

OZARK ADVENTURE

SPONSORED BY FANTASTIC CAVERNS SCIENCE RESEARCH PROGRAM

Keeping It Clean!

Visitors to America's caves expect to see natural beauty, unscathed and protected. Most people stopping to see a cave do not understand the enormous amount of work it takes to keep a cave system protected and beautiful. There are influences on a cave that come from both outside and inside the cave. Some of the most common factors that take away from a pretty cave are dust and lint. Several large, well-attended cave attractions spend weeks each year collecting lint from inside the cave. Where does the lint come from? **PEOPLE!** That's right. When we go inside a cave, we take with us tiny particles of dust and lint from the outside. We even leave skin cells and hair when we tour a cave. The amounts from each person are minute, but when there are thousands of tourists through a cave in a single year, these tiny deposits add up in a hurry.

Some of the most popular caves in the country are within our national parks. Mammoth Cave National Park (www.nps.gov/macn), located in central Kentucky, has over 400,000 visitors tour the cave each year. As you can imagine, this many people create quite a pile of lint. Each year, volunteers and staff at Mammoth Cave host "Lint Pickin' Days" in the cave.



Waynesburg College (Waynesburg, PA) lint crew in the Historic Section of Mammoth Cave. Photo by Rick Olson, Mammoth Cave National Park, Kentucky.

The group follows the tour trail through the cave and clean up the small deposits of lint. They use tools that range from tweezers and brooms to double-sided tape and vacuum cleaners with HEPA (high efficiency particulate air) filters to collect the debris. These special filters catch very small particles of dust and lint and prevent them from being scattered in the cave. Cave staff and volunteers also participate in special "Don't Mess With Mammoth" weekend projects that collect trash from area sinkholes and dumps. By doing this on a regular basis, Mammoth Cave National Park is kept looking natural for future visitors to enjoy.

Another example of hard work that goes

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Volunteers from Trinity Christian College (Palos Heights, IL) participate in annual "Don't Mess With Mammoth Days" cleanup event. Photo by Rick Olson, Mammoth Cave National Park, Kentucky.

Fixing it Up!

By Jonathan B. Beard



Jonathan Beard works to repair a broken stalagmite by carefully gluing it back together. This photo shows the second of two pieces being reattached to its base. Can you tell where the bottom piece was attached? (Fisher Cave, Meramec State Park, Missouri) (Photo - Michael Carter)

Rule of Caving.” **Take nothing but pictures. Leave nothing but footprints. Kill nothing but time.**

Jonathan Beard is a cave specialist and past president of the Ozark Highlands Grotto, a Springfield caving club that studies and protects area caves.

2005 Cave Works!

Imagine living in a cave. In this dark world, you learn to depend on all of your senses just to survive. You will use your sense of touch, smell, taste and hearing in ways you never imagined. The **2005 CAVE WORKS!** special learning program will introduce some hands-on activities to help visiting students learn to “see in the dark” (echolocation) and to discover other senses needed to survive in this environment. Visiting groups will be split up into small teams to visit parts of the caverns not usually toured.



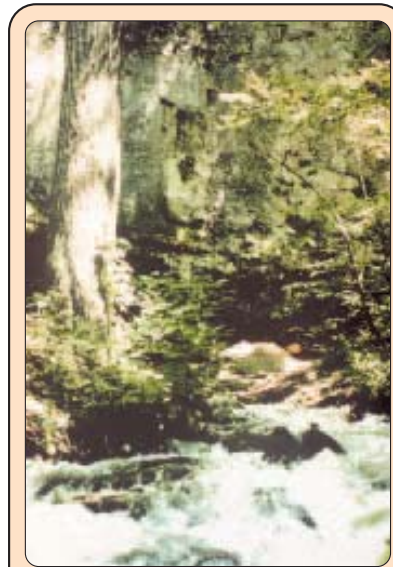
Here, they will work by lantern light to discover, identify and learn about cave-dwelling wildlife. The opportunity to find cave crayfish and blind cavefish, or to search for evidence of bats and other cave dwellers that are commonly found in caves is just around the corner.

CAVE WORKS! is a special learning program that is only available in January, February and March...the time of year when it’s cold outside, but a warm 60° inside the cave.

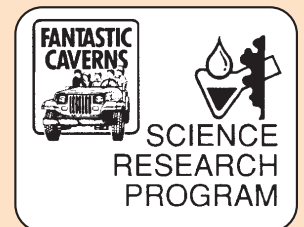
I started exploring caves in 1970. In my caving career, I have taken thousands of pictures and mapped over 150 caves. While that is all rewarding for me, my most pleasing work is when I work to restore damaged caves to their original condition. It’s pretty common to find spray paint or damaged formations from either careless cavers or vandals. Caves are wonders of nature that are easily damaged. I try to fix them up so they will be natural again.

