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857 TRANS.

WOLLASTONITE AT HAMPSHIRE

According to instructions the calc-silicate rocks at Hampshire were examined and samples collected for study.

LOCATION AND ACCESS -

The occurrences lie to the south-east of the Hampshire Railway station on the Emu-Bay Railway, at distances of three quarters of a mile to the Emu River, one and one-half miles to Limestone Creek and four and a half miles to the Hampshire Iron Deposits. Hampshire Railway station is about 16 miles from Burnie to which it is also connected by a good metal road. From the Hampshire Railway there is a metalled road to Upper Natone, which crosses the Emu River and Limestone Creek and a branch road runs south towards Holloway's House. Near this house, there is about half a mile of unmetalled road in bad condition before reaching the board-road to Cumming's Mill about 4 miles distant. This crosses the iron-bearing outcrops just before reaching the mill.

The deposits on Limestone Creek are about 20 chains west of the metalled road before reaching Holloway's House, and about 200 feet lower near the east bank of the creek. The hillside is steep but the construction of a sidling track would present no difficulties but would have to be surfaced, as the basalt soil is very boggy in wet weather.

The Emu River has an overgrown track leading from the Upper Natone Road.

TYPE OF DEPOSITS -

There are fundamental differences in the type of the deposits, for, while the Limestone Creek and Emu River deposits are bedded limestones metamorphosed by the granite intrusions, the Hampshire deposits are basic dykes intruding the granite and have been greatly altered by carbonation, silicification and the introduction of iron-bearing solutions.

HAMPSHIRE IRON AREA -

The above interpretation of these occurrences differs from that given by A. McIntosh Reid (Typetwritten Report, "Hampshire Mineral Area" 1924) who maps them as leases of limestone mostly in the granite and shows smaller lenses of iron deposits (mainly magnetite) in the limestone outcrops. It is more probable, however, that these bodies are altered basic dykes, which were carbonated and then silicified by iron-bearing solutions. This silicification is clearly seen microscopically in Slide No. 1116, which shows limonite pseudomorphs set in a ground mass of coarse quartz crystals in which sagenitic webs of rutile can be observed.

These deposits cannot be looked upon as a possible source of wollastonite, but they are a potential source of iron ore.

LIMESTONE CREEK AREA -

Along the east bank of Limestone Creek there are two good exposures of metamorphosed limestone which are in close proximity to each other. The actual contact of the limestone and the granite is masked by the overlying basalt or its detritus, on the steep sides of the valley. Scattered fragments of limestone and several small exposures show that the deposits are of appreciable lateral extent, but, trenching would be necessary to define their limits and the amount of overlying hill wash. From the actual exposures it is seen that the rocks are thin bedded alternating layers of calc-silicate rocks, recrystallised limestones and some quartzites. Fibrous white crystals of wollastonite are present in some of the harder fine-grained bands.

An analysis of one of these denser bands by Mr. W. St. C. Manson, Chief Chemist and Metallurgist gave the following result (Reg No. 504) :-

	Per cent.
SiO_2	29.20
Al_2O_3	3.11
Fe_2O_3	0.72
P_2O_5	0.13
CaO	44.46
MgO	3.42
Loss on ignition	18.62
S	0.24
(Acid insoluble)	40.04

A slide was prepared and under the microscope (Sl. 114) the rock is seen to be made up chiefly of wollastonite in long bladed crystals, with about an equal amount of calcite, and an appreciable amount of diopside as granules. Occasional crystals of pyrite are present and under high power, granules of ? prehnite are seen. The petrological equipment at our disposal, however, does not permit the determination of these finer grains or the relative proportions of the various constituents. It has been proved, however, that wollastonite is present and that approximately 25 per cent of the rock is composed of this mineral.

Some of the other bands are re-crystallised limestone (Sl. No. 115) and others are quartzites. The rocks dip gently to the west and, as a rule, the individual beds are not more than nine inches thick. The thickest seen would not exceed two feet in width.

The amount of wollastonite present in any particular bed would depend on its original composition, and so would vary from bed to bed. Wollastonite is a constituent of only a fourth of the beds, and, as the maximum thickness of any one of these is under two feet and generally under nine inches, it is extremely doubtful whether we have here a commercial source of this mineral.

EMU RIVER AREA -

The rock exposures are much poorer than along Limestone Creek, and as far as can be judged from the material that is available, the grade is similar to the above. Should the Limestone Creek deposits prove of value, this is another area where prospecting for Wollastonite would be justified.

CONCLUSIONS -

Rocks containing Wollastonite are present both in Limestone Creek and Emu Creek. The calc-silicate rocks are interbedded with quartzites and recrystallised limestones. The calc-silicate identified, are mainly wollastonite and a little diopside, but these are also associated with a considerable amount of free calcite.

The commercial importance of these deposits depends on whether it is the mineral wollastonite itself that is in demand, on what tolerance in chemical and mineralogical composition is admissable, on the quantity needed and the market price. Until this information is available no opinion can be expressed as to the potential value of these deposits as a source of wollastonite.

D.E. Thomas, D.Sc.,
GOVERNMENT GEOLOGIST.

Q.J. Henderson,
FIELD GEOLOGIST.

Department of Mines,
HOBART.

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