds, Birds, Fishes, Trees, Plants, Mountains, Caves, Volcanoes, Rivers, Cities, Remarkable Edifices, Ruins, Antiquities, etc, etc: with Several Hundred Illustrative Embellishments*. Boston: Lee and Shepard, 1873.

Not seen. Cited in McCall, R. Ellsworth. "The Evolution of the Map of Mammoth Cave, Kentucky." *Proceedings of the Indiana Academy of Science* 7 (1896): 50. McCall comments: "The account of the cave, which this volume gives, in 1873, is a verbatim reproduction of Nahum Ward's original description, made in 1816." This 1873 volume also includes a reproduction of Ward's map.



EXPLANATIONS, BY MR. WARD.

A—Mouth of the cave, 40 feet high, and 20 wide.
 BB—Hoppers, where salt-petre is made by Wilkins and Gratz, the owners of the cave. Oxen are worked two miles in.
 C—Pits, 175 feet deep in many places in this chamber.
 D—This area contains upwards of eight acres, covered with one arch, at least 150 feet high in the centre, called the *Chief City*.
 E—*Second City*, contains about six acres; the walls around at least sixty feet perpendicular height: one arch.
 F—*Fourth City*. This chamber, with the avenue leading to it, was never explored until I entered it. I went to the end.
 G—This is called the *Fifth City*.
 H—The bed of this chamber, which is 1800 feet in circumference, is forty feet above the level of the passage leading to it. You go up a passage like that of a chimney, forty feet perpendicular height.
 I—At this place I found a cedar pole, twelve feet long, and which was perfectly sound.
 O—I went no farther than this: how much farther I might have gone I know not.
 L—*Third City*. From the side of the cave issued a fine stream of water, which falls sixty feet.
 R R R—Green River passes over three branches of the cave.
 S—A long body of yellow ochre found here.
 T—A very beautiful dome, at least forty feet diameter, and sixty feet high.
 X—Here are six or eight large columns of spar, standing upwards of sixty feet perpendicular height, the bases of which rest in elegant basins of water, as clear as amber-

minutes before the shock, a heavy rumbling noise was heard coming out of the cave like a mighty wind; when that ceased, the rocks cracked, and all appeared to be going in a moment to final destruction. However, no one was injured, although large rocks fell in some parts of the cave.
 "As you advance into the cave, the avenue leads from the *Second Hopper*, west one mile, then S. W. to the *Chief City* (D) which is six miles from the entrance. This avenue is from 60 to 100 feet in height, and about the same in width, the whole distance after you leave the *Second Hoppers*, until you come to the cross roads of *Chief City*, and is nearly upon a level; the floor, or bottom, being covered with loose limestones and salt-petre earth. When I reached this immense area (*Chief City*), which contains upwards of eight acres, without a single pillar to support the arch, which is entire over the whole.
 "I was struck dumb with astonishment.
 "I can give you but a faint idea of this *Chief City*. Nothing under heaven can be more sublimely grand than this place, covered with a solid arch at least 100 feet high, and to all appearance entire.
 "After entering the *Chief City*, I perceived five large avenues leading out of it, from 60 to 100 feet in width, and from 40 to 80 in height. The walls (all of stone) are arched, and are from 40 to 80 feet perpendicular height before the arch commences.
 "The first which I traversed after cutting arrows on the stones under our feet, pointing to the mouth of the cave (in fact we did this at the entrance of every avenue, care (in fact we did this at a loss for the way out, on our return) was one that led us in a southerly direction for more than two miles. We then left it, and took another that led us east, and then north, for more than two miles further; and at last, in our windings, were brought out by

plan of this cave, one of my guides, who had been some time groping among the broken stone, called out, requesting me to follow him.
 "I gathered up my papers and compass; and after giving my guide, who sat with me, orders to remain where he was until we returned, and, moreover, to keep his lamp in good order, I followed after the first who had entered a vertical passage just large enough to admit his body, we continued stepping from one stone to another, until at last, after much difficulty from the smallness of the passages, which is about ten feet in height, we entered on the side of a chamber at least 150 feet in circumference, and whose arch is about 150 feet high in the centre. After having marked arrows pointing downwards upon the slab-stones around the little passage through which we had ascended, we walked forward nearly to the centre of this area.
 "It was past midnight when I entered this chamber of eternal darkness, where all things are hushed, and Nature's self lies dead. I must acknowledge I felt a shivering horror at my situation, when I looked back upon the different avenues through which I had past since I entered the cave at eight in the morning; and at that time of night, when church-yards yawn, to be buried several miles in the dark recesses of this awful cavern—the grave, perhaps, of thousands of human beings—gave me no very pleasing sensations. With the guide who was now with me, I took the only avenue leading from this chamber, and traversed it to the distance of a mile in a southern direction, when my lamps forbade my going further, as they were nearly exhausted. The avenue, or passage, was as large as any that we had entered; and how far we might have travelled, had our lights held out, is unknown.—It is supposed that *Green River*, a stream navigable for boats several hundred miles, passes

the most graceful manner, are shown with the greatest brilliancy from the reflection of lamps.
 "A part of the *Hunted Chamber* is directly over the *Bed Room*, which passes under the *Hunted Chamber*, without having any connection with it. My guide led me into a very narrow dell on the left side of this chamber, and about 100 yards from *Wilkins's Arm-chair*, over the side of a smooth limestone-rock, 10 or 12 feet, which we passed with much precaution; for, had we slipped from our hold, we had gone to that bourne whence no traveller returns; if I may judge from a cataract of water, whose dismal sound we heard at a considerable distance in this pit, and nearly under us. However, we crossed in safety, clinging fast to the wall, and winding down under the *Hunted Chamber*, and through a very narrow passage for 30 or 40 yards, when our course was west, and the passage 20 or 30 feet in width, and from 10 to 18 high, for more than a mile. The air was pure and delightful in this as well as in other parts of the cave. At the further part of this avenue, we came upon a reservoir of water, very clear and delightful to the taste, apparently having neither inlet nor outlet. (X)
 "Within a few yards of this reservoir of water on the right hand of the cave, there is an avenue, which leads to the north-west. We had entered it but about 40 feet, when we came to several columns of the most brilliant spar, 60 or 70 feet in height, and almost perpendicular, which stand in basins of water, that comes trickling down their sides, then passes off silently from the basins and enters the cavities of stone without being seen again. These columns of spar and the basins they rest in, for splendour and beauty, surpass every similar work of art I ever saw. We passed by these columns and entered a small, but beautiful chamber, whose walls were about

A Mammoth Cave broadside. Courtesy of Kentucky Library, Western Kentucky University.

THE DISCOVERY OF THE FIRST CUBAN BLIND CAVE FISH: THE UNTOLD STORY

Aldemaro Romero
Department of Biological Sciences
Arkansas State University
State University, AR 72467

INTRODUCTION

Although there have been numerous published reports on blind cave fishes dating as far back as 1541 (Romero, 2001), the first scientific description of one species was not published until 1842. That description was of the northern cavefish *Amblyopsis spelaea* from Mammoth Cave, Kentucky (Romero, 2002). That scientific description took place shortly after it had first been sighted (Romero and Woodward, 2005).

With the exception of the northern cavefish, the history of the discovery of cave fish species and how their discovery impacted the views of speleologists and other scientists at the time they were described has rarely been told.

The first two species of blind cave fishes scientifically described from outside the United States were found in Cuba and their description was published in 1858. They are the Cuban cusk-eel *Lucifuga (Lucifuga) subterranea* and the toothed Cuban cusk-eel, *Lucifuga (Stygicola) dentata*.

I have found the original documents that relate the discovery of these species. These sources are in hard-to-find Cuban publications and in Spanish. Therefore, I will condense the information I have been able to find and discuss the impact of these discoveries at the time they were made.

FELIPE POEY

One of the two central characters in the saga of the discovery of the first blind cave fishes from Cuba was Felipe Poey y Aloy (hence Poey).

Poey (po'-ay) (*b.* Havana, Cuba, 26 May 1799; *d.* Havana, 28 January 1891) was the son of a Frenchman who had been involved in the slave trade and a Cuban-born mother who was half Spanish, half Cuban. At the age of 5 Poey went to France with his family where his father died two years later. While there, he was struck by polio, which paralyzed the right side of his body, after which he returned to Cuba. To follow his mother's wishes, he went to Madrid, Spain, where he obtained a law degree in 1822. He began his lawyer's career in Spain and became involved in politics (he was a liberal) but soon became disenchanted, returned to Cuba, married, and decided to become a full-time naturalist.

In 1826 he traveled to Paris, France, where he worked under the famous naturalist Georges Cuvier. At that time Cuvier and Achile Valenciennes were working on the encyclopedic *Histoire naturelle des poissons* (The Natural History of Fishes), which would end up being a 22-volume publication.

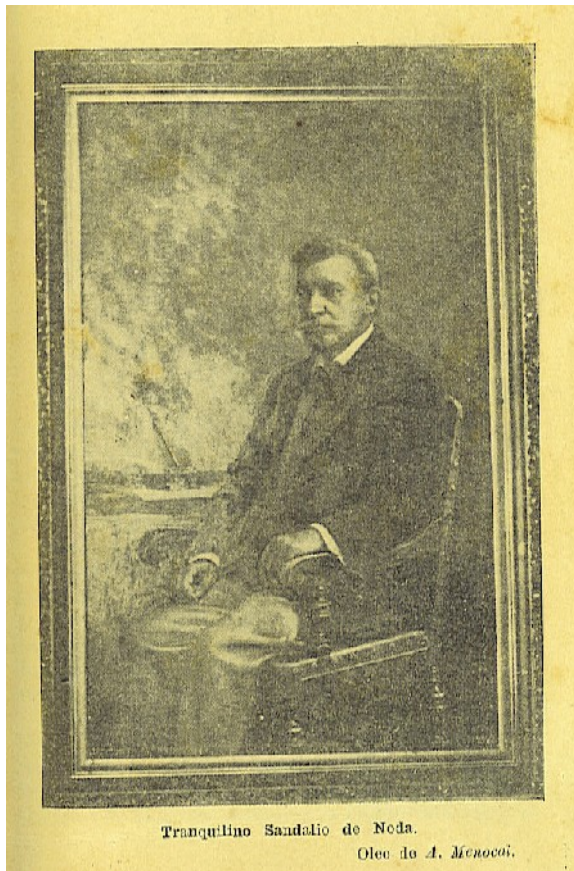


Poey arrived in Paris with 35 specimens of Cuban fishes in a barrel of brandy plus 85 drawings of fishes from that island. The information from these fishes was incorporated into Cuvier and Valenciennes's gigantic work. From early on Poey was very interested in working with fishes, visiting the fish market of Havana almost every day. Yet, he was a polymath with areas of interests ranging from anthropology to poetry. He was a very prolific author who corresponded with virtually every noted naturalist of his time and went on to occupy important academic posts at the University

of Havana. He was a member of almost every major scientific society in the U.S. and Europe, and many of his new specimens and life-size drawings are found in the collections of the United States National Museum (Smithsonian), the Museum of Comparative Zoology (Harvard), the Natural History Museum of Madrid and the National Museum of Natural History in Paris.

