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PETER MARSHALL HAUER

Special Issue

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THE COVER

The cover drawing is Peter Hauer's idea of Huck's Pappy from the adventures of Tom Sawyer and Huckleberry Finn. Mark Twain was one of Pete's favorite authors. This also reminds some of life in West Virginia.

* * * *

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Journal Staff

Editor: Jack H. Speece
711 East Atlantic Avenue
Altoona, Pennsylvania 16602

Typist: Audrey N. Speece

SPELEO CONTRIBUTORS

PETER MARSHALL HAUER

Nov. 11, 1945 - June 9, 1975

Historian, Explorer, Author

NSS # 7391 F

Caves of Schoharie County
Caves of Massachusetts
Caves of War
History of Simmons Cave

Born in Lebanon, Pennsylvania, Peter later moved to Norwood, Massachusetts, where he attended Cornwall Academy at Great Barrington. With a keen interest in the natural sciences, a BS degree in Biology was completed at Gettysburg College. Post graduate work provided a certificate which was necessary to teach at the Outdoor Education Center near Harrisburg, Pennsylvania.

Peter always had a great love for the outdoors and science. About the age of nine is when he visited his first caves, Luray and Mammoth, and became interested in paleontology and fossils. At age ten, a meeting with well-known speleologist, Roger Johnson, encouraged him more. Early caving activities were associated with the grotto at Harvard University. By the time he attended Boston College, he was ready to start making significant contributions to the caving world.

Specializing in the study of saltpeter, Pete often signed his letters "KNO3". His studies carried him throughout the country and on a National Geographic study of saltpeter at Mammoth Cave in 1974. Numerous articles on the subject were prepared for a variety of speleological publications.

Active in all areas of caving, Peter was the first recipient of the James Mitchell Award, presented annually by the National Speleological Society, and received the title of "Fellow". He also served as the secretary-treasurer of the American Spelean History Association, after its organization in 1968. He was so well thought of by his fellow cavers that shortly after his death, a perpetual fund and annual award in his honor were created. The Peter M. Hauer Spelean History award is now presented annually by the N.S.S. to the individual who has made the most significant contribution to the field during the preceding year.

Peter was a man of character and dedicated to his convictions. After five years, he left his teaching profession to eek out a living from the earth on an old farm near Lobelia, West Virginia. This was his love, to be close to nature in the mountains and caves. Some considered him radical and eccentric, but his sincerity and dedication could set an example for others to follow. His interests and experiences covered the spectrum and touched people from all walks of life. He was easy to like and became a friend and teacher to all who knew him. A devout conservationist and president of the local chapter of the Isaac Walton League, he was very gentle and a lover of animals. The simple things were enough to satisfy him and he lived as his conscience dictated, without scorn and disturbance from society. Perhaps he patterned his life after Thoreau, who went to the woods so he could live deliberately and renew himself with nature.

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PETER HAUER - NOTES AND VIEWS

Jack H. Speece

Peter Marshall Hauer was born on November 11, 1945, in Lebanon, Pennsylvania, to Lloyd Jacob and Carmelita Carrie Leedy Hauer. In the early 60's they moved to Norwood, Massachusetts, where Peter attended the Cornwall Academy at Great Barrington. He graduated as a noted student, demonstrating the most original thought and promising curiosity in the humanities and science. The next several years he spent studying at Boston College before moving to Gettysburg College, where he majored in biology and graduated in 1967. Post graduate studies were made at Shippensburg State College (PA) to earn a teacher's certificate. His first job was as a teacher for underprivileged youth at the Outdoor and Environmental Education Center near Harrisburg, Pennsylvania.

Peter always had a great love for the outdoors and science. About the age of nine is when he visited his first caves, Luray and Mammoth, and became interested in paleontology and fossils. At age ten a meeting with well-known speleologist Roger Johnson encouraged him more. Early caving activities were associated with the grotto at Harvard University. By the time he attended Boston College he was ready to start making significant contributions to the caving world.

During the early settlement of this country, during the War of 1812, and particularly during the Civil War, the search for nitrates for use in making gunpowder became very important. One of the major sources for saltpeter was cave earth. Peter specialized in the study of saltpeter caves and became so interested that he sometimes signed his letters "KNO3", which is the chemical formula for this ingredient. His studies carried him throughout the country and on a National Geographic study of saltpeter at Mammoth Cave in 1974. Numerous articles on the subject were prepared for a variety of speleological publications.

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Peter was a man of character and dedicated to his convictions. After five years, he left his teaching profession to eek out a living from the earth on an old farm near Lobelia, West Virginia. This was his love, to be close to nature in the mountains and caves. Some considered him radical and eccentric, but his sincerity and dedication could set an example for others to follow. His interests and experiences covered the spectrum and touched people from all walks of life. He was easy to like and became a friend and teacher to all who knew him. A devout conservationist and president of the local chapter of the Isaac Walton League, he was very gentle and could not tolerate anyone killing or hurting animals. Never did he interfere or ridicule anyone else for his beliefs as he seeked his own humble way of life. The simple things were enough to satisfy him and he lived as his conscience dictated, without scorn and disturbance from society. Perhaps he patterned his life after Thoreau, who went to the woods so he could live deliberately and renew himself with nature.

The circumstances surrounding Pete's death are quite fascinating. No one will probably ever know what exactly happened. Strange incidents started happening as early as December 28, 1974, when Pete and Ellen Snyder returned to the farm to find

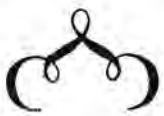
several animals killed in a rather mysterious manner. Later his goats were cut in a symbolistic way. A retarded boy who lived nearby was blamed for the crime but Pete never felt he was capable of performing the deeds. The horse was choked to death with a large stick. By Spring Peter was fearful for his life wad was afraid to sleep in his bed. He spent milder nights on the hill above his house. A .25 caliber pistol was also purchased for protection. Pete remarked to several people on several occasions that he feared for his life but never went into any detail or reason.

On June 4, 1975, Walter Smith, son of a Weirton Steel Company executive, was reported missing from his summer job as recreation director at Wagota State Park. He had told friends that he was going to ride his bicycle to Hillsboro. Walter rode his bike a lot and once stopped at Peter Hauer's house for a drink of water. It was reported that Smith wore a cult ring and had a Morningstar Cult medalion in his room. His nude body was found about 200 yards inside Lobelia Saltpeter Cave on Wednesday evening, June 11, 1975, wrapped in a piece of plastic and partially covered with rocks and dirt. He had been shot in the back of the head, then once above each eye in the forehead at close range. A short piece of rough hemp rope was tied around his neck and a piece of blanket wrapped around his head.

On Sunday, June 8, 1975, Peter Hauer attended the funeral of Henry Walton, where again he mentioned that he was afraid that someone was going to kill him. Around 5:00 p.m. he left to show some pictures at Martie's and call the Superintendent of Watoga State Park to ask if the Smith boy had been found. Late in the evening (11:00 p.m.) he called and had a pleasant conversation with Ellen Snyder, his girlfriend. On Monday he wrote to several of his friends and was seen by the neighbors working in his garden. This was the last anyone reported seeing him alive. It wouldn't be until late fall until his bones would be found by a hunter and his son, with a short rope hanging from a tree about a mile from his home. His cremated remains would wait until December 13, 1975, before his friends would lay him to rest on a hillside overlooking the farm.

On Wednesday, June 11, 1975, a typewritten "Last Will and Testament" was found in Peter Hauer's typewriter which told where Smith's body could be found and expressed his sorrow and that he would take his own life and his body would eventually be found in a cave in the nearby hills. The letter appeared to be written by Peter and also stated who should receive his worldly possessions. Although the police were quick to declare the case as murder-suicide, the murder weapon was never found, a motive never defined, or the boy's bicycle ever discovered. Reports of a cult movement in the area were not evaluated, nor the place of the killing. Only Pete or his body was missing to close the files as far as officials were concerned. The following weekend over 125 caving friends joined to search the nearby caves for some type of evidence or the body of Pete Hauer. Their efforts were futile as the F.B.I. joined in for a nationwide search.

