

Proceedings

Mammoth Cave National Park's Max Kämper Centennial Symposium

&

9th Science Symposium: Cultural History and Research

October 9-10, 2008

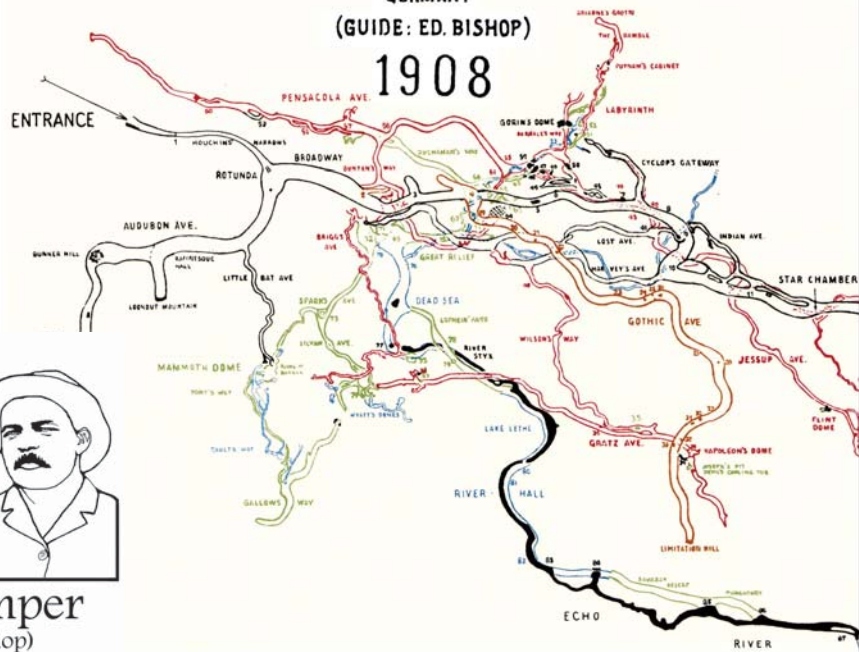


MAP OF THE MAMMOTH CAVE KENTUCKY

SURVEYED AND DRAWN BY
MAX KAEMPER, BERLIN
GERMANY

(GUIDE: ED. BISHOP)

1908



Max Kaemper
(Guide: Ed Bishop)
1908 ~ 2008



Table of Contents



	<u>Page</u>
The Evolution of Cave Mapping and Cartography by Pat Kambesis	1
Mapping of Mammoth Cave: How Cartography Fueled Discoveries, with Emphasis on Max Kaemper's 1908 Map by Roger W. Brucker	2
The Puzzling Mr. Janin and Mammoth Cave Management, 1900-1910 by Katie Algeo	11
The Man Behind the Map by Charles J. DeCroix and Rick Olson	22
Searching for Max: The Engineer, the War and the World's Longest Cave by Bernd Kliebhan and Nina Thomas	23
Max Kämper's Introduction to the New World by Stanley D. Sides, M.D.	36
Max Kämper's Explorations at Mammoth Cave by Charles J. DeCroix	37
The Slave Guide Legacy at Mammoth Cave by Joy Medley Lyons	38
Max Kaemper's Unique Selection of Place Names for His 1908 Map of Mammoth Cave by Charles A. Swedlund and George M. Crothers	39
Mammoth Cave: What a Difference a Few Friends Can Make by LaJuana S. Wilcher	43
Contributions to Karst Science and Education from the Mammoth Cave Region by Chris Groves and William B. White	44
A Long History of Linkages and Synergy: Western Kentucky University and the Mammoth Cave System by Deana Groves, Chris Groves and Weldon Hawkins	45
The Lamps That Lit Their Way by Rick Olson	46
Mammoth Cave International Center for Science and Learning by Rick Toomey and Shannon Trimboli	57
Appendix A: Symposium Program	
Appendix B: Concert Program	



Max Kaemper
(Guide: Ed Bishop)
1908 - 2008

The Evolution of Cave Mapping and Cartography

Pat Kambesis

Cave Reserarch Foundation, 177 Hamilton Valley Road, Cave City, Kentucky 42127; Hoffman Envrionmental Research Institute, Department of Geography and Geology, Western Kentucky University, Bowling Green, KY 42101

Abstract

“Does it go?” Is the initial question that has inspired many a cave explorer to push the extent of a cave system. But the answer only brings more questions...how far, how long, how deep does it go? During the exploration process, as a cave system reveals its complexity, the questions also change – what is the cave’s relationship to the surface, and to surrounding caves? What are the features and obstacles that the cave contains? Those involved in cave exploration know that the only way to answer these questions is with systematic documentation in the form of cave and surface surveys, detailed notes and observations and ultimately cave maps. A cave map not only portrays the geography of a cave, but also shows the location of features within the cave, and illustrates the relationship of a cave other caves and to the surface topography. The basic data that needs to be collected in order to produce a cave map has not changed much since the advent of cave survey and cartography. However, the evolution of survey and computer technologies has changed how caves are mapped and how cave maps are produced. This presentation will provide an overview on the evolution and development of cave mapping and cartography.

Mapping of Mammoth Cave: How Cartography Fueled Discoveries, with Emphasis on Max Kaemper's 1908 Map

By Roger W. Brucker

Cave Research Foundation, 1635 Grange Hall Road, Beavercreek, OH 45432

Abstract

Maps came first at Mammoth Cave, Kentucky. Then came explorers who used the maps to make discoveries as they gained a more comprehensive understanding of the longest cave in the world. The saga of mapping at Mammoth Cave parallels the mapping of North America from the 1600s onward. The first map was an “Eye-Draught Map of Mammoth Cave”, penned from memory in 1811, not a survey, to acquaint merchants with the location of saltpeter dirt. In 1835 the managers of Mammoth Cave hired a surveyor, Edmond Lee, to survey and map and profile the main cave passages. Stephen Bishop, a slave guide at Mammoth Cave (1838 – 1857) drew a comprehensive map in 1842, partly based on the Lee survey. Bishop’s map is a schematic diagram showing many named passages and their relationship to each other. Max Kaemper, a German civil engineer, was hired by the cave manager to make an instrumental survey of the cave in 1908 and to draft a map showing five levels of the cave in distinctive colors. The Walker survey in 1936 served to establish an accurate baseline through the cave and tied entrances to each other. Ray Nelson drafted an unpublished map of the Walker survey, New Discovery survey, and more in 1956. Cave Research Foundation cartographers began mapping passages in the Flint Ridge Cave System in 1954 resulting in one of the first cave maps plotted on a topographic map. The Flint Ridge Folio, 1964, brought Flint Ridge mapping up to Kaemper’s graphic standard with the improvement of the superimposition of the surface topography. Since the 1972 connection between Flint Ridge and Mammoth Cave Ridge, Mammoth Cave has blossomed into a cave with a comprehensive high-accuracy set of cave maps showing 365 miles of connected cave. The Kaemper map lay fallow in Park Service files for many years until it was rediscovered by James F. Quinlan in 1963. Diana Daunt retraced the original Kaemper map for publication by the Cave Research Foundation. The utility of the Kaemper map is its use by generations of explorers to find their way around in Mammoth Cave and to ultimately resurvey and remap all the features Kaemper recorded, and more.

Introduction

Explorers have been making maps of Mammoth Cave since before the war of 1812. The fascinating history of this cartographic activity has been partially described by Meloy¹. To keep cave mapping in perspective, it parallels the early exploration of the United States. Explorers ventured into far away places and brought back tales of wonder, wealth, and possibilities. Second-wave explorers made maps, so their audience could visualize and understand better the relationship of lands, rivers, mountains, and culture including trails. Each round of maps inspired new explorers to go forth, and cartographers followed in their wake. When President Thomas Jefferson commissioned the Lewis & Clark Expedition to explore lands west of the Mississippi River in

1804, they plotted a map of their two years of discoveries and prepared an extensive report.

Some Mammoth Cave maps influenced generations of explorers while other maps hardly saw the light of day. Arguably, the most influential maps were those that showed the cave in relation to topography. Karst is an erosional landscape of sinkholes, sinking springs, and caves. When the cave map and its overlying surface topography are shown together, features such as vertical shafts are shown to be located at the heads of reentrants, and truncated passages and terminal breakdowns are shown to occur under the walls of valleys. Insights from these map understandings led explorers to find over 300 miles of passageway that were unknown prior to 1954.

In his book, *Mapping and Imagination in the Great Basin: A Cartographic History*,² Richard V. Francaviglia concludes (p.196): “Like exploration itself, then, mapping is never the innocent process it first seems, for it demands even more knowledge, first of surfaces and then of more hidden places. Nor are maps produced in the process neutral or innocent, for they work hand in hand with exploration to first intrigue, then inform, and ultimately seduce.” Mammoth Cave’s maps certainly reinforce Dr. Francaviglia’s observation.

Three important conclusions need to be kept in mind as we think about the maps of Mammoth Cave: 1. Many of the maps were deliberately kept secret and thus for explorers in general did not exist until published. The Kaemper map is one of these hidden maps. 2. Unless the topography is shown superimposed on the cave map, the viewer cannot know the relationship of the cave to the surface above it. Few Mammoth Cave maps include topography, and 3. Unless map viewers engage in active exploring or touring of the cave, map viewing is mainly an aesthetic experience.

Maps of Mammoth Cave³

	Map Name	Date	Remarks
1	Eye-Draught*	1811	Three versions of a sketch map showing saltpeter areas
2	Bogert	1813	Working sketch map for saltpeter miners. Several made.
3	Egnew	1815	Copy of Bogert map.
4	Nahum Ward	1817	Sketch map after saltpeter mining ended. Several made.
5	Lee*	1835	First instrumental survey, plan and profile.
6	Bishop*	1842	Based on Lee map. Sketched. Widely published.
7	Blackall	1871	Supressed until 1899, showed scale and north arrow.
8	Klett	1881	Hovey used this map to correct the Bishop map. Published.
9	Hovey	1882	Based on Lee and Bishop. Widely published.
10	Call	1897	Based on Hovey plus Cleaveland Avenue survey.
11	Hovey & Call	1897-9	Minor variation of Call. Showed scale and north. Widely published.
12	Vaughn & Marshall	1899	Accurate Colossal Cave map. Connected to MC 1972.
13	Kaemper*	1908	First accurate survey of cave. Topo overlay? Secret until 1963.
14	Hovey	1909	Based on Call and 8 other maps. Published.
15	Parrish	1922	George Morrison survey, showed scale, north, property lines.
16	Loebeck	1928	Diagram published widely.
17	Nelson*	1956	1935 Walker survey, New Discovery. Secret.
18	CRF FR Folio*	1964	Flint Ridge Cave System, connected to MC 1972. Published.
19	CRF map card*	1977-85	Map card with topo. Several editions published. Shows Roppel Cave.
20	CRF Poster	1981	Multi-color shows levels. 250 miles.
21	CRF*	2007	Multi-sheet map based on 50 years of CRF surveys.

Figure 1. 21 maps of Mammoth Cave (After Meloy².) *Maps discussed in this paper.

Cave maps are foundational to every kind of scientific and historic study of Mammoth Cave. Cave maps are the basis for management and interpretive decisions, and engineering decisions such as lighting and entrance development.

I was taken to Mammoth Cave in 1937 at age eight. My mother and I took the All-Day tour from Historic Entrance to Frozen Niagara Entrance. As we rode the bus back to the hotel I realized that the cave ran beneath the surface we

were riding over and I wondered where were the underground features relative to the surface? Many years later, in 1954, I decided to make a topographic map of Flint Ridge and plot Floyd Collins’ Crystal Cave on top of it as we surveyed during the NSS 1954 C-3 Expedition.⁴ In 1970 and 1977 I plotted the cave on the topographic map and published it as the CRF Map Card of Mammoth Cave, which is still on sale in the Visitor Center.

I will comment on the Kaemper map of Mammoth Cave in the context of a continuous output of cartography that brought understanding of this vast cave to successively higher levels of accuracy and knowledge.

Some Maps of Mammoth Cave

Eye-Draught Map, 1811

The first map of record is the “Eye-Draught Map of Mammoth Cave”, Figure 2. The map is a sketch, not a survey, prepared to show eastern saltpeter merchants the extent of peter dirt

deposits in Mammoth Cave. Three variation copies were made. Gunpowder, an essential commodity on the frontier, was also needed for the War of 1812. Caves in Kentucky like Mammoth Cave and Great Saltpeter Cave were important sources for saltpeter that the duPont Company in Philadelphia made into gunpowder. The sketch clearly shows the cave entrance, the Narrows, Main Cave, and several branching avenues.

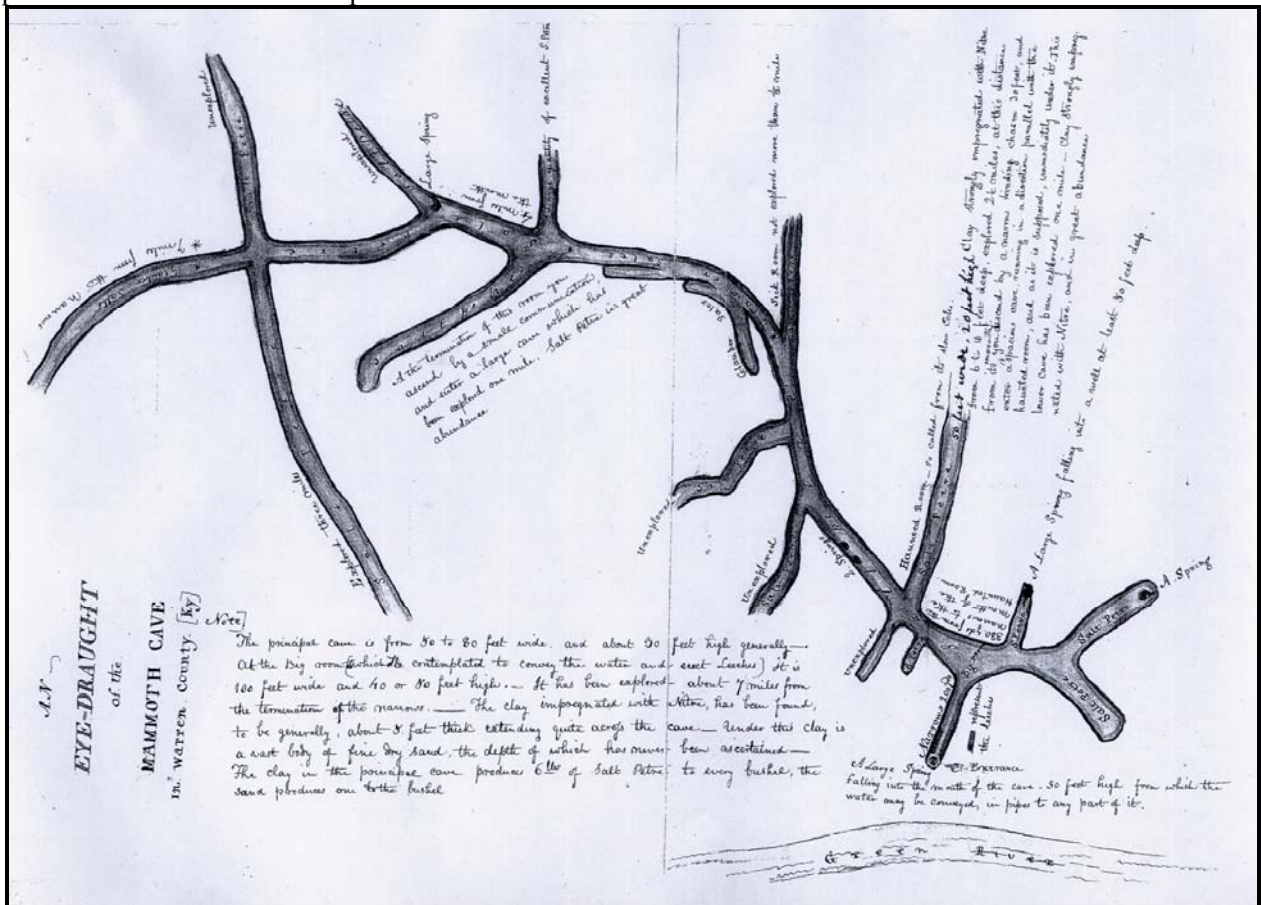


Figure 2. Eye-Draught map of Mammoth Cave, one of three variants.

Edmond Lee Map, 1835

After the 1812 war between British and American forces ended in a draw, Mammoth Cave’s saltpeter mining dwindled and ended, overcome by technology. People would pay money to be taken into Mammoth Cave and the tourist industry began with a modest log hotel and a small guide force. In 1834 the manager hired a professional surveyor, Edmund F. Lee, to

make a comprehensive map of the known main portions of Mammoth Cave. He spent several months in 1834 and 1835 running a compass and level line down the main passages. His map shows the Main Cave, or Broadway, from entrance to a breakdown beyond Chief City. If the lower levels of Mammoth Cave were known at all at that time, the way there consists only of

a “Snake Hole” in what we know as the Wooden Bowl Room.

Lee’s map was probably a sales tool when Hyman Gratz sold Mammoth Cave to Glasgow, KY attorney Franklin Gorin in 1838 for \$5,000.

The Lee map is a beautiful example of early cave cartography and deserves study by everyone interested in the history of Mammoth Cave.

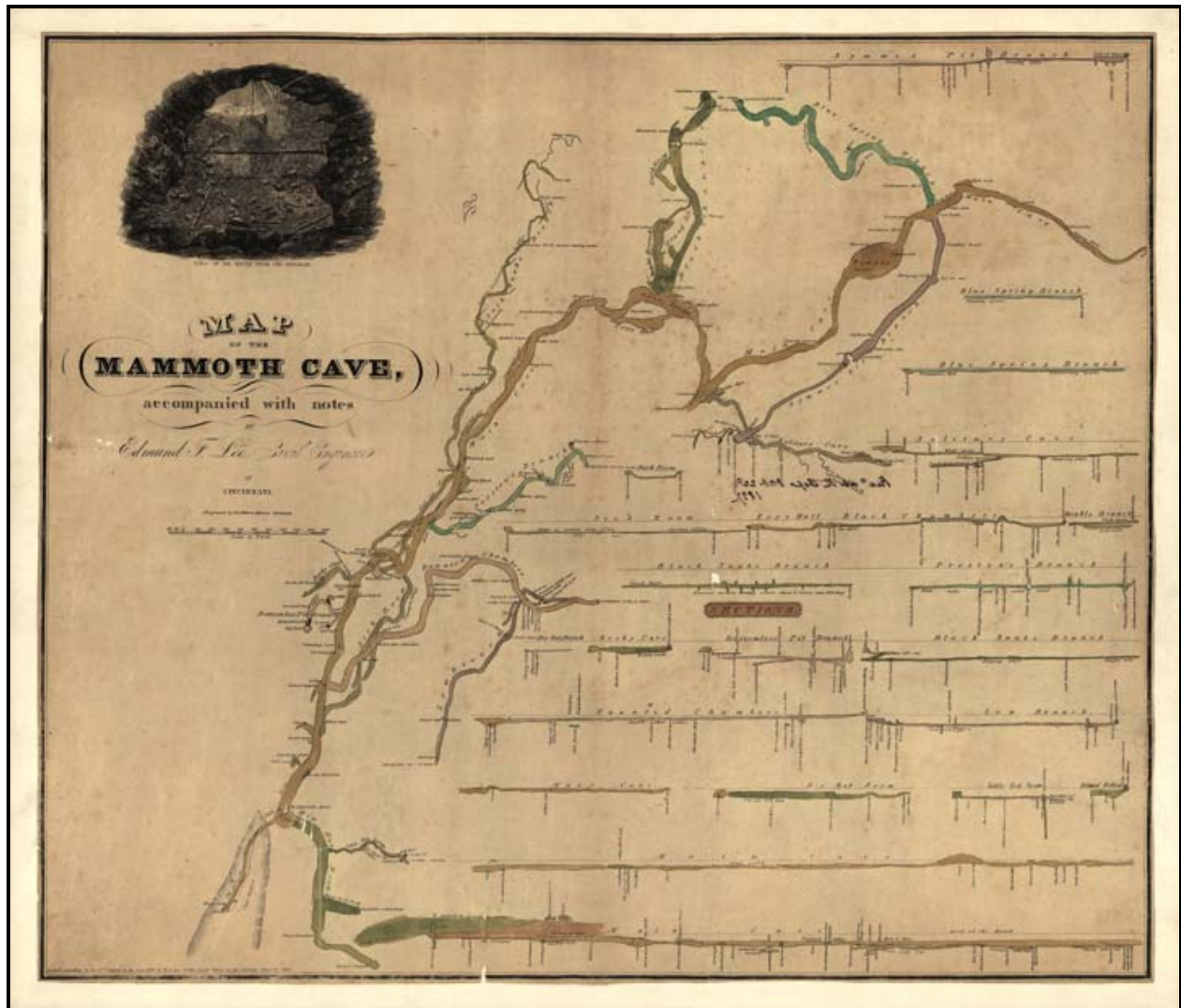


Figure 3. Lee Map of Mammoth Cave.

Stephen Bishop Map, 1842

Franklin Gorin, a lawyer and land sales agent for the Croghan family in Louisville, moved to Mammoth Cave with his seventeen year-old slave, Stephen Bishop, in 1838. His purchase was more an opportunity than a valuable asset because the log hotel was a dump by the standards of the day. He began a program of improvement of the buildings and set Stephen

to learning to take tours into the cave, taught by some guides that had come with the property. Stephen, curious by nature, began to look beyond the large passageways and soon discovered Gorin’s Dome, reached through the Snake Hole. Gorin sold the cave in 1839 to John Croghan, M.D. from Louisville, and Stephen Bishop was sold as part of the cave package.

Stephen's explorations carried him onward to Echo River, Cleaveland Avenue, and Mammoth Dome. In 1842 he convinced his owner, John Croghan, to publish a map showing the passages, and Stephen was taken to the Croghan family home, Locust Grove, in Louisville. There he spent several weeks drawing a map of Mammoth Cave. He consulted the Lee map.

Bishop's map resembled a bowl of spaghetti dumped on the floor. The map went through several printings, once as a tip-in to Alexander Bullitt's *Rambles in Mammoth Cave* (1845). The Bishop sketch map served as the basis for several subsequent maps.

