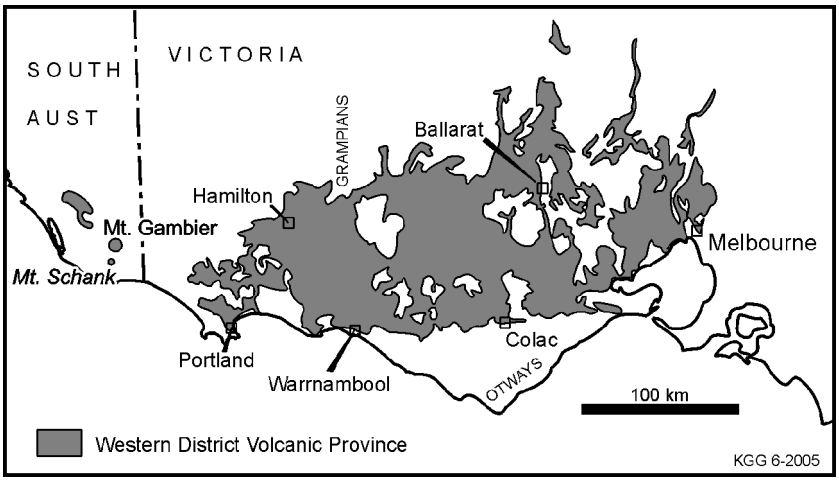
Volcanic Plains
of Western Victoria

Compiled by Ken Grimes, Hamilton Field Naturalists Club, June 2005.

The volcanic plains of western Victoria form a belt 100 km wide which extends 350 km west from Melbourne nearly to the South Australian border. In addition several volcanoes occur near Mt. Gambier. The gently undulating plains are formed of lava flows up to 60 m thick, and are studded with volcanic hills. About 400 volcanoes are known within the region, which has been erupting intermittently for the last five million years. The youngest volcano appears to be Mt. Schank, in South Australia, which erupted about 5,000 years ago. The Aborigines would have watched this and some of the other eruptions, and they have stories of burning mountains. Further eruptions could happen, but are not likely in our lifetimes.

The Volcanoes

Volcanoes erupt when molten material (called *magma*, and at about 1200˚C) is forced up from great depths. On reaching the surface this may flow across the ground as lava, or be blasted into the air by gas pressure to build up cones of fragmentary material. Most of the local volcanoes erupted for only a few weeks or months, and never again – the next eruption was at a new site.



Extent of the Volcanic Plains in Western Victoria

In the Western District there are mainly three types of volcano*, though combinations of these also occur. About half of the volcanoes are small steep-sided *scoria cones* built from frothy lava fragments thrown up by lava fountains. Most of the remainder are broader but flatter *lava volcanoes* formed from relatively gentle flows of lava welling out of a central crater. A group of about 40 *maar craters* near the coast formed from shallow steam-driven explosions which produced broad craters with low rims. These now often contain lakes.

Volcanic rocks

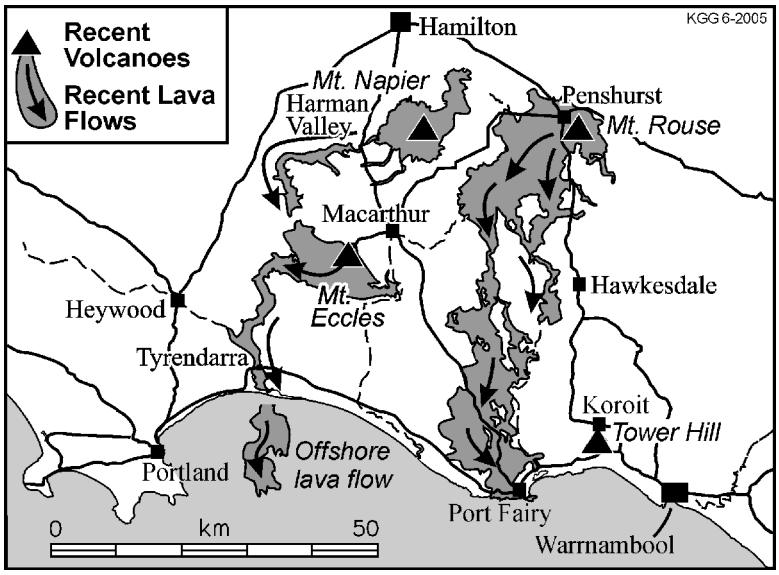
The *lava* in this region is formed of *basalt*: a dense dark rock which may be solid, but more usually has gas bubbles (called *vesicles*) embedded within it. This lava has flowed across the surface as a stream or sheet of molten rock. Closer to the eruption we find mounds of scoria and spatter. *Scoria* is a light weight, frothy type of basalt formed where molten lumps of lava are thrown out of a vent and solidify as they fall back to the ground where they accumulate as lose clinker. *Spatter* forms in a similar way, but the lumps are still soft when they land and spatter and stick together as a welded mass. More explosive eruptions create lots of volcanic *ash* or *tuff* – finer fragments of lava and other rocks that settle in sheets on the surface. In the eastern part of the region the rocks contain olivine and other large crystals carried up from deep beneath the surface.

Lava Flows and related features

Lava is a hot molten rock that can flow easily, rather like hot porridge. The original surface of a hot fluid lava flow is smooth or wrinkled, and called *pahoehoe*. As the lava flow cools and loses gas it becomes stiffer and may break up into sharp fragments, called *aa* (pronounced Ah-Ah). The advancing front of a pahoehoe flow forms lava lobes which crust over, inflate and burst to form new lobes. An advancing aa flow has a rubble front with fragments constantly rolling down and being buried at the toe. As the lava moves, large pressure ridges may be buckled up – either transverse to the flow, or running parallel to the edges. A solid

* See separate sheets for more details.

crust forms quickly, but beneath this liquid lava may continue to flow and is often concentrated into *lava tubes**. The crust insulates the hot lava in the tubes below, keeping it fluid and resulting in very long flows. Examples are the Mt. Rouse flow, which runs 60 km to Port Fairy; and the Tyrendarra flow from Mt. Eccles which extends offshore (sea level was lower at the time of that eruption). In places, part of the lava continues to flow on the lava surface in narrow channels – rivers of lava. Overflow from these channels can build up levee banks. Examples of lava channels and levees can be seen from the Harman Valley lookout, and at Mt. Eccles.



Recent (less than 500,000 years old) lava flows and stony rises in the Hamilton-Warrnambool area

Variations in the pressure of the liquid core can push the crust up into mounds, including the steep-sided *tumuli** seen at Wallacedale. Loss of pressure may result in the lava draining from beneath the crust, leaving open lava caves (as at Byaduk) or allowing the crust to subside and form hollows. The net result of all this movement is a chaotic surface known locally as the *stony rises*. These are well preserved on our younger flows (see map), but on the older lavas erosion and soil development have destroyed most of the original surface features.

The lava flow often follows an old valley, splitting the original watercourse into two – one on each side of the central lava flow. A good example of such twin lateral streams is along the southern part of the Tyrendarra lava flow, where Darlot Creek follows the eastern side of the lava flow and the Fitzroy River the western side. Swamps and lakes form where the original streams have been dammed.