

# WORLD IN THE DARK

by Susan Mackie

For most of us, who live in a world of light, of noise and cars and city streets, it's often hard to imagine anything else. But far below us lies another world. It is a place of darkness, of silence, of quiet creatures that shun the daylight. The only sounds are the occasional soft rustle of bats' wings, and gentle drips of water echoing through the caverns.

This is the world of subterranean caves. Whether formed by the constant flow of water over time, from lava spills, or from natural crevices in the earth's shell, they are unique in structure, but equal in their fascinating characteristics.

## How are they formed?

Many caves are ten thousand years in the making. The most common type, the karst cave, begins with rain. As the droplets fall through the atmosphere, they absorb trace amounts of carbon dioxide, forming a very weak acidic solution (much like the fizz in a soft drink). After falling to the earth, it slowly seeps into cracks

and crevices, gradually dissolving the rock and forming cavities as it moves downward. Over thousands of years, caves are formed – some with many underground rooms and chambers.

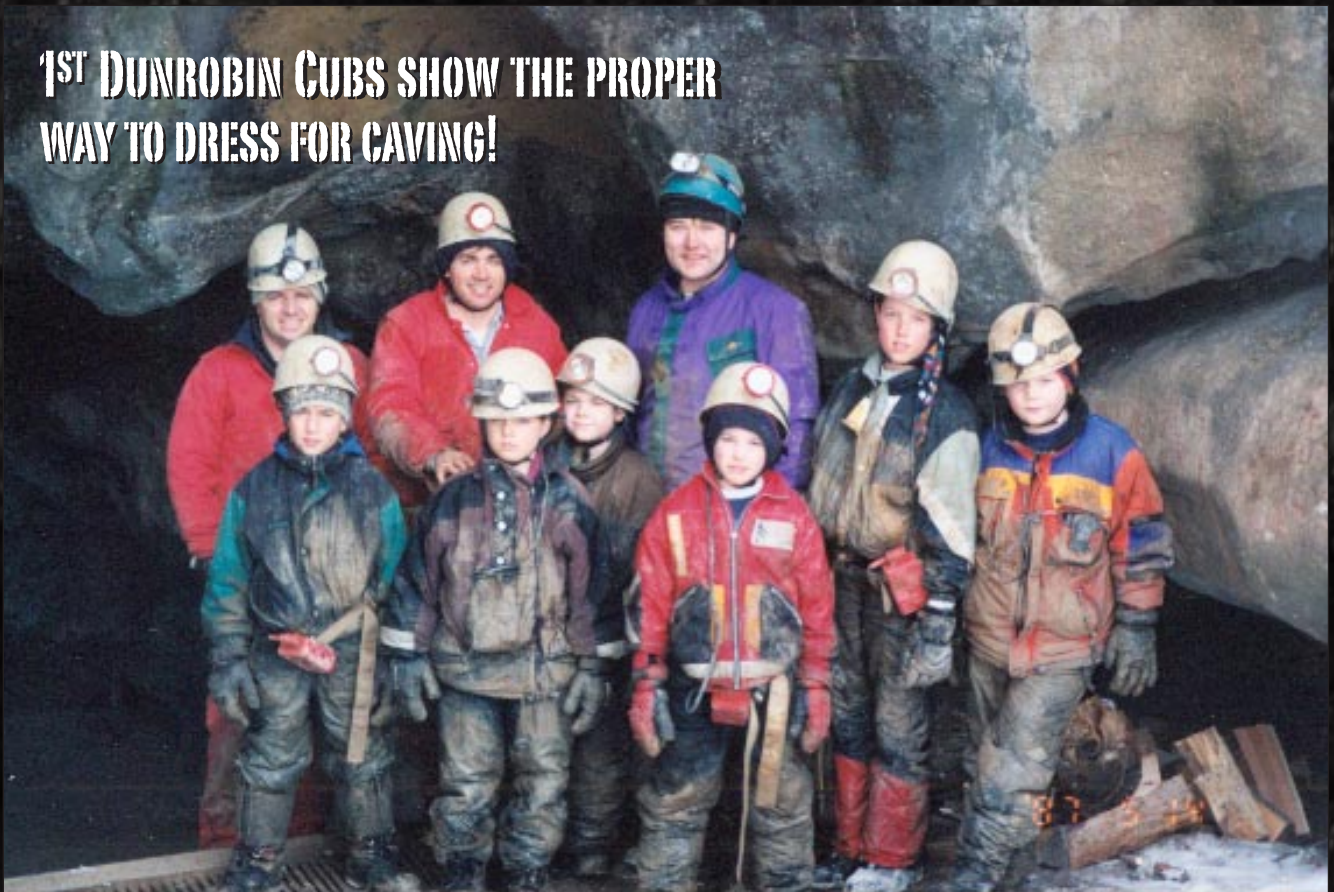
This acid also dissolves calcium carbonate as it drips through limestone – since the mineral is too heavy for the water, it is deposited as small crystals called "calcite". It is this cal-