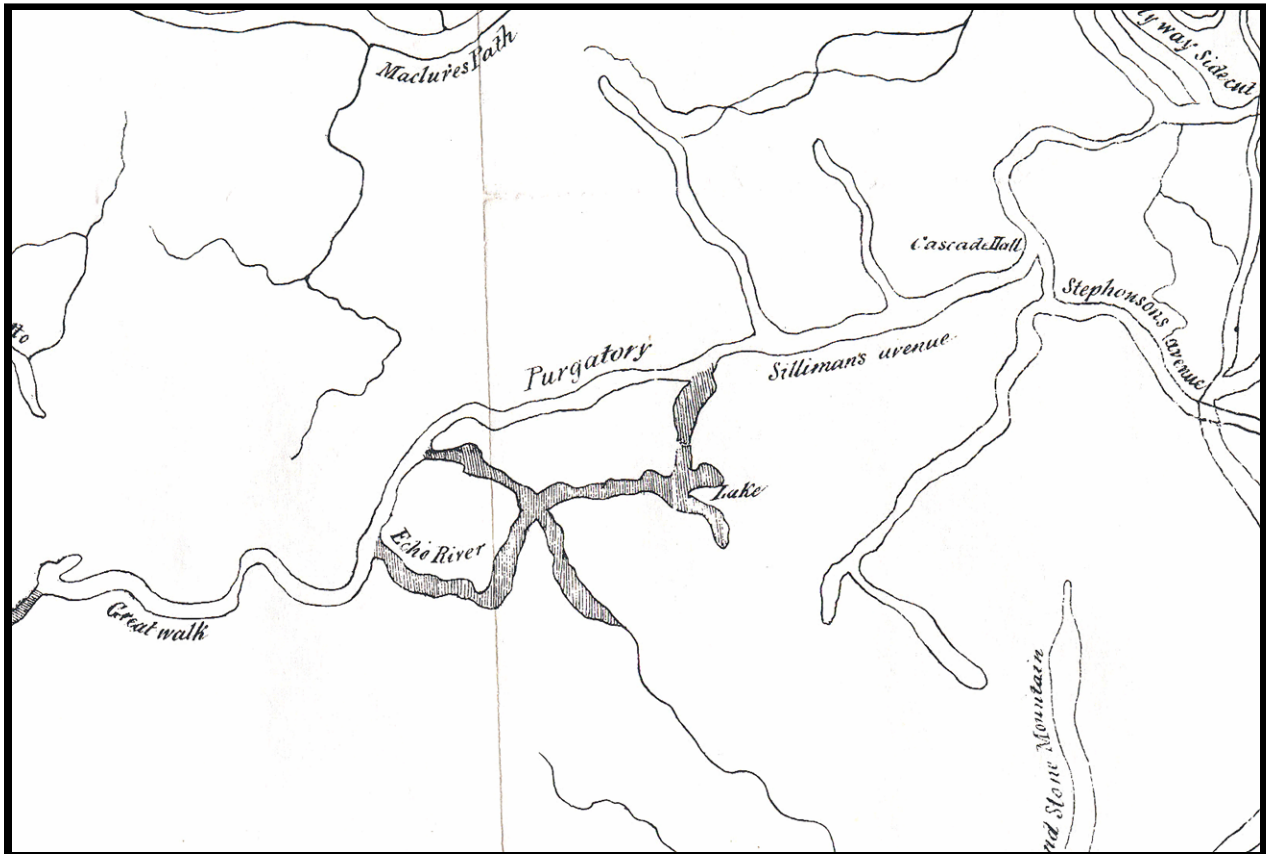


Figure 4. Detail of Bishop Map showing Hansons Lost River connection.

As an interesting sidelight, Bishop's map shows the passage off Echo River through which the 1972 connection with Flint Ridge was made. That passage is not shown on the Kaemper map because the pool of the Brownsville Dam on Green River probably drowned the entrance to that passage before Kaemper surveyed the lowest level.

Kaemper Map, 1908

Albert Janin, Trustee of Mammoth Cave for the Croghan estate, in 1908 hired a 23-year old German surveyor, Max Kaemper. Henry C. Ganter, the cave manager assigned guide Ed

Bishop to show him all the cave and help him survey it. The pair spent eight months surveying and plotting notes. The resulting map was drafted in five colors, each showing its respective level of the cave. It may be the first map to depict cave levels with distinctive color. Names of many places and passages were shown in a table. Kaemper mapped about 35 miles.

The map shows no scale or North orientation, but registration marks appear to correlate with similar marks on a topographic map. Kaemper's map was proof that some of Mammoth Cave extended off owned property,

and hence the map was suppressed. It showed that Boone Avenue and Mary's Vineyard lay off the Mammoth Cave property, a secret that George D. Morrison learned later from his

friend, ex-manager H. C. Ganter. Morrison used this information to hunt for the right location for his New Entrance to Mammoth Cave.

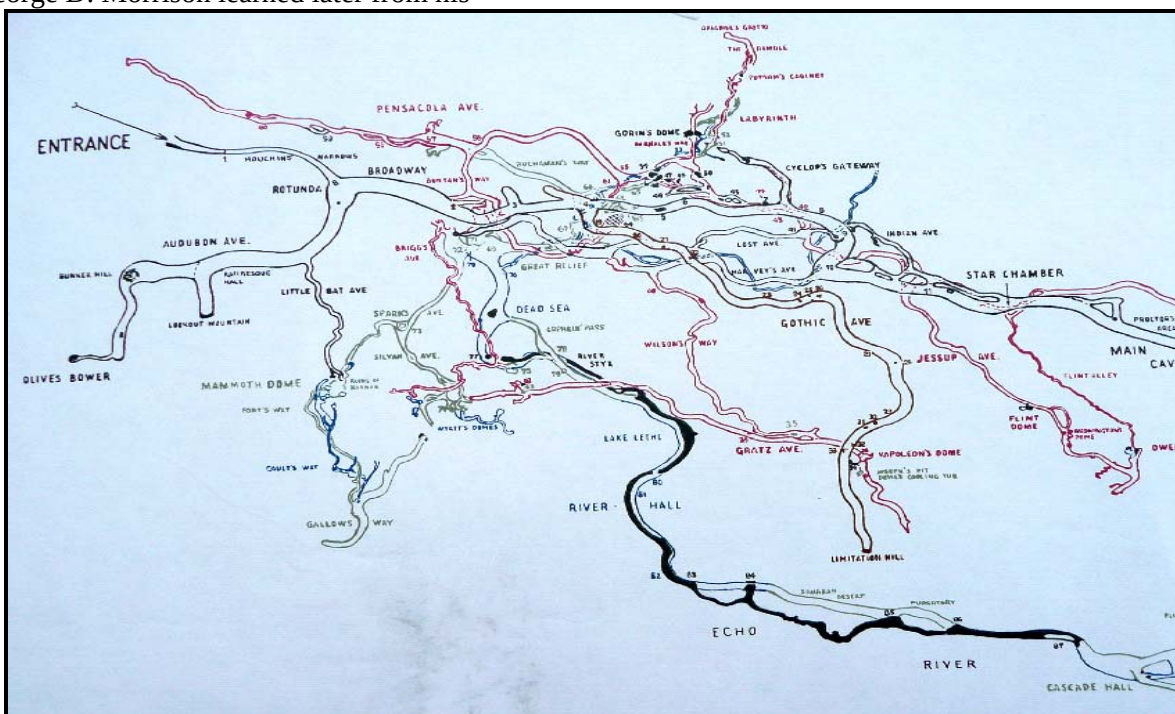


Figure 5. Kaemper map showing the Acute Angle.

When the Kaemper map surfaced after the National Park Service obtained the cave, his map was filed away. In 1963 Park Geologist James F. Quinlan rediscovered the Kaemper map. Since it was in fragile condition, Pat Quinlan traced the Kaemper map. Roger Brucker traced the Quinlan copy. And Diana Daunt made a more careful tracing of the original which was published by CRF. Daunt also drafted a map of the Historic Tour from CRF surveys and other sources during that time. The Kaemper map was extensive and guided CRF survey teams in their systematic effort to resurvey Mammoth Cave to higher standards of accuracy and greater detail. Today the Kaemper map is used by Wild Cave Tour guides to show their curious patrons the route they took during their strenuous trip.

Walker Survey, 1936

In 1935 the U.S. Government sent surveyors to map a 21-mile length of passages. This highly accurate bench-marked survey provided entrance control, and a subsequent base line for

later CRF (Cave Research Foundation) surveys of Mammoth Cave. Ray L. Nelson compiled the Walker survey, the New Discovery survey, and three additional miles into a 28-mile Nelson map in 1956. Between the Kaemper map and Nelson map, Quinlan tallied a total of 46 miles of surveyed and mapped passages.³

Flint Ridge Folio, 1964

In 1954 the National Speleological Society mounted the C-3 expedition into Floyd Collins' Crystal Cave on Flint Ridge, adjacent to Mammoth Cave Ridge⁴. Surveys made by NSS cavers were combined with an instrumental survey of the upper levels of the cave which were plotted on a topographic map. That map was redrafted as an isometric drawing and published in *The Caves Beyond*⁶. As exploration continued, Flint Ridge Reconnaissance maps were plotted of new surveys on a series of overlapping 8-1/2" x 11" sheets of cave and topography at a scale of 1" = 100'. The pace of discoveries and cave surveying outgrew these

Ten years later, in 1964, CRF published the Flint Ridge Folio, first edition, by Roger W. Brucker and Denver P. Burns, Figure 1., showing the Flint Ridge Cave System consisting of several connected caves: Crystal Cave, Unknown Cave, Colossal Cave, and Salts Cave. The discovery of a natural connection between the Flint Ridge Cave System and Mammoth Cave in 1972 resulted in a cave 144.4 miles in length – Mammoth Cave became the longest cave⁵.

Large-scale maps of the growing Mammoth Cave were unwieldy, so in 1977 CRF published the first of several “map cards” to display the total surveyed Mammoth Cave system on a single sheet of heavy paper. The latest version

Cave Research Foundation Map, 2007

This is a detailed historical map of the Chesapeake Bay region. The map shows the intricate network of the Potomac River, the main stem of the Chesapeake Bay, and various tributaries like the Rappahannock and James Rivers. Numerous islands and peninsulas are labeled, including Kent Island, Solomons Island, and the Delmarva Peninsula. Major cities and towns such as Annapolis, Baltimore, and Washington are marked. The map also depicts the surrounding land with various place names, roads, and geographical features. The style is characteristic of 18th or 19th-century cartography, with a focus on coastal and riverine details.

8

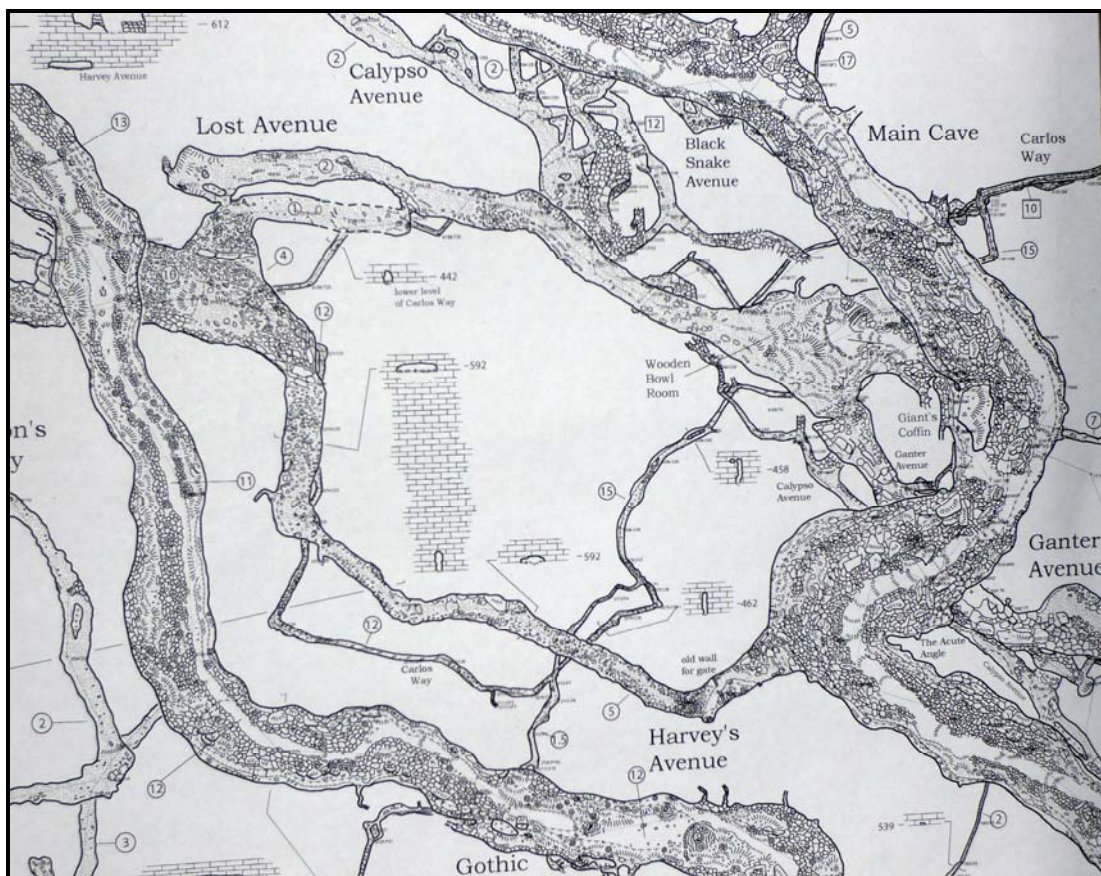


Figure 7. Detail of the CRF 2007 Main Cave map showing the Acute Angle.

Mapping Today

CRF cartography at Mammoth Cave requires a large volunteer staff of cave surveyors, data entry persons, data checkers, cartographers, and survey control integrators. Digitized topography is available for the computer plotter to superimpose on the cave passage maps. A variety of second order level nets and GSP downloads have been used for survey control over entrance locations, and to adjust surveys for magnetic North declination changes through the years. Survey loop closures are continually improved by resurvey for increased accuracy.

Individual CRF cartographers have been assigned to draft individual sheets, Figure 6. Their job is to identify areas where passages have not been surveyed and target those for priority investigation. They prepare the finished plan views and cross-sections to CRF cartographic standards so the maps exhibit uniformity of style and can be added to as new

discoveries are made. When will this cartographic work be finished? Nobody can say and predictions that Mammoth Cave will eventually reach 500 miles or 1000 miles in length suggest the answer to the question is: "Not in our lifetime."

Conclusions

It can be argued that Mammoth Cave maps triggered exploration through time, but it is certain that the maps launched the major CRF discoveries since 1954. Cave explorers believe they see a pattern in the mapped passages. With sufficient surveying, the map helps build awareness of where cave passages may be "missing" or undiscovered. Explorers then go to the blank areas of the map, and use their knowledge of truncated passages and terminal breakdowns to find the most likely leads. The deepest passages pass beneath valleys and they are reached through vertical shaft drains. Discoveries cascade so rapidly that the only way explorers can comprehend them is to follow a

systematic surveying and mapping regimen. “No exploration without survey” became a CRF doctrine, and the required narrative exploration trip reports followed.

Mammoth Cave mapping is a dynamic process partly fueled by discoveries and partly by improvements in cave cartography. For this reason the map of Mammoth Cave may never be “finished.”

The Cave Research Foundation pioneered many of these exploration/cartography techniques, which are now widely employed by cave explorers everywhere – especially cavers working on large cave systems that require years of effort. Max Kaemper’s contribution was not only a beautiful and accurate map, but it inspired the Cave Research Foundation to take mapping to the next levels – survey and map every part of the cave, no matter how wet or small. This systematic, foot-by-foot descriptive effort continually leads to new and significant discoveries.

Notes

1. Francaviglia, Richard V., *Mapping and Imagination in the Great Basin: A Cartographic History*, Univ. of Nevada Press, Reno, NV, 2005, 231 pp.
2. Meloy, Harold, *Early Maps of Mammoth Cave, J. of Spelean History*, vol 1 no 3 (#3) 1968, p 47-57.
3. Meloy, Harold , *Historic Maps of Mammoth Cave*. Unpublished manuscript, MCNP library, 19 pp, 1976. On page 15 is a description of the Nelson map of 1956.
4. Lawrence, Joe, Jr. and Roger W. Brucker, *The Caves Beyond; the Story of the Floyd Collins’ Crystal Cave Expedition*. Cave Books, Dayton, Ohio, 283 pp, reprinted 2007.
5. Brucker, Roger W. and Richard A. Watson, *The Longest Cave*, Southern Illinois University Press, Carbondale, IL, 316 pp, reprinted 1987.
6. Borden, James D. and Roger W. Brucker, *Beyond Mammoth Cave; a Tale of Obsession in the*

World’s Longest Cave, Southern Illinois University Press, Carbondale, IL, 353 pp, 2000.

7. *ibid.* Lawrence, Jr., Joe, pp 56-7.

The Puzzling Mr. Janin and Mammoth Cave Management, 1900-1910

By K. Algeo

Department of Geography & Geology, Western Kentucky University, Bowling Green, KY 42101

Abstract

Albert Covington Janin was the key architect of tourism development at Mammoth Cave for two decades at the start of the twentieth century, yet little has been written about his tenure. This paper explores his background and accomplishments for the period 1900 to 1910 as an initial attempt to understand his contributions to Mammoth Cave. Material about his activities in relation to Mammoth Cave is synthesized from primary sources in the archival collections of the Huntington Library (HL) of San Marino, California, and the Historical Society of Washington, DC (HSW).

“...a riddle wrapped in a mystery inside an enigma...”

- Winston S. Churchill, October 1, 1939

The purpose of this paper is to flesh out the context of Max Kämper’s visit to Mammoth Cave by providing background on a key figure at the cave at that time, Albert Covington Janin. Although Winston Churchill was referring to Russia in the 1939 radio broadcast that made the enigma quote famous, the epithet equally fits Albert Janin, for he is also a puzzle with a particularly elusive solution. For almost a quarter of a century (1904-1928), Janin served as a trustee of the Mammoth Cave estate. He was resident at the cave for much of the year, making him the chief architect of tourism development there and the main day-to-day decision-maker. His tenure spanned an era of rapid change in American tourism — including the rise of automobile tourism, the democratization of tourism to include the working class and African-Americans, and the movement to create national parks in the eastern United States. Yet for a figure occupying such an important position at this critical juncture for Mammoth Cave, his life and contributions to Mammoth Cave have been little explored, perhaps because he is something of a paradox. This paper will explore three aspects of Albert Janin’s paradoxical character — let us call them a riddle, a mystery, and an enigma.

The Riddle: Who was Albert Janin and what were his qualifications to run Mammoth Cave?

Albert Janin, born in 1844, was the youngest of six brothers, sons of a French immigrant who settled in New Orleans (Fig. 1). His father, Louis Janin, became a successful lawyer with a practice first in Louisiana, and later in Washington, DC. Albert was sent to Germany for his schooling (all of his siblings received some of their education in Europe), and when he returned to the U.S., he moved through a series of positions under the watchful eye of one or another of his brothers. Albert studied law in San Francisco, although not very diligently. According to Laas’s (1998, 51-52) narrative of his young adulthood, Albert provoked his father’s concern over his habits of self-indulgence and financial speculation, which led him to borrow money and amass debts, even as a young man. Louis Janin’s solution was to bring Albert to Washington, DC, to keep an eye on him and hopefully develop his legal career. Albert’s charm and ability to speak multiple languages allowed him to fit easily into Washington society. It was there that he met Violet Blair, daughter of a socially and politically prominent family (their house on Lafayette Square was across the street from the White House), whom he married in 1874. Violet’s mother, Mary Jesup Blair, was one of the nine original heirs who inherited the Mammoth Cave trust under the terms of John Croghan’s will (Fig. 2). So, Albert married into Mammoth Cave. It would not become important in his life, however, for another quarter of a century.

Albert spent most of the first two decades of his married life in Louisiana, where he

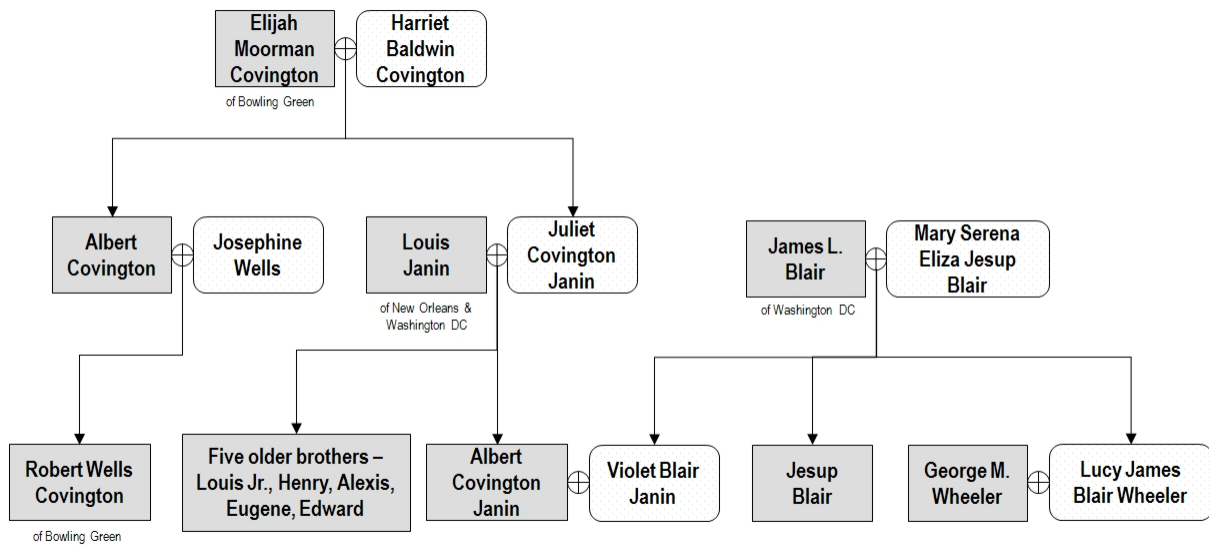


Figure 1. Albert Janin – Critical Family Connections. (Note: Many family members have been omitted from the chart for clarity.)

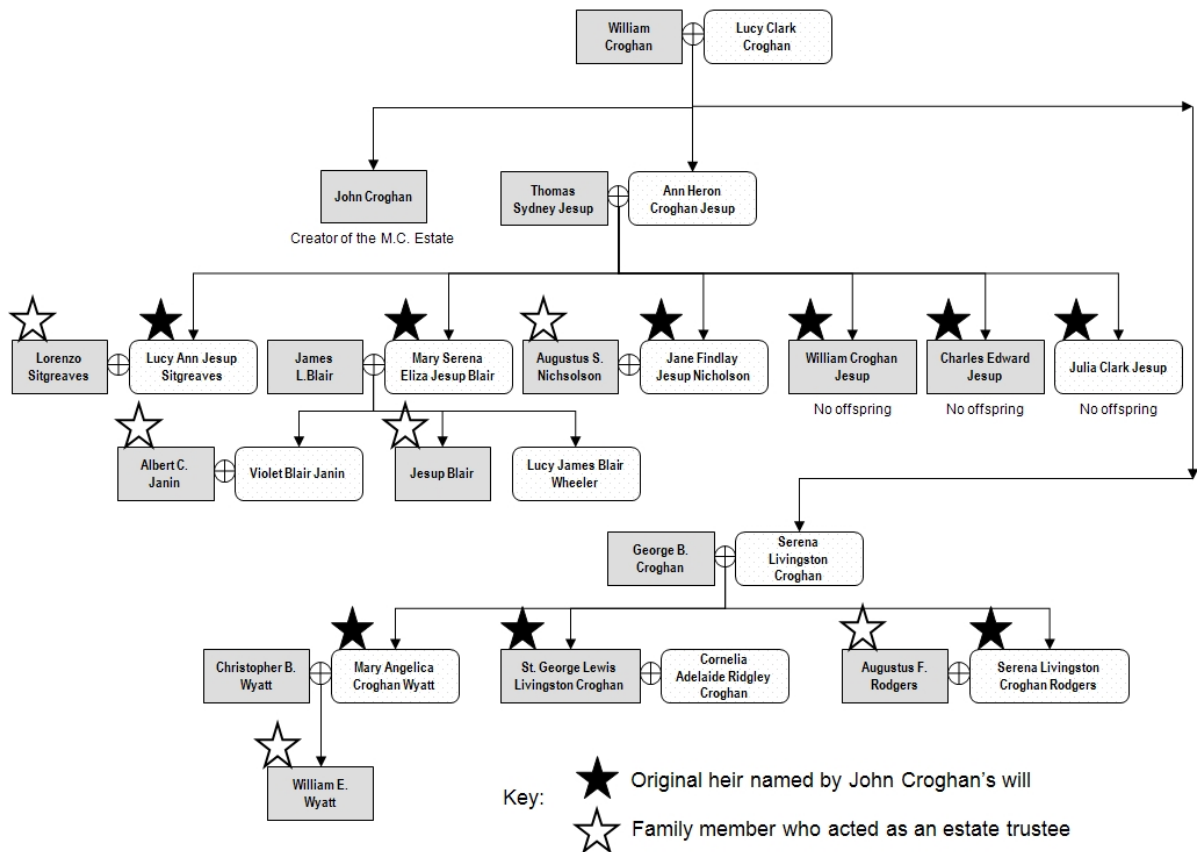


Figure 2. Mammoth Cave Estate – Heirs and Trustees. (Note: Many family members have been omitted from the chart for clarity.)

maintained a law practice, but spent much of his time pursuing one failed business venture after another. His legal work, which was modestly successful, centered on representing plaintiffs before the French and American Claims Commission, which was created in 1880 to resolve individual citizens' claims arising out of the Civil War, the French & Mexican War, and the Franco-Prussian War against various governments (Laas 1998, 78). The scheme that consumed most of his time, energy, and money, however, was the construction of a canal south of New Orleans, between the Mississippi River and Lake Borgne, from which ships could quickly reach the Gulf of Mexico. This canal would cut off the long passage down the crows-foot of the Mississippi delta, reducing travel time and easing passage for deep-draft boats. Money could be made both by charging tolls for ships and by subdividing and selling the land along the canal. Janin did not initiate this project. His legal services were contracted in 1882 to sell what was then called the Mississippi, Mexican & Gulf Canal. By 1884, Janin had formed a partnership with Russel Ralph Pealer to form the St. Louis, New Orleans and Ocean Canal Company, which took over the Lake Borgne canal project. Instead of selling the canal for a client, Janin bought it himself.

