THE SPELEOGRAPHY OF GREAT SALT PETER CAVE

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Introduction

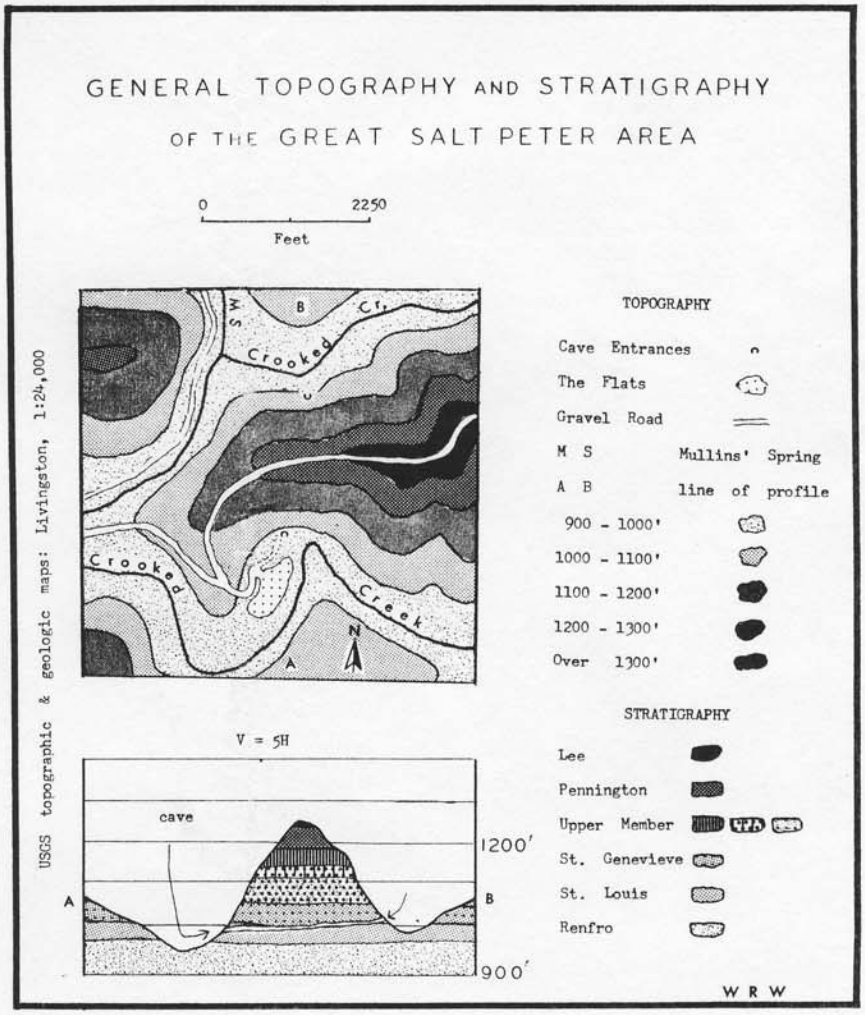
One of the best known of the many caves of Kentucky is Great Salt Peter Cave. For several decades during the past and on into the present century, this cave has been as well known as is Mammoth Cave. To the observant and inquisitive speleologist the aura of many past eras is reflected in its passages.

General Geology and Topography

Great Salt Peter Cave is located in the escarpment of the Cumberland Plateau known to geographers as the Ridgetop and Limestone Valley Settlement Area and to the geologists as the Eastern Kentucky Karst Region (see chart). The cave is in the drainage of Crooked Creek, a tributary to the major regional stream, Roundstone Creek. It is approximately thirty miles southeast of Richmond, Kentucky. The USGS (1:24,000) Livingstone Quadrangle indicates the location of the cave by name and symbol. A gravel road from State highway 1004 at Orlando leads directly to the south entrance.

The Karst region is fromed by an outcrop of Mississippian limestones which dip gradually to the southeast where they are overlain by Pennsylvanian sands, shales, and conglomerates, interspersed with a few thin coal seams. The principal limestones, St. Genevieve and St. Louis, are the same as those in which most of the caves of the western part of the state have been formed. The Pennsylvanian materials, being highly resistant, are the major ridgetop formers throughout the area and it is due to their occurrence and persistence that the caves of the region still remain.