cite that builds up to form either stalactites (hanging downward from the cave ceiling) or stalagmites (growing up from the floor).

## Cave life – The Three T's

It may be hard for us to imagine spending a lifetime in a cave – but there are creatures who can't live anywhere else. Cave life can best be

## 1<sup>ST</sup> DUNROBIN CUBS SHOW THE PROPER WAY TO DRESS FOR CAVING!



Photos: Ray Renan, 1st Dunrobin Cubs

defined as the three T's – Trogllobites, Trogllophiles, and Troglloxenes. Trogllobites (worms, crayfish, eyeless fish) can live only inside caves. These animals are very rare – in fact, the only true trogllobite found in British Columbia's mammoth cave system is a tiny freshwater crustacean. These animals are usually white or pink in colour, and have underdeveloped or no eyes.

Trogllophiles (snails, spiders, crickets, mites) can live outside and inside the cave if there is a sufficient food supply. Troglloxenes (bats, pack rats and flies) cannot complete their life cycle in a cave. Of course, there are also "incidentals" - occasional visitors to caves (raccoons, frogs, humans). Bears enjoy seasonal cave life, where they can hibernate and produce their young.

### Cave Cycle – what's it like down there?

Like the earth above, a cave has its own life cycle and weather system. Indoor temperatures of both cave and water vary according to location, air movement, and the temperature of the water entering the cave. Surprisingly, there is a windchill factor underground – caused by the temperature variance between the entrance and the interior passageways. This is the "chimney effect," and is also responsible for rain showers inside the cave! Perceptive, experienced cavers may be able to anticipate outside weather conditions, even from inside.

### Protecting the Cave Environment

This underground world, though fascinating, is fragile. Environmental practices and land usage above

## CAVERS' CODE OF CONDUCT:

- ☞ Keep to the established underground routes
- ☞ Do not litter or mark the caves
- ☞ Do not disturb crickets, spiders or other forms of life
- ☞ Do not touch cave formations

## ROCK CLIMBING TERMS

**BELAYER:** A belayer is a climber holding the safety rope at the bottom of the hill. Before the ascent, the belayer helps check that the harness is properly secured.)

**"SLACK!":** Means the climber wants some slack in the rope.

**"TENSION!":** Means the climber wants more tension in the rope.

**"FALLING!":** A climber calls this out if he/she is falling. It warns the belayer to take up any slack on the safety rope.

**"ROCK!":** Anyone seeing a falling rock yells out this warning.

**"ROPE!":** This warning from climbers at the top of the cliff tells those at the bottom that a rope is coming down.

A typical pre-climb conversation should sound like this:

