

DOLOMITE IN THE SMITHTON DISTRICT.MUNICIPALITY OF CIRCULAR HEAD.INTRODUCTION.

Recent detailed geological mapping in the Smithton District has disclosed the occurrence of large areas of dolomite. For many purposes dolomite, or magnesium limestone, is now largely replacing magnesite and is being used in the manufacture of carbon dioxide, in the sulphite process of paper manufacture as a source of metallic magnesium and as raw material for the production of technical magnesium carbonate, used in pipe coverings. In view of its increasing use and economic importance it has been deemed advisable to give a brief account of the Smithton dolomite with respect to its occurrence, accessibility, possible extent and working facilities.

ACCESS.

The District is connected by rail and road with the parts of Stanley and Burnie, the latter being the principal port of North Western Tasmania. Smithton also offers harbour facilities for small trading vessels of approximately 100 tons.

GEOLOGY.

The Dolomites are interbedded with the cherts, slates and breccias of the Dundas Series and, themselves, form portion of this large series of, presumably, Cambro-Ordovician rocks. They have been subdivided into two main belts, an eastern and a western, which are separated by the rocks with which they are interbedded. A fairly wide dolerite dyke of Devonian Age intrudes the slates and breccias occurring between the two areas of dolomitic rocks.

THE WESTERN BELT OF DOLOMITES.

This consists mainly of massive light grey to yellowish grey dolomite which has a roughly cubical fracture. It contains small areas of crystalline dolomite of a white or yellowish white colour and, in a few places, is traversed by a network of quartz veins. There are also occasional beds, a few feet in thickness, of a dense bluish-grey limestone which is interbedded with the massive dolomite.

The chemical composition of the dolomite from the western belt is illustrated by the following analyses.

Constituents	S.33 Regd. No. 1806	S.128 Regd. No.1581.
SiO ₂	4.32	0.44
Fe ₂ O ₃	1.26	1.14
FeO	0.75	...
Al ₂ O ₃	1.50	0.54
TiO ₂	Tr.	
CaO	28.73	31.62
MgO	20.28	20.85
P ₂ O ₅	Tr.	
S	0.11
CO ₂ & Igniton Loss	44.08	46.85
	101.03	101.44

Sample S. 33 obtained from a quarry on the south side of the Broadmeadows Road Bridge over the Duck River, is a fairly representative sample of the western belt of dolomite but the analysis cannot be regarded as a true expression of the average composition of these rocks. Theoretically this rock contains 51.26% CaCO_3 and 42.39% MgCO_3 but as the Ca and Mg are present in, approximately, the 1 : 1 ratio necessary for complete dolomitisation this may be expressed as 93.65% $(\text{CaMg})\text{CO}_3$.

The second sample, No. S. 128, is fairly typical of the crystalline dolomite. This rock contains 56.41% CaCO_3 and 43.58% MgCO_3 which may be expressed as 95.28% $(\text{CaMg})\text{CO}_3 + 4.71\%$ CaCO_3 .

Areal Distribution.

The western belt of dolomites is exposed in the bed of the Duck River from a point about thirty chains west of the Smithton Road Bridge to the mouth of Allen Creek, some six miles to the south, and outcrops again near Edith Creek Station, which is approximately 8 $\frac{1}{2}$ miles south of Smithton. The minimum width of this belt as revealed by outcrops is 110 chains and a conservative estimate of the area covered by dolomite would be 12 square miles, approximately, and hence enormous quantities of the material are available. The whole of this belt lies in the relatively flat country bordering the Duck River and, with the exception of a few surface exposures along the banks of the river and a small area near Edith Creek Station, is covered to a depth of ten to twenty feet by clays and sand.

Access.

From Smithton, several first class roads serve the northern portion of this area. There are the Mella Road, the Broadmeadows Road and the Lower Scotchtown Road. To the south, between Copper Creek and Edith Creek Station, both the Irishtown-Trowutta Railway and the Trowutta Road pass immediately to the east of the area.

Working Facilities.

