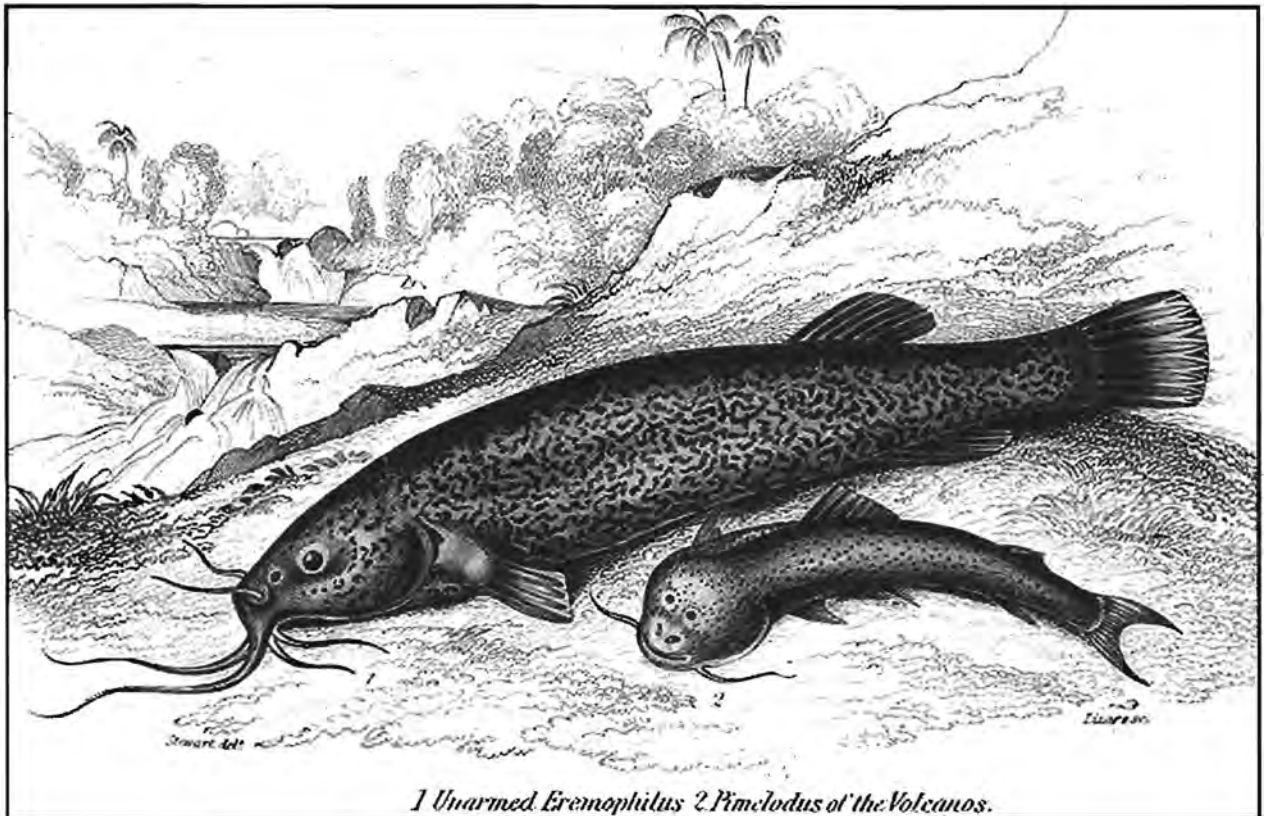


The Journal of  
**Spelean History**  
OFFICIAL PUBLICATION OF THE AMERICAN SPELEAN HISTORY ASSOCIATION



Volume 35, No. 2

July - December 2001

# THE JOURNAL OF SPELEAN HISTORY

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The American Spelean History Association is chartered as a non-profit corporation 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 of \$8 are due January first of each year. Meetings are held in conjunction with the annual convention of the National Speleological Society and sometimes at West Virginia's Old Timer's Reunion.

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Schomburgk's interpretation of the "Pimelodus of the Volcanos."

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Submitted by Bill Mixon

*Foreign Travellers in the Slovene Karst 1537 - 1900.* Trevor R. Shaw. Založba ZRC [ZRC Publishing], Ljubljana, Slovenia; 2000. 20 by 27 cm, 244 pages, softbound. ISBN 961-6358-12-X. \$14.20. May be ordered by Mastercard or Visa for an additional \$3.90 for surface postage from Založba ZRC, PO Box 306, 1001 Ljubljana, Slovenia; zalozba@zrc-sazu.si. Also available from Speleobooks; see [www.speleobooks.com](http://www.speleobooks.com) or inquire at [speleobooks@speleobooks.com](mailto:speleobooks@speleobooks.com).

