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FRONT COVER

John M. Nelson, guide at Mammoth Cave, Kentucky, 1905.

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BAROMETRIC DEPTH MEASUREMENTS IN MAMMOTH CAVE

Trevor R. Shaw

Introduction

J.F. Campbell of Scotland made a four month tour of North America in 1864. He visited Mammoth Cave on October 13, staying at the Cave Hotel. His tour took him to "Lethe River", Great Relief, and the Star Chamber. Most important, he measured the depths of various points by barometric readings, 48 years before those of Martel. This was probably the first occasion on which the technique was used in a cave anywhere in the world.

The Man

John Francis Campbell was born on December 29, 1822, on the Scottish island of Islay. He was the eldest son of Walter Frederick Campbell, and his mother, Lady Eleanor Charteris, was the eldest daughter of the seventh Earl of Wemyss. His education took place at Eton and at the University of Edinburgh. He died at Cannes on February 17, 1885 (Henderson, 1963; Ralston, 1885).

Campbell's main interest was in the folklore tales of the western Scottish Highlands which he collected from their verbal telling and then published. Geology and meteorology also attracted him and he was the inventor of the sunshine recorder. His books were predominantly on folklore but his other studies influenced those he wrote about his travels.

He made another visit to North America in 1874, in the course of travelling on to Japan and around the world (Campbell, 1876), but caves were not encountered on that occasion.

The Tour

Campbell was 41 years old when he undertook the tour that concerns us here. Leaving Liverpool by steamer on July 9 and returning there on November 26, he spent 17 weeks in North America, covering a total of 9396 miles there, by train and coach and in coastal and river steamers. His itinerary included Nova Scotia, Newfoundland, Labrador, Montreal, Niagara, Chicago, St. Louis, Louisville, Indianapolis, Pittsburgh, Harrisburg, Washington, Philadelphia, New York, and Boston.

Although the Civil War was still raging it did not affect Campbell's travels, except perhaps by confining them to the central and northern parts of the country. The main battles in Kentucky had been two years earlier and it was largely free of Confederates by October, 1864. He saw several wounded ex-soldiers and reports a raid on a Kentucky Central Railroad train that took place near Lexington while he was at Louisville.

The war was, however, affecting the tourist trade. The Mammoth Cave Hotel had been built to accommodate between four and five hundred visitors

(Wright, 1860, p.9). When Campbell was there, "The whole company numbered eight. Before the war, they often numbered hundreds." Entertainment was not forgotten and a dance was held. "Two Britishers, the landlord and a Yankee, two ladies from Nashville, and two from down-stairs, composed the ball. The music was a fiddle," (Campbell, 1865, p. 352).

A Short American Tramp in the Fall of 1864

The book of the tour (Campbell, 1865) was published anonymously in Edinburgh in the following year. Consisting of vii + 427 pages it is not illustrated, except for a Canadian map and view and the sketch on the title page (Fig. 2). Although little known as a source of cave history, the book is not uncommon. It is recorded by Sabin (1891) and copies exist in 18 U.S. libraries (Anon., 1970). It is also noted, with the author unnamed, in the Mammoth Cave bibliography of Hovey and Call (1914, p. 204), but not by Jillson (1953) or Wilkes (1963).

Geological aspects of the country are noted throughout the book and 24 pages of the introductory chapter are devoted entirely to geology. Campbell's interest in meteorology is seen not only in the appendices on weather and sea temperatures but in his remarks on the "breathing" of the cave and his use of "a pocket aneroid barometer" to measure depths below the surface. He used this instrument constantly throughout his travels, even while on railway journeys.

The account of the cave visit, on pages 344 to 351, is reprinted in its entirety later.

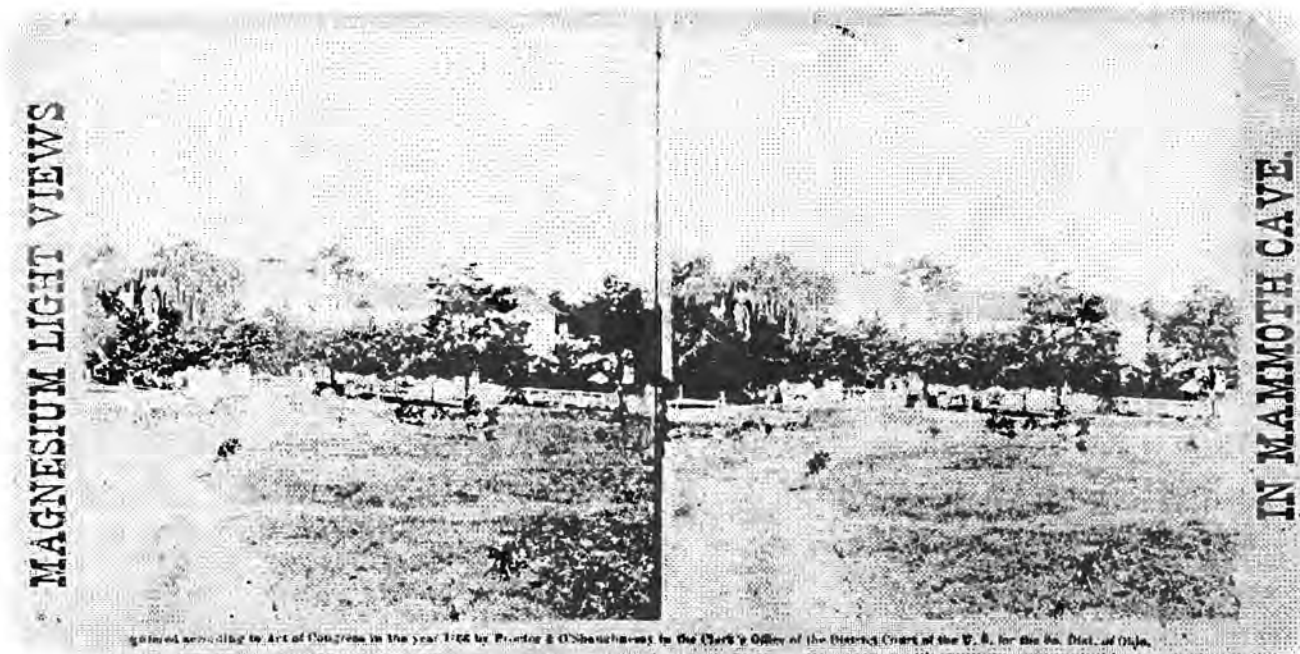


Fig. 1: "Cave Hotel" photographed in 1866 by Charles Waldack.

