at depth, but at the present time most of us have found out that any such theory is not founded on fact. These minerals are found to be the matrix or gangue associated with the chalcopyrite ore, particles and masses of which are found shot through the bodies of magnetite and pyrrhotite, but I have never seen these minerals at depth give place to solid copper ores. On the other hand bodies of magnetite which carry a substantial percentage of chalcopyrite, theoretically almost pure, near the surface, sometimes give out entirely at depth leaving only a narrow seam of calcspar on the foot wall of the fissure in diorite which has previously been filled to a width of 8 ft. by the magnetite and chalcopyrite.

Let us take up the consideration of the various occurrences of copper ores in the rotation in which they are referred to in the list already given.

1.—The bodies of bornite ore accompanied by variable proportions of copper carbonates, chalcocite and at deeper levels by chalcopyrite:

The localities in which such deposits have already been found are Texada Island, Sidney Inlet on the west coast of Vancouver Island, Gribbell Island, and Whitehorse in the Yukon Territory. As these deposits have been already discussed several times in papers read before institutes of mining engineers, and in others published in technical journals, in this paper only brief reference will be made to results as shown from the latest and deepest development work.

The deepest workings on deposits of this character of ore are on the Copper Queen and Marble Bay Mines on Texada Island, on each of which the workings have been carried below the 600-ft. level, while on the Copper King in the Whitehorse belt the ore has been followed down to 200 ft. on the incline of the footwall, about 45°.

In each of these cases the ore body has been found strong, and giving every indication of maintaining its continuity for a still greater but undetermined depth. Its grade has not deteriorated, but, instead, on all the properties mentioned has increased in value. In the Texada Island properties the increase has been in the gold contents of the ore, while on the Whitehorse property it has been in a greater percentage of chalcocite as compared with that found on the 100-ft. level.

Prospecting carried on during 1905 in the mountains adjacent to Gardner Canal in the neighbourhood of Gribbell Island exposed outcroppings of bornite ore hitherto unknown. This fact may have an important bearing, because it tends to establish a relationship between the various known deposits of this character of ore along the Coast, and indicates that wherever a zone is found in which occurs crystalline limestone and felsite, the prospector may reasonably expect to find paying deposits of copper ore.

The question naturally suggests itself as to what is the extent of such zone or zones, and the probabilities with regard to continuity. So far as at present kown the occurrences of such zones are few and far between, the extent of each being limited to comparatively small dimensions when compared with the other mineralised zones along the coast. Except in the Whitehorse belt the continuity of the contact between the crystalline limestone and felsite is confined within the boundaries of a single mineral claim, and often the contact cannot be traced even to that length. The ore bodies do not generally maintain the same continuity as the contacts but occur as lenses isolated from each other and rarely exceeding 100-ft. in length. Consequently this class of copper bearing ore deposits, although in every instance where systematic exploitation has been made they have proved of considerable commercial value, cannot be included among the big mines, but rather stand in a class by themselves as profitable small ones. The Whitehorse belt possesses the possibility of developing some larger mines because several claims along the line of strike of the contact can be grouped together and developed as one property.

Until thorough geological investigations shall have been made and surveys worked out in detail, or the coast line more extensively prospected and the relationship if any between these various zones established, it will be impossible to say how valuable or important this class of ore bodies may become.

2.—The second class of ore bodies, which comprises the deposits of chalcopyrite ores, occurring in a gangue or matrix of magnetite in fissures in basic igneous rocks, is one having a large number of representatives, especially on Vancouver and Prince of Wales Islands. Unfortunately development work on some of these has demonstrated that the ore bodies have pinched out at comparatively shallow depths. For this reason operators generally have lost confidence to such an extent that at the present time but very little work is being done on any ore body belonging to this class.

The surface outcroppings in almost every instance where such an ore body has been discovered have indicated such favourable conditions as regards the extent of the outcropping and grade of the ore that a few years ago this class of ore bodies was a particular favourite among the prospectors. As a matter of fact very few ore bodies of this character have received the attention they warranted.

The question of genesis of such an ore body appears to me to be one of vital importance, and nowhere on the Pacific coast has sufficient research been made to establish the theory on which to build a reliable opinion as to the genesis.

From a casual examination it would appear as though the magnetite was a direct resultant from the cooling of the molten mass of basic rock and that at or about the same time certain agencies had been at work which caused the deposition of chalcopyrite in particles and masses disseminated with more or less regularity throughout the mass of magnetite.

Whether such agencies worked on the ascending or descending theory is to my mind the most important feature to be demonstrated with regard to this class of ore bodies, but the development has not yet been