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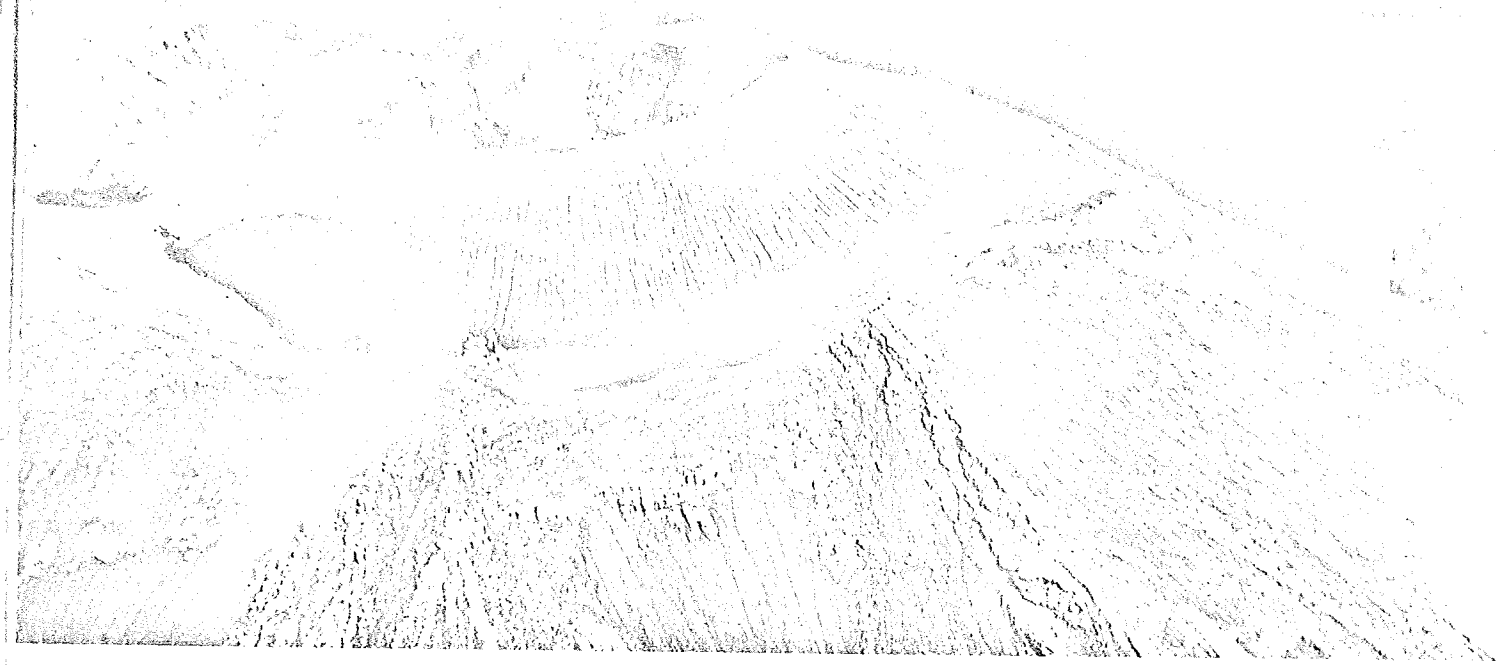

Above: aerial view of the active Mt. Ngauruhoe crater, photographed in January 1973. Below: the Pohutu Geyser at Whakarewarewa Thermal Reserve near Rotorua.

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New Zealand's volcanoes create power

E.W. Gordon

Many visitors to New Zealand leave with the impression that they have visited one of Earth's safety valves. They remember the boiling mud pools and geysers, the stream pouring from cracks in the earth's surface, and smoking volcanoes.

New Zealanders, however, rarely think of their country in these terms. Most of them have visited the thermal areas to see those mud pools, which so much resemble pots of boiling porridge, and to gaze in awe at the great volumes of steam pouring unceasingly from the earth; but,

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Above left: another geyser playing at Whakarewarewa Thermal Reserve. Above right: the "Steaming Cliffs" at Lake Rotomahana near Rotorua.

as they point out, the thermal area is a relatively small portion of New Zealand's surface area and most of the people live some distance from it.

The active volcanic area of New Zealand is about 150 miles long and 20 miles wide. It extends northeast across the centre of North Island from the still active mountain triplets, Ruapehu, Tongariro and Ngauruhoe to the coast and another 25 miles or so across to White Island in the Bay of Plenty which is the tip of a still active volcanic cone, periodically sending forth billows of ash and steam.

There were once sulphur works on the island, but in 1914 a mud flow from the crater swept them and 12 sulphur workers into the sea.

Within the thermal area, as well as in other parts of New Zealand, there are many volcanoes which are classified as extinct. New Zealanders can never be entirely sure, however, that their extinct volcanoes have completely ceased activity.

