

HAMILTON GEOLOGY EXCURSION REPORT

Weekend 27-29 May 2006 with leaders Ken Grimes and Chris Ah Yee

This was a very successful and enjoyable weekend with the number of participants peaking at 25 on the Saturday, the majority of whom were FNCV members. The success of the field trip is largely due to our two local leaders, Ken Grimes, a consultant geologist and geomorphologist, and Chris Ah Yee, an amateur fossil collector. Their clear and enthusiastic explanation of what we saw, the detailed itinerary, the superb field notes and much work on the ground such as obtaining permission from land owners for access made this a great weekend. And the weather stayed fine!

On Saturday Ken concentrated on volcanic landforms, starting with the Harman Valley lava flow which came from Mount Napier, still hidden in the mist at this time in the morning. This volcano's minimum date of 7000 years based on dating swamp deposits overlying lava (carbon-14) has recently been pushed back to 32,000 years by measuring cosmogenic chlorine isotopes formed at a steady rate when cosmic rays hit the surface of a rock. The excellent example of a valley lava flow seen from the lookout has been under threat from a new method of clearing rocky ground for pasture by crushing the surface with huge steel rollers. This has been halted on the grounds that native vegetation is being damaged but it seems that the geology is not protected. Our second stop on the same lava flow was to see the Wallacedale tumuli, the steep-sided mounds pushed up by pressure in the liquid lava below. Late in the day we visited Byaduk Caves, again in the same lava flow from Mount Napier; the caves are where parts of the roof of a lava tube have collapsed.

The rest of the day was spent at Mount Eccles where we circuited the elongate crater lake (Lake Surprise), entering the Tunnel Cave on the way and examining a small cliff of spatter about halfway round. Lake Surprise would have produced a fountain of lava several hundred metres high; if this landed nearby the semi-liquid lava came down like cow pats and welded itself together as spatter. Fragments carried further by the prevailing wind solidify more before landing and so form the looser scoria which is often quarried for road-making material.

After lunch we visited the Natural Bridge or Gothic Cave, so named because of its pointed arch roof. It is believed the roof formed over an open lava channel as the still plastic lava sides slumped together. Fresh-looking gouges in the walls of the cave are where rafts of lava crust carried along on the flow banged into the still soft wall. Next we saw The Shaft, the only known example in Australia of a volcanic vent that has stayed open. They usually clog with lava or collapse back on themselves. This one is 27 metres deep; we approached the edge cautiously!

On Sunday, Ken showed us two contrasting waterfalls: the Nigretta and the Wannon Falls. At the Nigretta Falls, the Wannon River cascades over strongly jointed Devonian ignimbrite (formerly thought to be rhyolite). Ignimbrite is a hot, welded ash from a huge pyroclastic eruption typical of acid or felsic volcanics. We could see flattened lumps of pumice and other ejected material in hand specimens. On the other hand, the Wannon

Falls are a classic example of a river flowing over a hard horizontal layer underlain by softer material, the harder rock being a Quaternary basalt. We walked around and behind the waterfall where we could appreciate its size.

During the afternoon we concentrated on Tertiary and younger sediments and their associated fossils. At Grange Burn we started at The Arch where the creek flows through a small natural arch in early-mid Miocene marine Bochara Limestone. This unconformably overlies the same Devonian ignimbrite we saw at Nigretta Falls. We followed the creek upstream until we reached a basalt dated at 4.47 million years. Marsupial remains have been found in the Pliocene palaeosoil beneath the basalt.

At Muddy Creek Chris pointed out and explained the significance of the fossil sites. We first encountered the early Pliocene marine shell bed (approx 5 million years) with large numbers of modern-looking fossil shells lying exposed. The writer found a small vertebra in the nodule bed at the base, which has since been shown to Erich Fitzgerald at the Museum. He is doing further research because it appears to be either macropod or seal. We hope to have it on display in the Clubroom soon with a clearer identification. After examining the Pliocene beds, the party moved downstream to collect fossils from the early-mid Miocene Muddy Creek Marl (approx 10 m yrs).

This brought to an end the two full days with our excellent leaders who had been thanked and presented with FNCV mugs at a dinner at the Caledonian hotel on the Saturday night. This report omits a number of stops we made to view various landforms and hardly does credit to the wealth of knowledge we gained. On Monday morning eight participants stopped at Penshurst on their way home to visit the Volcanoes Discovery Centre which had been especially opened for us. We also had a look at the Ever-flowing Spring and Mount Rouse before setting off homeward.

Rob Hamson

Addendum to geology report on the Yarra River excursion in FNN 154. The source of the map was not acknowledged. It was from p 457 of *Geology of Victoria 2003* ed W D Birch.