

LIMESTONE DEPOSITS AT SMITHTON.

During the recent geological survey of the Smithton district, the limestone deposits were examined with the object of describing them from the economic view point. The Agricultural Department have recently inquired about the limestone and this report is written for their information. There are three different types of deposits each of which occur in different localities.

One type is the Tufaceous and marly deposits of Pulbeena, another the dense limestone of Lower Scotch Town, and the third the mound deposits near Marthick's Siding.

The dolomite limestones of Mowbray Swamp are not included in this report.

PULBEENA.

The Pulbeena deposit occurs on the 198 acre Soldier Settler's block leased to A.B. Fenton immediately north of Pulbeena station. The limestone occurs at and immediately beneath the surface to a depth of at least five feet. It has been exposed in a shallow excavation from which a quantity was removed for agricultural purposes, and in many of the drains in the vicinity,

Part of the deposit especially that within two feet of the surface is of a cellular nature and represents replacements and casts of leaves, twigs, moss, grass, &c. The material at a greater depth is more friable and of a marly nature. Both types and particularly the marl contain numerous small freshwater shells.

Recent drains have given good exposures of the limestone and also show that it occurs in thin layers interbedded with a black peat or peaty soil. In general the layers do not exceed one foot in thickness. In Fenton's excavation, the limestone is apparently three to four feet in thickness but at a distance of less than two chains it is found to be interbedded with peat.

From the occurrence it is obvious that the limestone and peat were formed in fresh water ponds, lagoons, swamps, &c. which may have been partly fed from the warm springs of the neighbourhood.

These conditions probably existed over several hundred acres in the vicinity of Pulbeena, but the limestone does not appear to have been formed throughout this area. So far as the excavations, drains, &c. show, the limestone occurs along a length of some 15 chains on the eastern side of the railway. The width is not known.

The quality of the limestone is shown by the analyses of Samples I, II, & III, in attached table. It is to be observed that the limestone is of fairly high grade and contains approximately 94% calcium carbonate and 3% magnesium carbonate.

The quantity available could not be estimated without a considerable amount of shaft sinking or boring. The thin beds of limestone and peat, of which individual beds would probably not continue over any great distance, would render this testing necessary. Generally speaking there is probably sufficient to supply a small but not a large demand.

As regards working facilities, the material is soft and near the surface and could, therefore, be easily and cheaply obtained. Much would depend, however, as to whether the peat would have to be rejected. If it contains any desirable properties from the agricultural view point, it could possibly be left with the limestone for treating the land.

The deposit is alongside the railway and close to a road so that there would be no transport difficulties.

LOWER SCOTCH TOWN.

This deposit is situated on the land blocks charted in the name of Peter Smith (315 ac.) and James Lawrie (53 ac. 3rds) which are situated on the east side of Duck River some three miles south of Smithton. Access is gained by the Lower Scotch Town road which branches off the Scotch Town or Trowutta road, one and a half miles south of Smithton.

The limestone is a hard, dense, dark blue type. The strata have a general northerly strike and dip westerly at 45 degrees. It occurs as a bed in the Dundas series of slates &c. The width of the bed is not definitely known, but the quarry proves it to be a chain at least. The overlying slates on the western side are exposed in the excavation for the kiln. Slates underlie the limestone on the eastern side but the junction cannot be definitely determined. The limestone may be anything up to five chains in width.

The limestone has been opened by a quarry some 5 or 6 chains east of the road. The quarry is at the foot of the south-side of a low hill and the limestone can be traced by outcrops across the summit of the hill for a distance of 5 to 10 chains. The only other locality where this bed has been exposed is in the Duck River immediately west of Smithton.

The quantity can in view of the above be regarded as sufficient to supply the requirements of the Smithton district for many years.

The quality of the limestone is shown by the analyses of samples IV. and VI., the former being of a small typical piece and the latter a representative sample across 12 feet. The latter proves the limestone to be of very high grade with 96% Calcium carbonate and 0.6% magnesium carbonate.

The facilities for working are good and quarries could be opened up on the hill. The present quarry is at the same level as the kiln and for economical working it would be advisable to open a quarry at a higher level, so that the floor is slightly above the level of the top of the kiln.

