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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.

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Editor's note: material previously sent to Carolyn Cronk is in transit and will be published in the next issue of the Journal. Contributors are strongly encouraged to submit electronic copies in Microsoft Word, with minimal formatting, and with images saved as jpg, via email. Send articles to Greg Brick at Aplustre@msn.com.

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Front Cover: “The artist has depicted a terrific battle between a mushroom grower and one of the enemies that attack his crop.” From the *St. Paul Pioneer Press*, May 27, 1923. See the article on mushroom caves in this issue.

American Spelean History Association

CALL FOR PAPERS

2004 NSS Convention, Marquette, Michigan

July 12-16, 2004

This is a call for presentations for the Spelean History session at the 2004 NSS Convention. The session provides a good way to let other spelean historians know what you are doing and to solicit input to assist in your research.

The session is informal and the audience friendly. There are no requirements to provide fancy visual aids or to provide a written paper (other than an abstract to include in the Convention Program). Of course, the *Journal of Spelean History* Editor would be glad to receive any written papers for publication.

Presentations can be on any topic related to spelean history, including historical exploration of caves, historical commercial caves, early cave science, human use of caves, etc.

The session will be chaired by Dean Snyder. However, Dean has rather erratic e-mail so abstracts should be sent to Bob Hoke, who will get them to Dean and to the person responsible for the Convention Program. In addition to the abstract, Hoke (or Dean) will need to know the title of your presentation, the amount of time you will need, and what audio-visual equipment you will need. Abstracts can be e-mailed to Hoke at bob@hoke.net or mailed to 6304 Kaybro St., Laurel, MD 20707.

Your abstract must be limited to 250 words. Make sure that it is a summary of your results and conclusions, not simply an advertisement for what you are going to talk about. Properly written abstracts will be printed in the *Journal of Cave and Karst Studies* and the *Journal of Spelean History*.

If you have any questions about the session please contact Dean Snyder or Bob Hoke. Dean's address is 3213 Fairland Dr., Schnecksville, PA 18078. His phone is (610)799-5030. The deadline for receiving abstracts is **May 23** (since the final schedule and abstracts must be sent to the Convention's Sessions Chair by June 1).

The Romantic and the Caves: John Muir and the Underground Environment

By Joseph C. Douglas

While the great conservationist John Muir will always be associated in the public mind with mountains and glaciers, he was known as “John of the Mountains” after all, he was interested in other expressions of the natural world as well, including caves. Although never the primary focus of his natural studies, Muir was aware that caves were an integral part of the natural and human landscape in many regions. The cave environment, especially its geological features, fascinated him. He became conversant with a variety of cave types, as he noted limestone caves, potholes or pits, lava tubes and trenches, and ice caves and crevasses in glaciers. He was also a careful observer of how people and cultures utilized caves. He understood that American Indians used caves as sheltered living spaces, but also as places to hide, while his own culture somewhat incongruously saw caves as social and commercial spaces, and as places of wonder and beauty. His own attitude towards caves reflected his larger attitude towards nature: John Muir was essentially a romantic who sought beauty, self-discovery, and the presence of the divine in nature, and thus in caves as well. Implicit in his view was the belief that these were important spaces to be conserved, much like the high mountains and big trees of the Sierra Nevada he so valued.

There is no record of John Muir visiting caves either in Scotland as a child, nor in Wisconsin, where he came of age in the mid-nineteenth century, though it was in his youth that he developed his overpowering interest in the natural world.¹ Yet once he began his travels, in the years following the Civil War, he began to encounter caves, and, being unfamiliar with them, they piqued his scientific interests as well as his innate curiosity. Muir was both a botanist and a geologist, and the unique flora often found at cave entrances, as well as the geology of caves, appealed to him. Indeed, in his first encounters with caves he focused primarily on the entrance zone and its flora. It was during his first great exploratory excursion, a thousand-mile walk from the Midwest to the Gulf Coast, that Muir first encountered caves, fittingly in Kentucky. On September 5, 1867, he “came to the region of caves,”² near Munfordville. The first cave he saw made a considerable impression, as he found northerly ferns and beautiful mosses in the cool entrance microclimate. He declined to shimmy down the dangerous looking slippery log pole to view the cave’s interior, opting instead to linger at the entrance, collect botanical specimens, and let the beauty of the spot soak in.³

This became John Muir’s pattern in the cave region of Kentucky. It is unlikely that he actually ventured inside any of the caves he saw there beyond the entrance zone. He visited Horse Cave and the Mammoth Cave on the same day, September 6, 1867, which precluded the possibility of a lengthy visit to either. Nor did he give an indication that he saw their interiors in his writings. He described the entrance to Horse Cave, writing “it seemed like a noble gateway to the birthplace of springs and fountains and the dark treasures of the mineral kingdom.”⁴ But instead of describing the cave in detail he discussed its cultural uses; the cave provided the entire village with water, and cool relief from the summer heat. The latter, he noted, was common practice throughout the region. At the Mammoth Cave, Muir again described the entrance and its flora in detail,

contrasting Nature's divine grandeur at the sinkhole with the artificiality of the Hotel grounds. And he called the cave a "magnificent hall in the mineral kingdom of Kentucky,"⁵ yet there is no indication that he took a tour, for he left for Glasgow Junction later the same day. In a letter to his friend Jeanne C. Carr, written three days later, Muir simply said, "I have seen many caves, Mammoth among the rest. I found two new ferns at the last."⁶

So it was in Kentucky that John Muir learned that caves are an integral part of natural and human landscapes in karst regions, and there that the special environments of cave entrances first captivated him. But it was not enough to divert him from his journey, despite an offer to linger in the area, teach school, and study the "Great Cave."⁷ He continued his walk to Florida. But it wasn't long before Muir's interest in caves broadened to include the dark zone environment; this was the result of his experiences in the caves of California.

It was in 1869, during his initial summer in the Sierra Nevada range, that John Muir first encountered a California cave; he visited Bower Cave, a recently commercialized site not far from Coulterville. He briefly described the cave, calling it a "delightful marble palace" and a "curious specimen of underground scenery."⁸ Muir particularly delighted in the deep, clear, little lake, and how the cave combined "sunny outdoor brightness and vegetation with the crystalline beauty of the under-world."⁹ He called the site "ravishingly beautiful," and noted that it was already "sadly disfigured by vandals,"¹⁰ details which would only have been obvious upon close inspection. Presumably he paid his dollar and toured the interior of Bower Cave, perhaps even visiting it more than once, as he returned to the general area again a few years later. Always observant as to how people interacted with nature, Muir noted that the cave was considered another sublime wonder of the Sierras by visiting tourists, and that the proprietor had fenced the cave and controlled access. It was also a social space.¹¹ Yet if the beauty of Bower Cave held Muir's attention, it was the cave at Cave City (later Mammoth Cave and now California Caverns) that totally captivated and enthralled him.