A SHORT
AMERICAN TRAMP
IN THE FALL OF 1864

BY



THE EDITOR OF 'LIFE IN NORMANDY'

EDINBURGH: EDMONSTON AND DOUGLAS

MDCCLXV

Fig. 2: The title page of Campbell's 1865 book (201 mm high).

The Cave

"The Mammoth Cave is a favourite summer resort, much frequented in peaceful times by rich citizens of rich towns in this rich state; and the road to it may be taken as a fair sample of country roads. It is a mere track in a hard-wood forest, with a pretty thick undergrowth of scrub and trailing plants (Campbell, 1865, pp. 354-355)."

Campbell traveled from Louisville to Cave City, which "consists of three shanties," on Wednesday, October 12. "A capital dinner is to be got there and the landlord is a right good fellow." He stayed at the Cave Hotel as already mentioned, visited the cave on Thursday, October 13, and returned to Louisville on Friday.

Although he refers to Wright's guide book of 1860, he does not use it as the basis of his description, most of which is clearly a personal account of his own visit. Indeed, the depths he gives for the various parts of the cave are obtained from his own barometric readings. His brief mention of White's Cave, on the other hand, may well be based on hearsay though he does not borrow any of Wright's phrases.

The unnamed "darky" guide would have been Mat or Nicholas Branford (Bright, 1860, p.8) or Bransford. Both men are shown in a stereoview of about 1870 reproduced here as Fig. 3.



Guides. Mat. Nick. Entrance to Mammoth Cave, Ky.

Fig. 3: "Guides, Mat, Nick, Entrance to Mammoth Cave, Ky." from a stereoview by an unknown photographer. It is undated but the style indicates late 1860s to mid 1870s. In this picture Mat looks considerably younger than he does in a photograph dated February, 1877 and probably taken in 1876 by Dr. Mandeville Thum. So this view probably dates from the early 1870s or before.

The reference to a scalded pig relates to an unpleasant visit he had made to an abattoir in Chicago.

Campbell's Barometric Readings

The underground aneroid readings are significant, for they appear to be the earliest attempt to measure the depths of various parts of the cave. It was not until 1912 that Martel (1914a) took similar readings. By coincidence, he too was there on October 13, as well as on the three preceding days, and his measurements were consequently far more extensive than those of Campbell. From them he was able to construct a sectional view of most of the cave system as it was known at that time. Martel (1914b) thought that he was the first to make such measurements: "I was allowed, for the first time, to take barometric readings which determined the relative depths of the various levels."

The aneroid barometer had not been long in existence when Campbell used it. It had been invented in 1845 in France, and was first sold in England two years later (Thoday, 1978). By Campbell's time some instruments were quite small and easily carried in caves. Symons (1863) reported the field testing of one that measured only two inches in diameter by three quarters of an inch thick. No record has been found of this simple and rapid, if somewhat inaccurate, technique being used in caves before Campbell.

His readings and deduced depths appear on page 345 of the reprint below, where it is pointed out that the barometer at the surface fell by 0.150 inches while he was underground.

The table is not easy to interpret, partly for that reason, and partly because of some inconsistencies, typographical errors, and the fact that the Cave Hotel on the plateau was used as a datum level rather than the cave entrance. The printing errors occur in the last column, where the depths of the Lethe River and Green River should be "down" from the surface and not "up". In the third and later columns it is at first confusing that the figures for the cave Mouth in the third line up have been corrected to conform with the earlier entry before the barometer had fallen, but the subsequent ones for the Green River and the Hotel have not.

A coarse attempt has been made, in Fig. 4 and Table I, to allow for the effect of the falling barometer on the readings taken underground. The changes have been distributed equally between the readings in the sequence in which Campbell took them, in the manner of distributing errors in a cave survey. Someone more familiar with the route could refine this by allowing for the probable journey times. There has been no attempt to align the Lethe and Green River levels and to adjust the other cave levels accordingly. A similar correction made to the surface reading for Green River makes it 337 feet below the Hotel and 247 feet below the cave entrance.

The corrected depths in Table I are those below the (historic) entrance. They are considerably greater than those of Martel and those obtained by modern surveying, but not ridiculously so. In any case their importance lies in their being probably the first attempt at accurate depth measurement in a cave that could not be plumbed directly by ropes.

p. 344 This region is like a rabbit-warren, in that it is full of holes. About twenty caves are known, and one of them has become famous. It has the unusual advantage of a short guide-book, written (1860) by a clever man,* instead of a tourist touting for inns. The Mammoth is so called because of its size. Mammoths' bones were found at some other place in Kentucky, but bats' bones are the biggest yet found underground. The cave is water-sculpture of the same kind as the sculpture on

p. 345 the tops of the hills outside, and in the beds of rivers below it. Beginning at the hotel, about 200 feet higher than Louisville, 560 above the sea, and near the level of Chicago, the cave goes down—the following table will show how much :—

Barometer.	Place.	Difference	Feet.	Total from surface.
29.400	Plateau	0	0	0 down.
29.500	Mouth	100	90	90 "
29.600	Richardson's Spring	200	90	180 "
29.700	{ Great Relief . . . } { Bacon Chamber }	300	90	270 "
29.750	Lethé River	350	45	315 up.
29.450	Arm-chair	50	45	45 down.
29.400	Mouth	100	90	90 "
29.650	Green River	250	225	225 up.
29.250	Hotel	150	135	135 "

Barometer fallen while underground and during the day 0.150 inch, equal to 135 feet. Rain in the evening, and heavy rain next day.

We started at 9.20 A.M. At 10.7, a mile and a quarter S.E., down 180 feet, we halted at Richardson's Spring. The Sidesaddle Pit, 60 feet deep, has fine flutings above and below the hole through which it is seen; it is very beautiful when lighted. The Bottomless Pit is 160 feet deep, and is, like the other, a rifled

(p. 344)

* Charles W. Wright, M.D., Professor of Chemistry, etc., in Kentucky and Ohio.

tube bored in the solid rock, with the different beds showing like courses of masonry. Fat Man's Misery is an underground copy of streams near the Perte du Rhone in Switzerland, in Wales, in the White Mountains, and in this country. It is a steep-sided trench **U** in a plateau, but roofed with a flat water-worn roof. Great Relief is 270 below the hotel, not quite a mile and three-quarters from the mouth. Here the direction changes to S.W. River Hall and Bacon Chamber are specimens of water-work like Fat Man's Misery, but this time in the roof. Channels three feet deep have been cut, and then the whole floor has been cut away and down, leaving the divisions hanging like bacon in a store-room.

