not so good as in the case of a polished surface, and isolated particles of the protected mineral which do not have some of the protecting mineral attached to them will readily dissolve.

Paragenesis—In a complex intergrowth of this sort it is impossible to separate different periods of precipitation. The growth of the various minerals has been, not in bands parallel to the direction of the vein, nor in concentric layers as we might expect if the mother solution varied in composition from time to time, but in a fibrous aggregate approximately normal to the vein wall and containing the individual minerals side by side. Apparently all the mineral constituents were being formed continuously during the whole period of precipitation, though the percentage of arsenopyrite appears to have increased toward the last. A rather slow, contemporaneous precipitation of the different minerals from a solution of fairly constant composition appears to be the most reasonable explanation of the formation of such an intergrowth.

Summary—There is good reason to credit the cobalt found in the analysis to safflorite. Arsenopyrite crystals were identified by blow-pipe tests and hence the sulphur may be assigned, in part at least, to arsenopyrite. The copper comes off in greatest quantity at first in separation experiments, and probably is present as an easily soluble compound with sulphur. The chief mineral constituent is löllingite.

In short, the material examined appears to be an extremely intimate intergrowth of several minerals closely related, chemically and crystallographically. It is not a single homogeneous mineral containing isomorphous replacing elements in molecular combination. On the other hand it has not been proved that the individual mineral components themselves are not subject to molecular replacement by isomorphous elements.

Arsenopyrite Crystals, O'Brien Mine

Crystals of arsenopyrite from Cobalt have been described and illustrated in Part II. of the Nineteenth Report of the Ontario Bureau of Mines.

The writer in dissolving away the calcite from some of the so-called glaucodot of the O'Brien mine found a residue of detached crystals up to 2.5 mm. across, which it was thought might be glaucodot, but which analysis proved to be arsenopyrite.

The crystals are of a habit which is rather unusual for arsenopyrite, the base being most prominent, followed in order by the prism ∞ (110), and small domes of (011) and 10 (101). The base gives multiple reflections and probably consists really of almost infinitely flat pyramids or domes. The drawing (Fig. 23) represents the type habit and characteristic development of the faces. The faces, especially the domes 01, $0\bar{1}$ are usually corroded, and only two crystals were found to give fairly good reflections. Besides the forms mentioned, which were definitely determined, there also occur corroded traces of the brachypinacoid and of a pyramid in the zone of the prism ∞. One crystal gave very poor readings for a prism which seems to be $\infty\frac{3}{2}$.