How much Cave City Cave overwhelmed him is clear in his lengthy and glowing description of his 1876 visit there. Advised to explore the "marvelous beauty" of the cave by local inhabitants, which he "was very glad to do,"¹² Muir engaged a guide to the entrance and set off. Once inside, the party went "from chamber to chamber more and more magnificent, all a glitter like a glacier cave with icicle-like stalactites and stalagmites combined in forms of indescribable beauty."¹³ Delicate folds of flowstone draperies, and the sound of softly struck stalactites, caused the party to "linger and revel, rejoicing to find so much music in stony silence, so much splendor in darkness, so many mansions in the depths of the mountains..."¹⁴ For Muir, the candlelight journey in the dark cave strengthened his faith in Nature's immortal beauty, which plainly existed everywhere: above, on, and below ground.

At Cave City Cave Muir again observed how 19th century Americans interacted with the cave environment. It was a marvel and wonder, and a commercial enterprise, but it was also a place for social activities and rituals, like dancing, holding mass, and performing weddings. "Mass-saying," he lamented, "is not so generally developed in connection with natural wonders as dancing. One of the first conceits excited by the giant Sequoias was to cut one of them down and dance on its stump. We have also 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.”¹⁵ Muir did not really understand this cultural impulse to convert nature into social spaces, but he was cognizant of it. His own inclination was to see natural wonders, including caves, as a romantic: they were sublime manifestations of Nature’s god, and places of beauty, imagination, and self-discovery. He viewed caves as cathedrals rather than dance halls, though clearly other Americans used them as both.

When John Muir compared Cave City Cave to a glacier cave he was speaking from firsthand experience with a wide variety of cave types. Summing up his observations years later, Muir wrote, “[t]he most beautiful and extensive of the mountain caves of California occur in a belt of metamorphic limestone that is pretty generally developed along the western flank of the Sierra... Besides this regular belt of caves, the California landscapes are diversified by long-imposing ranks of sea caves, rugged and variable in architecture, carved in the coast headlands by centuries of wave-dashing; and innumerable lava tubes, great and small, originating in the unequal flowing and hardening of lava sheets in which they occur, fine illustrations of which are presented in the famous Modoc Lava Beds, and around the base of icy Shasta. In this comprehensive glance,” Muir went on, “we may also notice the shallow wind worn caves in stratified sandstones along the margins of the plains; and the cave like recesses in the Sierra slates and granites.”¹⁶

A close examination of Muir’s writings yields more details of his explorations of these other types of caves. For example, on his first trip to Mt. Shasta in October of 1874 he saw several cave and karst features, including vertical pits. In his notebook Muir wrote, “Very fine potholes. Also many caves. Some deep and laked, and are a kind of pothole.”¹⁷ Nearby, Muir explored an extensive lava tube called Pluto’s Cave. He later described it, speculating on its fiery origin, and its use by Native Americans as a shelter. He wrote, “[o]n the north side of Shasta, near Sheep Rock, there is a long cavern, sloping to the northward, nearly a mile in length, thirty or forty feet wide, and fifty feet or more in height, regular in form and direction like a railroad tunnel, and probably formed by the flowing away of a current of lava after the hardening of the surface. At the mouth of this cave, where the light and shelter is good, I found many of the heads and horns of wild sheep, and the remains of campfires, no doubt those of Indian hunters who in stormy weather had camped there and feasted...”¹⁸ While Muir noted that the metamorphic limestone belt of the western Sierra Nevada contained the state’s most beautiful caves, he observed that “[t]hese volcanic caves are not wanting in interest, and it is well to light a pitch pine torch and take a walk in these dark ways of the underworld whenever opportunity offers, if for no other reason to see with new appreciation on returning to the sunshine the beauties that lie so thick about us.”¹⁹

John Muir also observed the use of caves and rockshelters as habitation sites by indigenous peoples at the Grand Canyon, writing that “[m]any caves were also used as dwelling places, as were mere seams on cliff fronts formed by unequal weathering...”²⁰ When he visited the Modoc Lava Beds in 1874, he perceived yet another use of the cave environment by American Indians, as hidden as well as sheltered spaces. Muir first viewed the lava beds from a bluff, seeing numerous caves below. He described in detail the rugged nature of the volcanic landform, which to him seemed dark and uncanny. This landscape provided good defensive positions, which had made it difficult to capture during the recent Modoc War. Muir wrote, “[i]t consists of numerous redoubts formed by

the unequal subsidence of portions of the lava flow, and a complicated network of redans abundantly supplied with salient and re-entering angles, being united each to the other and to the redoubts by a labyrinth of open and covered corridors, some of which expand into spacious caverns...[o]ther castles scarcely less strong are connected with this by subterranean passages known only to Indians...Captain Jack's cave is one of the many somber cells of the castle. It measures twenty-five or thirty feet in diameter at the entrance and extends but a short distance in the horizontal direction. The floor is littered with the bones of animals slaughtered for food during the war."²¹ Although Muir had little respect for the Modoc people, their intensive use of this pseudokarstic environment in an attempt to preserve their lifeways caught his attention. In his notebook he wrote this snippet of poetry, referring to the late Indian war:

Indian's stone house, so called when threatened
Frightened by shells
Modoc boy, flat, round, handsome. Few families left...
Redoubt like a crow's nest²²

Because of his fascination with glaciers, John Muir examined several ice caves in the West. Writing of one of the glacial lakes on Mount Ritter he visited in 1873, Muir stated, "[b]eautiful caves reach back from the water's edge...[u]ndermined by water, the fissures filled with blue light..."²³ Examining a glacier on the other side of the mountain, he noted, "[o]n the west is a splendid frame of pure white neve, abounding in deep caves with arched openings. One of these has a span of forty feet, and a height of thirty."²⁴ Caves at the base of glaciers were the fountains of the high country, Muir suggested, as "the young rivers flow rejoicing from the glacial caves."²⁵ He reiterated this belief at Mount Ranier, where the Nisqually River "goes roaring by, gray with mud, gravel and boulders from the caves of the glaciers of Ranier, now close at hand."²⁶ Lava tubes, limestone caves, glacial caves, and sandstone shelters, Muir knew them all. Additional research may shed further light on his other cave explorations. He almost certainly visited sea caves on the California coast at some point, and he may have visited other limestone caves in the U.S. as well. Friends suggested he tour Luray Caverns while on a trip back east in 1898, but it is not known if he actually went there.²⁷ However, he did visit at least one more important cave area late in life, the Jenolan Caves in Australia.

While on his world tour in 1904 he visited the famous Jenolan Caves, which had been a popular tourist attraction in the Blue Mountains of Australia for some years. Everything about the place made a deep impression on Muir, particularly the landscape, the flora, and the caves.²⁸ In his old age, just as in his youth, he found beauty and meaning in the sights, sounds, and structures of nature, even as mediated by the interpretive conventions of the day. His description of the caves is revealing. He wrote in his Journal: "4th Jan. [1904] Went thro[ugh] 1 of the 3 caves in the forenoon, another PM & the last in evening after dinner. Walked perhaps 8 or 10 m[ile]s thru the heart of a gray marble ridge of mtn along many jewelled alleys to many jewelled halls & nooks & secret chambers, decorated infinitely with the ordinary stalactites & stalagmites etc[.] of every form and color, with many forms of crystalline stone fabrics of graceful cloth hangings in folds ineffably beautiful. These cloth-like fabrics were also translucent, & varied much in color and pattern. Chambers many small with exquisitely fine small jewels the whole

lighted with electricity, & the chambers & streets further specially lighted with lime lights by the guides. The most delicately beautiful of the stalactites grows & crystals are in chambers mostly small formed beneath broad folds of overarching stalactite material [,] this lime being then worked over and over again with constantly increasing fineness of wildness. The sweetness of tone of stone harps is wonderful. The flat sheets [are] also musical and the forms themselves of these crystalline masses gathering constellations are also musical.”²⁹

In conclusion, John Muir explored, viewed, and studied numerous caves over a period of more than thirty-five years. These were primarily in California, where he knew the caves very well, but not exclusively, as his travels in Kentucky and Australia demonstrate. He was particularly interested in the geology of cave interiors and the flora of cave entrances. He was keenly aware of the tremendous variety of caves and their important roles in natural and human landscapes. As for the latter, he frequently observed how different cultures utilized caves, though his own conception of caves mirrored his views of larger nature.

