

# Pukekawa – the Domain Volcano



New Zealand is a land of volcanoes and earthquakes. Volcanic activity has played a major role in shaping New Zealand since its earliest origins, around 500 million years ago.

Auckland City is built on an active field of small basalt volcanoes. Forty-eight have erupted within 29km of the city centre over the last 150 000 years. The most recent eruption, 600 years ago, formed Rangitoto Island at the entrance to Auckland Harbour. Because of the intensity of past volcanic and geologic activity within the Auckland region another eruption possible.

## **Auckland Domain Volcano (Pukekawa)**

Auckland Museum is built in the Auckland Domain on the rim of a volcano that erupted 100 000 to 150 000 years ago, making it one of Auckland's oldest volcanoes. The volcano began life with a large explosion or series of explosions. The bank surrounding the playing field with the Museum on one side and the Hospital on the other is a tuff ring made from a mixture of fine scoria, or lapilli and original basement rock. A small lava flow to the west, outside the tuff ring in the region of the medical school and a small scoria cone formed by fire fountaining in the centre completed this activity.

The volcano consists of a wide explosion crater containing a small central scoria cone. The crater floor was initially a lake. Over thousands of years, it filled with alluvium and plant remains to become a swamp. In European times the swampy floor has been drained and smoothed to form playing fields. A semi-circular tuff ring, formed by the accumulation of volcanic ash, surrounds the explosion crater. The Domain duck ponds are fresh water springs, derived from ground water draining the Crater Lake and swamp.

The springs provided Auckland's first piped water supply in 1866. The Domain Wintergarden's fernery occupies a disused scoria quarry on the north side of the small central scoria cone.

## **Maori Use of Pukekawa**

The Domain has been altered significantly by contact with humans. When Maori people arrived in Auckland they cleared the land for gardens, particularly choosing the fertile north-facing slopes of the volcanic cones. Later their descendants looked to more permanent settlements, so that parts of the hill slopes were terraced to provide family homes and storage pits as well as gardens. The claims for land grew stronger. Tribes and hapu sought wider occupation throughout Tamaki, its gravelly volcanic soil becoming famous for growing kumara. From about 1400 AD the higher volcanoes became defended hill forts, mostly to protect the stored crops, while on the lower slopes terracing was extended to feed an increased population, including large numbers of colonial migrants.

Pukekawa was an ideal site for Maori habitation with the flat swampy crater providing eels and plenty of water. Pukekawa means "hill of bitter memories" and refers to tribal battles fought here until 1828 between Hongi Hika

leading the Ngapuhi from the North and Potatau Te Wherowhero leading the local Ngati Whatua. A sacred Totara tree planted by Princess Te Paea Herangi to commemorate the battles and the eventual settlement of the dispute stands on Pukekaroa surrounded by a palisade.

## **Later Use of Auckland's Volcanoes**

Pukekawa was part of the land which Ngati Whatua sold to the Europeans who by 1860 had drained and filled the swamp and turned it into cricket fields. A quarry was established at the north end of the scoria mound for a time. The old quarry is now used as a fernery. No sign of the old vents that formed the scoria mound are left.

The volcanic scoria cones and lava flows provided the only source of hard rock within easy reach of the growing settlement of Auckland. Over the years dozens of quarries have actively nibbled, bitten and gulped at our volcanic heritage to satisfy the city's endless demand for building aggregate, road metal and solid fill. Today about 20% (2 million tonnes) of New Zealand's aggregate for concrete and roads is quarried from Auckland's basalt lava flows. The largest quarry is still actively digging into several thick flows on the northwest side of Mt Wellington.



AUCKLAND WAR MEMORIAL MUSEUM

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## A self-guided walk

### Crater

Stand on the top of the tuff ring [A] by the museum and walk halfway across the playing fields [B] which are part of the volcanic crater. The museum is on the crater rim, so is the hospital on the other side.

Now walk to the side of the lava cone near the toilets [C].

*What rock is the lava known as? What colour is the lava? What is its texture?*

Walk up the scoria cone to its highest point near the palisade surrounding the sacred totara planted to honour the Maori chief Te Wherowhero. Walk around the top until you feel you have looked at all of the crater [D]. The scoria cone is almost central.

*Why?*

Show what the shape of the crater would look like from the air by shading the outer tuff ring on the map. One part has eroded away.

*What caused the erosion there? The main vent is hidden — what happened to it?*

### Fernery

Visit the Fernery [E] through the back of the Wintergardens.