Trevor Shaw is well known to cave historians or, if not, certainly deserves to be for his monumental history of cave geology. He received the Peter M. Hauer Spelean History Award in 1985. In recent years he has been spending a lot of time at the Karst Research Institute of the Slovenian Academy of Science and Art, and he has published numerous articles in its journal *Acta Carsologica* and elsewhere. For this book he has tracked down written reports on visits to the Classical Karst and nearby karst features in what is now Slovenia by eighty-eight foreign travelers. Geologists whose principal purpose was to visit and study the caves are not included. The list is limited to people who visited the features as incidents of touring or business travel.

Initial chapters describe the methods and conditions of travel during the period and give modern descriptions of the features mentioned by the travelers. The bulk of the book contains, following brief introductions, the reports of their visits, some taken from diaries and similar sources and previously unpublished. Reports published in book form in English are generally reproduced in facsimile; others are newly typeset after being translated, if necessary, into English. Shaw has omitted some repetitious descriptions of cave formations, but has preserved information illuminating the management of the attractions during the period. The earliest report is a translation of a Latin poem about the Cerknisko jezero, the polje lake at Cerknica, that was published in 1537. That lake was the main karst attraction in the area before the nineteenth century, when Postojnska jama, the show cave at Postojna, took over. It is interesting to read about the fees for tours at Postojna, with separate charges for admission, guides, and illumination, which consisted of hundreds to thousands of candles, depending on how much the traveler was willing to spend. Many travelers also recorded their impressions of the desolate landscape of the Classical Karst.

Some visitors recorded here are well known for other reasons. Among the earlier ones are the chemist Humphry Davy, the calculator designer Charles Babbage, and Roderick Murchison, the geologist who first identified and named the Silurian and Devonian series of rocks. Later ones include Thomas Cook, who gave his name to the expression “Cook’s tour,” and Sigmund Freud, who, true to form, concluded that the guide’s interest in caves was an “erotic substitute,” especially when the statement was elicited from him that, “It’s like a virgin; the further one goes the nicer it is.”

Shaw has tracked down contemporary portraits of an impressive percentage of the writers. Other illustrations include numerous old maps, drawings, and paintings of the caves and other features. The one thing I miss in the book is more in the way of modern maps to clarify the locations of the features and things like the courses of the Pivka and Reka disappearing rivers. The only modern map is a small scale sketch of the roads taken by the travelers before the opening of the Vienna-to-Trieste railroad, and it does not show most of the important places. Shaw does include the famous 1573 map that includes the name *Karst* and shows rough locations of Postojna (as Adelsperg) and the Cerknisko jezero (as Cyrckniczer see).

To avoid distractions, Shaw has not footnoted unusual place names and distance units in the main text, but one appendix lists the ways each feature was named in several languages, with variant and misspellings. Another gives the modern equivalent of old units; for instance, the German mile was about equal to five English miles. Then there are 422 endnotes, a short summary in Slovene, and an index. The whole is very well produced, the only eccentricity being use of guillemets. I guess that reflects a difficulty in finding a font with both English quotation marks and the necessary letters to print Slovene names.

Altogether an enjoyable book, and an excellent model for someone to follow in putting together a similar book on, say, Mammoth Cave, although a Mammoth Cave book probably shouldn’t be limited to foreign travelers.

# RECONSTRUCTION OF THE GEZIRA GROTTA CAIRO, EGYPT

by William R. Halliday

In May 2001 I had a chance to revisit the deteriorated Gezira Grotto, (aka Aquarium Grotto, Fish Grotto) in the fashionable Zamalek District of Cairo. Previously I had reported on this artificial pleasure grotto and its history in *JSH* Vol. 33, No. 2, April - June 1999, p. 41. This time I found it undergoing an extensive renovation. Piles of construction materials occupy large portions of the adjacent park and much rubble clearly has been removed. Some sections of the more remote parts of the complex now have a different shade of concrete, and attractive handrails are apparent in some areas.

On the other hand, multilingual KEEP OUT signs have appeared in several entrances and I could not get a good enough view to see how many of the once-celebrated pseudospeleothems have fallen prey to the gutting now in progress. Immediately after my first hurried flash photo (taken through an entrance with a wire fence, but a KEEP OUT sign in Arabic only), a guard appeared from the shadows and politely said "No Photos!" His English and my Arabic were inadequate for me to learn the reason, nor the purpose of the reconstruction. My slide is overexposed, but shows that some of the pseudospeleothems still are present, however, and a row of pseudostalagmites over another entrance still is intact.

I was told later by a resident of Cairo that the grotto is being rebuilt as a restaurant, and it should be very popular when completed in a year or so. Let us all hope that it regains its once-delightful spelean atmosphere.

# HUMBOLDT'S ALLEGED SUBTERRANEAN FISH FROM ECUADOR

by Aldemaro Romero & Kelly M. Paulson

## HUMBOLDT AND HIS REPORT

Friedrich Wilhelm Heinrich Alexander von Humboldt (b. Berlin, Germany, 14 September 1769; d. Berlin, 6 May 1859) was one of the most respected scientists of his time. Humboldt made enormous contributions to geography and natural history and could be considered the last great polymath of the natural sciences. His travels of exploration through the American continent and central Asia are among the most famous scientific explorations ever. Even Charles Darwin felt greatly influenced by him (Brent 1981: 98).