Regional relief throughout the general vicinity of the cave varies between 200 and 300 feet with ridgetops averaging about 1200 to 1300 feet above sea level. Generally streams have eroded to the base of the Mississippian limestones and several feet into the underlying shales at elevations of 900 to 1000 feet. The greatest local relief occurs near the tops of ridges where the Pennsylvanian conglomerate forms vertical bluffs up to seventy-five feet in height. Below the conglomerate contact, the slope to the valley floors and streams is about twenty degrees.



Remains of a leaching vat. The form seen here is the skeleton which has been left after removal of the logs and slabs. The smooth sides are caused by construction with slabs.

Most of the first-order streams of the area are ephemeral unless fed directly by resurging waters. Crooked Creek, although apparently dry in late summer, actually always carries water. The water usually accumulates in discontinuous pools and/or moves slowly beneath alluvial sands and gravels of the creek bed.

The Cave

Great Salt Peter Cave lies in the contact area of the St. Louis and St. Genevieve limestones at an elevation of approximately 1000 feet, about 80 feet above the bed of Crooked Creek. The cave has two entrances; the south entrance is at an elevation of 980 feet, and the north at 1010 feet, at opposite sides of the hill. The accompanying map of the cave shows prominent features and area names.

Discovery and Exploration: 1799-1801

According to Brown, 1806, John Baker discovered and partially explored Great Salt Peter Cave in 1799. When he discovered the cave, Baker proceeded only a short distance into it; perhaps only through the twilight zone. The following day he returned with his wife and two or three of their children. They entered the cave through the north entrance; Baker carried a pine torch. After penetrating several hundred yards, Baker became excited by the sound of a "thundering torrent" and dropped the torch. The thunder was a 20-foot waterfall. The torch was extinguished and the family, without flint and steel, was enshrouded by the darkness. For about three days they wandered about in the cave, fearful of approaching too close to the "torrent." It was finally Mrs. Baker who "saw the light of day" and the family found their way out of the cave. Ironically, had the Bakers approached to within 50 feet of the "frightening torrent," they would have been able to see the south entrance.

Although no other references to exploration within the cave during this era were found, one can

conjecture that many other residents of the area explored the cave. The cave is located near one of the better-traveled roads of that period and so it was, after initial discovery, readily accessible.

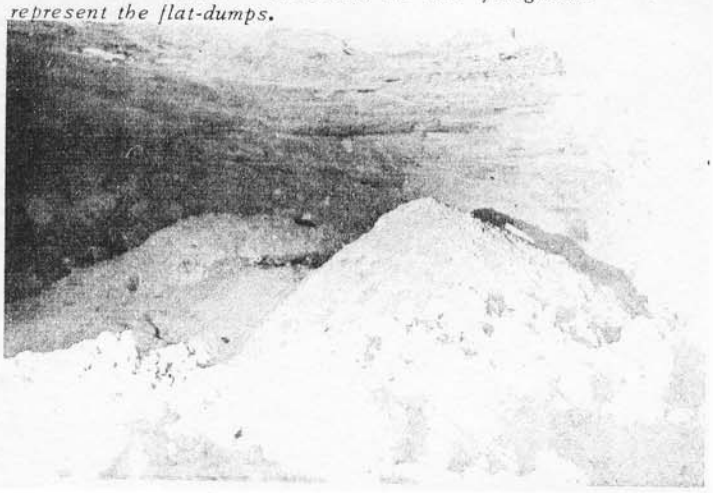
First Period of Major Importance: 1801-1813

The events during this period projected Great Salt Peter into regional and national importance. No longer was the cave just a hole in the ground. Great Salt Peter Cave was to become one of the country's major resources. The whole community adjacent to the cave was caught up and entwined in the economic and military necessity of transforming the cave into its present state, which is as much a manifestation of human endeavour as it is of natural processes of solution and deposition.