Unlike most leading conservationists after 1900, Muir rejected the utilitarian emphasis on efficient use of resources so dominant in the progressive era. Reflecting the cultural currents of the America of his youth, he was a romantic, a living link between the age of Thoreau and Emerson and the early 20th century. While many progressive conservationists scoffed at his romanticized views, they could not ignore him. His science was superior, he knew more about glaciers than anyone else, and no one had proved hardier in fieldwork. He, and a few others, kept alive, nurtured, grew, and adapted an old and deep vision in American culture of nature as sublime force, so powerful it could transform. This was of tremendous importance later in the twentieth century, with the rise of environmentalism.

John Muir wanted to preserve nature so it could bring meaning, enlightenment, and a sense of the divine to people. Caves were a part of Muir’s sublime nature, and implicit in his glowing descriptions of the underground environment is the thought that they too should be preserved. He also saw two immediate benefits to exploring caves: caves revealed the workings of the inner earth, and caves gave new perspectives on other natural environments. This in turn would lead to deeper understanding. He wrote, “[f]resh beauty opens one’s eyes wherever it is really seen, but the very abundance and completeness of the common beauty that besets our steps prevents it being absorbed and appreciated. It is a good thing, therefore, to make short excursions now and then to the bottom of the sea..., or up among the clouds on mountain-tops, or in balloons, or even to creep like worms into dark holes and caverns underground, not only to learn something of what is going on in those out of the way places, but to see better what the sun sees on our return to common every-day beauty.”³⁰

REFERENCES

1. Standard works on John Muir include Terry Gifford, ed., *John Muir: His Life and Letters and Other Writings* (London: Baton Wicks, 1996), which includes William Bade, *The Life and Letters of John Muir*; Stephen Fox, *The American Conservation Movement: John Muir and His Legacy* (Madison: University of Wisconsin Press, 1981); and Michael P. Cohen, *The Pathless Way: John Muir and American Wilderness* (Madison: University of Wisconsin Press, 1984). For an introduction to Muir and caves see Jennifer Ong, "How Well Do You Know John Muir?" *NSS News*, March 2003, p. 71. See also Sally M. Miller, ed., *John Muir: Life and Work* (Albuquerque: University of New Mexico Press, 1993) and Linnie Marsh Wolfe, ed., *John of the Mountains: The Unpublished Journals of John Muir* (Madison: University of Wisconsin Press, 1979).
2. John Muir, *A Thousand-Mile Walk to the Gulf* (San Francisco: Sierra Club, 1991) p. 5.
3. *Ibid.*
4. *Ibid.*, p. 6. See also p. 7
5. *Ibid.*, p. 7. See also p. 8.
6. John Muir Papers, Series 1, Reel 1, p. 2.
7. Muir, *A Thousand-Mile Walk to the Gulf*, p. 8.
8. Muir, *My First Summer in the Sierra* (Dunwoody, Georgia: Norman S. Berg, 1972) p. 34.
9. *Ibid.* See also p. 33.
10. Quotations from Ong, p. 71.
11. Gifford, p. 205; Wolfe, p. 191; Muir, *My First Summer in the Sierra*, p. 34; See also John Muir, *The Mountains of California* (Berkeley: Ten Speed Press, 1977) p. 335.
12. Muir, *The Mountains of California*, p. 329.
13. *Ibid.*, p. 335.
14. *Ibid.*, p. 336.
15. *Ibid.*, p. 335.
16. *Ibid.*, pp. 329-330.
17. John Muir Papers, Series 3, Reel 32, p. 4. See also p. 5.
18. John Muir, *Steep Trails* (Boston & New York: Houghton Mifflin, 1918) p. 30. See also pp. 31, 63.
19. *Ibid.*, p. 63.
20. *Ibid.*, p. 267.
21. *Ibid.*, pp. 67, 68. See also p. 66.
22. John Muir Papers, Series 3, Reel 32, p. 33. See also p. 32.
23. Wolfe, p. 149.
24. *Ibid.*, p. 155.
25. *Ibid.*, p. 295. See also Gifford, p. 212.
26. Muir, *Steep Trails*, p. 187.
27. Gifford, p. 330.
28. For Muir's visit to Australia, see Miller, pp. 286 ff.
29. John Muir Papers, Series 2, Reel 29, n.p.
30. Muir, *The Mountains of California*, p. 330.

Ben Hains: Stereo Views

By Chris Howes

Ben Hains was a professional photographer from New Albany, Indiana. He was enticed into cave photography by the Reverend Horace C. Hovey late in 1888. At that time Hovey was giving lantern-slide lectures and required new and better photographs. Hains proved more than proficient at this task and, following a lecture in March 1889, the magazine *Scientific American* proclaimed: "These are pronounced the very best specimens of subterranean photography yet produced." Hains quoted this statement on his cards with the proud title: "Ben Hains, Cave Photographer."

Hains was extremely prolific. However, while he deserved his fame, the claim that his pictures were the best ever must be considered in the context of advertising. He specialized in photography at Mammoth Cave, Wyandotte Cave, Marengo Cave, Fountain Cave (then named Cave of Fountains), and Grand Caverns (then Weyer Cave). However, Hains was also unusual in that he had a genuine interest in the caves he photographed and helped to explore in more than one of them.

Many of Hains' pictures were copyrighted by H.C. Ganter, manager of Mammoth Cave; some of these were used as postcards, while others were published as stereo cards. In addition, many books carried his photographs as illustrations. His photographic endeavor was undertaken at the right time, for flashpowder was a recent invention that Hains exploited underground; it conferred a high intensity light that for all intents was 'instantaneous,' enabling Hains to photograph moving objects such as boats on Echo River. It still produced the same 'smoke' as did burning magnesium, which occluded the scene and prevented further photography, but flashpowder gave a true advantage in that its fumes came after the exposure, not during it.

Hains is known to have produced more than 250 stereo views and he probably marketed many more. As did most commercial photographers, he numbered his pictures for ease of reference and published lists of available pictures on the reverse of his stereo cards. These lists have been used to assemble a partial list of titles, added to which are details gleaned from other sources such as published photographs and postcards. Titles in the table retain their original spellings, punctuation, and capitalization, although there may be discrepancies in different issues of cards. For example, of the cards inspected, 228 does not include parentheses around the number while later cards do, perhaps because the numbering starts again, and 240 does not end with the otherwise obligatory full point. Factors such as these may differ in other imprints and releases.