Among the many contributions made by Humboldt there is a paper, "Dissertation on a new species of pimelodid, thrown out by the volcanoes of the Kingdom of Quito" (*Memoire sur une nouvelle espece de Pimelode, Jetee par les volcans du royaume de Quito*) (Humboldt 1805). There, after describing volcanoes in general, he claims that among the things they spew forth are an "innumerable quantity of fish" (*une innombrable quantite de poissons*). Further, he says that although he had not witnessed this phenomenon himself during the year he spent in Quito, "volcanoes vomiting fish is such a common phenomenon, and so well-known among all the local inhabitants, that there can not be the slightest doubt of its authenticity" (*les poissons vomis par les volcans sont un phenomene si commun et si generalement connu de tous les habitans de ce pays, qu'il ne peut pas rester le moindre doute sur son authenticite*).

His sources were the archives of small villages around Cotopaxi, where he sometimes came upon notes regarding fish that came from the great depths of the earth. Some went into greater detail: the rotting fish strewn across the earth created a great stench; fish were enveloped in volcanic mud. Some natives assured him that sometimes the fish would still be alive after their trip through the hot core of the volcano, through the air, and then onto the ground.

He goes on to describe a new fish species, *Pimelodus cyclopus* known today as *Astroblepus cyclopus*. Other synonyms include

*Cyclopium chimborazoi* and *Astroblepus chimborazoi*. This species is known in Ecuador as Prenadilla (“the little pregnant one”).

#### SCHOMBURGK’S POPULARIZATION OF THE TALE

Humboldt’s publications, which he financed himself, were very limited in the number of copies printed. Thus, his report of this fish did not achieve full notoriety until it was summarized in the English literature by Robert Hermann Schomburgk (b. Freyburg am der Unstrut, Saxe-Albertine, Germany, 5 June 1804; d. Schoneberg, near Berlin, 11 March 1865). Although German-born, he would later become British and famous for his explorations of the then British Guiana from 1841 to 1895 as well as those of the British Virgin Islands, Santo Domingo (today the Dominican Republic) and Southeast Asia. His most famous ichthyological work was his *Natural History of the Fishes of Guiana* (Schomburgk 1841-43). There, he gives Humboldt’s fish an English name: “The Pimelodus of the Volcanoes” and summarized Humboldt’s tale by stating that:

The singular fact in the history of this fish is, that from the volcanos in the vicinity it is, during the periodical eruptions, discharged in thousands; and in a state so perfect, as to show little mutilation either from scorching or from the effects of the hot water with which it is discharged. Baron Humboldt states, that in turning over the records kept by the small villages in the vicinity of Cotopaxi, he found mentioned, that, on the lands of the Marquis Selvalege, so large a quantity was thrown, that a putrid odour was spread over the country. The almost extinct volcano of Imbaburu, in 1691, discharged thousands over the plains surrounding the village of Ibarra, and the miasmata which occurred from them, fevers were attributed; and from another volcano, in 1698, thousands were also thrown, encased in algamaceous balls. Humboldt is of opinion that these volcanos contain subterranean lakes, from whence the supply is afforded, the numbers in the little rivulets around being comparatively small; he adds, many of these rivulets may communicate with these subterranean caverns; and that the first Pimelodi which have stocked them must have ascended against the stream.”

#### MYTH AND REALITY

Obviously no fish can be “vomited” by volcanoes. The temperature alone (ca. 1,500° C) would disintegrate any living organism. As

Schomburgk states in his narrative, Humboldt went into great pains in trying to explain this phenomenon. His explanation may have been influenced by stories made popular by Athanasius Kircher (1602-1680) whose highly speculative, and often wrong, interpretations about subterranean waters were very popular into the eighteenth century (Romero 2000).

Having said that, though, the fish that Humboldt described from the rivers around Quito is not only real but it has also been found in caves. At the British Museum of Natural History in London, there is a specimen of *A. cyclopus* catalogued as BMNH 1977.5.24.13 collected in a cave north of Puyo, quite far away from the localities mentioned by Humboldt. Cave individuals of the genus *Astroblepus*, whose species has yet to be determined, have been cited as occurring in Peru (Vilchez Murga 1968, Ribera, & Belles 1984). Also, two troglobitic species of the genus *Astroblepus* have been formally described: *A. pholeter* by Collette (1962) in Latas, 4 km north of Archidona, Napo Province, eastern Ecuador (again far away from Humboldt's localities and *A. riberae* by Cardona, & Guerao (1994) for Peru. *A. cyclopus* has also been reported in rivers of Colombia.

Therefore, Humboldt's account of these subterranean fishes being spewed from volcanoes can be considered more a myth than a fact based on local legends. These types of accounts are not unusual in the literature (see Romero 1999a, b, 2000; Romero & Lomax 2001), and represent styles of scientific reporting typical of times when facts were not necessarily checked before being published.