Regardless of the circumstances involved in the mysterious disappearance of Peter Hauer, he will always be remembered by those who knew him as a kind and gentle person, incapable of such acts of which he was accused. Probably only guilty of being in the wrong place at the wrong time. Noted especially for his saltpeter cave research and conservation, his efforts will remain for future generations to enjoy. He was a humble man who gave up a good job in a big city to live a simplified life on an old farm in West Virginia.



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CAVE SYMBOLISM IN AMERICAN LITERATURE OF THE NINETEENTH CENTURY

Peter M. Hauer
December 16, 1967

A cave may be defined as "a natural cavity, recess, chamber, or series of chambers or galleries occurring beneath the surface of the earth and usually extending to total darkness and large enough to permit human entrance."[1] Modern speleologists have applied a more limiting definition, but the earlier will do for the purpose of this paper. Most caves are formed by solution of limestone, and they occur in a great variety of shapes, volumes, lengths, and locations. This relatively common geologic phenomenon has been an integral part of the history of mankind, and the arts have reflected this heritage in a variety of media.

Human paleontological research has established a considerable age for the species Homo sapiens, and even greater age for the related forms of the same genus. The Cro-Magnon culture, earliest race of our present species, spent a considerable period of time utilizing caves and rock shelters as a home. It is only during the most recent fraction of our evolution that we have been free of a general dependency on caves for our survival. During the last century man rediscovered his earliest art within caves. Statuary, bas-relief, and paintings between 10,000 and 60,000 years old were found in numerous caves of France and northern Spain. These works depict herds of animals which were vital to the life of Ice Age man. There is little doubt that they served a symbolic and religious function.[2] The art piece was symbolically slain, the hunter thus

attempting to insure his kill of the real animal. In some cavern chambers, attainable only by crawling through tight tube-like passages, evidence of puberty rite ceremonies has been found.[3]

The use of cave description in literature is prevalent from the earliest of man's work. Greek philosophy stems from Plato's Allegory of the Cave in Book VII of The Republic:

> "You have shown me a strange image, and they are strange prisoners. Like ourselves, I replied; and they see only their own shadows, or the shadows of one another, which the fire throws on the opposite wall of the cave? True, he said; how could they see anything but the shadows if they were never allowed to move their heads?"[4]

This parable demonstrates the two phases of man's reality: the changing physical world of sensation and opinion, and the unchanging, intelligible world of absolute knowledge.

Homer also used numerous cave scenes in his epics, the most famous being the cave of the Cyclops in the Odyssey. Later, the Epicurean, Lucretius, attributed the cause of earthquakes to vast cave systems collapsing deep in the earth.[5] A modern French speleologist filled a complete chapter in a popular cave book by merely listing cave references in the Bible. An example is David's encounter with Saul in the cave at the Wildgoats Rocks of Engeti.[6] In Beowulf, the struggle with Grendel's mother occurs in an underwater cave, and Beowulf is slain by the dragon at the mouth of its treasure cave. The allegorical journies of Dante in the "Inferno" of the Divine Comedy rely heavily upon cavern description throughout the various levels of Hell. In 1667, Milton described the caves of Eden:

> "Another side, umbrageous grots and caves
> Of cool recess, o'er which the mantling vine
> Lays forth her purple grape and gently creeps
> Luxurient."[7]

Shortly thereafter, the cave scene entered American literature, where the tradition would be continued.

A cursory examination of American literature has resulted in the location of about twenty novels, short stories, and essays, containing cave references. They vary from brief metaphors to full narrative volumes. In the volumes studied, this represents a majority with cave descriptions, over those without. This success is prejudiced by the emphasis on works by Mark Twain, who used cave references extensively.

Thomas Jefferson was a prime example of the Enlightment man. Like Franklin, he delved into an endless variety of studies, following the Renaissance ideal of the Universal man. And, also like Franklin, he made substantial contributions to a variety of interests. His only real book, Notes on the State of Virginia (1784-5) was, perhaps, the beginning of the cave reference in American works. Jefferson was the first in the nation to portray a rational, scientific view of the cave. He commented on such diverse aspects as the use of spelean saltpeter in the gunpowder industry of the period, the blowing phenomenon of Blowing Cave, Virginia, and accurate descriptions of several other caves, including Madison's Cave, Virginia. The text included a map of this small cavern: the first cave map ever published in the United States.[8] In 1796 he published a paleontological description, in the Journal of the American Philosophical Society, of prehistoric sloth bones found in Organ Cave of what is now West Virginia.[9]

In 1789 the American novel was born.[10] A mere six years later (1795), the first American novel to bear a cave theme and name in the title was printed.[11] The tradition of the cave as a literary tool in American fiction had begun. An early source is one of the first American authors to become popular overseas: James Fenimore Cooper. The epic narratives of Natty Bumppo contain several cave references. In The Last of the Mohicans (1826), Bumppo, as Hawkeye, has cornered the Huron, Magua, in a mountain cave:

> "The pursuers dashed into the long and narrow entrance, in time to catch a glimpse of the retreating forms of the Hurons. Their passage through the natural galleries and subterranean apartments of the cavern was preceded by the shrieks and cries of hundreds of women and children. The place, seen by its dim and uncertain light, appeared like the shades of the infernal regions, across which unhappy ghosts and savage demons were flitting in multitudes."[11]

This metaphysical meander seems out of place in the comparatively normal action of hunter and quarry through a woods. It is not likely that Cooper meant us to take the scene literally. The noises in the cave are merely the echoes and re-echoes of the sounds of the chase. The Indians in flight have entered the cave seeking protection. This entry to the recesses of the earth by the primitive savage seeking shelter supplies the impact to the sequence. There are additional implications, probably not intended by the author. They imply an innate psychological urge to return to man's original source of protection, not merely his early phylogenetic shelter, but the ultimate ontogenetic source of life: the womb.[12] In addition, the Satanic imagery strengthens the stereotype of the fierce savage abducting the helpless maiden. It might be noted that the actual physical cave upon which Cooper based this incident is a mere 100-foot narrow slit, a monument to the vast geologic power of fictional license.

The City of Pittsfield, in Western Massachusetts, is located in the center of the Berkshire Hills. This area became a favorite summer retreat for much of the Concordian and Bostonian literary genius. South of the city lies Monument Mountain, a sheer crumbling rock mass, immortalized by William Cullen Bryant's poem about an Indian maiden's suicidal leap from its highest crag. This site was once a favorite locale for the Romanticist's physical experiences with nature in its raw beauty. A folklore volume records a hike interrupted by a storm, with shelter gained in a small talus cavern.[13] The hikers included Oliver Wendell Holmes, Herman Melville, and Nathaniel Hawthorne, whose name is now given to that cave. It may or may not be pure coincidence that cave references were found utilized by all three of these men.

Nathaniel Hawthorne's short story, "My Kinsman, Major Molineax" (1832), was published in The Token, his first book. A dark, satanic figure is met at the Inn:

> "The eyebrows were deep and shaggy, and the eyes glowed beneath them like fire in a cave."[14]

This simile suggests an intense, sightless stare. I once placed a bright red flare just inside the mouth of a cliffside cave, about midnight, and sat outside studying the effect. The analogy used by Hawthorne is most appropriate to the desired imagery. The effect is most unearthly. Later, in The Scarlet Letter (1850), Hawthorne again used the cavern simile. In this case he describes the character of Roger Chillingsworth:

> ". . . probing everything with a cautious touch, like a treasure seeker in a dark cavern."[15]

The usage is not so striking as the first example, but is nevertheless effective. Hawthorne himself exhibited probing curiosity. He is known to have visited at least one other Berkshire cave, a marble arch near North Adams.

Another cave in the Berkshire Hills was visited by one of the Monument Mountain trio, and it became the setting in a novel, Elsie Venner (1861), by Holmes. The novel was merely scanned for this paper, but it appears that the cave served as a setting for recluse activity. It was aptly introduced with an historical legend which acted to supplement the mood of the use which the cave was to gain:

> ". . . Higher up there were huge cliffs with chasms and, it was thought, concealed caves, where in old times they said, Tories lay hid, some hinted not without occasional aid and comfort from the Dudleys, then living in the mansion house. . . ."[16]

The third author of the trio was Herman Melville. Until Twain began producing his works after the Civil War, Melville remained the master of the cave reference in American literature. These references reflect the vast extent to which symbolism was used by Melville. In Typee (1846), his first novel, he and Toby are running through the hills of the island, and find a steep cliff.