A series of letters written by Violet Blair Janin to her husband in 1882 and 1883 reveal her concern about Albert's neglect of his law practice and his propensity for bad investments. Repeatedly she admonishes him not to be lazy, to attend to his law business, and to forget the canal:

"Please don't be lazy but translate LeMore's case [a claim for illegal imprisonment by the army in 1862]. If you lost that case by neglect, I will be ashamed of you. ... I am not disappointed about the canal, as I expected nothing."

- Violet Blair Janin to Albert C. Janin, 5 Jan. [no year, but probably 1882 or 1883], HSW

"I want you to pay attention to that paper from the commission. If any of your cases fail from your laziness I will considered [sic] you disgraced & utterly unworthy of respect. Nothing but laziness & novel

reading kept you from translating the LeMore brief long ago. For Heaven's sake don't make me ashamed of you. With your knowledge of French you ought to find no more difficulty in translating it than I find in translating German or Italian into English. I am not joking, I mean every word I say... LeMore has been a good friend to you and you ought to do everything in your power to win his case."

- Violet Blair Janin to Albert C. Janin, 19 Jan. [no year, but probably 1882 or 1883], HSW

"... if you had paid attention to what I have advised, you would have managed your affairs with more common sense & would not have them in such a muddle now. I have no patience with a person who is too obstinate to listen to reason, & then wants to be considered a misunderstood martyr... I don't believe you have the remotest chance of selling that canal to Sir E.R. for any sort of price so you might as well turn your attention exclusively to your cases."

- Violet Blair Janin to Albert C. Janin, 19 Jan. [no year, but probably 1882 or 1883], HSW

"I am afraid from your letter that you intend to drop the meat for the shadow. Neglect the French cases for a foolish extravagant speculation. For ten years I have been hearing nonsense about the fortune you were going to make in a few months or a year, & I suppose it will continue as long as you can get anything to speculate with. If you were free of debt, had won your cases, & could afford to amuse yourself in that way, I would simply laugh & say nothing, but situated as you are now, I feel much more like having a hard cry over it than a laugh."

- Violet Blair Janin to Albert C. Janin, 10 Oct. 1883, HSW

Other speculative ventures in which Albert invested included Minnesota real estate development, dredging shell for paving, a New Orleans newspaper, and ice-making machines. Janin lost money on all of these projects, not only his own money, but also substantial sums borrowed from his mother, his brothers, his

wife, and his mother-in-law. Janin also ran unsuccessfully for a Louisiana congressional seat and saw another attempt to run for office fail when he did not win his party's nomination (Laas 1998, 57). In short, by the end of the nineteenth century, Janin had failed in half a dozen business ventures, amassed large debts, and had seen a political career aborted before it even got started. All of these efforts detracted from a modestly successful law career. The answer, it seems, to the riddle, "What qualifications did Albert Janin have for running Mammoth Cave?" is simple -- none.

Yet the canal was a good idea. It was eventually completed, although not by Janin, whose property and equipment were seized and sold to pay his creditors. The Lake Borgne canal was supplanted in the twentieth century by the much larger Mississippi River and Gulf Outlet (MrGo) Canal, but this newer canal was built for the same purpose. Janin's legacy in canal building can be seen in the name of the community at the mouth of the canal, Violet, a name that was later transferred to the canal itself (previously called the Lake Borgne Canal and the Ship Island Canal) (Fig. 3). And, of course,

fortunes have been made in ice-machines, western mines, and real estate development. The problem with Janin's schemes seems to have been not so much in their conceptualization, but in their implementation. Atkins (2001, 60), who developed a psychological profile of Albert Janin as part of a study of family dynamics among siblings, concludes that Janin "was a dreamer. He liked more than anything to speculate." He expressed "continual optimism and fanciful visions of a successful future" (Laas 1998, 46).

Violet's letters are noteworthy and worth quoting at length because they reveal a keen understanding of her husband's character and business failings:

"You refer in your last letter to my want of faith in the canal. I have exactly the same amount of faith in it as I now have in scrip, ice machines, frozen rooms, cod liver oil, Minnesota mine lands, agricultural lands, Va. Railroads, La. Bonds, Wall St. speculations, the N.O. Democrat, Dupre Appleman, Oglesby, Gilmore Hearsey, Hosmer, Edward, & a score of other people

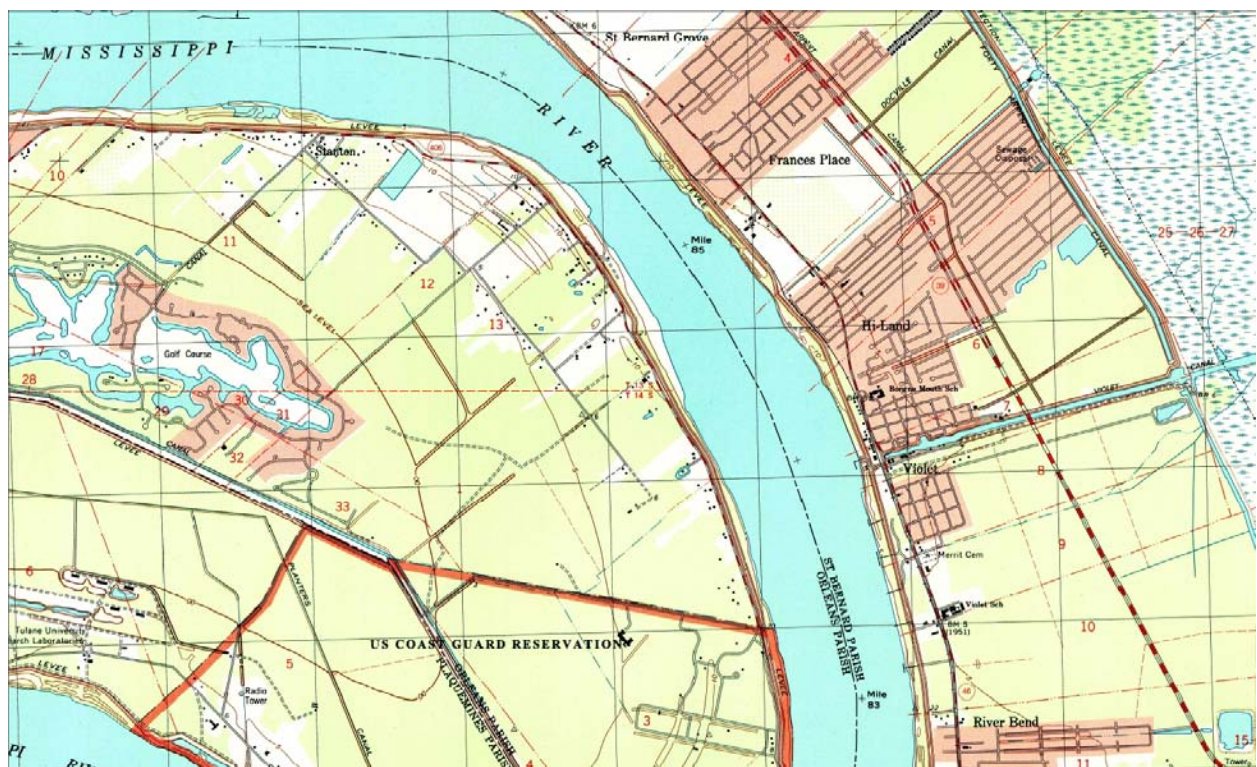


Figure 3. Portion of the 1:24,000 USGS Chalmet, Louisiana, topographic map showing the community of Violet in the center right at the confluence of the Mississippi River and the Violet Canal.

& things you have put faith in – any of the above things might prove successful in the hands of practical business men, but in your hands serve only to lose your own & other people's money in. I don't mean you are not clever, no one can appreciate your intelligence more than I do, but the law is your trade, & you succeed only when you stick to your trade. For Heaven's sake don't be foolish & do anything extravagant at that wretched canal."

- Violet Blair Janin to Albert C. Janin, 27 Sept. 1883, HSW

Violet was an astute investor who secured and expanded her own fortune despite her husband's repeatedly demonstrated financial ineptitude (Laas 1998). She became the financial manager of her mother and several aunts and was an advisor in Mammoth Cave matters, as well. Despite her knowledge of her husband's failings and her lack of confidence in Albert's business acumen, Violet, along with her close relatives, moved Albert progressively into a position of authority at Mammoth cave. This leads us to the mystery...

The Mystery: Why was Albert Janin at Mammoth Cave?

The earliest evidence that I have so far found of Albert Janin's involvement with Mammoth Cave is his presence at an October 1900 meeting of the estate trustees. Janin was not a trustee at this point, and it is notable that he was described not as a representative of his mother-in-law, Mary Jesup Blair, but of his mother-in-law's sister, Lucy Jesup Sitgreaves:

"Dear Albert:- Your presence at the meeting of the Trustees of the Mammoth Cave Estate this morning was most agreeable to me, and I wrote Mrs. Sitgreaves to that effect. Now, I want you (as her representative) to write her a detailed account of what took place..."

- Augustus S. Nicholson to Albert C. Janin, 27 Oct. 1900, HSW

The matter of representation was critical, because the extended family had factionalized into several camps with different designs for Mammoth Cave, and each camp wanted representation on the board of trustees. Lucy Sitgreave's husband, Lorenzo Sitgreaves had

been one of a group of five men appointed as trustees by the Edmonson Circuit Court in 1873, but Sitgreaves had resigned in 1882. He was replaced on the board by William E. Wyatt, the son of another original heir, Mary Croghan Wyatt. Wyatt was extremely active as a trustee, and it is probably fair to describe him as the leading decision-maker during the 1880s and 1890s. His work, however, generated animosity and mistrust among the Blair/Sitgreaves camp. Albert Janin's nominal representation of Lucy Sitgreaves was probably the opening move by the Blair/Sitgreaves camp to gain greater control of the board. Janin could not represent his mother-in-law on the board, because she was already represented by her son, Jesup Blair.

Following the board meeting at which Janin was present, he was sent to the cave to investigate the controversy at the heart of the family split – whether the person acting as the estate agent, Henry C. Ganter, was cheating the estate:

"At a meeting last October at the Blairs these facts were spread before them, but they refused to believe; of course you know, Jesup is only a figure-head, & it is Violet who makes the trouble. At this meeting they said they would send an impartial person down to investigate, & whom did they send, but Violet's husband, Mr. Janin, who goes & does nothing but write a report backing up Ganter."

- William E. Wyatt to Lucy Croghan Brown, 30 Nov. 1900, HSW

From 1900 through 1904, multiple law suits, injunctions and petitions were filed in the Edmonson and Warren County Circuit Courts by both sides of the Ganter controversy. The Wyatt/Nicholson faction installed William S. Miller as estate agent in place of Ganter, and the legal wrangling between the factions intensified. Most of the legal briefs for the Blair/Sitgreaves faction were prepared by Albert Janin. He was drawn into Mammoth Cave affairs because he was a competent lawyer; Violet and her mother were helping him "stick to his trade." Albert's role quickly expanded beyond that of family lawyer, however. A December 1900 petition to the Court asked both for the removal of Miller as estate agent and for the appointment of Albert

Janin as a trustee. Neither request was granted at that time, but Janin was ultimately successful in achieving both these aims. Janin had the backing of the Blair/Sitgreaves faction in his quest to become a trustee:

“Following the precedent set by yourself last year in selecting a Mr. Truman to examine the accounts of the manager of the estate, I have selected Mr. Albert C. Janin, to examine the said managers accounts for the period of one year – beginning where Truman’s investigation ended.”

- Jesup Blair to Augustus S. Nicholson, 4 Oct. 1901, HSW

“Do not let the Court adjourn without getting yourself made a trustee and also others that you may think best.”

- Mary Serena Eliza Jesup Blair to Albert C. Janin, 18 Jun. 1902, HL

Violet supports the elevation of her husband to trusteeship, but her support is qualified. She knows too much about Albert’s past business ventures to trust all decision-making to him:

“I do hope that you will be made a trustee but I will never consent to have you made sole trustee.”

- Violet Blair Janin to Albert C. Janin, 29 Nov. 1901, HSW

Violet’s letters to her husband from this time period reveal the depth of her concern about his diligence in tending to family business. They express no worries about his competence, only about his willingness to apply himself conscientiously. Violet repeatedly admonishes Albert not to “trot off” to Louisiana before Mammoth Cave affairs have been settled:

“I am scared to death at the idea of having you leave Ky just when the case is coming up. They will think it is your fault if you lose it and that you ought not to have run away from the battle.”

- Violet Blair Janin to Albert C. Janin, 29 Nov. 1901, HSW

“I am very much afraid that if you go to New Orleans that you will not get back to Cave in time for G’s [Ganter’s] suit to come up. I do not grudge you the pleasure of going there, but I do not think you are likely to suffer from ‘all work’.”

- Violet Blair Janin to Albert C. Janin, 15 May 1903, HSW

“..Something in your last letter made me fear that you were thinking of trotting off to N.O. before Ganter’s case is finished. I hope you will not do so and that I am needlessly alarmed.”

- Violet Blair Janin to Albert C. Janin, 12 Oct .1903, HSW

I hope you will not leave until Rhodes’ papers have been filed in court & decided, much as we want to see you, we are afraid of any hitch in the proceedings and don’t want to have the affair dragging on a year or two longer.

- Violet Blair Janin to Albert C. Janin, 19 Feb. 1904, HSW

The April 1902 death of Jesup Blair left an opening on the board of trustees and, critically, left the Blair/Sitgreaves faction without representation. In December 1902, they introduced a petition to the Edmonson Circuit Court to require trustees to be residents of Kentucky, ostensibly for ease of meeting and to ensure greater oversight of cave operations, but this requirement would also have ended the trusteeships of William E. Wyatt and Augustus S. Nicholson, who were regarded as the “enemy.” This same petition asked that three prominent local men be appointed as sole trustees -- Clarence U. McElroy and D. W. Wright of Bowling Green, and Marcellus Lay of Brownsville. Neither of the petition’s propositions were granted (it is possible that the gentlemen named declined to enter so fractious an enterprise, as others are on record of having done). By mid-October 1904, Albert Janin had been appointed a trustee by the Court and was in residence at the cave, overseeing day-to-day operations. His fellow trustees still included William E. Wyatt and Augustus S. Nicholson, but there was another newly appointed trustee --

Robert Wells Covington, a Bowling Green banker and cousin to Albert Janin.

The mystery of why Albert Janin was at Mammoth Cave despite his demonstrated business incompetence seems to have a multifaceted solution. Legal action was desired by the Blair/Sitgreaves faction, and Janin was a capable lawyer, when he applied himself. It is possible that the family also hoped he could draw on family connections on his mother's side. Albert's mother, Juliet Covington Janin, came from an old and prominent Bowling Green family, and some of Albert's cousins were among the town's leading citizens -- lawyers, judges, and bankers. He fell into a pattern of socializing with the Covington family and several others, visiting them in their homes and receiving them at Mammoth Cave. But Albert's selection as a trustee probably hinged on his being the last man standing in the immediate Blair-Sitgreaves circle. This was a time when women rarely took on certain public roles. Through all branches of the extended family that owned Mammoth Cave, although women comprised the majority of the owners, it was usually their close male relatives who took active management roles, as trustees, lawyers, representatives, investigators, etc. Violet's father and brother were dead. Her uncle, Lorenzo Sitgreaves, had resigned the trusteeship, which may have been for health reasons or because of demands of his job, which kept him traveling on the western frontier. Violet's brother-in-law (Mary Jesup Blair's other son-in-law), George Wheeler, had been tapped much earlier for an active role in Mammoth Cave affairs. During the 1880s and 1890s, Wheeler had periodically worked to rationalize Mammoth Cave affairs. Although he wasn't a trustee, he visited the cave, wrote reports, and made recommendations. His efforts were interrupted by bouts of illness and came to an abrupt halt after a falling out with his mother-in-law over financial matters which led Mary and Violet to believe he could no longer be trusted. Although Albert had also acted foolishly in the financial realm, he had not deceived them. Thus, essentially for want of other options, Albert was forwarded as a Mammoth Cave trustee.

The Enigma: How did Albert Janin succeed at Mammoth Cave?

Up to this point, little of this narrative flatters Albert Janin. He was a spectacular failure as a businessman, a non-starter as a politician, and had become a trustee largely by virtue of his gender and a lack of alternatives within the Blair-Sitgreaves camp. So, at the age of 60, having lost a small fortune and succeeded at relatively little in his life, he became a trustee of the Mammoth Cave estate. The enigma is that, in his early years of management, he did remarkably well, particularly given the toxic atmosphere that existed among the two camps of estate owners and the challenges to management occasioned by rapid changes then taking place within the tourism industry.

First, let us consider Janin's role at Mammoth Cave to establish that he actually did exert a large influence. Despite the presence of a "cave agent," a man who managed the cave tour side of the business, and a "hotel agent" or lessee, who nominally ran the hotel, Janin's almost daily letters to his wife make clear that he was, in fact, doing a great deal of the actual managing, promotion, and development of Mammoth Cave tourism. Willis W. Ranshaw, a doctor from Covington, Kentucky, held the hotel lease for two five-year terms from 1902 to 1911. He was, however, an absentee lessee, and during most of this period, Albert Janin managed the hotel as well as overseeing the rest of the estate. Ranshaw was a good friend of Janin's, and it is quite possible that he took the lease as a favor, so that the terms of Croghan's will would be upheld, but Janin would have practical control:

"Marnie was afraid that Dr. Ranshaw might not be willing to renew the lease, but I told her I thought that he would for your sake. She thinks it very important the present status should be continued."

- Violet Blair Janin to Albert C. Janin, 12 Aug. 1907, HSW

Janin seems to have found the effort of management more than he had bargained for, because his letters contain repeated complaints about the work load. He made an attempt in the fall of 1907 to turn control of the hotel over to Dr. Ranshaw:

"I am making up my hotel accounts and expect to have a good sum on hand, by

October 1st, to turn over to the Dr. if he wants to 'run' the business. I want to be relieved of the responsibility."

- Albert C. Janin to Violet Blair Janin, 27 Sept. 1907, HSW

"I expect to turn the hotel business over to the Doctor Monday evening. He thinks he can manage it successfully. If he can't I shall have to resume partial control again. But I want him, first, to try and learn what a difficult undertaking it is.

- Albert C. Janin to Violet Blair Janin, 28 Sept. 1907, HSW

"This being the last day of the month, I am settling all outstanding accounts against the hotel, and expect to turn over the business to the Dr. with more than \$2,500. Doesn't that make a pretty good record for me, who took the hotel with an indebtedness of about \$1,000?"

- Albert C. Janin to Violet Blair Janin, 30 Sept. 1907, HSW

The effort was short-lived because Janin discovered that no one was as adept as he was at handling the large tour groups of a hundred or more that arrived often with little notice. Such unanticipated tour groups required prompt, coordinated action on the part of the kitchen and dining staff to feed the visitors and skill on his part to keep everything running smoothly. Others were overwhelmed by the sheer amount of detail entailed in running the hotel:

"I find that nobody here but myself can handle the financial part of the hotel business at this critical time of the year without endangering the credit of the institution. For some time past I have let Martin [Charlet] attend to the settlement of the bills. His other occupations weigh so heavily upon him in busy times that he loses control of the financial... That is what I see I must undertake."

- Albert C. Janin to Violet Blair Janin, 19 Jun. 1909, HSW

Willis Ranshaw died in Jan. 1911, and his two sisters inherited his lease of the Mammoth Cave hotel. They visited during the summer, and no doubt helped with management during that time, allowing Janin to get away and visit his

wife in DC, but Albert Janin remained the driving force behind day-to-day affairs:

"I am so sorry to hear of Dr Ranshaw's death, because you were so fond of him. ... If there was only someone capable to taking charge and relieve you of so many journeys out there."

- Violet Blair Janin to Albert C. Janin, 2 Jan. 1911, HSW

Now that Janin's key role in Mammoth Cave management has been established, let us consider the results he achieved. Among reforms instituted by Janin at Mammoth Cave was a system of strict account keeping. From 1905 to 1911, he kept detailed books, recording payments for the many items needed to run the estate and dividends paid on a monthly basis to estate heirs. His books (in the Huntington Library's Janin Family Collection) show that he remitted to the heirs most of the cash on hand each month, retaining only a small amount as operating capital. For the first few years, the amount of ready cash he retained was about twenty dollars. By 1907, he seems to have realized that a larger cushion was needed, and increased ready cash to between \$100 and \$200, still by no means extravagant. He also kept a close eye on expenses, working to reduce waste and petty pilfering:

"[I instituted] a new scheme for preventing drinking, loafing and waste in the kitchen."

- Albert C. Janin to Violet Blair Janin, 9 May 1907, HSW

The financial result was marked and welcome. The Mammoth Cave business was on a sounder financial footing than it had been for decades:

"Mary & Aunt Lutie are delighted with the way you do business. Mary is going to keep the copy of your letter to the Trustees & also your 'business regulations'. She is going to write to you. Nothing could be clearer or more effective as a check."

- Violet Blair Janin to Albert C. Janin, 29 Aug. 1905, HSW

"Mother is anxious that you should take entire charge of the [Mammoth Cave] household as you did last year & have everything as you like it."

- Violet Blair Janin to Albert C. Janin, 15 Aug 1905, HSW

"I also added that we had never rec'd so much money from the Cave before."

- Lucy Jesup Sitgreaves to Mary J. Blair, 15 Sept. 1907, HSW

"I am indeed astonished by the M.C. dividend. It is enormous for this month & all the more so, for such times."

- Violet Blair Janin to Albert C. Janin, 13 Jul. 1908, HSW

Under Albert's management, the hotel, which had been a perennial money sink, began to make money:

"I have just paid the estate's taxes for 1906 - \$735.00 - not with Cave fees, but with 'Hotel money'. I am glad that you, your mother and Aunt Julia like my management of the property. If I had Carte Blanche to act, I would surprise the owners with the result."

- Albert C. Janin to Violet Blair Janin, 11 Oct. 1906, HSW

By the end of the decade, even William E. Wyatt, the "enemy" trustee had been won over by Janin's efforts:

"Wyatt told Aunt Janie that everything was fine at the Cave. He had nothing, but praise for the state of things there, she told mother."