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PIMELODUS CYCLOPUM



Humboldt's original illustration of "*Pimelodus cyclopum*"

## KARST FEATURE IN BOSWELL

Asked by Bill Mixon

Never being one to shrink from fat books, I've been slowly reading my way through the unabridged Boswell's "Life of Johnson." (Amusing story: When I was looking for a copy to buy, inquiry at the service desk at one large bookstore got the response, "This is about LBJ, right?" So much for book clerks being knowledgeable about books). In it, for Monday, 22 September 1777:

I recollect a very fine amphitheatre, surrounded with hills covered with woods, and walks neatly formed along the side of a rocky steep, on the quarter next to the house, with recesses under projections of rock, overshadowed with trees; in one of which recesses, we were told, Congreve wrote his 'Old Bachelor.' We viewed a remarkable natural curiosity at Islam; two rivers bursting near each other from the rock, not from immediate springs, but after having run for many miles under ground. Plott, in his 'History of Staffordshire,' gives an account of this curiosity; but Johnson would not believe it, though we had the attestation of the gardener, who said, he had put in corks, where the river Manyfold sinks into the ground, and had caught them in a net, placed before one of the openings where the water bursts out. Indeed, such subterraneous courses of water are found in various parts of our globe. [Islam was an estate near Ashbourne.]

Does anyone know where this is in contemporary terms? Has such a connection been proven by dye or otherwise?

Answered by Jenny Potts

A friend has just passed on to me your query from the cavers digest about the water tracing at Ilam in Staffordshire.

The river is now called the Manifold and the little village is Ilam. The Hall with its grounds is still there, (including Congreve's recess with its stone bench) though part was knocked down some years

ago and the remaining buildings, owned by the National Trust, are now a Youth Hostel. During the building of the Hall and laying out the grounds, the walks were constructed alongside the river, opposite the “amphitheatre” mentioned by Boswell, and have considerably altered the risings.

The risings must have originally come from the base of the small cliff, (Boswell’s “rocky steep”) but the walk was built up along the base of the cliff and now bridges the risings, which emerge through arches. Also a weir was built at the downstream end of the walkway to raise the water level and this created a deep pool about a mile long so most of the risings are now below water level. Hence it’s impossible to see what was originally there or how the springs may have been diverted, although there are actually more than the two Boswell refers to.

In the summer the River Manifold is dry for most of its course between Wetton Mill and Ilam. The River Hamps, which flows into the Manifold a few miles above Ilam, is also dry between the village of Waterhouses and its confluence with the Manifold. The Manifold usually flows most of the way in the winter, although the Hamps remains dry in all but the wettest weather. Heavy rain in the catchment area can produce a flash flood, even in summer, when a wall of water can be seen roaring down the dry river bed - quite spectacular if you are ever lucky enough to see the phenomenon.

There are a number of risings in the river where it flows through the grounds of the Hall and I did a series of very successful water tracing experiments here in 1971. I investigated a number of different sinks in the beds of the Rivers Manifold and Hamps and also some other known sinks in the area. I knew about the Boswell “connection” and also that someone in 1926 had successfully repeated the experiment with coloured dye and an article about this had appeared in the Times newspaper in 1927. (Corks would not have come through as the risings were floored with silt and fine gravel by 1926). All my results are written up in the Journal of the Orpheus Caving Club, Vol. 5, 1981, pp. 33-38. My piece is part of a whole series of articles about the Manifold Valley, its geology, hydrology, caves and underground water courses, cave diving at Ilam, etc.

A further series of tests investigating yet more sinks in this very complex area were done in 1987 and 1988 by Pete Mellors, using

lycopodium spores. (In the years between 1971 and 1987 the gravel and silt had been cleared from the risings by cave divers who followed the underground water course upstream for quite a distance). All Pete's results are written up in the Derbyshire Caving Association Newsletter, No. 71, August 1989, pp. 2-9.

## SALTPETER - A PHILATELIC HISTORY

By Thomas Lera

Niter, also known as saltpeter, is a white, translucent, lustrous mineral composed of potassium and nitrate ( $\text{KNO}_3$ ). The archaic spelling "saltpetre" refers to the nitrates mined from caves. In the United States, it occurs in loose soil of the limestone caves of the Kentucky - Tennessee Valley as well as in the Mississippi Valley. It is formed in warm climates by bacterial action during the decomposition of refuse and guano. Where people and animals live in close proximity, debris accumulates in and around their homes. The contact between this putrefying material, plus alkaline soil, plant ashes, air and moisture allows for "nitrification," which is the conversion of nitrogen compounds into nitrates, which penetrate the soil. The key criterion for nitrate deposits in caves or rock shelters is the presence of any kind of forest growing above them.<sup>1</sup> Grassland soils retain nitrogen within the soil-root zone and use nitrogen immediately. Forest soils have lower nitrogen retention so the nitrates more easily leach out to infiltrate the cave environment below.<sup>2</sup>