Because of the dates of his birth and death, he was technically a Spaniard, but he confessed that “As a naturalist I have never been a Spaniard, I have been cosmopolitan.” Despite cataracts in old age, he never stopped writing (for more biographical information about Poey see Jordan, 1899; Sánchez Roig, 1937; Vivanco y Díaz, 1951; Cruz, 1979; González López, 1999).

TRANQUILINO SANDALIO DE NODA



The other character in this story is Tranquilino Sandalio de Noda y Martínez (hence de Noda) (*b.* Las Cañas, Guanajay, Pinar del Río, Cuba, 3 September 1808; *d.* San Antonio de los Baños, Havana, Cuba, 27 May 1866). Despite having been born in a rural area, his neighbors were French planters that owned good libraries. He received personal tutoring from his mother, a primary school teacher, and another local teacher José María Dau. From the latter he not only

acquired basic knowledge in the sciences and humanities but also the habit of educating himself in any field, including several languages (for more biographical information on Noda, see Guerra, 1924 and Sánchez Roig, 1942).

THE DISCOVERY

In 1823, the *Capitán General* (governor designated by the Spanish government) of Cuba, Francisco Dionisio Vives, asked Dau, de Noda’s tutor, to conduct a geological survey of Santa Cruz de los Pinos (Pinar del Río Province, western Cuba). Dau asked de Noda, then only 15, to accompany him. That is when his interest in caves surged and provided him the opportunity to observe the hypogean fauna and to find many fossils in caves.

In 1831 de Noda learned of the Cuevas del Cajío (Cajío Caves) at Güira de Melena, in the southern portion of the Havana Province, where there were rumored to be blind fishes. After finding the cave and crawling into a very hot, bat-crowded hall, he and his companions reached a pool with “white” fishes in crystal clear waters between 60 and 90 feet underground. His companions captured one fish using a basket. De Noda wrote that the fish were easily disturbed by splashing on the surface of the water.

The captured individual died within a few hours. De Noda drew the specimen and preserved it in a bottle with rum. The fate of the specimen and illustration is unknown but that he sent them to Poey is mentioned in Poey’s correspondence. Poey told him that he classified this fish as a new genus and species and gave it the scientific name of *Lucifuga subterraneus* (name later changed to *Lucifuga (Lucifuga) subterranea* for Latin grammatical reasons as well as for classification ones).

In 1876 Poey published in the Havana newspaper *El Mercurio* his correspondence with Tranquilino Sandalio de Noda. A copy of the original article containing such correspondence cannot be found, but it was reprinted in Poey (1888) and Carbonell y Rivero (1928). Three letters from Noda to Poey and one from Poey to Noda are reprinted in Poey (1888), and those are the primary sources I am using for this article.

Poey’s scientific description of cave fishes from Cuba was published in different venues. The first was “Memorias sobre la historia natural de la isla de Cuba” (Memoirs about the natural history of the island of Cuba). This work is complicated to cite, particularly when it comes to dates. First of all, this is a collection of papers in two volumes. The first set of papers was published between 1851 and 1854 and the second set between 1858 and 1861.

The paper containing the description of the cave fishes from Cuba was published under the title

“Peces ciegos de la isla de Cuba, comparados con algunas especies de distinto genero” (Blind fishes from the Island of Cuba, compared with some species of a different genus) as the paper “xivi” of volume 2, in pages 95-114 of the whole opus. Therefore the correct date of publication should be 1858.

In that publication Poey creates a new genus and species (*Lucifuga subterraneus*) based on 12 specimens and goes on with a very detailed and accurate description of both external and internal morphology, including some minor differences among the specimens he studied such as variability in eye development from rudimentary to totally blind.

Poey cited the species as from five localities in Cuba: la Cueva del Cajío (near Güiría de Melena), Cueva del Cafetal La Industria (between Alquizar and Guanímar), la Cueva de Ashton (in San Andres), Cueva del Dragón (in San Isidro), and Cueva del Cafetal La Concordia (near Alquizar). Poey does not say if he visited these caves, but despite the fact that he was a man of fair complexion, medium height, and heavy build, polio had paralyzed the right side of his body, so chances are he never visited them. Furthermore, he cited as collectors of specimens from the different localities different people: de Noda, Antonio Dubrocá, Juan Antonio Fabre, and Fernando Layunta. He gives priority to de Noda for visiting the Cajío Cave in 1831.

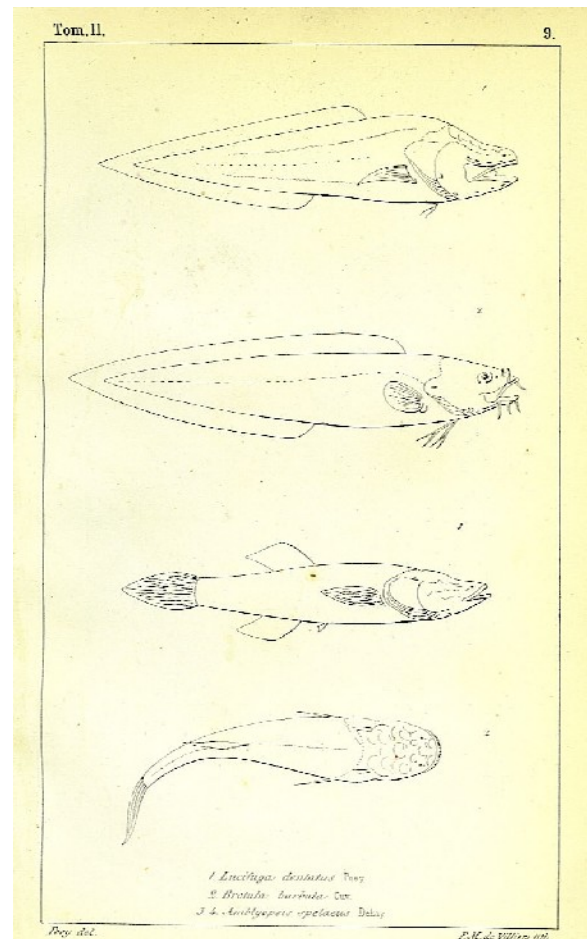
Poey then described a second new species: *Lucifuga dentatus* (now known as *Lucifuga (Stygicola) dentata*, also for Latin grammatical and classification reasons). This one was described as totally depigmented and found in the three first localities cited above. He also comments on the bearded brotula *Brotula barbata*, a deep-sea fish that sometimes has fatty tissue covering its eyes, the northern cavefish *Amblyopsis spelaea*, and the pirate perch *Aphredoderus sayanus*.

The reason he included the bearded brotula was because it is the closest relative to the Cuban cave fishes that he described. He used the northern cavefish for comparison purposes because it was the only other known species of cavefish in the world, and he included the pirate perch because that fish is a close relative to the northern cavefish.

Later, between pages 108 and 114, he discussed whether these fishes were the product of special creation or the product of evolution. In this article published a year before Darwin’s *Origin of Species*, Poey compares the two schools of thought (creationism and evolution), the first one defended by his former teacher Cuvier, and the second by Geoffroy Saint-Hilaire.

After saying that he does not belong to either school, Poey says that on one hand he has a great deal of inclination for Cuvier’s creationism, but that on the other hand he has found very convincing arguments for evolution. The first statement seems to be the

product of respect for his former ichthyology teacher. But, then, given the variability that he observed among the Cuban cave fishes (the biological characteristic that later Darwin would use to explain how natural selection works), he concluded that these species are the product of “transformation” (older term for evolution). He further rejects the use of the term “degeneration” to describe the loss of eyes and other features among cave organisms, preferring “modification.”



This is the first time that Poey makes any mention of evolution in his writings. Although ambivalent at the beginning (Pruna, 1994), he went on to become an evolutionist based on his studies of blind cave fishes. Thus, when the works of Charles Darwin, Thomas Henry Huxley, and Herbert Spencer were published, he embraced them enthusiastically. He seemed to be particularly impressed with Spencer (Jordan, 1899) probably because of Spencer’s progressionist ideas and his belief that cave colonization was not the result of “accidents” but rather an active process. This intellectual development took place rather smoothly. After all, the introduction of Darwinian ideas in Latin America was progressive and without much resistance at least among academic

circles (for an overview of this issue see Pruna and García González, 1989).

Poey wrote that he had had extensive correspondence on the Cuban blind cave fishes with Charles Frédéric Girard with whom he agreed that to better understand the issue of “transformation” of blind cave fishes, studies on the development of these fishes had to be carried out. Actually, this was an idea that Girard’s teacher, Jean Louis Rodolphe Agassiz, had previously proposed (Romero, 2001). Girard would go on to describe a new species, the southern cavefish *Typhlichthys subterraneus* in 1859, one year after Poey’s description of the Cuban species.

Poey went on publishing two other pieces on the blind cave fishes of Cuba. One was in 1865 in his “Repertorio Físico-Natural de la isla de Cuba” (Physical-natural repertoire of the Island of Cuba) in which he updated some of the classification based on comments from the ichthyologist Theodore Nicholas Gill. In this he also added a few new localities for these fishes and reprinted a letter from de Noda that included the fact that the “negros” usually go to the Cajío Cave to fish these animals to eat them. This seems to be the only reported case of cave fishes being consumed by humans. Cave fishes in general are not appreciated as a source of food for humans: they are generally small, found in small numbers, and many feed on bat guano.