With the shortage of gunpowder before and during the War of 1812, saltpeter was extracted from the cave in large quantities. The manufacture of saltpeter on a commercial basis began about 1801, increased until the year 1812, and began to diminish immediately after. The method of manufacture, as reconstructed from evidence in the cave, and from Brown, was in most instances similar to that used elsewhere. Vats were constructed from easily available timber. The peterdirt was dumped into the vats. Water poured through the dirt was subsequently drained into a collection trough. The solution was carried outside the cave and boiled. The sodium nitrate, the product of the leaching process, was then mixed with ashes and altered to potassium nitrate, one of the ingredients of gunpowder.

On closer observation, however, there were several practices different from those used in other manufacturing sites. The leaching vats were constructed of a foundation of logs over which were placed wooden slabs about two inches thick. On the slabs, wood shingles were fitted together to make the bottom of the vat water tight. The sides of the vats

In the background are ridge dumps produced by the two-wheeled carts. Materials in the foreground represent the flat-dumps.



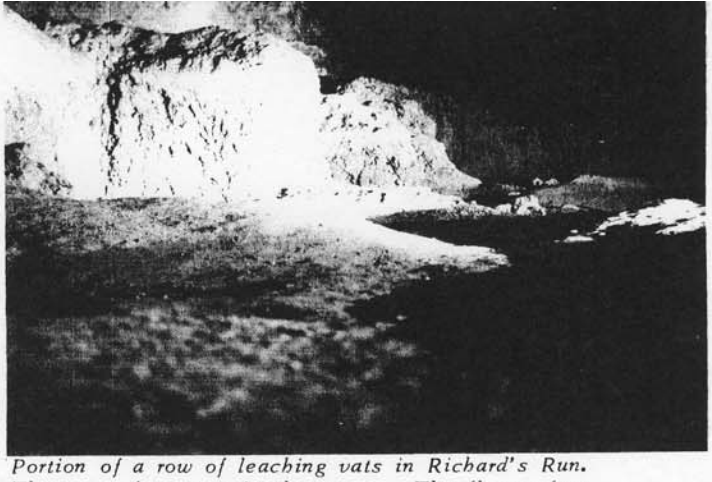
were constructed from slabs about two to three inches thick, fastened with pegs between four corner-post logs. The average dimensions of the remaining vats are 38 inches high, 96 inches wide, and 84 inches deep. At the bottom and alongside of a series of adjacent vats was built a collection trough. This trough was generally a log which had been split and then hollowed out. The best preserved trough is 22 inches wide, 9 inches deep, and 33 feet long. It served nine leaching vats.

According to Brown, the source of water for the leaching process during the winter was the waterfall near the south entrance. The water was piped in through logs. However, this source of water was apparently not sufficient during the summer and water was brought to the vats from Crooked Creek. From the topography of the area, it appears that it would have been more feasible to bring the water, possibly by cart, from the nearest point of Crooked Creek into the cave via the south entrance. Here the distance is slightly longer, but the slope is significantly less than that of the north entrance. Also, no signs of a trail or road exist on the north slope.

After one vat-full of dirt was thoroughly leached, the spent or sterile dirt was removed from the vat and new dirt placed in it. After this process used all the easily accessible dirt in the vicinity of the vats, and if the vats were still useful, dirt was brought from other parts of the cave.

After a long period of use, the vats frequently became sufficiently deteriorated, or the location of the new dirt was sufficiently distant from the vat site, that new vats were constructed. The site of the old vats was generally used as a dumping place for the spent dirt removed from the newer vats. By this process of constructing and then abandoning vats as the peter-dirt supply shifted, the manufacturing process migrated throughout the cave. However, the migration was neither random nor haphazard. From the evidence in the cave, the vats of this period were constructed in the sections of passages somewhat removed from the major (south) entrance. The first vats were constructed either in Richard's Run or in the northern end of the Main Trunk. Old vats are still present in both of these sites, but buried beneath several feet of dumpings. As the manufacturing process continued and the dirt in these sections was used, the vat sites migrated toward the Maypole Room. The buried remains which are farthest from the Maypole Room are generally the least preserved.