Several small quarries have been opened up in the dolomite the largest of which are situated at the following localities, viz. immediately west of the apex of Watsons Bend on the Duck River, near the Broadmeadows Road Bridge, on Marthick's Pur. Block 49 ac. 2rds. 26pchs. and to the north of Edith Creek Station. The material is used as road metal.

In any proposed scheme for working the dolomite on a large scale sub-surface quarrying would be necessary, as the configuration of the ground is such that only small amounts of the material could be extracted by ordinary quarrying methods.. With due consideration to questions such as transport, accessibility and depth of overburden, the exposed portion of the area near Edith Creek Station and that portion near the Broadmeadows Road Bridge would appear to be most suitable.

THE EASTERN BELT OF DOLOMITE.

Although generally similar in hand specimen to the rocks described above, the dolomites of the eastern belt are sometimes partly replaced by chert and generally appear to contain more silica than those of the western area.

The chemical composition of the dolomite from the eastern belt is illustrated by the following analyses.

Constituents	S. 113 Regd. No. 1808	- Regd. No. 1141.
SiO ₂	6.20	15.00
Fe ₂ O ₃	0.70	2.29
FeO		
Al ₂ O ₃	0.90	0.91
TiO ₂	Tr.	
CaO	28.77	26.00
MgO	20.06	18.01
P ₂ O ₅	0.057	
S	0.068	
CO ₂ and Ignition Loss	43.40	38.00
	100.115	100.21

Specimen No. 113 is fairly typical of the dolomites of this belt. Theoretically the rock contains 51.33% CaCO₃ and 41.92% MgCO₃; as these are again present in, approximately, the 1:1 ratio necessary for complete dolomitisation this may be expressed as 93.25% (Ca,Mg) CO₃.

The second specimen contains 46.39% CaCO₃ and 37.64% MgCO₃ or 84.03% (Ca,Mg) CO₃.

Both samples were obtained from outcrops of dolomite between Fahey's Lane and Kay's Road and are fairly typical of the rocks of the area. The analyses show that they contain more SiO₂ than the rocks of the western group.

Areal Distribution.

This belt extends from Fahey's Lane to the junction of Young's Road and the Nabageena Road and lies immediately east of the Irishtown Road. The maximum width is sixty chains and the minimum seven chains, the average width being about twenty chains. The total length is approximately 140 chains and hence the total areal extent would be approximately one half of a square mile. To the south and east the dolomite is covered by basalt.

Access.

Both the Irishtown-Smithton Railway and the Irishtown Road pass quite close to the western edge of the area, and furthermore the Irishtown-Wiltshire Railway passes through its centre.

Working Facilities.

Portions of this area are situated in relatively hilly country and a good deal of material could be obtained by surface quarrying. The depth of soil varies from 5 to 10 feet.

CONCLUSION.

From the foregoing it will be seen that enormous quantities

of dolomite are available. Many portions of the two areas are readily accessible both by rail and road and the district is connected by rail with the main ports of North Western Tasmania, hence transport should present no difficulty in the exploitation of the deposits. The Edith Creek area appears to be most suitable both as regards transport facilities and conditions suitable for open quarrying.

While the analyses shown cannot be regarded as giving the average composition of the dolomite they may be taken as a general guide, as all the specimens were selected as being fairly representative of the rocks of both areas. The material is a high grade dolomite.

NOTE:- In giving the theoretical composition of the dolomites the Calcium and Magnesium were assumed as being present entirely as carbonates and the impurities were not taken into account. Small amounts of the Calcium and Magnesium may be present as silicates.

K. J. Finlayson

FIELD GEOLOGIST.

HOBART,

August 27th, 1931.

Registered Number	Constituents	Per Cent	Per Ton		
			Ozs.	Dwts.	Grs.
1380	SiO ₂	0.08			
	CaO	31.10			
	MgO	<u>21.45</u>			
1274	SiO ₂	0.28			
	Fe ₂ O ₃ & Al ₂ O ₃	0.50			
	Mgo	21.93			
	CaO	30.78			
	CO ₂ & Loss	<u>46.98</u>			
		<u>100.47</u>			