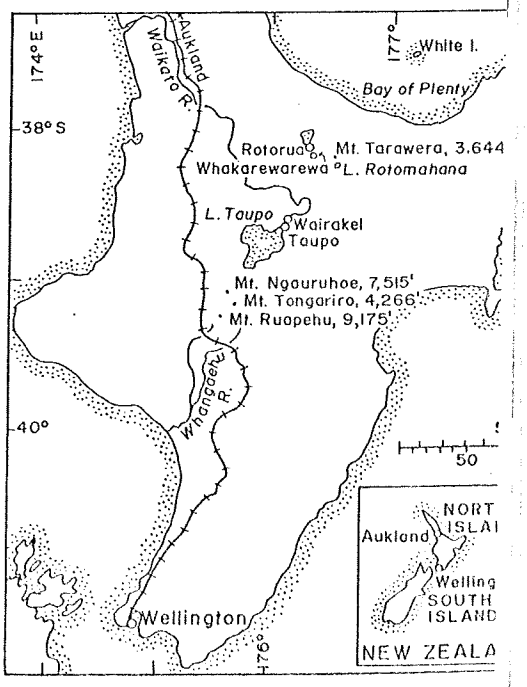
Mt. Ruapehu was thought to be extinct until 1945 when a red hot plug of lava rose in the crater lake. The same mountain indirectly caused the deaths of 151 people in 1953 when a huge volume of water and ash was suddenly discharged from the crater lake into the Whangaehu River. This monster wave pushed over the piers of a railway bridge on the main trunk line causing the derailment of the Auckland-Wellington express.

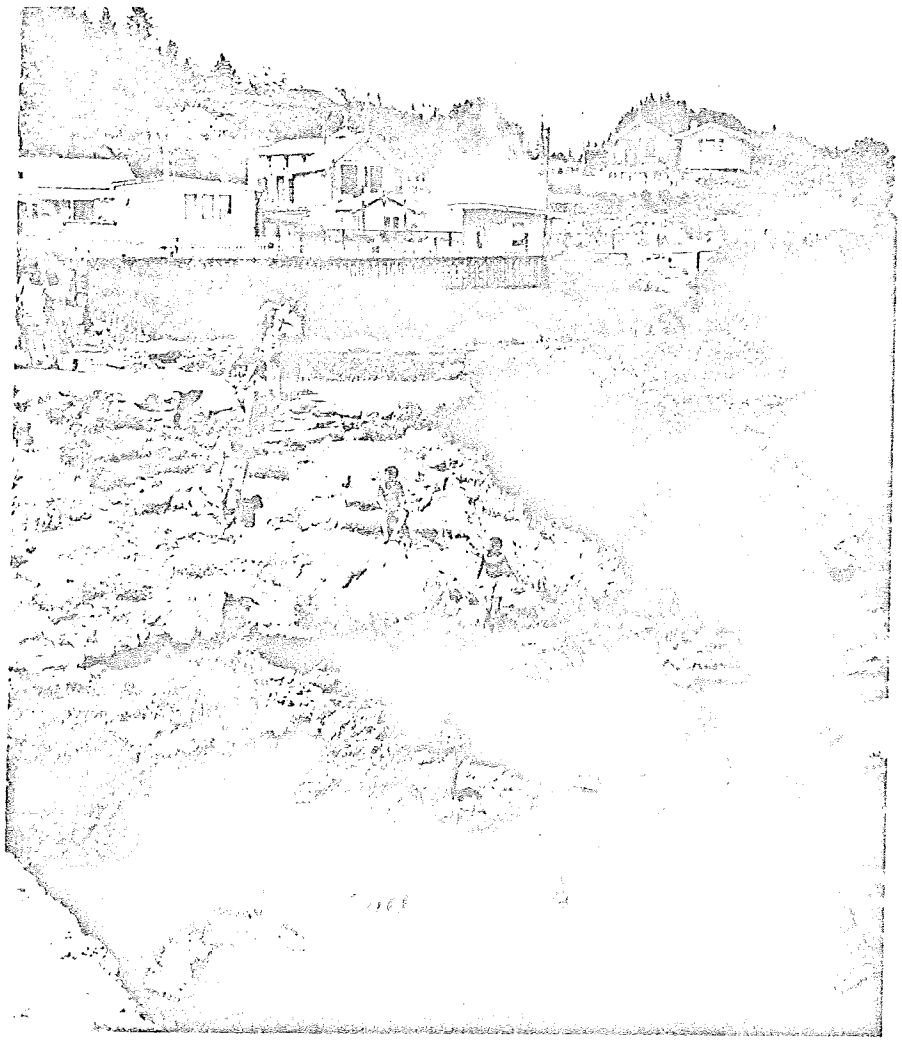
Ruapehu's neighbour, Mt. Tongariro, is the "old man" of the area. On its flank a symmetrical conical mountain called Mt. Ngauruhoe has grown, a mountain which continues to be the most active of New Zealand's volcanoes, periodically emitting clouds of ash and steam and occasionally some lava.

The most disastrous eruption in New Zealand's recent history occurred on June 10, 1886, when a nine-mile line of craters across Lake Rotomahana and the summit of Mt. Tarawera were blown out. Several Maori villages were buried and about 130 people were killed. The famous Pink and White Terraces, deposits formed from hot springs by the lake side, were also buried. One of the villages which was buried during the eruption has since been dug up and can now be visited. Some of the more notable remains from the village are kept in the nearby Rotorua museum.