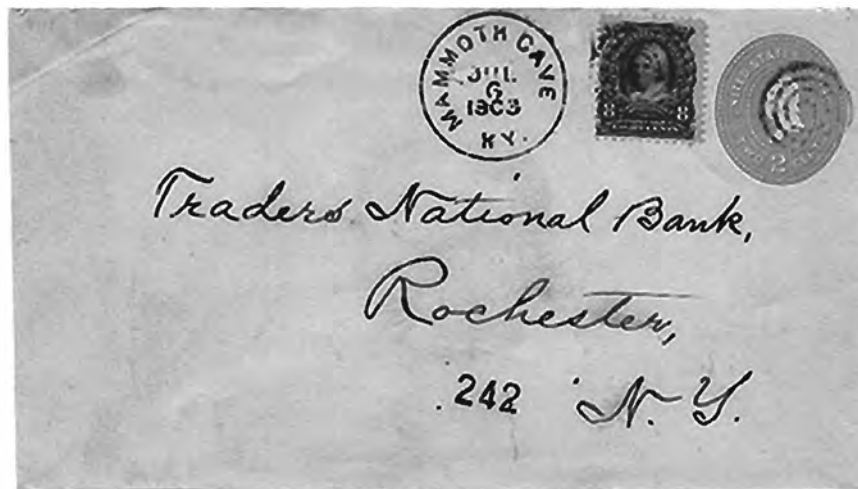
However, niter was only a minor constituent of the saltpetre or "petre dirt" mined from caves and subsequently leached of nitrates for processing into  $\text{KNO}_3$ , the principal ingredient of gunpowder.<sup>3</sup> The ingredients and composition of gunpowder in the 1860s were little changed from the formula devised six centuries earlier by Roger Bacon: 75% saltpetre combined with sulfur and charcoal, in equal or slightly varying proportions of 12 to 13 percent each.<sup>4</sup> Saltpetre sites were developed where there was a dependable water supply and enough nitrates in the subsoil to warrant mining.<sup>5</sup> The forest also supplied timber for manufacturing tools and firewood

used for the evaporation kettles and production of the charcoal used in the chemical conversion of saltpeter to gunpowder.<sup>6</sup>

Nitrate deposits were discovered in the saltpeter earth in Mammoth Cave before 1800, presumably from years of droppings by the bats that once lived in the cave. Many tons of saltpetre were produced in Mammoth Cave during the War of 1812, much of which was shipped to New Orleans to be used in the manufacture of gunpowder. Through a skillful manipulation of such resources as Little Brown Bats, LaFitte the Pirate, Shreve's steamboat, "Old Hickory" and Mammoth Cave, America won the battle of New Orleans and the War of 1812.<sup>7</sup>

During the War of 1812, many caves were mined for saltpetre, although few had the large working area of Mammoth Cave. Much saltpetre was taken from the Shenandoah Valley caves, but the largest quantities came probably from caves in Kentucky and Tennessee. The saltpetre-gunpowder manufacturers needed their work sites as close to major transportation routes as possible; therefore the drier caves and rock shelters near the crossroads of travel became saltpetre mines.<sup>8</sup> During the Civil War, the Confederacy's manufacturing of gunpowder depended on caves for at least half of its source of saltpetre.

Cancellations from Mammoth Cave, Kentucky, Big Bone Cave, Tennessee and Organ Cave, West Virginia that were mined for saltpeter are illustrated below.



*Mammoth Cave, KY*



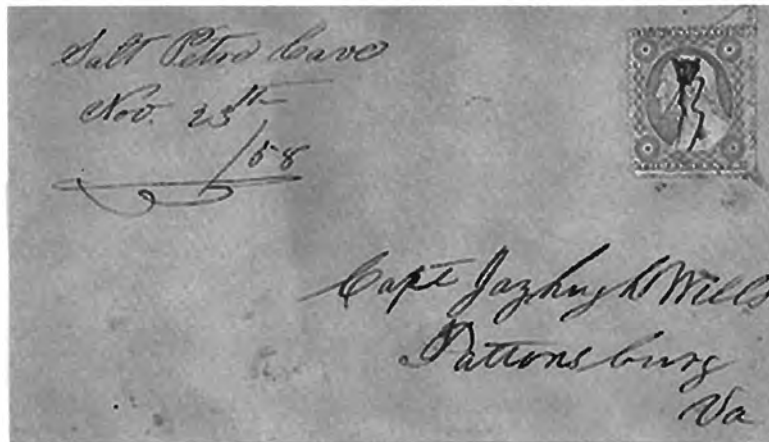
Bone Cave, TN



Organ Cave, WV

One such cave was Perry's Salt Petre Cave of the James River in Botetourt County, Virginia, a rather large cave over 1300 feet in length with a beautifully arched entrance. It has a maximum depth of 60 feet and is located seven miles NW of Buchanan on the north side of Hickory Hollow, on the East Side of the James River. There is