He would finally cite these Cuban blind cave fishes again briefly in 1868 in his "Synopsis Piscicum Cubensium," or "Catalogo razonado de los Peces Cubanos" (An explained catalog of Cuban fishes), an atlas of 10 volumes with more than 1,000 illustrations drawn by himself, with the descriptions of about 800 tropical American fishes. This work was purchased by the Spanish government, placed in the "Biblioteca de Ciencias Naturales" (Natural History Library) at Madrid, Spain, and exhibited by the Spanish government at the International Exhibit of Amsterdam in 1883, where it received a gold medal and honorable mention.

WHERE ARE POEY’S SPECIMENS?

There is one question worth exploring about Poey’s work on the Cuban cave fishes. That is, what was the fate of the specimens that he used to describe these new species (type specimens or holotypes)? Given that there is no trace of those specimens in the Natural History Museum of Havana, which he founded, and the fact that he usually sent specimens to colleagues and museums around the world, it is worth looking at

existing specimens to see which one could be his holotypes.

The list of museums that have specimens of Cuban cave fishes collected in the nineteenth century and that have kept correspondence from Poey are in Table 1. The list of specimens known to exist in museums for the two species in question are in tables 2 and 3. In Table 2, the list includes one specimen in the U.S. National Museum of Natural History (Smithsonian) that was collected by Poey, but without a date. Another is in the Museum of Natural History of Paris labeled as collected by Valenciennes in 1865. This specimen could not have been collected by Valenciennes for the simple reason that he never visited Cuba. It is most likely that he received it from Poey in 1865 (six years after the species was described). The same can be said about similar labeling for the *L. dentata* in Paris in Table 3. All the other specimens were collected by someone else or on dates much after the actual discovery. Thus the holotype for *L. (L.) subterranea* is either the one in Washington, D.C. or the one in Paris.

In the case of *L. dentata*, there is a specimen in the Museum of Comparative Zoology at Harvard University (MCZ 32329) whose collector’s information is labeled as “Poey et al.” Since in his original description Poey acknowledges the fact that the specimens of these fishes were collected by others, that specimen could well be the holotype for that species. Howell y Rivero (1938) analyzed the vouchers with which this and other specimens were deposited at that museum and reached the same conclusion. Another potential holotype is MCZ 12415, but I lacked sufficient information about that one to make any determination. This could also be a syntype (one of two or more specimens simultaneously selected as types by the original author of a name of a species).

CONCLUSIONS

Poey relied on others to collect blind cave fishes in Cuba. His anatomical and taxonomic analyses of these specimens were highly accurate, and these fishes helped to convince him to embrace the idea of evolution. He had ample correspondence with contemporary colleagues from the U.S. and Europe and most likely sent the specimens he used for describing the two species of Cuban blind cave fishes to museums abroad, particularly the National Museum of Natural History in Washington, D.C. and the Museum of Comparative Anatomy at Harvard University.

Table 1. Museums outside Cuba that have specimens of Cuban cave fishes collected in the nineteenth century and correspondence from Poey.

Correspondent(s)	Museum	Museum Acronym
Georges Cuvier, Achile Valenciennes	Musé National d'Histoire Naturelle	MNHN
Charles Frédéric Girard, Theodore Nicholas Gill	U.S. Museum of Natural History	USNM
?	British Museum of Natural History	BMNH
?	American Museum of Natural History	AMNH
?	Museum of Comparative Zoology (Harvard University)	MCZ
?	Museo Nacional de Historia Natural (Madrid, Spain)	MNCN

Table 2. Known specimens of *Lucifuga (Lucifuga) subterranea* (in chronological order of collection) in museums around the world.

Catalogue #	Locality	Collector	Collection Date
USNM 00001739	Cuba: Cuevas de Alquizas	Poey	?
MNHN a-5234	Cuba	Valenciennes	1865
SU 8510	Cuba: Hawey	C.H. Eigenmann	1893 or before
CAS 30438	Cuba	C.H. Eigenmann & O. Riddle	1902
AMNH 18463	Cuba		ca. 1904
AMNH 18712	Cuba: Tranquilidad	C.H. Eigenman	March 1902
AMNH 18714	Cuba	C.H. Eigenmann	March 1902
FMNH 3934	Cuba: Cañas	C.H. Eigenmann & O. Riddle	March 1902
FMNH 33090	Cuba	Eigenmann?	?
FMNH 52631	Cuba	C.H. Eigenmann	?
SU 8509	Cuba: Jaiguan	C.H. Eigenmann	?
BMNH 1904.1.28.137	Cuba: Cañas	?	1904
BMNH 1904.1.28.135-136	Cuba: Cueva Tranquilidad	?	1904
MCZ 29902	Cuba: Matanzas: Cañas	C.H. Eigenmann	1910
USNM 00204452	Cuba		1936?
MCZ 31221	Cuba: Guira de Melena	Carlos de la Torre	?

Table 3. Known specimens of *Lucifuga (Stygicola) dentata* (in chronological order of collection) in museums around the world.

Catalogue #	Locality	Collector	Collection Date
MCZ 32329	Cuba: Cuevas en San Antonio	F. Poey et al.	?
MCZ 12415	Cuba	F. Poey	1861
MNHN A-5232	Cuba	Valenciennes	1865
MNHN A-5233	Cuba	Valenciennes	1865
FMNH 3933	Cuba: Cave near Alacranes	C.H. Eigenmann & O. Riddle	March 1902
CAS 6714	Cuba: Cañas	C.H. Eigenmann	March 1902
CAS 30437	Cuba	C.H. Eigenmann & O. Riddle	1902
FMNH 112219	Cuba	C.H. Eigenmann	ca. 1902
CAS/SU 8511	Cuba: Cave near Pedregales	C.H. Eigenmann	ca. 1902
FMNH 96223	Cuba	H.B. Ward	25 August 1904
BMNH 1904.1.28.132-134	Cuba: Cueva Tranquilidad	?	1904
MCZ 29903	Cuba: Matanzas: Cañas	C.H. Eigenmann	1910
FMNH 33084	Cuba	Eigenmann?	2 November 1936
MCZ 36166	Cuba: Pinar del Rio	L.R. Rivas	1940
BMNH 1981.10.27.1-4	Cuba	?	1981
FMNH 52595	Cuba: Cañas	?	?
AMNH 1537	Cuba: Pinar del Río: Cueva Modesta	B. Dean	?
AMNH 10143	Cuba: Pinar del Río: Rio Taco Taco	?	?
MCZ 30615	Cuba: Finca La Carbonera	Thomas Barbour	?
MCZ 30616	Cuba: Matanzas: Alacranes: Cueva del Mar	T. Barbour	?
MCZ 30617	Cuba: Matanzas: Alacranes: Cueva del Mar	T. Barbour	?
MCZ 31212	Cuba: Matanzas: Alacranes: Cueva del Mar	Carlos de la Torre	?
MCZ 31213	Cuba: Guira de Melena	Carlos de la Torre	?

ACKNOWLEDGEMENT

Joy Trauth read an earlier version of this article and made valuable suggestions.

LITERATURE CITED

- Carbonell y Rivero, J.M. 1928. *La ciencia en Cuba*. La Habana, Cuba: Montalvo y Cárdenas.
- Cruz, M. 1979. *El ingenioso naturalist Don Felipe de La Habana*. La Habana, Cuba: Editorial Gente Nueva.
- González López, R.M. 1999. *Felipe Poey y Aloy. Obras*. La Habana: Imágen Contemporánea.
- Guerra, A. 1924. *Un procer humilde (Tranquilino Sandalio de Noda)*. La Habana, Cuba: Imprenta La Moderna Poesía.
- Howell y Rivero, L. 1938. List of fishes, types of Poey, in the Museum of Comparative Zoölogy. *Bull. Mus. Comp. Zoölogy* 82:169-227.
- Jordan, D.S. 1899. *Science Sketches*. Chicago: A.C. McClu.
- Poey, F. 1858. Peces ciegos de la isla de Cuba, comparados con algunas especies de distinto genero, pp. 94-114, *In: Memorias sobre la Historia Natural de la isla de Cuba, acompanadas de sumarios latinos y extractos en frances, etc.* La Habana, Cuba: Barcina.
- Poey, F. 1865. Peces ciegos, pp. 113-116, *In: Repertorio fisico natural de la Isla de Cuba*. La Habana, Cuba: Gobierno y Capitanía.
- Poey, F. 1868. Synopsis Piscium Cubensium, pp. 279-484, Vol. 2, *In: Reporte Fisico-Natural de la Isla de Cuba*. La Habana, Cuba: Gobierno y Capitanía.
- Poey y Aloy, F. 1888. *Obras literarias de Felipe Poey*. La Habana, Cuba: La Propaganda Literaria.
- Pruna, P.M. 1994. National Science in a colonial context: The Royal Academy of Sciences of Havana, 1861-1898. *Isis* 85:412-426.
- Pruna, P.M. & A. García González. 1989. *Darwinismo y sociedad en Cuba. Siglo XIX*. Madrid: Consejo Superior de Investigaciones Científicas.
- Romero, A. 2001. Scientists prefer them blind: the history of hypogean fish research. *Environmental Biology of Fishes* 62(1-3):43-71.
- Romero, A. 2002. Between the first blind cave fish and the Last of the Mohicans: the scientific romanticism of James E. DeKay. *Journal of Spelean History* 36(1):19-29.
- Romero, A. & J. S. Woodward. 2005. On white fish and black men: did Stephen Bishop really discover the blind cave fish of Mammoth Cave? *Journal of Spelean History* 39(1):23-32.
- Sánchez Roig, M. 1937. *Felipe Poey, el máximo naturalista de Hispanoamérica*. La Habana, Cuba: Imprenta Molina y Cia.
- Sánchez Roig, M. 1942. *Un sabio olvidado: Tranquilino Sandalio de Noda y Martínez*. La Habana, Cuba: Compañía Editora de Libros y Folletos.
- Vivanco Y Díaz, J. 1951. *Don Felipe. Su vida y su obra*. La Habana, Cuba: Imprenta "El Siglo XX."

“Charon Trimmed His Lamp”: Carver’s Cave and the Definition of a Show Cave

Greg A. Brick
Professor of Geology
Normandale College
Bloomington, MN 55431

Jonathan Carver first visited the famous cave named after him, in St. Paul, Minnesota, on November 14, 1766, then wintered among the Sioux Indians in a bark hut near what is now New Ulm, Minnesota, until spring of the following year. On May 1, 1767, he returned to the cave and took part in a “grand council” of the Indians. A hundred years later, on May 1, 1867, the Minnesota Historical Society celebrated the centennial of this second visit.¹ Recent investigation into the events following the celebration gives rise to the strong possibility that Carver’s Cave was, for a brief time after the Civil War, a show cave of sorts. But it hinges on your definition of a show cave. Here’s the story.

