# Tunnel Cave, Mount Eccles

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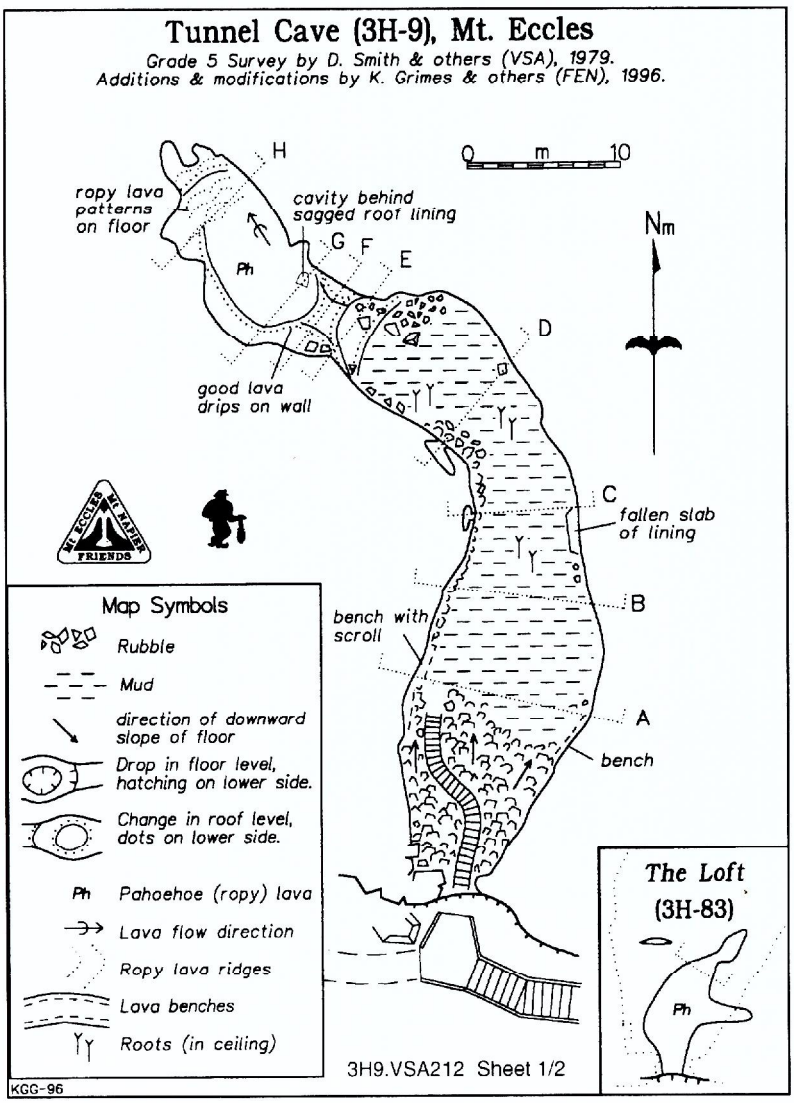
*Editor's note: This article is based on a leaflet written by Ken Grimes for visitors to Mt Eccles National Park. It is republished with the permission of the author.*

**The origin of the cave.**

*Tunnel Cave* [H-9] is a "lava tube" created by the drainage of lava from an underground conduit and was formed towards the end of the eruption of Mount Eccles. During the eruption the crater would have been a lake of molten lava which overflowed through a gap in the crater wall and ran away along a large channel running to the west and south. These channels (or "canals") would have been similar to river channels, but instead of water they carried molten lava.

*Tunnel Cave* is in the side of the main channel. The cave would have started off as a channel open to the air, but the surface of the lava flowing in the channel cooled and solidified to form a crust. Additional overflows from the main canal buried this roof with a stack of thin layers which we now see in the cliff above the entrance. One of these thin layers partially drained and left a low cavity, The Loft [H-83]. Access to The Loft is not recommended because of damage to the ferns and the risk of dropping rocks, or yourself, onto people below.

