shows a flat-dipping "slide" immediately below the 520 ft. level of the pumping shaft; (3) the longitudinal section of the workings (plan 3 above) shows a "slide" cutting the 520 ft. level about 180 ft. west from the cross-cut; and (4) the flat-dipping fracture "B," if continued east on the same strike as observed in the adit, will pass very close to the position of the "slide" in (3) above. The evidence is fairly conclusive that fracture "B" is the slide below which the Cromwell lode has not been prospected. The amount of movement on this fault cannot be determined from the information available, and the direction of movement on the fault is not known.

According to the Hosking longitudinal section the Cromwell lode immediately over the adit is worked to a depth of about 200 ft. from the surface or to about 170 ft. above the adit. Eastward the workings and explorations are deeper, and about 12 chains north of the adit are at the same level. (The extension of the 520 ft. level west to beneath the battery site as shown in plan No. 2 is not supported by other evidence and is not regarded as real.) The unexplored country beneath the old workings above the adit seems to be well worth prospecting. A rise from a point 160 ft. south from fracture "A" should reach fracture "B" near where fracture "B" cuts off the downward continuation of the Cromwell lode at a height of about 40 ft. above the adit. The rise should be continued to 60 ft. above the the adit, cross-cuts put out north and south to find the Cromwell lode, which could then be further explored.

About 50 ft. back from fissure "A" an inch fracture dipping flatly north, when first reached, discharged much water, which deposited hydrated iron oxide freely. Later the flow greatly decreased, and the water-level in the 520 ft. shaft, 15 chains eastward, fell. The fracture is subparallel with fissure "B" and may have been formed at the same time.

The origin of the lodes of Otago was discussed in the annual report of the Geological Survey for 1935, and it was pointed out that practically nothing is known of their behaviour in depth. The Cromwell lode was by far the most productive in Otago, and the long adit provides an excellent opportunity of getting definite information that cannot but be of value in the investigation of other lodes occurring in the schists of Otago and Marlborough. In the writer's opinion the chances of a payable deposit are small, but almost certainly the majority of other geologists do not accept his views on the formation of these lodes. The work recommended would help to determine if the lodes in schist carry ore below the influence of downward seeping waters; if ore continues in the Cromwell lode to fracture "B," the direction of movement along this fracture would be ascertained.

GLENORCHY DISTRICT.

By J. Henderson.

The Village of Glenorchy is built on the flats at the head of Lake Wakatipu, on the east shore at the mouth of the Rees River. The north arm of the lake, eighteen miles long, has a straight course striking a few degrees west of north. It averages about two miles and a half across, though in places nearly four miles wide. The shores are remarkably straight. On the west side the deltas of the Von and Greenstone rivers project in narrow segments and on the east those of Simpson Creek and the Buckler Burn; but the projections are slight and the neighbouring indentations cannot be described as bays. The underwater contours are not so simple, and Pigeon Island, five miles from Glenorchy, and its two neighbours rise from a subaqueous promontory which extends from the west side half-way across the lake, which is here at its widest, and encloses a deep narrow inlet opening south.

The Dart and Rees rivers enter at the north end and their valleys extend the depression northward; indeed, for five miles their combined delta forms the lowland between the valley walls. The Dart Valley extends north in line with the north arm for a farther ten miles, but that of the Rees diverges slightly toward the east.

Mountains.

Mountains rise steeply on both sides. On the east the Richardson Range extends along the north arm of the lake and the east side of the Rees to Centaur Peak (8,284 ft.), a distance of thirty miles. The divide is generally less than four miles east of the lake and valley, and short torrents cut the highlands into sharp peaks. Mount Larkins, six miles east-south-east from Glenorchy, rises to 7,324 ft., and few of the crests are less than 6,000 ft. above sea-level.

On the west side the mountain rampart is more massive and formidable, the peaks are higher, and the streams larger and more widely spaced. The Greenstone, which enters the lake five miles from Glenorchy, cuts right across the highlands to an easy saddle to the Hollyford; the passes at the heads of the canyon-like valleys of the Route, Rock, and Bean burns, tributaries of the Dart from the east, provide much more difficult access to the same river basin. South from the Greenstone the Thomson Range forms an unbroken wall on the west side of the northern arm of Wakatipu, and continuing south separates the Von and Mararoa valleys. The highlands north from the Greenstone are known collectively as the Humboldt Mountains, and these in the north merge into the Barrier Range, lofty highlands of which the east-west reach of the upper Dart drains the southern flank. The great Bonpland ridge, extending unbroken for fifteen miles between the gorges of the Greenstone and Route Burn, rises to a height of 8,102 ft. in vast precipitous slopes over against Glenorchy. North of the Route Burn, the chief peaks of the Humboldt Mountains, are Somnus (7,424 ft.) and Cosmos (7,340 ft.), the latter by some considered part of the Barrier Range.

The highlands between the valleys of the Dart and the Rees constitute the Forbes Range. The former stream swings round their north and west sides and the sources of the Rees are largely fed from their northern part; the main Rees valley lies east of their irregular southern part, the vast massif of Earnslaw (9,200 ft.). This much-dissected plateau overlooks Paradise Flats, an old course of the Dart, which separates Mount Earnslaw from Mount Alfred (4,548 ft.), the isolated peak rising between the delta plains of the Dart and Rees.