- Violet Blair Janin to Albert C. Janin, 3 May 1910, HSW

Tourism was growing in America at this time, and more people were traveling than ever before. Several advances in transportation brought more visitors to the cave. In 1907, the Corps of Engineers completed the Green River lock and dam system, opening the river to steamboats. River boat excursions to Mammoth Cave from Bowling Green and Evansville, Indiana, became popular. Henry Ford's innovations in automobile manufacture put cars within reach of ordinary households, and by 1914, tourist arrivals by car started to outnumber those who came by train to Mammoth Cave. So, fortuitous circumstances increased travel to Mammoth Cave and contributed to its renewed

profitability, but Albert Janin also worked hard to promote and advertise the cave in new ways, and much of the success must be attributed to his efforts:

"It seems to me my work here is never done. That is, probably, because, in addition to the routine work, I am constantly devising new schemes for creating business and improving conditions here."

- Albert C. Janin to Violet Blair Janin, 22 Apr. 1907, HSW

Janin had a knack for marketing and promotion. He designed numerous advertising materials – brochures and flyers, color lantern slides to be used in lectures, and he tried very hard to get a Hollywood film featuring the cave made. He held a beauty contest, which drew contestants and audience from around the western Kentucky region. One marketing innovation was to send a man to expositions and fairs in nearby major cities to staff an information booth. In the past, the estate had relied on the L&N Railroad's excursion agents to work up parties from such gatherings. The direct approach allowed Mammoth Cave to control the message, and it eliminated the cut of the ticket price that the railroad took:

"The Louisville Exposition is quite a success. D. [Dan] C. Ganter is officiating at the Information Bureau."

- Albert C. Janin to Violet Blair Janin, 22 Mar. 1907, HSW

"Owing, I think, directly to the manner in which Dan Ganter has been distributing my M.C. [Mammoth Cave] circulars at the State Fair, ...33 of the party, instead of taking only the Short Route & no meals and returning last night in their special coaches, determined to take both routes and remain at the Hotel till this afternoon. .. I shall keep Dan all the week distributing circulars in the Fair building & 'talking Cave'."

- Albert C. Janin to Violet Blair Janin, 25 Mar. 1907, HSW

Janin was also savvy in offering free passes to key individuals who could influence travel and in cultivating connections with colleges whose student bodies would become regular patrons:

“My liberality in giving free entertainment to editors of Baptist newspapers, together with the circulation of ‘Cave literature’, bore good fruit. We received many more Baptist visitors than any of us expected, and there were a nice lot of people. Several of the editors will give us good ‘write-ups’.”

- Albert C. Janin to Violet Blair Janin, 19 May 1909, HSW

“We are reaping today the first fruits of our liberality last year in donating Cave fees to the fund required for establishing a State Normal School [now WKU] at Bowling Green. Professor Cherry has just brought a big crowd of students. The Cave fees will amount to about \$400.00. He will probably bring another party this year.”

- Albert C. Janin to Violet Blair Janin, 6 May 1907, HSW

Janin innovated in other ways, as well. He had an appreciation for technology and the organizational efficiencies it could bring:

“We have now a telephone line into the Cave, which enables the guides to notify us how many visitors have decided to take the Long Route and will want lunches at the dining hall.”

- Albert C. Janin to Violet Blair Janin, 24 Jul. 1907, HSW

He oversaw the installation of lighting in the hotel and cave and bought a “utilitator”, a tractor that could plow the estate’s fields and whose engine could power a saw for cutting lumber. Janin also paid attention to the overall visitor experience. He installed Lucy Ganter, wife of sometime hotel manager Henry Ganter, in the hotel kitchen. She was already a good, if traditionally starch-heavy, cook...

“We had a fine dinner yesterday – fricasseed chicken, creamed potatoes, and macaroni cooked by Lucy Ganter... The hotel is acquiring a fine reputation for its good meals.”

- Albert C. Janin to Violet Blair Janin, 22 Jul. 1907, HSW

But then Janin sent her to Louisiana to absorb the best of Louisiana French Creole cuisine:

“I am very much interested in Lucy’s proposed Mardi Gras trip to Louisiana. I want her to learn how to prepare a number of dishes – gumbo, [unreadable], fricassee, stewed kidneys, stewed shrimp &c.”

- Albert C. Janin to Violet Blair Janin, 28 Jan 1909, HSW

Upon her return...

“Lucy has regaled us with fricassee of chicken, “grillades” and “pain perdue” – all finely cooked – and promises a gumbo tomorrow.”

“We got the promised gumbo yesterday. Lucy would make a splendid chef. She has industry, energy and fine judgment. She learned a great deal at New Orleans, and quickly.”

- Albert C. Janin to Violet Blair Janin, 9 & 12 Apr. 1909, HSW

At the conclusion of the first decade of the twentieth century, the Mammoth Cave enterprise was doing better than it had done for decades. It was making more money for the owners, its reputation as a quality attraction had been bolstered among the traveling public, and the new section of cave discovered by Max Kämper and Ed Bishop and named for Janin’s wife, revitalized interest:

“Leaders of parties are saying more and more that the Cave and Hotel are now more attractive than they ever were. Violet City is perceived by many to be the finest thing in the Cave. Bishop says people “go crazy over it”. I wish we had money enough to make it still more attractive to visitors by making the trip easier.”

- Albert C. Janin to Violet Blair Janin, 31 May 1909, HSW

Management of Mammoth Cave became more problematic for Albert Janin in subsequent years. He faced increasing competition from other show caves and hotels, and, as his health declined, he was less able to stay on top of the many details that management of the estate demanded. But for this period of time, 1900

to 1910, Albert Janin's contribution to Mammoth Cave was positive and significant, which leads us back to the enigma – how did this man, who had never succeeded in a business venture in his life, at the age when most are thinking of retirement, make a success of Mammoth Cave? Not only did he put the business on a sound financial footing and oversee a period of expanded tourism, but he managed to quell the vituperous factionalization of the Mammoth Cave heirs. While a definitive answer is elusive, I can suggest a few qualities that contributed to his success. He was honest, and his scrupulousness about keeping accounts of income and expenditures stemmed the leakage of estate goods and services that had been a financial drain. He wanted very much to make a success of the business for the sake of his family members, some of whom were dependent on Mammoth Cave income. He was worldly enough to have traveled widely in America and Europe, giving him an appreciation for what tourists were looking for and allowing him to adapt practices he had observed elsewhere. For instance, he was quick to encourage cook Lucy Ganter to pursue an interest in haute cuisine, allowing her time to travel and study French Creole cooking. He believed that advertising and promotion was a good investment, reversing a long-standing aversion of the trustees to reducing dividends for the sake of advertising. And he was a bit of a dreamer and schemer... which might not have been a bad quality in tourism development. Not all his plans came to fruition (e.g. the Hollywood movie was not made), but enough did to turn the fortunes of the estate around.

Laas, V., 1998, *Love and Power in the Nineteenth Century: The Marriage of Violet Blair*. Fayetteville: University of Arkansas Press.

REFERENCES

Manuscript Collections

Blair-Janin Papers. Historical Society of Washington, DC.

Janin Family Collection. Huntington Library. San Marino, California.

Secondary Sources

Atkins, A., 2001, *We Grew Up Together: Brothers and Sisters in Nineteenth-Century America*. Urbana: University of Illinois Press.

The Man Behind the Map

By C. DeCroix, and R. Olson

Mammoth Cave National Park, P.O. Box 7, Mammoth Cave, Kentucky 42259

Abstract

In 1992 I (Chuck DeCroix) was trained to lead the Wild Cave tour offered to the public at Mammoth Cave. I was especially impressed with areas such as Becky's Alley, Lida's Pass, and Gerta's Grotto that were highlights of the tour and featured on Kämper's map. Very little was known about these sections of cave – i.e., when they were discovered, who they were named after, etc. The Kämper map was an important reference used for the Wild Cave tour, and the activity would typically conclude with visitors gathered around the guide highlighting the tour route on their copies of the map.

My fascination with the Kämper map inspired me to start researching the various passages featured on the Wild Cave route. I utilized cave signatures, historical references, and genealogical connections to piece the puzzle together. In the summer of 1996, I took Dr. Stan Sides' "History of Exploration" course offered through Western Kentucky University. Stan and I talked about Max Kämper and I shared my findings with him and the class over the course of the week. Many Sunday mornings to follow were spent at Stan and Kay's cabin talking history over coffee. Stan realized the importance of studying the Kämper map and also the need to actually find out what happened to Max after he left Mammoth Cave.

One day in the summer of 1996, Rick Olson's phone rang, and a man with a German accent introduced himself as Bernd Kliebhan. He explained that the president of the Cave Research Foundation, Phil DiBlasi, had recommended that he call Rick in the hope that he could help facilitate Bernd's research on E. A. Martel, who had visited Mammoth Cave in 1912. Rick had recently returned from the National Speleological Society convention in Salida, Colorado and had seen Bernd's outstanding film on Martel, "Journey into Darkness," which had won first place in the motion picture category. Rick sought and received permission to assist Bernd in his historical research at the park. In a way this was surprising, because history is a fair piece from ecology (Rick's area of responsibility at the park), but it is a tribute to the park's leadership that they could be this flexible when the situation called for it.

A few days later, on September 3, 1996, Bernd called from his hotel in Cave City and Rick drove down to meet him. After some discussion about what Bernd wanted to see and do while in the area, Rick asked Bernd if he had ever heard of Max Kämper. He replied that he was not familiar with this name. Rick explained that Max had made a map of Mammoth Cave back in 1908, but that we knew nothing about him except a rumor that he had been killed in World War I. Bernd was, of course, intrigued that a fellow countryman was so highly revered at Mammoth Cave. Rick said there was someone else at the park that Bernd needed to meet, and I had the great pleasure of meeting him and spending time with him in the cave. There was precious little information on Martel at Mammoth Cave and, thankfully, Stan Sides had already compiled what there was. So, in addition to showing Bernd places like Martel Avenue, Rick and I spent the next three days going to places in the cave that provided clues to Max Kämper's story. As we talked about Martel and Bernd's research, we consistently mentioned the great challenge of trying to track down Max Kämper and his possible descendents. Rick was especially good at emphasizing how important this project was, and after several friendly suggestions, a jovially exasperated Bernd assured us that he would do his best to find Max Kämper. Bernd returned to Germany with a new mission, and the rest of the story is history!

Searching for Max

The engineer, the war and the world's longest cave

By Bernd Kliebhan and Nina Thomas
Burgweg 15, D-35516 Muenzenberg

Abstract

In 1908 the German engineer Max Kämper mapped 35 miles of Mammoth Cave, KY. The “Kämper Map,” forgotten in the archives for half a century, is nowadays considered as a masterpiece of underground cartography. Little was known about Max Kämper despite several attempts of American speleo-historians. Most traces were wiped out in two world wars. Nevertheless the authors could find out details of the biography of Max Kämper in German archives. The text is based upon the radio story “**Suche nach Max**,” broadcasted by Hessischer Rundfunk - hr1 December 26, 1999, audio download available on <http://www.kliebhan.de/kaemper.htm>

The mysterious inscription

Chuck lifts his lamp and points to an inscription at the cave wall. “Max Kaemper March 1908” is cut into the rock, many miles away from the entrance in a remote section of the American Mammoth Cave, the world's longest cave.

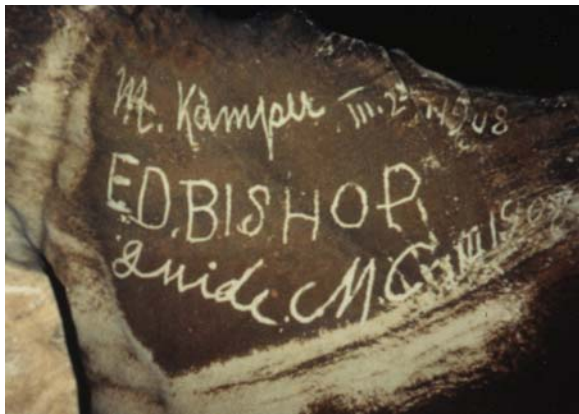


Fig.1 One of many inscriptions of Max Kämper in MMC

“Max Kämper was a German engineer who came to Kentucky as a tourist in 1908” explains Chuck, our guide. “Initially he wanted to stay only for some days, but the gigantic cave fascinated him so much that he stayed on and on. Eight months later he had explored and mapped over 30 miles of the cave. His unbelievably precise map is still considered as a marvel of cartography, decades ahead of his time. On Christmas, 1908 he traveled back to Germany. After this, there was no sign of life from him any more.”

Why did he draw this cave map? Who was Max Kaemper? “That is one of the great mysteries of Mammoth Cave,” states Chuck.

Chuck spreads the map left behind by Kaemper. A tangle of colored lines represents the ramifications of the underground labyrinth. Between them, in tiny, careful writing hundreds of names. Every passage, every dome, every remarkable place was named after persons who were obviously important to Max: many girls' names among them, but also those of the owners of the cave and their families. The notables of Kentucky got their their tributes as well as Bismarck and Moltke.

Each name stands for a story. On this map the life lines of people from both sides of the Atlantic cross each other.

Today, Mammoth Cave is the heart of an American National Park and an important object of scientific research. Park ranger Chuck investigated together with historians of Western Kentucky University all the stories behind the names on the Kaemper map - a research in the most unusual historical book imaginable. They called their project “The Kaemper Connection.”

In archives and in the cave itself, where a countless number of inscriptions can be found, Chuck detected many facts about the early explorers of the cave. Only the author of the map, Max Kaemper, remained a phantom: All attempts to find out more about this legendary figure failed.

Innumerable letters were sent by Chuck and his research colleagues to archives and libraries. They asked every German tourist who seemed to be interested in the subject. They sent out calls for help on the Internet: "Let's find who Max Kaemper was." Everything in vain. Two world wars had wiped out the tracks.

Only very persistent research in German archives would perhaps unveil the secret. Meeting German journalists who are interested in caves is like a gift for Chuck: "Can't you find out who Max Kaemper was?" he asks us. We accept the challenge.

In the labyrinth of archives

Finding out after two world wars the identity of a German tourist who visited a cave in Kentucky at the turn of the last century is everything but simple. Especially as Chuck could give us only some few reference points. An article from a 1909 issue of "Scientific American" with some data, not more.

Nevertheless: We knew that the wanted person was a citizen of Berlin and an engineer. And that he had come to the USA to study American production and mining methods.

The obvious idea to check the University archives in Berlin did not help us: The archives of the former Mining Academy were burned during the second world war. And in the Technical University the situation was the same. But there still exists the old address books of Berlin stored on microfilm in each larger library.

And indeed: In the address book of 1911 we find an engineer named Max Kaemper. However, this discovery does not help us a lot because the municipal archives of Berlin do not show where he had gone. "Everything lost in WW2," we are told laconically.

The central archives of the Evangelical Church in Berlin survived the war, but there is another problem: Under Data Protection Laws only relatives have access to the data. But it's exactly those people we are looking for.

We plunge again into the address books: Max lived in the Hermannstrasse, in close

neighbourhood to Heinrich Kaemper, the owner of an engine factory.

Since the early 20's Elsbeth Kaemper, widow of an engineer, lived in the Grunewald. Obviously Max had not survived WW1.

20 years later, at the beginning of the 40's we find the factory owner at the same address. We develop a hypothesis: Max, the son of a factory owner, travels to the USA in order to make professional contacts. He is killed in the First World War. His widow accommodates her father-in-law at the beginning of the Second World War. It sounds plausible - and turns out nevertheless to be a dead end. After we retraced Heinrich Kaemper's tracks up to his birth place we find that Max was definitely NOT his son.

We start another attempt and plunge again into the address books. We find that in 1931 Elsbeth Kaemper, Max's widow, lived in close neighbourhood to one Lina Kaemper, a general's widow.

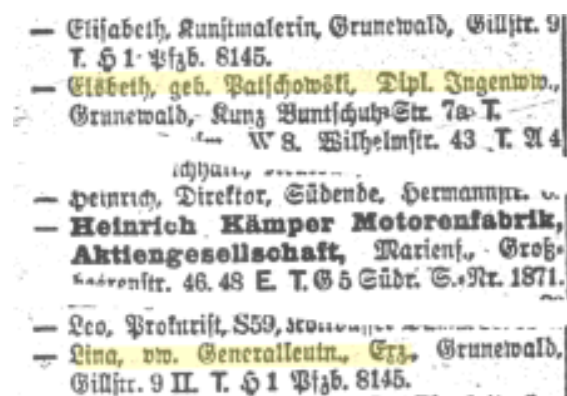


Fig. 2 extract of the Berlin address book of 1931, naming Max's sister Elisabeth, his widow Elsbeth, his cousin's "Heinrich Kämper Motorenfabrik" and his mother Lina.

And Max **must have had** a relationship with the Prussian military; or else he would hardly have given the name "Moltke Dome" to a hall in Mammoth Cave.

Luck and coincidence help us: An archivist in Berlin who became fond of our search discovers the obituary of Lieutenant General Hugo Kaemper. "His only son Max fell 1916 at the Somme" was the crucial sentence for us. Some further lucky coincidences - and nine months after

beginning of our search we have a telephone call with the 87-year-old son of Max Kaemper.

On the following weekend we sit together with Max Kaemper's family. They had heard about his journey to America in 1907/1908. They knew as well that he had visited Mammoth Cave. But that he was a legendary figure to American cavers was unknown to the family.



Fig 3. Max's son Hans and his wife Gerlinde Kämper answering Bernd Kliebhan's questions

Nevertheless: Our assumption that Max had something to do with Heinrich, the factory owner, was not completely false. Heinrich was his cousin. And Mrs. Kaemper, the daughter-in-law of Max, even knows why he went to America:

"He was to take over the Kaemper Engine Company. But first he should see the world and get a wider view of things. There were probably connections to America. He worked as a trainee at different companies. He should see the world and how they work over there. This journey was a present from his parents, a reward for his successful exam."

Underground hiking

Like 100 years ago Mammoth Cave is a popular tourist destination. Every year, hundreds of thousands of visitors led by the park rangers walk through the endless galleries and chambers, one ranger in uniform in front, another in the rear. Nobody should get lost in the cave. Quite different routes through the cave are offered - from the short trip to the entrance area up to eight hours of a wild cave trip following the steps of the first explorers.

The participants of this "extremely strenuous" trip must not exceed a chest perimeter of 41 inches. Because of the narrow passages in which they would be stuck otherwise.

The four-hours "Lantern tour" gives the best impression of how the cave visits were run at the turn of the century. With petroleum lamps as the only sources of light, visitors hike along the vast "Main Cave" which is several miles long.

The history of Mammoth Cave is the main topic of this tour. The guide stops again and again, in order to explain historical remains.

Pipes and ruined timber constructions witness the activities of the first European settlers who penetrated into the cave at the beginning of the 19th century. Not driven by curiosity, but for quite practical reasons: The settlers needed gun powder. From the mountains of guano deposited by bats over hundreds of thousands of years saltpeter could be made - an important ingredient in the production of black powder.

Black slaves were sent underground to do the job. Time witnesses describe the scenery as almost infernal: blazing fires, biting smoke, between them hard working exhausted men. In 1812, production was given up, it was no longer profitable. Elsewhere gun powder was cheaper. But the owner of the cave had a new idea: He wanted to show his cave to paying visitors. He had people to do that: The black slaves who knew the cave better than anybody else, got the task of guiding the guests through the underworld.

The black guides became rapidly the brand name of Mammoth Cave which was praised in advertisements as "the longest cave of the world" which nobody could prove, but which could not be disproved either. Working underground, once loathed by the slaves was now a desirable and highly appreciated job to them. Because in this world they had the saying. At the surface the white slave owners decided over right and wrong. Underground everything was different in every regard. Down here the black guides could even make their own money.

The guides were allowed to keep the tips the guests gave them. Therefore they invented always

new attractions, in order to impress their visitors. Masterfully they threw burning torches up to incredible heights, in order to illuminate large chambers. Nerve-strong explorers among the visitors were led across deep pits into passages which few humans probably had seen before. The guests also loved to leave their signatures in the most inaccessible places. Thousands of inscriptions decorate even now the ceiling of "Gothic Avenue," seven feet high and more.

A highlight of the trips at that time was the "Star Chamber," where tips must have been plentiful. Tips are taboo to nowadays rangers. But apart from this, the impressive show in the Star Chamber is exactly the same today as it was described by a visitor 100 years ago:

"The guide collects our lamps and vanishes with them behind a jutting rock. Then comes the marvelous illusion. The roof seems lifted to an immense height. Indeed, we seem to gaze from a canyon directly up to the starry sky. A meteor shoots across the vault. We behold the mild glory of the Milky Way. Suddenly the guide breaks in upon our exclamations of delight by saying "Good night. I will see you again in the morning!" He plunges into a gorge.

We are in utter darkness. The silence is so perfect that we can hear our hearts beat.

Presently a glimmer comes from another direction, like a faint streak of dawn. The aurora tinges the tips of the rocks; the horizon is bathed in a rosy glow; a concert of cock-crowing, the lowing of cattle and other barnyard sounds, answered by the barking of the house-dog, seem to herald the rising sun; when the ventriloquial guide appears, swinging his cluster of lamps and asking how we liked the performance. Our response is a hearty encore."

The hike continues, through enormous chambers in which in former times large quantities of prehistoric remains were lying around. Several thousand years ago, Indians with torches penetrated up to 2 miles into the cave, in order to dig for gypsum and other minerals. The remains of their torches, baskets and sticks had been preserved well over thousands of years in the dry cave climate, but ignorant visitors burned the historic testimonials in order to warm themselves.

The ceiling becomes lower. The soil is covered with rock debris. Finally a wall of chaotically lying rocks blocks the way. "Ultima Thule" the place is called - the end of the world.

Until 1908 the cave visits ended here, reports the ranger. But then a German visitor named Max Kaemper together with his black guide Ed Bishop found a way through the obstacle. Max Kaemper squeezed himself through wobbly rocks and arrived in a large hall. "Ultima Thule" was not the end of the cave, it continued further, to gigantic depths. He named the chamber "Kaemper Hall" - after himself.



Fig.4 Max Kämper, photograph from about 1910

An impressive pit in it was named "Bishop's pit" in honor of his guide.

The next even larger hall got his sister's name. And the next chamber, still larger, was named "Violet City" after the cave owner's wife. Violet City is the spectacular highlight of the Lantern tour. The petroleum lamps are not sufficient to illuminate the huge hall. The true dimensions can only be suspected. By the upper end dripstone formations can be seen. The approaching lamps illuminate series of stalactites hanging down from the dark, curtains and cascades of calcite. Through an artificial tunnel the tourists leave the cave.

The black box

The Kaemper family became infected by our “Searching for Max” and has looked for further documents. A box emerges. The widow had kept yellowed souvenirs of her husband in it.

We open an envelope and see cave photos. Pictures, taken by Max in 1908 of his discoveries in Mammoth Cave. We recognize the characteristic dripstone cascades of Violet City.



Fig. 5 Violet City, Photograph Max Kämper 1908

We see pictures of canyons and rivers. The quality of the pictures is amazing. They are skillfully illuminated by magnesium light and perfectly printed.

Full of excitement we open a black notebook. The large surprise: it contains entries of Max Kaempers journey to America. It's not a diary in the strict sense of the word, rather a cashier's journal. Day for day Max noted with the utmost care his expenses and incomes. Sometimes he added small comments.

Day for day, location for location, Max's activities in America can be reconstructed. The shape of a real person emerges.

With 750 Marks fare in the bag and 155 pounds of luggage he leaves Berlin at the end of April, 1907. Via Munich and Milano he travels to Genova where he embarks the “Norddeutscher Lloyd” mail-boat “Friedrich der Grosse.” The

passage costs 400 Marks. On May, 16 he arrives in New York.

Max has some problems adjusting himself to the bubbling, booming town. He writes many letters to his family. One of them outlasted the time.

