SUBTERRANEAN RENOVATIONS

THE UNIQUE ARCHITECTURAL SPACES OF SHOW CAVES

Under America’s surficial terrain, another landscape lurks, where built and natural forms blend to create unusual spaces, in some of the more compelling tourist caves in the United States.
Like an elaborate stage for an audienceless performance, spectacular natural caves formed and transformed over the ages in the unseen world of the underground. Typically evolving drop by drop, as the earth melted away with the natural dissolution of limestone, strange sculptural creations grew in hollow cracks and capacious chambers; white curtains of speleothems like frozen waterfalls and delicate dioramas of stalactites mutated in geologic slow motion. Shallow pools of still water would mirror seemingly limitless distances, were it not for the absence of light, and sounds would echo, oddly magnified, except for the near total silence.

When modern humans came into this subterranean world, first as explorers, then as tourists, they brought with them both light and sound, as well as shovels, cement, electricity, postcards, and even fried chicken. From the first lantern-led tours through Mammoth Cave in the early 1800's to the drive-through caves of today, the two hundred or so caves in the country that have been opened to the public (out of over 30,000 caves discovered in the United States so far) have been transformed by the interests of tourism and the fancy of cave owners and promoters.

Most modifications to the natural cave are of a practical nature, made in order to accommodate visitors. New cave entrances are blasted to allow more convenient access, pathways are installed to allow visitors to move easily along the otherwise uneven cave floor, and lighting of some type is installed to make the formations and pathways visible.

The cave developers that go beyond these basic alterations begin a sort of architectural discourse between the strange natural underground features with sometimes stranger-still man-made forms. The effect is the creation of unprecedented, and even sublime spaces, reflecting the complex relationship between humans and the non-human natural world.
As the point of transition from the surface to the underworld, the entrance to a show cave can sometimes offer few clues to the character of the spaces below. **Jewel Cave**, in Tennessee, a delicately decorated little gem of tourist cave, is reached, as in a fairy tale, through a simple wooden door in an hillock overgrown with flowering plants.
Onyx Cave in Kentucky, catches tourists off the Interstate heading to nearby Mammoth Cave with its large billboard and plain portal. On the hill next to Onyx is a family fun park, with haunted house and ferris wheel, reflecting the trend of creating additional surface attractions that many smaller show caves have had to follow to make up for shrinking attendance to the cave. Such is also the case at Kentucky Down Under, an Australian-themed animal park/cave attraction, where the entrance to the cave is an unmarked stone arch covering a stairway which plummets into the ground through the asphalt of the parking lot.
The imposing edifices that sometimes surmount tourist cave entrances often house a labyrinth of gift shops and eateries, as at Ruby Falls, on a hill above Chattanooga, an attraction perhaps more famous for its billboards than its cave, or at Howe Caverns, New York, the biggest cave attraction in the Northeast.
At Meramec Caverns in Missouri, the entrance and gift shop extends from an external building at the cave's mouth into the natural opening of the cave, a transition perceptible only by the change of material forming the walls and ceilings of the space - from cement and metal to natural rock. Even the linoleum floor continues deep into the cave.
At Carlsbad Caverns, New Mexico, the natural entrance is next to a seating area that resembles a classical Greek amphitheater, where spectators wait at dusk for hundreds of thousands of bats to emerge during the summer months. The entrance ramp curves back and forth, descending into the darkness.
A tall spiral staircase, enclosed in a steel cage, brings visitors to the cave floor below at California's Moaning Caverns. A similar structure is used at the Ruins of Karnak in Mammoth Cave, Kentucky, the largest cave system in the country.