The list reveals that there are many gaps in the sequence, for example number 58, the sequence from 73 to 78, and 81 to 100 inclusive. It is possible that these represent photographs that appeared for sale at an earlier time but were later withdrawn from sale as Hains' catalogue grew. It is easier to surmise a reason for the gap in numbers from 132 to 201, representing a missing sequence between two caves. Numbering sequences like this would allow further photographs to be added for a particular site, in this case Mammoth Cave.

In the table, the first number is that which was allocated by Hains for his stereo series. A different series of numbers was used for the same photographs when they were

sold as 8in x 10in prints, this adding a suffix. For these, the first number was 0 (so that 012 was 'The Acute Angle' in 8in x 10in format).

The final column under Mammoth Cave indicates the holder of the copyright (B. Hains or H. Ganter) and the copyrighted date that appeared on the stereo card, which would be expected to be the same as the year the photograph was taken. In some instances Ganter copyrighted pictures for a second time, when he used them as postcards (thus producing two copyright dates). This principle probably applies to other views in addition to those indicated here, and has confused dating in some cases. Dates which appear in square brackets [] were not copyrighted in the cards seen; the date given here is deduced using other sources, although some have not yielded to investigation and a spread of probable dates is included (as is the case with 68, which was copyrighted by Hains but which of the four years he did this is unclear). It might be presumed that, as the sequence holds copyrighted dates of 1889 to either side of the 'unknown' date, these are also 1889. Although this appears a reasonable deduction, it may not hold true as numbers 64 and 65 were copyrighted out of sequence. This may represent a photograph taken at a later date to replace a poorer one from the same location; the number of cards available have not permitted a comparison of views to determine if the image is different. However, when multiple cards have been seen (for example, as a stereo view and a postcard) the view is identical other than cropping for presentation.

Only views from Mammoth, Wyandotte and Marengo have been included in this list and it is hoped that other researchers may be able to add information from other sites, whether of caves or not, and to help fill in the missing gaps in the sequence. It is certain that the list is incomplete. Fewer views were available from other sites and in this limited study only dates for Mammoth Cave have been given.

My thanks to Trevor Shaw for his input to this listing.

Mammoth Cave

1. Entrance – from a distance.
2. Entrance – looking down in.
3. The Iron Gate.
4. First Saltpeter Vats. (1812.)
5. Old Saltpeter Pipes. (1812.)
6. Methodist Church.
7. Heaps of Lixivated Earth.
8. Standing Rocks.
9. Martha Washington's Statue.
10. Wandering Willie's Spring.
11. The Water Clock.
12. The Acute Angle.
13. The Stone Cottage.
14. The Giant's Coffin.
15. Passage Back of Giant's Coffin.
16. "Pigeon-holes" in the Archway.
17. Bottomless Pit.
18. Fat Man's Misery.
19. The Hanging Grove.

Copyrighted

[1889]
[1889]
BH/1889
BH/1889
BH/1889, HG/1892
BH/1889
BH/1889
BH/1889
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BH/1889
BH/1889
BH/1889
BH/1889
BH/1889
BH/1889, HG/1892
BH/1889
BH/1889
BH/1889
BH/1889
BH/1889

20. The Pine Apple Bush.	BH/1889
21. Entrance to Gothic Avenue.	BH/1889
22. The Post Oak Pillar.	BH/1889
23. Stalactites in Gothic Avenue.	BH/1889
24. The Pillars of Hercules.	BH/1889
25. "Pompey.	BH/1889
26. "Caesar. "	BH/1889
27. The Gothic Altar.	BH/1889
28. Water-worn Rocks in Gothic Avenue.	BH/1889
29. The Arm Chair.	BH/1889
30. The Elephant's Head.	BH/1889
31. The Lover's Leap.	BH/1889
32. Elbow Crevice.	BH/1889
33. Exit of Corkscrew into Main Cave.	BH/1889
34. The Corkscrew (near middle).	BH/1889
35. The Corkscrew (lower end).	BH/1889
36. The Egyptian Temple.	BH/1889
37. Bacon Chamber.	BH/1889
38. The River Styx.	BH/1889
39. Dead Sea.	BH/1889
40. On Echo River.	BH/1889, HG/1893
41. Queen Victoria's Crown.	BH/1889
42. Martha's Vineyard.	BH/1889
43. The Snowball Room.	BH/1889
44. Lower Passage, opening into Cleveland's Cabinet.	BH/1889
45. Gypsum Formation. (No. 1.)	BH/1889
46. Gypsum Formation. (No.2.)	BH/1889
47. Gypsum Formation. (No.3.)	BH/1889
48. Gypsum Formation. (No.4.)	BH/1889
49. Gypsum Formation. (No.5.)	BH/1889
50. Gypsum Formation. (No.6.)	BH/1889
51. Gypsum Formation. (No.7.)	BH/1889
52. Gypsum Formation. (No.8.)	BH/1889
53. Flora's Garden. (Gypsum Formation No. 9.)	BH/1889
54. The Rocky Mountains.	BH/1889
55. Stalactites in Groghan's Hall.	BH/1889
56. End of the Cave.	BH/1889
57. Star Chamber.	BH/1889 or '92
59. Fairy Grotto.	BH/1889 or '92
60. An Alcove in Gothic Avenue.	BH/1889 or '92
61. Kentucky Monument.	BH/1889 or '92
64. Dinner in the Cave.	BH/1892
65. Head of Echo River.	BH/1892
66. Scotchman's Trap.	BH/1889 or '92

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| 67. Pillared Castle, in Gothic Avenue. | BH/1889 or '92 |
| 68. Anetta's Dome. | BH/1889, '90, '93, or '96 |
| 69. Lookout Mountain. | BH/1889, '90, '93, or '96 |
| 70. Olive's Bower. | BH/1889, '90, '93, or '96 |
| 71. The Sentinel, in Olive's Bower. | BH/1889, '90, '93, or '96 |
| 72. In the Gallery, in Olive's Bower. | BH/1889, '90, '93, or '96 |
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| 79. Serena's Arbor. | BH/1889, '90, '93, or '96 |
| 80. Gorin's Dome. | BH/1889, '90, '93, or '96 |
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| 101. White's Cave – Humboldt's Pillar. | BH/1889 or '92 |
| 102. White's Cave – The Frozen Cascade. | BH/1889 or '92 |
| 103. White's Cave – Stalactitic Curtain (No. 1.) | BH/1889 |
| 104. White's Cave – Stalactitic Curtain (No.2.) | BH/1889 or '92 |
| 105. White's Cave – Stalactitic Curtain (No.3.) | BH/1889 or '92 |
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| 107. White's Cave – Crystal Lake, showing wall. | BH/1889 or '92 |
| 108. White's Cave – Pillars of Science. | BH/1889, '90, '93, or '96 |
| 109. White's Cave – The Three Graces. | BH/1889, '90, '93, or '96 |
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| 121. Path to the Cave, looking up. | [1889] |
| 122. Path to the Cave, looking down. | [1889] |
| 123. Original House (1812, Weatherboarded since). | [1889] |
| 124. Mammoth Cave Hotel (1889). | [1889] |
| 125. Main Hall of Hotel. | [1889] |
| 126. Porth before "Cottages." | [1889] |
| 127. Hotel Yard (looking South). | [1889] |
| 128. Hotel Yard (looking South-west). | [1889] |
| 129. Entrance – from half way down the steps. | [1889 or '92] |
| 130. Exit of Echo River. | [1889 or 92] |
| 131. Looking up Green River. | [1889 or '92] |
| 132. Entrance to Dixon's Cave. | [1889, '90, '92, '93, or '96] |

Wyandotte Cave

201. Entrance.
202. Columbian Arch.
203. Gorge in Washington Avenue.
204. Banditti Hall.
205. Pillar of the Constitution. (From below.)
206. Pillar of the Constitution. (From above.)
207. Coming through the Cut-off.
208. Entrance to Pillared Palace. (Front view.)
209. Entrance to Pillared Palace. (Oblique view.)
210. Wall near Entrance to Pillared Palace.
211. A View in Pallared Palace.
212. Group of Stalactites in Pillared Palace.