As well as infrequent eruptions, New Zealand's thermal area provides the country with many assets.

The Wairakei steam fields, formerly regarded as a treacherous and noisy no-man's-land, have been converted into electricity-producing





Above: Mt. Ruapehu with a hotel, The Chateau, nestling in its foothills. Left: children diving for coins in the river at Whakarewarewa. In the background is Whakarewarewa Maori village (Whaka).

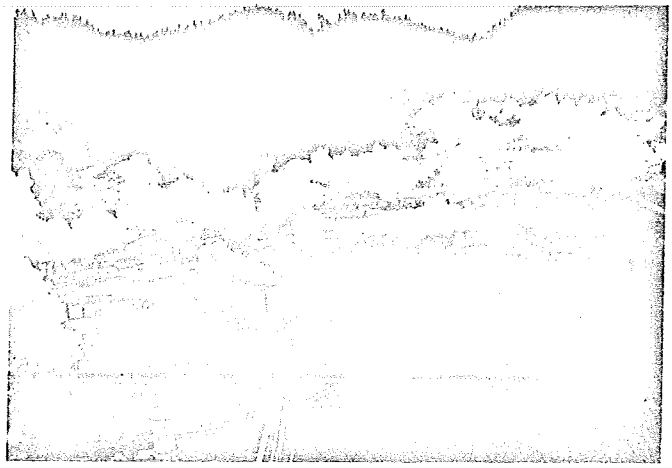
wonderlands. The steam which once escaped thunderously into the atmosphere though cracks in the earth has been harnessed, silenced, and directed by aluminum pipes to the Wairakei geothermal power station built on the banks of the Waikato River.

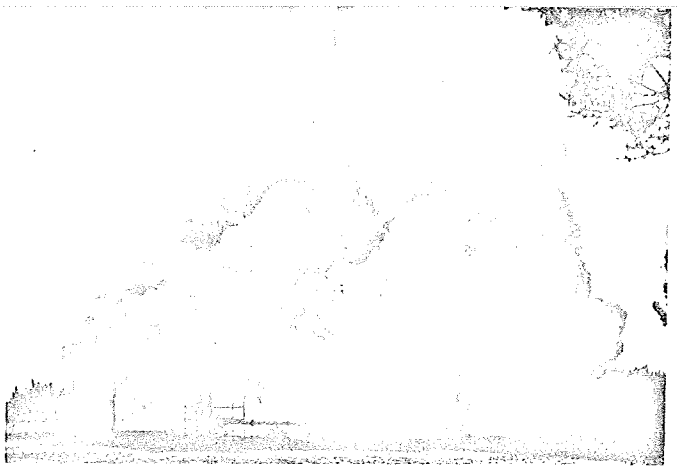
New steam bores have been drilled to harness the energy of the vast underground water system heated by very hot, perhaps molten, rocks. The bores, usually drilled to a depth of 2,000 ft., release the pressure on the water below which boils giving off steam at pressures of up to about 160 lb. per square inch.

The Wairakei power station currently provides 10% of New Zealand's electricity needs, more than any other single station.

The thermal area has become one of New Zealand's major tourist attractions, and guided tours are conducted around many of the steam fields including Wairakei.

One of the most famous areas is





Above left: aluminum pipes carry steam from the Wairakei steam fields to the geothermal power station. Excess steam is silenced then released. Above right: New Zealand's second geothermal steam field at Broadlands in the western Bay of Plenty.

Whakarewarewa, where narrow wooded paths lead over boiling mud pools; steaming clear-blue, bottomless water baths; spouting geysers and hissing sulphurous air vents. Children dive off the bridge leading to the area for coins thrown in the river below.

Maori guides from the village at Whaka lead guided tours around the area, stopping at the Maori Art and Crafts Centre there. Here young Maori men and women learn their traditional arts of carving, weaving, and the making of traditional costumes.

Another asset the thermal area provides is the hot mineral water springs. The therapeutic value of these waters was first recognised by the early Maoris who used to rest their weary bodies in the soothing Wai-ariki-wai-ora, the warm waters of healing.

Swimming pools have been built around many of these springs, especially in the cities of Taupo and Rotorua. Some of the pools are large and use cooler water to prevent swimmers from becoming exhausted. Others are small and private with temperatures high enough to discourage swimming. Some even have television at the poolside, providing the ultimate in relaxed viewing. These pools are popular with the public all year round but especially in the cooler winter months.

New Zealanders may be happy to see their volcanoes cease activity, but if the steam fields, geysers, mudpools and thermally heated water suddenly disappeared, there would be a universal cry of dismay. The advantages of having a thermal region appear in most New Zealand eyes to outweigh the disadvantages.

Below left: Wairakei steam field; shown right are the seamless insulated pipes which carry the steam 1.5 miles to Wairakei geothermal power station. Below right: vegetation in the foreground of this picture, taken in the thermal park near Rotorua, has been killed by sulphurous water and heat.