Infandum Regina jubes renovare dolorem.

Am I to be haunted by the shade of that scalded Chicago pig even here?

Course south, and down to Lethe, 315 feet below the hotel, and supposed to be level with Green River outside. The water runs south-east, two miles and a quarter from daylight.

The rock in this chamber is worn like rock in the subterranean river which was cut through in Park Mine, in Wales. No one knows where the water comes from; but when the Green River rises, the Lethe does the same, and the mud in both is mud washed from the top outside, and dropped in the river. It is peculiarly stiff, tough, sticky stuff. A boat was in it swamped by a fall in the stream. The water was thick as pea-soup, and there was no chance of catching an eyeless fish. The cave beyond Lethe is but a repetition of the first part. We left the boat and Lethe in the mud, and returned. Fossils are so weathered in this place that some were broken from the wall; one was attached by a tenth of an inch of limestone, the rest of it projected more than an inch, perfect as when it was buried; others were peeping out of the rock, others were half out; and so the river-mud must contain numbers of unmelted fossils, the insoluble refuse of dissolved limestone rock. On the way back branched off into side galleries to see the Star-Chamber, the Gothic Chapel, and other lions, and got to grass after five hours. Walked six miles by pedometer, seven according to the guide's

reckoning. Went down-hill to Green River and found the stream running S.W., at right angles to Lethe. The long round is said to be a tramp of sixteen miles.

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By way of experiment, took the lead on the way back, and told the darky to follow and say nothing. Though well used to underground work, and provided with an organ of locality that seldom fails, and with a compass to boot, I was lost in ten minutes. It is supposed that this single cave has a total length of galleries equal to 100 miles. One hundred and fifty avenues have been explored. No map of it has been attempted, and generally it is still an unexplored natural mine. In all probability all the caves and all the rivers in Kentucky communicate with each other, with the Mississippi, and with the upper air. The ventilation of this mine is perfect. It is said to breathe once a year; but the salt-mines in Cheshire do the same for the same reason. In summer, according to the doctor, when the temperature of the external air is above that of the cave the current sets out, when the temperature outside is below 59° the current sets in; in spring and fall, when the temperature is balanced, the air stagnates for a few days or hours. As there is a current, there must also be a passage through. In summer, when the temperature is near 100°, the cold air at 59° tumbles out at the mouth with such force as to blow out the lamps in the narrows. Further in, the motion in larger halls is imperceptible. The air is perfectly pure, perfectly still; no ray of light ever gets in, no sound louder than the flap of a bat's wing is heard in the dry galleries, and here some wise-acre thought fit to lodge consumptive patients. The poor creatures pined and died, and their houses are left standing records of an unsuccessful medical experiment.

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In the cave are bats, of course; rats a size larger than Norway rats, with head and eyes like a rabbit and back hair like a gray squirrel—legs and abdomen white; also cave-cricket. These are curious monsters, blind, and apparently deaf and dumb. They do not stir for noise or light, but they have enormous antennæ, far longer than they are, and the smallest touch on these awakens the sleepy cricket. Cave-lizards are from three to five inches long, yellow, with black spots, and semi-

transparent. The eye is large and prominent, and they are sluggish in their movements. Eyeless fish and crawfish are found in Echo River. The fish are viviparous, have rudiments of eyes, but no optic nerve. The eyeless crawfish spawn like other crustaceans, and both are perfectly white. Ordinary fish and crawfish are sometimes washed in, and frogs may be heard croaking in this region. The eyeless fish eat each other, and resemble the common catfish, but rarely exceed eight inches in length. Human patients who remained in the cave for three or four months presented a frightful appearance. The face was entirely bloodless, eyes sunken, pupils dilated to such a degree that the iris ceased to be visible; so that, no matter what the original colour of the eye

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might have been, it soon appeared black. If, instead of living for some months, and dying in a few days after leaving the cave, a healthy tribe of niggers were to breed there, and feed upon each other—as do the fish, crawfish, crickets, lizards, bats, and rats—a new human species of ‘Underjordiske’ might people Kentucky down-stairs. When warm water comes in, a fog as thick as the fogs off Newfoundland settles on the dark waters of Lethe.

The cave-world has its own system of atmospheric circulation—its evaporation and condensation, clouds, rivers, denudation and deposition, chemical and mechanical wearing of rocks, its own fauna, and a flora of fungi. Altogether it is a very queer place to wander about in, with a black slave for *genius loci*, and a ‘wonderful’ petroleum ‘lamp.’

In the Star-Chamber an illustration of ‘suggestion’ is enacted. The roof is high and black, and people have pelted it with stones, so that white spots are laid bare. The officiating black priest prepares the tourist mind by long pauses and preparations, and total darkness; and after a time he assures his followers that they see stars and a comet, clouds and a storm. My obstinate eyes would see nothing but blackened stone, white chips, and the shadow of a great rock, or of a black blockhead moving over the darkness of the roof; but these obstinate peepers never will see mesmeric marvels—so they are to blame. The majority who go to the Star-Chamber return delighted with the view, which is said to rival the vault of night. The coal-hole, with imagination, would produce the same effect.

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There are but few stalactites in the Mammoth Cave, and these few are smoked and spoiled ; but within a mile of it is another cave, in which the limestone formations are, if possible, more beautiful than those of Adelsberg. An artist might sit here for hours amongst the cave-cricket, and learn design from nature. Endless curves and hollows, cups and basins, pendants and strange branching growths of pure white alabaster, might have suggested to some Western story-teller the silver trees and jewelled fruit of Aladdin's cave. That confounded Yankee custom of tacking men's names to natural curiosities has nicknamed this grotto White's Cave ; and all other caves are temples in which some snob or other is enshrined.

Place	Barometer ins Hg	Barometric difference ins Hg	Barometric difference (corrected) ins Hg	Depth Below Mouth		
				Campbell in 1864 ft	Martel in 1912 ft	Miotke (1975) Palmer (1981) White et al. (1970) White & White (1989) ft
Hotel	29.400	- 0.100	- 0.100	90 above	102 above	100 above
Mouth	29.500	0.000	0.000	0	0	0
Richardson's Spring	29.600	+ 0.100	+ 0.120	108	46	-
Great Relief Bacon Chamber	29.700	+ 0.200	+ 0.240	216	167	162
Lethe River	29.750	+ 0.250	+ 0.308	278	216	180
Arm Chair	29.450	- 0.050	+ 0.030	27	23	-
Mouth	29.400	- 0.100	0.000	0	0	0
Green River	29.650	+ 0.150	+ 0.275	247	226	219

Table I: Campbell's barometric readings and depth figures, corrected; with more recent depths for comparison.