213. Pillared Palace, the \$50.00 Stalactite.
 214. A Pillar in Pillared Palace.
 215. Calliope's Bower. (Roof.)
 216. Calliope's Bower. (Group of Stalactites.)
 217. The Hippopotamus.
 218. The Throne.
 219. Monumental Hall.
 220. Rothrock's Cathedral and Monument Mountain.
 221. The Auger Hole.
 222. Coming Down Slippery Hill.
 223. White Cloud Room. (Looking in.)
 224. The Bishop's Rostrum; or Pulpit.
 225. The Ball Room.
 226. The "Last Rose of Summer."
 227. Beauty's Bower. (Gypsum.)
 228. Milroy's Temple, Baily's Gallery No. 1.
235. Milroy's Temple, Niagara Falls. (No. 1.)
 236. Milroy's Temple, Niagara Falls. (No. 2.)
 237. Milroy's Temple, Niagara Falls. (No. 3.)
240. Monument Mountain, from part way up west side
 241. Hall of Ruins.
243. Rugged Pass.
 244. Frost King's Palace, showing the "Carpet Bag."
 245. Ship in Stocks.
 246. Stalactites in Hall of Representatives.
 247. The Alligator.
 248. The Turnip, in Calliope's Bower.
 249. Pillared Palace, Bunch of Curled Stalactites.
 250. Pillared Palace, Henry's Column.
 251. Counterfeiter's Trench.
 252. The Natural Bridge.
260. Hard Gypsum in Floral Hall. (No. 3.)
 261. Gypsum Formation. (No. 4.)
300. Wyandotte Cave Hotel.
361. The Photographer and his Assistant.
 362. "Road" to Wild Cat Cave.
 363. Mouth of Saltpeter Cave.
 364. Path to the Cave, looking down.
 365. View South-East from front Porch of Hotel.
 366. Below the Dam, on Blue River.

- 367. Instantaneous View of Water on the Dam.
- 368. Above the Dam, on Blue River.

- 401. Little Wyandotte, Pillar near Entrance.
- 402. Little Wyandotte, The "Peris' Prison."
- 403. Little Wyandotte, Inner End.

Marengo Cave

- 501. Statue of Liberty.
- 502. The Tobacco Sheds.
- 503. "Adams Express Co"
- 504. "The Church Organ."
- 505. Wall in Crystal Palace.
- 506. Roof in Crystal Palace.
- 507. In Crystal Palace Gallery. (West end.)
- 508. In Crystal Palace Gallery. (East end.)
- 509. The "Bridal Curtains."
- 510. The Visitor's Wonder.
- 511. Stalactitic and Stalagmitic Columns.
- 512. Hains' Alcove.
- 513. "Cave Hill Cemetery."
- 516. "Tallow Dips" in Vault.
- 517. Hovey's Column.
- 518. Tower of Babylon.
- 519. The Obelisk.
- 520. Mount Marengo.
- 521. The Golden Gate.
- 522. The "White Caps."
- 523. The Gnome's Doorway.
- 524. Cupids Net.
- 525. The Prison Bars.
- 526. Mount Vesuvius.
- 527. Garfield's Monument.
- 528. Crystal Palace-View from North End.
- 529. Washington's Plume.
- 530. The Marble Table.
- 531. Psyche's Spring.

- 591. Entrance of Old Cave.

“Terrific Battles”: Pests, Disease, and Technological Change at St. Paul’s Mushroom Caves

By Greg A. Brick

The Greeks and Romans were fond of eating mushrooms collected in woods and meadows but it was not until about 1650, in Paris, that one particular species, the White Mushroom (*Agaricus bisporus*), was actually domesticated, or cultivated. (Some have regarded this as an unfortunate choice, claiming this species is the least tasty of all. Other species were cultivated in China many years earlier.) The White Mushroom thrived on horse manure but not as well on that of other animals. About 1800, Parisians found that mushrooms could be grown in the dark, in the subterranean stone quarries that honeycombed their city, providing even temperature year round. Mushroom cultivation did not reach the United States until 1865. Beginning in 1881, there was a well-known attempt by the Mammoth Cave Mushroom Company to raise mushrooms in Audubon Avenue, the product to be served at the Mammoth Cave Hotel and shipped elsewhere.

At St. Paul, Minnesota, mushroom farming was introduced by French immigrants in the 1880s and lasted a century. Mushroom Valley was the informal name for a stretch of the Mississippi River gorge in downtown St. Paul, containing about 50 caves, originally dug in the St Peter Sandstone for sand, but later mostly used for mushroom growing.

In the early days it was often necessary to abandon a cave after growing mushrooms in it for just a few years owing to the accumulation of diseases and insects. About 1890, however, the Pasteur Institute in France developed a method for the germination of mushroom spores. A pure spawn industry began marketing disease-free inoculum, grown in milk bottles, to mushroom farmers.

An article in the *St. Paul Pioneer Press*, May 27, 1923, titled “St. Paul’s Caves Eclipse Backlot for Gardening, Except for Crop Foes,” by Jay W. Ludden, offers a unique glimpse of mushroom pathology at the St. Paul caves in the wake of these events. Ludden was clearly awed by the sheer size of St. Paul’s mushroom caves: “These caverns have cathedral-like arches, and looking into them through the dusk that conceals details and accentuates the big lines, one is reminded of etchings of the interiors of medieval temples. This impression is strengthened when at the distant end of the cave the workmen’s lamps give light as from an altar.”

“As with all gardening,” Ludden mused, “the more one goes into it, the more one is disillusioned as regards its simplicity. Pests and blights and molds confront one, and remedies are more or less difficult to apply.” But by 1923, the pure spawn technique had been adopted by local growers: “Spawn culture is a big industry of one St. Paul company, which has had at one time on the racks used for the purpose, 125,000 milk bottles containing spawn.”