An antiquarian signing himself merely “F” (probably a Dr. Fahnestock), in a letter to the *St. Paul Pioneer*, January 31, 1867, first suggested the idea of celebrating the “Centennial Anniversary” of Carver’s visit after describing a visit to the cave that he himself had just taken:

A comfortable boat lay moored to the shore, and our Charon trimmed his lamp, and prepared to ferry us over the Stygian waters. We rather enjoyed this modern Acheron [River of Woe]. The water gradually deepens from the front, and at the furthest extremity of the cave is eight or ten feet deep, and so clear that a person sitting in one end of the boat may see the bottom, when the torch is held at the other end.... The distance from the edge of the water to the end of the cave is one hundred and twelve feet, by our measurement. To the left, near the extreme end is said to be a communication through another opening, but by the dim light of a single lamp, we could not see it distinctly enough to form an idea of its size. The water is said to communicate with the beautiful clear pool in the rear of the ale vaults in Dayton’s Cave.... Would it not be a fitting tribute to the memory of the redoubtable and chivalrous Captain [Carver], to celebrate the Centennial

Anniversary of his visit, by a gathering at the Cave, on the first day of May, 1867?

The “Charon” referred to, of course, was the ferryman in Greek mythology who escorted souls across the river to Hades. It was a figure of speech applied to other guides, as at Chute’s Cave, in neighboring Minneapolis.²



“The Carver Centenary,” as it was called, duly took place on the day indicated. The *St. Paul Daily Press* had this to say the next day (May 2, 1867):

Yesterday being the centenary anniversary of this memorable visit, Mr. Williams, the enthusiastic secretary of the [Minnesota] Historical Society—accompanied by Judge Aaron Goodrich, Dr. Fahnestock, of Philadelphia, Charles E. Mayo, Pennock Pusey, Father Ireland, Messrs. Sweeney, and others—eleven in all, paid a visit of ceremony to this once famous, but now but little heeded cavern. The party were provided with lanterns and candles, and after creeping in through the low entrance nearly covered with debris, they found a skiff ready to float them on

the subterranean lake, which now, as a hundred years ago, fills the gloomy basin of this strange cavern.... Sweeney sketched grotesque caricatures of the group of explorers—and with story, laugh and jest, an hour was whiled pleasantly away, when on emerging from the cave, we popped upon the *genius loci*, in the person of the proprietor of a ginger pop factory a few yards distant from the cave...

This account tallies with the Reverend John Mattocks' official account of the celebration:

A small boat was found moored to the shore, capable of holding a couple of persons at a time, and the visitors, two at a time, embarked, and paddled up the cavern, one rowing, and the other holding a lantern at the bow for a headlight.³

It may be that the Centenary was the inspiration for the adjacent railroad to provide, as a public service of sorts, a boat moored in the cave, as reported by the *St. Paul Weekly Pioneer*, May 27, 1869:

But even at the time of that centenary visit the mouth of the cave was nearly blocked up by the debris and fragments of stone thrown down the bluff from the quarry high above. This mass of rubbish has lately been removed by the Lake Superior and Mississippi Railroad Company, so that the whole width of the entrance can be seen, and it is their intention before long to smooth down the approach to the entrance to nearly the level of the lake in the cave, have it kept clean and nice, and

also to put a neat little craft of some kind in the lake, so that it will be a more than ever desirable place for parties of ladies and gentlemen to visit. As it is now, although the rubbish at the entrance is not yet entirely cleared away, a party in which there were several ladies found no difficulty in entering the cave yesterday and enjoying a most pleasant ride on the crystal waters of the lake. Thanks are due to Superintendent Johnson, of the Superior road, for affording facilities for the exploration of the cave, as well as to the other officers of the company for clearing away the obstructions at the entrance, and their care to not only preserve the cave but make it easy of access to visitors.... The Railroad Company intend soon to smoothly cut away most of the bluff...but thanks to them the cave and its entrance will be preserved, and made a more desirable, convenient, and accessible place of resort to pleasure parties.

Of course, there are other examples of railroad companies developing show caves, the best known being Colossal Cave in Kentucky, commercialized by the Louisville & Nashville Railroad in the late 1890s.⁴

Carver's Cave was much featured in the tourist literature of the day. *The Minnesota Guide*, published in 1869, had this to say:

The pool of water remains just as [Carver] found it a century ago, and a boat is kept there in which you can—if you have a light with you—explore the gloomy cavern to its extremity.⁵



“Sweeney sketched grotesque caricatures of the group of explorers.” Carver's Cave as it was on May 1, 1867, the Carver Centenary. Notice the boat at far end of cave.

If the railroad cleared out the cave entrance to make it more accessible to visitors and provided a boat moored in the cave lake circa 1869, does that make Carver's Cave a genuine show cave? If it does, the result is significant because St. Paul would then have two documented show caves (Carver's and Fountain), which added to the one in Minneapolis (Chute's), would make a total of three. The Twin Cities of Minneapolis and St. Paul, with three show caves, would qualify as the show cave capital of the Midwest in the Nineteenth Century.

The National Caves Association (NCA), which describes itself as "a non-profit organization of publicly and privately owned show caves," defines show caves on its website (www.cavern.com) as "caves developed for public visitation." The recently published *Encyclopedia of Caves and Karst Science*, on the other hand, under the entry "Tourist Caves," states that "Tourist caves can be simply defined as those displayed to the general public in return for a fee or other financial consideration."⁶ Carver's Cave qualifies as a show cave under the broader NCA definition, but not the stricter, monetary one.

Gary K. Soule, one of America's preeminent show cave historians, presents yet another viewpoint, which suggests the complexities behind any definition:

It is important to define what constitutes a true "show cave." A show cave can be classified as a cave where payment is made for entry, but as organized, paid instruction during "wild" trips increases this criterion becomes blurred. At least one site in the US is free, but has walkways, a shop, lighting, and guides. Clearly, this definition is not completely acceptable. In 1987 during a discussion with Russ Gurnee, we decided that while many factors must be taken into account and that there are many borderline cases, the main criterion is whether the cave has more or less fixed hours of operation that are advertised.⁷

Any discussion of the potential commercialization of Carver's Cave would be incomplete without mentioning John H.

Colwell. In this case at least, it is clear that the proposed commercialization never took place. In 1913, Colwell, who was a "member of the cave committee appointed by the Association of Commerce," led the effort to reopen Carver's Cave amid a blizzard of media attention. In the *St. Paul Pioneer Press* for January 8, 1913, we read that:

The purpose of the exploration is to lead up to building a stairway down the bluff to the entrance and then build walks inside and light the interior with electric lights so that the cave may be opened to the public and become a means of amusement and instruction.

After several false starts, Carver's Cave was finally relocated and opened later that year, on November 5, 1913. In the *Pioneer Press* the following day, we read that

Mr. Colwell plans to string lights within the cave, build steps down the bluff from Short street, build a roadway from Commercial street and, if possible, continue it around the Burlington yards to the fish hatchery and beyond to connect with the Johnson parkway and condemn land on the brow of the bluff for a little plaisance at the top of the flight of stairs. He hopes to persuade the city to do the last.

Another proposed gimmick was more unusual. The journalist Charles T. Burnley reported that:

Plans are being made to exploit it as a beauty spot and a lure to tourists. A large electric sign is to be placed high on the face of the cliff above the cave. It will be in plain view from the new Union Depot, from steamers on the Mississippi River and from a great part of the business section of St. Paul.⁸

Colwell's plans never came to fruition. He later authored a series of eight articles, "The Story of Dayton's Bluff," which appeared in the *Minneapolis Tribune* in late 1924. His articles, tucked in among glowing advertisements for "Lydia E. Pinkham's Vegetable Compound," make no mention of further plans to commercialize the cave. "Carver's cave," he concluded somewhat mysteriously, "has never been officially explored."⁹



NPS historian John O. Anfinson at the sealed entrance to Carver's Cave, February 2005. The lake inside the cave drains around the edges of the steel doors, creating the pond out front. The cave is now part of the recently created Bruce Vento Regional Park.

NOTES

1. A.R. Woolworth & N.L. Woolworth, "Carver's Cave: An Enduring Landmark on the Upper Mississippi River," IN: E.C. Alexander, Jr., ed., *An Introduction to Caves of Minnesota, Iowa, and Wisconsin. Guidebook for the 1980 National Speleological Society Convention*, pp. 50-58.
2. "Underground Minneapolis," *Journal of Spelean History* 37(2003): 54-55.
3. J. Mattocks, "The Carver Centenary," *Collections of the Minnesota Historical Society* 2 (1867): 256-284.
4. S.D. Sides, "Early Cave Exploration in Flint Ridge, Kentucky: Colossal Cave and the Colossal Cavern Company," *Journal of Spelean History* 4 (1971): 63-69, 74.
5. J.F. Williams, *The Minnesota Guide* (St. Paul: E.H. Burritt & Co., 1869), p. 41.
6. J. Gunn, ed., *Encyclopedia of Caves and Karst Science* (New York & London: Fitzroy Dearborn, 2004), s. v. "Tourist Caves."
7. G.K. Soule, "Show Caves," IN: D.E. Northrup et al, eds., *A Guide to Speleological Literature of the English Language 1794-1996* (St. Louis: Cave Books, 1998), p. 120.
8. C.T. Burnley, "Case of the Vanishing Historic Site, Or What Happened to Carver's Cave?" *Ramsey County History* 4 (1967): 8-12.
9. J.H. Colwell, "The Story of Dayton's Bluff," *Minneapolis Tribune*, November 2, 1924.

Dancing in the Cool of a Cave: Historic Social Use of the American Underground

Joseph C. Douglas
Associate Professor of History
Volunteer State Community College
Gallatin, TN 37066

One of the most significant developments in the history of American caves during the nineteenth century was the increasing tendency of Americans to view and use the environment as social spaces, that is, as appropriate places for non-utilitarian and often non-commercial cultural group activities. This paper will examine the use of caves as social spaces by focusing on the creation of dance in the environment. This pattern of interaction was strong, persisting through the disruptions of the Civil War. The conversion of caves into social spaces also cut across functional lines of usage and, like the conception of caves as curiosities, imbued the environment with cultural value that lent ambiguity and complexity to American's interactions with the environment. As Americans increasingly created industrial landscapes they simultaneously used caves as social spaces.

