COMMERCIAL GRAPHITE IN TASMANIA.

Graphite, a soft black greasy form of carbon occurs naturally in two varieties known to commerce as crystalline and amorphous. However, this nomerclature is based on the size of the graphite flakes and probably all graphite is a crystalline form of carbon. The so-called amorphous graphite consists of flakes too small to be distinguished by the naked eye and may consist wholly or in part of amorphous carbon.

The most frequent occurrence of graphite is in metamorphic rocks formed either by regional or contact metamorphism, but graphite does occur infrequently as flakes in igneous rocks and, as in Ceylon, in definite veins and fissures. The origin of graphite is still a matter of some controversy. It may have been formed by the alteration of carbonaceous matter in the original sediments or it may be due to the breakdown of calcium and other carbonates. Graphite is of most frequent occurrence in schists and limestones of Pre-Cambrian Age and its presence here does rather favour the inorgasic theory.

Tasmanian production of graphite (sic) has been very slight, only 22 tons spread over four years thus -

1940 - 5 tons
1941 - 5 "
1943 - 7 "
1949 - 5 "

Although for statistical purposes, this is called graphite, the actual percentage of the mineral is very low and the material actually sold is a schist all of which has been obtained from the Ulverstone district.

Two miles east of Ulverstone a road marked Ulverstone Rifle Range leads off the Bass Highway to the South. At about a mile along this road and a few chains to the east of it an adit has been driven for 40 feet into dark micaceous schists. These schists are overlain by several feet of heavy wash and do not normally show at the surface. They are dark gray in colour, flakey and have a greasy feel but the latter two properties are due to mica and not as may be supposed to graphite.

A sample of the material, similar to that which has been mined and sold was submitted to the Chief Chemist and Metallurgist who reported as follows "After removing most of the mineral matter by acid treatment the carbonaceous residue was tested chemically for graphite. While the test was negative, I am not satisfied that such a test is conclusive and would recommend that a microscopic determination be made. After acid treatment to remove any possible carbonates, the carbon present was determined as under : Carbon 0.6 percent" The test for graphite is an extremely difficult one and involves the formation of graphitic acid.

A thin section of the rock was examined and it was found to be a quartz muscovite schist. The muscovite which is in excess of the quartz contains tiny sheets and flakes of a black opaque substance that resembles graphite. Some of the pieces can be definitely identified as flakes of graphite but others are too small and the rock may contain some amorphous carbon. These quartz muscovite schists with their small graphitic content are the result of regional metamorphism. They are of Pre-Cambrian age and the origin of the graphite was probably inorganic. In discussing the origin of graphite, Winchell and others have suggested that carbonates have been broken down to form silicates and that CO_2 and CO have been released. These in turn have been deoxidised to form carbon (graphite). They postulate two reversable equations.

$$C + 2H_2O \rightleftharpoons CO_2 + 2H_2$$

and

$$C + CO_2 \rightleftharpoons 2CO.$$

The extent of these schists cannot be determined without extensive prospecting but the tonnages available are probably considerable. That is the graphite bearing material does not occur in any sort of a lode or vein formation but the graphite is disseminated through rocks which were originally normal bedded sediments. The grade of the schists, however, is too low to consider them as ores of graphite. It is true that in the United States outcrops of schists, in a weathered state, and containing 3 - 4% of graphite have been worked by open cut methods. But the chemical analysis here shows only 0.6% Carbon. Even if all this were in the form of graphite, and this is doubtful, it would still be very much lower than the minimum grade worked in other countries.

I understand that the tonnages so far sold have been for use in the paint industry, where they are mixed with an imported high grade graphite and they may have limited future use in this direction.

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References:

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