Removing spray paint is hard work! I use brushes to scrub the paint off. It takes a long time, but it’s worth the effort to see a pretty cave again. When I repair broken formations, I use glue that is made in Springfield, Missouri, at the 3M factory where I work. First, I have to match the broken pieces so they can be put together. I wipe it clean then add the adhesive to the broken parts. Stalagmites are much easier to repair than stalactites because you don’t have to prop them up and hang them from the ceiling. In about two days, the glue dries and the formation is as good as new.

Over the years, I have repaired damage at many caves in the Ozarks. Even if I never revisit those caves, I feel good knowing that they are again unbroken natural wonders. The very best way to make sure a cave stays beautiful is to remember the “Golden



At Fantastic Caverns, students are important. This issue of **Ozark Adventure** is used by over 70,000 students in classrooms throughout the Ozarks region of Missouri, Arkansas, Oklahoma and Kansas. While this is a gigantic project for a small family business, understanding the caves and springs of the Ozarks is important. Taking care of these unique natural resources will keep the Ozarks a wonderful place to live and visit.



The *Fantastic Caverns Science Research Program* sponsors *Ozark Adventure*.

Keeping it Clean!

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into keeping a cave pretty is at Fantastic Caverns (www.fantasticcaverns.com) near Springfield, Missouri. Here, visitors travel through the cave on tour trams with little opportunity to actually touch formations. Yet the cave formations inside this natural limestone cavern can get dirty. This is a result of air-born dust particles that collect on the damp formations. The dust builds up in little lines that kind of look like worms.

To clean the cave, employees use a portable pressure washer. They start at the beginning of the tour and begin washing everything in sight. Stalagmites, columns, stalactites, flowstone, floors and ceilings all get this special treatment! Because of the immense size of the cave, it takes the clean up crew over a week to clean passageways that are visited by tours.

Once in a while, a cave will need to be cleaned up in a much more serious way. Since caves are hidden away beneath the earth, people sometimes don't realize just what kind of influence they can have on this underground world. Things we do on the surface often have terrible consequences in the caves below us. One of the longest and hardest cave cleanings took place in the town of Horse Cave, Kentucky. This is the town where Hidden River Cave (www.cavern.org) is located. For many years, sewage from the area seeped into the groundwater system. This is common in karst areas known for having many caves, springs and sinkholes. As time passed, the water flowing through the cave system was polluted by the sewage. Methane gas even developed in explosive concentrations and the town could no longer use the underground river for their water supply.

Cleaning up this cave was a major project. First, the source of the pollution had to be stopped. This meant fixing existing sewer lines and building new ones to stop the flow of pollution into the ground. Next, there were algae levels and silt in the cave stream that had to be removed before the water in the underground river could support life.

Today, success! The stream flowing through Hidden River Cave once again supports cave life and is toured by visitors to the American Cave Museum (www.cavern.org) located above the entrance. Here, people from around the world have learned lessons on how to not only clean up similar problems in their communities, but more importantly, how to avoid them.



Formations shown before (at left) and after cleaning (at right).



Cave staff at work pressure cleaning dust and lint from formations.

2004 FALL WORD DISCOVERY

Circle the vocabulary words you can find in the grid. Words can go horizontally, vertically and diagonally in all directions.

Z M U W M D L N V M Z R Y N H D W S M M
 A Q G N R C R A Y F I S H A E M E V M V
 W D M H D D P J B B Q J I T G T T M K L
 H T H H K E P K H R X R U G I B C P V Z
 R B L E S L R C T I O L K M L K N G N R
 K C Z N S I G G F D L K G D A M A G E D
 W I L D L I F E R O T A E Z Q P P S T D
 N E D D I H V E P O L S I N R P E F S Q
 M Y L T T Y G E V A U W U O X C X R E A
 T G N N W N C M T A J N T D R R S K V U
 S E S N E S I S W L C E D U N M U J A S
 C H S U B C J L L W C B O J R B R B C H
 W D F D E Y S L L T T S F R T U V W Y T
 D T D Z A B E K E A E D E P O S I T S O
 L K R L U P H D K R R R T X L H V M C M
 L M E F T A S M F L E U N M Z Z E N Z M
 M P T F I I U X B P Q V T N Y T K L C A
 P F A D F N R L A K D G T A N M H M G M
 Z L W V U T B I R H H G H P N V T V H L
 V R Y R L Z R F Y C N R E L P O E P N Z

See If You Can Find These Vocabulary Words:

caves
 stalagmites
 deposits
 underground
 paint

repair
 senses
 natural
 lint
 Mammoth

polluted
 damaged
 adhesive
 survive
 protected

people
 dust
 water
 fix
 broken

wildlife
 beautiful
 hair
 hidden
 cavefish

brushes
 resources
 crayfish