

tion of the surface of the rock is covered with earth and this again by a thick growth of coniferous trees and deep moss, it is reasonable to expect that many more will follow when the timber is removed and extensive costeaning is undertaken.

The Nipissing Company is installing heavy machinery for the purpose of pumping water from Petersons Lake to high levels, with a view to washing the earth entirely off the surface by the hydraulic process. This will allow of a complete search being made for the outcrops of the vertical silver-bearing zones, which are often inconspicuous at the surface and might escape discovery by the ordinary methods of prospecting.

From our present knowledge it would appear that the silver has a regional environment as well as certain local geological relations, resembling the mode of distribution of the richer nickel ores in the Sudbury district. There, outside of a certain area, although the geological conditions may be similar, no one ore rich enough to work can be found. Similar phenomena obtain in other parts of the world in regard to other metals, such as tin and mercury. Although diligent prospecting has been carried on throughout a large area outside of the silver district immediately around Cobalt, no discoveries of similar occurrences of silver have been made. I may, however, mention that traces of native silver have been discovered recently on the east side of Lake Timiskaming at a place which lies in a line with the northeasterly course followed by the successive silver mines in the centre of the Cobalt district. This discovery is close to the Wright silver-lead mine, which is in a very pronounced volcanic agglomerate. A thorough exploration of this part of the lake shore and the country behind it might bring out interesting results.

Small quantities of smaltite have, however, been found in different localities beyond the silver district. It now appears that the silver is not necessarily connected with this mineral. It has been mentioned on a previous page that in the Cobalt district the largest bodies of smaltite so far tested contain only traces of silver. Unless the conditions necessary for the production of the silver itself are repeated in some other locality no further important discoveries of this metal may be made in this part of Canada.

One of the most vital questions in connection with the silver mining in the Cobalt district is that respecting the depth to which the deposits may continue. The direct evidence afforded by the main vein of the Larose mine carries us down only 205 feet from the collar of the shaft, but the silver-bearing character of two other veins, which cut the 80 feet of agglomerate, etc., above the level of the collar, may be considered in this connexion, which would give us a depth of nearly 300 feet. The ore and rock brought up from the lowest workings of this mine show that the vein has undergone no ma-

terial change so far, being about equally rich and varied in its contents all the way down; but, as above mentioned, there is in the lowest workings an increase in the proportion of argentite, and the vein and its walls have a firmer and fresher character. Good-sized flattened nuggets continue to be found among the native silver. At the 800 feet level the line of fracture is marked by two parallel calcite veins of 5 and 7 inches respectively, separated by an interval of slaty tufa, rich in native silver, which also extends, as thin plates, into the wall-rock on either side, as far as four feet in some parts.

It may be reasonably supposed that the farther a vein can be traced on the surface, the deeper it is likely to go. Although nearly all the individual veins are small, they may be regarded as only one manifestation of a mineralized plane or zone of fissure or disturbance. The fact that these fissure-planes, or lines of fracture, are vertical, and that they coincide with the prevailing system of strong joint-planes are circumstances favorable to persistence in depth. The agglomerate and its associated rocks have been found, by means of the shaft and boring at the Larose mine, added to the height of the rocks above the shaft, to have a depth of at least 300 feet, but it may be much greater than this. The thickness of the jointed agglomerate may be found to have some influence, not only on the depth of the fissures, but also on their argentiferous character, as the silver appears to have been derived from the country-rock in which the veins occur. If the veins prove to pass down through the agglomerate into some underlying rock their silver contents may continue downwards with them.

If a comparison be made between the geological and mineralogical conditions at Cobalt, and those of the Thunder Bay silver region, it will be found that there are more points of difference than of resemblance in regard to the principal group of mines in the latter region, which embraces the Rabbit Mountain, Silver Mountain, Porcupine, Beaver and West End mines. In all these the silver occurs, both native and as argentite, in well-marked brecciated veins of quartz, which cut down through a heavy sheet of diorite into a great thickness of darkly colored unaltered shales, lying horizontally. These belong to the Animikie series, which is much newer than the rocks of the Cobalt district. The conditions at the Shuniah and Thunder Bay mines a short distance northeast of Port Arthur, have some resemblance to those of the mines just mentioned, and both of them were rich in native silver at the surface, but on sinking, it soon gave out. At the Silver Islet mine the conditions were quite different. A broad dike of a peculiar variety of diorite, which can be traced for miles parallel to the northwest shore of Lake Superior, cuts through a great thickness of nearly horizontal gray and nearly black unaltered shales. A very strong vertical calcite vein cuts this dike almost at right angles. Ex-