Molten lava continued to flow in a tunnel left beneath this crust, and at the end of the eruption the liquid lava partly drained away to leave the cave we now see. The original, larger, entrance probably collapsed shortly afterwards. The present entrance is a small hole accidentally left at the top of the large mound of collapsed rubble.




**The cave environment**

When you get to the bottom of the steps and wait a bit while your eyes get used to the dark, you will note the temperature. Caves generally have a stable temperature beyond the entrance area which approximates that of the surrounding rock — somewhere near the mean annual temperature of the region. The humidity in the cave is also higher than on the surface. Cave environments are characterised by darkness, dampness and a stable temperature with little air movement.

As your eyes adapt you notice a greenish tinge to the rocks. A range of small plants are managing to survive on the limited light that comes in through the entrance. These include small ferns, mosses, liverworts and algae. If you look closely at the rocks you will see that there is a marked change in colour from green on the sides facing the entrance to black on the dark side. As well as the green areas, you will see patches of pale grey powdery material, rather like a sprinkling of flour. This is formed of actinomycete, microscopic organisms that resemble both fungi and bacteria. They do not need

light, so can be found throughout the cave. They are responsible for the 'earthy' smell of a cave.

One would expect bats in a cave of this shape and size, but they are seldom seen now. The constant flow of visitors disturbs their sleep, and so they have taken to using other, more peaceful caves. Bats are a major source of food in cave environments. They feed outside but return to roost in the cave, where the guano accumulating below them is used by a wide range of fungi, insects and other small animals. The departure of the bats and the disturbance and trampling of the floor sediments means that we now see little in the way of animal life here.

**Features of the cave.**

*Tunnel Cave's* arched roof and flat floor are typical of lava tubes. Originally, while active, the cave's cross section would have been elliptical. The flat floor is the surface of the final stream of molten lava which solidified as it moved through the cave. For the first part of the cave it is covered with a thin layer of hard mud, washed in from the entrance and compacted by human traffic. If you have a bright light you may see colour variations on the walls - white, cream, and shades of brown and orange. These are mostly mineral coatings that have formed by weathering of the basalt rock.

Running along the left hand wall is a low bench. Such benches are common in lava tubes, and mark old 'tidemarks' left from times when the lava surface was higher. Where the lava touched the wall it cooled and formed a semi-solid lining that can be anything from a few centimetres to a third of a metre or more thick. When the level dropped, the solidified lining remained as a bench.

During much of the eruption period, the tube would have been completely filled with flowing lava. Towards the end, as the levels dropped, soft lava coatings several centimetres thick were left on the walls and roof. The surface may have an irregular lumpy form, or have dribbles and drips, and horizontal or vertical grooves and ridges. The horizontal lines are probably 'tidemarks', but the origin of the vertical marks is less certain. It is possible that fragments of soft lining slid down the wall to leave grooves and ridges.

In a few places there are narrow grooves and scrape marks left by fragments of crust that were floating on the surface of the lava river. In places you see small flaps of lining 30 or 40 centimetres across that have broken free and sagged down. Some of these appear to have burst like bubbles because gas pressure built up behind them. Towards the end of the cave (Section G) there is a small cavity which has formed behind a span of lining that broke free and sagged into the empty cave while still soft. Within the cavity you can see an older lining that has also cracked and sagged slightly.

The original wall features are often hidden by a younger growth of knobby to prickly 'cave coral'. This mineral growth (mainly calcite) has precipitated from coatings of water on the cave surface. The water picked up the mineral material from the weathered lava as it percolated down from the surface.

At the far end of the cave you can see where the roof drops and finally meets the floor, which is the surface of the undrained part of the underground lava flow that solidified in place and now blocks the rest of the original tube. We can guess that the tube, filled with lava, would once have continued for quite a distance further. At the far end of the cave one also sees wrinkles of ropy lava (pahoehoe) on the floor. These are small pressure ridges formed by the movement of a lava that had a fairly thick consistency, similar to porridge. Comparable ridges may once have occurred in the floor of the main passage, but have been hidden under the mud.