



CHAPTER

24





## Caving

*“Mystery, adventure, discovery, beauty, conservation, danger. To many who are avid cavers and speleologists, caves are all of these things and many more, too.”*

—David R. McClurg (caver, subterranean photographer, caving skills instructor, and longtime member of the National Speleological Society), *The Amateur’s Guide to Caves and Caving*, 1973



Beneath the Earth’s surface lies a magnificent realm darker than a moonless night. No rain falls. No storms rage. The seasons never change. Other than the ripple of hidden streams and the occasional splash of dripping water, this underground world is silent, yet it is not without life. Bats fly with sure reckoning through mazes of tunnels, and eyeless creatures scurry about. Transparent fish stir the waters of underground streams, and the darkness is home to tiny organisms seldom seen in broad daylight.

This is the world of the cave, as beautiful, alien, and remote as the glaciated crests of lofty mountains. Just as climbers are tempted by summits that rise far above familiar ground, cavers are drawn into a subterranean wilderness every bit as exciting and remarkable as any place warmed by the rays of the sun.

Water is the most common force involved in the creation of caves. As it seeps through the earth, moisture can dissolve limestone, gypsum, and other sedimentary rock. Surf pounding rocky cliffs can, over the centuries, carve out sea caves of spectacular shape and dimension. The surface of lava flowing from a volcanic eruption can cool and harden while molten rock runs out below it, leaving behind lava tubes. Streams running under glaciers can melt caves in the ice that stay around for a season or two, or a century or two.

Boulders tumbling down a mountainside sometimes come to rest against one another in ways that form passageways.

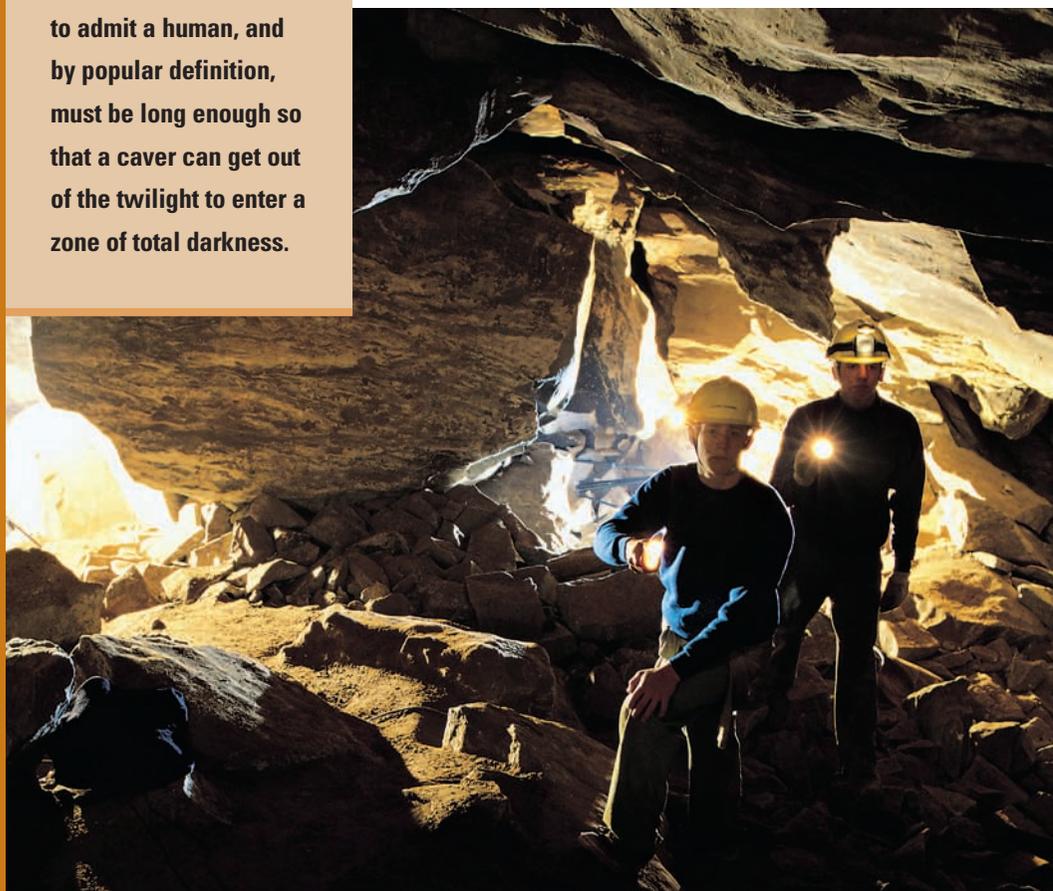
Many caves are so small that people can barely enter, while others extend for miles and include rooms of tremendous dimensions. Features come in all sizes, too, from soaring rock columns to tiny needles of stone. While most caves are stable enough to survive earthquakes, the contents of caves are often extremely fragile.