> "And what, in the names of caves and coal-holes, do you expect to find at the bottom of that gulf but a broken neck - why it looks blacker than our ship's hold, and the roar of those waterfalls down there would batter one's brains to pieces."[17]

This reference demonstrates an important aspect of the cave symbol: the double usage, a single object which may represent two opposite moods. The first usage was previously demonstrated by the Freudian suggestion of the Cooper reference, mainly the protective, seductive, womb-return, positive aspect. This aspect will shortly be demonstrated again in a Moby Dick quote. The second aspect, seen in the above quote of Toby, is in opposition to the first. Here the cave serves as a negative object of horror, something that repels and strikes a fear of the dark unknown, of death and the supernatural. The Cooper quote also demonstrates this aspect in its last sentence; thus a single incident portrays both the negative and the positive.

In Moby Dick (1851), Ishmael suggests a descent "into the great Kentucky Mammoth Cave of his (the dissected whale's) stomach." This is the positive side, in this case expressed by curiosity.[18] Later, two more cave references appear. Moby Dick smashes Ahab's longboat, "and Ahab and his men struggled out from under it, like seals from a seaside cave."[19] Thus we are back to the negative image, one of a life-death struggle to escape. The last Moby Dick reference returns us again to the positive mode:

> "Were I the wind, I'd blow no more on such a wicked miserable world, I'd crawl somewhere to a cave and slink there."[20]

Our last view of Melville's speleological ramblings appears in "Benito Cereno," one of The Piazza Tales (1856). He describes some colored persons lying under a ruined longboat:

> ". . . a social circle of bats, sheltering in some friendly cave; at intervals, ebon flights of naked boys and girls, . . . darting in and out of the den's mouth."

This last of Melville's examples again gives us the positive side. Note the words "friendly" and "den" (home), with their connotations.

Other American authors carry on the tradition. Henry David Thoreau discusses housing in Walden (1854). His return to nature theme results in cave references of the positive type, the sheltering, Freudian attraction.

> "We may imagine a time when, in the infancy of the human race, some enterprising mortal crept into a hollow in a rock for shelter."

The key words here are "infancy" and "crept." Thoreau further demonstrates this Freudian symbolism in a more obvious quote from the same page:

> ". . . Who does not remember the interest with which when young he looked at shelving rocks, or any approach to a cave? It was the natural yearning of that portion of our most primitive ancestor which still survived in us."[21]

The implications are obvious.

Innumerable other references from many authors could be given. An example is Cudjo's Cave (1863) by J. T. Trowbridge, a novel based on an actual Virginian cave where a hidden negro was murdered at the beginning of the Civil War.[22] Another example is Ben Hur by the Civil War general, Lew Wallace. Several cave references are used, including a vivid description of a leper's cave where Ben Hur's sister and mother are found. Ralph Waldo Emerson introduces his "Illusions" essay in his last book, The Conduct of Life (1860) with a trip to Mammoth Cave in Kentucky. Here he describes the illusion of a starry sky in the Star-Chamber Room, where thousands of crystal facets on a black ceiling reflect the light.[23]

The most productive author of cave fiction in nineteenth century America was Mark Twain (alias Samuel Clemens). In the five volumes studied for this paper, about 85 pages were found to contain cave references. This profusion is readily explained. Much of Twain's fiction is historical in nature. Real life people and places become intertwined in a complex sandwich of history and fiction, resulting in such masterpieces as Tom Sawyer (1876) and Huckleberry Finn (1884). Other volumes by Twain are autobiographical in nature, and relatively accurate in fact. Examples are The Innocents Abroad (1869), Life on the Mississippi (1874), and The Autobiography of Mark Twain (1917). The nonfictional versions often give the historical background which appears later in the fictional works as scattered and embellished art. The famous cave chapter of Tom Sawyer (continued in Huckleberry Finn) was based on McDougal's Cave, near Twain's hometown of Hannibal, Missouri.[24] A description of the cave appeared in his autobiography, in Life on the Mississippi, and in The Innocents Abroad, where, describing narrow Italian passages, he wrote:

> "The memory of a cave I used to know at home was always in my mind, with its lofty passages, its silence and solitude, its shrouding gloom, its sepulchral echoes, its flitting lights, and more than all, its sudden revelations of branching crevices where we least expected them."[25]

For the description of this cave to have appeared in five of his volumes, Twain must have been amply impressed by his boyhood memories of it. The sequences in Sawyer and Finn surrounding the cave are familiar and will not be paraphrased here. Essentially, the boys utilize the cave as a site of rebellious activity. This is reminiscent of the mystical rites which the Cro-Magnon people used caves for. Symbolic implications are not as important in Twain's use of caves so much as in the previous works. His primary aim was to utilize satire and sarcasm from realistic scenes with an ample supply

of nostalgia.

Twain's spelean experiences (of real life) were not limited to this one cave. In The Innocents Abroad he describes trips to at least ten caves. These involve tales of legend-bound grottoes, cavernicolous religious shrines, and explorations of famous caves such as the renowned Blue Grotto of Capri. The religious cave sites are utilized for Twain's typical sarcastic attitude towards organized religion. In describing the Grotto of the Nativity, the alleged birthplace of Christ, he comments:

> "The grotto was tricked out in the usual tasteless style observable in all the holy places of Palestine. . . . The priests and the members of the Greek and Latin churches cannot come by the same corridor to kneel in the sacred birthplace of the Redeemer, but are compelled to approach and retire by different avenues, lest they quarrel and fight on this holiest ground on earth."[26]

Similar observations are made at the Moslem Mosque's cavern, and nearly every other cave visited in the book.

A more thorough survey of the literature of the period would undoubtedly have produced a voluminous amount of cave description, both symbolic and literal. This paper has attempted to portray a sampling of the major references encountered.

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CAVES IN WEST VIRGINIA'S PIONEER HISTORY

Peter M. Hauer

The Appalachian Mountains of West Virginia are the eastern frontier homelands of American pioneer history. The rugged forest wilderness that clothed this land gave birth to a basic American hill culture which evolved slowly and traditionally from a pioneer survival lifestyle to a rugged rural individuality which persists to this day.

The hills themselves have helped shape the human history that they witnessed. The Appalachian hills of West Virginia hold some of the major cave areas of eastern United States, and the cavernous geography became a part of the culture of the Appalachian people. Hundreds of caves were known and used by the Allegheny pioneers, including Daniel Boone, who stayed at a sandstone fissure cave, to George Washington, who in 1748 as a teenage surveyor carved his name on a frontier cave wall. The extensive cave region of the Greenbrier River was first explored by Dr. Thomas Walker in 1750 on his return trip after discovering what is now known as Cumberland Gap. This soon became the wilderness trail to the Kentucky-Tennessee frontier. Dr. Walker named it Cave Gap, after a large cave which he found there.

The limestone valleys of the uplands of the Potomac and Greenbrier rivers hosted a steady advance of pioneers into the rugged lands beyond the Allegheny front. The settlers engaged in nearly fifty years of open feuding with the Indians who fought bravely for their hunting lands along the Seneca Trail. This major pathway followed the

heart of the cave country from the South Branch of the Potomac River, across the drainage divide on Cheat Mountain to the valley of the Greenbrier. In Smokehole Canyon of the Potomac, the domed wall of one cave is still stained with the soot of Indian and pioneer fires where a natural chimney cured the meat from many hunts. The Indian heritage of the Greenbrier region is preserved in the mud of a riverside cave by the hardened footprints of the original premountaineers.