During the height of mining immediately before and during the War of 1812, there were 60 to 70 men employed in the cave. Most of these laborers were people living near the cave. Since this number of men would, at this early date, represent a rather large portion of the total male labor force available, it is quite possible that many of the traditional occupations of the region were abandoned. Also taken out of the traditional economic system of the region were large numbers of oxen, carts, and wagons which were used in the operation.



Portion of a row of leaching vats in Richard's Run. There are four vats in the scene. The flat surface in the foreground is due to flat dumps.

The oxen and vehicles were used to haul the new dirt to the vats and to haul the spent dirt away from the leaching process. Collins describes the scene thus: "Carts and wagons passed through (the cave) from one side of the mountain to the other, without difficulty. The way is so level and straight, that oxen were soon taught to pass through in perfect darkness, without a driver."

In several parts of the cave there is evidence of the passage of the oxen and carts. The location of the best preserved tracks is indicated on the map. Also visible in the place indicated on the map are stria caused by the yokes as the oxen passed through a part of the cave with a five-feet high ceiling, the lowest ceiling height in the main passage of the cave. At other parts of the Main Trunk are pieces of breakdown which bear testimony to the iron-rimmed wheels which passed over and left smoothed-out grooves as witness to their passage.

Other remnants of the mining are the dumps, which are indicated on the map. The "ridge dumps" were undoubtedly produced by unloading two-wheeled carts by allowing the weight of the load to tilt the cart backwards. The average volume of these dumps is approximately one cubic yard. The flat-type dump was probably produced by shoveling the dirt from four-wheeled wagons.

The source of light used by the miners was primarily pine torches and oil burning lamps. Examples of the lamps are preserved in the museum of Renfro Valley. Evidence of pine torches is preserved in the cave itself. Soot streaks appear on the walls at intervals of approximately each fourth vat. The torches were set in place either in man-made ledges or nooks, or naturally-occurring nooks.

During this period, most of the saltpeter produced was shipped either to Pittsburg or Lexington, Kentucky, by wagon and boat. As early as 1805, a "rather large gunpowder mill" had been erected in Lexington. By 1810, there were 63 gunpowder mills in Kentucky which produced 115,716 pounds of powder from 201,937 pounds of saltpeter. Kentucky produced an even larger quantity in 1812, and on a national scale was followed by Virginia with 48,175 pounds and Massachusetts with 23,600 pounds. Following the War of 1812, the production of saltpeter from the cave fell off sharply, continuing primarily in response to local and regional demands.

Inter-War Period: 1815-1843

The events of the cave through this era are relatively obscure and appear to be similar to those of the pre-1801 era. However, it seems plausible that the cave did not lapse into complete obscurity or that it remained without visitors or local producers of the saltpeter.

Period of the Mexician War: 1844-1848

Shortly before 1845, commercial working of the deposits of the cave commenced anew: woodsmen felled trees for new vats, and for ashes; miners went to work with pick, shovel, ox-cart, and lights. Again the cave began to hum with the sounds of the mining activities.

During this period, however, the activities of the cave were not as important as the 1812 era. Only a few men were employed and only a few oxen. From evidence gleaned in the cave, there appears a distinct change in the method of vat building. The new vats were constructed almost wholly from logs with no slabs, even for the sides. This change in vat construction may be interpreted in several ways: 1) it might be due to an increased demand for saltpeter which required a faster method of vat construction; or 2) it may have resulted from a shortage of laborers for the hewing of logs into slabs. Whatever the major reason for change, we do find a series of vats constructed in a radically different manner from that of an earlier era.

Close-up of a portion of a leaching vat. Clearly indicated in the hard clay are the impressions of the slabs used for walls. The "tunnel" under the vat is caused by removal of the logs on which the vat was constructed. A portion of a log is visible in the center background as well as in the right foreground.