The forces shaping caves and their features work with exceeding patience. Centuries may pass before groundwater widens a chamber or lengthens a passage by even an inch. A drop of water hanging from the point of a *stalactite* leaves behind a trace of mineral residue when it finally falls, lengthening the stalactite ever so slightly, then splashing on a *stalagmite* rising from the cave floor and depositing a hint of minerals there, too.

Massive and delicate, living and stony, a cave is almost timeless, little touched by the world above. We have the power to explore and enjoy the underground world of caves, but we must always do so in ways that protect these pristine environments.

### WHAT IS A CAVE?

**A cave is a naturally formed void located beneath the surface of the Earth. By definition, it must have passages or rooms large enough to admit a human, and by popular definition, must be long enough so that a caver can get out of the twilight to enter a zone of total darkness.**





## The Importance of Caves

Cave environments are tightly entwined with the world above. Caves often play a role in rapidly transporting water and providing means for recharging aquifers. Bats, snakes, frogs, insects, and other cave visitors, all known as *trogloxenes*, form webs of interdependency near cave entrances. Permanent underground dwellers such as blind crayfish, blind Texas salamanders, blind shrimp, and the endangered tooth cave spider—the *troglobites*—can live nowhere but in caves. They are parts of fragile ecosystems unique on the planet.

Caves can provide a window into the past for *archaeologists* (those studying past human life), *biologists* (those studying animals), and *paleontologists* (scientists studying fossilized remains to better understand earlier geological periods). For many people, caves are places of breathtaking beauty, challenging adventure, and the promise of the unknown.



*Cavers find many strange sights underground, such as the remains of a bat encased in a stalagmite.*

## Leave No Trace Caving

Caves and the formations within them evolve with such exceeding slowness that underground environments have little capacity for recovering on their own from the negative impact of human visitors. A broken stalactite or stalagmite may grow back, but only after thousands of years. Marks left on stone will be visible for centuries to come. Discarded batteries, orange peels, and other bits of litter will stay exactly where they are until someone carries them away.

Only by protecting caves can today's subterranean travelers ensure that future cavers will have a chance to enjoy their own underground discoveries and adventures. If you aren't willing to protect fully the condition of the caves you want to visit, stay aboveground and find some other way to spend your time.

In addition to following the general Leave No Trace principles, following the guidelines below will ensure that you are caving responsibly:

- Go to the bathroom before entering a cave and/or carry out human waste in containers designed for that purpose.
- In well-traveled caves, stay on established trails. In caves without pathways, choose routes that will have the least impact on the subterranean environment.
- Watch for roosting bats and other cave dwellers, and try not to disturb them. Keep noise down to respect wildlife and other visitors.

- Enjoy viewing and photographing cave formations, but don't touch them. Oils and dirt from your hands can impede their growth. Leave cave formations, rocks, and artifacts for others to see.
- Nutrients foreign to a cave ecosystem can be harmful to microbes and may attract mice and other nonnative creatures underground. Before eating in a cave, spread a plastic trash bag on the floor to catch crumbs and other bits of food, then carry them home with you.
- Human waste is disastrous to cave environments. Every caver should consider carrying a *pack-it-out kit* for solid waste removal, and a designated bottle for carrying out urine.
- Wear only boots or shoes with nonmarking soles. Boots with blonde soles or gum rubber soles are acceptable; black-soled hiking boots are not.