Elevators have been installed in a number of caves, including Mammoth Cave and Carlsbad Caverns, to manage larger crowds, as well as to aid in bringing supplies to the underground lunchrooms, and make access to the caves possible for wheelchair-bound visitors.
Access to **Fantastic Caverns** in Missouri, the only drive through cave in the country, is through a metal garage door. At the visitors center, tourists board specially made wagons, pulled by propane-fueled jeeps, for the ride through the cave.
The natural cave environment is totally dark, thus only artificial lighting will make the formations visible. Some cave owners paint with colored lights, creating multicolored corridors or rooms where a single color washes over the space uniformly. Others employ a warm, white incandescent light which better highlights the cave's varied rock textures. Light fixtures are often hidden behind existing formations, or in coverings made to look like natural features. The concealment of wire conduit is considered an art, and professional cave designers gouge troughs in the rock or in the cave floor to place the miles of wire that connect as many as thousands of individual fixtures, then almost invisibly cover the wire with a cement mixture made with the natural cave material.
Illuminated panels are used in many caves to highlight features and aid in cave interpretation. The names given to individual cave formations are consistent across the country, and are surprisingly devoid of mythical or underworld references. Rather, the formations are often said to resemble familiar food items, such as the popcorn formation, fried egg formation, bacon formation, or potato chip formation.
Sound and light shows, presented in several tourist caves, integrate natural cave formations into a themed spectacle, and usually occur as a climax near the end of the cave tour. At Meramec Caverns, an amphitheater that seats about fifty people has been built overlooking a magnificent wall of flowstone. The lights of the show are controlled manually, responding to a recording of God Bless America and culminating in the projection of an American flag onto the natural curtain wall. At Ruby Falls, after being led into a dark, tall chamber at the furthest point on the tour, recorded music builds to an anthemic crescendo, and colored lights are suddenly turned on revealing Ruby Falls, a natural waterfall with a veil of water which falls 145 feet into a shallow pool.
DeSoto Cave in Alabama is one of a few caves that offer biblical-themed sound and light shows. In the main chamber of DeSoto, a fountain is lit by individual colored lights from below, in front of an audience seated on rows of benches.
The Great Stalacpipe Organ deep within **Luray Caverns**, Virginia, is a unique and wondrous addition to the natural cave environment. It uses the cave itself as a musical instrument, creating resinous sounds like that of crystal glasses being rubbed along their rim. The organ's keyboard activates padded hammers that strike natural cave formations, individually selected for the correct pitch and tonal quality, within a three acre area of the cave. It is considered by some to be the largest musical instrument in the world.
Meetings and performances take place in several show caves, and facilities have been installed to accommodate such gatherings. The Volcano Room of **Cumberland Caverns**, in Tennessee, is used for meetings of the National Speleological Society, and for an annual Christmas party, thrown by the cave operator (who is one of the world's few professional cave designers, Mr. Roy Davis). A three quarter ton crystal chandelier, which came from an old theater in Brooklyn, New York, hangs permanently above the meeting area.
Dances have been held in caves for many years, especially in caves near local communities, and in southern states in the days before air conditioning. Stages, bandstands and dance floors have been constructed and remain in many of these caves. At Meramec Caverns, a rotating mirror ball hangs from the ceiling, and the floor is paved in linoleum tile. Plastic chairs, normally stacked in piles against the wall, are laid out in rows for gatherings such as the local Elks Club, which meets in the cave.
then...