Period of Local Function: 1850-1940

For approximately ninety years, only small amounts of saltpeter were mined. Even though this interval includes the period of the Civil War, and several battles were fought in the vicinity, very little attention was given to the cave as a potential source of saltpeter. It was during this period the names Ball Room or Maypole Room became attached to the largest chamber in the cave. During each year, usually at spring planting, the residents of the region would forget many of their common problems by celebrating the beginning of summer with an all-day outing on the "flats" near the south entrance of the cave. Here the people would gather, and bringing foods, beverages, and musical instruments, pass the day. Two of the main events of this Summer Day Celebration took place in the Ball Room. One was a dance in the southern end of the chamber. Here the passage is relatively smooth and level and "fit for dancing." Another major event of the day was the competition to climb the May Pole, a poplar sapling. The log was trimmed of branches and peeled of its bark. The pole was placed in the large chamber so that its upper end was jammed against the ceiling and the lower end into the dirt floor. At the top of the pole was a dollar bill which belonged to the first man to climb it.

The cave during this era was also a scene of two conflicting activities: moonshining and religion. The major house of worship within the immediate vicinity was a branch-and-vine-covered shelter of logs. On days of inclement weather, the members of the congregation would meet in the Ball Room of the cave. At several times during this era there was also moonshining activities within the cave. According to the present residents of this area, the latest and most popular site for the still and associated equipment was in the southern end of the Main Trunk on the west side of the passage near the ceiling height figure of "7." As a by-product, swine were brought into the cave and fattened on the mash from the whiskey-making process.

It was during this era that many of the old vats were destroyed and were used for firewood. During winter or rainy periods, those people who had not accumulated a supply of wood stored in a dry place found a ready supply of seasoned wood in the cave. During a span of several decades almost all of the wood was removed from the cave.

Thus, although during this period the cave completely lapsed from national or even state-wide attention, it was one of the dominant centers in the affairs of the community. This era in the history of Great Salt Peter came to an abrupt end with the transfer of ownership from Mrs. Morris, a widow, to John Lair, owner of Renfro Valley.

The Period of Commercialization for Tourists: 1940-1943

In the early part of 1940, John Lair purchased the cave with the intention of promoting it into a major tourist attraction of Kentucky. It was well-known throughout the state and is located only about eight miles from one of the major north-south highways in the eastern part of the United States: Highway 25, the Dixie Highway. Also, Renfro Valley, through its nationally-known Barn Dance, fine cuisine, and museums, was a major tourist attraction which could be used to attract attention to Great Salt Peter Cave.