“According to his letters he had great adjustment problems, mainly with the behaviour of the people. He writes: What Americans call liberty and equality we would define as rudeness. Perhaps I will get used to it in the course of time. It's mainly the behaviour in the restaurants. Something like this does not exist at home. I would bet that a German student who in Berlin tried to behave himself in an “American” way only one day long, would get a dozen challenges to duel. But we are not in Berlin here.”

But quite quickly Max begins to enjoy New York. The days of the young engineer are devoted to the art of engineering. The evenings and weekends to arts and music. He visits museums, concerts and theatres. No important premiere which he omits. He listens to all the stars of his time in the concert halls. In the Metropolitan Opera in 1907 the tenor Enrico Caruso triumphs. Max sits in the auditorium when technicians record the event for future generations on Edison cylinders.

Max moves to the heart of the theatre quarter, where Madison Square is located today. He takes violin courses and meets with friends for playing music.

Almost each week he buys new notes: the current hits of the turn of the century as well as Beethoven's violin sonatas and other classical works.

In February of 1908 he leaves New York and starts for a journey to the American industrial areas. In Pittsburg he visits several steel plants - on recommendation of his uncle Heinrich Lueg, one of the steel barons in the Ruhr district. The entries in the notebook are scarce, the visits hardly more than rapidly finished duty exercises. For the target of his journey is situated in the south: in the most remote part of Kentucky, in the close hills of a tiny sleepy small town named “Cave City.”

At the end of February 1908 he arrives at Mammoth Cave. An uncomfortable season for a visit. The hotel: badly heated and quite shabby. The weather cloudy, the trees bald. In winter times not an inviting region at all.

We ask ourselves what may have caused him to undertake this journey. In his notes there is no hint that this trip had been planned beforehand. There is not the smallest indication that Max was interested in caves at all. But now - for whatever reasons - he had arrived here.

Black guides take him along the routes which the tourists usually are shown at that time. After two days he has seen the standard program and could have left. But the cave has fascinated him. He wants to see more of this gigantic labyrinth, including the galleries outside of the touristic routes. He wants to go where only few have been before. And he wants to go even further inside the mountain, into new, unknown passages which nobody entered before.



Fig 6 Postcard showing Ed Bishop

The black guide Ed Bishop takes Max to the most remote area of the cave. The trip takes several hours. At the end of a canyon they reach the point where some years before a guest from New York had turned around. A pit in the floor blocks the way. Max and Ed climb over the obstacle and discover a dripstone decorated chamber from which further black openings lead into the unknown.

Max calls the pretty chamber "Gertas Grotto."

Two days later the two men are again in the cave, in order to draw a map of their discovery. Now at last, the engineer is infected by the cave virus. Day after day he is now underground with Ed Bishop, drawing and measuring. His ambitious, almost unattainable target: he wants to explore the whole system of Mammoth Cave systematically up to the most remote parts and he wants to draw a complete map of the largest cave in the world.

In his note book he writes down briefly on which day which cave section is on the schedule. Max and Ed work fast and precise. Mile after mile is mapped with tape and compass. Max knows what is to be done: in the army he had learned, as an artillery lieutenant, to deal with maps and measuring points.

DARE				April	1908
27	Map of Sandstone Ave.				27
15	Discovery of Paper	30		30	
28	Violet City discovered				
29	Map of Cave, Charlotte, Harrison				
	in New Discovery				
16	Pit in floor	25			
17	Portman Ave	15		40	
30	Cataracts				
	Pit of Cave	55		35	

Fig. 7 Max's diary mentioning the discovery of Violet City on April 29, 1908.

The two men must have been in a very good physical condition because the way to the most remote sections of the cave was a long, long trip. Surely some of their underground trips took more than 24 hours.

In his hotel room Max must have spent long nights drawing and calculating. But beside all this he still has time for an active social life. He is invited to family celebrations. Accompanied by a young lady at the pianoforte he even gives a concert in the cave hotel which is well accepted in the local newspaper.

The handsome guest from Germany must also have pleased the upper class daughters of the region because they even do not hesitate to accompany Max on some of his cave trips. Max

shows gratitude and give Lida and Becky and Maymie a little bit of immortality by naming galleries after them: Lida's pass..., Becky's Alley..., Maymie's stoop.



Fig. 8 Detail of the Kämper Map from 1908

But the woman who is obviously most important for him lives on the other side of the Atlantic: Gerta. After her he named his first discovery. And her name marks also the end of its notes: "Message of Gerta's engagement" is written there, in a somewhat smeared writing. Some days later the recordings end.

Who was Gerta? Mrs. Kaemper, the daughter-in-law of Max, had the answer:

"Gerta was a cousin, with whom he also made music /... / they were probably youth friends /.. / and I think he also adored her."



Fig. 9 Gerta Luyken, photograph from about 1910

Mapping below ground

An inscription of 1912. Somebody perpetuated himself at the end of a side passage. An interesting discovery for Stan and Rick of the Cave Research Foundation. The inscription is photographed, its position is carefully noted and recorded in the inscriptions data base.

In the 60's the members of the Cave Research Foundation started research in Mammoth Cave and the many other caves in the national park. Most of them are amateurs, as far as speleology is concerned. Stan is a physician, Rick is a biologist. They share a great enthusiasm for caves and for the fascination of the dark unknown. Every year the group organizes expeditions in order to explore new passages. Often the researchers stay underground for several days because the areas to be explored are situated many hours away from the next entrance. Only well-trained and safety-conscious people may join the team. Adrenaline junkies looking for risks are of no use. What if deep inside the earth an accident would occur!

Each discovery is mapped immediately. That's the only way to keep track of the tangle of underground passages. And each year new galleries are added - an end is not in sight. Until today, the group has mapped and entered into computer programs more than 350 miles of cave passages. Thus, Mammoth Cave is by far the longest cave in the world.

As long as 150 years ago, the owners tried to attract visitors with fantastic statements about enormous dimensions of the cave. Over 100 miles length were claimed by an advertisement of the 19th century. The figure was mere speculation, because exact data concerning the extents of the labyrinth did not exist. Different rough sketch plans circulated, but there was no exact cartography of the cave. The owners did not want it. Each attempt to map the cave was stopped by them. And not without reason, as a traveler already experienced 150 years ago:

"Sir! Is there no map available of your infernal kingdom?" - "Map?" repeated Mr. Proctor, who in wintertimes is not only the owner of the hotel and the cave but also if necessary waiter and

guide. “No, Sir! There is no map. The cave was never surveyed. The owners do never allow a survey of the interior of the famous Mammoth Cave.” And he left the room.

The man had a sharp nose. Most Kentuckians have one. He smelled that there was an enemy. After some minutes his son came in. I ordered one more drink and let me show the Kentucky rifle (on the wall). Then I asked in an unconcerned way why the cave was not mapped. The boy was less polite than his father: “Dam me! Anyone should try this!” and he knocked the butt-end of his rifle on the roaring floor.

“You know, the cave is damned big - we bought 2,000 acres around the entrance, but - dam me” – that’s a complete waste! One branch for sure reaches as far as Cave City, another near Glasgow. On some places the cave is deep under ground. On others it is close to the surface. If anyone in Cave City knew its course he would dig a new entrance and then - good night, Cave Hotel! - it would be our ruin!”

The young man probably did not suspect how right he was. In 1921 a mining engineer named George Morrison succeeded in opening, from the adjoining property, another access to the cave, called the “New Entrance.” Morrison knew how to make money from his discovery: He built a hotel and, by means of a large publicity campaign and enormous sign posts, he directed the visitors into his part of the cave. And as his “New Entrance Hotel” was closer to the main street than the old lodging house, their business went downhill, while Morrison’s enterprise flourished. A violent controversy broke out, conducted verbally as well as by force of arms - a story which eventually entered history books as the “Kentucky Cave War.” Only the establishment of the National Park in 1941 terminated the battle.

When Max Kaemper started his research in Mammoth Cave in 1908 the cave owners were aware that the cave probably extended far under the adjoining properties. And therefore they forbade categorically each mapping attempt to anybody because an exact cave map would be an extremely explosive document. On the other hand: Without an exact measurement the legal risks in any controversy with the neighbours could not be estimated.

In this dilemma the young German Max Kaemper with his boundless enthusiasm for the cave came in handy: The owners could be quite sure that he would not talk a lot about the results of his measurements. He would go home - and the owners could carefully hide his map.

After some hesitation the owners of cave gave the green light for the mapping. For free food and lodging in the cave hotel Max should draw a cave map.

The owners had an obvious motive for this agreement. But what about Max, what were his motives? What caused him to start his research; how did he get the strange idea to travel in February 1908 to that uncomfortable, cold town of Cave City? His note book does not give any explanation and his family is just as puzzled as we are.

Engineering and poetry

Eight months of research in the world’s longest cave - Max did not keep this experience to himself. We are quite sure about this. He must have shared it with his friends. If we want to know more about his motives we must have a look at his friends. Only there we may perhaps find answers to our questions. We must learn more about Berlin at the turn of the century.

Max was member of a student’s association named MOTIV, so the family tells us. The name sounds like a good omen to our attempt to find a plausible reason for his interest in speleology.



Fig. 10 MOTIV’s logo from 1900

“MOTIV” still exists today, a small association of art-loving students of the Technical University in Berlin with two dozens of active members and a

somewhat larger number of “old boys.” Some years ago the first female students were admitted. Archives do not exist any more. “Everything gone in the last war,” regrets the chairman. Internet helps: In different libraries we can locate copies of some of the early annual reports of the association.

Gradually the academic world becomes alive in which Max lived before he set off for his journey to America.

MOTIV was at that time one of the large renowned student associations at the Technical University. Its curriculum was regarded as one-sided: In order to balance this it was thought it would be “best to waken the interest in all areas of human knowledge and ability” - so the common conviction. And therefore poems were written and theatre was played, students painted and made music.

In Berlin at the turn of the century, MOTIV festivities were great social events with 1000 guests and more. In 1902 the association moved to an impressive home in Charlottenburg - today the former MOTIV house accommodates the “Renaissance Theatre.”



Fig.11 The “Motiv House” in Berlin 1910

In Wuerzburg we discover some pages of music in an archive specialized on the history of student associations. Walter Luyken, Max’s closest friend and brother of the admired Gerta, had contributed to the summer festival of its association a composition, a menuet for violin and piano. We show the notes to two musicians from Latvia, Nilss Silkalns and Terese Rozenberga. They find the piece interesting and perform it for us.

Mrs. Kaemper:

“I imagine Gerta now at the piano. And Max Kaemper plays the violin. A composition made by Gerta’s brother Walter. I imagine that the two had

played this piece together. And when you play music together you have a close relationship to each other. And this is perhaps why he dedicated his discovery in the cave to Gerta.”

“There was no television and not many other diversions. They played music at home. They also composed music. This was part of their leisure activities; self-made music, not only listening.”

The ways of Max and Gerta separated because she had married another man during his America journey. But among the families of MOTIV members there were many other young ladies of marriagable age. The old gentlemen did not object if their daughters looked out for well suited husbands among MOTIV members - quite on the contrary. During a MOTIV party Max became acquainted with his later wife Elsbeth, the sister of a MOTIV brother.

Mrs. Kaemper:

“One day, on the tennis court, he asked her: “Are you still free? ” and she answered: “Gladly, Mr. Kaemper.” “But that was after the America journey.”

MOTIV was a rather unpolitical association. Arts and social life were in the center of attention. There was no meddling with political issues, however harmless. But references to “patriotic enthusiasm” were a must in every one of their yearbooks. With special pride it was noted that a MOTIV delegation attended the ceremonies celebrating the 80th birthday of Bismarck, the former chancellor. The student’s song for this jubilee had been composed by a MOTIV member - a fact which was to be reiterated in MOTIV’s annals for years to come.

A neighbour of the Kaemper family in the Grunewald was Alexander Conze, an archaeologist, who had become famous for his research on the Pergamon altar. The families were good friends. A photo shows the Kaempers and the Conzes playing cards, with Max and his sister Elizabeth as spectators. Max took this picture using an autorelease. Max’s sister Anna later on married Conze junior.

The spectacular archaeological discoveries of the neighbour were certainly a frequent topic in the hospitable house of the Kaempers.

And there was cousin Karl, who could also tell exciting stories of his journeys of discovery. Karl Luyken, a distant relative of Max and also a MOTIV brother, was a member of the German Antarctic expedition from 1901 to 1903. On the Kerguelen islands he studied the magnetism of the Earth, by Imperial Order, under the most difficult conditions.

Mrs. Kaemper:

“All the Luyken cousins were very interested in the things around them. One of them made this South Pole trip /... / They all photographed and also processed their negatives. That was this time of fundamental change and they were very interested in everything, in these technical novelties. And also very talented in music. That was quite common in the family.”

The interest in scientific research existed in the family. But what impact drove Max just into Mammoth Cave?

Coincidence helps us. A publication of the caver and local historian of Nuertingen, Hans Binder, comes on our desk. Its title is “The engineer and poet Max Eyth and his plan of Mammoth Cave of 1866.”



Fig.12 Max Eyth

Max Eyth was an engineer who travelled all over the world in the middle of the 19th century and wrote many books about it. 40 years before Max Kaemper he had visited Mammoth Cave. In his book “In the Current of our Time,” published in Berlin in 1905, Max Eyth described his experiences in Mammoth Cave.

Max Eyth was a prominent figure in Berlin at the beginning of the century. He had become famous as the founder of the German Agricultural Society and was highly esteemed among engineers. In 1904 he gave a speech at the general meeting of the Association of German Engineers about “Engineering and poetry”

“In Germany it is widely assumed that poetry and engineering are two spheres between which a contact is hardly conceivable. The major part of the educated class is colour blind to the poetry of engineering. The fact that a vase or an amphore can be beautiful is not denied. Nobody can indicate a good reason why in a similar way a machine - this device with an independent movement, with a certain independent existence - could be not beautiful as well. Technicians see this beauty. They see the beauty of a locomotive, of a machine tool sketched with technical taste. The formation of taste in this sense is missing almost completely outside the world of experts, among the so-called educated people. Technicians may be patient of this phenomenon, because the future belongs to them.”

That was exactly how the members of “MOTIV” felt. Max Eyth was surely a sort of shining example to the young engineers who had gathered in MOTIV.

We point out this possible connection to the family and they check again their library. And indeed: Max Eyth’s description of Mammoth Cave is there, and must have been there since Max Kaemper’s times. We do not have any doubt: Max Kaemper’s journey to America was a journey on the footsteps of his idol Max Eyth, the famous engineer and poet, whose travel descriptions led the young engineer finally to the largest cave of the world.

Death at the Somme

At the Kaemper family three tin boxes emerge. They contain negatives. Format six to nine, obviously shot in the First World War. We can hardly expect to get the prints from the laboratory.

We are quite familiar with Max after all our research. But now almost one year of his life is spread in front of us, seen by his own eyes. We cannot find any written testimonials from him

from this period. But what he saw, what he considered worth preserving on pictures tells perhaps more than a box full of letters.

The departure from Berlin: Photos show family members, carefully posing for the camera. The ladies seem to be somewhat anxious, the gentlemen look serious and resolute. A speaker's platform, oak leaf decoration, many somberly dressed and top-hatted gentlemen, many in uniform. In the background the Brandenburg Cathedral. No. 239 Artillery Reserve Regiment goes to war. Cannons are loaded on waggons. In front of the train the unit poses for a memory picture.

The journey goes to the East. Max is interested in technical details, in signal towers and railroad junctions, cannon loading and locomotive types. In Poland, Max and his comrades are quartered in a small village. An accumulation of straw covered wood huts. It is bitterly cold but obviously this does not affect the good mood. In the living room of the farmers the officers have their coffee. Outside in the snow the lower ranks provide firewood and make the laundry. No feeling of war, strain or fear in the pictures.

Spring comes and Max goes West. A stately French farm in the Vosges Mountains is chosen for quarters and again there is little evidence that we are in the middle of a world war. Max photographs fields and meadows, calves and pigs. He takes a picture of himself on his horse. We see merry German soldiers cutting asparagus and feeding rabbits, drinking coffee under fruit trees. The first medals are celebrated with champagne: the war - a grand pleasure.



Fig.13 French farmer's wife. Photo Max Kämper 1916

Max makes the old farmer's wife pose beside the cast-iron stove and directs his lens toward the young girls making hay. One of the beautiful ones sends a coquettish glance from under her large straw hat to Max - only the ever present guard in the background reminds of the fact that there is war.

A new scene. Max has shifted to Northern France. At the river Somme there has been raving for some weeks a bloody trench warfare with hundreds of thousands of victims on both sides. The German High Command had given order to resist the attacking Frenchmen and Englishmen at any cost. More and more fresh units are sent to the front.



Fig. 14 Shelter during the battle of the Somme 1916

Engineers like Max are important in this war. Their cannons, their tanks, their logistic skill shall bring about the decision. All their art of engineering is now used in order to kill on an industrial scale.

Max experiences the true face of the war. He takes pictures of bomb craters and grave fields, destroyed farmhouses and shot-up church towers, wounded comrades.

Whether Max wrote down his experiences in letters is unknown. But on the right and left of him there were some, who found words for the horrific scene:

"Hill No. 60 is blown into the air by the Englishmen, together with three men of the observation unit. Many more died, suffocated. Everywhere and never ending the fire of shells exploding and guns firing. The Man of the

Century, the Engineer, has caused another Great Flood with leaden hail-storms, with flaming, smoking and cracking fountains, with deadly lightnings and continuous thundering. With men who came here herded together on ships and trains, who were thrown into this inferno only to perish in it before they could even take a breath. The earth brings up ten thousands of new muzzles every hour whose sharp teeth flash and tear up men. Its torn, ugly coat soaks up innumerable precious scarlet drops."

Fighting around the artillery position commanded by Max becomes more violent now. Max photographs mainly his comrades. From picture to picture the faces turn more serious, sadder, apathetic.

One of the last pictures shows Max in the trench, taken by autorelease. Between high earth walls Max in his wide army coat can hardly be recognized under the steel helmet. High above him a mountain of ammunition. He still had time to process the picture in a shelter and to stow it carefully in a tin box. Later, after the war, he would surely find time to make prints of his war memories he may have thought. But it never came to that. A direct hit ended his life on November 10, 1916.



Fig.15 Last picture of Max Kämper, 1916

The faint photo of a grave, in the same envelope the remainders of a dried flower. For Elsbeth Kaemper a world broke down with the death of her husband. How often will she have looked at this picture and read the letters in which the incomprehensible was described?

Mrs. Kaemper:

"These are the letters of condolence his father received. /.. / In this one it says: "... mournful and sad at the death of our dear Battery Commander, my good and able friend, Lt. Kaemper, the son of Your Excellency. He died at noon on November 10th together with two other battery commanders when their shelter was blown up by a direct hit .." -- "his corpse was found last night. Helmut, who was on battery duty that week while the others were in resting position, immediately sent people to dig him out. But he could not be rescued. He was dead at once. And the debris of the shelter were full of toxic gas. Helmut adds, that the death of Lt. Kaemper is a severe loss to the Battery. He was like a father to his people and enormously popular."

We set out to find the grave. The lady at the Tourist Information in Arras thinks she has misunderstood when we ask for German war graves. "Vous êtes allemands? - You are Germans?" That had never happened before. Englishmen, Canadians, even Australians came in order to visit the old cemeteries. But Germans? Perhaps they are embarrassed, she reckons.

We meet a young French historian who explores the details of the "Great War;" with a somewhat strange enthusiasm. He shows us the way to the largest German graveyard. Precisely arranged, endless lines of white crosses on a well maintained green. On each cross three names, three death dates. They died young, many just 18, 19 years old. A monument reminds the living and affirms that these boys did not die in vain. If they had been given similar respect during their lifetime ...

The gardener produces a bulgy catalogue with long lists of the dead buried here and the exact location of their final resting places. Soon we stand at Max Kaemper's grave. A white marble cross, overshadowed by high trees on the War Cemetery of Cambrai. Our search for Max has come to its last stage.



Fig.16 Max Kämper's grave in Cambrai

In the Mammoth Cave National Park, Chuck hung up the picture of Max in the Rangers Lounge. Especially the female cave guides like to have a look at it. Such a handsome man! Rick, the biologist, fixed the picture of Gerta over his desk. Little wonder that Max was so fond of her, he comments.

The Kaemper family plans a journey to America for next summer. Klaus, the grandson of Max, wants to take his cello. He has played in many places. But a concert in Mammoth Cave as a homage to his grandfather - this would be something very special.

Postscript

In October 2000 three of Max's grandchildren and his daughter-in-law visited Mammoth Cave. They spent some wonderful days with Chuck, Rick and Stan who showed them the places first seen and mapped by Max Kämper 92 years ago.



Fig.17 Max Kämper's grandchildren visiting MMC

REFERENCES

- Binder, Hans, 1997:** Der Ingenieur und Dichter Max Eyth (1836 – 1906) und sein Plan der Mammuthöhle in Kentucky (USA) aus dem Jahr 1866, Abh. zur Karst- und Höhlenkunde, Heft 28, München
- Bridwell, M.M., 1971:** The Story of Mammoth Cave National Park, 11th Edition
- Bruckner, Roger W. & Watson, Richard A., 1976 -** The Longest Cave. New York
- Hovey, Horace C. , 1909-** Kaemper's Discoveries in the Mammoth Cave: Scientific American, May 22, 1909: p. 388 + 390
- Hovey, H.C., 1909:** Hovey's Hand-Book of the Mammoth Cave of Kentucky. Louisville
- Kämper, M. 1908;** Karte der Mammoth Cave, unpublished / a redraw of the map by Diana O. Daunt was published in 1981 by the Cave Research Foundation
- Kliebhan, B. 1997:** Max Kämper und seine Vermessung der Mammoth Cave im Jahre 1908 . Die Höhle 4/97
- Sutton, Michael R. 1990 -** Thirty Years of Mapping by the Cave Research Foundation: NSS Bulletin 52 (1990): p.1-15
- Special Thanks to Wulf-Ekkehard Lucke (Landesarchiv Berlin), Birgit Böhme (Berliner Stadtbibliothek), family Hans Kämper (Ochsenhausen), Hans Binder (Nürtingen), Dr. Heinrich Luyken (Familienverband Luyken), Dr. Klaus Thomas (Bad Homburg), Bernd Adam (Akademische Vereinigung "MOTIV"), Chuck DeCroix, Rick Olson and Stan Sides (Cave Research Foundation).

Max Kämper's Introduction to the New World

By Stanley D. Sides, M. D.

Cave Research Foundation, 2014 Beth Drive, Cape Girardeau, Missouri, 63701

Abstract

Twenty-seven year old engineer Max Eduard Kämper arrived in America at 4:00 pm on May 16, 1907 and was greeted by a thunderstorm. His presumed goals were to study American manufacturing methods, learn English, and enrich himself musically. New York had so many German immigrants at the time that German was the second most common language spoken in the city. He stayed at the Belvedere House at the corner of 4th Avenue and 18th Street, and the next day visited acquaintances in Newark. He visited New York landmarks and May 20 visited the famed Hippodrome theater. He moved on May 25 to a furnished apartment at 306 East 14th Street, away from the teeming unsanitary tenements of lower Manhattan.

Kämper visited Lidgerwood Hoisting Machines on Dikeman street in Brooklyn near the Brooklyn Bridge on June 3. He applied for employment and began work on Friday, June 7. The firm manufactured steam powered construction elevators and suspension cableways. His beginning salary was \$16 weekly, which was increased to \$18 in August. He carefully wrote all expenditures and salary in his diary, with his last salary from Lidgerwood paid in November.

Max's letters home reflected resentment of the disorganized immigrant culture he found about him. He began to immerse himself in the culture of the city as his English language skills developed.