*Leave interesting cave finds like this calcium formation for future cavers to enjoy.*

For details on making and using pack-it-out kits for human waste, see the chapter titled “Hygiene and Waste Disposal.”

### ***Caving Organizations and Land Management Agencies***

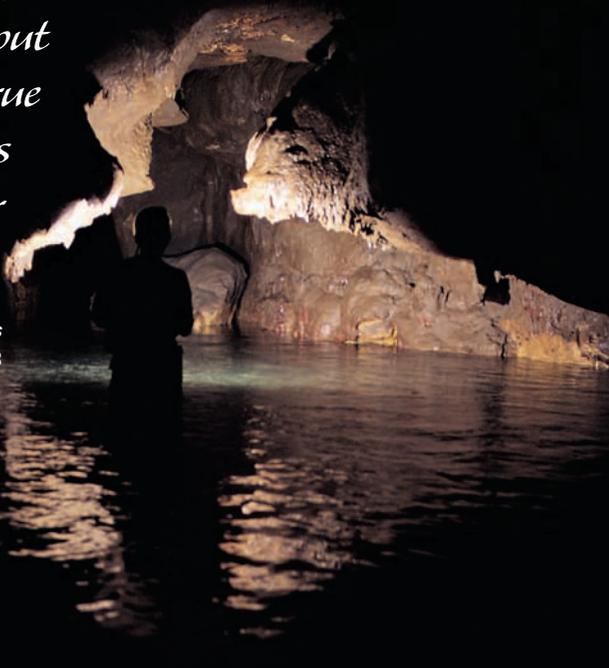
Dedicated to promoting responsible caving, local chapters (or *grottos*) of the National Speleological Society can be very helpful to Scout groups. Two other organizations are the American Cave Conservation Association and the Cave Research Foundation. Public agencies overseeing certain caves are essential resources for cavers of any age and experience level. Among them are the National Park Service, USDA Forest Service, and Bureau of Land Management.

Caving organizations and public agencies might also be able to provide guidance to Scout groups interested in assisting with the restoration of damaged caves. No projects should be undertaken without the permission of the agency or landowners in charge of a cave, and all work should be supervised by people with a knowledge of cave restoration and repair.

For links to these organizations and agencies, see the *Fieldbook* Web site. 

*“Caving is dangerous,  
make no mistake about  
that. But it is also true  
that caving is only as  
dangerous as a caver  
makes it.”*

—David R. McClurg, *The Amateur’s  
Guide to Caves and Caving*, 1973



## **Caving Safety**

The hazards of caving probably are no greater than those encountered by mountain travelers. However, rescues can be more complicated when a person is injured underground in the remote interior of a cave. Thorough planning and preparation can help you minimize caving’s inherent risks. Underground hazards can include flooding, falling, equipment failure, disorientation, hypothermia, heat exhaustion, and exposure to histoplasmosis (a bronchial disease caused by a fungus), rabies, and other biological concerns.

Prepare for safe caving through careful planning, proper leadership and training, carrying the right equipment, and exercising good judgment. Keep the following guidelines in mind when planning for and participating in caving:

- Never cave alone. A group entering a cave should consist of a minimum of four people, at least one of them an experienced caver. If there is an emergency, one person can stay with an injured person while the other two go for help.
- Before you embark, always file a detailed trip plan with a responsible adult. Write down the exact location of the cave entrance, where you intend to go while you are underground, and when you expect to come out. Then stick to your itinerary. If you have not returned by the time noted on your trip plan, the person expecting you must assume you have encountered difficulties and should notify authorities to begin search-and-rescue operations. (For more on trip plans, see the chapter titled “Planning a Trek.”)

