

DEPARTMENT OF MINES
SOUTH AUSTRALIA

DOLOMITE
SOUTH AUSTRALIA

by

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DOLOMITE
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INTRODUCTION

Dolomites grading into magnesian limestones and limestones are widely distributed throughout South Australia. They form thin beds in the Cleve Metamorphics on Eyre Peninsula; they are common in the Adelaidean and Lower Cambrian of the Flinders Ranges, Mount Lofty Ranges and Yorke Peninsula; Tertiary deposits outcrop in the South East while Cainozoic lacustrine deposits are widespread (Johns, 1963).

Most of the local output is utilised as a fettling material in the steel industry and for manufacture of plate glass. The current production exceeds 300 000 tonnes, valued at over \$570 000, per year.

LOWER PROTEROZOIC DOLOMITES

Discontinuous beds of dolomitic marble occur at several stratigraphic levels within the Cleve Metamorphics on Eyre Peninsula. The Middleback North Dolomite has been sampled at a number of localities in the Middleback Ranges, extending between the Katunga Hills and Iron Duke, and shows little departure from the following: CaCO_3 , 50%; MgCO_3 , 35%; SiO_2 , 3%; R_2O_3 , 6%; MnO , 5%.

The deposits of the Cowell area are more extensive and a number of lenticular beds are concentrated at several stratigraphic

levels. Sampling of those beds which possibly contain exploitable reserves has confirmed that they are too siliceous for metallurgical use and on average contain: CaCO_3 , 52%; MgCO_3 , 40%; insolubles, 8% (Cramsie, 1968).

In the Tumby locality the dolomites are thin and are expected to be similar in grade to those tested elsewhere.

ADELAIDEAN DOLOMITES

In the Adelaide region the Beaumont Dolomite, the Montacute Dolomite and upper unit of the Brighton Limestone are highly siliceous with silica contents being generally greater than 5%. The Skillogalee Dolomite is the principal formation in the northern Mount Lofty and Flinders Ranges while other dolomites are prominent throughout the Adelaidean sequence. Available analyses indicate that silica contents of all these formations are seldom less than 5%. The Woocalla Dolomite on average contains 50% CaCO_3 , 40% MgCO_3 and 5% SiO_2 .

CAMBRIAN DOLOMITES

Carbonate rocks outcrop almost continuously along the coast between Normanville northerly to beyond Sellick Hill. Reserves are large and conditions for quarrying are generally favourable. Sampling in the Myponga area indicated that some formations are dolomitic but silica contents generally exceed 2%.

The Kulpara Limestone is a conspicuous formation that outcrops at intervals between Kulpara and Ardrossan and includes thick sequences of uniformly high grade dolomite. Reserves are consider-

able and quarry sites in a gently folded formation are readily available.

Diamond drilling has been undertaken by the Broken Hill Pty. Co. Ltd. to outline reserves of metallurgical grade dolomite and a large area at Ardrossan has been quarried since 1950 for refractory use in the company's steelworks. The dolomite is fine-grained, dense and buff in colour; a typical analysis is as follows: CaCO_3 , 55.1%; MgCO_3 , 43.1%; SiO_2 , 2.5%; Fe_2O_3 , 0.7%; Al_2O_3 , 0.7%; P_2O_5 , 0.02%.

Sampling of the Ajax Limestone along the west front of the Flinders Ranges has revealed that the lower part of the formation is dolomitic (Johns, 1967; Olliver and Cramsie, 1967). The deposit has been tested by diamond drilling near Brachina where fine grained fawn to grey coloured dolomite over a thickness of 73 m averaged CaCO_3 , 54.3%; MgCO_3 , 41.9% and SiO_2 , 1.6% (Cramsie, 1967). Large resources are obviously available but further work would be required to define specific reserves.

CAINOZOIC DOLOMITES

Metasomatic replacement deposits

Dolomites have been derived in several areas in the lower South East of the State by metasomatic replacement of bryozoal limestones in proximity to faults. They are usually pink and of variable hardness and texture. Dolomitization is irregular and unpredictable and dolomites pass vertically and laterally into normal white highly calcareous polyzoal limestones gradually, or more often, abruptly.

At Up-and-Down Rocks, near Tantonoola, reserves of 1.6 million tonnes of high grade dolomite have been outlined in an irregularly dolomitized zone adjacent to the Tartwaup Fault (Johns, 1965; Tarvydas, 1969). The rock, utilised in the manufacture of plate glass, is of fairly uniform composition as follows: CaCO_3 , 60%; MgCO_3 , 39%; SiO_2 , 0.3%; Fe_2O_3 , 0.3%.

Dolomites of similar type and composition occur near Mount Gambier, at Blue Lake and between Burnda and Compton. A number of irregular discontinuous lenses of dolomite, arranged en echelon within bryozoal limestone, mark the trace of the Nelson Fault over almost 2 km in Hd. Caroline, 30 km southeast of Mount Gambier (Johns, 1965b).