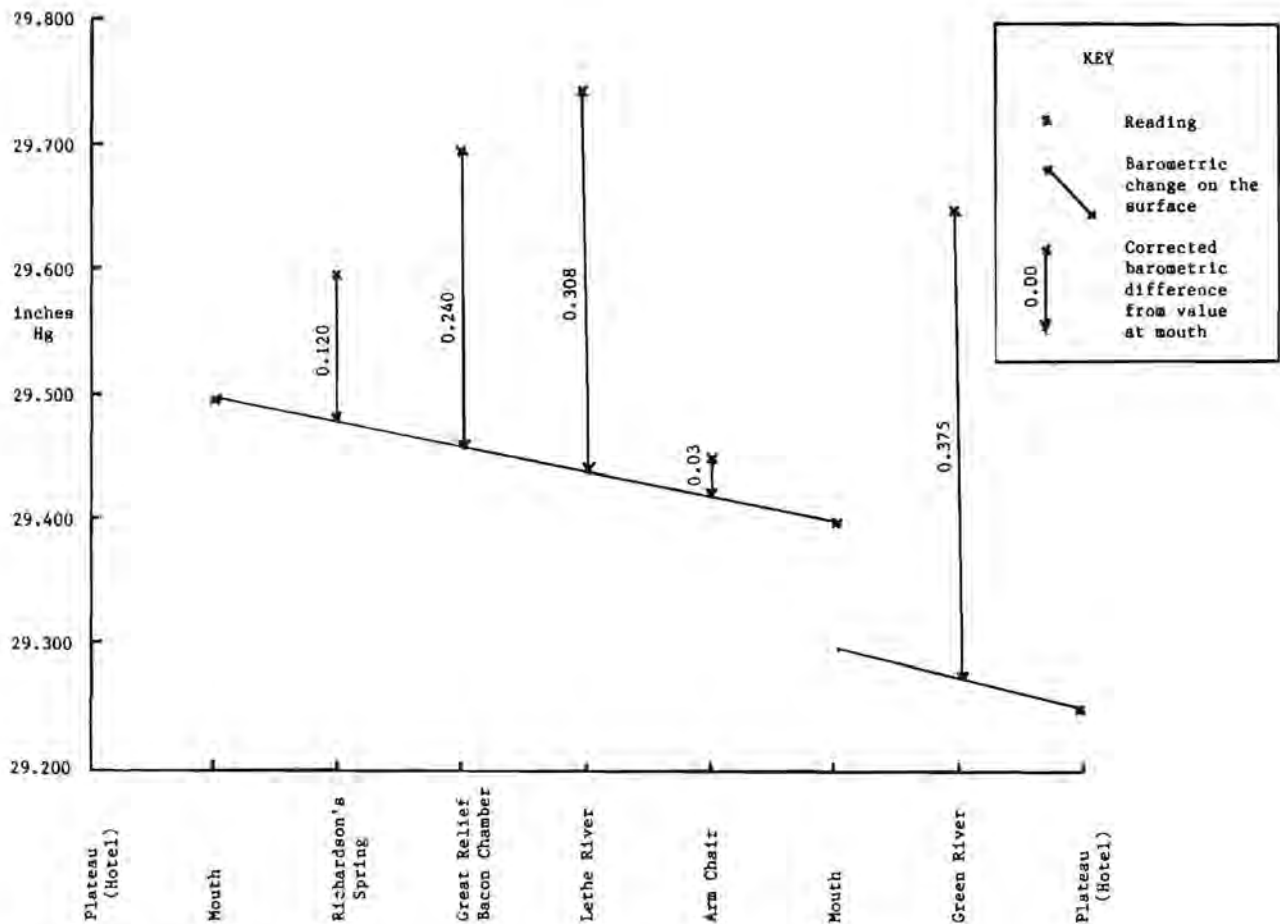


Fig. 4: Campbell's barometric readings, with corrections.

Acknowledgements

I am grateful to the staff of the Science Museum Library in London for the date of introduction of the aneroid barometer, and to Ray Mansfield who searched the modern literature for altitude figures.

References

- Anon. 1970. The National Union Catalogue pre-1956 Imprints, London, Mansell, 92, p. 232.
- (Campbell, J.F.). 1865. A Short American Tramp in the Fall of 1864. Edinburgh, Edmonston and Douglas. A microfilm copy (01291 reel 127, no. IE) was issued in 1960 by University Microfilms.
- Campbell, J.F. 1876. My Circular Notes. Extracts from Journals, Letters ... and ... Notes Written while Travelling Westwards Around the World. London. Macmillan.

Henderson, T.F. (1963). Campbell, John Francis (1822-1885). P. 840 in The Dictionary of National Biography, 3, Oxford University Press.

Hovey, H.C. and Call, R.E. 1914. Bibliographie Chronologique et Analytique de Mammoth Cave, Kentucky (Étas-Unis d'Amérique) 1815 a 1914. Spelunca Bull. et Mém. de las Soc. de Spéléol., 9(73) for Sept. 1913, pp. 191-237.

Jillson, W.R. 1953. A Bibliography of Mammoth Cave (1798-1949). Frankfort.

Martel, E.A. 1914a. Explications sur Mammoth Cave 1912. Spelunca Bull. et Mém. de las Soc. de Spéléol. 9(74) for Dec. 1913, pp. 241-302.

Martel, E.A. 1914b. Sur Mammoth Cave (Kentucky). Comptes Rendus de l'Académie des Sciences, 159(26), pp. 1013-1016. An English translation, without the sectional diagram is printed in The Journal of Spelean History, 2(1), 1969, pp. 5-6.

Miotke, F.D. (1975). Die Höhlen im Mammoth Cave-Gebeit (Kentucky). Wurzburg, Bohler.

Palmer, A.N. 1981. A Geological Guide to Mammoth Cave National Park. Teaneck, Zephyrus Press.

Ralston, W.R.S. 1885. Mr. Campbell of Islay. Athenaeum (2991), Feb. 21., p. 250.

Sabin, J. 1891. A Dictionary of Books Relating to America, from its Discovery to the Present Time. New York, Sabin, 19, p. 490.

Symons, G.J. 1863. On the Performance, Under Trying Circumstances, of a Very Small Aneroid Barometer (abstract). Rept. 32nd meeting of the British Assoc. for the Advancement of Science, Cambridge 1862. Transactions of the Sections, p. 35.

