that the country containing the known part of the lode, and east of the fault, has been let down relatively to the country west of the fault. The numerous faults that traverse the country close to the Main fault are probably in large part subsidiary fractures produced by the distortion and shattering of the country. Some information is available in regard to several of these faults, which strike and dip in all sorts of ways, but since their nature and distribution in no wise affect the position of the lode beyond the Main fault they need not be further discussed.

There can be no doubt that the Progress lode is cut off in depth by a fault, which, striking north-north-west and dipping east-north-east, has depressed the block of country east of the fault, in which is the known part of the Progress lode, relatively to the country west of the fault and forming its footwall. The bulk of the writer's work on this visit was directed to tracing the Main fault on the surface and to ascertaining to what extent the footwall country was shattered. In Oriental Creek, west of the fault, the rocks are much crushed, as is also the case along Devil Creek from the junction of Union Creek, 20 chains down-stream, to a point 10 or 12 chains west of the Old Progress battery. The presence of this crushed country caused the writer to state some years ago (N.Z. Geol. Surv. Bull. 18, 1917, p. 159) that the belt of disturbed country west of the Progress workings was 25 to 30 chains wide. A closer examination has shown that the crushing of the strata in Devil's Creek west of Union Creek junction is due to a fault striking along the stream-valley a little north of west and dipping steeply northward. This fault is thought to have been formed at the same time as the Main fault. The west crosscut from No. 10 level west of the Main fault penetrated disturbed country, which became more broken the farther west it advanced. According to Mr. R. Stewart, the last 160 ft. of the crosscut followed an east-and-west "track" or fracture along intensely crushed strata. In other parts, however, the footwall country is relatively unbroken. Thus No. 2 Old Progress adit is driven through greywacke, solid save for a few minor pug bands. Fossicker Creek, immediately south-west of the Main fault, for more than 20 chains traverses unbroken and regularly dipping strata. The road along Progress Creek exposes a section in which the regularly dipping strata are traversed by two or three minor fractures. Thus, except for the east-south-east-striking fault along part of the valley of Devil Creek, the country immediately west of the Main fault is, on the surface, almost undisturbed. In depth, in the neighbourhood of the lode where the country is softer and less resistant, there will probably be more disturbance near the fault than at the surface. But such disturbance should offer no great difficulties to prospecting and mining, seeing that the ore was followed right up to the main fracture through a wide belt of country shattered alike on the surface and in depth next the lode.

The amount and direction of the displacement along the Main fault are important matters, and unfortunately there is little evidence bearing on these points. On direct underground evidence the vertical displacement is at least 150 ft. Surface features near the outcrop of the fault on the ridge between Devil and Oriental creeks suggest a vertical movement of about 200 ft. But this estimate is not reliable. The horizontal component of the fault-movement is not likely to be great. The change in direction of the fault forms a slight embayment in the footwall mass, from which the corresponding projection in the hanging-wall mass would not readily be displaced. For this reason the amount of horizontal movement along the fault-plane was probably small, and any horizontal movement that did take place would shift the hanging-wall mass containing the known part of the Progress lode a little northward relatively to the footwall block.

The average battery extraction from the ore of the Progress lode was about £2 per ton, and a yield of this amount from large ore-bodies such as characterize the Progress shoots is payable even with the present abnormally high costs of labour and materials. The ore won from the lode during the last dozen years has been of decidedly lower grade, for the reason that the bulk of it was mined from the Middle shoot, which, on the whole, contains a lower proportion of high-grade ore than the Progress and Dam shoots. These latter were cut off by the Main fault at a less depth than the Middle shoot, and so were exhausted earlier. It is axiomatic in mining that the largest and richest ore-body has a limit in depth. But some types, to which those of the Reefton district belong, are much more persistent than others. As far as the lodes of the Reefton mines are concerned, all have maintained the size and gold-content that characterized them near the surface.

The explanation advanced for the termination of the Progress shoots in depth could be most cheaply tested by diamond-drilling from the surface. If the mine were working, prospecting from suitable points in Nos. 9 and 10 levels would be recommended; but if the whole cost of the maintenance of a surface staff is to be added to the prospecting cost the increased depth of drilling from the surface would be more than offset. Diamond-drilling in the Progress Mine has hitherto not been found a satisfactory method of prospecting, for the reason that nearly all the drilling has been done in the much-disturbed country east of the Main fault. In such country the cost is high and cores are difficult to obtain. Better results would undoubtedly be obtained in less broken country. Two sites, one on either side of Devil Creek, and a chain or so on the footwall side of the Main fault, are suggested, so that boring through the east-south-east fault along Devil Creek may be avoided. From the boring-sites, holes parallel with the plane of the Main fault should radiate so as to explore the country west of the fault and above the points where the shoots were cut off, the bores from the more northerly position being all north of the Devil Creek fault, and those from the southern all south of it. The boring-sites will be from 1,250 ft. to 1,350 ft. above sea-level, according to the position selected. The three principal shoots terminated against the Main fault at varying depths, the Progress shoot (50 ft. below No. 9 level) at 520 ft. above sea-level, the Dam shoot (about No. 10 level) 420 ft. above sea-level, and the Winze and South blocks parts of the Middle shoot (about 60 ft. above No. 11 level) 330 ft. above sea-level. To obtain the heights at which the downward extensions of the shoots reach the fault-plane the amount of the vertical displacement must be added. This is an unknown amount, but is at least 150 ft. But it is advisable that the bores