As the camp-like nature of the temporary outposts settled into homestead farms and plantations the rich natural resources of the land influenced the lives of the people. The natural valley grasslands or savannahs and their fertile limestone fields of bluegrass supported many cattle, sheep and horses. Corn, timothy, wheat and oats flourished on this limestone soil, and by 1755 the corn grown in the Greenbrier region was declared to be the best in the Virginia colonies. The first acre of corn west of the Allegheny front was harvested by William Hamilton adjacent to the entrance of Higgenbothams Cave, near Frankford, West Virginia, which Hamilton settled in 1769. The valley had 300 families by 1776 at places such as Sinking Creek, Sinks of Greenbrier, and the Little and Big Levels (Hillsboro and Lewisburg), all well-known cave areas today. Later, on Cave Farm at Renick, hundreds of horses were confiscated by Union troops during the Civil War. By no coincidence, Confederate General Robert E. Lee's famous horse, Traveller, came from the Greenbrier Valley.

Attempts to control the Indian hostilities in the upper Potomac valley led to the building of a series of small forts. At Trout Rock, south of Franklin, George Washington was ordered by the House of Burgesses to build a fort in 1756. This was adjacent to Trout Cave, a later source of saltpeter.

The earliest West Virginia cave descriptions come from this area through the pen of Bishop Asbury, an important early Methodist leader in the pioneer back country. In 1781 he visited the now publicly developed Seneca Caverns and the formerly commercialized Stratosphere Balloon Cave. In his journal the bishop wrote that

> "last evening I rode a mile and a half to see some of the greatest natural curiosities my eyes ever beheld: they were two caves about two hundred yards from each other; their entrances were, as in similar cases, narrow and descending, gradually widening towards the interior, and opening into lofty chambers, supported, to appearance by basaltic pillars. . . . there were parts which we did not explore; so deep, so damp, and near night. I came away filled with wonder, with humble praise and adoration."

The frontier conditions did not stop men from enjoying the recreational values of caves.

One of Asbury's circuit-riding ministers, John Smith, gave the first descriptions of a West Virginia saltpeter cave, in somewhat poorer spelling than the old bishop. Making the Greenbrier circuit in August, 1787, he explored and described Greenville Saltpeter Cave:

> "Cureosity led me to the mouth of A cave which led into a large Spacious room Underground. We took lights in our hands and traviled thro' many delightful apartments Some Places Apearantly thirty or forty feet high and as many yards broad and Others not so large After we had gone about a Mile we came to a place where we was Oblig'd to crall on our hands and knees for some yards . . . A mile from where we entered

in ransacking this Dark Valt I saw the manner of making of Salt Petre which is made there in great quantities."

Saltpeter, or potassium nitrate, is the main ingredient of gunpowder, a vital material for colonial frontier survival. It occurs mixed with dirt in many West Virginia caves. The earliest saltpeter mining, of necessity, predates any written records. In 1784, a trading post in the Greenbrier-Monroe counties area took most of its trade in ginseng roots from the highland virgin forest, but also received brimstone, corn, rye, snakeroot and saltpeter, making obvious the use of caves at that early time. In 1784 Thomas Jefferson noted the presence of fifty saltpeter caves along the Greenbrier River in his Notes on the State of Virginia. By 1797 saltpeter miners unearthed Pliestocene ground sloth bones which found their way to Jefferson who described this West Virginia ice age resident. Of course nothing at that time was known of the widespread changes, both in climate, and flora and fauna, during glacial periods. Jefferson thought it was a great clawed lion until later discoveries in South America corrected this error. These bones afforded him a name in the annals of American paleontology as well as speleology. Colonel John Stuart (or Stewart), the early Indian fighter who dominated the settlement of the Greenbrier region, obtained the bones for Jefferson. Recently Jefferson's original thank-you note to Stuart was unearthed and is now in the Lewisburg, West Virginia, Library.

Greenville Saltpeter Cave was mined extensively for its namesake mineral through the Confederate occupation in the 1860s. But the operation reached its economic apex around 1804 under the ownership of Jacob and John Mann. To mine the saltpeter dirt donkeys were pulled through crawlways, tied and bound securely on gunny sacks, to the deposits. There they pulled cartloads of dirt to V-shaped leaching vats. Water was poured through the vats. The water-soluble potassium nitrate saltpeter crystals drained from the bottom of the vats into hand-hewn troughs. The resultant "liquor," or grau, was taken outside where the crystals were boiled out in iron kettles. It was purified and converted to true saltpeter by the addition of old-fashioned wood-ash lye, an ingredient of every pioneer household. The tracks of the donkey, cart, and men survive to this day in the hardened dirt, although the wooden forms of the vats have been burned for firewood by unthinking vandals. Following the Civil War the demand for gunpowder decreased and other means of making it came into use. So this underground industry ceased.

The most perfectly preserved leaching vats known anywhere date from the Civil War period, and can be seen in publicly-operated Organ Cave, a few miles to the north of Greenville Saltpeter Cave. Both caves are now registered as National Natural Landmarks by the United States Department of the Interior. Although most saltpeter relics have fallen prey to time and vandalism, a few remnants survive to this day in the many dozens of saltpeter caves which have been located in West Virginia. One of the most unusual historical artifacts in a cave is a wooden miniature Kentucky rifle, apparently whittled by a saltpeter miner during spare moments deep in the innards of the Potomac's Smokehole Canyon. High on a wall of this canyon in another deep cave is a red-clay and saltpeter mine used by a Mr. Peacock in 1808. His ladder still rests against an upper-level cliff.

At Schoolhouse Cave in the Harman Hills of Germany Valley Jacob Harper, born in 1744, made saltpeter and thence gunpowder which he sold for fifty cents per pound, a good sum in those days. Dyers Cave near Lost River, and Saltpeter Cave on Patterson Creek Mountain were probably mined before the Revolution. Legend records that early settlers taking refuge in Dyers Cave during the Indian wars were devoured by a pack of hungry wolves. Only their tools and clothes were left for evidence! The development of saltpeter mining tools and techniques was parallel and inseparable from the similar hand-made implements used in log-cabin style homestead farming. Frontier tools such as broad axes, foot adzes, froes and mauls, and the frontier techniques of pegging, riving and hewing were as useful to the backyard spelean miners as they were to the

frontyard farmer, who were often one and the same person.

Probably the epitome of this early frontier hand-craft technology was the construction of time-honored wooden grist mills with their hypnotically rhythmic wheels, built for the flow of many a mountain stream. These mills have their rightful place in cavern history, and the dozen or so remaining are all located in major cave acres. The only currently functional wheel-driven mill in the state today is the McClung-Zenith Mill in Monroe County. This is operated by the local historical society from a raucous little stream emerging at the entrance of fair-sized McClung-Zenith Cave.

To the north, on the county line at Second Creek, stands the Patton Mill built in 1785 by Frederick Cromer. This mill is adjacent to the site of a powder mill which blew up from a lit candle around 1800, killing a slave woman and boy. Here the earth from Alta Vista Saltpeter Cave was leached, and possibly that from Haynes Cave, too. The most unusual series of Civil War period saltpeter bridges, lashed with hickory bark and grapevine, span the chasms of Haynes Cave. The village of Patton is today an isolated near-ghost town. Located in a deep ravine of Second Creek, it is just upstream from the resurgence of the Organ Cave system, one of the world's longest caves as well as one of America's oldest known.

The most intimate relationship between cave and mill exists on the old Higgenbotham Homestead near Frankford, close to that first acre of corn. Here was the first mill west of the Alleghenies, built in 1769. The mill dam was actually inside Higgenbotham Cave, and a monument and grindstone at the entrance memorialize its historic significance. A different momento is the ancient white clay smoking pipe found by a recent group of cavers where it washed out of a clay bank near the mill site. In a nearby little cave modern-day cavers crawl through a cold pool of water to a hidden room sporting the flourishing script of the family names of Crocket, dated in the days of Tennessee's famed pioneer.

The water energy that flowed out of Higgenbotham Cave operated the mill, and in 1909 supplied household water to a rural Victorian farmhouse. Domestic water supply is the most common use of cave waters to mankind, especially in well-developed cave areas where surface streams may be scarce. Many West Virginia mountaineers personally refresh themselves from gushing streams emerging in their backyards despite the growing threat of pollution. On the Higgenbotham place a hand-split picket fence surrounds a classic sinkhole opening with a small stream flowing just inside. This was once the cooling place for the mornings and evening milk, butter and cheese which was stored in earthenware crockery.

