

LIMESTONE IN JERUSALEM PLAINSTHE PROPERTY OF MILLS BROS.

During the period 17th to 29th April an examination was made of the Waterhouse Soldier Settlement area with a view to determining whether or not deposits of limestone occurred which would be suitable for Agricultural purposes in the development of the settlement. At the time of that inspection a visit was made to Jerusalem Plains to examine Limestone deposits reported to occur there. The impression then gained was that limited quantities of a low grade limestone may occur but further testing, preferably by boring, would be necessary to determine the grade and quantity of ore available.

The present report deals with a further preliminary examination of the area during which five bores were put down.

Jerusalem Plains is an extensive low-lying, sandy coastal plain situated in the north-eastern part of Tasmania, on the broad promontory extending from West Sandy Cape to East Sandy Cape. The Plains are distant about seven miles from the township of Bridport over roads which are in part gravelled but are mainly newly formed. On the northern and western boundaries of the Plains large sand dunes occur most of which are now settled and carry reasonable growths of grass and scrubs.

At the time of the April visit the plains were being ploughed preparatory to the sowing of grasses. In December quite a heavy growth of clover had developed.

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The occurrence of calcareous deposits on the area has been known for a considerable period. Several attempts have been made to burn some of the material for the production of agricultural lime. It is not known how successful these efforts were but it is doubtful whether any lime was produced. The open cuts are generally of very shallow depth and reveal a depth of up to two feet of sandy soil above a layer of a fairly hard material which in appearance is a calcareous sandstone, the sandy particles of which have been cemented together with calcium carbonate. This compact material extends for only a few feet when loose material is met.

In the preliminary report of April it was recorded that the limestone occurred as a couple of small hillocks in the centre of ploughed fields and boring was then recommended to determine whether the deposit was continuous between those two points.

Five bores were put down. Their positions were selected to determine the nature of the deposits on the hillocks and the intervening country. The bores ranged in depth from nine to twenty feet. Most of the bores struck water at a depth of from eight to ten feet and it was not considered advisable to bore to greater depths because of the difficulty in recovering the product from below water level.

The bores were put down with the three inch hand boring plant of the Mines Department and samples were taken where possible at intervals of two feet. The samples were tested in the field to determine whether or not carbonates were present and were then

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forwarded to Launceston for Analysis.

The following bore records, to which the part analyses showing percentages of Lime and Calcium Carbonate have been added, give some idea of the nature of the material passed through and the list of analyses shows the grade of the various samples.

Bore No. 1.

Date 7/12/'50

Position of Bore

Between two shallow
open cuts opened
for Limestone.
Ships tank near one

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Sample No.	Depth Section	Total Depth	Description of Ground	% CaO	% CaCO ₃	Feet xCaCO ₃ %
1	2	2	Surface Sand	2.8	5.0	10.0
2	2	4	Compact sand or soft stone	16.7	29.82	59.64
3	2	6	" " yellow when wet dries white	21.3	38.03	76.06
4	4	10	do do	23.4	41.78	167.12
5	2	12	do some broken sea shells	22.3	39.82	79.64
6	2	14	do do do	16.8	30.00	60.00
7	2	16	do do do shells increasing	23.5	41.96	83.92
8	2	18	Yellow sand some shells	21.0	37.50	75.0
9	2	20	do do	11.0	19.64	39.28

650.66

Water level 10 ft. from Surface

Average 32.06% CaCO₃
Excluding samples 1 and 9

601.38
Average 37.52 % CaCO₃
Excluding samples 1 and
to a depth of 12 ft. 380.46

Average 38.04 % CaCO₃

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Bore No. 2.

Date 8.12'50

Position of Bore

3 chains

N.N.W. from No. 1

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Sample No.	Depth Section	Total Depth	Description of Ground	% CaO	% CaCO ₃	Feet x% CaCO ₃
1	2	2	Surface sand	3.9	6.9	13.8
2	2	4	Limy sand	21.1	37.67	75.34
3	3	7	hard band ? limestone			
			to sand	20.7	36.96	110.88
4	2	9	sand	21.5	38.39	76.78
5	3	12	sand to hard stone			
			? boulder	21.0	37.50	112.50

389.30

Water at 8 ft.

Average 32.44 % CaCO₃

Excluding Sample 1

375.5

Average 37.55% CaCO₃

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Bore No. 3.

Date 11/12/1950

Position of Bore

200 yards N.N.W. No. 2
near two big honeysuckle trees

Sample No.	Depth Section	Total Depth	Description of ground	% CaO	% CaCO ₃	Feet x % CaCO ₃
1	2	2	surface sands to			
			comparatively hard layer	0.4	0.71	1.42
2	($\frac{1}{2}$)	2 $\frac{1}{2}$	clayey material red in colour)	5.5	9.82	19.64
	($1\frac{1}{2}$)	4	limey clay			
3	2	6	(Sandy material lighter in)			
			(colour. Some limestone frags)	21.4	37.85	75.70
4	1 $\frac{1}{2}$	7 $\frac{1}{2}$	Light coloured sandy material	20.8	37.14	55.71
5	4 $\frac{1}{2}$	12	sandy, finer and softer	18.0	32.14	144.63
6	5	17	limey sand	18.7	33.39	166.95
						464.05

Water at 8 ft.

Average 27.29% CaCO₃

Sand rising in casing for at least 6 ft.

Excluding Samples Nos. 1 and 2
442.99

Average 34.07% CaCO₃

Bore No.4.

Date 11/12/50

Position of Bore

$\frac{1}{4}$ Mile NNW No.3
on top of Billock.