**CLIMBER:** "On belay!"

**MEANING:** The climber is asking the belayer if she is ready.

**BELAYER:** "Belay on!"

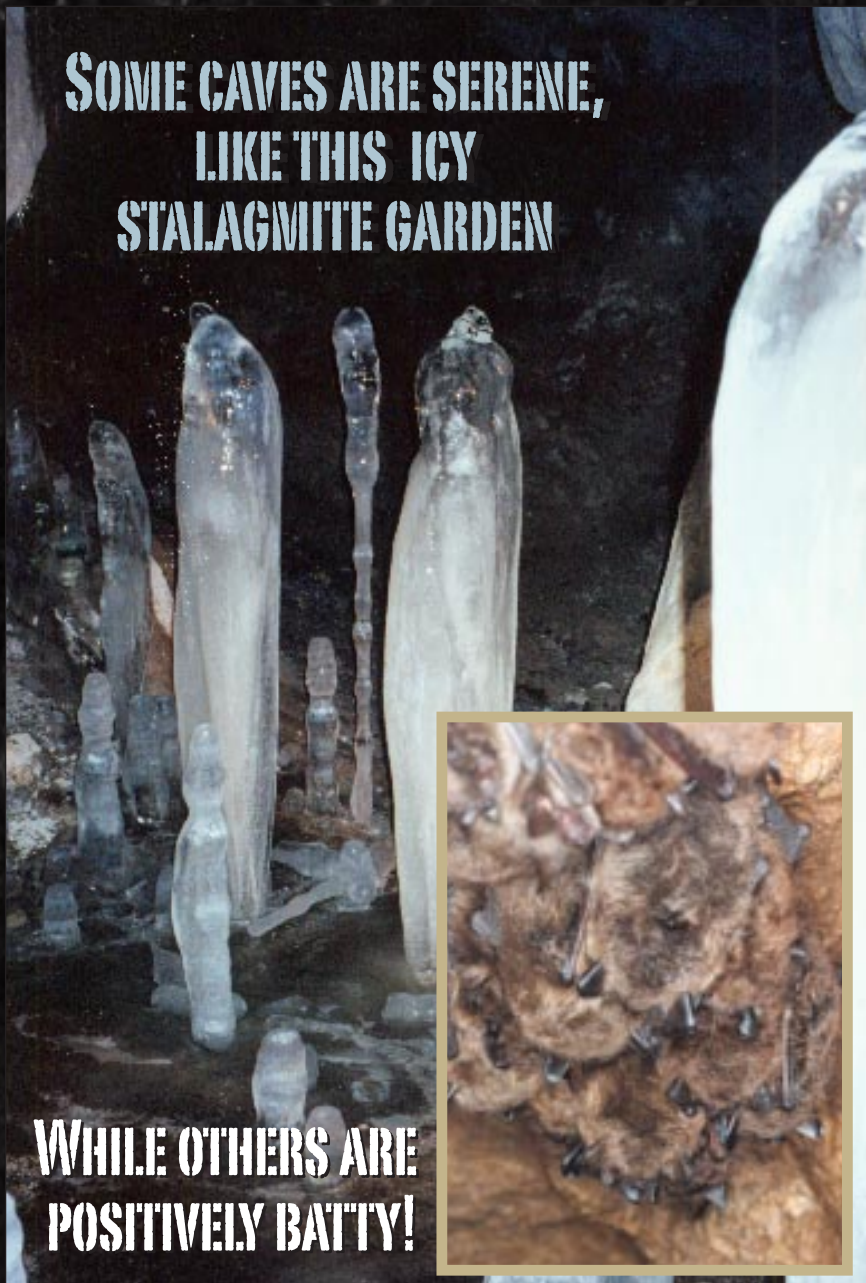
**MEANING:** I'm ready for you to start climbing now.