considerable superficial evidence that saltpetre was once mined in this cave, but little now remains. This cave is very likely the place where, reported in 1775, Charles Lynch found “many rocks of genuine saltpetre.” The entrance passage leads to the right and slopes down at an angle of approximately 30 degrees for 100 to 150 feet. The floor then becomes almost level, but is cut by a series of shallow canyons, which cross the passage at nearly right angles. A series of three pole-supported bridges spans the canyons. These bridges, which bear the earmarks of mid-1980 design and workmanship, are the first evidence encountered to indicate the saltpetre miners worked this cave. The Virginia Region Limited Access Caves List includes Perry’s Saltpeter Cave. It is classified as “CE” meaning that the cave is closed during all or part of the year and closure is strictly enforced by the landowner. It is a bat hibernaculum in the winter.



Letter to Captain Jazhugh of Pattonsburg, VA from Harvey J. Wilson, November 22, 1858. Earliest Known Cover from this Post Office, which opened on June 2, 1858 with John A. Biggs, Postmaster.<sup>9</sup>

The post office was located in a red store across the road from the railroad tracks on the edge of the James River, near the lower end of a trail that leads about 1/4 mile to the cave. The building also served as a railroad station for the Richmond and Clifton Forge Railroad, now part of the Chesapeake and Ohio Railroad.

Listed below are postmasters of the former Saltpetre Cave Post Office, which was established on June 2, 1858, discontinued on September 29, 1866, reestablished on November 16, 1866, and discontinued again on September 29, 1923.

SALTPETRE CAVE POSTMASTERS BOTETOURT COUNTY, VIRGINIA

<u>Name</u>	<u>Date Appointed</u>
John A. Biggs	06/02/1858
Adam C. Buhrman	05/26/1860
<i>Discontinued 09/29/1866 - Reestablished 11/16/1866</i>	
James W. Sorrell	11/16/1866
Mrs. Eleanor H. Goodwin	08/02/1871
Wilbur F. Goodwin	02/24/1873
Thomas L. Mayo	10/20/1874
Francis W. Hunter	01/10/1876
Miss Mary S. Mays	03/25/1878
Hezekiah Allen	04/27/1880
George P. Persinger	08/05/1886
Hezekiah Allen	09/21/1896
Wilbur F. Goodwin	08/20/1900
Joseph S. Persinger	09/08/1902
<i>Post office closed on 09/29/1923; mail delivered to and from Eagle Rock.</i>	

Two other postmarks from Saltpetre Cave are shown below. One is a circular date stamp dated August 6, 1894. The other is a manuscript cancellation dated September 27, 1887.



1887

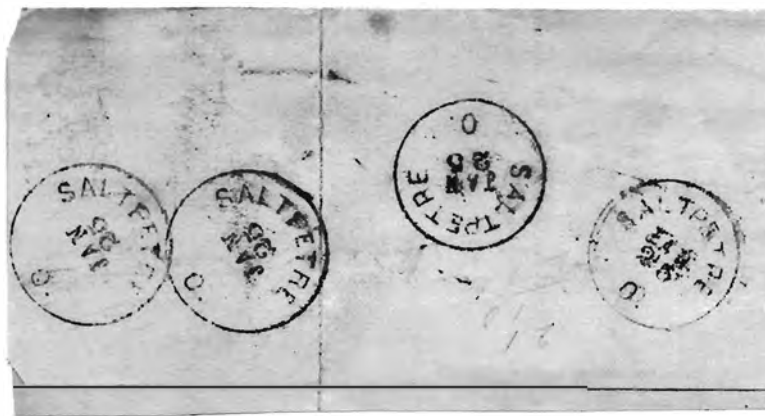




1894

During the Civil War, the Confederate Nitrate and Mining Bureau considered this town important due to its strategic location near the center of great mining and other mineral products, as well as its saltpetre. It became headquarters for District No. 3, which includes western Virginia. Captain R. C. Morton was detailed as the officer in charge.<sup>10</sup>

Another town in Washington County in southern Ohio was actually called Saltpetre, and was open from 1872 to 1914. The examples below illustrate different circular date stamps and different spelling of the town name.



Circular date stamps on a grocers bill which was also the Saltpetre Post Office was dated January 25, 1888. These cancellers were used until 1896.