- Each person should carry at least three reliable sources of light—ideally, good flashlights with fresh batteries. A headlamp will allow you to use both hands while crawling and climbing.
- Don't exceed your capabilities. Caving is a learned skill. Begin with short, easily manageable trips underground. As your understanding of caving grows, you can gradually extend the time and distance of your subterranean journeys.
- Stay out of mines. Caves have endured eons of motion by the earth and can generally be assumed to be relatively stable. The same cannot be said of mines and other excavations created by humans, which are much more prone to rockfall and collapse.
- Be aware of the potential for flooding. It might seem odd that weather can have an impact on the conditions of a cave, but it can. Rainwater seeping underground can have dramatic effects on the levels of subterranean pools and streams long after a storm. As a rule of thumb, enter caves only after several days of fair weather.
- Never use ropes, ladders, anchor points, or other installations in caves unless absolutely assured of their security by group leaders who had a hand in the initial selection and placement of the components and who have made a thorough evaluation of the current status of each item. Mountaineers don't trust ropes or hardware they did not themselves bring on a climb; the same holds true for cavers.
- Caving involves a set of skills that should be learned under the supervision of qualified instructors who have mastered their craft through many caving experiences. Seek out good teachers and group leaders, and study the skills of caving from the ground down.

### ***Lost in a Cave***

Do all you can to keep track of your location as you move about underground. Sticking to established routes, traveling in the company of cavers familiar with particular underground passages, and following published maps can all be means of staying found. Turn frequently and study the way you have come, the better to recognize the appearance of your return route.

If you do become confused about where you are while caving, stop immediately and stay as calm as you can. Switch off your headlamp to conserve its power. Have a bite to eat and a sip of water, pull on some extra clothing to help you stay warm, then wait to be found. Give a shout every minute or two and listen for an answer, but don't wander about aimlessly searching for a way out. It might take time, but if you left your trip plan information with a responsible person, someone will come for you.



## Caving Equipment and Supplies

Even though you will always travel in caves with several companions, equip yourself to function independently. Carry a day pack or fanny pack that contains the outdoor essentials with a few variations. You won't need rain gear or sun protection, but a pocketknife and a first-aid kit could come in handy underground. A map of the cave and a compass also could prove useful.

For more on the outdoor essentials, see the chapter titled "Gearing Up."

## Clothing

Old, rugged clothing or coveralls are a must underground. A caver walks, crawls, climbs, and squirms through passages that may be sloppy with mud, water, and bat guano. Some caves are chilly and damp, conditions conducive to hypothermia, so you might need to pull on layers of wool or fleece to stay warm. Pads for your knees and elbows will provide protection if you will do extensive crawling, and so will gloves. Leave a set of clean clothes outside the cave for the trip home, and a plastic trash bag for stowing your muddy clothing and shoes.



## Light

The only illumination in a cave is what you take in, so you must carry dependable sources of light that will last as long as you are underground. Nothing is more vital to your safety; a caver stranded without a light has no choice but to sit still in the darkness and wait to be rescued. To be sure that won't happen to you, have at least three independent, reliable sources of light. Even if two of them fail, you can still see to find your way to the cave's entrance. The best caving lights are electric headlamps (with fresh batteries) that can be attached to caving helmets.

### *Battery-Powered Headlamps vs. Carbide Lamps*

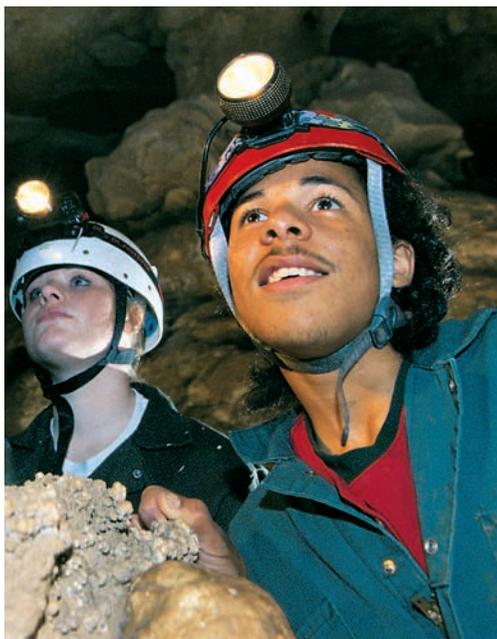
Battery-powered headlamps are powerful, reliable, and inexpensive, and have all but replaced the carbide lamps that were the choice of earlier generations of cavers. Carbide lamps do generate bright light, but they also produce undesirable by-products in the forms of acetylene gas and spent fuel residue. Agencies managing many caves have discouraged or banned the use of carbide. You can help ensure the health of other cavers and of the caves you visit by choosing battery-powered lights for all your underground journeys.