Music and the arts occupied much of his free time. He began violin lessons with Frau Schwende in Brooklyn on June 17, and purchased a copy of Beethoven sonatas on July 13. He noted it was 95 degrees on July 18 and he had a hay fever attack on July 24. He visited Coney Island with friends from the German student association, Motiv, and corresponded with Motiv colleagues in Germany. An acquaintance, Franz Voelker, spent a night with him on September 26 and the next day Max traveled by train to Inwood, a farming area on the northern tip of Manhattan Island. Records indicate Carl Voelker, perhaps the father of Franz Voelker, lived at 216th street and Bolton Road in Inwood. Many diary entries record the visits he had with the Voelkers, including visits on Thanksgiving and Christmas.

On December 7, Max moved further north in Manhattan to 45 West 25th street, and January 18 moved nearby to 40 West 25th Street. He no longer needed to be near his work at Lidgerwood and the move brought him nearer the cultural center of the city. He heard concerts, visited museums and attended the theater. On December 14, he heard renowned tenor Enrico Caruso sing at the Metropolitan Opera House.

During his 8-1/2 month stay in New York he visited nearly all the famous places in the area, including trips to Buffalo, Albany, and Niagara Falls in New York and New Haven, Connecticut. His diary reflected a change in 1908 as he prepared to leave New York. He visited a steelworks or foundry on January 11. He visited the Voelker's at Inwood on January 31 and said farewell to two other friends on February 1. On February 3 he left New York for the South Bethlehem (Pennsylvania) Steel works. He traveled west visiting steelworks and foundries until he arrived at Louisville, Kentucky on February 22. He took the train to Mammoth Cave on February 24, apparently intent on seeing this natural feature that famed German engineer Max Eyth had visited and surveyed in 1867.

Max Kämper's Explorations at Mammoth Cave

By Charles J. DeCroix.

Mammoth Cave National Park, P.O. Box 73, Mammoth Cave, Kentucky, 42259

Abstract

German engineer Max Kämper arrived at Mammoth Cave on February 24, 1908 after spending 8 ½ months in New York. He had been studying American manufacturing techniques and improving his knowledge of the English language. It was not a random act that brought Max to Mammoth Cave as was first believed. There was another famous German engineer, also named Max that had mapped Mammoth Cave in 1866. Max Eyth was the inspiration for all young German engineers at the turn of the 20th century and his writings, painting, and map surely inspired Max Kämper to see Mammoth Cave for himself.

Kämper started his cave journey as a typical visitor. He acquired a book about Mammoth Cave and purchased tickets for the Short and Long routes. Max went rowing on the Green River and took time to visit other area caves including Ganter's Cave and White's Cave. The rugged landscape and remoteness of the Kentucky country-side must have been a stark contrast to his view in New York.

Max kept a detailed journal of his daily expenditures accompanied by a brief entry of the day's activities. Evidence that Max's stay was going to be longer than originally planned is indicated by the journal entry for March 6 – Max was "exploring" Gerta's Grotto. This brand new discovery was proudly named after Max's cousin Gerta Luyken. Two days later, on March 8, Max records that he is now "mapping" Gerta's Grotto with the assistance of Ed Bishop.

Max Kämper's visit to Mammoth Cave had now turned into an obsession and he began to systematically map the cave paying for the services of cave guides, mainly Ed Bishop. Word of the fixated German had made its way back to Judge Albert Covington Janin, trustee of the Mammoth Cave Estate. Janin realized that Kämper was the perfect man to produce a new map of the cave for personal use of the trustees. An agreement was secured for Max to map the cave in exchange for free lodging, meals, and caving. With the guarantee of unlimited exploration and the services of Ed Bishop, Max Kämper was now equipped to create the greatest cave map for its time.

In addition to his many hours spent working in Mammoth Cave, Max found ample time to enjoy the social aspects of staying at a world-renowned tourist attraction. He escorted lovely young ladies into the cave, such as Becky Wilkins and Lida Flenniken – who would have "Becky's Alley" and "Lida's Pass" named after them. There was an evening porch party at the Mammoth Cave Hotel at which Max played violin accompanied by the tall and lovely Mayme Depp on piano. Max would name Mammoth Cave's "Mayme's Stoop" in her honor. His days were filled with cave exploration, but his nights were devoted to music, parties, and charming the young ladies.

Max wrote Judge Janin from Cincinnati that the map was finished on December 3rd. He went to Washington, D.C. and turned the map over to Janin personally and then sailed back to Germany on the Prince Freidrich Wilhelm. In the wake of his efforts, a legacy of intrigue and mystery surrounded the man and his map.

Little was heard from Max after he left the United States. Through the years, rumors began to circulate that he had been killed in World War I – but no one at Mammoth Cave could confirm or deny. After extensive research, German caver and journalist Bernd Kliebhan found himself sitting at a table with the family of Max Kämper – his son, Hans, daughter-in-law, Gerlinde, and several grandchildren. The search for Max was finally over.

The Slave Guide Legacy at Mammoth Cave

By Joy Medley Lyons

Mammoth Cave National Park, P.O. Box 7, Mammoth Cave, Kentucky, 42259

Abstract

Serving as guides and explorers at Mammoth Cave partially rescued four men from the obscurity of enslavement. Stephen Bishop, Materson Bransford, Nicholas Bransford and a young man named Alfred all had their very existence documented in the written journals and diaries of various nineteenth century Mammoth Cave visitors. They were physically described, their personalities contemplated, their intelligence gauged, their dialects imitated. At least one abolitionist characterized Stephen Bishop as a charismatic natural leader who could govern the citizenry of freed men in Liberia, should he choose to relocate there.

Modern cavers and researchers have monitored the cave explorations of these men for years. Their signatures or names and dates are found in numerous areas of the cave, often documenting discovery dates and exploration parties. With the exception of Mat Bransford, who has known descendants, the personal and professional lives of the other enslaved guides are shrouded in mystery. About the year 1887, Ed Bishop came to Mammoth Cave as a guide and explorer. He claimed to be the grand nephew of Stephen Bishop. What was that familial connection? Who parented Stephen Bishop? Who are the descendants of Nick Bransford? What took Ed Bishop away from Mammoth Cave and where did he go? What physical reminders are found on the cultural and geographic landscape today that lend better understanding to these early guides and their enslavement – to the lives of Black cave guides during the years of Reconstruction in Kentucky?

Continuing painstaking research by current Mammoth Cave guides and scholars brings to light previously unknown information about our enslaved predecessors and their descendants. Government records, oral tradition and other primary sources are helping us better understand the men – and women -- behind the cave signatures.

Max Kaemper's Unique Selection of Place Names for His 1908 Map of Mammoth Cave

By Charles A. Swedlund¹ and George M. Crothers²

¹Professor Emeritus, Photography, 319 E. Poplar St., Cobden, IL 62920

²Associate Professor, Department of Anthropology, 211 Lafferty Hall, University of Kentucky, Lexington, KY 40506

Abstract

In this paper we present Max Kaemper's unique selection of Place Names for his 1908 map of Mammoth Cave. He realized the importance of Place Names and they became a feature on his map. His sensitive selection of Place Names provides a greater cultural emphasis, when compared to the previous maps.

Max Kaemper (23years old) was from Germany, came to America and visited Mammoth Cave.¹ He took tours in the cave, and for some wonderful unknown reason became "influenced" by the cave. Perhaps, similar to the reason we have gathered here today. We suggest this "influence" made some interesting changes in his ideas about map making. His interest in the cave was stronger than that of a casual visitor. He wanted to see more cave, especially those areas off the normal tourist routes. One goal was to conduct a survey and produce a map. In this manner he could use the expertise in map making he had acquired as an engineer and use it to see more of the cave. He presented a proposal to the cave management to make a map of Mammoth Cave. It was accepted. In return the cave management gave him free room and board and assigned Ed Bishop, guide, to assist him.² It is important to point out that Mr. Kaemper instigated the project rather than the cave management. It was a project Kaemper wanted to do. I do not think financial gain or professional status was his motive, but the "influence" of the cave.

An important part of a map is the Place Names that identify specific features represented on the map. Place Names have evolved over the years due to the influence of visitors with various degrees of education, backgrounds, interests, etc. The guides also created, contributed, and endorsed Place Names for their presentations to the visitors. Early visitors had a "clean slate" and relied on their personal experiences to give descriptive Place Names to the formations and features. Visitors with a

"classical" education often presented references to Greek Mythology and Historical Legends. A cave being an entrance to the underground was ideal for referring to Old Testament stories of Hell and Damnation. Place Names were also chosen for political and practical purposes such as honoring a guide, a cave operator, or an owner of the cave. The Place Names are an integral part of the historical heritage of Mammoth Cave and reflect the ideas and attitudes from the various periods of time.

A Place Name on a map has a degree of authority because it has been published. The authors assigned the Place Names with a great degree of knowledge, thought, and responsibility to insure that the map will be respected as a factual presentation. The Place Names will achieve a form of permanence as long as the map is respected.

The Place Names have evolved from the earliest Lee Map to the later Kaemper Map. For example, the Lee Map indicates "Little Bat Room," the Bishop Map also indicates "Little Bat Room," and only changes slightly to "Little Bat Avenue" on the Kaemper Map. A more drastic change occurs with the "Giant's Coffin." It is indicated as the "Steam Boat" on the Lee Map, "Giant's Coffin" on the Bishop Map, and "The Giant's Coffin" on the Kaemper Map. The strangest change in Place Names occurs in Gratz Avenue. The feature is a small shallow pool of water that maintains a rather constant depth and volume. The Kaemper Map indicates "Pool" but in parentheses indicates "Formerly Lake Purity." The Bishop Map indicates "Lake Purity." The

Lee Map indicates “Pool of Clitoris.” This Place Name is rather shocking. None of the other Place Names have any reference to anatomical details. We looked the word up in several dictionaries. The word is derived from the Greek *kleitoris*, which many sources translate as “little hill.” *A Dictionary of Medical Derivations*, however, translates this literally as “the man with the key” or “the gatekeeper.” A playful origin of names for the clitoris is repeated in many languages. For example, a British folk term for the clitoris is “the little man in the boat.”³ Whether this or some other folk term is the reference for the “Pool of Clitoris” is unknown and the origin of this Place Name is a puzzle.

The comparison of Max Kaemper’s map with those produced earlier by Edmund F. Lee, 1839, and Stephen Bishop, 1845, will be the basis for illustrating what we suggest are interesting differences. These differences are due to the personality of the individuals and the conditions they had to work with. In order to compare the differences between the Place Names on the three maps, we needed to find an element that was present in each of them. Our examination produced the following categories:

Female
Male
People (gender non-specific)
Features

We examined each Place Name on the three maps. Each Place Name was placed in one of the four categories. For example, the name “Catherine City” on the Lee Map was considered Female. The name “Wilkin’s Arm Chair,” on the Lee Map, was indicated as Male because Charles Wilkins was once one of the owners of Mammoth Cave. The name “Washington’s Grand Dome,” on the Lee Map, was indicated as People because gender is not determinable. The name “The Church,” on the Lee Map, was indicated as a Feature because it is a physical place and not related to Female, Male, or People.

The Place Names in each category on the three maps were counted producing a Category Number. The Category Number was divided by the total number of Place Names on that

particular map to produce a percentage. A percentage from one map could be used to compare the percentage of a Category Number from another map. It enabled comparisons even though each map had considerably different amounts of Category Numbers and total number of entries.

THE EDMUND F. LEE MAP, 1839

Edmund F. Lee was a 24-year-old Civil Engineer from Cincinnati, Ohio.⁴ He produced the first instrument survey or “chain and transit map,” including both horizontal and vertical dimensions of Mammoth Cave.⁵ It required 3-4 months to accomplish. George S. Gatewood, a guide, helped with the chaining.⁶ It was the first accurate map of Mammoth Cave. It became obsolete when Stephen Bishop crossed The Bottomless Pit and opened up a whole new section of the cave. Lee’s Map has 180 Place Names. It is a very beautiful map with profiles of passages, engraving of the entrance, and notes.

Lee’s Place Names are descriptive in a matter of fact manner consistent with his background as a Civil Engineer (Table 1). Features account for 91% of the total Place Names with only 1% and 3% for Female and Male names respectively.

THE STEPHEN BISHOP MAP, 1845

Stephen Bishop was an African-American slave whose duties were to guide visitors through the cave. He was knowledgeable about the cave and received very favorable reviews from the visitors: “Stephen, the best guide.”⁷ He was also very active in exploring the cave and made numerous discoveries. Perhaps his most important contribution was crossing The Bottomless Pit. This opened up new sections of the cave and greatly enlarged its length. During the winter of 1841–42, Stephen drew a map of Mammoth Cave.⁸ It is commonly believed that he used the Lee Map as a guide and added passages and features he discovered. His map is simpler in design than Lee’s. It also lacks a scale. A disappointing characteristic of his map is that it includes a lot more cave passage than the Lee map, but has 80 less Place Names (Table 2).

Stephen Bishop's Map has increased Female, Male, and Feature Place Names compared to the Lee Map, but is still heavily based on Features. The reason for so few entries will probably never be answered. One may speculate that the decision was out of Stephen's control.

THE MAX KAEMPER MAP, 1908

This map upon being finished was hidden from public view for many years. The cave management feared trouble with bordering landowners, because passages went beyond the boundaries of the land owned by Mammoth Cave estate.⁹ As a result, the map lacks a scale. The multi color cave passages indicate the different levels, which is very helpful when one passage goes under another. It is a large map enabling the passages to be easily seen. This map has the highest number of Place Names. A total of 333. The Place Names are divided into two groups. One group has the Place Names labeled on the map and consists of 221. There are also numbers on the map, which refer to an Index with a total 112 names. The use of the numbers and accompanying Index helps to keep the map from getting cluttered.

This map has a more even distribution of entries even though Features still has the highest percentage (Table 3). However, its percentage is much lower than the other maps. There is a considerable increase in percentage for Female

and Male. The increase in percentage for People is moderate. The three Categories Female, Male, and People now have closer percentages to each other. Kaemper's Place Names are in harmony with each other and do not express a bias. We do not think this harmony was perpetrated but natural due to his sensitivity and lack of a preconceived agenda.

Kaemper retained the traditional Place Names of the earlier maps, but presented a new direction with additional Place Names. A number of them refer to people from the local area. The honouring of local people, instead of famous personalities, creates a more democratic atmosphere. It diminishes the possible idea of snobbery or elitism. The names are more evenly distributed between women and men. A visitor is not required to have a "classical" education to understand the Place Names he selected. Names of ladies provide a soothing, warmer feminine quality rather than the he-man macho stereotype. The ideas of Hell and Damnation are reduced providing a calmer atmosphere. His additional Place Names relate to people and culture rather than geology, mythology, or theology.

We find it wonderful that Max Kaemper's choice of Place Names has a more human quality than the other maps. He followed what he felt was important from his experiences in the cave rather than relying on his previous training. He was "influenced" by the cave and the people he met at Mammoth Cave.

Table 1. Place Name categories on the 1839 Lee map.

Categories	Number of Entries	Percent of Total
Female	2	1.1
Male	5	2.8
People	9	5.0
Features	164	91.1
Total	180	100

Table 2. Place Name categories on the 1845 Bishop map.

Categories	Number of Entries	Percent of Total
Female	4	4.0
Male	8	8.0
People	14	14.0
Features	74	74.0
Total	100	100

Table 3. Place Name categories on the 1908 Kaemper map.

Categories	Number of Entries	Percent of Total
Female	66	19.8
Male	68	20.4
People	58	17.4
Features	141	42.3
Total	333	99.9

REFERENCES

1. National Park Service, Mammoth Cave National Park, Vertical File, #10003.
2. De Paepe, Duane, 1985, Gun Powder From Mammoth Cave: The Saga of Saltpeter Mining Before and During the War of 1812. Cave Pearl Press, Hays, Kansas.
3. Casselman, William, 1998, A Dictionary of Medical Derivations: The Real Meaning of Medical Terms. Parthenon, New York.
4. National Park Service, Mammoth Cave National Park, Vertical File, #10003.
5. National Park Service, Mammoth Cave National Park, Vertical File #1011.
6. National Park Service, Mammoth Cave National Park, Vertical File #1011.
7. Barnell, 1849, "The Mammoth Cave." The Knickerbocker, Vol. 33.
8. National Park Service, Mammoth Cave National Park, Vertical File #1070.1
9. National Park Service, Mammoth Cave National Park, Vertical File#10003.

Mammoth Cave: What a Difference a Few Friends Can Make

By LaJuana S. Wilcher, Esq.

English, Lucas, Priest & Owsley, L.L.P., 1101 College Street, Bowling Green, Kentucky 42101

Abstract

Relationships between private citizens and the government have been critical to the establishment, development, and growth of Mammoth Cave National Park. This presentation will trace those relationships in the context of the story of Mammoth Cave specifically and of the U.S. National Park Service generally. The presentation will also introduce the audience to the Friends of Mammoth Cave National Park, and identify needs and initiatives identified as priorities by the Park.

Contributions to Karst Science and Education from the Mammoth Cave Region

By Chris Groves¹ and William B. White²

¹Hoffman Environmental Research Institute, Western Kentucky University, Bowling Green, KY 42101

²The Pennsylvania State University, University Park, PA 16802

Because it is the Earth's most extensive known cave system, the Mammoth Cave System and more broadly the south central Kentucky karst region have long been a magnet for scientists, students, and explorers interested in caves and karst landscapes. With a known length of 590+ km, also nearby are the Fisher Ridge (177+ km) and Whigpistle (52+ km) Cave Systems, and all of these are still being actively explored. A "perfect storm" of integrated speleogenetic elements has conspired to form these extensive labyrinths, whose significance has been codified as a US National Park, UNESCO World Heritage Site and International Biosphere Reserve.

Since at least the late nineteenth century, the Mammoth Cave area has been the quintessential karst landscape of the United States, and indeed can be considered the birthplace of modern cave science in the country. Since then, work there has resulted in broadly important contributions to karst science and education. Some highlights include:

- 1) Early efforts to move interest in caves from sport to serious science through the efforts of the Cave Research Foundation (CRF) and its first President Phil Smith;
- 2) Development of methodologies for the implementation and management of very extensive cave surveys by the CRF and Central Kentucky Karst Coalition;
- 3) Development of methodologies for fluorescent dye tracing and delineation of karst groundwater recharge areas, particularly in efforts led by Jim Quinlan of the National Park Service;
- 4) Pioneering work in cave biology and ecology including that of Tom Kane and Tom Poulson;
- 5) Understanding of ancient agricultural and cultural development of Native American populations by cave studies of P.J. Watson and colleagues;
- 6) Development of methodologies for karst hydrogeological studies by Art and Peg Palmer, W.B. White, J. Hess, C. Groves and J. Meiman, and others;
- 7) Implementation of methods for absolute dating of landscape evolution in karst areas, including the efforts of Victor Schmidt (paleomagnetism), Harmon, Schwarz, and Ford (speleothem isotopes) and Darryl Granger (comogenic nuclides);
- 8) Establishment of the educational programs of Western Kentucky University's Center for Cave and Karst Studies and Karst Field Studies Program at Mammoth Cave by Nick Crawford in 1979. Many renowned karst scientists (including Professors Ford and Williams, who have both also undertaken research in the area) have taught courses in this program, and over 1,000 students have participated.

A great charm of the region, and a great benefit for the programs at Western Kentucky University, is that it finds itself on the list of "must see" karst areas of the world, along with Postojna, Slovenia and Guilin, China, and thus a stream of the world's top karst scientists, and the great ideas they bring with them, continually passes through.

A Long History of Linkages and Synergy: Western Kentucky University and the Mammoth Cave System

Deana Groves¹, Chris Groves², Weldon Hawkins²

¹Department of Library Technical Services, WKU Libraries and Museum, Western Kentucky University, Bowling Green, KY 42101 USA

²Hoffman Environmental Research Institute, Western Kentucky University, Bowling Green, KY 42101 USA

South central Kentucky's Mammoth Cave System is by far the most extensive cave system on earth, and has been designated not only as an American National Park, but also by UNESCO as a World Heritage Site and International Biosphere Reserve. In addition to the unique natural landscape, there has been a rich human history in and around the cave over several thousand years.

Nearby is Western Kentucky University (WKU), which since the early 1900's (and as various precursor institutions including the Potter School for Young Ladies and later the Western Kentucky State Normal School) has had numerous interactions with the cave system and its proprietors. These events and relationships have been remarkably synergistic, for example providing the University with a nearby, world-class learning environment while offering the cave managers, particularly in recent decades, the expertise of faculty and student scholars in interpreting the cave system, landscape, and associated resources.

Early interactions include many school field trips to the cave and area, which originally involved multi-day excursions. While some of these were by train between Bowling Green and the cave, at least in some cases the boys would make the 100-kilometer round trip on foot accompanied by horse-drawn wagons loaded with girl students who, while riding ahead of the boys, would sing songs to encourage and provide energy to their walking colleagues. A camping trip along the Green River after one such cave trip was described as having festivities occurring to a level "not seen since the celebrations of the Danes on the morning after the slaying by Beowulf of the sea-monster Grendel."

A particularly significant event occurred in early 1925 when the assistance of the WKU football team was requested (along with many others participating) in the attempted, and ultimately unsuccessful, rescue of trapped cave explorer Floyd Collins at Sand Cave.

Class field excursions still continue regularly to the cave, and more recently several departments have developed interactions at the cave including professional funded research, graduate thesis and undergraduate research projects, and extensive educational experiences. These include the WKU Center for Cave and Karst Studies Summer Field Studies Program and the Mammoth Cave International Center for Science and Learning, jointly funded by Mammoth Cave National Park and WKU's Center for Cave and Karst Studies.

Through the years the WKU library system has built an extensive collection of contemporary and historical print materials concerning Mammoth Cave. An important outreach beyond the cave and University community involves the recent and ongoing collaborative work between The WKU Libraries and Museum and Mammoth Cave National Park, funded through the US National Park Service Cost Share Challenge Program, to inventory, organize, and make available online these materials for broad access through the internet.

The Lamps That Lit Their Way

By Rick Olson¹

¹Division of Science and Resources Management, Mammoth Cave National Park, Mammoth Cave, Kentucky 42259

Abstract

The distinctive lanterns used at Mammoth Cave from the middle 1800s until 1938 appear to be a locally derived design. Early whale oil railroad lanterns share some characteristics of the Mammoth Cave lanterns, but L&N Railroad lanterns do not appear to have influenced the design. At this time, the design pathway appears to lead from simple open-flame tin candle lanterns to the same lantern with a petticoat lamp affixed in place of the candle, and then finally to the font or oil container being soldered onto the lamp base as one unit. This basic Mammoth Cave lantern varied somewhat over the decades, and was probably the primary light source used by Max Kaemper and Ed Bishop in their survey and exploration work. It is possible that Max and Ed had a carbide headlight or even a gas lantern to augment the feeble light from the Mammoth Cave lamps, but there is no record of such use.

Introduction

By the time that Max Kaemper and Ed Bishop were mapping and exploring Mammoth Cave, the Mammoth Cave lamp had been the standard source of illumination for many decades. It is a tribute to their caving skill and persistence that they were able to map approximately 35 miles of Mammoth Cave and make significant new discoveries in the dim light of these lamps.

Imagine trying to read a compass with a lamp designed to illuminate upward instead of down into the instrument where you need the light, and yet keep the lamp far enough away to avoid causing compass error. Yet manage they did. Delving into the details of period lighting may seem tangential to this centennial celebration, but cavers give considerable attention and debate to lighting technology, and certainly an exploration of the lights used at the time gives us a better idea of how Max and Ed saw the cave.

Basic Features of the Mammoth Cave Lamp

One key feature of the lamps we still have today is the two tube burner that was an early innovation by Benjamin Franklin (Hayward 1962). He found that two wicks placed close to each other burned brighter and more cleanly than two separate wicks. The burner was mounted atop a font or oil vessel constructed of tin that was integrated into the base of the lamp. Wires

extended up from the base and were formed into a ring handle. A tin disk heat deflector was situated just below the wire ring handle. It was simple, durable, inexpensive, and apparently effective enough.