**CLIMBER:** "Ready to climb!"

**BELAYER:** "Climb on!"

**CLIMBER:** "Climbing!"

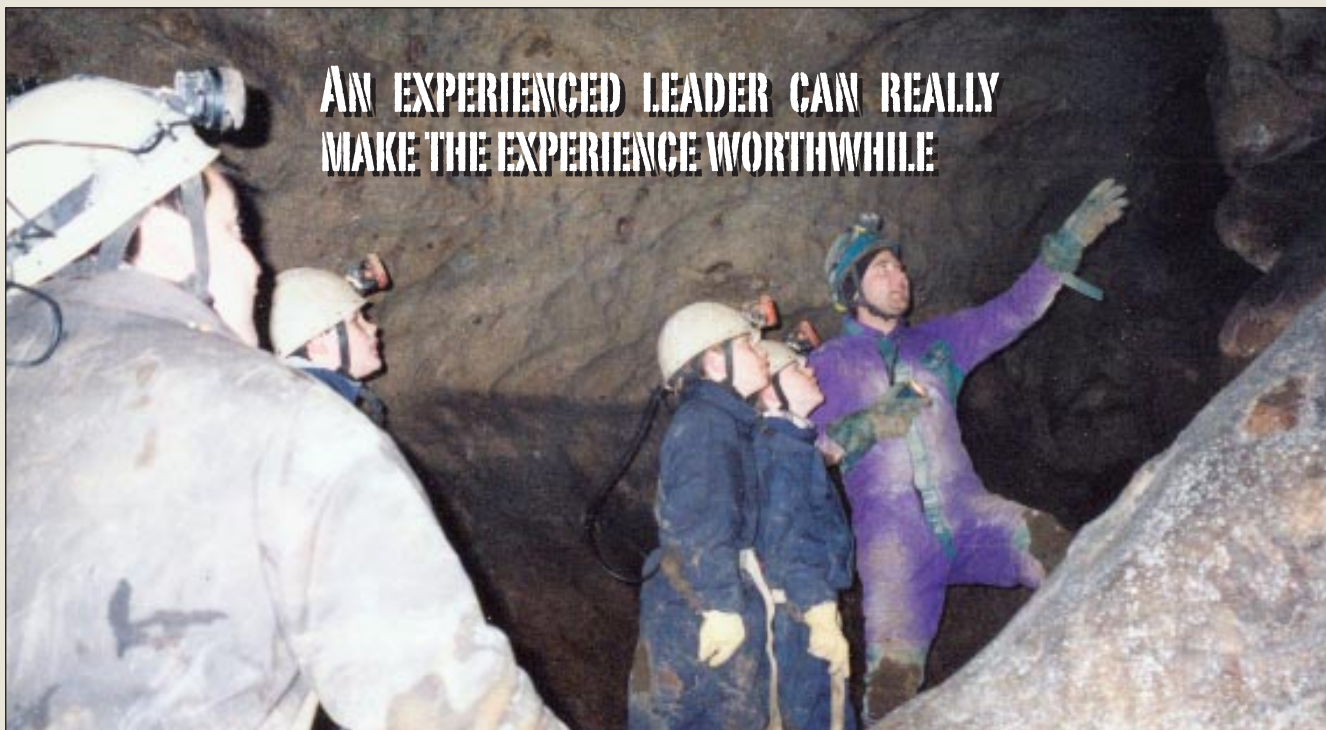
SOME CAVES ARE SERENE,  
LIKE THIS ICY  
STALAGMITE GARDEN



WHILE OTHERS ARE  
POSITIVELY BATTY!



## AN EXPERIENCED LEADER CAN REALLY MAKE THE EXPERIENCE WORTHWHILE



ground greatly impact a world dependent on outside energy to maintain its life cycle.

Cavers and other visitors to caves can help protect this sensitive world and its inhabitants by using common sense – keeping as quiet as possible, not disturbing animals or plant life, picking up any garbage, and practising leave-no-trace procedures.

### Cavers

Adventurers drawn to cave exploration are called “cavers”. They are

compelled by the solitude, the hidden beauty, and the ever-present possibility of finding new caves. In the underground wilderness of Canada’s caves, the darkness is sometimes broken by beams of curious light coming from their helmets.

Here in Canada, caving is practiced across the country, but is most prevalent in Vancouver and the Rocky Mountains – areas containing the largest, most spectacular caves.

Aside from the excitement of discovery, natural caves contain a wealth

of information on ecology, biology, history, geology and archaeology. Many scientists in these disciplines branch out into speleology (the scientific study of natural caves), to reap the immense amount of information caves can provide.

While professional cavers do enjoy a more educated trek, there are also many Canadians who explore caves for recreation and to try a new adventure. There are commercial cave tour operators who provide just such unique experiences – for people

## GEAR

The following gear is recommended:

- Strong helmet light, with backup source
- Helmet with chin strap
- Sturdy rubber boots or hiking boots
- Gloves
- Knee and elbow pads
- Layered clothing (long underwear, clean cotton coveralls, nylon oversuit)
- Ropes (for specialized, advanced procedures) – carabiners, waistlength
- More specialized rigs can be obtained for advanced caving
- Kit bag to hold spare batteries, snacks, equipment and rigging gear

## CAVE TERMINOLOGY

- FORMATIONS – (SPELEOTHEMS)** – calcium carbonate deposits. These include soda straws, stalactites and stalagmites, columns, coral, draperies and flowstones.
- SODA STRAWS** – very thin, hollow tubes, formed as water drips through their centres, depositing rings of calcite around the rim of the formations.
- STALACTITES** – formations of mineral layers growing downward from the ceiling (formed by water flowing over soda straws, after the centers become plugged) – tops are fairly sharp and carrot-like in appearance.
- STALAGMITES** – often found beneath stalactites, formed growing up from the floor when mineral-laden water drips from above. These have flat or slightly rounded tops.
- COLUMNS** – formed when stalactites and stalagmites grow together, or when one of them grows to the floor or the ceiling.
- CORAL (POPCORN)** – irregular clusters of crystals of calcium carbonate, building up on walls and existing formations.
- DRAPERIES** – deposits in lines that fold as if they were curtains.
- FLOWSTONES** – look like icing – form where films of water flow over walls, floors and different formations.

who have the interest in trying something new, but may not have the equipment or knowledge to attempt this type of potentially dangerous activity alone.

