Wangaehu River. Similar beds outcrop in the Waikato River just below the bridge on the Waiouru–Tokaanu Road. In many of the stream-valleys, and particularly along the Waikato River, beds of fluviatile gravels and conglomerates occur, and most of the valleys running into the Kaimanawa Range are similarly filled.

Igneous Rocks.—Lava-flows from the volcanoes have been numerous, and some have been very extensive. An early flow of dark vesicular andesite from Ruapehu reaches the Waikato River twelve miles away on the east side and extends at least six miles west of Ruapehu. The lavas range in colour from greyish to black, and in texture from coarsely crystalline to fine-grained, but are all hypersthene andesite. Black andesite pumice was found in the upper reaches of the Mangatoetoenui Stream. The lavas contain inclusions of greywacke, already referred to; but none of Tertiary rocks was found.

Evidence of recent activity of the volcanoes is shown by the covering of loose andesitic material which follows the contour of the underlying surface. The principal ash-showers and average thicknesses in downward order are—

Andesite ash from Ngauruhoe	Maximum 6 in.
White rhyolite pumice from vent near Lake Taupo	1 ft.–3 ft.
Thinly bedded steel-grey andesite ash containing leaves ..	1 ft. 3 in.
Fine brown andesite ash	3 ft. 6 in.
Andesite Lapilli	6 in.

In addition to these, several older coarse and fine showers, usually water-sorted, are exposed in some sections. In a few places on the western side of Ruapehu two older showers of fine andesite ash containing roots were observed.

The fine brown andesite shower extends over the whole of the subdivision, and beyond the limits of the Taupo shower forms the surface soil. It has a thickness of 2 ft. 6in. on the eastern boundary. The succeeding shower has been carried north and east from its source of origin. It is 9 in. thick on the Kaimanawa Range and slightly thicker on the north of Lake Roto Aira, but is absent at Waiouru and on the west of Ruapehu. Though branches and roots are rarely found, it contains numerous leaves resembling those of *Gaultheria* and *Nothofagus cliffortioides*, or mountain-beech; but their indentification is difficult. The overlying white rhyolite pumice shower covers the whole of the subdivision, though at Horopito it thins to a few inches. In many places it contains charred tree trunks and stems up to 6 in. in diameter.

Unlike the previous showers, the andesite shower from Ngauruhoe is unconsolidated. It extends beyond the boundaries of the subdivision as a thin coating on the soil.

Volcanoes.

Ruapehu.—Apparently there was originally one large crater on Ruapehu, the northern and southern limits being Ruapehu and Te Heuheu, peaks on the irregular crater-rim. As the result of a later explosion two craters were formed within the large crater, the eastern one being bounded by a line passing through Scoria Peak, Cathedral Rock, Mitre Peak, and the spur leading to Mitre Peak, and the western one by the rim of rocks enclosing the Crater Lake. Possibly a third crater lay between Mitre and Girdlestone peaks, on the south-eastern corner of the mountain. The names "East Crater," "West Crater," and "Girdlestone Crater," respectively are proposed for these. The eastern edges of East and Girdlestone craters have been blown out, and West Crater is now the most clearly defined.

The most impressive feature of the mountain-top is the Crater Lake, a circular basin having a diameter of about 30 chains. Lying towards the eastern edge of West Crater, it is bounded on the south and west sides by vertical cliffs of ice; on the north-east side the original lava walls are visible; on the east is a cinder cone rising to a height of 250 ft. above the level of the lake. The strongly acid water has a chalky green colour and emits a sulphurous smell. The temperature of the water at the south-eastern corner of the lake at the time it was visited (April, 1930) was below blood-heat. No steam was seen rising from the lake, nor was the water swirling; previous observers have, however, recorded both these phenomena, indicating higher temperatures. The result of an analysis by the Dominion Analyst of a sample of the water is shown in column 1 of the following table. Column 2 shows the analysis of water from the Wangaehu River, collected four miles east of Crater Lake, and columns 3 and 4 shows both analysis reduced to a percentage basis.

		Total Dissolved Solids in Parts per 100,000.		Percentage Composition of Dissolved Solids.	
		1. Crater Lake.	2. Wangaehu River.	3. Crater Lake.	4. Wangaehu River.
Ammonium chloride	NH_4Cl	2·4	0·4	0·3	0·3
Potassium chloride	K Cl	6·3	1·1	0·8	0·8
Sodium chloride	Na Cl	65·6	10·8	9·0	7·7
Calcium chloride	$CaCl_2$	143·0	32·1	19·5	22·9
Magnesium chloride	$MgCl_2$	82·3	16·9	11·3	12·1
Ferric chloride	$FeCl_3$	16·9	4·0	2·3	2·9
Aluminium chloride	$AlCl_3$	84·7	1·5	11·6	1·1
Aluminium sulphate	$Al_2(SO_4)_3$ ..	104·9	46·4	14·4	33·2
Sulphuric acid (free)	H_2SO_4	194·1	20·9	26·6	14·9
Silica	SiO_2	29·8	5·6	4·1	4·0
Total dissolved solids	.. ..	730·0	139·7	99·9	99·9