The cultural tendency to convert natural environments into social spaces reached beyond caves to other natural features, ranging from the resort springs of the east to the big trees of the west. Yet the social use of the environment is especially noticeable in the cave environment. The environment itself contains a sparse, condensed, historical record of human activities, and in many caves the dominant usage after the Civil War was as social and recreational spaces. Far from being limited to commercial tourist caves, this phenomenon was widespread, though commercial cave operators certainly knew about, and incorporated into their businesses, the accepted cultural practices.

Americans in the nineteenth century danced in caves, beginning early in the century and increasing in the middle and latter decades. This activity was first seen in America's earliest tourist caves but also reflected folk practices, as persons held balls and dances underground in caves that were never commercial spaces. While the upper classes who frequented early nineteenth century tourist sites like Weyers Cave and the Mammoth Cave were greatly enamored with the muse Terpsichore, the habit of dancing underground extended beyond that class to the ordinary local inhabitants of many karst regions. The activity of dancing in a cave was emblematic of the increasingly frequent conversion of natural underground spaces into social spaces. By the end of the nineteenth century the activity was common, and it

not only persisted but it was more fully developed in the twentieth century.

One of the few scholars to look at the activity, historian Ann Toplovich (1983), has suggested that the "golden age" of cave dancing lasted from the 1890s to 1940, but my research modifies her chronology somewhat. The custom of dancing in caves began and expanded between 1815 and 1860, was occasionally seen during the Civil War and its immediate aftermath, but then reached a climax between the 1870s and 1940, with some remnants of the activity continuing to our own time. More than 35 caves are suspected sites for the activity though undoubtedly many more exist which have not yet been identified in the literature or the field.

The first known dance cave in the United States was Weyers Cave in Virginia, the nation's first commercial tourist cave. While visitors to caves may have danced in caves in the late eighteenth century there is no evidence of it in the historical record. Yet by 1815, just a few years after the opening of Weyers Cave as a tourist site, one room in the cave was already designated the Ballroom (Jones, 1815; Anonymous, 1820). While the name may have originally come from the resemblance of the size and shape of the one hundred foot long and sixteen to twenty foot high, decorated, level-floored room to a built ballroom, later sources suggest that the space was indeed utilized for the social activity. In an 1820 account, an anonymous author, probably controversial naturalist Constantine Rafinesque (1820), noted that he had earlier visited Weyers Cave, where Pluto, the god of the underworld, "admits of dance and song, of beauty and fashion." An anonymous first-hand account from 1828 of one of the early illuminations of the cave, in which the site was displayed using two thousand candles, reported underground dancing during the special event. The author stated that, "[i]n retracing my steps, as far as the Ballroom, I found a number of ladies and gentlemen amusing themselves in a cotillion" (Anonymous, 1828). An 1833 account suggested that dancing in the cave was not a rare occurrence and that the space was well suited for the activity, as the author wrote that "[t]he floor is sufficiently level to admit of dancing upon it, and it is not uncommon to have balls here. The ladies are accommodated with a very convenient Dressing Room..." (Anonymous, 1833).

After attending an illumination of the cave in 1838, Methodist minister J. H. Young described the event, noting somewhat despondently that "[i]t seems people *will dance*, whether they do it under ground or above it; for even in these sepulchral regions balls have been given" (Young, 1839). Young's point about dancing both above and below was keenly observant, for by the early 1840s dances were also held at the cave hotel on the evenings after the annual illumination. J. S. Buckingham's depiction of one such dance appeared in print in 1842, in which the revelers danced all night and disturbed the repose of the English visitor (Buckingham, 1842). Still most references in the literature are to dances underground. An 1849 account of the cave mentions that dances were occasionally held underground in the Ball Room, while Bertha Mortimer's description of the cave in 1859 suggested that dancing in the cave was formerly part of the annual illumination of the cave, though apparently the event was not held that year (Anonymous, 1849; Mortimer, 1859). Still, for over forty years, tourists at times danced in Weyers Cave, establishing a pattern of use that persisted even amidst the social disruption of the Civil War.

During the Civil War, numerous soldiers from both the Confederate and Union armies visited Weyers Cave, like many other southern caves, as a welcome diversion from the monotony and terror of army life. Attracted by the cultural conception of caves as curiosities, these soldiers engaged in a variety of social and recreational interactions while underground, including, in at least one case, dancing. The lack of females was no obstacle for a group of Union Army officers and men who inspected the cave in May of 1864. According to the diary of one of the visitants, Elmer J. Barker of the 5th New York Volunteer Cavalry, the group took the military band underground with them and the men began to dance. Barker wrote, "[t]he band struck up and we all danced to the music. The men threw off their rubber coats and those who represented ladies retained theirs so we could distinguish the difference" (Barker, 1968; Reid, 1989). For pre-Civil War tourists, and for military officers and ordinary soldiers alike during the conflict, dancing at Weyers Cave was viewed as an appropriate social activity for the underground environment, in the latter case even if no female dance partners were available.

Americans looking to dance underground in the nineteenth century, like most casual visitors, were attracted to the environment in part due to its curious and sublime nature, as interpreted in American culture, and because they conceived of caves as social spaces. But practical considerations also mattered; not many caves contained the requisite features that encouraged social activities like dancing within the particular expression of the environment. Functionally, dance caves tended to have some common features.

Generally, they provided a reasonably dry shelter, contained a relatively smooth and level floor, and provided sufficient space for the activity. Sometimes, the morphology of caves Americans selected to dance in consisted of a single, wide passage or rotund room, while in other cases, like at Weyers Cave or the Mammoth Cave, the would-be dancers, or the management of the tourist site, chose a particularly suitable chamber within a more extensive cave (Hauer, 1971; Smith, 1998a). In addition to these physical considerations, caves of a moderate temperature were especially desirable dance sites, as they provided relative warmth in the winter and refreshing coolness in the summer. Visitors danced underground in all seasons, employing both a combination of cultural ideas about caves, along with specific practical requirements, to help shape their selections of suitable spaces in the environment in which to dance.

Although most of the dancing at the Mammoth Cave in Kentucky took place above ground, at the Mammoth Cave Hotel, seasonal visitors in the 1840s took to the cave for dances in the oppressive Kentucky summers. The coolness of the cave attracted many, and some of them decided to dance there. A room inside the cave was already known as the Ballroom, though there is little evidence that dances had been held there previously (Smith, 1996). Writing of his 1844 journey to the cave, knowledgeable author Alexander Clark Bullitt (1845a) intimated that the name was given for the room's potential suitability, not its past history. Yet the following year, in a letter to his newspaper, the *Daily Picayune* of New Orleans, Bullitt penned a firsthand account of a dance in a room called the Chapel, the tour party having brought the hotel band with them to provide music (Bullitt, 1845b; 1845c). In the late 1840s or early 1850s, Englishman John Palliser traveled to the Mammoth Cave and reported that visitors had engaged in an elaborate dance underground the previous season. He wrote, "[t]he young ladies had, the year before, voted it too hot to dance above-ground, and had actually planned and given a subterranean ball; choosing a very fine cavern, spacious enough, but not too large to admit of its being properly lighted, and having a boarded floor laid down for the occasion. I saw some vestiges of the arrangements still remaining; and my fair friends assure me that...they intended to give another" (Palliser, 1856). For the dancing visitors to the cave, many fundamental aspects of the environment contributed to its usefulness, and attractiveness, as a social space.

Not all cave dances in the antebellum period took place in commercially oriented tourist sites like Weyers Cave and the Mammoth Cave. Country folk turned to suitable, locally known caves to hold dances without regard to profit, often converting a former commercial space, such as a saltpeter mine, into a primarily social space. Most of these events left little

historical record, but occasionally they are referenced in newspapers or other publications. For example, an account of Big Saltpeter Cave in Missouri from 1857, after describing a room in the cave called the Ball Room, noted that a local man named Prewett “had given balls in the chamber frequently; the last was in the winter of 1850, at which time there were about eighteen or twenty persons there. They went in the morning and...arrived at home in the evening, cooking and eating in their subterranean saloon, and had a merry time of it” (Anonymous, 1857). Dunbar Cave in Clarksville, Tennessee, has a long history of dancing at the site, and although it became most famous as a commercial dance spot in the ninety years following the Civil War, local inhabitants also utilized the cave for dances in the antebellum period. One account from 1939 noted, “The large chamber, still called the Ballroom, was used for dances before the War between the States and a nearby chamber housed a saloon” (Writers Project of the WPA, 1939). There was also an area called the Ball Room in a former saltpeter cave in Perry County, Tennessee, so named because “the citizens of Perry, during the Christmas holidays, gave a ball at this place in the room, which was attended by quite a number of belles and beaux for miles around” (Anonymous, 1853). Although the author of the latter article thought the event singular, it was in fact part of a larger pattern of folk usage of the local, non-commercial cave environments for dancing and other social activities, a pattern which continued alongside the dancing associated with tourist caves after the Civil War.

From the 1870s through the end of the century there was significant growth and expansion in cave dancing in the United States, as more people engaged in the activity in more caves across a greater range. Americans danced in commercial and non-commercial caves alike, and the social usage of the environment dominated the history of many individual caves at the time. The conversion of former saltpeter mines into social spaces continued apace, with the collapse of the extractive saltpeter industry after the Civil War. At Sauta Cave in Jackson County, Alabama there were numerous social outings of mixed groups to the cave from 1872 onward. As one newspaper observed, the cave became “a place of resort for social gatherings” (Anonymous, 1872; Smith 1984). Groups of visitors viewed the cave, held picnics, and, in 1874, danced to the playing of a fiddle. One observer wrote, “[t]he young people took a few rounds in, then out of the cave, and all ‘went merry as a marriage bell’” (Anonymous, 1874). The practice of dancing underground apparently became quite common at the site over the following decades, as a 1903 map of the cave revealed a sizable alcove called the Dance Room several hundred feet inside the cave (Anonymous, 1903). At Bat/Saltpeter Cave in Newton County,

Arkansas, neighbors to the property converted the former saltpeter mine into a generalized social space. For many years after the Civil War, “the cave served as a sort of community hall; in it were held social functions from dances to revivals” (Anonymous, 1964). In Tennessee, Bellamy Cave in Montgomery County, also a former saltpeter source, was in 1884 reported to be “a large cavern with a small entrance, a place of public resort, where neighbors have picnics and balls” (Anonymous, 1884). At these three sites, as at many others, Americans turned nearby caves which had previously been valued for their saltpeter production into recreational spaces appropriate for non-commercial social activities, of which dancing was only one of several group activities.

