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MEMORANDUM

LIMESTONE DEPOSITS AT BRONTE

1. General -

Following the request on(24th March from Mr. H.S. Barnett) for an endeavour to find limestone deposits suitable for agriculatural purposes in the vicinity of Bronte, an examination was made in that area, with the result that beds of Permian limestone were located and sampled.

2. Location and Access -

The deposits are situated on both sides of the steep valley of Serpentine Creek, 4½ miles by road, north of Bronte Post Office. Access is gained from Lyell Highway at Bronte by way of the road leading to Great Lake which passes through the area.

3. Limestone Deposits -

Permian limestones outcrop at four points along the sides of Serpentine Creek gorge. On the west side the upper bed is exposed in road cuttings for a distance of 200 yards along the Bronte-Great Lake road. It is interbedded with siliceous mudstones and dark grey shales and dips at a low angle to the south-east. The limestone varies in thickness from four to ten feet but, in places, includes from one to four narrow shale bands varying from two to twelve inches in width.

The road cuttings in this locality range up to 15 feet in height but, as the limestone is principally in the lower portion, extensive quarrying into the hillside would soon become uneconomic owing to the increasing overburden of other rocks. Apart from the above considerations, small quarries for extracting limited quantities of limestone are practicable.

On the east side of the valley, approximately half a mile south-east of the road cutting exposure, the upper limestone bed occurs as low cliffs and shallow caves about the head of a small tributary valley trending north-westerly to join Serpentine Creek. At this point the limestone is well exposed and averages six feet in thickness along a length of about 100 yards. In these outcrops shale bands within the limestone bed are not prominent and appear to be almost totally absent. Overlying strata consists of pebbly sandstone, and dark grey pebbly shales occur below the limestone. Here the limestone is more regular and massive and the quarrying facilities better than at the road cuttings on the opposite side of the valley. However, the absence of an access road and the rugged nature of the approach creates a transport problem.

A lower thin limestone bed, 15-18 inches in thickness and some 70 feet below the upper bed, is exposed in cliff faces on either side of Serpentine Creek valley in the same locality. This bed is too narrow for economic quarrying and almost inaccessible for transport.

4. Sampling -

Six representative samples of limestone were cut across the upper bed exposures.

Samples No. 1 and No. 2 were taken from six feet of limestone at different points along the outcrop on the east side of the valley.

Samples Nos. 3, 4 and 5 represent thicknesses of six feet, nine feet and eight feet respectively, at the northern end, middle and southern end of the road cutting exposure on the west side of the main valley. In these three samples the following bands, interbedded with the limestone at the above points, were excluded:-

No. 3 Sample-Shale band, 3 inches wide.
No. 4 Sample-Shale band, 12 inches wide.
No. 5 Sample-Four Shale bands, each 4 inches wide.

Sample No. 6 represents a picked band of limestone, 18 inches in width which persists throughout the greater length of the road cutting exposure.

The following table of analyses shows the results of the sampling:-

Sample No.	Constituents.	Per Cent.
No. 1	SiO_2	31.92
	CaO	33.08
	MgO	0.84
No. 2	SiO_2	31.72
	CaO	32.93
	MgO	0.64
No. 3	SiO_2	41.36
	CaO	25.45
	MgO	0.91
No. 4	SiO_2	51.94
	CaO	19.34
	MgO	0.80
No. 5	SiO_2	52.00
	CaO	18.03
	MgO	0.78
No. 6	SiO_2	13.88
	CaO	42.72
	MgO	0.45

The above results indicate that the limestone in the road cuttings is generally low in lime but that the persistent 18 inch band is of much higher grade.

The average quality of the upper bed on eastern side of Serpentine Creek valley is of better quality throughout than that exposed in road cuttings further to the west.

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