Where Did This Type of Lamp Come From?

The design of the Mammoth Cave lamp appears to be mostly locally derived, probably driven by ideas from the guides. In searching the literature on lard oil and whale oil lamps, there are a bewildering number of designs. Early whale oil railroad lamps share some attributes with the Mammoth Cave lamps (Figure 1).



Figure 1. Early whale oil railroad lanterns were similar in some ways to the Mammoth Cave lard oil lanterns. (From Hayward 1962).

This railroad lamp design had a ring at the top for easy carrying, and a font base with a two tube burner. The glass globe made it wind proof, and that would certainly be useful in the cave, but of course the glass is both fragile and would have been relatively expensive in the early to mid 1800s. Burning heavy oil could produce soot as well, and this would make it difficult to keep the globe clean. If you replace the globe and tin carrying ring with wire, and add a heat deflector disc beneath the wire ring, then a Mammoth Cave style lamp is the result.

Another lantern that may have served as a precursor to the Mammoth Cave lamp is the candle lantern in Cleaveland Avenue. This lantern has been known to park managers and guides for many years, and is essentially a Mammoth Cave style lamp with a cup for a candle instead of an oil font/burner (Figure 2). I have seen nothing exactly like it in the literature, but again, if you simplify a glazed tin candle lantern in the same way as described for the railroad lantern above, then you arrive at the design of the Cleaveland Avenue candle lantern. A similar candle lantern, in much better shape, is in the park's Curatorial Facility and is also shown in Figure 2.



Figure 2. At left is a candle lantern in Cleaveland Avenue, Mammoth Cave. At right, a similar candle lantern in the park's museum is shown.

It must have been very difficult to travel from the Historic Entrance, across Styx and Echo Rivers, up Silliman's Avenue and the Pass of El Ghor, and all the way down Cleaveland Avenue with an unprotected candle flame. Perhaps that

is why it was left where it was once better lights were available!

A lard oil or signal oil lantern that probably did not influence the Mammoth Cave lamp design is an L&N Railroad lantern that I purchased at an antique store in Uno, Kentucky (Figure 3). The font, which took a standard screw in two-tube burner, is mounted on a wider base, has a completely different handle arrangement, and is more robust and expensive compared to the Mammoth Cave lamps.

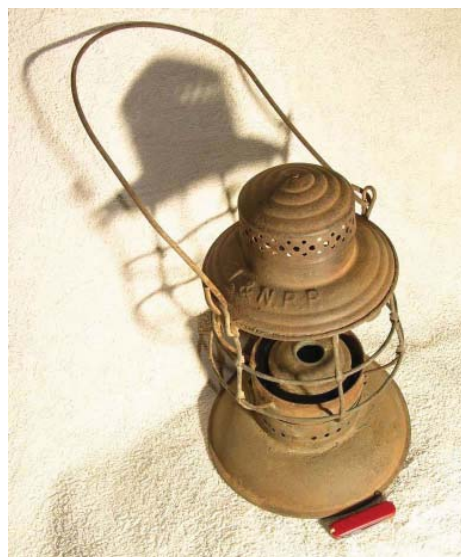


Figure 3. An early L&N Railroad lantern.

The L&N Railroad did not reach the Mammoth Cave area until after completion of the bridge at Munfordville on July 1 of 1859 with service commencing in October of the same year (Herr 1964). By then the basic Mammoth Cave lamp design was likely well established. One excellent clue as to the origin of the Mammoth Cave lamp is provided in a sketch of Nick Bransford by Danish-American artist Joachim Ferdinand Richardt (Thompson 2002). This excellent artwork was drawn in 1857, and shows him sitting with a Mammoth Cave lamp. The sketch and a detail showing just the lamp are displayed in Figure 4. In the detail, it can be clearly seen that the font is essentially a "petticoat lamp".



Figure 4. At left, a sketch of Nick Bransford by Richardt in 1857. At right, a detail of the lantern he is holding.

A petticoat lamp has a flared base supporting the font, and a fill tube off to the side of the font. This fill tube can be clearly seen in both figures 4 and 5. Underneath the petticoat base is a socket that enables the lamp to be mounted on a peg. This feature allowed the lamp to be attached to the high back of a chair to give light optimal for reading. I have no way of knowing if this ever happened, but if a wooden peg were inserted into the cup on a candle lantern of the type shown in Figure 2, then a petticoat lamp could be attached in place of a candle. This way, if you ran out of oil, then you could reach into your pocket for a candle, and continue on your way. Such a “dual fuel” feature would be very appealing.



Figure 5. A petticoat lamp is seen in the front row, second from the right. (From Hayward 1962)

According to Jerry Bransford, great great grandson of Mat Bransford, a photograph was taken in 1857 of Mat standing with guide equipment of the day, including holding a Mammoth Cave lantern (Figure 6). This lantern also incorporates a “petticoat lamp” in place of (or possibly attached to) the candle cup on the lantern type shown in Figure 2, but note that there are only three wires supporting the base.

In what must have been an unusual trip for a slave, Mat Bransford, a contemporary of Stephen Bishop, traveled to Louisville, stayed in a hotel, and had his portrait taken (Anonymous 1863, Lyons 2006). In the photograph, he is seated with guide tools of the trade, including a Mammoth Cave lantern of the type that persisted well into the 20th century. By this I mean that the font was constructed by the tinsmith making the lantern, and that the base of the lamp was the bottom of the font rather than being a tin saucer that a petticoat lamp was attached to. Mat is holding the lamp type that would come to dominate, but experimentation was far from over (Figure 7).



Figure 6. Mat Bransford holding a lantern utilizing a “petticoat lamp”.

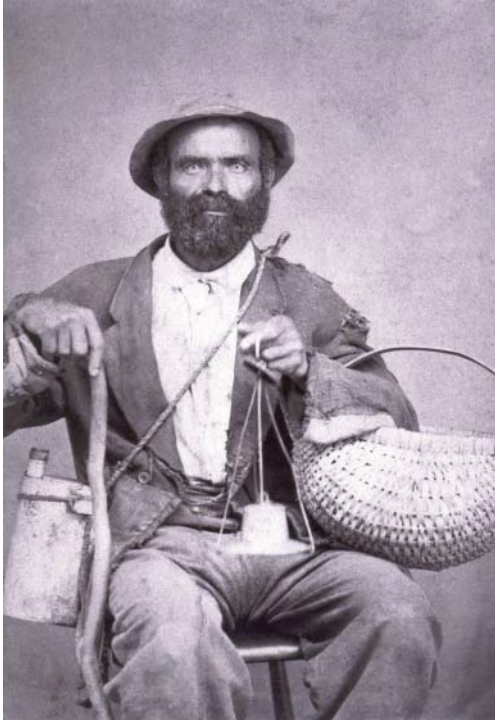


Figure 7. Mat Bransford seated with a Mammoth Cave lantern of the “final design”.

In 1866 Charles Waldach of Cincinnati, Ohio visited Mammoth Cave and took stereo photographs (Howes 1989). One particularly useful picture is of Mat and Nick Bransford at the Historic Entrance. They are seated on the grass with three Mammoth Cave lamps among other guide paraphernalia (Figure 8). The lamps are unusual in that they each have three tin vanes attached to the font that must have



Figure 8. Mat and Nick Bransford at the Historic Entrance with three unusual Mammoth Cave lamps.

been flame protectors. I experimented with my prototype reproduction Mammoth Cave lamp (made by tinsmith Bill Lawrence of Woodbury, Kentucky), and found that the vanes did help protect the flame although with some light loss. The tradeoff must not have been considered worthwhile because the vanes did not persist in subsequent lamp versions. The fonts are petticoat lamps affixed to tin saucers, and the wire handles are much higher above the flame than the lantern Nick is shown holding in the Richardt sketch (Figure 4). Another interesting aspect of these lamps is the heat deflector. They are a domed piece of tin made by a stamping process not likely done locally, and appear to be the same as in the lamp held by Eduard Martel at the entrance of Salts Cave in 1912 (Figure 24). My guess is that these heat deflectors were mass produced for a different purpose, such as a teapot lid, and that this is an adaptive use.

Charles Waldach also took a photograph of two gentlemen near Bottomless Pit. In the photo (Figure 9), one man is holding a Mammoth Cave lamp that clearly has a petticoat lamp type font,

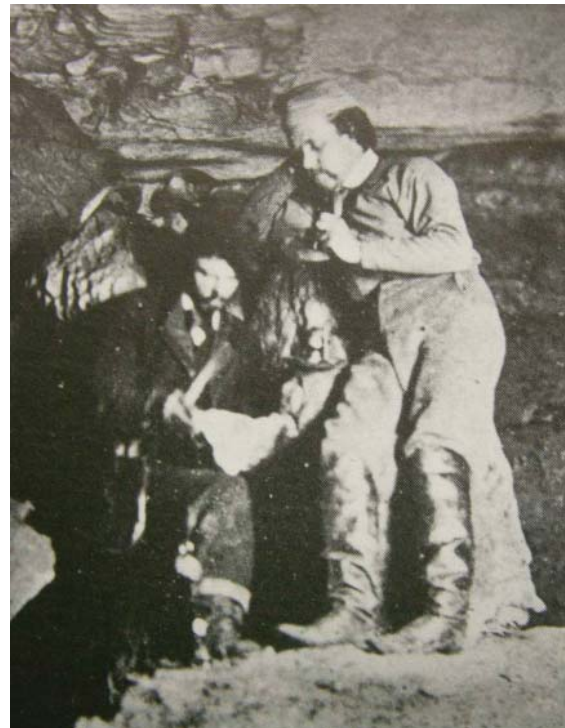


Figure 9. Photo of gentlemen near Bottomless Pit showing an early lamp design without flame protectors.

but it is not fitted with flame protectors like the lamps with Mat and Nick. Note that this was three years after Mat was photographed with what we recognize as the Mammoth Cave lamp in its final form.

When Was The Mammoth Cave Lamp Design Developed?

It is not known when lamps came into regular use in Mammoth Cave, but lard oil was in common use from 1833 to 1863. Lard oil was a by product of lard rendering, and was much more affordable than whale oil, which was commonly used from 1800 to 1840 (Kovel and Kovel 1967). In the winter of 1822-23, William Blane described a trip to Mammoth Cave guided by Mr. Miller (Blane 1824). Regarding lighting, he said “We were well provided with candles, and carried with us a small lamp, and a pot full of oil to replenish it.” Upon reaching the Rotunda, “We here lighted our candles, and proceeded on our subterranean excursion”. Based upon this first hand description, candles appear to have been the main light source, and the Mammoth Cave lamp, if it existed at all yet, does not appear to have been the dominant light source as of 1824.

In an account describing a tour of River Styx in 1844, it is stated that “The lamps are fastened to the prow; the images of which are reflected in the dismal pool.” (Bullitt 1845). No description of what kind of lamps was provided, or even whether they used oil or candles. Carefully checking letters written by visitors in the early to middle 1800s may allow the advent of dominant oil lamp use to be learned.

Who Made The Mammoth Cave Lamps?

None of the lamps examined to date in private collections and in the park’s curatorial facility have any kind of mark on them to indicate the manufacturer. In 1998, I contacted the Huntington Library, and purchased copies of Mammoth Cave estate papers from the 1800s and early 1900s. For my \$150.00 investment I got two scant references to lanterns (Figures 10 and 11). Both are from an accounting ledger;

" 11 Athens & Off. paper.	+ 21.80	+
" 11 Fairbanks - Morse scale	+ 20.00	+
" 11 J.C. Clark Jr. Electric supplies	+ 5.93	+
" 28 John Thompson - sign painter	+ 5.50	+
" 11 McGuire - lanterns	+ 19.88	+
" 25 King - St. Jt.	+ 7.20	+
Feb. 1 - Harbo G. and Low	+ 10.00	+
	<u>184.15</u>	

Figure 10. Ledger entry showing purchase of lanterns.

March 14 State Mining Bldg	9.00	+
29 War. Lnd	23.64	
April 6. Armour	+ 9.75	+
Telephone Co.	19.57	
6 McGuire Co.	+ 18.40	+
6 Harbo G. rent	+ 10.	+
6 Conventual League	+ 10.	+
" 7. Radio Sewer	+ 22.5	+
9 Robinson. R. H. H.	+ 17.28	+
25 Range	+ 96.16	+

Figure 11. Ledger entry showing payment to McGuire Company again later in 1917.

one is dated January 23, 1917, and indicates a check was written for “McGuire – lanterns\$19.88”, and the other entry is dated April 6 of the same year for “McGuire Co.\$18.40”.

I spent part of a day at the Kentucky Library looking in old directories, but found nothing on the McGuire Company. A better researcher may have better luck. Were the checks to the McGuire Company for Mammoth Cave lanterns? Based upon photos of visitors at the Historic Entrance, likely they were because

kerosene lamps do not appear in these photos until after 1930 (Thompson and Thompson 2003). Judging from the number of variations on the basic Mammoth Cave lamp theme, many different tin smiths were engaged to make lanterns at different times.

How Many Varieties Of The Mammoth Cave Lamp Do We Know Of?

The amount of variation in the Mammoth Cave lanterns is either surprising, or isn't, depending on how you look at it. The main differences are in the construction of the font, the heat deflector, and in the wire ring handle. I know of 3 variations of the types that used petticoat lamps as fonts, 4 variations in lamps with single wire handles, and five variations in lamps with twisted wire handles for a total at this time of 12 varieties. Keep in mind that a morphometric analysis by a historian might detect more variation, and other lamp types may be found in the future. The pictures of lamps below (Figures 12-20) are presented in hypothesized order of production with particular points noted in the captions. In general, the diameter of the wire ring handle increased with time, and the height/width ratio of the front/base also increased with time, which put more light on the ground.



Figure 12. Found in Rafinesque Hall, this lamp has a narrow font, a broad flat heat deflector, and a small single wire handle.



Figure 13. This lantern was found last year in Cleaveland Avenue by National Speleological Society volunteer John Kirk. Note the small heat deflector with stamped concentric rings, and the small diameter of the single wire handle.



Figure 14. This lamp in the park's curatorial facility has a single wire handle, a broad flat heat deflector, and a narrow font.



Figure 15. This lamp in the park's curatorial facility is very similar to the lamp shown in the previous figure. It too has a single wire handle, a broad ridged heat deflector, and a particularly tall, narrow font.

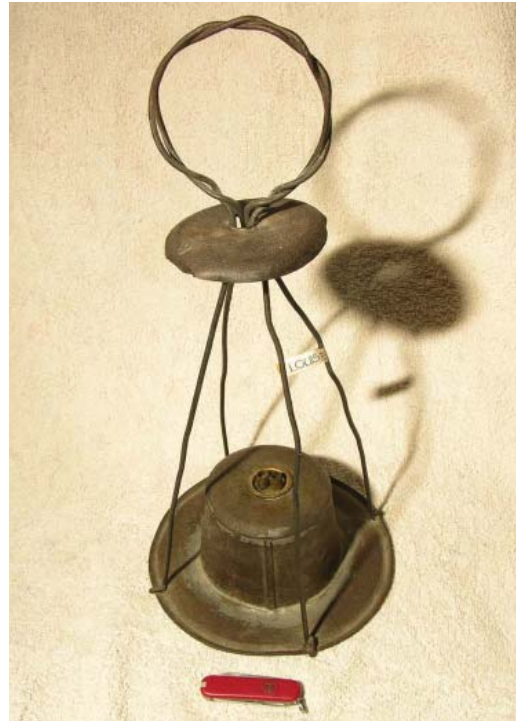


Figure 17. This lamp in the author's collection has a large loosely twisted handle, a heat deflector with a curved edge, and a flat topped font with a curved edge.



Figure 16. This lamp, also in the park's curatorial facility, has a tightly twisted wire handle, a broad heat deflector, and a domed font top stamped from a single piece of tin.



Figure 18. Like the previous lamp, this one in the park's curatorial facility has a large, loosely twisted handle and a heat deflector with a curved edge, but the font top is slightly domed.



Figure 19 . A late model Mammoth Cave lantern in the author's collection. It has a large, loosely twisted wire handle, a stamped domed heat deflector, and a domed font top. Martel is holding a lantern of the same type in figure 24.



Figure 20. Likely the last production run of Mammoth Cave lanterns, many of these were wired and used to light the hotel's Woodland Cottages until they were removed in the summer of 1996. Note the beveled heat deflector.

Were The Lamps Used in the Woodland Cottages Reproductions ?

There has been some speculation that the electrified lamps used in the Woodland Cottages were mock-ups made to look like real Mammoth Cave lanterns. However, there are two lines of evidence indicating that they were genuine lanterns. First, the fonts are "watertight" so to speak, and there would be no need to make them so that they could hold oil if they did not need to. Second, there is a lamp near the Devil's Looking Glass (Figure 21) that is almost certainly part of the same production run. Measurements were taken on both an electrified lamp and the one in the cave using a vernier caliper. The diameters of the handles measured 3.48 and 3.49 inches, the diameters of the heat deflectors measured 3.65 and 3.63 inches, and the height of the bevel on the heat deflectors measured 0.51 and 0.52 inches respectively. I can only conclude from these measurements that these lamps were part of the same production run, and that the lanterns used in the Woodland Cottages were overstock put to an alternative use after these lanterns were no longer used in the cave.



Figure 21. Lamp near Devil's Looking Glass of the same production run as those used in the Woodland Cottages.

When Were Mammoth Cave Lamps Last Used?

In an interview with former guide Parker Ritter on July 3 of 1998, Colleen O'Connor and Rick Olson learned that the Mammoth Cave lamps were last used in 1938 (O'Connor 1998). Kerosene lamps had been gradually replacing the old open flame lamps, and in 1938 the change in lighting was complete. Mr. Ritter indicated that although the fuel was called lard oil, another type of oil was likely used.

What Fuel Was Used in Mammoth Cave Lamps?

Correspondence between the American Cotton Oil Company and the Mammoth Cave Estate dated April 20, 1917 discusses purchasing a barrel of "J.V.L. Winter White Miners Oil (Figure 22). Expense records for cave lighting from 1904 and 1905 also indicate significant purchases from the American Cotton Oil Company, so likely that is the fuel that Max Kaemper and Ed Bishop used in 1908 (Charlet 1905).

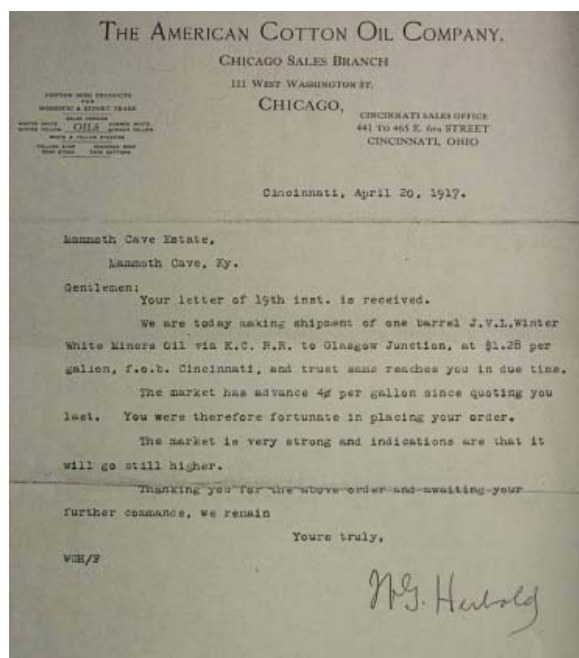


Figure 22. Correspondence between the American Cotton Oil Company and the Mammoth Cave Estate

Concluding Thoughts on Lighting Used by Max Kaemper and Ed Bishop

The ideal situation would be for us to have a picture of Max and Ed with all their cave surveying and exploring equipment included. We don't have that of course, and so we can only make inferences. In Figure 23, Ed Bishop is shown at the Historic Entrance in 1905. He is carrying Mammoth Cave lanterns in addition to his torch throwing stick. If he had a more advanced light, it is not shown. Similarly, E. A. Martel is shown at the entrance to Salts Cave with a Mammoth Cave lamp (Figure 24). He visited in 1912 and was world famous even then. If more advanced cave lights were available, then one would think he would have them. There is a slight possibility that Max and Ed may have used a carbide auto headlight (Figure 25). This speculation is based upon an account by Horace Hovey (1907), in which he describes the use of such a lamp at Cathedral Domes. Max Kaemper and Horace Hovey did correspond, so it is possible that the use of a carbide lamp was suggested. Perhaps someday more information will come to light.



Figure 23. Ed Bishop at the Historic Entrance in 1905.



Figure 24. E. A. Martel at the entrance to Salts Cave in 1912 with a lard oil lamp probably fueled with cottonseed oil.



Figure 25. An antique carbide headlight of the type that Hovey might have used at Cathedral Domes.

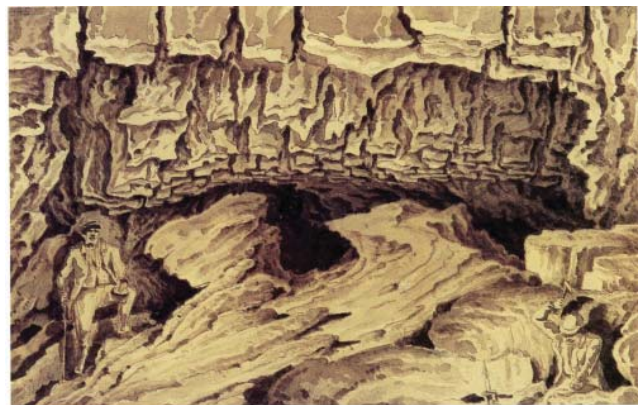
This is a long shot, but there is a slight possibility that Max and Ed used a gas lantern during their exploration and survey work. A primitive gas lantern appears in a photo of Mat Bransford the younger (Figure 26) at the Historic Entrance in about 1915 (Lyons 2006). This lantern, or one just like it, is in the park's curatorial facility, and was made by the Akron Gas Lantern Co. I have been unable to learn anything about when these lanterns were first marketed, but W. C. Coleman began selling gas lanterns in 1902 (Kretschmann 2008). Given



Figure 26. Mat Bransford at the Historic Entrance with an early gas lantern.

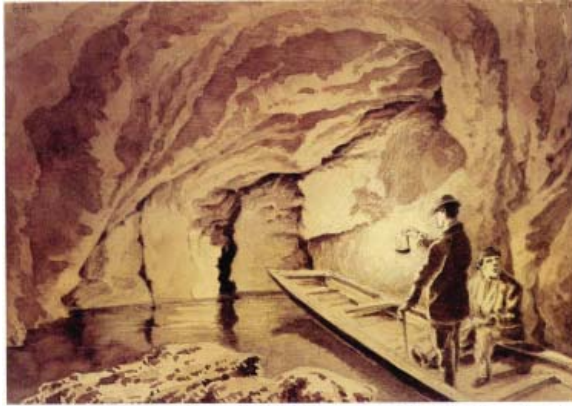
the weight and bulk of this gas lantern, it would have been inconvenient to carry, but imagine how it would show the way through the huge trunk passage they discovered and named Grand Avenue.

One final thought is important to keep in mind: at any given time, a variety of light sources were probably in use. As an example, the Mammoth Cave lantern was clearly being used by 1866 when Max Eyth visited Mammoth Cave. However, in two of the paintings he made of the cave, different light sources are shown (Binder 1997). In his painting of the Bacon Chamber (Figure 27), two gentlemen are seen with candle holders, and in his painting of River Styx, a gentleman standing in a boat is holding a bette lamp (Figure 28). Then as today, people apparently used a variety of light sources.



1. 7: Mammuthöhle. Baconchamber. Aquarellierte Zeichnung von Max Eyth, 1866.

Figure 27. A painting of the Bacon Chamber by Max Eyth in 1866 showing men with candle holders.