Although this vernacular use of caves as free social spaces declined somewhat after 1900, the practice never totally disappeared, and it revived in the 1920s and 1930s. In Tennessee, for example, both folklore and material evidence within the environment suggest that Sounding Cave in Marion County and Wanamaker Cave in Grundy County were the sites of impromptu dances between 1920 and 1940, and perhaps earlier at the former. There is evidence that several other communities similarly utilized other caves, presumably in the same period, but the historical record is incomplete (Smith, 1998a; Douglas, 2003a).

Paralleling this pattern, dancing at commercial caves became an even more prominent feature of later nineteenth century tourism, followed by a relative decline between 1900 and 1918, only to be revived afterward, reaching a climax between 1920 and 1940. After the Civil War, numerous cave entrepreneurs used the cultural conception of caves as social spaces to bolster their commercial operations at tourist caves, regardless of whether they were linked to resorts or if they existed as stand alone enterprises. Here, commercial and social usages of the environment co-existed. At Nickajack Cave in Tennessee, a significant saltpeter source and the site of numerous recreational and social visits by soldiers during the Civil War, owner James W. McReynolds gave notice to the public in 1878 that commercial tours were now available and that a platform had been erected inside the cave's entrance for dancing. The activities at the cave continued through the 1880s (Smith, 1998b). After Luray Caverns in Virginia was first explored in 1878, the discoverers immediately began to convert the cave into a thriving tourist attraction. As part of their strategy, they promoted the wonders and curiosities in the cave, but they also laid down a wooden floor for dancing and promoted the site as a social space, holding the first of a series of underground winter balls on December 27, 1878 (Anonymous, 1879a, 1879b). A visitor the following year wrote that, “[a]bout the time you enter the Ballroom you conclude you do not know where you are. It is a large chamber with vaulted roof

and plank floor, and everybody that enters the cave has to come here and dance" (Anonymous, 1879c). Osceola (or Indian Cave), located in the Mammoth Cave region of Kentucky, was discovered in 1861. After the Civil War there was an attempt to commercialize the cave as a tourist site, and at least part of the lure of the cave was its suitability for dancing underground. In her written reminiscences, Mrs. M. C. Morgan (1929) remembered that "[w]e young people used to visit it, taking lunch and our string band of music, and dance for hours inside this cave." While at most of these sites dancing was only part of a tourism complex which also included tours of the particular cave, at one place, Shelta Cave in Huntsville, Alabama, cave dancing was the main activity and the focus of the effort to commercialize the environment.

Shelta Cave, named for the daughter of the entrepreneur who developed the site for tourists in 1888, Henry Fuller, was intended to be the most unusual dance hall in the state of Alabama. After purchasing the property, already known to contain a spacious cave, Fuller constructed steps into the cave entrance, built a dance floor with large stand-up bars at both ends, and installed an electric light system, the first in Madison County. Although he also offered boat rides in the cave, his main emphasis was on dancing. After a promising start, the cave dance business at Shelta Cave soon encountered financial difficulties. Despite courting members of the press in an attempt to garner favorable publicity, Fuller was deep in debt and unable to dig his way out, and in the economically unstable year 1893, after five years of operation, the venture failed. The cave was auctioned at a sheriff's sale in 1897 (Varnedoe, 1989; Snider, 1990; Carney, 1991). Despite this lack of success, other cave entrepreneurs would later also emulate the effort, attempting to create viable commercial caves that primarily featured dancing.

Between 1900 and 1920, there was a decline in casual visitation to many American caves, including some dance caves. At Kenny Simmons Cave in West Virginia, for example, the yearly Fourth of July celebrations at the cave, which featured "music, dancing, swinging[,] etc." (Hauer, 1971), ceased to be held in the early 1900s. Yet the idea of dancing in caves persisted, as seen in the 1908 opening of Crystal Cave in Missouri as a commercial cave, replete with carbon arc lamps, a wooden dance platform, and a boardwalk for touring the cave. Occasional dances continued to be held in Crystal Cave until the onset of the Great Depression in 1929 and 1930 (Soule, 1994).

Following the end of World War I, there was a remarkable surge in the creation of commercial dance caves in the United States. This development was linked to the new mobility Americans achieved using automobiles as well as the cultural obsession with dancing (Toplovich, 1983). In the 1920s, the desire to

dance underground, in the cool of a cave, was so strong that if a natural cave was unavailable, Americans turned to artificially created underground spaces. One such place was Robbers Cave in Nebraska, an anthropogenic sandstone feature converted into a tourist site. The owners, the Scarborough family, opened the cave as for picnics (for a fee) in 1906, then poured a concrete floor for dancing in the 1920s (Underwood, 1998).

But the explosion in underground dance activity was not limited to the 1920s. Americans continued to create additional dance spots underground throughout the 1930s as well, despite the hardship of the Great Depression. Making money by going into the underground dance hall business built upon existing patterns of use and represented, in part, an attempt to economically survive hard times. Thus, in the twenty years from 1920 through 1940, the practice of dancing in the cave environment peaked, though many of the establishments Americans created to profit from the activity were short-lived.

In the 1920s, several new commercial dance caves were opened to the public for the first time. At the Rockbridge near Columbia, Missouri, a short tunnel cave previously linked to industrial brewing, owner John Heibel built a resort that featured dancing and illegal alcohol. Numerous social and political functions were held at the site, and "people came from miles around to dance, drink and enjoy themselves" (Weaver, 1974). Black Cat Cave in Rutherford County, Tennessee was utilized as a restaurant and dance club at about the same time, and there too illegal booze could sometimes be found, indicating that the idea of caves as hidden spaces, never before a factor in the selection of dance sites, was at least a consideration during prohibition. Black Cat Cave continued to operate as a speakeasy until the late 1930s (Toplovich, 1983).

The 1930s saw the rise of several important new dance caves, such as Lost River Underground Night Club in Bowling Green Kentucky, which opened in 1933 and featured 7,000 feet of concrete dance floor, a large bar, and electric lighting. This popular attraction boomed in the 1930s, saw reduced visitation during World War II, but did not cease operations until the late 1950s. Bangor Cave in Alabama opened as a dance hall and night club in 1937 and acquired local fame for its dances, as well as a reputation as a gambling den. In Clay County, Tennessee, Leonard Cave was opened as a restaurant and dance hall in 1935. Called Cavern Hall, the resort lasted just over a year, until a shooting in the cave led to the demise of the commercial venture. All three of these enterprises focused upon dancing, eating, and drinking, though tours of the cave were also available (Anonymous, 1935a; 1935b; 1936; 1937; Barr, 1961; Frank, 1981; Anonymous, 1989).

Although Toplovich has suggested that dancing in caves was a particularly southern phenomena, the practice spread West before the Civil

War and continued to exist outside the South in the late nineteenth and twentieth centuries. The South did have the majority of dance caves, in part because of the abundance of adequate sites (a function of the uneven distribution of caves) as well as the moderate temperature of southern caves. While dance caves were conspicuously absent in the northeast, the social use of caves was a national trend, and one expression of it, dancing in caves, was common in the South, Midwest, and the West. Marengo Cave in southern Indiana, for example, developed into a well-known dance site, and the square dances held annually in the underground environment became notable local events (Toplovich, 1983).

Even before the Civil War, Bower Cave in California was developed as a tourist cave, including a wooden dance platform, to tap the flow of visitors to the Yosemite Valley. John Muir inspected the cave in the 1860s and marveled at its features. Muir later wrote that he had witnessed dancing in the cave, though he did not totally understand the impulse behind the American tendency to convert nature into social spaces. When Muir visited Cave City Cave in California in 1876, it also contained a large room called the dance hall, occasionally used for that purpose. Later in the nineteenth century, Malheur Cave in Oregon contained a flat floor, and nearby residents commonly used the cave for dances in the last two decades of the 1800s. Dance Hall Cave at Maquoketa, Iowa was developed for tourists and presumably hosted dances, though the chronology is unclear. As noted above, Robbers Cave in Nebraska was a dance site. During World War II, after the peak of the dance cave business, soldiers from the Army Air Corps turned a cave near Wendover, Utah into a dance site, pouring a concrete dance floor and calling the cave Juke Box Cave. Clearly, dancing in caves was widespread in the American landscape (Anonymous, 1861; Muir, 1894; Muir 1911; Horner 1928; Soule, 1989; Anonymous, 1997).

The type of dancing people engaged in underground depended on several factors, including whether the event was sponsored by tourist cave entrepreneurs or if it was just a local, non-commercial affair, the type of music employed, and the time period. The earliest dances at Weyers Cave and the Mammoth Cave usually featured music from fiddles or a brass band, and the visitors turned to the popular dances of the day. The non-commercial cave dances also featured fiddle music, but style of dancing was vernacular (Smith, 1996; Douglas, 1996).

The history of dancing at Ruskin Cave and Dunbar Cave in Tennessee highlighted shifts in dancing styles over a long period of usage. Ruskin Cave was the site of non-commercial dancing by local residents beginning in the 1880s, when a dancing area was established inside the large entrance (Anonymous, 1886). These earliest dances were folk dances. By the

1890s, the Ruskin Co-operative Association, a utopian socialist community, owned the cave and sponsored their own dances, but cultural differences with the local inhabitants were revealed in their approaches to the activity. One member of the Ruskin community later wrote, "[t]he native population used the cave for picnics and dances, as we did on the Fourth of July. We sponsored a dance in the cave that was a complete failure. Music was furnished by our orchestra, but those people would have none of it. They wanted their own hillbilly music, played in their own style. The native had what they called barn dances...our dances were quite different...We danced square and circle dances as well as waltzes, two-steps, polkas, and scottisches [sic]" (Cornwell, 1972). By the mid 1920s, when Ruskin was emerging as a resort, music for Fourth of July celebrations was provided by an African American Brass Band led by Emmett Sims. During the 1938 Grand Opening of the cave resort under new management, music was provided by Adrian McDowell's Orchestra, suggesting that the popular dances of the Big Band period were now featured at the cave, though vernacular dances may have persisted as well. After World War II, and especially in the 1960s, the style of music and dancing shifted again, towards country music and square dances, with members of the Grand Ole Opry performing at the site (Anchors, 1989).

