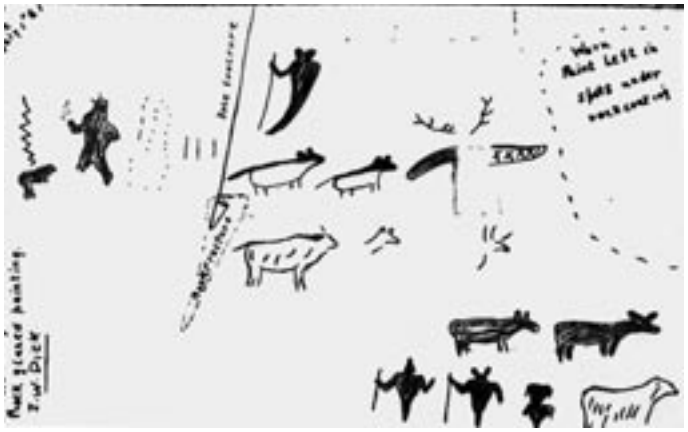

Drawing of pictographs on Grotto Mountain, 1959, Glenbow NA-5093-739

Pictographs on Grotto Mountain, C. Schock

Rat's Nest Cave

It is doubtful that Hector's grotto was what is now known as Rat's Nest Cave. The descriptions just don't fit. There are several cave entrances on Grotto, but Rat's Nest is the most extensive system that has been located on the mountain.

Entrance to Rat's Nest Cave is now restricted to guided trips. With an expert who is familiar with the underground terrain, you can explore and marvel at the range of cave features. A stiff climb of just under an hour takes you to the entrance, which is a low, arched opening that leads to a sloping passage. Inside, the cave maintains a constant year-round temperature of about 5 degrees C. The cave is undeveloped: there are neither artificial lighting nor handrails to help you negotiate the route through the chambers. There is a varied network of passages to explore for about four kilometres back under the mountain.

Rat's Nest Cave is a Karst cave. This means that it was dissolved out along faults in the limestone by water containing carbon dioxide, creating carbonic acid. Water followed the sloping thrust fault and started the process of enlarging the cracks in the rock. Where faults intersected, larger galleries were created. During the glacial periods, melting water flowed through the growing passages – and those who study caves can even tell you which direction it flowed by marks evident on the cave walls. The cave opening now stands well above the present valley bottom. But when it formed, it would have been at the level of the valley floor. The glacial cycles that created the cave also scoured out the valley to the level it has today.

The cave's name is derived from one of the furry residents, the brushy tailed wood rat. These animals form "middens" in crevices in the cave walls – nests filled with bits of food and other treasures that they drag home. Hence their common name: pack rat. Bats and shrews (insectivores) are the other mammals that use the cave, and both little brown and silver-haired bats have been spotted. Other than that, life in the cave is minute: a variety of arachnids (spiders) and insects.

There are records of a huge spectrum of animals preserved in Rat's Nest Cave – animals that lived in the area up to 7,000 years ago. Near the entrance is a shaft that drops 15 metres, and at the bottom of this is a bonebed two metres

All photos: In Rat`s Nest Cave, C. Yonge

Just What is a Speleothem?

The word "speleothem" comes from the Greek words *spelaion* ("cave") and *thema* ("deposit"), so these are cave deposits or formations. The ones we commonly know are called stalagmites and stalactites – those tusks on cave floors and ceilings. They are formed from a mineral called calcite, and their existence depends on a number of conditions not present in all caves.

Water provides the vehicle to carry minerals into the cave. It seeps through the ground and vegetation on the earth's surface, and in the process it picks up carbon dioxide and gains acidity as a weak form of carbonic acid. Next, the water flows through cracks in rock containing calcium carbonate. Calcium is readily dissolved out of the limestone of the Rocky Mountains and is carried in the water. When the water reaches an opening in the cave, it encounters conditions that cause it to release its load as calcite. The drip leaves a minute deposit of mineral on both the roof and floor, thus building a stalactite and a stalagmite. If they grow down and up to the point that they join, they become a pillar.

This all occurs at an average rate of up to a centimetre per century (many deposits grow a lot more slowly, for example taking 2,000 years to grow just one centimetre). It's not exactly a speedy process. So you can image the amazing age of some of the speleothems seen in the underground world.

Speleothems can take an amazing variety of forms, many of which are found in Rat's Nest Cave. Water flowing down walls instead of dripping from ceilings creates flowstone, which looks just like a frozen waterfall. If the drips run along a crack in a sloping ceiling, they can produce shawls or curtains, which are sometimes so translucent that you can see through them. Young stalactites are hollow, and are called straws, which they resemble. Cave pearls form around granules, just like those around sand in an oyster.

In addition to the various shapes, speleothems can take on different colours, though most commonly they are cream- or tan-coloured. Small amounts of organics or trace minerals influence the hue of the formation. If the presence of these elements changes over time, it can produce a striped effect.

These otherworldly sculptures are one of the lures to explore these underground galleries. And their rarity and delicacy makes it imperative that we are mindful of protecting them from damage resulting from our explorations.