The cool even temperature of the drier caves was traditionally used for winter produce storage, especially apples and potatoes. An old-fashioned mountaineer bee-keeper in the Swago Creek area still stores his food in a tiny cave next to the farmhouse. The multi-storied bee-hives surrounding the cave keep his food safe from apple-snitching young urchins! The storage capacity of this tiny potato hole is minimal compared to the immense Snedegars Cave, with subway-like passages. Potatoes were driven in on a two-horse wagon, with room enough for the team to U-turn to make their way out.

Although mushroom growing is a well-documented use of dry caves in spelean literature, West Virginia caves have been little used for this purpose. That function was limited to a few experiments in well-known caves of the late 1800s such as Mammoth Cave of Kentucky. Perhaps the woodsman skills of the pioneers kept them well supplied with foraged mushrooms.

Moonshine stills, however, have been hidden in numerous West Virginia caves. Many a revenue collector would have done well in the hills with today's modern cave surveys.

There are few remains of such workings other than some rotting barrel staves and hoops; the increasing value of the copper tubes and tanks has led to their disappearance.

Imagine the surprise of a speleologist who, when exploring a West Virginia moonshine cave, came upon a flowstone-encrusted human skull! A hole in the temple apparently was made by a musket ball. Who knows what tale of violence took place in this clandestine distillery? Underground or above, stillhouses were guarded with less humor than Snuffy Smith would have one believe.

A more sociably acceptable pleasure afforded by caves was gathering ice in the heat of June or July in sandstone fissure and talus caves. This chore was often followed by a Sunday picnic of ice-cream cranking and eating. On Ice Cave Mountain in the northern part of the state, Sunday picnic groups at the talus caves numbered in the dozens. But this social event was eventually brought to an end by the ice-box, refrigerator, and freezer. Spoiled garbage, dead farm stock, old fence posts, and assorted junk often found their way into the subterranean drainage via the sinkhole dump on the back pasture. This environmentally abusive habit unfortunately still exists on a small scale, but is slowly ending.

The cave environment gave to the mountain tradition a rich source of folk and haunt tales. A favorite story is that of a hidden valley behind Droop Mountain Battlefield of Civil War fame in Pocahontas County. There an old log house was once a tavern on an extinct stage road. After the battle of Droop Mountain the inhabitants took the muskets from the dead soldiers and hung them by a huge stone fireplace. Reputedly this caused the sheepskin rugs on the floor to "baa" at night while rocks floated through the room. The house had to be abandoned. Finally a brave neighbor crept into the house and threw the ill-gained muskets into the creek. Recently, some modern-day homesteaders have re-occupied the old haunted house. They are bothered by cavers who visit the valley, but the spooks are gone.

In Pendleton County's Potomac Valley, the defunct post office of Cave, West Virginia, is still listed on some old road maps. At Simons Cave during the Gay Nineties an annual Fourth of July celebration was held in a huge subterranean room. A brass band, dancing, swinging, home-made apple-brandy, and an underground boat ride on the cave's River Styx were featured. A few caves gave public tours in the terminal pioneer years; the first to do so was Organ Cave. In 1882 the well-known speleologist, Horace Carter Hovey, mentioned a tourist's trip to the namesake Organ formation by pine-torch light as early as 1835. Candles in tin reflectors were used at the turn of this century and by 1914 a Delco generator was supplying the new Edison light bulbs with electricity. Today's visitors have more modern lighting, but one old bulb still hangs on the ceiling, a testament to the careful preservation of the cave's commercial artifacts.

And with the years of commercialized caves and mass spelunking come the last days of the true West Virginia mountaineer old timers. They were born in log cabins in the virgin wilderness or on primitive homestead farms on wagon-rutted dirt roads, and the few who survive are old men and women today. Remembering the exciting lifestyles of early America in their last days they spin tales and reminiscense of mountain life and tradition in the cave country of West Virginia.

SALTPETRE HISTORY

Peter M. Hauer (1975)

From the time that the first European settlers arrived on the Eastern shores, until

more than two centuries later, when the vast American wilderness had been forever altered by human settlement, frontier survival depended greatly on the availability of black powder. The pioneer's muzzle loading firearms were just extra weight to carry without gunpowder, and the primary ingredient of that powder was potassium nitrate, or saltpetre, a chemical which held considerable importance in the early history of this nation.

Saltpetre has been known since ancient times, as a meat preservative, embalming substance, and a veterinary and medicinal substance, but not until firearms became a part of warfare in the fourteenth century did it have any great military, and thus economic, importance. By the time of the first European settlements in North America, saltpetre manufacture had become an everyday craft in Europe. Machiavelli's The Arte of Warre tells how it was ". . . gotten out by fire and water of dry and dustie ground, or of the flower that groweth out of new walls in sellers, or of that ground which is found within toombes or desolate caues (caves) where raine can not come in." By 1625 the British were importing large amounts from India.

In America, the isolation of frontier living created special problems so far as maintaining a reliable source of saltpetre was concerned. The first coastal settlements had to rely on importation and a generation or two of accumulated organic matter, from which to leach the soluble nitrate salt. Human and animal wastes were aged under rain-proof nitriary sheds, and this material with the dry dirt under houses, tobacco sheds, and slaughterhouse floors, was mixed with limestone, old mortar and ashes. When aged and leached the unsavory liquor was manufactured into saltpetre crystals.

The infancy of the American saltpetre industry is recorded in seventeenth century court and legal documents of the Massachusetts Colony, including a 1724 ruling that prohibited paving cellars or dove houses "in order that the growth of saltpeter might not be obstructed." On June 6, 1639, a Massachusetts court order granted 500 acres of land to Edward Rawson "so as he goes on with the powder if the saltpetre comes." In the next year a saltpetre house was in operation in Boston, and in 1642 the General Court ordered "that every plantation within this colony shall erect a house in length 20 or 30 feete, and 20 feete wide within one half year next coming &c to make saltpetre." Twenty-four years later, in 1666, the Court empowered selectmen to impose fines "not exceeding ten shillings for one offense, upon all persons that shall neglect or refuse to perform such order or orders for the propagating and increasing of saltpetre in their respective towns."

In 1675, Governor Leverett complained, in a letter to a friend concerning a newly erected powder mill, that "Our difficulty will be for peter, which we must, in our beginning, have from without us, but hope, in time, may raise it amongst us." The bloody Indian Wars of that decade are reflected in his concern. Perhaps the most novel saltpetre scheme in the Bay Colony was a 1706 patent application by one Thomas Houghton, who intended to make saltpetre from the product of the whaling industry!

This early history differs little from Colony to Colony. In Pennsylvania, the Pennsylvania-German settlers "knew the art as well as the old women knew how to make soft soap." South Carolina offered the first bounty on saltpetre in 1707. The early Virginia settlements had a plentiful source of instructive literature from London, where the subject of saltpetre formation and procurement had been published in The Mysteries of Nature and Art (1635), The Natural History of Nitre or, a Philosophical Discourse of the Nature, Generation, Place, and Extraction of Nitre with its Virtues and Uses (1670), and Legends no Hisories, Animadversions upon the History of Making saltpetre which was Penned by Mr. Henshaw (1670). Those who came to the Virginia settlements after 1627 were aware of the importance of nitre procurement, for King

Charles had that year proclaimed all human and animal urine to be collected for saltpetre manufacture under the 1625 patent granted to Sir John Brooks and Thomas Russell.

By 1630 the Virginia Governor, John Harvey, had "hope to discover a Salt Petre mine in the Bay." His hope was to be delayed for well over a century, and fulfilled in the unknown mountain lands to the west whose waters filled the Bay.

By the mid-eighteenth century, the firmly established tidewater and piedmont inhabitants began to show an interest in western expansion, and the mountains beyond the Blue Ridge were first explored by European descendents. The rugged mountain wilderness was to afford an isolated life-style even more precarious than the early coastal villages. Supplies had to be carried there on back of man or animal rather than by sea. It is not surprising to note that one of the earliest explorers, Christopher Gist, having traversed the mountains presently comprising West Virginia, to the vicinity of modern-day Pittsburgh, records in his diary of March 5, 1752, the discovery of a cave which "had been much used by Buffaloes and Elks who came there to lick a kind of saltish clay . . . in the Cave, and of which I took a sample in a Leather Bag." Since Gist was exploring for a land-grant company that intended to have these lands settled, it is reasonable to assume that his sample was taken in the belief that he had found a saltpetre source, so vital to any wilderness habitation.