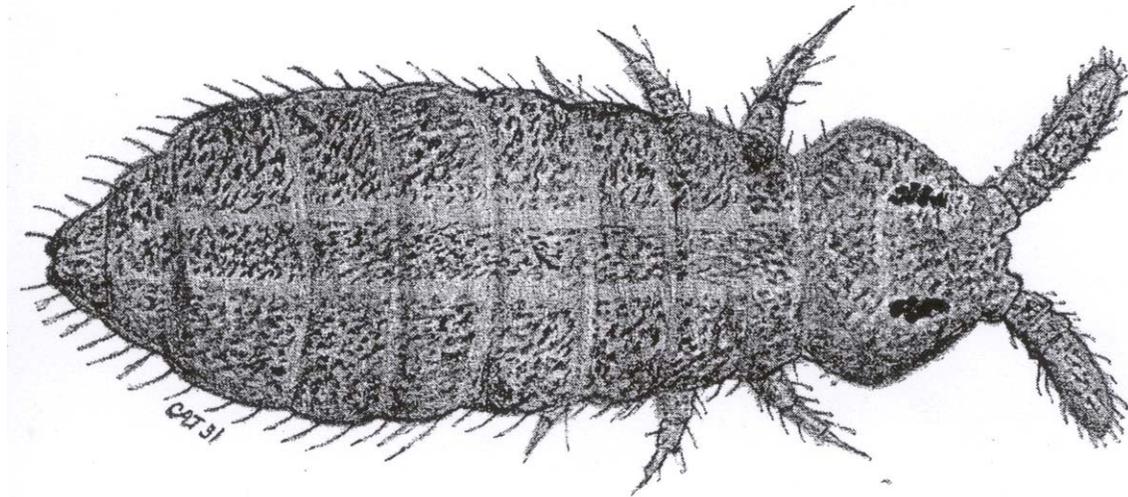
But Ludden reported that “Terrific battles are carried on in the dark depths of the caverns, victory going sometimes to the gardeners, and again to the bugs, which, microscopically, are appalling and ferocious.” The newspaper article contains an incredible image (see cover of this issue) showing a man, dagger drawn, battling an enormous manure fly inside a cave carpeted with the “ghostly blossoms” of mushrooms.

“The artist has depicted a terrific battle between a mushroom grower and one of the enemies that attack his crop,” the caption explains.

One of the standard authorities on mushroom pests, *Circular 457*, published by the United States Department of Agriculture in 1941, describes the manure fly (*Aphiochaeta albidihalteris*) as having “a hump-backed appearance. They are quite active, moving about constantly in a series of jerky runs.” While there were several control measures, such as light traps, dusts, and fumigation, the best strategy was to prevent infestation of beds in the first place. Horse manure compost was placed in the caves, allowed to “pasteurize”—also called “sweating out”—during which the temperature of the compost rose spontaneously to 145 degrees Fahrenheit, which killed or drove off most of the pests. After letting the temperature return to normal, the beds were inoculated with spawn and the mushrooms began to grow.

The adult flies themselves did not attack the mushrooms. Instead, the maggots, if pasteurization failed to kill them, ate the spawn and tunneled into the stems and caps. But the manure fly was not the only kind of fly to attack the crop. While manure flies (“little flies”) were indeed the first to appear, they were replaced later in the growing cycle by fungus gnats (“big flies”).

Ludden listed other mushroom pests according to their scientific names—often badly misspelled. “Mites, wood lice, springtails” were included. Springtails are tiny wingless insects, but they sometimes covered the floor of the cave in such great numbers as to resemble gunpowder. Also mentioned are fungal diseases of mushrooms, such as damping-off, and a “spottiness” that may have been due to mold. Just as significant is that other devastating mushroom diseases of the day, such as “bubbles” and “mummy,” were not mentioned by Ludden, so perhaps they were not important in St. Paul at that time.



**The mushroom springtail (*Achorutes armatus*),
from *Pennsylvania State Agricultural Bulletin 270* (1931).**

Another of the “crop foes” not found was weeds—at least those of the photosynthetic kind. “For the weeds grow to a height of only four or five inches,” Ludden continued mawkishly, “pale and frail, like the heroines in the old time volumes of *Select Reading for Young Ladies*, then droop and die, like one of those heroines distraught by the idea that her mother suspects her of having told her first untruth.”

Further technological changes after 1923 improved the lot of the mushroom grower. The adoption of the “tray system” in the 1930s, and the consequent disappearance of the old floor beds, was a big step forward in controlling mushroom pests. No longer could the pests seek refuge in the underlying soil during pasteurization, only to later reinfest the beds. Indeed, remains of these wooden trays form the chief diagnostic artifact of former mushroom caves in St. Paul.

A more recent newspaper article, “Mushroom Farming is Family Tradition,” in the *St. Paul Pioneer Press*, March 28, 1976, paints a portrait of Mushroom Valley in its final days. “Mushroom growing,” the farmers pointed out, “remains hard and backbreaking work because some things simply cannot be mechanized—including the picking of mushrooms.” Few members of the younger generation seemed willing to adopt the manure-based lifestyle involved. By contrast, William Lehmann, known locally as the “Mushroom King,” had already moved his operation to “the world-renowned cement-block caves of Lake Elmo” in 1965. Presumably, the more rural setting at Lake Elmo, east of St. Paul, made for lower manure transportation expenses than an operation located in the heart of a modern city. And specially designed aboveground facilities, while initially more expensive than caves, allowed for much finer tuning of environmental conditions, including the control of pests and diseases.

Food Caves Survey

There is a branch of Spelean History that does not as yet have a name. For many years, I have had an interest in beer, cheese, and mushroom caves (but especially the latter), which abound in the City of Seven Hills, as my hometown of St. Paul, Minnesota, has been called. So I will call these caves, collectively, “Food Caves,” for want of a better term. Food Caves, in this regard, are on a par with Saltpeter Caves and Show Caves as specialties within Spelean History.

At the present time I would like to solicit information from the readership regarding this type of cave. If you have any information you would be willing to share regarding such caves in your own part of the world—whether in the United States, or anywhere else—please let me know. Due acknowledgement will be given for your contributions. Greg Brick, 1001 Front Avenue, St. Paul, Minnesota, 55103, USA. Email: Aplustre@msn.com.

**Abstracts from the Spelean History Session
2003 NSS Convention, Porterville, California
Session Chair: Dean Snyder**

70 Years Under the Earth

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Seventy years ago this month, my father led me down a pole ladder into Devil's Kitchen, a spacious travertine cave in Yellowstone National Park. At that time the cave was a popular tourist attraction. Half a lifetime later, I found readily recognizable 19th Century stereo views of this cave, including two by Jay Haynes, celebrated photographer of the park. Originally called "The Mammoth Cave of Wyoming," this cave long has been closed administratively because of supposedly lethal levels of carbon dioxide. Also closed without adequate study is nearby McCartney's Cave, which may be even larger.

With new knowledge of safe exploration techniques in warm, hypercarbic caves and a need for fuller understanding of the depositional speleogenesis of various types of travertine caves, these and other travertine caves of Yellowstone National Park should be reopened to appropriate scientific study.

Charles Darwin's Interest in Caves

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The well-known naturalist Charles Darwin noted only a few small sea caves in South America during his nearly five-year trip around the world in the early 1830's. His correspondence and published writings indicate a knowledge of and interest in various aspects of speleology. Prior to the publication of *The Origin of Species*, Darwin requested information about cave-adapted species and in that book devoted two pages to the subject. He was also interested in paleontological and archeological cave sites as evidenced by correspondence and publications. Unfortunately, poor health prevented possible fieldwork in caves by Darwin after his return from his voyage.

[Note: Fred Grady's abstract was originally published in JSH 33: 17. He first delivered the paper at this year's Convention, however.]

