

vertical dips are not uncommon. Though the tilted blocks may be so disposed as to simulate folded strata, few, if any, anticlines or synclines exist, and careful examination generally shows that the apparent major folds have been fractured by faults along the crests or troughs.

The west and north-west portions of the area consist of the highlands forming the Brunner and the Victoria ranges, south of the Buller, and the Lyell range, north of that river. These elevated earth-blocks are bounded by faults on both sides. The highlands north of the Buller are drained by the headwaters of the Matiri, and by the Newton and Lyell rivers. The Little Deepdale and the Big Deepdale are the main drainage-channels of the highlands to the south.

That part of the Murchison depression examined is roughly triangular in shape, with a base extending between the headwaters of the Tutaki and Big Deepdale, and an apex five miles due north of the Owen-Buller junction. It is drained by the Maruia, Matiri, Matakītaki, Mangles, and Owen rivers, and by that portion of the Buller between the junctions of the Maruia and Owen.

High-level terraces are conspicuous in the valleys of the Matakītaki, Maruia, and Big Deepdale, and along the Buller from Longford to and beyond the boundaries of the subdivision. The most extensive of these averages in height about 1,000 ft. above the present drainage-levels. In the vicinity of the Maruia-Buller junction and thence down-stream to the Lyell, this terrace is well marked. Terrace-remnants of different heights up to this 1,000 ft. level occur in several of the main valleys.

Small lakes dammed by land-slips are present in Blue Duck Creek, in the Eight-mile (a tributary of the Matakītaki), and in the Matiri River. The most extensive is Lake Matiri, which has an area of 150 acres.

PRINCIPAL FAULTS.

From near the Buller-Gowan junction the Tutaki fault has a south-west course to a point three miles south-east of Mount Murchison, whence it swings to the south-south-west, and follows the Mangles and Tutaki valleys, determining the contact of the igneous and sedimentary rocks. It is a reverse fault, the plane dipping at an angle of 60° to 65° to the south-east. The Tertiary strata close to the contact usually dip at from 70° to 80° in the same direction.

The strong fault separating the granite of Mount Murchison from the Tertiary to the west strikes south-west into the younger rocks and three miles south-west of the mountain divides into three branches. The east branch strikes south-south-west and passes about 20 chains west of Noel Peak. Near Mr. Lyon's house, in the Mangles Valley, the throw diminishes and the strata appear to be folded into a syncline; but variable strikes occur west of Page Morel Trig., indicating the probable continuation of the fault south of the Mangles. The middle branch of the fault strikes south-west and passes some 40 chains west of Mount Harte. Near the Blackwater-Mangles junction the fault-zone is 60 chains wide. From here it strikes more to the south and continues up the Blackwater Valley, apparently with diminishing intensity. The west branch crosses the Mangles Valley a mile and a half above the junction of the Blue Duck Creek, and continues beyond the headwaters of that stream into the headwaters of the Six-mile, a branch of the Matakītaki.

The fault following the Buller Valley from Owen junction to Longford continues south-west to and beyond a point near the Glenroy-Matakītaki junction.

The lower course of the Matiri is a fault-line valley. The fault strikes north-east and passes beyond the subdivision into the Wangapeka basin. Its continuation south of the Buller is obscure, but it probably runs up the Matakītaki Valley for two or three miles. Another north-east-striking fault determines the course of the headwaters of the Matiri River.

In the Deepdale, lower Maruia, and Buller valleys narrow strips of steeply dipping and more or less crushed Tertiary strata extend north-east and north-north-east along fault-zones traversing the granites of the western part of the subdivision.

The Boundary Peak fault of Bulletin No. 18 enters the subdivision three miles south-south-west of that mountain and, striking north-east, separates the Lyell and Mount Glasgow ranges.

GENERAL GEOLOGY.

The following table shows the subdivisions of the strata within the area examined:—

Approximate Age.	Series.	Subdivision.	Thickness.	Description.
Recent and Pleistocene	..	..	..	Fluvio-glacial gravels, varved clays and silts, fluvatile gravels.
<i>(Unconformity.)</i>				
Miocene and Oligocene	Oamaruan ..	Upper beds	10,000 ft.	Conglomerates and coal-seams ; arkositic sandstones, grits ; mudstone, argillaceous sandstone, banded sandstone.
		Middle and lower beds	6,000 ft.	Limestone, mudstone, and banded sandstone ; calcareous claystone and mudstone.
<i>(Disconformity.)</i>				
Eocene	Mawheranui	Kaiata beds	1,700 ft.	Conglomerate, calcareous mudstone, argillaceous sandstone, carbonaceous mudstone.
		Brunner beds	700 ft.	Arkositic grits, conglomerates, sandstones and shales with small sub-bituminous coal-seams.
		Hawk's Crag breccia ..	150 ft.	Breccia of angular and sub-angular argillite, greywacke, quartz and schistose rocks.
		<i>(Unconformity.)</i>		
Ordovician	Aorere .. ..	.. ..	..	Greywacke, argillite, hornfels, phyllite.
Post-Ordovician and pre-Tertiary	.. ..	Igneous rocks .. ..	.. ..	Basic dykes, acid dykes, granite, diorite quartz porphyry, gneiss.