and these waters might deposit new minerals in the cres, or might rearrange and concentrate the ore minerals already present. Conclusive evidence on these points has not yet been obtained. Such as there is, seems to disfavour the first and support the second or third hypothesis.

Denudation has been heavy, so that the present surface is probably far below what was the surface when the lodes were formed; a large amount of this denudation was no doubt accomplished by the Cordilleran glacier. The source of the solutions was deep-seated. It is reasonable to suppose that, in ascending, there was a level where precipitation commenced, another where it reached a maximum, and possibly, approaching the surface, still another where, on account of the waters having been largely robbed of their treasure, precipitation diminished. Ascending currents would be more likely to follow the underside of the dykes. One of the latest actions to be discovered in the lodes is the solfataric-like alteration of the rock and the formation of zeolites at certain points in the mines. Recent sinking to deeper levels (1,550 ft.), in the Le Roi and Centre Star, and prospect work on the lowest level of the War Eagle, have disclosed ore that compares favourably with any from the surface workings. Silica, however, appears to be increasing. In the Centre Star South lode, near the shaft, the sulphides are disseminated on the 7th level. On the 8th, there is a tendency toward concentration into shoots; on the 9th, the minerals are sufficiently assembled to constitute ore that continues with some improvement to the lowest workings, 200 ft. below the 9th level. In the Le Roi a similar condition is met with. The 1,350 ft. level (corresponding in elevation to the Centre Star 9th) shows the top of an ore shoot that improves in value to the 1,450-ft. level, and which has now been followed to the 1,550-ft. level, at present the bottom of the mine. These facts indicate either that there were original differences in the vertical distribution of values-just as there are horizontally, as shown by the difference in the grades of various stopes on the same lodes-or that, if secondary enrichment has taken place, it was produced by ascending solutions.

It is nevertheless true that outcropping veins often show some surface enrichment, in some cases to a considerable distance below the weathered surface. It is evident, from the discussion on the distribution of ore in shoots in the vein, that this does not mean that the ore of deeper workings will necessarily be of lower grade than that near the surface, but only that the grade of the ore of that particular part of the vein has been raised, perhaps very materially, by surface concentration. A better ore shoot at a deeper level, unaffected by surface action, might contain a still higher grade ore. Consequently, great care, and a close study of the conditions in any given case, are necessary, before drawing conclusions as to the probable grade of ore to be expected below.

FUTURE PROSPECTS.

Since enrichment by descending waters does not seem to have been of great consequence in these lodes, except in some cases superficially, and since the mineralisation has been accomplished by ascending hydro-

thermal solutions, there is, as yet, no apparent reason why pay ore should not continue in depth. The shoots followed on the main Le Roi-Centre Star lode give out between 800 and 1,050 ft., and have, so far, not reappeared below. Ore was lost in the War Eagle at about the same depth, so that for a time it appeared as if ore bodies might not occur at deeper herizons. But work on the South lode shows extensive mineralisation which improves in successively lower levels, and in the lowest levels, shoots with pay ore have now been located. As noted above, there are facts suggesting that where the Main lode is not heavily mineraliised, the solutions may have followed the South lode, i.e., that the main highway for the mineralisers was, in part of their course, the South lode, and, in part, the Main lode. Recently, Superintendent R. H. Stewart of the Centre Star-War Eagle mines, has found that below the 8th level, the War Eagle vein flattens to 10° or 15°, which throws the vein away to the north and accounts for the earlier failure to discover ore in the lower workings. Diamond drilling on these lower levels shows that the vein again straightens and that ore is continuous to the 11th and lowest level of the mine. A cross-cut on this level to the vein is said to have revealed good ore for a width of 20 ft.

Though it cannot be predicted to what depth pay ore will extend, it may be said that the prospects for deep mining in Rossland were never before so favourable as they are at present, and that operating companies are justified in pushing prospecting to deeper levels.

Notwithstanding the heavy shipments from the mines and the extensive prospecting done, there is still a considerable amount of promising ground above 900-ft. levels as yet insufficiently prospected, or even untouched. The mode of occurrence of ore shoots, already described, and the past experience of the mines, that following poor parts of the vein, horizontally and vertically and cross-cutting for parallel ore bodies, will often disclose good ore bodies, render it more than probable that certain portions of such areas contain ore. It should be remembered that little indication of pay ore may be found until the shoot itself is encountered. In one instance, two good stopes were separated by an interval of vein, which was indicated to be low grade by neighbouring ends of the two stopes, and by drill holes from the connecting drift (which was off the vein), yet a subsequent drift on the vein showed that a whole stretch between the two stopes was pay ore, except a couple of feet at the ends of the stopes and the points pierced by the drill holes. A large stope was opened up as the result of this discoverv.

Somewhat similar discoveries have been and are yet frequently made; ground thought to be valueless has proved valuable, and this will no doubt continue for some time. Mineralisation has been so heavy and so complicated that all the ground near the highly productive shoots is worth bold though judicious prospecting. Outside the producing ground, there are points that are worth exploration. For instance, the Le Roi-Centre Star vein east of the Centre Star gulch should certainly receive attention. Ore of good grade was shipped from the Iron Mask vein. The well