It is unfortunate that these pioneer explorations, and consequently the settlements that followed, are so poorly documented in our literature. The earliest history of saltpetre mining in American caves is thus obscured, and even the records from the American Revolution mention but little about these caves, since the bulk of extant knowledge on the matter was written by coastal gentlemen engaged in the traditional nitriary shed form of production.

The late Burton Faust, the pioneer author of saltpetre history, believed in regards to Clark's Cave, Bath County, Virginia, that "All evidence indicates that this cave was worked for saltpetre as early as 1740." It is a reflection on the scarcity of written records of the time that Mr. Faust was never able to locate documentation of so early a saltpetre mine, after decades of careful library search here and in Europe.

The first documented account of saltpetre mined from a cave stems from Continental Congress activities of the Revolutionary War. The records of the various Committees of Safety also contain detailed accounts of saltpetre manufactured from organic matter, on a large scale. When the British stopped exporting powder and nitre to the colonies in October, 1774, and the imminence of war was felt, gunpowder became a primary concern of our embryonic government. On June 10, 1775, a Committee on Saltpetre was established by the Continental Congress, and a resolution drawn to send all saltpetre on hand to gunpowder factories. The July 3rd meeting of the Committee of Safety in Philadelphia resolved to procure more saltpetre, and on the 28th of the same month, Dr. Benjamin Rush, of the Saltpetre Committee, wrote a short essay entitled "Several Methods of Making Saltpetre, Etc."

In August, South Carolina offered L200, L150, L100, and L50, to the first four saltpetre works erected that would produce 50 pounds of saltpetre. Then, on October 13, an announcement in the Virginia Gazette told of the discovery by Major Charles Lynch of Bedford County of "many rocks of GENUINE SALTPETRE in that county, which will remove every obstacle to that gentleman's furnishing the country with GUNPOWDER, he having a mill for the manufactory thereof erected for some time, with which he has already made considerable quantities."

This certainly sounds like the first recorded saltpetre cave mining description, but since the source is not specifically described, it is only an assumption. Coinci-

dentally, on the very next day the Continental Congress appointed a committee of five to promote saltpetre manufacture, and two weeks later, on October 26, the Congress instructed its Virginia delegates to follow up on Lynch's discovery and ". . . to send an Express to enquire into the truth of the fact and to bring a sample of the mineral."

By the following Spring, the Virginia Colonial Assembly resolved to aid Lynch and on May 18, 1776, they directed "That the Slaves, new prisoners in the publick Jail, be delivered to the said Charles Lynch, to enable him to carry on the making of saltpetre at the rocks mentioned in his representatives to the Committee of Safety, and that the sum of 50 pounds be advanced to him."

Thomas Jefferson gives us some possible clues to the success of Charles Lynch in his Notes on the State of Virginia (1784). Noting the presence of 50 saltpetre caves in the Greenbrier River region of present-day West Virginia, he also reported that "On Rich Creek, a branch of the Great Kanawhy, about sixty miles below the lead mines, is a very large one, about twenty yards wide, and fifteen or twenty feet above the floor. A Mr. Lynch, who gives me this account, undertook to extract the nitre. Besides a coat of the salt which had formed on the vault and floor, he found the earth highly impregnated to the depth of seven feet in some places, and generally three, every bushel yielding on the average three pounds of nitre. Mr. Lynch having made about ten hundred pounds of the salt from it, consigned it to some others, who have since made ten thousand pounds."

Rich Creek passes through a band of cavernous limestone in southern Monroe County, West Virginia, before joining the New River and thence the Kanawha. This is not an unreasonable distance from Lynch's home in Bedford County. A currently active speleological survey being conducted in Monroe County has not yet relocated the cave described by Jefferson.

Within a year of Lynch's discovery, a similar report followed from Baltimore's Dr. Charles Weisenthal, Chairman of Maryland's Council Committee on Saltpetre. This report is the earliest first-hand account of a saltpetre cave in America. A few sandstone crevice caves were mined in Pennsylvania during or before the Revolution, but no positive date has been documented for them. Likewise, early French Lead miners in Missouri made saltpetre from caves as early as 1720, but no specific documentation has been published. On October 1, 1776, Weisenthan describes his journey to the remote South Branch of the Potomac, in a letter to the Council: "The place is on Patterson's Creek, about twelve or fourteen miles from the South Branch, near Colonel Hight's. It is a perpendicular rock, in the middle of which is a cavern." Weisenthal describes the occurrence and formation of the saltpetre therein, and predicts that "From the situation and causes, I had reason to suppose that the mountains must contain a great many sub-caverns . . . full of saltpetre as to furnish the Colonies with that desirable article to the fullest extent."

Though the strain of war had increased the importance of saltpetre caves, it is doubtful that very much cave nitre was produced compared to the older nitriary shed means of manufacture. The saltpetre cave boom was to follow shortly after the war, and Johann Shoepf, a friend of Dr. Weisenthal, writes in 1788 regarding the war years, that "The workmen for this business were dear, as for all mine-work, and during the war scarcer . . . they were nevertheless unwilling to go into the mountains to dig and boil saltpetre."

The nitriary shed producers were full scale at work, however, and in January of 1776, home production of powder had totaled 815,000 pounds, about a third of the amount that had been procured from all sources by this time. Of this, only 115,000 pounds had been manufactured from home saltpetre sources. By 1778, Ben Franklin had

signed with the French government a Treaty of Alliance, and the resulting supplies of powder and saltpetre from France reduced the munitions situation to a level which helped the Americans to gain victory, finalized in the Treaty of Paris in 1783.

It is doubtful that the advent of peace very much reduced the saltpetre production in American caves. With peace, a new wave of western advancement and settlement proceeded into the remaining unsettled Appalachian hills and beyond. This tremendous population influx into the mountains, coupled with the old problem of isolation from supply sources, would have increased the importance of saltpetre caves more than ever. Indeed, along with furs, ginseng and other foraged products, saltpetre became an important early trade item for export from remote trading posts, as exemplified in an account book of one early merchant. This trader, in 1784, took in saltpetre for trade in the Greenbrier River area of modern West Virginia, the same year that Jefferson mentioned 50 saltpetre caves in that region. A 1781 survey of an original land grant property on the Greenbrier mentions a "salt petre cave," known today as Organ Cave, and considered to be the third longest known cave on earth.

One of these caves was visited in 1787 by a Methodist circuit rider who "saw the manner of making of Salt Peter which is made there in great quantities." This cave is known today as Greenville Saltpetre Cave, and was one of the larger saltpetre mining operations in American History.

The importance of these caves was further increased when the Tariff of 1789 put saltpetre on the free list, forcing the war-born coastal nitriaries out of business. Within the next decade, in the remote mountain regions, saltpetre mining was actively pursued by ambitious prospectors who reamed the cavernous limestone hills and sandstone cliffs of the newly settled wilderness.

A geography published in London in 1792 described saltpetre mining activities in central Kentucky, where "The making of this salt, in this country, is so common that many of the settlers manufacture their own gunpowder. This earth is discovered in greater plenty on the waters of Green River, than it is in any other part of Kentucky."

By this time, the earlier settled limestone areas had been successfully developed as a saltpetre resource. In 1795 it is recorded that several tons of saltpetre were processed at Campbell's Salt Works from the caves of modern southwest Virginia. In 1796 saltpetre miners in southern Greenbrier County, West Virginia, discovered some prehistoric ground sloth bones, which were sent to Thomas Jefferson, and gave him a place in the history of paleontology, as well as a recorder of saltpetre history.

The next fifteen years were to witness considerable interest in saltpetre caves, highlighted by the demands of the War of 1812. Home saltpetre production from caves progressed to a commercial level. In April of 1804, the DuPont powder factory in Delaware went into production, marking the birth of gunpowder manufacturing on a scale that would become part of an industrial revolution. In 1808 E. I. DuPont wrote to a Virginia saltpetre dealer for a route to follow through Western Virginia, so that he might visit the numerous saltpetre caves in the region. During this same period, DuPont sought to purchase saltpetre in Kentucky, from a dealer named Charles Wilkins, who was shortly to become a partner in a very large manufacturing operation at Mammoth Cave. By 1805 Tennessee had so many saltpetre caves in production that gunpowder in Nashville cost only $1.00 for three pounds.

