The Mount Rouse Volcano

Ken Grimes, Hamilton Field Naturalists Club, April 2008

The mountain

Mount Rouse is a composite volcano of both basaltic lava and scoria. The summit rises 100 metres above the lava plain (to 367 m above sea level) and provides excellent views of the surrounding "*stony rises*" lava flows and nearby volcanoes (e.g. Mount Napier to the west). The main peak is a massive cone of red, brown and grey scoria with local areas of lava spatter and some thin lava flows. This has a crescentic form (see map) - it is a breached cone opening to the south-west.

To the south of the main cone is a deep circular crater, referred to as the "Dry Crater" or "Crater Lake", that extends below the level of the surrounding lava flows and generally contains a small lake or swamp. This crater is rimmed with basalt but the outer walls are red scoria (visible in the old quarry on its SE side). It is probably the source for most of the lava flows that spread out as "stony rises" from the mountain.

The eruption

The big scoria cone would have been formed by a tall lava fountain which jetted up out of a small lava lake for several hundred metres into the air. As the lava spray fell back to earth it frothed and solidified to form the loose scoria that built up most of the cone. In places nearer to the crater larger globs of spatter were still soft when they landed and stuck together as twisted lumps - visible in some of the road cuts on the way up the mountain. (beware traffic!). The base of scoria cone has been overlapped by the final lava flows, and the contact between the lava and the underlying scoria can be seen in the two south-eastern quarries.

A small amount of lava may have flowed out of the breach on the SW side of the big crater, but the bulk of the lava appears to have flowed from the lower crater to the south. That crater is breached on its west side and a winding lava channel leading away from this is visible from the mountain, but not particularly obvious (see map). The contours on the stony rises suggest that there was also an overflow of lava to the east at times - possibly leaving the crater near the parking area beside the roadway

The lava flows

The lava flows from Mount Rouse are the longest in the Western District volcanic province - extending for at least 60km south from the mountain to the present coast at Port Fairy. They can be seen on the beaches at Port Fairy, extending out to sea - but offshore geophysical surveys suggest that they do not continue any great distance from the beach. Long flows such as this can only form if the lava is moving in "lava tubes" beneath an insulating crust.

The flows form what are known as "**stony rises**" - irregular humps and hollows of stony ground. They would have formed by a series of advancing lobes which piled up and crusted over, then burst and spread further as new lobes. Pressure beneath the thin crusts would have inflated some lobes (rather like a balloon full of water) to form the "rises"; elsewhere, or later, draining of lava from beneath the skins would have formed the hollows (see diagram).

As the flow expanded, following the creek channels south towards the coast, the stagnant areas would have solidified and the moving lava been concentrated into narrow channels which then crusted over to form hidden lava tubes. Hot lava flowing through these tubes was insulated and so could travel long distances to feed the advancing front - some 60 km in this case.

Elsewhere, lava tubes have drained at the end of the eruption to leave open caves (e.g. at Byaduk) but this does not seem to have happened in the Mt Rouse flow as few caves have been reported.

Age of the eruption

The lack of extensive soil suggests that the lava flows are relatively young compared to the older volcanics around them, which have deep black or red clay soils. Several isotope dates from the lava at the Port Fairy end of the flow indicate an age of between 0.3 and 0.45 million years, which is supported by dates of 0.32 and 0.35 from a lava flow 20 km south of the volcano. This is in conflict with a single isotope date of 1.8 million years for a thin flow within the main scoria cone at Mount Rouse. The younger ages fit better with the soils and general appearance of the flows and are therefor accepted here. Comparison with modern eruptions at Hawaii suggests that the Mount Rouse eruption would have lasted less than a year.

The Ever-flowing Spring

The stony rises comprise a series of stacked lava flows, each of which contains bands of gas bubbles or "vesicles". In addition there would have been horizontal gaps between the separate flow layers, and vertical cracks in the lava, Some open lava tubes might be present. These porous zones form useful conduits for water and one such band probably feeds the spring in the centre of the town of Penshurst. The water would be derived from rain water soaking into the stony rises and scoria cones to the south and travelling north through the porous bands to nourish the spring.

History

Aboriginal name = *Collorrer*

European history: The town was sited next to the Ever-flowing Spring - a resource which had also been an attraction to the Aboriginal population.

The stony rises are a ready source of building stone. There are numerous stone walls, stone buildings, barns and tank-stands to be seen in a drive around the back-streets of the town. Note also the many wind-mills, tapping water in the porous bands within the lava flows.

As for most of our volcanoes, quarrying has removed a significant portion of the scoria and left large pits that detract from the overall beauty of the mountain. Tree planting has obscured some geological features, such as the crater within the big scoria cone.