In fact, caving is an activity made for teamwork! Explorers must depend on each other and stick together to face the physical and technical challenges caving sometimes demands. It's also fun – providing hours of camaraderie that comes from an enjoyable, shared experience.

### Risks and Hazards

As with any outdoor adventure activity, cave exploration does have its risks. Falling, becoming stuck, getting lost or separated from a group, light failure, hypothermia, and spontaneous flooding of caves rank among the most common hazards. It can be a strenuous activity – requiring good overall fitness and health. Of paramount importance is having the proper gear, and adequate clothing to guard against the cold dankness. No one, not even experienced cavers, should ever go caving alone.

### Good Caving

When you're out caving, you'll see sights you've never seen before – and will never forget.

With careful planning, the right equipment, a positive attitude, and above all – teamwork - your group's caving expedition can be a world of adventure in the magical world of the dark.

(See next month's *Leader Magazine* for World In The Dark: Part 2 – A Winter Spelunk.) ^

## CAVING SAFETY

### Before entering the cave...

- Let someone at home know your itinerary and approximate schedule
- Select appropriate personal equipment and supplies
- Know how to properly use your personal equipment
- Check your equipment and ensure that it is in good working condition
- Check the weather and project the hydrological response of the cave to adverse weather conditions
- Don't go underground under the influence of alcohol, drugs or medication that could impair your judgement or performance
- Inform the trip leader of any personal physical or mental limitations
- Never plan to cave alone (groups of 3 are good, groups of 4 are preferable)

### Inside the cave...

- Identify, recognize and evaluate caving hazards
- Don't exceed your abilities and limitations

- Stay together
- Don't linger at entrances or potentially unstable zones, or vertical exposed areas
- Avoid jumping, sliding or making rapid manoeuvres
- Don't attempt something without a backup plan
- Don't share your equipment
- Avoid unnecessary chatter
- Know the agreed-upon communication protocol

### Minimum Impact Procedures...

- Limit size of party
- Use good source of light
- Use suitable protective clothing
- Don't smoke or make fires
- Stay on the established 'minimum impact' route
- Never break or soil speleothems (stalactites, stalagmites)
- Never mark surfaces
- Don't discard anything
- Don't disturb hibernating bats or other sensitive organisms

## CAVING WEB SITES

**Caving Canada** – [www.cancaver.ca](http://www.cancaver.ca)

**Horne Lake Caves Provincial Park** – [www.hornelake.com](http://www.hornelake.com)

**Bonnechere Caves** – [www.bonnecherecaves.com](http://www.bonnecherecaves.com)

**Canada's Longest and Deepest Caves** –  
<http://www.nature-exploration.com/stats.htm>

**Hiker Central.com** – <http://www.hikercentral.com/caving/>  
(see a virtual cave)

## CAVE TYPES CAVE TYPES CAVE TYPES CAVE TYPES CAVE TYPES

**Karst (solution)** – most likely to be found in carbonic rock formations, such as limestone, gypsum.

**Caves** They form by water running off non-soluble harder rock. Once the water hits the limestone, it quickly finds its way underground through the porous rock formations.

**Talus Caves** – or boulder caves – found at the base of a cliff or scree slope (usually the result of a rockslide).

**Crevice Caves** – usually found where a cliff face has pulled away from the stable rock face, creating a crack or crevice that sometimes widens enough for a person to explore.

**Sea Caves** – or lateral caves, are found generally in sandstone formation areas. Sometimes

limestone formations will produce sea caves as well.

**Lava Tubes** – found in lava beds. These tubes are the result of molten lava flowing down a gully, valley or depression. The surface of the lava cools, but the lava below continues to flow out of the valley, leaving a "subway tunnel" formation. Complex lava tubes have been discovered and explored.

**Commercial caves** – open to the public, tours provided, fee charged.

**Wild caves** – often located in secluded areas – undeveloped caves, no lights or pathways. Only experienced cavers should attempt.