The development of this industry was important enough so that in the winter of 1806 Dr. Samuel Brown of Transylvania University in Kentucky rode all the way to Philadelphia to address the American Philosophical Society on the subject. Dr. Brown gave a detailed paper, describing a mining operation on the Great Cave of Crooked Creek,

then in Madison County. This cave had been mined as early as 1802. Brown was particularly concerned that "our greatest chemists have still much to learn with regard to this salt, so valuable in time of peace, so indispensable in time of war."

Dr. Brown estimated a potential yield of 128,000 pounds of saltpetre from the Great Cave and five others in that vicinity. His paper is important, not only for a detailed account of limestone saltpetre caves, but also for an insight into the saltpetre deposits in sandstone shelter caves, found in great numbers throughout Kentucky as well as southern Ohio and Illinois.

Brown indicated that several years before, the saltpetre prospectors had discovered that the unleached bedrock from these shelters could easily yield saltpetre by crushing and boiling the rocks, then converting with ash lye. One of these manufacturers, a Mr. Fowler, had obtained 100,000 pounds from 28 "rockhouses," all within 70 miles of Lexington.

Dr. Brown's account offers the possibility that this type of mining may have been widespread and significant. This writer has examined one such shelter in the Red River Gorge, in eastern Kentucky, where several intact mining relics indicated that it had been worked. The possible number of shelters thus mined, which might be located through field work, is very promising.

By this time the industry had revived in the Ozarks of Missouri, where caves probably had been worked for saltpetre by the French as early as 1720. An 1810 expedition on the Gasconade River had yielded 3,000 pounds for James McDonald in a few weeks' time. In that same year, Albert Gallatin, Secretary of the Treasury, reported that gunpowder manufacture "was nearly and could at any time be made equal to the consumption." Although he was referring to the eastern mills, which still relied heavily on imported saltpetre from the East Indies, the census of that year gives the most complete production records of any year between the Revolution and the Civil War. By 1810, 400,000 pounds were being produced annually from western caves, and 200 powder mills had been constructed in 16 states. Had this industry not been developed by this time the United States may have fallen as a victum of the War of 1812. When war was declared with the British in June of that year, the American importation of saltpetre from India was immediately halted by a general embargo. The eastern price of saltpetre skyrocketed, and the profits of an ensuing "saltpetre rush" in the west were "so great, as to see half the western world gadding after nitre caves."

This important period of saltpetre mining history resulted in the first detailed of large saltpetre mining operations, such as Clark's Cave (Virginia), Sauta Cave (Alabama), Big Bone Cave (Tennessee), Ashley's Cave (Missouri), Wyandotte Cave (Indiana), and particularly Mammoth Cave (Kentucky). A detailed account of all of these caves is beyond the scope of this paper, but some attention will be given Mammoth Cave, since it was the site of our research activities into the nature and formation of cave saltpetre.

Mammoth Cave, part of the longest known cave system on earth, was known as a saltpetre source before 1798, when Valentine Simmons purchased "200 acres of second-rate land in Warren County," including "two petre caves." These two petre caves were Mammoth Cave and the adjacent Dixon's Cave. Both were being mined commercially by 1808, when Dixon's Cave was sold separately by a new owner. By 1812, a series of complex business dealings and title exchanges involving the two caves led to a clear title and a $10,000 purchase of a half interest by Hyman Gratz, a Philadelphia saltpetre merchant, who became a full partner with a Kentucky dealer, Charles Wilkins, just in time for the demands and profits of war.

Capably managed by Archibald Miller, the cave was extensively mined during the War

years by up to 70 slaves. Ox carts hauled the saltpetre dirt to huge square leaching hoppers. The hoppers were supplied with water by gravity-fed wooden pipes from the outside, and the resultant saltpetre liquor was piped from a central pumping station to the boiling furnaces outside, where as many as 50 large iron kettles were used for the manufacture of the saltpetre, using wood ash lye, supplied by Ebenezer Merriam, who came to the cave in 1813.

The total production figures for Mammoth Cave have not been recorded, though Faust mentions a $20,000 purchase contract for Mammoth Cave saltpetre for the year 1812. The entire Warren County production, which included other caves, for the period of March to September 1812, totaled 22,850 pounds. If most of this came from Mammoth Cave, it is a fair production figure, since Big Bone Cave in Tennessee produced only 20,000 pounds in the entire war, with as many as 300 laborers. One early geography book, published in 1813, mentioned an 8-mile-long saltpetre cave on Green River, undoubtedly Mammoth Cave, and noted that "upwards of 500 pounds of salt petre are daily made there."

The Treaty of Ghent ended the War of 1812 on December 24, 1814, though the battle of New Orleans, said to have been fought with powder made from the Great Saltpetre Cave on Crooked Creek, occurred nine days after the treaty, due to slow communications. It is likely that the operation at Mammoth Cave came to an abrupt end in the winter of 1815. Foreign saltpetre was again competitive, and the economic aftermath of the War led to a delayed Panic of 1819, the first of the cyclic economic depressions that have persisted until the present.

Ebenezer Merriam, the lye supplier to the Mammoth Cave operation, reflected back to his memories of the saltpetre industry when writing in 1844, when he noted that "the Mammoth Cave works have been idle about twenty eight years, and wholly on account of the admission of foreign saltpetre duty free. If Government is to derive revenue from duties imposed on imports, let that duty be uniform and equal. Let it be so permanent, that money invested in manufactures, shall not be sunk to the owner by a vascillating Tariff. Men will not embark in manufactures on such uncertainty, and therefore, a shifting Tariff is a public evil."

When Gratz finally bought the other half interest in the cave from Wilkin's heirs in 1828, the price was a mere $200! Dr. Adams, who mined "The Indian Saltpetre Cave" (Wyandotte Cave) from 1812 to 1818, relinquished his claim to the cave in 1818. The demand for gunpowder in Kentucky in 1819 was so low that the Eagle Powder Mills near Lexington resorted to an extensive advertising campaign in newspapers throughout the Middle West. It would be interesting to know if the person who advertised a saltpetre cave in the Lexington (Kentucky) Reporter in 1818 was ever able to sell it!

Undoubedly, small scale home production of saltpetre continued in numerous caves, despite the demise of an export level of production. Even the Mexican War, in 1846, failed to bring back an industrial revival in saltpetre caves, the government having already stockpiled sufficient amounts of gunpowder. Resumption of saltpetre mining would have to wait a larger and bloodier holocaust.

The final and largest scale use of saltpetre caves and nitriaries was abruptly resumed by the Confederate needs of the Civil War years, in response to a Union blockade that prevented importation on a scale sufficient to meet the demand. Because of this blockade, the Confederacy had to promote considerable effort towards blockade running and home production, whereas the North was able to import freely from overseas.

The Confederate States of America were formed in February of 1861, and on the 20th of that month the Confederate Provisional Congress passed an act to establish powder

mills and manufacture gunpowder. This activity was formalized on April 8, with the formation of an Ordnance Department under the leadership of Major Josiah Gorgas. At this time the southern gunpowder supply was nil, and only a few small mills were operating within the Confederacy. Four days after the formation of the Ordnance Department, the War began with the attack on Fort Sumter.

In May, Secretary of War Walker informed the Confederate Congress of the nitrate deposits in caves, and dispatched an agent, Mr. Riddle, with ample inducements to engage in production, and to examine some of the caves in northern Alabama. Then, on July 10, 1861, Major Gorgas appointed Col. George W. Rains, a chemist, to head the Gunpowder Department for Ordnance. Before the year was out, Rains had published his Notes on Making Saltpetre from the Earth of the Caves, in which Gorgas put a notice offering 35 cents per pound for home produced saltpetre. This booklet was used to encourage home production. In 1862 the great geologist Joseph LeConte wrote yet another guidebook to add to the patriotic fervor. The form letter sent with these pamphlets to answer inquiries about nitre making was signed by Secretary of War Seddon, and he urged the citizen to "engage as far as you conveniently can, and encourage others to engage in this work, which is felt to be of grave moment to the government."