*The circular date stamp dated April 15, 1908 has a different spelling for Saltpeter, Ohio.*

There were saltpetre caves in Europe as well. Hans Breu of Bayreuth, France, explored the Sophienhohle in 1490 for saltpetre.<sup>11</sup> One of the caves on Gorge d'Enfer (Commune de Tayac, Dordogne) and the Grotte des Espelugues (near Lourdes) were worked for saltpetre in 1793 when lack of imports made it difficult to make gunpowder.<sup>12</sup> In 1821, Greek soldiers exploited saltpetre caves within Greece, to enable them to make gunpowder.<sup>13</sup>

Chile saltpeter, or soda niter, is composed of sodium and nitrate ( $\text{NaNO}_3$ ). It occurs in beds or caliche, over vast areas, which vary in thickness from 15cm to 3.6m (6 in. to 12 ft.), and are interspersed with sand and deposits of gypsum, sodium chloride and other salts. The caliche is quarried and purified before the saltpeter is exported and used extensively as a fertilizer and in the manufacture of nitric acid. This type of saltpeter is not used in the making of gunpowder because it absorbs moisture from the atmosphere and gradually dissolves. In Chile, the saltpetre industry, which has long produced much of that country's prosperity, is not dependent on cave saltpetre. Chile merits special attention because in 1930 it issued the world's first stamps commemorating the centenary of the initial export of saltpeter from Chile on July 21, 1830. All have peaceful agricultural themes, reflecting saltpeter's second use as fertilizer. Chile again depicted the saltpeter industry on the 10-peso stamp of 1936 and on 1986 in its export series.



Peru exported saltpeter, derived from the Peruvian Cormorants Guano deposited on salt flats and depicted this on several stamps, two of which are shown below.



Saltpeter is of varied commercial importance. It is used as a fertilizer, in the manufacture of glass, as a food preservative, and, in some medicines, as a diuretic. It is also found in explosives, fireworks and matches, is employed in fluxes used in metallurgy, and is an important source of nitrogen in the manufacture of nitrogen-containing compounds, particularly nitric acid.

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Submitted by Warren Smith

Regarding Tom Metzgar's story "Cave History Recorded by Andrew J. Waychoff" in Vol. 33, No. 4 of JSH, I thought you might find this additional information to be of interest.

. . . Thanks for your recent letter. My family does claim a relationship to Lewis Wetzel. Lewis did not have children, but we claim a connection as descendants of a brother. (I believe his name was George). By coincidence, I also grew up in northern West Virginia only a few miles from Wetzel County (named for "Uncle Lewis").

The writer's description of Lewis Wetzel as an "Indian hunter" is consistent with everything I have read or heard about him. As I understand it, Lewis was not yet ten years old when Indians attacked his home and killed family members right before his eyes. Other children also survived, but the experience left Lewis with an enduring and open hatred of the red man. He went looking for Indians to kill and was apparently very good at it. He is said to have possessed the ability to load a muzzleloader on the run, which no doubt proved quite useful. The Ohio Valley's settlers held him in high regard, so much so that he avoided trial and execution and was merely banished from the area when he brazenly murdered an Indian Chief at a peace conference. He is said to have died as violently as he lived - from a knife to the back in a New Orleans brothel.

excerpt from a letter written by Robert J. Wetzel, August, 2000

# PHOTOGRAPHY IN OREGON CAVE IN 1888

Submitted by William R. Halliday

In 1885, Homer D. Harkness and Walter C. Burch made the first attempt to commercialize Oregon Cave. Although they hung on for almost a decade, distance and difficulty of access doomed the enterprise from the start. In 1888, however, Homer and two other members of the Harkness family accompanied the noted W. G. Steel and two others to the cave. During this trip E. D. Dewert of Portland, Oregon took several flash photos in the cave. These were among the earliest of all American cave photographs and should be noted as such.

Steel described the trip and the photography in a chapter of his rare book "The Mountains of Oregon" (Portland, David Steel, successor to Himes the Printer, 1890, pp. 34-39), reproduced below. As the account seems to exclude the possibility of use of a stereo camera, it is unlikely that these are among early Keystone View Company stereoviews of the cave and efforts should be made to identify them.

## JOSEPHINE COUNTY CAVES.

On Friday evening, August 24, 1888, S. S. Nicolini of Ragusa, Austria, E. D. Dewert of Portland, and the writer boarded the south-bound train for Grant's Pass, intent on a few days' outing. This town of Grant's Pass was so named for a pass in the mountains several miles south, where, in early days, the silent hero camped for the night.

Early Saturday morning my head was banged up against one end of our sleeping car, an instant after hearing the shrill whistle sounding down brakes. As soon as possible I got on the outside and found the engines standing within a few feet of a yawning chasm where a bridge had been. Now, however, seven bents had been burned away and a terrible railroad accident was averted by the quick eye of Engineer Elliott, who saw the fire as we turned the curve and stopped the train almost instantly.

At Grant's Pass, H. D., M. M. and F. M. Harkness joined us, and we started for the Josephine County Caves, about thirty miles due south, in the Siskiyou mountains. For twenty miles the trip was made over a very good road by wagon. At this point it became necessary to pack our things on two horses and walk over a trail into the mountains. On a hot day, this portion of the trip is very laborious, owing to the fact that it is up the steep mountain side about two-thirds of the way, and down an equally steep incline the remainder. We arrived at our destination a little before noon on the 27th, and found two openings, one above the other, and about one hundred yards apart, on the south side of a deep canyon. When out hunting a few years since, Elijah Davidson, of Williams Creek, found a bear and chased it into the lower entrance, thus discovering the caves.