As regards transport, the deposit is close to the Lower Scotch Town road which connects with the township and railway station of Smithton in a distance of three miles.

MARTHICK SIDING.

This deposit occurs along the eastern side of Perkins Creek, to the north-west of Marthick Siding. This siding is two miles south-east of Smithton and can also be reached by a cross road off the Irish Town road.

The limestone is a hard, slightly cellular brownish type, the colour being due to oxide of iron. The deposit has

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been formed chiefly as mounds built up by springs and now represents a deposit with an undulating surface. This thickness is 10 to 12 feet and the area approximately five acres. The quantity is, therefore, small but would be sufficient to supply the requirements of the Smithton district for a number of years.

The quality is shown by the analyses of Sample VII. It is not of high grade, the calcium carbonate content being approximately 92%, the magnesium carbonate being approximately 3%, and ferric oxide 4.28%.

The deposit is immediately below the surface and so could be broken in open quarries probably without any water trouble.

It is well situated as regards transport, being alongside the railway and near Marthick's road which, however, is not a first class one.

CONCLUSIONS.

The three limestone deposits differ in many respects. From the point of view of quality the Scotch Town is the best deposit followed by the Pulbeena and Marthick deposits in that order (In the Pulbeena deposit the fact that the peaty layers would have to be sorted out, rather detracts from its quality).

As regards quantity, the Scotch Town is the best and the others are to all intents equal.

From the view point of transport, the three are well situated as regards proximity to roads, but the Scotch Town deposit is three miles from a railway while the others are alongside the railway and close to sidings.

In considering working facilities it will be observed from the above descriptions that the Pulbeena and Marthick deposits would have to be excavated by shallow quarries below the surface of generally flat land (with possible troubles from water draining into the excavations) while the Scotch Town deposit could be quarried by faces carried into the hill with a maximum height of 100 feet.

From the point of view of the material the Pulbeena is the softest and the easiest to work while the Scotch Town is the hardest and would be the most costly to break.

If desired, the Scotch Town and Marthick limestones could be "burnt" in kilns, but the nature of the material would not permit of this being done with the marly limestone at Pulbeena. On the other hand the Pulbeena limestone would be more easily crushed (the marly portion would probably be sufficiently fine after being broken in the quarry) than the harder Scotch Town and Marthick material. The possible use of the peaty material mixed with the limestone is a point that the Agricultural Department might investigate if deemed advisable.

Viewing the deposits generally it would appear that it would probably be preferable to develop the Scotch Town deposits in spite of the slightly higher cost of quarrying and possibly of transport of the material. The limestone would, however, either have to be crushed or burnt.

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GOVERNMENT GEOLOGIST.

ANALYSES OF SMITHTON LIMESTONE

	I	II	III	IV	V	VI	VII
	S109 1579	1269	1270	S120 1996	S32 1805	1300	S13 1578
Silica.....	0.48	0.88	0.84	0.52	1.08	0.76	0.60
Ferrous oxide.....	0.56	0.44	0.52	0.56	1.38	0.31	4.28
Ferrie ".....							
Alumina.....	0.24			0.36	0.22	0.38	0.52
Magnesia.....	1.72	1.35	1.51	0.50	7.53	0.29	1.42
Lime.....	53.76	52.59	52.39	54.23	46.40	53.85	51.68
Carbon dioxide & Loss.....	43.70	44.90	44.72	43.30	44.12	44.11	42.00
Titanium dioxide.....	Nil			Trace	Trace		
Sulphur.....				0.068	0.11		
Phosphorus pentoxide.....	Trace			0.068	0.077		0.08
		100.16	99.88	99.606	100.917	99.70	100.58

- Sample I. Typical sample, tufaceous limestone, Pulbeena.
- " II. Representative sample, tufaceous limestone, Fenton's Quarry.
- " III. " " marly limestone, " "
- " IV. Typical sample, limestone, Lower Scotch Town Road.
- " V. " " " Duck River, Smithton. (Partly dolomitised)
- " VI. Representative sample across 12 feet in quarry, Lower Scotch Town Road.
- " VII. Typical sample, brown limestone, near Marthick Siding.