Thoday. A.C. 1978. A Science Museum Booklet: Barometer. London, HMSO (pp. 27, 29).

White, W.B., Watson, R.A., Pohl, E.R., and Brucker, R. 1970. The Central Kentucky Karst. Geogr. Rev., 60 (1), pp. 88-115.

White, W.B. and White, E.L., (eds). 1989. Karst Hydrology Concepts from the Mammoth Cave Area, New York, Van Nostrand Reinhold.

Wilkes, F.G. 1962. A Guide Manual to the Mammoth Cave of Kentucky. Louisville, Bradley & Gilbert. A facsimile reprint was produced by J.H. Speece in 1969 as a limited edition of 65 copies (Speece Reprint No. 4).

GERARD FOWKE

H. Dwight Weaver

Archaeologists are said to have been the first to discover caves for science. In Missouri the very first reports on caves were made by geologists and biologists. With the exception of Luella Agnes Owen (Cave Regions of the Ozarks and Black Hills, 1898), and Gerard Fowke (Report on Cave Explorations in the Ozark Region of Central-Southern Missouri in 1918-1919, 1922), very few of these reports reflect serious attention. In 1918 and 1919 Gerard Fowke investigated scores of Missouri caves, Indian village sites and aboriginal burial grounds. These caves were situated along some of the major streams of south central Missouri.

Fowke was first and foremost an archaeologist. Most of his life was spent in pursuit of knowledge about the primitive inhabitants of North America. He searched for evidence to support the theory that aboriginal races migrated to the United States from Asia; compiled an archaeological history of Ohio; discovered, explored, mapped and excavated caves in Indiana and Missouri; poked about in prehistoric flint quarries; created archaeological displays for historical societies, world fairs, academic institutions and museums; traveled the world as a pedestrian and in his 77 years of life forgot more about the topography of the United States than most of us will ever learn.

Fowke was tall, powerful, stern, spartan in habits and very independent. He spent much of his adult life alone in the "outbacks" of the world, and feared no one. He never married. Those who came upon him in remote places found his viking-like bearing something to respect.

Born in Mason County, Kentucky, June 25, 1855, the son of John D. and Sibella (Mitchell) Smith, he was the oldest of five children. His childhood was anything but quiet and uneventful. By his tenth birthday death had claimed his mother and his younger brothers and sisters. Thereafter he led a somewhat nomadic existence at his father's heels, for the elder Smith, a pioneer school teacher, moved frequently through the states of Kentucky, Iowa, Alabama and Tennessee until his death in 1870.

Forced to fend for himself at age 15, Gerard tried his father's profession and taught school in the backwoods of Kentucky and the farmlands of Illinois until 1881, when he entered The Ohio State University at Columbus as a special student to study geology and mathematics. Having traveled along the Arkansas and Missouri Rivers in that year, he had become intrigued with the geological features he observed.

Fowke was a restless man who bored easily, so being a teacher was too sedentary for him. He found geological and archaeological pursuits to his liking because they kept him outdoors and meant frequent travel, often to far places. During his career he did field work in such distant lands as the lower Amur Valley of Siberia; Columbia, South America; Guatemala and Mexico. Closer to home he concentrated on the states of Arkansas, Alabama, Ohio, Kentucky, Kansas, Indiana, Illinois, Virginia, West Virginia, Missouri, New York, Louisiana, Tennessee and Pennsylvania.

The desire for travel he apparently took from his father's side of the family, but from his mother's side he adopted his name. He was christened Charles Mitchell Smith at birth, but legally changed to Gerard Fowke on February 26, 1887, after a maternal ancestor from Virginia. Institutions with which Fowke was identified during his life were the Philadelphia Academy of Sciences; Smithsonian Institution; Bureau of American Ethnology; American Museum of Natural History; Ohio State Geological Survey; Ohio State Archaeological and Historical Society and the Missouri Historical Society.

Gerard Fowke's first venture into Missouri came in 1902 when he excavated ancient elephant beds at Kimmswick. He was not the first to poke through this well-known paleontological site, first publicized by Albrecht Koch in 1839. Originally, this was a treasure trove of mastodon bones and was popular with private collectors for more than a century. But Fowke was not looking for mastodon relics, he was in search of human remains.

From here he went to Lansing, Kansas, for a brief look at geological deposits thought to contain human remains, and then back to eastern Missouri, southern Indiana, southern Illinois, central and western Kentucky, northern Alabama and western Tennessee to explore caves said to contain Indian burials; and to study aboriginal quarries where primitive men had dug for flint and hematite.

Fowke gained some special attention in 1904 by arranging the archaeological display for the St. Louis Exposition. In the same year he also excavated prehistoric material from a cave near Ironton, Missouri, and looked at flint deposits at Crescent, Missouri. In 1905 Fowke studied loess deposits along the Missouri and Mississippi Rivers and opened his first Indian mound near East St. Louis. During the next several years he concentrated upon mound excavation along the Missouri, Gasconade and Blackwater Rivers and eventually concluded that they were unique among aboriginal stone burial vaults.

From 1911 to 1915 he did a considerable amount of work for the Missouri Historical Society classifying and arranging their material and creating displays. He also found his way into another Missouri cave, this one along the Current River in Dent County. In 1918 and 1919 he excavated many Missouri caves for human remains and was quite satisfied with his discoveries.

In his later years, Fowke continued his interest in describing and excavating caves, arranged additional collections for the Missouri Historical Society and explored Carlsbad Caverns in New Mexico in 1928. Gerard Fowke died March 5, 1933, of a cerebral hemorrhage at King's Daughter Hospital in Madison, Indiana. He was 77 years old.

The speleological significance of Fowke's published reports on Missouri caves can be readily perceived by even a quick reading. There are concentrations of caves listed along specific rivers and their tributaries. Directions to many of the caves are detailed. Historic place names are preserved; property owners named; entrance dimensions and physical conditions given; legends and other cultural resource material recorded; the presence of bat colonies occasionally noted; natural bridges and tunnels mentioned and archaeological discoveries listed.

Fowke was a perfectionist and a man of high ideals. He was quick to scold and criticize his contemporaries, and his independent, eccentric nature gave him much unhappiness at times. He quarreled with other archaeologists, and he quarreled with his benefactors.

Fowke has been criticized for his hasty work in Missouri caves, for he carried out his excavations as quickly as possible and paid scant attention to the stratification of artifact sites. Vertical and horizontal profiles are important. Cave sites are "difficult to record and interpret" (Chapman 1964). He has also been criticized for sending his Missouri cave artifact collection to Washington, D.C. "Missouri people failed to see these interesting objects which should naturally belong to our State" (Ruwwe 1936).