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Sample No.	Depth Section	Total Depth	Description of Ground	% CaO	% CaCO ₃	Feet x %
1	2	2	Surface Sand & Soil	0.5	0.86	1.72
2	2	4	Fairly hard Yellow-white limey Sandy material	19.1	34.1	68.2
3	2	6	" " "	21.3	38.03	76.06
4	2	8	do. do. to sand rising in casing	22.4	40.0	80.0
5	3	11	Find grained sand rising in casing	19.9	35.53	105.59
6	3	14	do. do.	19.7	35.17	105.51
		15	do. do.		N. S.	

438.08

Average 31.2% CaCO₃

Excluding sample 1.

436.36.

Average 36.36 CaCO₃

F. S.
W. S.

Bore No. 5

Date 12/12/150

Position of Bore

200 to 300 yards south of Bore No. 1
near open cuts for limestone and
towards Lagoon

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Sample No.	Depth Section	Total Depth	Description of Ground	% CaO	% CaCO ₃	Feet x % CaCO ₃
1	2	2	Surface sand	1.8	3.21	6.42
2	2	4	Find sand	3.5	6.25	12.50
3	2	6	" "	8.5	15.17	30.34
4	3	9	" "	16.6	26.94	55.88
		14	Pump not holding sand			

105.14

Average 11.6% CaCO₃

Water at 8 ft.

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Analyses of Samples from Bores
Mills Property Jerusalem Plains

Reg. No.	Bore No.	Sample No.	Acid Insol.	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	Ignition Loss
850	1	1	89.5	0.6	2.2	2.8	0.3	4.9
851	1	2	65.6	0.2	1.0	16.7	0.6	15.5
852	1	3	57.7	0.5	0.7	21.3	0.7	18.5
853	1	4	53.6	0.6	0.8	23.4	0.7	20.2
854	1	5	56.3	0.3	0.7	22.3	0.9	19.3
855	1	6	66.3	0.4	0.6	16.8	0.3	14.6
856	1	7	53.7	0.4	0.6	23.5	0.7	20.4
857	1	8	59.2	0.2	0.8	21.0	0.3	18.1
858	1	9	77.8	0.2	1.0	11.0	0.5	9.6
859	2	1	89.2	0.4	0.9	3.9	0.1	5.2
860	2	2	57.7	0.4	0.8	21.1	0.8	18.8
861	2	3	59.0	0.4	0.6	20.7	0.9	17.6
862	2	4	58.0	0.3	0.5	21.5	0.9	18.8
863	2	5	59.8	0.3	0.5	21.0	0.8	17.7
864	3	1	96.4	Nil	0.7	0.4	0.1	1.8
865	3	2	86.2	1.4	1.4	5.5	0.1	5.5
866	3	3	58.4	0.8	0.7	21.4	0.5	18.2
867	3	4	59.0	0.4	0.6	20.8	0.5	17.8
868	3	5	64.0	0.3	0.5	18.0	0.5	15.4
869	3	6	63.0	0.3	0.3	18.7	0.8	15.8
870	4	1	96.3	0.1	0.6	0.5	0.1	2.3
871	4	2	61.0	1.0	1.0	19.1	0.7	17.3
872	4	3	55.9	0.4	0.7	21.3	1.0	19.6
873	4	4	55.4	0.5	0.6	22.4	1.0	19.9
874	4	5	60.1	0.3	0.7	19.9	1.0	17.7

Reg. No.	Bore No.	Sample No.	Acid Insol.	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	Ignition Loss
875	4	6	60.2	0.4	0.7	19.7	0.9	17.6
876	5	1	90.6	1.4	1.8	1.8	0.2	4.2
877	5	2	86.7	1.6	1.9	3.5	0.3	5.5
878	5	3	80.7	0.7	1.2	8.5	0.3	8.1
879	5	4	67.0	0.4	0.9	16.6	0.5	13.9

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The boring showed very little material of a hard and compact nature. In bores Nos. 1 and 4 a comparatively hard layer occurs within the first four feet and Bore No. 2 was bottomed on either a hard band or a boulder of hard rock.

The remainder of the material is of a sandy nature and is loose in texture. In Bore No. 1 sea-shells were met in the sample taken at 12 feet and were present in all lower samples. Some shell fragments were seen in other bores.

As the five bores put down are more or less in a line no appreciable area has been proved to contain lime but the boring does suggest that there may be a fairly large deposit of low grade material.

The average grades of the lime product have been calculated for each of the bores and in some cases for different sections of the bore. The figures show that, by excluding the surface samples, the average percentage of Calcium Carbonate is considerably increased but that the quality from bore to bore is fairly regular varying from 34.07% CaCO_3 to 38.04% CaCO_3 with an average of perhaps 36% CaCO_3 .

Whether or not a material of this grade could be economically used for agricultural purposes would depend on the costs of transport and mining. To shallow depths the cost of mining at Jerusalem Plains would be low so that Transport costs are important features.

The grade of limestone usually used for agricultural purposes contains not less than 75% CaCO_3 and often exceeds 90% CaCO_3 . With a product of an average grade of 36% CaCO_3 two and a quarter to three times the quantity of the higher grades material would have to be used to secure the same

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results. Transport costs therefore assume added importance in the economic use of the material from Jerusalem Plains but over short distances the costs of transporting the greater amount needed may not outweigh the costs of transporting the better grade material over long distances.

No attempt has been made to estimate quantities of material available. As the bores were not placed at positions where high grade material was expected the grade proved by these bores may be assumed to approximate the grade for greater areas and therefore it is advisable that further boring on a grid pattern be carried out to determine the area and quantity of the product available.

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CHIEF GEOLOGIST.

Mines Department,
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