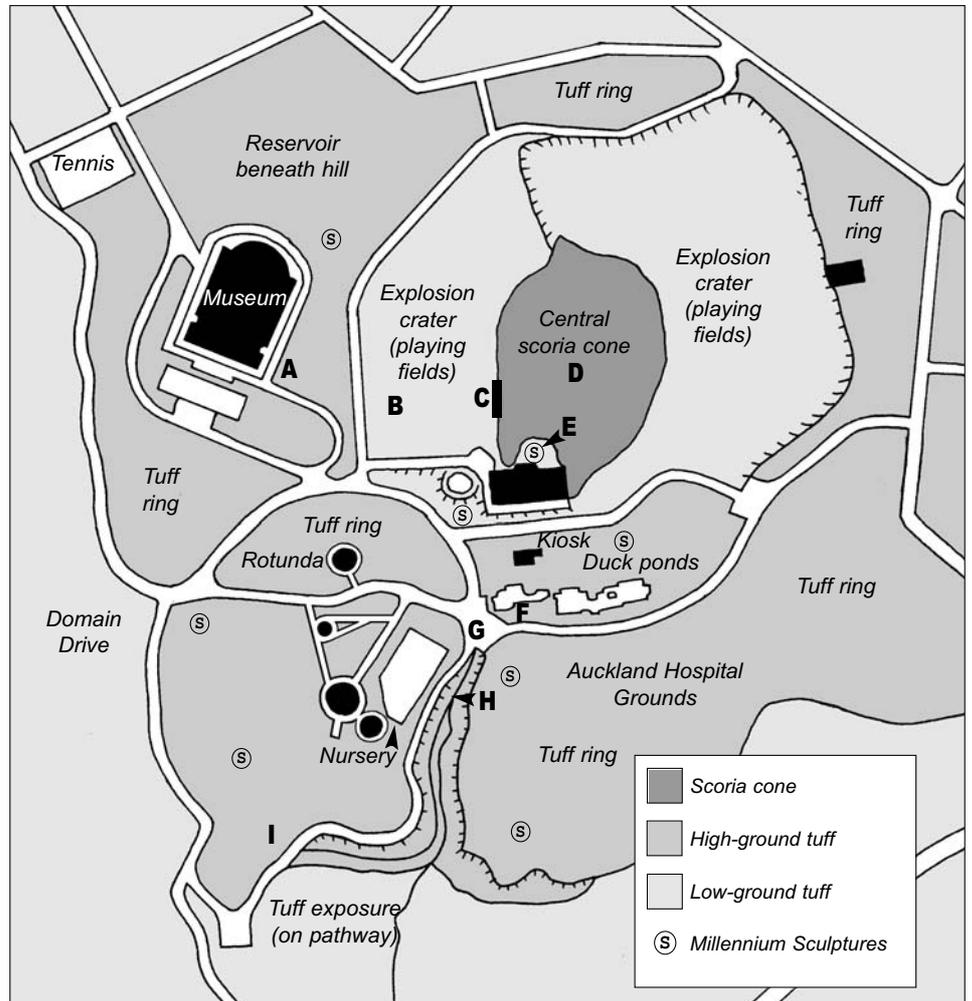
*What lava type was quarried here?*

*Why do you think concrete was used to line the bottom of the Fernery ponds and not the other rocks that are there?*

### Duckponds

Walk between the two ponds. Cross the road at the kiosk end of the duckponds [F]. Look for the “Forest Walks” sign [G]. Walk down the track called Lover’s Walk.

Look at the basalt blocks that lie in the stream.



Auckland Domain

*Why were they placed there by council staff?*

Basalt blocks were used to form steps on the path [H] (as well as the edges of many roads in Auckland).

*Where do you think the stream lava blocks came from and who would have quarried and shaped them?*

These rocks are not from the Domain, but from another volcano near by.

*Which volcano?*

### Tuff deposits

Take the right hand track just before the second bridge over the stream. Just before the track divides again (the Glade and Lover’s Walk Link), look at

the tuff deposits on the right, beside a big rimu.

*What colours make up the tuff layers?*

The green colour is not part of the tuff.

*What could be causing this colour?*

*Can you see any layers? What do you think might have caused the different layers to form?*

Take the Glade path uphill up the steps and back to the road [I]. Follow the road back up past the Nursery. You can now look at the rotunda, the sculptures, and gardens or return to the museum. A self-guided sculpture walk is available from the Museum Information Desk.