Gerard Fowke (Photo courtesy of Ohio State Archaeological and Historical Society).

Fowke may also have been incorrect in some of his conclusions regarding the human remains and artifact sites of Missouri caves. In some instances caves in which he found no evidence of human occupation or use later became artifact sites. Stark Caverns in Miller County was investigated by Fowke, and he declared "the cave was never fit for occupancy." In 1967 four well-preserved Indian burials were excavated at this cavern.

Gerard Fowke walked an estimated 100,000 miles or more during his career "traversing portions of nearly every state between Canada and the Gulf of Mexico, and from the Atlantic to the Great Plains" (Heer 1929). He had very little formal education but was shrewd, intelligent and possessed a "tenacious memory." His name is known to modern archaeologists and his works are occasionally referred to, but as a person he has largely been overlooked by biographers of archaeologists even to this day. As a contributor to the speleology of Missouri, he should not suffer the same fate.

References Cited and Selected Bibliography

Chapman, C.H., and E.P. Chapman, 1935. Stone Age Men of Crawford County, Missouri, Missouri Magazine (Feb. issue).

....., and 1964. Indians and Archaeology of Missouri. Missouri Handbk. No. 6. Univ. of Missouri Press. Columbia, MO.

Fowke, G. 1922. Archaeological Investigations; Explorations in the Ozark Region of Central Missouri. Bur. Amer. Ethnol. Bull 76. Pages 13-100.

Heer, F.J. 1929. Ohio Archaeological and Historical Quarterly 38(1). Columbus, Ohio.

Indianapolis Star (newspaper). 1933. Archaeologist Who Sought Traces of Indians Over 100,000 Miles Dies. March 6 edition.

Loose, A. 1975. Cultural Resources. Pages 22-23 in National Cave Management Symposium Proceedings, Albuquerque, New Mexico. Speleobooks, Albuquerque, New Mexico. 146 pp.

Missouri Archaeologist. 1965. Vol 27 (3-4).

Ruwwe, J.W. 1936. Primitive Man in Phelps County. Missouri Magazine (Jan. issue).

Starr, H.E. 1944. Dictionary of American Biography. Charles Scribner's Sons.

Who's Who in America. 1932-33. Chicago, Illinois.

THE SPELEOHISTORIAN AND HIS DISCIPLINE

H. Dwight Weaver

Definition

History, broadly defined, is "an account of what has happened; something that belongs to the past." Prefacing the word history with "speleo" or "spelean" gives us a term that means "cave history."

Some individuals like to think of history as everything that has happened in the past. In a sense this is true, but for the cave researcher this is not a focused or practical definition.

The more common meaning of the word history is "a record of man's past." The key words are record and man. With these two words we can formulate a definition that is both practical and meaningful for the cave historian. Spelean history thus becomes "the recorded events of man's past related to a cave, caves, or caving."

Events

What are some of the events in man's past related to caves?

Generally the first linking of man and cave is that of discovery. Man discovers a cave. Immediately our natural curiosity wants to know where, when, and how. These become the important elements in a historical narrative about the cave's discovery be it mythical, legendary, or factual. It may even be important in some studies to determine who "man" is. If the study is about a North American cave, then what race of man are we talking about? White man? Black man? Native American? Or some prehistoric culture?

Current North American spelean history studies confine themselves largely to fairly recent historical events—events dating principally from about 1700 to the present. As yet largely unresearched (and often virgin territory for a historian) is the period between 1513 when Spaniard Juan Ponce de Leon led an expedition into the heart of North America, and the arrival of European settlers. France, Spain, Portugal, and England all sent explorers to the New World during this period and spelean historians are relatively certain that these explorers not only discovered caves, but found them useful. How and to what extent we are uncertain.

Caves sheltered both the Indians and European immigrants. During the settlement period caves were used for homes and gathering places for religious, political, and recreational events.

Caves have also been mined and quarried for various natural resources. They have been used as places of commerce, places of storage, places of hiding, and as a source for water and water power.

Tools

The basic mechanical tools of the spelean historian are very simple—pen, note pad, tape recorder, and camera. These permit observation, interview, documentation, and collation, which eventually facilitate comparative research, speculation, writing, and publication.

The spelean historian uses a tape recorder to conduct interviews with people who may have information pertinent to cave history. A recorder is useful in recording personal observations made during field work. The recorder also permits the dictation of information gleaned from published materials.

In addition, spelean historians now generally use personal computers to store information, process words, prepare studies, and develop camera-ready copy for publication.

The spelean historian interviews people; photographs people, places, and things; looks for documentation in newspapers, magazines, journals, books, diaries, pamphlets, advertising literature, and photographs; searches through library records, checks government records such as deed books, circuit court records, and surveyor's records; and, of course, consults with colleagues.

Once the basic information is gathered (or at least as much as is possible at the time or suitable for the historian's purpose), he prepares a narrative of the cave, or caving topic in outline form. He may look for similarities in the historical events at other caves nearby or even distant, concerning himself with the nature of the event, people involved, and the time frame or date. All of this can be helpful in speculating upon how the cave's history has been influenced by local, regional, state, and national events, or how the presence of the cave and the events surrounding it have influenced local history.

Finally, the historian writes a formal narrative and usually publishes it in some manner to make it a part of the public record and one of his or her achievements.

Goals

Why do people become spelean historians? Isn't history research rather dull? What do you do with all the materials you gather?

Persons become spelean historians for the same reasons that others become cave surveyors, photographers, or geologists. Something about the discipline sparks an interest.

Is it dull stuff? Any kind of research can be dull. It may be that a specific kind of subject matter just has never interested you. Or perhaps you have not been properly introduced to the discipline. Spelean history research and writing can be just as exciting or as dull as you want to make it. It is a broad field ripe for research with hundreds of untouched topics suitable for study.

Goals can be very personal and widely differing. The more prominent and active spelean historians in the United States have multiple goals.

Generally, people do spelean history research to satisfy their own curiosity about a given subject, to do something new and different, to contribute to a group project, to gain public recognition, or for commercial gain.

Each researcher devises his or her own methods for collecting, storing, and using data. Good organization, a focused project, accurate data, and keen discipline will produce good results.

Not all of what is gathered during research and field work finds its way into published reports. Some of it will be superfluous to the intended narrative, some will be incomplete or too unreliable for use, and some material may be unsuitable for release because of its nature. Research sometimes produces distasteful, embarrassing, or libelous information about living individuals- information that is best kept as an unpublished resource for the distant future.