At Dunbar Cave, styles in music and dancing also shifted over the years. The specific dances visitors engaged in before the Civil War remain unclear, though they were almost certainly folk dances, perhaps intermixed with popular styles. Between 1870 and 1895, bran dances were held in the cave, in which "bran was scattered on the floor to a depth of several inches and music was furnished by a 3 or 4 piece band," which featured African American players and fiddle tunes (Writers Project of the W. P. A., 1939). In contrast to the preponderance of folk dances in the late nineteenth century, during the cave's heyday as a commercial resort in the 1930s, Big Band music and dancing styles dominated, as nationally known musicians like Benny Goodman and Tommy Dorsey performed at the site. Like at Ruskin Cave, after World War II musical and dancing styles shifted again, also towards country music and square and round dances. Clearly, the cultural idea of cave dancing was flexible and dynamic, and Americans adjusted cave dancing to fit the needs and styles of the day. Thus caves featured a variety of musical and dancing forms, so that dancers in Leonard Cave in the 1930s hoofed to the tunes of the Kentucky Ramblers and other string bands, visitors to Black Cat Cave, another Tennessee dance site, performed the square dance, while at Ruskin and Dunbar caves the music and dances were different, yet part of the same cultural tradition. Remnants of cave dancing still existed at the beginning of the twenty-first century

(Writers Project of the WPA, 1939; Toplovich, 1983; Denning, 1993; Sellars, 1997; Anonymous, 1935c).

In the nineteenth century, cave dancing was part of a larger cultural trend towards converting natural environments, including tourist sites, into social and recreational spaces. This tendency was especially noted by naturalist John Muir, who, though he did not totally understand the impulse, placed cave dancing in a larger context. Muir wrote that "[o]ne of the first conceits excited by the giant Sequoias was to cut one of them down and dance on its stump. We have seen dancing in the spray of Niagara; dancing in the famous Bower Cave above Coulterville; and nowhere have I seen as much dancing as in Yosemite. A dance on the inaccessible South Dome would likely follow the making of an easy way to the top of it" (Muir, 1894). For Muir, the conversion of natural spaces into social spaces was obvious, yet also quite odd, in part due to his own view of caves as sublime features of the natural world (Douglas, 2003b).

When Americans turned caves into social spaces for music, dancing, and various meetings, especially after the Civil War, there did not appear to be any significant conflict between the new pattern of usage and the older patterns of utilitarian and commercial exploitation of the same environment. At Ruskin Cave, for example, dances were held at the same time the cave powered a mill, housed a commercial cannery, and provided domestic cold storage (Toplovich, 1983; Anchors, 1989; Cornwell, 1972). In fact, as already seen, commercial cave operators incorporated the cultural trend towards social and recreational usage of the cave environment into their tourist ventures to attract paying visitors.

There was a tension between social usage of caves and the concept of caves as sublime expressions

of nature which disquieted John Muir, especially as it seemed to him that the former was becoming more important than the latter. His own bent towards seeing religious values in nature was part of a long established American cultural tradition of the eighteenth and nineteenth centuries, yet he feared it would fade, while 'frivolous' interactions with the environment were growing. Describing his visit to Cave City Cave in California, Muir wrote that "[w]e were shown one large room that was occasionally used as a dancing-hall; another that was used as a chapel, with natural pulpits and crosses in pews, sermons in every stone, where a priest had said mass. Mass-saying is not so generally developed in connection with natural wonders as dancing" (Muir, 1894). Nor was Muir alone in sensing tension, as Alexander Clark Bullitt had earlier noted it, though when he wrote in the 1840s the social use of caves was still developing. Writing of the Mammoth Cave, Bullitt wrote that "[a]t the trifling expense of a plank floor, seats and lamps, a ball-room might be had...but the awful solemnity of the place may, in the opinion of many, prevent its being used as a temple of Terpsichore" (Bullitt, 1845a).

Clearly, there was some potential conflict between competing and parallel conceptions of caves, yet the tension between caves as social spaces and caves as sublime curiosities should not be overdrawn. Religious revivals, services, and meetings were held underground too, as they were social events as much as dancing, touring, or secular music making. Caves were flexible social spaces which could be used to accommodate a variety of social activities, not all of them as frivolous as John Muir feared (Toplovich, 1983; Anchors, 1989; Muir, 1894; Writers Project of the WPA, 1939).

LITERATURE CITED

- Anchors, William G., 1989, *Ruskin and Jewel Caves: A Brief History*. Dickson, Tn.: n.p., pp. 36-43.
- Anonymous, 1820, Cave in Virginia. *The Rural Magazine and Literary Evening Fireside*, p. 396.
- Anonymous, 1828, Weyer's Cave (In Virginia). *National Intelligencer*, October 25, 1828.
- Anonymous, 1833, American Caverns. Weyer's Cave. *The Family Magazine*, p. 2.
- Anonymous, 1849, Weyer's Cave. *The Independent*, November 29, 1849.
- Anonymous, 1853, A Wonderful Cave in Perry County, Tenn. *The Spirit of the Times*, May 7, 1853, p. 137.
- Anonymous, 1857, Rival to the Mammoth Cave of Kentucky. *The [New York] Weekly Tribune*, June 27, 1857.
- Anonymous, 1861, *Scenes of California*. San Francisco: n. p., n. p.
- Anonymous, 1872, [Scottsboro] *Alabama Herald*, August 29, 1872.

- Anonymous, 1874, [Scottsboro] *Alabama Herald*, August 20, 1874.
- Anonymous, 1879a, The Great Luray Cave. *Frank Leslie's Illustrated Newspaper*, January 18, 1879.
- Anonymous, 1879b, The Wonders of Luray Cave. *Frank Leslie's Illustrated Newspaper*, September 13, 1879.
- Anonymous, 1879c, The Caves of Luray. The Bones Down in Skeleton Gulch. *The [Charleston, South Carolina] Weekly News*, October 15, 1879.
- Anonymous, 1884, A Gang of Murderous Outlaws Unearthed Near Clarksville. *Knoxville Daily Chronicle*, June 8, 1884.
- Anonymous, 1886, Great Cave. *Hickman Pioneer*, September 27, 1886.
- Anonymous, 1903, Sauta Cave[,] near Scottsboro Ala[bama]. Tennessee State Library & Archives, Special Collections, Map # 611.
- Anonymous, 1935a, Scene in Leonard Cave. *Red Boiling Springs [Tennessee] News*, August 3, 1935.
- Anonymous, 1935b, Leonard. *Red Boiling Springs News*, August 17, 1935.
- Anonymous, 1935c, Dine and Dance in Cavern Hall. *Red Boiling Springs News*, August 17, 1935.
- Anonymous, 1936, Ed Dorfman Shot by Deputy Sheriff. *Red Boiling Springs News*, August 7, 1936.
- Anonymous, 1937, Dance at Bangor Cave. *Cullman [Alabama] Tribune*, June 10, 1937.
- Anonymous, 1964, Bats/Saltpeper Cave History. *Arkansas Speleological Bulletin 1*. n.p.
- Anonymous, 1989, The Lowdown on the Leonard Cave. *Macon County [Tennessee] Times*, May 25, 1989.
- Anonymous, 1997, *Salt Lake Tribune*, June 16, 1997.
- Barker, E. Eugene, 1968, Letter to Clay Perry. *Journal of Spelean History*, 1(2). p. 36.
- Barr, Thomas C., 1961, *Caves of Tennessee*. Nashville, State of Tennessee, p. 125.
- Buckingham, J. S., 1842, *The Slave States of America* Vol. II. London. Fisher, Son, & Co., pp. 391, 392.
- Bullitt, Alexander Clark, 1845a, *Rambles in the Mammoth Cave, During the Year 1844*. Louisville. Morton and Griswold, 2nd reprint ed., St. Louis. Cave Books, 1985. pp. 42, 43.
- Bullitt, Alexander Clark, 1845b, Letters from the Mammoth Cave, No. VII. [New Orleans] *Daily Picayune*, September 28, 1845, p. 2.
- Bullitt, Alexander Clark, 1845c, *Letters from the Mammoth Cave*, No. VIII. [New Orleans] *Daily Picayune*, October 1, 1845.
- Carney, Tom, 1991, The Underground Dance-Hall. *Old Huntsville* 3(10). pp. 35-37.
- Cornwell, Ilene, 1972, Ruskin! *Tennessee Valley Historical Review* 1(4). p. 28.
- Denning, Jeanette Keith, 1983, Good Times. Vacationing at Red Boiling Springs. *Tennessee Historical Quarterly* 42(3), p. 237.
- Douglas, Joseph C., 1996, Music in the Mammoth Cave. An Important Aspect of Nineteenth Century Cave Tourism. *Journal of Caves and Karst Studies* 58(3), p. 210.
- Douglas, Joseph C., 2003a, A Note on the History of Wanamaker Cave. *Tennessee Caver*, 2(3). pp. 26-28.