Rains was an efficient and successful choice, for he managed to build, from scratch, a huge powder mill in Augusta, Georgia, and have it operating by April 10, 1862. This mill alone was to produce 2,750,000 pounds of powder in the course of the war. Rains also organized the construction of nitriaries in many cities, and brought cave production to an all-time high, partly with the passage of an act to promote saltpetre production by loans to initiate operations by private contractors (January 13). On February 4 Secretary Seddon ordered the seizure of saltpetre from speculating profiteers, and increased the price to 40¢ per pound offered to legitimate manufacturers.

The day after the opening of the Augusta Mill, an Act was passed to organize a corps of officers to supervise the entire network of niter caves and beds, with Major Isaac St. John as head, under Chief of Ordnance Gorgas. On June 16, this Corps was enlarged to a Nitre and Mining Bureau, controlling over a dozen niter districts with central headquarters, and an adequate supply of saltpetre was to be assured for the duration of the war.

Virginia's War Governor, John Letcher, felt reassured enough to suggest that the South take an aggressive stand. In a letter to South Carolina Governor F. W. Pickens, written the day after the formation of the Nitre and Mining Bureau, he urged a forceful invasion of the North, and noted that "Our mountain caves yield immense deposits of nitre."

But the production of saltpetre was not without its problems. Enemy incursions constantly disrupted the cave operations. Superintendent St. John reported to Secretary Seddon, on December 3, that "In the Pendleton district several of our establishments have been broken up. . . . The yield for November in this and the adjoining Greenbrier district will be reduced from this cause at least 10,000 pounds. In Tennessee and Upper Alabama our works are frequently interrupted and in a recent case with loss of life. On the army movements of Tennessee and Virginia during the present month depend at least 40 per cent of our home production of nitre."

This problem of enemy incursions was emphasized by a recent discovery of an inscription carved in the wall of Long Island Saltpetre Cave in Alabama: W. S. Rosecrans, USA, 1863. Rosecrans was the Union Major General commanding the entire Army of the Cumberland, taking a break to quench his curiosity and explore a Rebel saltpetre cave!

In another vein, the Nitre Bureau was often accused of being a haven for draft dodg-

ers seeking refuge from military action. St. John defended his Bureau, noting "our workmen were forcibly taken from niter works, and three times from one of the Virginia caves." By October 1, 1864, 200 of these men had proven their worth in line of battle at Mount Hope. They were noticed for good conduct and lost nine killed and sixteen wounded.

Col. St. John bragged that "The danger over, these men return to their work generally unaffected by camp habits; and clothing and feeding each one himself soon again returns each his quota of niter. One regiment and a half of niter workmen cover all details from the Potomac to the Mississippi and insure a full supply of ammunition for our armies in the field. To break up this organization will be to inflict a double blow on the service." He also noted that 2659 men had been employed in cave niter production, and 581 Negro slaves tended the unsavory nitre beds in the cities, working with only a few dozen whites.

Most of the cave workers were white laborers from ages 18 to 45, "due partly to the frontier character of the work and partly to the necessity of a considerable proportion of trained or expert workmen. Whenever exempt labor could be substituted it has been done rigidly and conscientiously." Life was difficult and harsh at the niter mines, as has been recorded in the letters and records of J. R. Hopkins, Superintendent of the Long Hollow Nitre Works in northern Alabama. Food and supplies were always in short supply, fear of capture omnipresent.

Even though nearly two million pounds of saltpetre had been run through the blockade in 1863 alone, the $3/pound cost compared to 50¢/pound from home sources made home manufacture so worthwhile that by the end of the year production doubled the output of the previous year. The investment had paid off for the Confederacy, and the Nitre Bureau's budget for the first half of 1864 was 9½ million dollars, followed by a full 12½ million for the first half of 1865. 2½ million of this was for nitre alone.

This investment resulted in 1,735,531 3/4 pounds of niter produced by September 30, 1864, as compared to 1,720,072 pounds imported. These production records illustrate that by now the nitre beds built the beginning of the War were starting to compete with the more militarily vulnerable cave deposits. By year's end, over a million cubic of niter beds had accumulated.

But saltpetre production was only a small battle won, and the War went to the North. With the advent of peace, surplus powder and new manufacturing techniques replaced the niter bed and cave, bringing to rapid extinction the ancient art of the saltpetre maker, as a new technological era firmed its grip on the world.

PETER M. HAUER SPELEAN HISTORY AWARD

In recognition of the many contributions Peter Hauer has made to speleology an award has been established in his honor. The memorial was funded by his numerous friends and several organizations in which Pete had served. Although originally conceived and created by the Mid-Appalachian Region and the American Spelean History Association, it was transferred to the National Speleological Society for proper administration. Because of Peter's special interests in spelean history, it was felt by all that this recognition should emphasize achievement in this field.

The award is presented annually by the National Speleological Society at its yearly convention and recognition banquet. It consists of both a certificate and a cash prize. The cash amount is based upon the current dividend of the trust fund. The presentation is made to the individual or group who has made a significant contribution to spelean history, with emphasis placed on accomplishments made within the current year. The

recipient is selected by the NSS Awards Committee, which solicits recommendations from the former award winners, ASHA, and the Society at large. Criteria used in selecting candidates include: (1) papers presented at the NSS Convention; (2) papers published in various newsletters, bulletins, ets.; (3) other noteworthy publications; (4) activities involving historical aspects of speleology; and (5) any worthwhile effort deemed rewarding by the Awards Committee.

Past award winners have been:

1979	Kevin R. Downey	--	Howe Cave research
1980	Jack H. Speece	--	Numerous articles
1981	Annie Whittemore	--	History of the Virginia Region
1982	Joel M. Sneed	--	Sauta Cave History
1983	Larry O. Blair	--	Kingston & Big Bone Cave Research

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PETE HAUER CORRESPONDENCE

Marion O. Smith

Pete Hauer and I only met once, at one of the Old Timer Reunions, but we occasionally wrote each other about spelean history topics, which I would usually initiate and Pete would respond. Below are two notes from Pete, postmarked September 14, 1973, and June 6, 1975. Although not especially revealing, they are of some interest, since the first mentions the discovery of a George Washington inscription, and the second was written only two or three days before Pete disappeared.

Peter Hauer
Rt. 1, Box 247
Hillsboro, W.Va.
24946

Dear Marion,

Just a VERY belated note to thank you for the copy of your most interesting articled I'm particularly fascinated by cave inscriptions, and would like to do a photographic article some time on the famous ones I know aboutɫ in various places. Havent found any famous generals yet, but did find a Confederate flag (very crude) in SW Virginia. Also found some early 18th century stuff in George Washington cave in W.Va., but have had the most luck in the Grottoes of the Shenandoah in Virginia, where we found an unrecorded George Washigngton insc.

I have no mowe information on Big Bone Cave, than in the standard published references.

Best regards,
Pete
Pete Hauer

P.S. – Do you have any spare prints of the Boerners inscrip.?

June 6th '75

Dear Marion,

Sorry to take so long to answer yours of the 13th (February!!)

Thanks for the 1975 ASHA dues. Times are tough, and we're going to have an ASHA meeting at Flint Ridge at an undetermined date (sometime within the week of July 4th), to try to restore the Association, Journal, and all. All ASHA members welcome. Hope to have an announcement in time in Vol 8 #1 of Journal.

Thank you for the Cave Hill map. Would sure like to get a photo of metal hoe Rich Moses found there. Thats a rare find. Best of luck traeing the history of the White County Saltpetre Manufacturing Co. Have you had any success?

Been working on Revolutionary War saltpetre caves here in WVA. Quite an untouched field.

Found an 1835 reference to saltpetre mining in Tazewell saltpetre cave, using Indian skulls for mother liquour dippers!

Hope to see you at Flint Ridge. At any rate, we could sure use some articles/ for the Journal.

With Haste,

Bob Hoover

NOTE: Due to re-typing in September, 1988, Volume 16, No. 2/3 pages will not mesh with Volume 16, Nos. 1 and 4.