All of these things influence the final use and format of collected data.

Organizations and Publications

Spelean history as an organized speleo-discipline is relatively new. The American Spelean History Association (ASHA), to which most active speleo-historians in America belong, was established in 1967. It produces a quarterly journal called The Journal of Spelean History. The ASHA actively solicits articles for publication. This is an excellent outlet for research material and also a means of making contact with other speleo-historians.

The National Speleological Society (NSS) produces the NSS News and the NSS Bulletin. These are outlets for history papers, and so are grotto newsletters.

As yet, few speleo-historians have written for nationally circulated newsstand magazines, but these could certainly be considered markets for a speleo-historian who has the writing credentials to break into such mediums. It could also be profitable. Unfortunately, most history publications circulated for the national market are largely staff produced, solicit their material from a narrow field of professional historians, or are so backlogged with freelance material that you are bucking a strong tide in an effort to break in.

You should consider local newspapers. Editors of small weeklies (and even some dailies) are generally on the lookout for interesting feature material that is out of the ordinary.

State and local historical societies usually have publications and generally welcome additions to their historical data-base.

Show-cave operators are always looking for new promotional ideas. Researching the history of a show cave can be very rewarding in terms of

achieving public recognition.

The Value of Spelean History

Spelean history can serve many useful purposes. The most important aim is to instill within people a greater appreciation of caves and the need for their protection, and to give the public a greater awareness of the historical significance and value of caves. Caves are a non-renewable natural resource and their history deserves public recognition.

Rewards, Shortcomings, and Perils

The rewards for doing spelean history research and writing is in satisfying personal curiosity, making a meaningful contribution to speleology, and in gaining recognition from within the caving community as well as from outside it. Something good can also be said about seeing ones name in print and the publishing of a historical paper over which you have labored long and hard.

But there are shortcomings. It is a new speleo-discipline and there seems yet to be a few in the caving community who view the speleo-historian as a bookworm, library nut, or armchair caver.

Admittedly, one does have to spend some time at the books and in the libraries during various stages of historical sleuthing, but a great deal of the information also has to be gathered in the field. You cannot write a really good cave history without at least seeing and exploring a part or all of the cave being researched. The best material on caving is written by individuals who have been or still are active cavers.

Another problem is patience. The speleo-historian must have a lot of patience because it is very meticulous research- real detective work. A historian often has to fit together many bits and pieces of information, throw in a dash of speculation and guess work, and make some educated surmises in order to produce an understandable and interesting narrative. Even then he or she may make some wrong guesses or come to some inaccurate conclusions. A spelean history quest is sometimes like following in the footsteps of Sherlock Holmes.

Your goal in writing will dictate, to some extent, the completeness, format, style, and tone taken in the finished product. Speleological papers can be as dry as dust to read. They may be filled with credit lines, references, and footnotes. They may be only one part of a much larger research effort and read out of context, seen to have meaning and interest only to those readers with inside information.

The task of making a spelean history truly readable and entertaining, as well as valuable, calls for a special kind of expertise. The writer combines statements and facts with which most scholars and readers will agree with information that is debatable as to accuracy and material needed to fill out the story, to give it life, and make it flow smoothly. This final material may deal with matters about which nobody can be certain. These kinds of statements must, for the benefit of all readers, be labeled with qualifiers such as "perhaps," "possibly," "maybe," and "probably."

Smooth, lively historical narratives are the type most preferred by readers.

Misquote and inaccuracy are two of the greatest perils. If you are writing for commercial sale there is the added threat of lawsuit. You must use great care in what you say, how you say it, and about whom you say it. Generally speaking, slander and invasion of privacy pertain to living persons, but once an individual is deceased, he is no longer a viable entity and you can feel relatively safe in writing about him or her in a negative way if you are sure of your facts. If there is even the slightest bit of concern in the back of your mind, seek a legal opinion.

And, how thick-skinned are you? Since spelean history often calls for a good deal of educated guess work, you are sticking your neck out when you publish. If criticism unduly bothers you, if you have a chip on your shoulder regarding your work, or if you are afraid someone will find a factual error, then spelean history writing and publishing may not be for you. When you do get criticism, consider the source carefully and let it be a learning experience, not a damper to your work or your enthusiasm. And remember- no one is perfect; no history is ever complete; you have a right to your opinions and guesses; nothing ventured is nothing gained. It all adds to our knowledge and information in the long run and sometimes errors lead to lively public debates that get us closer to the factual truth than might have otherwise been possible.

Selected Spelean History Topics for Missouri Research

Mining: Saltpeter, onyx, guano, alum
Farming: Mushroom, rhubarb, celery, frog
Cryptography: Historic graffiti, petroglyphs
Storage: Ice, meat, produce (apples, potatoes), junk, corpses, weapons and munitions, storm and fallout shelter
Commercial: Theatre, beer garden, dancehall, roller rink, gambling, cock fighting, saloon, industrial, architectural, show caves
Hunting: Buried treasure (gold, silver, stolen items), bears, modern relics, Indian artifacts, caves (flooded, filled, destroyed, unrecorded, lost)
Manufacturing/brewing: Beer, wine, whiskey, cheese, moonshine, gunpowder, novelties
War/1812/Civil/Military: Union/Confederate, guerrilla, secessionist, underground railroad
Domestic: Home, barn
Indian: Burials, artifacts, lore/myth/legend
Medical/Shelter/Burial: Indian, white man, black man, hermits/recluses, hobos, mausoleums, experimentation
Religious/Occult/Romance: Religious services/events, family reunions, parties, weddings, funerals, cults, hauntings, superstition, folklore
Criminals/Outlaws/Legal: Jails/dungeons, mentally ill, historic outlaws, modern criminals, murder, civil suits
Modern: Environmental pollution, catastrophic events, lost in cave stories, place names (cave and underground), spelunking, cave research, cavers, caving organizations, cave accidents (rescues and deaths)

Closing Thoughts

All too often, spelean history research is a fascination of the aging caver. What youth so often fails to perceive is that everything we do today could be the history of tomorrow. We too often pay too little attention to the significance of the things we see and do. Much is lost through a lack of foresight. What I would encourage every caver to do is to keep a caver's diary and maintain it faithfully through the years. The diary should contain all types of information, not just a log of field trips taken. Even your musings, disappointments, great moments should be there, along with dates and the names of caving friends and associates. It is also wise to record what you learn about your caving associates. This diary should be passed on to the caving community after your death.

