

## LIMESTONE AT LOONGANA.

### Introduction.

Vast deposits of limestone, sometimes occurring in cliff faces of over 100 feet in height, fringe the valley of the Leven River between the Loongana Mill and the spectacular gorge known as Hells Gates. These deposits have never been exploited for their lime content (they have been used as road metal) and no records exist either of their extent or quality. These are the same beds which outcrop at Gunns Plains and indeed, as the crow flies, this latter locality is only a few miles from Loongana and is separated from it by high hills caused by a large anticline which has brought the more resistant pre-limestone rocks above the limestone. This latter rock occurs in synclinal troughs in each locality and the deposits are so similar in structure, extent and quality, that a general report on one would be applicable to the other.

### Location and Access.

Loongana is not a postal district and is the general name for an area extending along the Leven River above Hells Gates. A few farms still flourish in the Eastern part of the District but those to the West are nearly abandoned and timber milling and log hauling is the main source of revenue. Because of these pursuits many second grade roads and tracks, suitable for heavy trucks or jeeps have been opened up, in addition to the metal road which traverses the district. The nearest post office is at Nietta, 20 miles from Ulverstone and near the terminus of the Nietta Railway Line. From here to the commencement of the deposits is about 6 miles.

### Topography.

The topography of the District has been greatly influenced by the type of rock. To the East of the area is portion of the great basalt plateau of North Western Tasmania. Minor plateaux of basalt occur within the area. The easily eroded limestones have resulted in the formation of a wide valley fringed with pleasant meadows and the change of topography at Hells Gates, where the harder Tremadoc sediments outcrop, is startling. These harder rocks form steep sided ridges north and south of the area, trending as the rocks strike east and west. The highest of these ridges to the south is Black Bluff and that to the north is called locally the Badger. Pleistocene glacial action has influenced the topography, especially in the western portion of the area.

### Geological Map.

The accompanying geological map of the area shows the relationship of the limestone to the underlying sediments. Occurring apparently conformably beneath the limestone are typical Tremadoc Sediments,

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Tubicolar Sandstone and beneath that again West Coast Range Conglomerate. To the West of the area are slates of Cambrian age - probably belonging to the Dundas Series which occur in faulted relationship to the limestone. Outpourings of lava in Tertiary times have resulted in the formation of basalt plateaux overlying the limestone. This basalt forms a lighter soil than that closer to the coast and may be correlated with Edwards Hampshire Type. River flats of recent alluvium fringe the river and major creeks except Jeanbrook Creek which flows over the basalt plateau and then suddenly plunges many hundred feet to the Leven in a few hundred yards. Under the basalt here and there may be seen remnants of Tertiary gravels and near the road about the centre of the area huge blocks of conglomerates indicate Pleistocene glacial action. The Tertiary and Pleistocene remnants, because of their limited extent are not distinguished on the geological map.

#### Structure.

As at Gunns Plains the limestone deposits form the top of a synclinal basin, the anticline between the two being of harder Ordovician and Cambrian Sediments and forming the high hills and the deep gorge through which the Leven has cut and is cutting with great difficulty. The main axis of the syncline, striking at  $90^{\circ}$ , runs parallel to the general flow of the River. The beds to the north of the axis are wider in lateral extent than those to the south. This is probably due both to their shallower dip and the greater repetition by minor folding. Minor anticlines may be observed in cliff faces in more than one part of the area. To the south, the underlying Tubicolar and West Coast Range Conglomerate beds outcrop and are apparently conformable with the limestones.

Faulting in the district is common. A large major fault coursing N.W. and dipping to the east, occurs to the west of the mill where Dundas Slates are in faulted relationship to the limestone. This fault crosses the Loyatea Timber Road near some camps where Dundas Slate outcrops to the West and Conglomerate to the East. Where Jeanbrook Creek enters the Leven, the limestone is in faulted relationship to Tubicolar sandstones and a splendid section of this fault may be observed on the river bank, where it strikes at  $330^{\circ}$  and dips to the south-west at  $75^{\circ}$ . On the Geological Map may be seen an isolated patch of limestone to the west of the main mass. The structure that has determined this is, owing to lack of outcrop and a cover of basalt and alluvium rather obscure. The limestone outcrops only along the bed of the creek for a few chains and is in faulted relationship with Cambrian sediments, to the North. It can be assumed that these beds belong to a small down-thrust block.

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The Limestone.

These beds, both in structure, extent and content bear a marked resemblance to those at Gunns Plains, and well they might, for they are the same beds as in that locality and distance some four miles away. They belong then to the Gordon River Limestone Series and consist of well marked beds of dark blue, high grade, crystalline limestone, well provided with bunches and seams of white calcite. The width of the beds seems to be about 1500 to 2000 feet so that they have suffered more erosion than at Gunns Plains. Quantities available for quarrying are almost limitless. The limestone outcrops along either side of the Leven valley for a distance of four miles. The width of the beds across the strike is about one mile though this is covered in places by alluvium and basalt.

The quality of the limestone is the same as that at Gunns Plains, where intensive sampling revealed that the individual beds did not vary greatly in  $\text{CaCO}_3$  content. Seven samples only were taken here and of these, four 48 - 51, were obtained from different beds from the road-metal quarry, situated not far beyond the bridge over the Leven. Two samples, 52 and 53 were taken from composite beds at the Big Face over the Leven River and one, 54 a composite of the beds in the Western outcrops. These samples showed.

Sample	Insol.	$\text{Fe}_2\text{O}_3$ & $\text{Al}_2\text{O}_3$	CaO	$\text{CaCO}_3$	MgO	$\text{MgCO}_3$
48	7.0	0.8	50.5	90.1	1.2	2.5
49	8.4	1.0	49.5	88.3	1.3	2.7
50	11.6	0.8	47.2	84.2	2.0	4.2
51	8.0	0.8	49.2	87.8	1.8	3.8
52	3.2	0.4	52.9	94.4	1.2	2.5
53	8.4	0.6	48.7	86.9	2.1	4.2
54	7.7	1.0	48.3	86.2	2.5	5.2

It can thus be seen that there is no great variation in the individual beds and an average grade of 88%  $\text{CaCO}_3$  would probably cover the whole area.  $\text{MgCO}_3$  is rather high (3.6%) but  $\text{SiO}_2$  is not, averaging 8%.

Quarry Sites.

Natural quarry sites abound in the area and two have been opened to a limited degree for road metal. However, there is one site which surpasses all others. This I have called the Big Face and it is portion of a spur of limestone with no overburden but a little soil, situated just over the Leven River at the second bridge. Here a spur of limestone some 500 x 1500 feet, rises to a height of 200 feet above a flat plain, through which flows the Leven. The actual sheer face is 70 feet in height and two samples were taken from this - No. 52 from flat level to 28 feet and No. 53 from 28 to 70 feet. These showed limestone of high grade averaging over 90%  $\text{CaCO}_3$ . Well over 5 million tons of limestone are readily available from this spur.

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Conclusions.

The Loongana area, which is situated within 10 miles of a railhead, contains vast quantities of high grade limestone some of which outcrops on spurs, from which it could be quarried with the greatest of ease.

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