## Helmet

Think of low, dimly lit cave ceilings, and you'll realize the importance of always wearing protective headgear. Helmets made especially for caving are the best choice, though rock-climbing helmets also are well-suited for cavers. Secure the chin strap to prevent your helmet from slipping off. (Construction hard hats are not suitable for cavers.)

## Food and Water

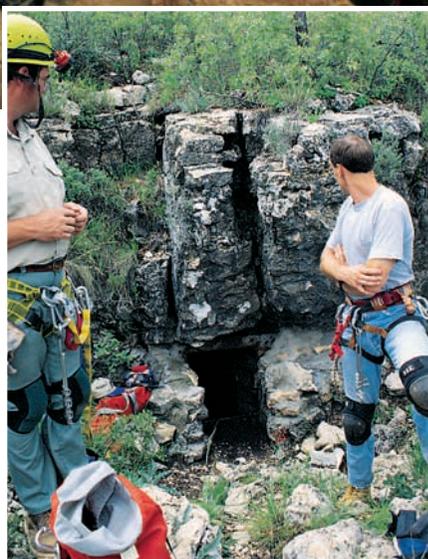
Carry drinking water and enough high-energy food to see you through a caving trip even if you are underground longer than you had planned.





## Caving Techniques

The goal of every caving expedition is to get in and out of the cave safely, to enjoy yourself while you are underground, and to leave no trace of your passing. That requires planning, beginning by contacting the agency responsible for managing that area. There might be limitations on the size of groups going into a cave, and permits might be required. Agency officials might be able to provide you with maps and suggestions for ways to enhance your experience.



Move slowly and deliberately in a cave. Avoid jumping and be especially cautious if you cross ledges or work your way over loose rocks and alongside streams. The most experienced cavers go first and last. Should the party become scattered, the skilled caver can bring the stragglers along.

## Horizontal Caving

Moving horizontally in a cave can involve a variety of movement methods including bearwalking, crawling, crouching, and duckwalking.



Bearwalking

Crawling

Crouching

Duckwalking

*“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 echos, its flitting lights, and more than all, its sudden revelation of branching crevices and corridors where we least expected them.”*

—Mark Twain (Mississippi River steamboat pilot, journalist, and acclaimed author of books including *The Adventures of Tom Sawyer* and *Huckleberry Finn*), *Innocents Abroad*, 1869

## Vertical Caving

Many caves include cliffs and pits that rival those encountered by rock climbers aboveground. Descending and ascending these obstacles—*vertical caving*—can require ropes, harnesses, and hardware, and should not be attempted without extensive training and supervision by qualified caving instructors. The BSA’s climbing/rappelling guidelines require that any climber or rappeller more than shoulder height above the ground must be protected by a belayer. Vertical caving is beyond the scope of this book.

For more on the BSA’s guidelines for climbing and rappelling, see the *Fieldbook* Web site, and BSA publications *Climb On Safely* and *Topping Out*. 

## Speleology

*Speleology* is the study of caves; a *speleologist* is one who does that studying. Your own explorations and studies of caves can encompass a wide variety of activities, from photographing subterranean features to examining subterranean geology and finding evidence of the creative forces at work. Perhaps you can discover some of the habits of tiny inhabitants of the darkness.

The more caves you visit, the more time you'll want to spend underground. One day you will come to the surface tired and covered with mud, but there will be a smile on your face and you'll know you have become a caver. You will have realized that a caver's happiest moments come when you can visit a cave and then leave it exactly as you found it.

### Cave Map Symbols

<b>Surveyed passage</b>		<b>Passage ceiling height</b>	
<b>Underlying (dotted) passage</b>		<b>Large breakdown</b>	
<b>Vertical drop in passage with depth</b>		<b>Small Breakdown</b>	
<b>Sketched passage</b>		<b>Clay</b>	
<b>Sloping passage</b>		<b>Sand</b>	
<b>Stream and pool</b>		<b>Bedrock pillar in passage</b>	
<b>Flowstone</b>		<b>Survey station</b>	
<b>Rimstone dam</b>		<b>Cross section</b>	

*Underground experts mapping caves use special symbols to indicate subterranean features.*