Some cavers cave for only a few years but others carry it as a lifelong hobby. I would encourage every caver who has been active in caving for several decades to sit down and prepare an autobiographical accounting of his or her caving years and to arrange for it to be donated to the NSS or some related speleological organization after death. In this way, you can assure your place in the scheme of speleological history. Organized caving is only about fifty years old in the United States. We are beginning to lose cavers who have been prominent since the inception of the organized caving and for the speleo-historian of the future, the experiences of this pioneering generation will be a historians' gold mine for centuries.

AMERICAN SPELEAN HISTORY ASSOCIATION Financial Report

1990	Income \$957.15	Expenses: \$1,228.63
1991 (so far)	Income \$874.50	Expenses: \$992.97

Respectfully submitted,
Fred Grady
Secretary-Treasurer

PAPERS PRESENTED AT THE 1991 AMERICAN SPELEAN HISTORY SESSION

Charles A. Lundquist - Early Visitors to Wolf Cave, Alabama

Wolf Cave in the Newsome Sinks of Morgan County, is one of the historic caves of Alabama. It is a large cave with an impressive entrance, and it has long been popular with casual visitors. The cave walls have inscriptions of names and dates that reach back to the early 1800s. The earliest notations typically are scratched in cursive script. Several visitors who made pre-Civil War inscriptions have been identified in census records, land transactions and other documents. The earliest clearly associated name and date are Wm Moore, July 18, 1835. Signatures by S. Newsom and R.W. Newsom dated November 10, 1839, are of interest because these individuals presumably are members of the Newsom(e) family for whom the Newsome Sinks are named. Richard W. Newsom in 1841 received title from the U.S. Government for land in S 31 Township 6S Range 1E, which is just northeast of Newsome Sinks. In 1843 he obtained title to land in the Oleander community nearby. Sowell Newsom, a candidate for the S. Newsom inscription, got land in Oleander in 1846. In 1831 William Newsome was the first recorded land owner within Newsome sinks valley, although his name was not found in Wolf Cave. The use of cursive script by early visitors sometimes allows a comparison of cave signatures with those on preserved documents. For example, Richard J. Rivers left two cave signatures in the 1850s that are remarkably like the signature on his marriage record in Morgan County. Success in associating cave inscriptions with individuals in historical records shows that the pre-Civil War visitors to Wolf Cave typically were local settlers of the area. The first recorded visits were contemporary with the earliest land acquisitions.

Fred D. Stone - McFail's Hole: History of Exploration, Purchase, and Early NSS Ownership

McFail's Hole, the longest cave in the Northeast, is also the first cave owned by the NSS. This talk is a personal account of the exploration and purchase of McFail's based on detailed files I kept during the 1960s. I will cover the following topics: 1) Discovery and exploration of McFail's major extension by Cornell Outing Club cavers in the early 1960s. 2) Events leading to the purchase of McFail's Hole on August 2, 1965. 3) Acceptance of McFail's ownership by the NSS Board of Governors at the 1965 Indiana Convention, setting the precedent for subsequent NSS cave ownership. 4) Origin of the McFail's Cave Management Committee, and how it successfully dealt with problems of visitation and liability.

Fred Grady - A History of the Excavations at Cumberland Cave, Maryland

A cave containing fossil bones was discovered near Cumberland, Maryland during excavations for the Western Maryland Railroad in 1912. Raymond Armbruster informed the Smithsonian Institution of the discoveries and assisted J.W. Gidley of the Smithsonian in collecting several hundred specimens over a period of three years. In 1950 Brother Nicholas Sullivan discovered additional fossil bones in a portion of the cave on the opposite side of the tracks from where the Smithsonian parties worked. Brother Nick's excavations continued through the early part of 1953 and resulted in the destruction of much of what was left of the cave. In 1968 a Carnegie Museum of Natural History party led by Allen McCrady and Harold Hamilton collected a considerable amount of material at Cumberland Cave, much of it from the Smithsonian dump piles. Finally in the late 1980s a few additional specimens from Cumberland Cave were donated to the Smithsonian Institution by Trent Spielman. An investigation of the site determined there was still more fossil material in what is left of Cumberland Cave.

Louise D. Hose - The Lost Park Reservoir Project, Park County, Colorado: an Ill-fated, Turn-of-the-Century Attempt to Use a Granite Cave as a "Natural Dam"

One hundred years ago, on January 1, 1891, Stephen R. Pratt and William A. Powers staked a claim and began working on an attempt to plug a natural granite cave, now called Goose Creek Cave, and form a reservoir in the alpine valley through which Lost Creek flows. The project continued for approximately 24 years and more than \$75,000 was spent in building roads and cabins, opening a 180-foot shaft to the middle part of the cave, lining the shaft, clearing timber from the proposed reservoir site, excavating the bedrock stream bed, installing a foundation for the dam, and installing two valves weighing 3000 pounds each. Despite these efforts, stream flow was never blocked.

Lost Creek flows into the approximately 3900-foot long cave under a ridge up to about 180 feet high. The ridge through which the stream flows is so distinct that the stream is called Goose Creek below the resurgence. The subterranean dam is about 1200 feet from the resurgence. The dam is 25 feet thick at its base, 20 feet thick at the top, and 80 feet high. It spans cave passage that is 50 feet wide at the base and 75 feet wide at its top. The flow of the stream seasonally varies but is approximately 25 cubic feet per second in mid-summer. The dam and some support structures remain today.

Dean H. Snyder - The Discovery and Early History of Crystal Cave,
Pennsylvania

While quarrying for limestone, William Merkel and John Gehret discovered a cave on November 12, 1871. One of its early explorers was Samuel D.F. Kohler, a local farmer who became so captivated by his adventures that he purchased the property for \$5,000 the next year. He made improvements and opened Crystal Cave for tourists with a Grand Illumination on May 25, 1872. This attraction became so popular that Kohler discontinued farming and built a hotel near the entrance. Kohler encouraged writers and scientific parties to tour the cave, and their glowing reports were used in advertising materials for many years.

After S.D.F Kohler's death in 1908, his son David managed the property. He made many improvements, including the installation of a generator so the cave could be electrically lighted. David Kohler sold Crystal Cave in 1923, but established the "Kohler Museum" where he exhibited memorabilia and speleothems from the cave. Since his death in 1949, his family has preserved the museum exactly as he left it. Due to the efforts of S.D.F. and David Kohler, more than a million visitors have been able to view the underground wonders of Crystal Cave, Pennsylvania.

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