Lacustrine deposits

Dolomites, dolomitic mudstones and intraformational dolomite - clay breccias accumulated in shallow brackish water lagoons that covered large areas in the northern part of the State during the Cainozoic. Etadunna Formation equivalents in the Lake Eyre Basin exceed 45 m in thickness in the floor of Lake Eyre and show little variation in composition from the following: CaCO_3 , 40%; MgCO_3 , 36% with silica from 3 to 20%. In connection with a study of feasibility of production of magnesia from Lake Eyre brines and dolomite, the dolomites which outcrop on the shores of Jackboot Bay, near Alberrie Creek R.S. and on the Neales River have been investigated by Umbum Creek Pty. Ltd. Drilling of the deposits immediately south of Lake Eyre has been undertaken (Whitehead, 1970).

Deposits which occur elsewhere in the interior are lithologically similar. They hold little commercial interest because of remote location and low grade.

Aspects of present day carbonate sedimentation in shallow water lagoons and at the closed shallow end of the Coorong have been discussed by Alderman and Skinner (1957) and Alderman (1959). Calcite and dolomite are both present in most localities; dolomite is often the dominant carbonate mineral and magnesite has accumulated in at least one lagoon near the Coorong.

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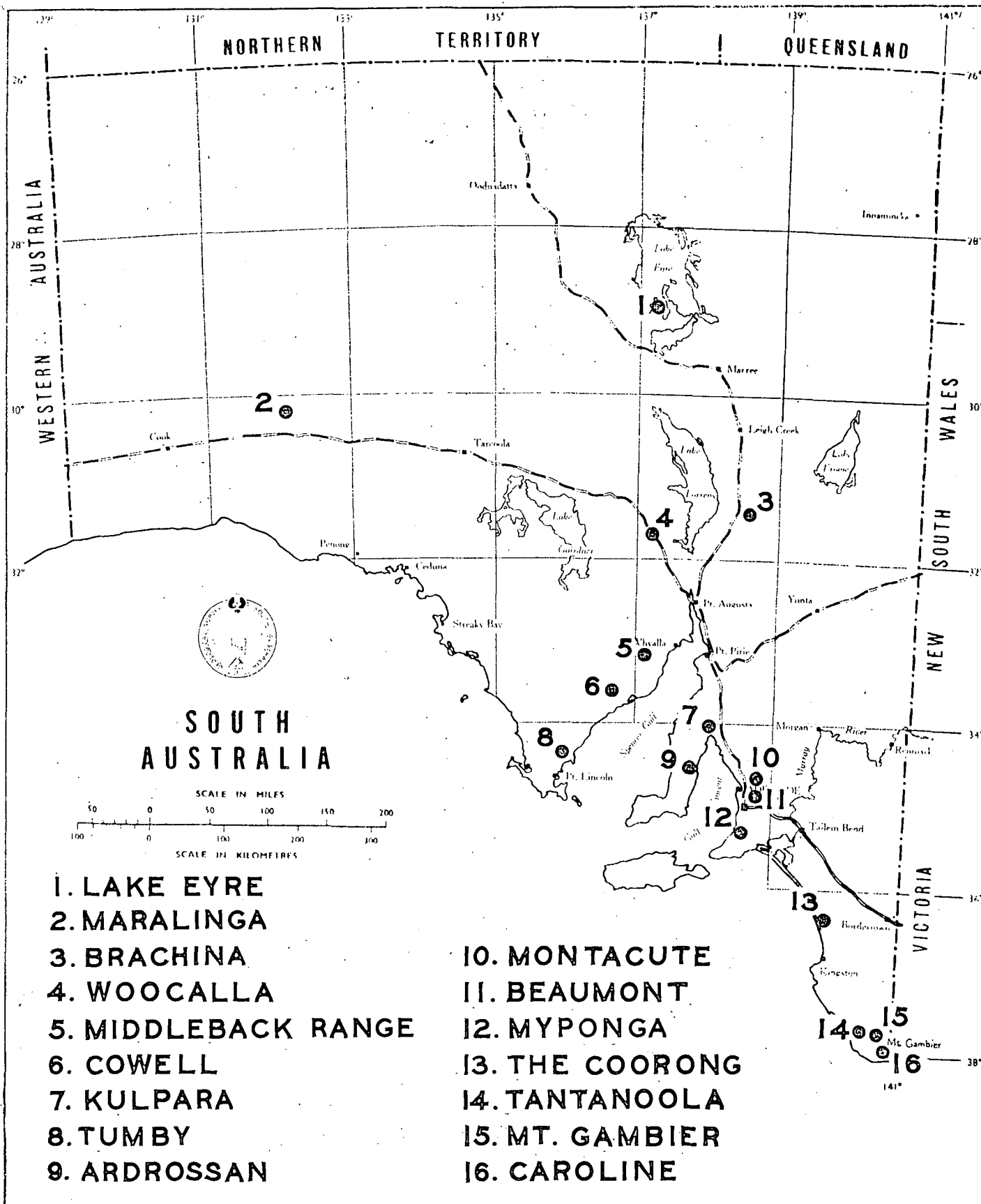
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