Sources of information:

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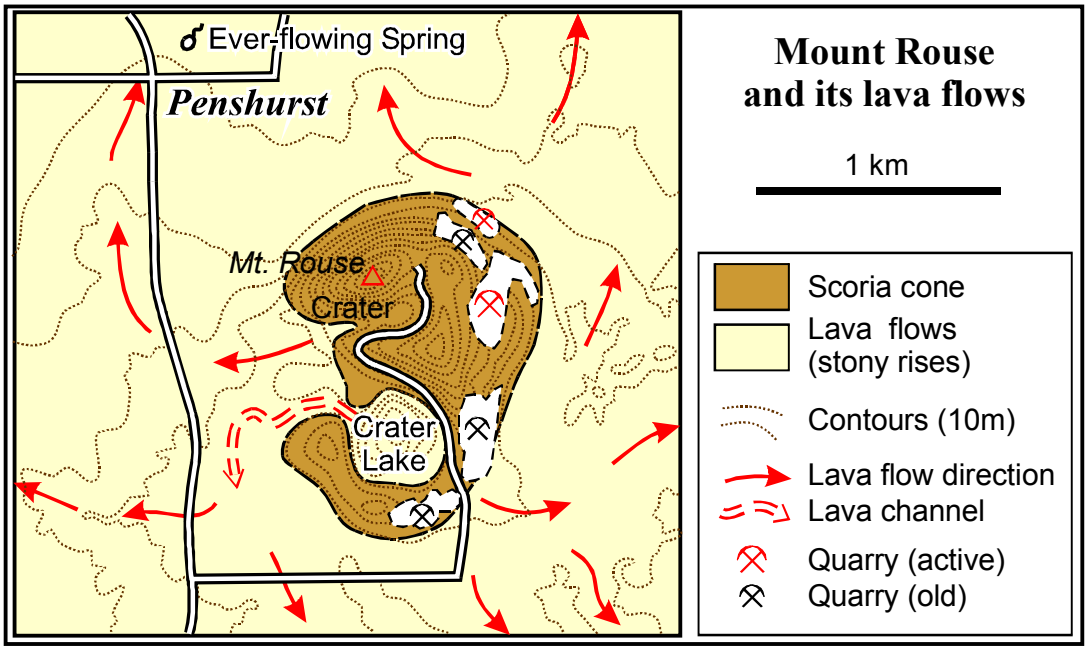

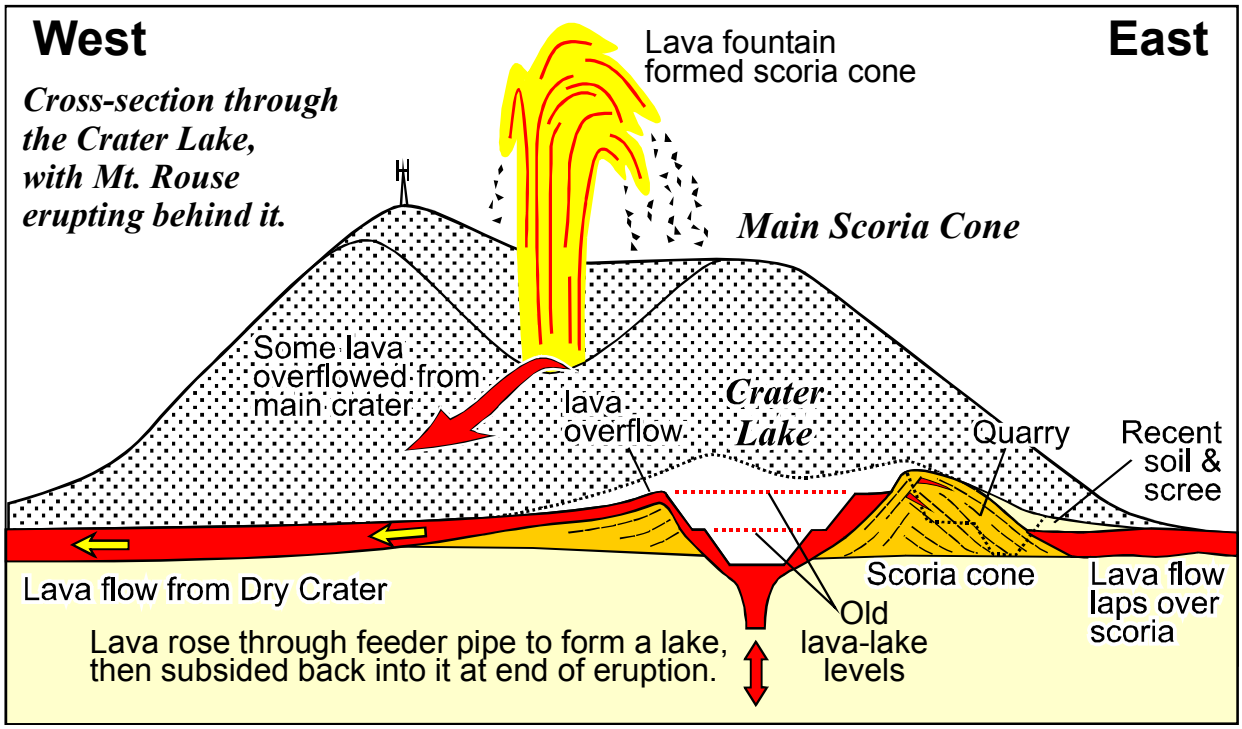

Stony Rises

The hummocky lava surfaces surrounding the mountain are known as **stony rises.** They formed partly as separate irregular lava lobes, and partly as the result of swelling and subsidence of the surface crust. Beneath the thin plastic crust the liquid lava was under pressure that pumped up parts of the flow to make mounds. When the pressure dropped other parts subsided as the lava drained away. Here and there the lava drained completely to leave a low, shallow cave beneath a thin crust.