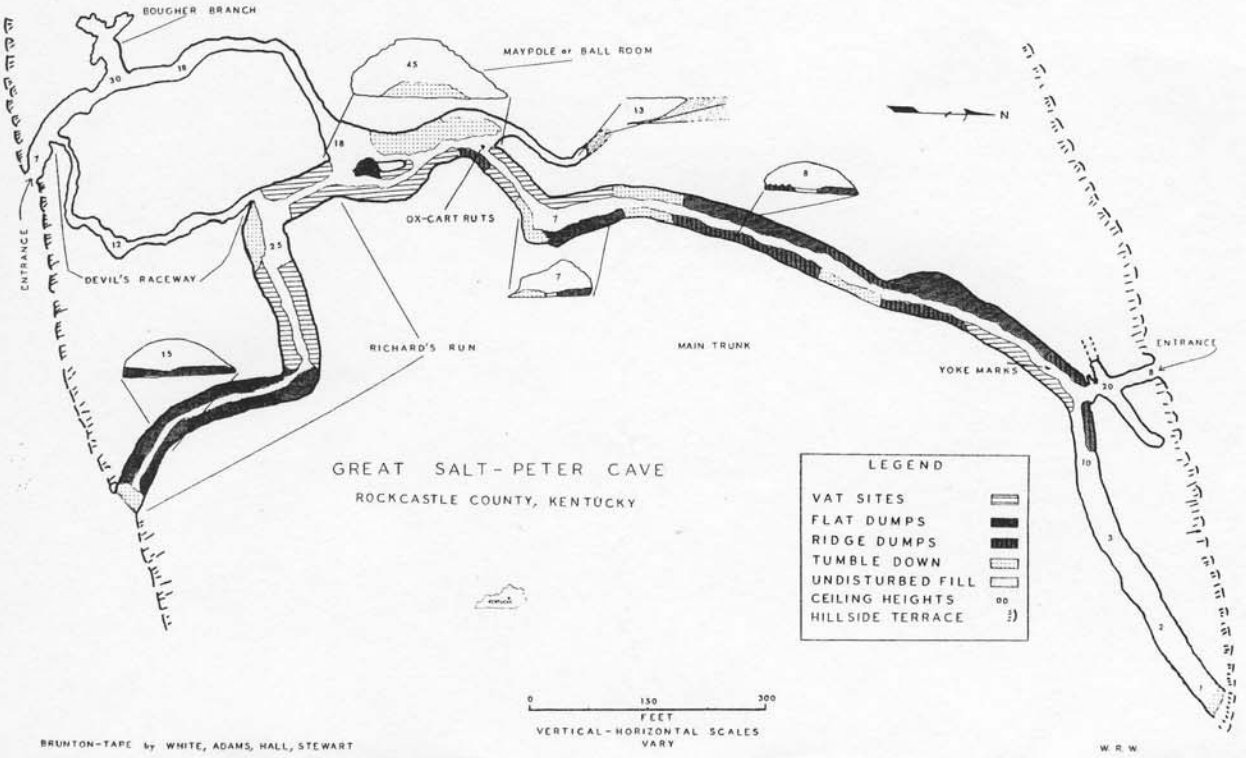
The commercialization of the cave involved restoration of a few vats, a slight levelling of the floor in a few places, and the placing of flagstones to form a walkway from the road into the south entrance of the cave. Also a series of steps was built from the main passage near the entrance to the Bougher Branch. To bring attention to the cave, CBS radio made a nationwide broadcast from just inside the south entrance on "opening night."

For several reasons the attractions of Great Salt Peter Cave were not sufficiently strong to warrant a continuation of its activities on a commercial basis. In 1943, the cave was abandoned commercially and again lapsed into relative obscurity.

The Recent and Modern Period: 1943-1966

Though Mr. Lair did abandon the cave commercially, it was not abandoned by those few who were attracted by its lure. Richard Mullins (Richard's Run) tells of leading groups of people, mainly from southern Ohio and northern Kentucky, through the cave almost every weekend. During the weekend of July 4, 1966, we met approximately 60 people during the course of the afternoon inside and outside the cave; the guide was Richard Mullins. It appears that the cave has not completely lost its function nor has it lapsed into complete obscurity.

The State of Kentucky has expressed interest in the cave for making the area into a State Historical Park and commercializing the cave. However, it is obvious that permission from Mr. Lair would be needed and he has plans for again commercializing the cave himself. In August 1966, a bulldozer was clearing the trees and other vegetation from the edge of the "flats" to make a parking lot, area for picnic tables, and recreational sites. Ideas and plans are being discussed as to what renovations or restoration should be undertaken in the cave. Although most of the plans have not been made public, it is apparent that perhaps Great Salt Peter



Cave is again awaiting for the resurgence of visitors to view and recall these eras of its past.

Acknowledgements

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Collins, Lewis. *History of Kentucky.* No publisher given. Covington, Kentucky, 1874. Especially relevant to this topic are pages 690-692.

Extant relevant records of Madison and Rockcastle Counties, Kentucky. Most of the tax records of the 19th century were destroyed by fire. However, some records were found which did mention the mining activity of the Great Salt Peter Cave.

Maxson, Ralph Nelson. *The Niter Caves of Kentucky.* This paper read before the Division of History of Chemistry of the American Chemical Society, March 31, 1931. Original is in the library of The University of Kentucky.

Personal interviews with Mr. John Lair of Renfro Valley, Kentucky and with Mr. Richard Mullins of Orlando, Kentucky.

Extensive field work by the author, William Adams, Charles Hall, and Don Stewart.

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