The Romantic and the Caves: John Muir and the Underground Environment

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Although not the primary focus of his interests, John Muir was aware that caves were an integral part of the natural and human landscape in many regions. From his first ventures into Kentucky caves in 1867, in his visits to major California caves in 1869 and 1876, to his 1904 tour of the Jenolan Caves in Australia, he was fascinated by the underground environment and its features. He was well aware of the variety of cave types, as he noted limestone caves, lava tubes and trenches, potholes or pits, and ice caves at the bases of glaciers. He was also a careful observer of how cultures and people utilized caves: as living shelters and hiding places for American Indians; as social and commercial spaces, and as places of wonder and beauty, for Euro-Americans. Muir's own attitude towards caves mirrored his larger attitudes towards nature. In contrast to the growing utilitarian conception of nature as usable resources in the late 19th and early 20th centuries, Muir was essentially a romantic who sought beauty, self-discovery, and the presence of God in caves. Implicit in his view of caves was the idea that they were important spaces to be conserved, much like the big trees and high mountains he so valued.

The History of the Exploration of California's Show Caves

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The discovery of gold near Sutter Creek in 1848 triggered the famous Gold Rush which brought about 100,000 hopefuls to the Golden State. Within 12 years they had panned, sluiced, dug, and blasted 550 million dollars worth of gold from the Mother Lode area. In the process, many caves were found. Prospectors discovered California Cavern and Bower Cave in 1850, Moaning Cavern in 1851, Black Chasm in 1854, Masonic Caves in 1857, Natural Bridges in 1872, and Mercer Caverns in 1885.

The huge influx of immigrants clashed with Native American Indians, especially in northern California, resulting in more discoveries. Kok-Chee-Shup-Chee or Natural Bridge Cave was found in 1852, Pluto's in 1863, Lava Beds in 1873, Lake Shasta Caverns in 1877, and Subway Cave around 1884.

In southern California, Mitchell was found by silver miners in the 1860's and Boyden Cavern in about 1888 by loggers. These discoveries were documented by prolific Victorian writers, the most famous of which was John Muir, who visited Bower, Cave City, Pluto's, and Lava Beds.

Most caves that are now show caves were commercialized in the 20th Century, many during the Great Depression.

Cave Clippings

By Greg A. Brick

This entertaining newspaper article appeared in the Saint Paul and Minneapolis Pioneer Press, December 1, 1889. It is of historical interest mainly for its description of the commercial operations at Chute's Cave—the first and only show cave in Minneapolis, Minnesota. The other two caves mentioned in the article have not been identified with certainty. Notice that the reporter takes the view that there are many caves in Minneapolis. This contrasts sharply with what Minnesota's third state geologist, Newton Horace Winchell (1839-1914), wrote about the same time. Having completed a classic study of the post-glacial retreat of St. Anthony Falls, Winchell declared in his Final Report of 1888 that "caves are absent from the Mississippi River gorge above Fort Snelling."

Underground Minneapolis

The caves of the Flour City have never been written up to any extent. Underground Minneapolis would be an interesting theme for some scribe who has diligence and skill in making the most of material at hand. The fact is, the river banks are perforated with caves, partly natural and partly artificial. Some people, however, think that the only example of these subterranean retreats is the one known as Chute's cave, the mouth of which is in the East side mill district. This most interesting place is no longer frequented by human beings of the ordinary sort. But a few years ago not a day passed that did not bring it visitors. A stream of water ran the whole length of the cave, and for the small consideration of a dime a grim, Charon-like individual would undertake to convey, in a rude scow or a boat, all visitors, who were so inclined, for a distance of a quarter mile or thereabouts into this gloomy passage. The mouth of the cave was at the foot of a high overhanging bank. Between the sand rock and the water was quite a large level space. This was thickly covered with trees and a growth of trees and vines also pretty effectually covered the bank. At one point there was a natural terrace in the bank, and here several magnificent springs of mineral water gushed out. The erection of a little lodge, steps, swings, etc., converted this into one of the oddest watering places that was ever known so near the bustling center of a city. One soon got used to the roar of the falls right at hand. On the hottest day in summer one might sit in this peaceful retreat, and, with the great elms murmuring overhead, and an occasional cloud of mist blowing in his face, keep as cool as a cucumber.

Another interesting cave is half a mile or so further down the river. This cave has several passages and some very queer echoes. The place has been put to all sorts of uncanny uses in the last dozen years. One very cold winter a band of toughs and thieves were located there, and they made a subsistence by systematic stealing in various parts of the city. They conducted their operations with a good deal of wise forethought, and it was quite a time before they were routed out by the police and the depredations stopped. The cave used to be quite a rallying place for the university students a few years. One year an epidemic of cussedness seems to have swept over the institution, and it found

vent in a series of hornings. One of the boys, who, by the way, is now a staid business man, was telling the other day how it all went. He had a lively remembrance of the night they horned Prof. Peckham, one of the university instructors of undoubted ability, but somewhat lacking in sweetness of temper. There was a heap of bricks in front of the professor's house, and with these as missiles the eminent scientist sallied out upon his tormentors. The combat was exciting. The professor grappled with some of his adversaries and they rolled in the dust together, the horrible clamor of the horns rousing everybody but the single sagacious policeman in the whole neighborhood. And when the battle was over those misguided youth repaired to the cave to bind up their wounds and enjoy the rest of the night's entertainment.

Still further down the stream there is an interesting grotto that must have been formed when the river was considerably higher than it is now. There are several passages and one good-sized room. But of course the greatest thing in the way of subterranean passage is the great sewer which passes under the most thickly populated portion of the city. In time it is pretty likely that underground Minneapolis will receive a substantial addition in the way of one large conduit, passing under the street to receive all telephone, telegraph and other wires that now have to be strung on poles. The problem of transportation has not grown so pressing in Minneapolis that people begin to look underground for a solution of it.

The next clipping, obviously fabulous, was published in the Pittsburgh Gazette, May 19, 1818, and republished by the Minnesota Historical Society in 1948. Several years ago I had my own encounter with a "monster" in Carver's Cave. I entered the cave to record water-quality data when I heard a splash far back in the lake that fills the cave. I assumed it was a rock fall. When I heard a second splash, I concluded there was something in the cave with me. After the third splash, I glimpsed an irritated beaver swimming about. On a subsequent visit, I found a beaver's "lodge" of sticks resting on the sand beach just inside the steel door that partially seals the cave's entrance. But the beaver was never seen again!

The Monster of Carver's Cave

Returning from the Indian hunting ground situated near the mouth of the St. Peter's [Minnesota River], I had occasion to go ashore at a rock which forms the cave, mentioned by Carver. Our attention was attracted by a noise, resembling the bellowing of a Buffalo; we immediately proceeded in search of the object, and at the mouth of the cave, encountered a serpent of prodigious appearance, probably fifteen feet long, and proportionately thick, with four short legs, resembling the alligator; his head was disproportionately large, with glossy eyes, situated towards the back of the head; the back was of a shining black, covered with strong, and apparently impenetrable scales; the belly variegated with different colours; its tail, on perceiving it, was coiled on its back, except when it beat the ground, which was also accompanied by bellowing. The whole party stood with muskets cocked, transfixed with terror, until it quietly glided into the cave.

All members are invited to contribute material to the "Cave Clippings" department!

