# Geothermal Page

**Geothermal Valley**

There are over 500 pools and 65 geyser vents, each with their own name, are found in the 70 hectare Te Whakarewarewa geothermal valley in Rotorua.

Our traditional Maori explanation of Te Whakarewarewa Geothermal Valley states that this place was one of the area’s ‘Te Pupu’ and ‘Te Hoata’, the Goddesses of Fire, emerged from the earth’s core while trying to find their brother Ngātoro-i-rangi, who was stranded on Mount Tongariro. As they rose to the surface looking for their brother, they left part of the fire they carried, creating geysers, hot springs and mud pools, creating the geothermal activity that remains today.

**Mud pool**

The mud pool is the result of acid gases and steam that cause the decomposition of minerals (feldspars) to form a clay called kaolin. Kaolin is white when pure, but finely divided black sulphur turns it to grey.

The activity varies with the amount of rainfall, but the temperature of the steaming bursts of mud is approximately 90-95 degrees Celsius (194-203 degrees Fahrenheit).

This mud pool is also known as the “Frog Pool” because of the similarity between the plopping mud and leaping frogs.

Some pools contain mud with medicinal properties that are used to treat skin, rheumatic and arthritic ailments. Māori traditionally used the mud to treat stomach infections by mixing a small amount with water and drinking it.

Mud pools are created in areas that have limited hot water, but abundant supplies of steam and rock.

That “pongy” smell Rotorua is famous for is due to hydrogen sulphide released by geothermal features. When released into the air, the hydrogen sulphide reacts with oxygen, creating sulphuric acid. This acid has the ability to dissolve rock into fine particles of silica and clay, and when combined with a small supply of water, a mud pool is created.

The Rotorua Thermal Mud used in face masks and other beauty products is sourced from mud pools about ten times the size of Ngāmōkaiakoko Mud Pool. You can purchase some of these products from Te Puia’s Gift Shop.

**Pohutu Geyser**

Our main geyser is called “Pohutu” which means “Big splash” and erupts up to heights of 30 meters. Pohutu is semi-predictable, as she plays 15-20 minutes after another of our active geysers. According to Maori culture, geysers are viewed as gifts from the gods

To the left of Pohutu (when viewing from the bridge) is the “Prince of Wales Feathers” Geyser – named after Prince Edward Albert visited here in the 1900’s. It was traditionally named the “Tohu” or sign as it usually plays 10 mins before and then simultaneously with Pohutu and reaches heights of up to seven metres (almost 23 feet).

The “Kererū” Geyser erupts every few days from the blackened crater closest to Puarenga Stream. The fan-shaped jet can reach heights of up to 15 metres (just over 49 feet). It is named after the New Zealand Pigeon.

Geysers act like a giant pressure cooker on earth, shooting boiling water and steam into the air.

All geysers have three components; an intensive heat source, a constant supply of water and an underground plumbing system.

As rainfall fills the intricate plumbing system below the earth’s surface, molten rock rapidly heats the water.

The water is under significant pressure causing the boiling point to be well over 125 degrees Celsius.

As pockets of water become turbulent, the pressure is relieved by violently shooting steam and water into the air with tremendous force.

# Learning Offered Page

**National Weaving School (Te Rito)**

Harakeke (Flax) is unique to New Zealand and is one of our most ancient plant species.

When our ancestors arrived to New Zealand they quickly discovered that flax could be woven to make clothing, housing materials and decorative tūrapa (panels) for their houses.

Two native species of flax both come from the lily family. Harakeke (common flax) grows up to three meters high and has firm, long leaves with a fine muka fibre, ideal for all types of weaving. Wharariki (mountain flax) is found along coast lines, growing up to 1.6 meters with softer leaves and less fibre than harakeke.

At the National Weaving school, students are taught the skills and traditions of a craft hundreds of years old. “I believe weaving can only be learnt the old way - by sitting, by listening, by touching and by doing,” says head of the weaving school, Edna Pahewa.

As well as learning how to weave harakeke (flax) and other materials, students learn the stories and designs unique to each iwi (tribe), as well as the Māori protocols associated with weaving. These include planting according to the phases of the moon and reciting prayers of thanks for flax and trees used.

Te Rito is named after the baby shoot that sits deep at the heart of the flax. That baby is the inner three shoots when cutting the flax as they are the nucleus - the family unit too precious to be broken. Without these shoots, the flax will lose its identity.

Māori used various art forms to record their histories and stories, preserving them for future generations. Weaving patterns and styles were designed to symbolise particular stories and these were handed down within a family or tribe.

**National Carving School – Te Wānanga Whakairo**

In 1967, the first intake to the National Carving School began the task of learning the disciplines of their Māori ancestors. Among those students was Clive Fugill, the man who would become master carver of the institute today.

“I’ll never forget that first day,” says Clive, “Our master carver, Hone Taiapa, looked at us all and said, “you are here to learn the art to pass it on to generations. Keep it alive for we could lose our identity.” It was exciting to be playing such an important role to save Māori art,” says Clive, “everyone has a reason in life. This was my reason. And that’s why I’m still here over 40 years later. If we lose our arts and crafts we lose our identity.”

Today fulltime carving students study for three years at the national carving school, under the guidance of those, such as Clive Fugill and James Rickard, master carvers at Te Puia who were once institute carving students themselves.

The protruding tongue, as used in the haka (war dance), is intended as a symbol of defiance, determination and strength, however in many carvings it can also symbolize the oral nature in which information was passed on from generation to generation.

Here at Te Puia we offer you the chance to take away traditional Māori carvings; beautiful handcrafted pieces made at our National Carving School. Look for the Te Puia Official Mark of Authenticity. We also accept carving commissions.

**Wooden Hand Clubs**

Before Europeans and European weapons arrived in Aotearoa, Māori warfare mainly involved hand-to-hand combat. Warriors used many different hand weapons, including taiaha (fighting staffs), pouwhenua (pointed staffs), tewhatewha (axe-like staffs), tao (short spears), huata (long spears) and patu (clubs). The long weapons were carried, and the small clubs were often tucked into a belt. Special weapons were sometimes given names and passed down through generations.

Wars could be fought over land and resources, but also as utu (revenge) or to increase mana (prestige). There were many traditions and rules to be followed during battles in earlier times. War parties (taua) could range in size from a small group to a few hundred people. Most battles took place in the summer months after the harvesting of crops was completed. The element of surprise was important, so raids often happened at dawn.

Though there were deaths and injuries as a result of skirmishes in pre-European times, the numbers were very small in comparison to the slaughter that occurred when muskets became available.