The **Wonderland Cave** opened to the public as a nightclub in the 1930's Ozark master-planned resort town of Bella Vista, Arkansas. Though visitors sometimes toured the expanse of the cave, the primary attraction was the dance floor, bandstand, and bar area, where big bands played regularly until the 1940's. In 1931, the Arkansas State Senate had an unofficial meeting in the cave.
A bar and nightclub operated in the cave until the early 1990's, but the cave is now closed and has been heavily vandalized.
Perhaps due to the romantic *waterfall-like* formations in some caves, or because of their inherent drama, weddings are often held inside show caves. The wedding usually takes place in a portion of the cave with a large flowstone curtain wall, with the vows being taken at the base of this formation. Some caves cater especially to weddings, such as the beautifully lit Diamond Caverns, Kentucky, which has an altar permanently installed in an alcove, or Howe Caverns, New York, which has a heart-shaped light embedded in a brick walkway. **Bridal Cave**, Missouri, with a boat dock on the Lake of the Ozarks, has had over 1,300 weddings performed in its natural chapel.
A room inside Truitt's Cave is sometimes used as a wedding chapel and reception area. There is a working fireplace in the room, which is usually kept burning in the 55 degree cave, even when it is a humid 100 degrees outside in the Ozark summer. The room was originally a restaurant where trout, raised in an underground pool in the back of the cave, was served to paying customers. Indeed, food service is another activity which has led to the creation of some interesting subterranean renovations.
The Snowball dining room at Mammoth Cave has a stainless steel serving counter offering baked goods, drinks, and cold sandwiches. These items can be eaten at the nearby rows of picnic tables, under a low natural ceiling of bulbous cave formations called snowballs. They stopped serving hot lunches recently when an algae forming on the ceiling of the cave was attributed to heat and steam from the kitchen.
Of course, if food is made available, so must bathrooms be. Mammoth Cave and Carlsbad Caverns, both of which are National Park Service owned caves that offer lunch, also provide underground bathrooms. These facilities are adjacent to the lunchroom, where typical institutional public restroom ceramic tile work merges into the natural rock walls and ceilings. Sewage is pumped hundreds of feet to the surface.
Lunch has been served 750 feet below ground in Carlsbad Caverns since around 1927. Permanent counters were installed in the 1930's, and the serving facilities have been expanded and improved several times, until the current kiosk layout and design was built in 1976. The concession that has held the contract for Carlsbad Caverns for years, the Cavern Supply Company, designed and operates this vending area in the cave. Fried chicken is no longer prepared in the cave, and a blackened part of the cave ceiling is said to have been caused by a kitchen fire some years ago. The lunchroom area also has several kiosks offering tourist souvenirs, such as viewmaster reels and t-shirts, and it is possible to mail a postcard and make payphone calls from this part of the cave.
Recent efforts to procure funding to remove the lunchroom and vending facilities at Carlsbad have so far failed. The motivation for destroying these unusual facilities is partly due to economics, as the sale of sandwiches has apparently slumped. A desire to reflect a more responsible stewardship of the natural resources of the cave may also be propelling the movement of the restoration of the lunchroom area (including the removal of the cement floor) to a more natural looking state.
Perhaps slow in coming - and coming too late for many show caves - an increasing sensitivity towards cave ecology is changing the way caves are presented and developed. In Fantastic Caverns, an underground classroom is used for teaching school children about cave ecology, and a video on the same subject is presented at the turn-around point of the cave tour, projected onto a screen watched by the captive audience, sitting in the jeep-pulled tourist carts. In fact, the drive-through touring method is said to decrease the impact that visitors have on the cave, by keeping visitors grouped in the cart, and controlling their movements (and the propane fuel does burn more cleanly than gasoline).
Some recently developed and redeveloped show caves are literally classrooms about the fragility of the underground environment. **Ozark Underground Laboratory** in Missouri is a show cave developed to educate the public about the interconnectedness of groundwater in limestone regions, and the delicate ecology of the cave, which includes rare organisms such as blind fish, salamanders, cave crickets, and albino crayfish. Established by a groundwater hydraulicist named Tom Aley, the tour of this cave is conducted by flashlight as there are no lights in the cave, and though there are gravel pathways, the tour guide (often Mr. Aley himself) walks ahead scanning the path for any creatures that might have wandered into harms way.
Lost River Cave and Hidden River Cave in Kentucky are two show caves which feature many of the past, present and possible future attributes of show caves. The first development of Lost River Cave came from industry, as the river flowing into the cave was dammed to power a nearby mill. Mammoth Cave, Carlsbad Caverns, and many other caves which evolved into show caves were also first developed for industry, for the mining of bat guano for fertilizer, or the nitrate rich cave soil for saltpeter (used in gunpowder). Later at Lost River, the cave mouth was developed into a dance hall, and the surface area around the cave turned into a resort. Tours were also led into the cave, and artificial lights were installed, as well as a statue of Jesse James (many cave operators, especially in the South, claim that the famous outlaw had a hideout in their cave). Then, as the nearby town of Bowling Green expanded and industrialized, pollutants from the community seeped into the ground, and found their way, due to the drainage characteristics of limestone landscapes (or karst regions, as such porous bedrock landscapes are also called), into the Lost River, and the cave. The cave became so polluted that it was declared an EPA Superfund emergency clean up site twice in recent history. As result of the polluting of the cave, tourism has virtually vanished.
Hidden River Cave, located in downtown Horse Cave, Kentucky, also suffered the fate of becoming a toxic waste site, as polluted groundwater backed up into the cave to the point where the odor of sewage (and gasoline from leaking underground gas tanks) made walking on Main Street unpleasant. The cave has recently been cleaned up and is now open again to visitors, who are led down a wooden walkway into the cave while being lectured to about cave ecology and karst region groundwater dynamics. At street level, the American Cave Museum
has displays about these matters, and is also the headquarters for the American Cave Conservation Association. In the visitor's center, a two story man-made grotto of plaster cave formations give the visitor a sense of the splendor show caves, but without the cave at all; the cave experience has been reduced to symbolic and didactic interpretations.
A balance between these two extremes - the good-intentioned reductions of the preservationist, and the distracting interventions of cave developers - is perhaps unattainable. But a most sublime show cave experience can be had by just wandering unescorted in a well lit cave, allowing one’s mind to wonder upon the transformations we impose on mysterious places, in order to feel at peace with the wild, natural world.
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