Each entrance is high enough to admit a person without stooping, and is probably about eight feet wide. At noon we entered the upper cave. For a few feet the floor inclined inward; we then descended a ladder for about six feet, and found ourselves in a passage way eight feet wide by an equal height, which changed, however, at every step. Now it would be wider, and now narrower, now higher, and now lower. Walls, ceiling and floor were composed of solid rock. To describe them, appropriately would simply be to use a gift made divine by inspiration. No man can behold them, then impart to others an accurate idea of their appearance. Soon after entering we were compelled to progress on hands and knees, then stood upright in chambers ten feet high, the walls of which were white. Stalactites were first seen here, and involuntarily we cast sly glances around to discover the bodies of kings preserved beneath such droppings in "King Solomon's Mines." We wandered from place to place, from chamber to chamber, dragging ourselves through passage ways barely large enough to admit a human body, while with toes and fingers we worked along, or stood in the midst of rooms that reached far above us. Now we see a beautiful pool of clearest water, surrounded by a delicate crystal formation in the shape of a bowl. In color it is as white as the driven snow, while each crystal is oblong,

projecting at right angles with the main portion for about an eighth of an inch. One peculiarity of these crystals that disappointed us was the fact that they change from white to a dull, yellowish color, immediately after being removed from the caves.

We were extremely anxious to try a new process for taking photographs in the dark, so Dewert took his camera and acted as photographer for the party. Owing to the limited space at times and cramped manner of locomotion it required the services of four men to carry the camera and accompanying necessities. Having reached a suitable place for a picture, the camera was first put in position, a board was laid on the top of it on which a tin reflector was placed, and a little powder called the lightning flash was then poured on the board in front of the reflector. At this point the order was given, "Douse the glim," and all lights were extinguished. The plate was exposed in perfect darkness, the powder was ignited, and instantly there was a flash of the most intense light. This light was so brilliant that, for several minutes, it caused in the eyes a glimmering sensation of light. Several photographs were taken in this way, which will doubtless prove excellent examples of what ingenuity can do in the dark.

It would require days of constant work to explore all the passages we found, whereas our time was limited to that portion of one day after 12 o'clock noon. For this reason we remained in the caves from noon to midnight, first examining the upper, then the lower one. This difference exists between them: The one above is possessed of fine stalactite formations, while below none appear. Instead, however, immense rocks are piled indiscriminately one upon the other, with great cracks between. Long ladders were used to climb to the top of the rocks, over the sides of which yawning pits could be seen that seemed to possess no bottom. Lack of time alone prevented us from making a thorough investigation, but I could not resist the temptation to climb over the side of one friendly rock for a few feet to see how it looked. Down for twenty feet the space remained unchanged, so that I could easily reach from



rock to rock. It then widened out and I could proceed no farther without ropes, so I returned to the party. A fine stream of clear cold water flows from this cave and a strong breeze of cool air rushed forth also. At times in both upper and lower cave, the wind blew toward the entrance so that it was impossible to keep the lights burning. No traces of foul air have been found in either cave.

Before our visit, visions of square chambers filled my mind, only to be dashed aside when real ones presented themselves, the irregular shape of which could not well be surpassed. There are no parallel walls, few straight ones, but corners everywhere. The floor will pitch in all directions, likewise ceiling and walls. Beautiful views of stalactites and stalagmites stand out in bold relief against snow white walls. At the farthest extremity of the upper cave in one direction an immense chamber presents itself, and should be known as the devil's banquet hall. It is probably 75x150 feet and sixty in height. Great blocks of rock hang as by a thread from the ceiling, while on every side rocks of equal size lie in all conceivable shapes. Standing at the point of entry one looks at the opposite side and sees great cracks, yawning cavities with open mouths of blackness, dismal shadows, to which flickering lights give a ghoulish, dance-like appearance. Yes, the devil seems to be holding high carnival, while his imps would dance the night away. They bob up and down and swing their arms in fiendish glee, while the dance goes on forever. None can look therein without seeing these imps and their antics. The floor recedes rapidly from the entrance, and is composed of great rocks scattered in confusion. We placed a number of lighted candles in different places, then climbed to the opposite side to view them, The shadows had partially disappeared, crevices and holes in the walls not before seen became suddenly black and excited our curiosity, so we climbed over high rocks into unknown passages. In a small chamber on one side we found a beautiful stream of water, falling several feet into a crystal basin. The walls of the chamber are white, and the effect by candlelight is very fine.

Midnight found us still employed, but we reluctantly ceased our labors and withdrew. Without unnecessary ceremony we wrapped our blankets about us, laid down beneath the stars, and slept the sleep of the just until 3 o'clock, when the dulcet notes of a coyote called us to the business of the day. Preparations were quickly made for the journey, and at daylight we were on our way to Grant's Pass, where we arrived at 9 o'clock P. M.