News Item

Contributed by Gary K. Soule.

From the *Hart County News-Herald*, September 9, 2003, pp. 1, 2.

William T. Austin died Sept. 2

William Thomas Austin, 75, facilitator of science in the Antarctic, of cave conservation all over the U.S., and of long-term improvements in his home town of Horse Cave, died Tuesday, September 2, at T. J. Samson Community Hospital, Glasgow.

Born in Louisville, he was the son of Joseph William Austin and Mary Thomas Austin.

After serving in the U.S. Army in 1946, he graduated from the University of Kentucky in Lexington, where he received a bachelor's degree in 1951, in Civil Engineering. After college, Bill returned to Horse Cave and used his engineering skills to improve the lighting circuits in Mammoth Onyx Cave and to install the first high-voltage lighting distribution system in Kentucky in Floyd Collins' Crystal Cave. Hidden River Cave in Horse Cave, owned by Bill's family, had been Kentucky's first cave to be lit with electricity. Bill was a pioneer in the field of 35 mm U.S. cave photography, and his photographs helped bring national publicity to Floyd Collins' Crystal Cave which led to the creation of the Cave Research Foundation (CRF). CRF explorations in the 1960's and 1970's culminated in the discovery of a connection between Floyd Collins' Crystal Cave and Mammoth Cave, making it the world's longest cave system.

Bill brought the first high-speed water jet propelled boat to this country from New Zealand in the late 50's, and later organized the only successful trip up the Colorado River to demonstrate the boat's propulsion capabilities. In his work with the National Science Foundation in Washington, D. C., Bill was Program Engineering Officer, and later worked in the field, helping in the design and construction of Antarctic stations.

After returning to Mammoth Onyx Cave in 1972, Bill devoted the next two and half decades working with others to successfully clean up Hidden River Cave in Horse Cave which had, by that time, become heavily polluted. He was instrumental in persuading the American Cave Conservation Association (ACCA) to move their national headquarters from Richmond, VA, to Horse Cave, to help with the project, and to establish a museum and educational center.

Bill and his wife, Judy, brought vision, determination, and enthusiasm to their efforts, which included the founding of Horse Cave Theatre, a non-profit professional theatre, and the creation of their pet project, Kentucky Down Under, a 75-acre private Australian theme park. Their involvement brought a host of economic benefits to these entities and others in the region.

He is survived by his wife, Judy Austin, Horse Cave; a son, Joseph Austin, Thompsons Station, TN; two daughters, Virginia Austin, Washington, D.C., and Mary Austin, M.D., and her husband, Stephen Hodges, Nashville, TN.

Visitation was held at Winn Funeral Home in Horse Cave on Friday, September 5, 2003, from 5:00–7:00 PM (CDT). In lieu of flowers, the family suggests that nay memorial contributions be sent to the American Cancer Society.

BOOK REVIEW

Mammoth Cave and the Kentucky Cave Region, by Bob and Judi Thompson. Arcadia Publishing, an imprint of Tempus Publishing, Inc., 2 Cumberland Street, Charleston, South Carolina 24901, 2003. ISBN 0-7385-1514-0. 6 ½ by 9 ¼ inches, 128 pages, softbound. \$19.99. **Reviewed by Gary K. Soule.**

This interesting book is part of the “Images of America” series that celebrates the history of neighborhoods, towns, and cities across the country. *Mammoth Cave and the Kentucky Cave Region* is every show cave historian’s dream. If you are looking for modern, full color photos of the show caves of Central Kentucky, this book is *not* for you. Any number of these more common books is available. This book is different. What this book *does* offer is a remarkable window into the historic past through the use of nearly 200 vintage, black and white, archival quality photos. These photos cover about 15 different show cave operations. No photos are more recent than 1941 and some go back to the 1800s. Many of the caves are no longer in operation.

The authors, Bob and Judi Thompson, have done a remarkable job in tracking down and researching the history of these rare photos. Some have never been published before. If you want to see how the caves and surface features were at one time, this is one book that will not be easy to put down once you start to examine it. They say a picture is worth a thousand words, and despite a nice two-page introduction and ample, fact-filled captions, the book is essentially a fascinating, photographic essay of the early evolution of the show caves. Featured are surface buildings and early hotels, transportation to the caves, early cave guides and tour groups, underground trails, features prior to any cave development, and a whole lot more. Imagine, for example, looking at photos depicting the entrances to both Mammoth Cave and Lost River Cave before any observable developments ever took place. Or an 1889 photo of the Snowball Dining Room in Mammoth Cave before it was ever made into a dining room.

Interested in early Mammoth Cave guides? A series of 17 unique photos starting with an 1865 photo of cave guides Mat and Nick Bransford, are featured. Another 15 historic photos cover the Floyd Collins tragedy. A 1925 photo of Bee Doyle in Sand Cave is included, as are photos of the body of Collins. Doyle, the owner of Sand Cave at the time of the tragedy, is shown holding the rock that trapped Collins.

But let’s go back even further in time. The authors have tracked down and published the *very first* underground photos ever taken in Mammoth Cave and the area. The year, you ask? 1866. They point out in the introduction that magnesium was used to light caves at that time, followed by flashpowder in 1891 and flashbulbs in 1931.

If you want to see the earliest Mammoth Cave Hotel and grounds photos, subsequent hotels, stagecoaches, the boat Leona at the Mammoth Cave landing, an automobile at the Mammoth Cave Hotel in 1910, and at least eight photos on the Mammoth Cave Railroad, not to mention the “cave mummy,” it is all here, and more! Even the “cave donkey” is shown, as well as the CCC camp near the New Entrance.

By now, if you are wondering what other caves are shown, they are as follows: American White Onyx Cave, Diamond Caverns, Dossey Domes Cavern, Hidden River Cave, Lost River Cave, Dixon Cave, White’s Cave, Ganter’s Cave, Indian Cave, Mammoth Onyx Cave, Floyd Collins’ Crystal Cave, Colossal Cavern, Sand Cave, Great

Onyx Cave, and Collins' Onyx Cave. As you have probably guessed, most are ex-commercial caves, so photos of this earlier time period are a national treasure.

Bob Thompson, the primary researcher, has for over a decade collected the history of the Mammoth Cave area, and searched deep into numerous libraries. These include the Western Kentucky University in Bowling Green, Kentucky; the Filson Historical Society in Louisville; and the Ekstrom Library at the University of Louisville, Kentucky, to name a few. Bob, a member of the NSS, is a noted speleohistorian. He has extensively researched early Mammoth Cave guides and little-known show cave history. He has assembled an extensive Mammoth Cave area postcard collection. He then researched the history of the postcards. In his book he has reproduced parts of a number of rare, ex-commercial cave brochures, including Colossal Cavern, Dossey Domes Cavern, and Collins' Onyx Cave. The latter cave is not to be confused with Floyd Collins' Crystal Cave, which he also reproduced. Due to his extensive documentation of numerous aspects of Kentucky cave history he received the Peter M. Hauer Spelean History Award at the 2001 NSS Convention at Mt. Vernon, Kentucky. Bob and his wife, Judi, live in Maineville, Ohio.

If nothing else, cavers should at least take a glimpse at this book, as it will sell itself! It is a welcome addition to any caver's library, not to mention the general public.