8: Mammothhöhle. Styx. Aquarellierte Zeichnung von Max Eyth 1866. Inv. Nr.

Figure 28. A. painting of River Styx by Max Eyth in 1866 showing a man with a bette lamp.

Acknowledgements

I have wanted to write this paper for over a decade. Many thanks to Gary Berdeaux, Chuck DeCroix, Ken DeJong, John Kirk, Bernd Kliebhan, Terry Langford, Colleen Olson, Rick Toomey, Shannon Trimboli, and Bob Ward for helping to make it possible.

References

- Anonymous. 1863, A short entry about Mat Bransford's visit to Louisville. Louisville Daily Journal, August 20, 1863, p. 3c1. (Reprinted in the Journal of Spelean History, 18, (2), April-June 1984, p. 60.)
- Binder, H. 1997. Der ingeneur und dichter, Max Eyth (1836-1906) und sein plan der Mammothhole in Kentucky (USA) aus dem jahr 1866, p. 13.
- Bullitt, A. 1845, Rambles in the Mammoth cave, During the year 1844 by a visiter. Johnson Reprint Corporation, 111 Fifth Avenue, New York, NY 10003, p. 81.
- Blane, W. 1824, Mammoth Cave, winter of 1822 – 1823 as described by William N. Blane in An excursion through the United States and Canada, London, p. 267.
- Charlet, L. 1905, Expense for oil, rags,lights,and Bengal lights from July 1, 1904 to June 30, 1905 (signed by Lewis Charlet), 1 page.
- Hayward, A. 1962, Colonial and early American lighting. Dover publications incorporated, 180 Varick Street, New York, NY 10014. p. 37,68,69.
- Howes, C. 1989, To photograph darkness, the history of underground and flash photography. Alan Sutton publishing, Brunswick road, Gloucester, UK, p. 48-71.
- Herr, K. 1964, The Louisville and Nashville Railroad 1850-1963. Public relation department, L. & N., Louisville, p. 23-24.
- Hovey, H. 1907, A Mammoth Cave cathedral, some discoveries of interest. Scientific American supplement No. 1651.
- Kovel, R, and T. Kovel, 1967, Know your antiques. Crown publishers, Inc. New York , p. 147.
- Kretschmann, K., 2008, How is a gas lantern made?, www.answers.com/topic/gas-lanterns, 3 p.
- Lyons, J, 2006, Making their mark, the signature of slavery at Mammoth Cave. Eastern national, Fort Washington , PA, p. 28, 38.
- O'Connor, C. 1998, Highlights from conversations with Mammoth Cave National Park's past guides. Vertical files at Mammoth Cave National Park , p. 2.
- Thompson, B. 2002, Historic paintings of Mammoth Cave. National Speleological Society News, April edition, p.109.
- Thompson, B., and J. Thompson, 2003, Mammoth Cave and the Kentucky cave region. Arcadia publishing, 2 Cumberland Street, Charleston, SC, 29401, p. 39, 46.

Mammoth Cave International Center for Science and Learning

By Rickard S. Toomey III¹, Shannon R. Trimboli¹, Bob Ward², Mike Adams², and Blaine Ferrell³

¹Mammoth Cave International Center for Science and Learning, Western Kentucky University, 1906 College Heights Blvd #31066, Bowling Green, KY 42101-1066, www.wku.edu/mcicsl

²Mammoth Cave National Park, PO Box 7, Mammoth Cave, KY 42259

³Ogden College of Science and Engineering, Western Kentucky University, 1906 College Heights Blvd #31066, Bowling Green, KY 42101-1066

Abstract

The Mammoth Cave International Center for Science and Learning (MCICSL) is a cooperative venture of Mammoth Cave National Park and Western Kentucky University. Funding, logistical support, and governance of MCICSL are shared equally by both entities. MCICSL is part of a national network of research learning centers located within the National Park Service.

The goals of MCICSL and the other research learning centers are to:

- I. Facilitate the use of parks for scientific inquiry.
- II. Support science-informed decision making.
- III. Communicate the relevance of and provide access to knowledge gained through scientific research.
- IV. Promote science literacy and resource stewardship.

MCICSL has been operational since the middle of 2005, so it is still building programs. Current staffing consists of a Research Director (Toomey) and a part-time Education Program Specialist (Trimboli). In spite of the limited staff, MCICSL is meeting its goals and is leading both research and education based programs.

Introduction

Research learning centers were developed by the National Park Service to facilitate research within the national parks and to provide better communication of research results to managers, partners, and the public. Originally 32 research learning centers were planned, each one serving a network of parks. The first research learning centers were funded in 2001, and in 2003, Mammoth Cave National Park was slated to receive funding to develop a research learning center. However, funding for additional centers was discontinued before Mammoth Cave's funding was received.

When funding for new research learning centers was suspended, Mammoth Cave National Park and Western Kentucky University created a proposal for a cooperatively run and funded center. Funding for the Mammoth Cave International Center for Science and Learning

was provided through two one-year (2004 and 2006) Congressional line item appropriations. In 2005, a full-time research director, Rick Toomey, was hired to run the research learning center. In 2007, he was joined by a part-time education program specialist, Shannon Trimboli.

Despite limited funding and staff, MCICSL is actively involved in numerous natural and cultural research and education projects at Mammoth Cave National Park. The center coordinates scientific research at the park and consults with the park on scientific issues. In addition, MCICSL leads or participates in many educational activities that highlight research at the park. Most of the center's educational activities are focused on learners that are secondary school age or older.

Meeting our goals and having fun
Facilitate the use of parks for scientific inquiry
(Figures 1 and 2).

MCICSL coordinates the research for Mammoth Cave National Park, including overseeing the research permit applications process. Through permitted research and research projects managed through agreements and other mechanisms, MCICSL facilitates



Figure 1. Tennessee State University students test the parking lot filter system in preparation for a larger project looking at parking lot runoff around Mammoth Cave.



Figure 2. Wittenberg University geology students use Electrical Resistivity Ground Imaging to look for cave passages near the park.

research by state and federal agencies, non-governmental organizations, private researchers, and numerous universities. MCICSL staff also assists the researchers in obtaining lodging, working with park staff and volunteers, and other logistical needs.

Support science-informed decision making
(Figures 3 and 4).

MCICSL staff serves as the primary or co-primary investigator on several research projects involving NPS caves both within Mammoth Cave National Park and at other national parks. These projects include a multi-park lighting research project, research to address on-going E. coli issues in cave waters, and a project to improve monitoring of backcountry caves. MCICSL has also consulted with park management on various resource protection issues and assisted in relighting several areas of the cave to improve visitor experience and reduce exotic plant growth. During the summer of 2008, MCICSL co-hosted an intensive, week-long Cave and Karst resource Management workshop at Sequoia / King Canyon National Park. This workshop was attended by cave resource managers from across the country.



Figure 3. Mammoth Cave ecologist, Rick Olson, sets up an experimental apparatus to measure the amount of algae growth that occurs under different lighting conditions. MCICSL is co-lead on this project, which is also taking place at four other national parks.



Figure 4. Rick Toomey (MCICSL) and Joel Despain (NPS) lead a group of cave resource managers on a trip to review ways of managing cave resources and public access to caves.

Communicate the relevance of and provide access to knowledge gained through scientific research (Figures 5 and 6).

MCICSL provides a variety of research-based formal and informal educational and outreach opportunities to diverse internal and external audiences. Each year, numerous professors contact MCICSL to schedule customized research-focused field opportunities for their students. In addition to their work with students, MCICSL hosts, or co-hosts, science and research-based workshops for teachers and the general public. MCICSL also produces written internal and external research summaries and is serving on the exhibit committee for Mammoth Cave's new Visitor Center.

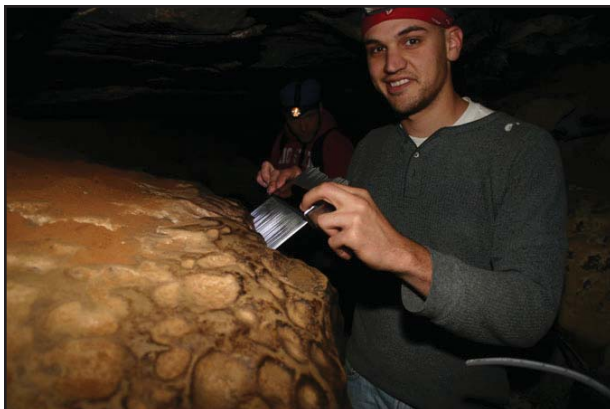


Figure 5. An Ohio State University geology student measures scallops to determine the speed and direction of the ancient cave rivers.



Figure 6. Participants in a weekend workshop visit the grave of William Bransford while learning about the history and contributions of African Americans to the Mammoth Cave area.

Promote science literacy and resource stewardship (Figures 7 and 8).

For the past three years, MCICSL has collaborated with Mammoth Cave's Environmental Education Division and the National Association of Geoscience Teachers to offer summer internships for local teachers. The teachers gain hands-on exposure to the variety



Figure 7. Two Geoscience-Teacher-in-the-Park interns assist park scientists by recording the GPS coordinates of a newly discovered cave entrance.

of resources found at the park while working alongside researchers. Several advanced high school classes have also participated in research-focused outdoor learning experiences with MCICSL staff. In addition, MCICSL and Tennessee State University have partnered on an NSF grant encouraging minorities to pursue science, technology, engineering and math careers. The partnership is using cultural connections to the park as a way to connect the students with the park's geoscience and environmental resources.



Figure 8. A Special Topics in Biology II high school class learns cave mapping techniques and how cave mapping is used as an important scientific tool in the management of cave resources.

What does the future hold?

With the continued support of park management and Western Kentucky University, MCICSL plans to continue facilitating research and research-based education and outreach within Mammoth Cave National Park. Securing permanent funding for MCICSL is an ongoing need that is being actively pursued by MCICSL and its partners. In addition, opportunities

for additional grant-based funding are being sought until permanent funding can be obtained. MCICSL is also actively involved in the development of a national Research Learning Center network strategic plan and other network activities.

Acknowledgements

Thanks to all those at Western Kentucky University and Mammoth Cave National Park who provide so much support and encouragement. Thanks also to our many partners who make the individual projects in which they are involved possible.

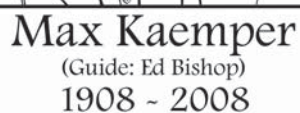
Partners

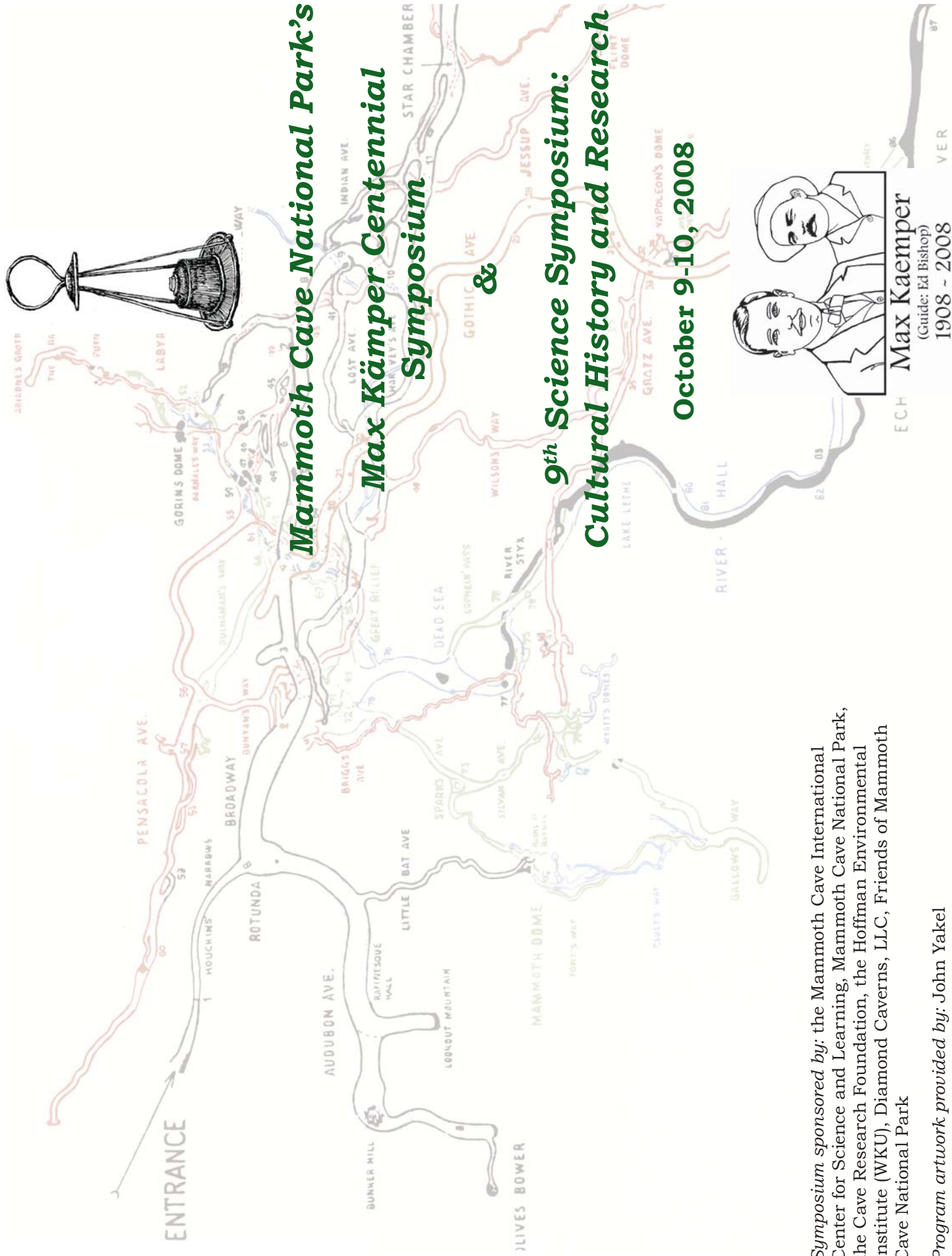
To learn more about the following partners, please visit their websites.

Mammoth Cave National Park:
www.nps.gov/maca

Western Kentucky University:
www.wku.edu

The Research Learning Center Network:
www.nature.nps.gov/learningcenters/





Symposium sponsored by: the Mammoth Cave International Center for Science and Learning, Mammoth Cave National Park, the Cave Research Foundation, the Hoffman Environmental Institute (WKU), Diamond Caverns, LLC, Friends of Mammoth Cave National Park

Program artwork provided by: John Yakel

Thursday, October 9, 2008

8:15	Coffee and Donuts	
8:45	Welcome	Mammoth Cave International Center for Science and Learning.....Rick Toomey Mammoth Cave National Park.....Bob Ward Hoffman Institute.....Pat Kambesis Cave Research Foundation.....Pat Kambesis
8:55	Announcements Rick Toomey	
9:00	The Evolution of Cave Mapping and Cartography Pat Kambesis	
9:30	Mapping of Mammoth Cave: How Cartography Fueled Discoveries, with Emphasis on Max Kaemper's 1908 Map Roger W. Brucker	
10:10	Break	
10:25	The Puzzling Mr. Janin and Mammoth Cave Management, 1900-1910 Katie Algeo	
11:10	The Man Behind the Map Charles J. DeCroix	
11:25	Lunch at Hotel	
1:00	Announcements Rick Toomey	
1:05	Searching for Max: The Engineer, the War and the World's Longest Cave (Part 1) Bernd Kliebhan	
1:45	Max Kämper's Introduction to the New World Stanley D. Sides, M.D.	
2:20	Max Kämper's Explorations at Mammoth Cave Charles J. DeCroix	
3:00	Break	
3:15	Slave Guide Legacy at Mammoth Cave Joy Medley Lyons	
3:50	Searching for Max: The Engineer, the War and the World's Longest Cave (Part 2) Bernd Kliebhan and Kämper Family	
7:00	Reception	

Friday, October 10, 2008

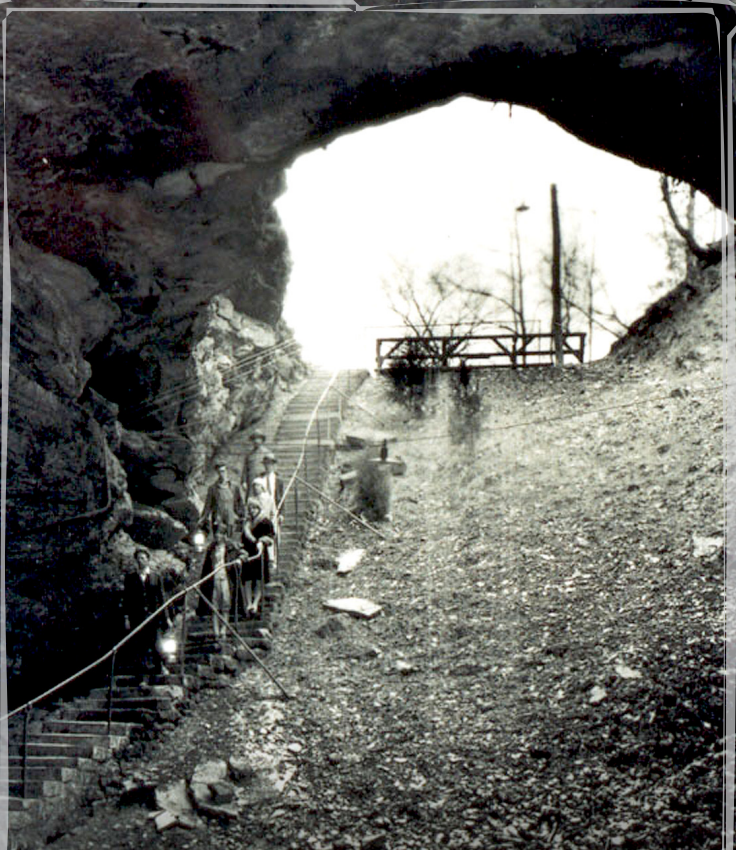
8:30	Coffee and Donuts	
9:00	Announcements Rick Toomey	
9:10	Max Kämper's Unique Selection of Place Names for His 1908 Map of Mammoth Cave Charles A. Swedlund and George M. Crothers	
9:40	Mammoth Cave: What a Difference a Few Friends Can Make LaJuana S. Wilcher	
10:00	Break	
10:15	Contributions to Karst Science and Education from the Mammoth Cave Region Chris Groves and William B. White	
10:35	A Long History of Linkages and Synergy: Western Kentucky University and the Mammoth Cave System Deana Groves, Chris Groves and Weldon Hawkins	
10:55	The Lamps That Lit Their Way Rick Olson	
11:40	Mammoth Cave International Center for Science and Learning Rick Toomey and Shannon Trimboli	
12:00	Wrap-up and final announcements Rick Toomey and Pat Kambesis	
6:00	Kämper Re-visited Concert Klaus Kämper, cellist, and Janet Bass Smith, pianist; Methodist Church, Mammoth Cave (Meet at Visitor Center)	



Saturday, October 11, 2008

8:30	Violet City Trip Chuck DeCroix, Rick Olson, Rick Toomey, and Stan Sides (Meet at enclosed shelter in picnic area, Mammoth Cave National Park.) <i>Sign-up required.</i>	
11:00	Grand Avenue and Woodbury Pass with lunch in Snowball Dining Room Chuck DeCroix, Rick Olson, Rick Toomey, and Stan Sides (Meet at enclosed shelter in picnic area, Mammoth Cave National Park.) <i>Sign-up required.</i>	

Kämpfer Revisited



Celebrating 100 Years of a Man,
His Map, and His Music

Friday, October 10, 2008

Programme

Sonata No. 1, First Movement

Johannes Brahms (1833-1897)

For violoncello and piano

Suite No. 1, Selected Movements

Johann Sebastian Bach (1685-1750)

For violoncello solo

Feux d'artifice (Fireworks)

Claude Debussy, (1862-1918)

For piano solo

Ständchen (Serenade)

Franz Schubert (1797-1828)

Arranged for cello and piano

The Entertainer

Scott Joplin (1867-1917)

For piano solo

Träumerei (Reverie)

Robert Schumann (1810-1856)

Arranged for cello and piano

Medley of Stephen Foster Songs

Stephen Collins Foster (1826-1864)

Arranged for cello and piano

**Selected German and American
popular songs from the
early 1900s**

Arranged for cello and piano

Complimentary refreshments will be provided in the
Mammoth Cave Hotel lobby following the concert.



Klaus Kämper, cellist, is the son of Hans and Gerlinde Kämper and the grandson of Max Kämper. He was born in Gelsenkirchen, Germany, and after completing the exams for university studies, studied cello in Düsseldorf with Prof. Goritzky and Prof. Metzmacher. He also participated in master classes with Gregor Piatigorsky and Zara Nelsova. He joined the famous Cherubini String Quartet as cellist and traveled around the world, winning several international prizes for chamber music. After fifteen years, he left the quartet and spent several years studying philosophy and Sanskrit. He started playing again as a soloist, and with the Schwabinger Piano Trio, the Novalis Quartett and others. Today he is a freelance cellist, living near Munich, Germany.



Janet Bass Smith, pianist, holds the Doctor of Musical Arts in piano performance from the University of Missouri-Kansas City, Conservatory of Music, and has done advanced study at the Juilliard School of Music and the Eastman School of Music. She has been on the faculty of four universities, teaching piano and music theory, and currently maintains an independent piano studio in Bowling Green, Kentucky. In 2003 Dr. Smith performed a Mozart concerto with an orchestra in St. Petersburg, Russia, and has performed both as a solo pianist and with her husband, Charles, a flutist, throughout the United States and Europe. Dr. Smith has published articles in several pedagogical journals and has received numerous awards for scholarship and performance. For the past eight years she has been active as a performer and marketing director for the Bowling Green Chamber Orchestra. She is a church organist, an amateur cellist, a prize-winning oil painter and poet, and an avid caver. For the past sixteen summers she has been a seasonal park ranger at Mammoth Cave National Park, where she guides all of the cave tours, including the six-hour Wild Cave Tour. The Smiths have been married for fifty-one years, have performed together for fifty-three years, and have four sons and seven grandchildren.



One hundred years ago, a young German engineer named Max Kämper, came as a visitor to Mammoth Cave. He became so enchanted with the cavern he obtained permission to map the vast system. For the next eight months Max, along with assistance from cave guide Ed Bishop, meticulously put together a highly detailed and accurate map revealing more of the cave than ever before. He probably never realized his work would be admired by generations to follow. Some admire its artistic expression of the cave. Others see beauty in its precision. Ultimately, it has become the iconic map for generations of future explorers, preserving the history of place names and cave features as well as the lives of individuals for whom various areas were named.



Max Kämper

On the warm summer evening of Monday, July 13, 1908, Max took a break from his cartographic masterpiece. Hotel manager Marty Charlet gave a porch party for guests. The *Glasgow Daily Times* reported, "The piano was moved onto the spacious porch of the hotel, and Mr. Max K[ä]mper, of Berlin, Germany, delighted the crowd with some excellent music on the violin accompanied by Miss Mayme Depp of this place."

Tonight we celebrate the centennial of Kämper's visit. Members of the Kämper family have crossed the Atlantic, back to the place where this remarkable map was created. Among them is Max's grandson, renowned cellist Klaus Kämper. This evening, history repeats itself as Klaus performs musical compositions from Max's era, accompanied by concert pianist and Mammoth Cave guide Janet Bass Smith.

Enjoy this evening's celebration of a man, his map, and his music.



EXPERIENCE YOUR AMERICA



Symposium sponsored by: the Mammoth Cave International Center for Science and Learning, Mammoth Cave National Park, the Cave Research Foundation, the Hoffman Environmental Institute (WKU), Diamond Caverns, LLC, Friends of Mammoth Cave National Park

Cover artwork provided by: John Yakel