- Douglas, Joseph C., 2003b, The Romantic and the Caves. John Muir and the Underground Environment. *Journal of Spelean History* 37(2). pp. 37-42.
- Frank, Edward Forrest, 1981, Historic Lost River Cave. *N.S.S. News*, July, pp. 159, 162.
- Hauer, Peter M., 1971, A History of (Kenny) Simmons Cave. *Bulletin of the National Speleological Society* 33(2), pp. 87-91.
- Horner, John R., 1928, *Days and Deeds in the Oregon Country*. Portland. J. K. Gill Co., n. p.
- Jones, General Calvin, 1815, *A Description of Weir's Cave in Augusta County, Virginia*. Albany. Henry C. Southwick, p. 6.
- Morgan, Mrs. M. C., 1929, Reminiscences of Mammoth Cave. *Glasgow [Kentucky] Times*, December 22, 1929.
- Mortimer, Bertha, 1859, Weyer's Cave, No. II. *Moore's Rural New Yorker*, November 5, 1859.
- Muir, John, 1894, *The Mountains of California*. New York. Century Co., p. 334.
- Muir, John, 1911, *My First Summer in the Sierra*. Boston. Houghton Mifflin, 1911, pp. 32, 33.
- Palliser, John, 1856, *The Solitary Hunter; or, Sporting Adventures in the Prairies*. London & New York. Routledge & Co., p. 52.
- Rafinesque, Constantine, 1820, A Letter, Touching Russell's Cave, from a Tourist in Kentucky to his Friend in Philadelphia. *Western Review and Miscellaneous Magazine*, p. 162.
- Reid, Glenda H., 1989, Weyer's Cave During the Civil War. *Journal of Spelean History* 23(3), p. 40.
- Sellers, Dennis, 1991, Dunbar Cave. Social Playground to Natural Habitat. *Tennessee Conservationist* 57(2), p. 8-11.
- Smith, Janet Bass, 1996, *Saxhorns, Stringbands and Other Music at Mammoth Cave*, unpublished ms., p. 9.
- Smith, Marion O., 1984, Late Nineteenth Century Social Outings at Sauta Cave. *Journal of Spelean History* 18 (1), p. 23.
- Smith, Marion O., 1998a, *Civil War Tour for Cavers. Sewanee to Chattanooga*. Louisville, TN. Byron's Graphic Arts, pp. 19, 20.
- Smith, Marion O., 1998b, History of Selected Southeastern Caves, in Schindel, G. and Hickman, J., eds., *Journeys Through TAG. 1998 N.S.S. Convention Guidebook*. Huntsville, AL. National Speleological Society, pp. 67-70.
- Snider, Bernice M., 1990, Huntsville's First Night Club. The Dancing Cave. *Old Huntsville* 2(2), pp. 14, 15.
- Soule, Gary K., 1989, Show Caves of Canada and the United States. *Journal of Spelean History*, 23(2), pp. 12.
- Soule, Gary K., 1994, Missouri's Crystal Cave. Joplin's Crown Jewel. *Journal of Spelean History* 28 (4). p. 74-83.
- Toplovich, Ann, 1983, 'Dancing and Fiddling in the Cool of the Cave'. Dance Caves in Tennessee. *The Courier* 22(3), p. 4-5.
- Underwood, Scott, 1998, *N.S.S. News*, June, p. 160.
- Varnedoe, W. W., 1989, A History of Recorded Alabama Caves. *Journal of Spelean History* 23(3), pp. 45-49.
- Weaver, Dwight, 1974, The Devil's Icebox, 1833-1973. *Journal of Spelean History* 7(4), p. 58.
- Writers Project of the Works Progress Administration, 1939, *Tennessee. A Guide to the State*. New York. Viking Press, p. 409.
- Young, Reverend J. H., 1839, A Visit to Weyer's Cave, Virginia. *Methodist Magazine*, p. 353.

CAVE CLIPPINGS

A Wisconsin Saltpeter Reference from 1890

I found the following clipping about Wisconsin saltpeter in the *Mazeppa* (Minnesota) *Tribune* for November 26, 1890. I made some preliminary inquiries among geological and soil surveys but could find no additional information on the alleged deposit. However, this was not the first reference to saltpeter in Wisconsin. Donald Ball (pers. comm.), who along with Gary O'Dell, produced that wonderful resource, *Bibliography of Niter Mining and Gunpowder Manufacture* (2001), informed me that John C. Van Tramp's *Prairie and Rocky Mountain Adventures*, published in 1870, mentions saltpeter among the minerals of Wisconsin, but without an exact location.

A SALTPETER MINE.

Acres of Earth Full of the Nitrate and Possessing Untold Wealth.

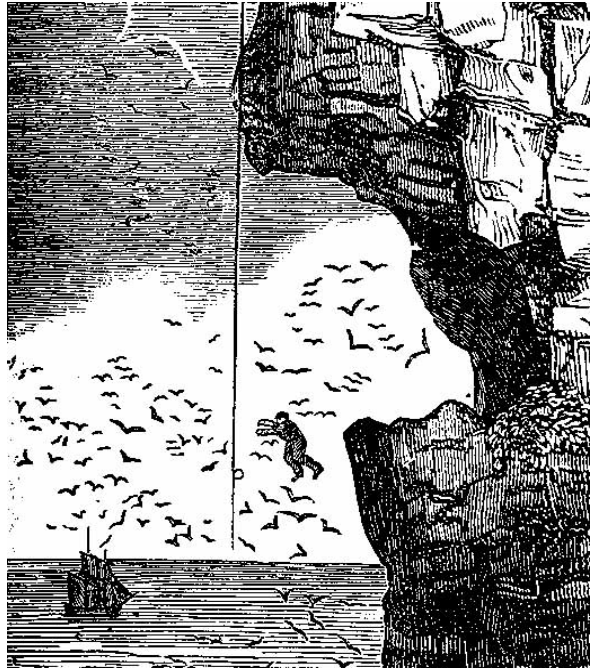
There is a substantial indication in the vicinity of Ashland of a discovery which gives promise of being productive of greater gains than iron. For some time past a man owning property on the Penokee range near Mellen has noticed that a number of deer have been attracted to the stream on his premises, and also seemed to eat the dirt on his land. He picked up a quantity of the dirt, thinking that probably it was ore, and submitted it to L. E. Dunham, chemist of the Ashland Iron & Steel Company, and Dr. John Madden for analysis. In the course of the analysis the discovery was made that the dirt contained at least 3 per cent. of pure potassium nitrate, or saltpeter. Dr. Madden considers this discovery most remarkable, and says if a large deposit is found untold wealth awaits the owner. The estimated value of the dirt as it lies on the ground is \$30 a ton, and its merchantable qualities are worth \$100 a ton.

REPRINT SECTION

Blessing the Cliffs

Until the latter part of the nineteenth century there was an evil spirit in a cave on Grimsey Island. Whenever the men there used to let themselves down over the edge of the cliff to catch sea-birds, a shaggy grey hand would come out of the cliff and cut the rope, and so kill the men who hung from it. In the end Parson Pall Tomasson blessed the cliff—or so say the people of Grimsey. This priest Pall had noticed that there were sharp ridges jutting from the cliff, against which ropes would fray; so he got the men of Grimsey to tie a rope round him and went down the cliff-face, but before he went down he had stuck a hammer in his jacket without the local people seeing it. And he gave them the task of singing psalms as loud as they could all the while he was down the cliff-face, and never to let there be a moment's silence until he gave them the signal to draw him up. As a result of this device the inhabitants of the island thought that their priest Pall had blessed the cliff, whereas he had made them sing so that they would hear nothing while he used his hammer to chip away the sharp ridges from the cliff; and since then no men have been killed on the ropes at that spot.

Stories about blessing cliffs were very common in the past, and were ascribed to the days of Bishop Thorlak the Saint, who died in 1193, and of Bishop Gudmund the Good, who died in 1237. Bishop Thorlak is supposed to have blessed several cliffs where sea-birds nest, and to have driven evil spirits out of them. When he blessed Latrabjarg in the west



country, he heard a voice say from the cliff, in words which have since become a proverb, 'The wicked do have to have somewhere to live.' Then the bishop left a small area of the cliff unblessed, and no one ever dared go down a rope there. Even so, one fool of a man did do so once; then there came a grey hand out of the cliff, and it cut the rope, and that man met with a sudden death...

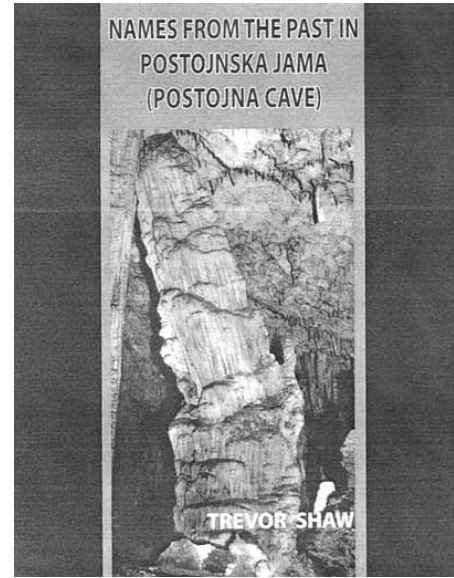
Those parts of nesting-cliffs which are said never to have been blessed are commonly called 'Heathen Cliff,' and this name is found in many places; it is thought dangerous to go down them, and nobody ever does. In some case it is elves, not trolls, that are thought to live there.

From Jacqueline Simpson, *Icelandic Folktales and Legends*, Berkeley: University of California Press, 1972. The engraving, entitled, "Perilous Adventure of a Bird-Catcher," is from Platt's *World Encyclopedia of Wonders and Curiosities* (1880).

BOOK REVIEW

Names from the Past in Postojnska Jama (Postojna Cave). Trevor Shaw. ZRC Publishing, Ljubljana, Slovenia; 2006. 7.5 by 10.5 inches, 151 pages, softbound. €16. Reviewed by Bill Mixon.

Postojnska jama, aka Adelsburger Grotte and a dozen other names or variants, has a long history as a show cave. Speleohistorian Trevor Shaw has been a Fellow at the Karst Research Institute there since 1992. His book *Foreign Travellers in the Slovene Karst 1537–1900*, published in 2000, is an interesting collection of accounts written by early visitors to the Karst. In this new book, he has cataloged 371 features or places in what is now the Postojna Cave that have been referred to in maps, guidebooks, postcards, and articles. For each place, he gives all the names that have been used. Because of the political history of the region, German, Italian, and Slovene are the main languages that have been used there officially, and many travel reports have been written in English, so these four languages are the ones covered.



When cataloging synonyms in so many languages, it is impractical to arrange them alphabetically, so the places are ordered according to their position in the cave. But there is also an alphabetical list of all the close to fifteen hundred names, from “Acqua, Grotta vecchia d” to “žrtvenik, Veliki,” with pointers to the entry in which they appear. There is also a bibliography of 138 sources, not all of those consulted, but all those containing either the first or the last known appearance of a name or variant.

If I have a more wonkish book in my library, I can't think of what it might be. The bulk of the book is of interest to only those *really* interested in the history of the Classical Karst. But the book does include a collection of thirty-two pictures of the cave, many in color. Almost all are drawings, engravings, or paintings from the nineteenth century or old photographs from the early twentieth. The book ends with an interesting collection of maps of the cave, again some in color. They range in age from 1821 to a modern map and show the use of many of the place names cataloged.