DEPARTMENT OF MINES
SOUTH AUSTRALIA

SILICA
SOUTH AUSTRALIA

by

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CONTENTS PAGE

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Sand dunes flank much of the coast of South Australia but along the southeast coast, Yorke Peninsula and western Eyre Peninsula the sand consists of calcium carbonates reworked from Pleistocene aeolianites. Accumulations of silica sand, winnowed from the coastal dunes, are reported from the lower Southeast but these have not been investigated as a source of silica.

Where Precambrian rocks form the coastline, sand dunes are composed of silica with minor amounts of opaque heavy minerals. These dunes are particularly well developed along Nepean Bay on Kangaroo Island and the metropolitan Adelaide beaches. Beaches and associated back shore dunes occur at intervals along the coast of Fleurieu Peninsual, one of the largest of these developments being at Normanville, 65km south of Adelaide.

Glass sand for local use is won from the Normanville deposit and treated on site to remove inpurities. Analyses of feed and treated material are given in Table 1 (1,2). Large reserves exist but mining areas are restricted by beach house development and pressure from conservation groups.

Older inland dunes and sand spreads derived from reworking of Tertiary sands were sampled by Olliver (1967) for foundry sand and the investigation included chemical and mineralogical analysis. Most samples exceeded 98% SiO_2 with Fe_2O_3 ranging from 0.3 to 0.5%.

Fine clayey sands overlie Tertiary depsoits worked for construction sand in the Adelaide area and the possibility of producing glass sands by washing is being investigated.

Inland dunes in the southern portion of the Murray Basin are grey in colour rather than the normal red, indicating lower iron content, but have not been analysed.

Quartzite overlying the white clay deposits at Birdwood, 40km northeast of Adelaide, is used on a small scale for refractory bricks. A partial analysis from Tarvydas (1971) is given in Table 1 (3).

The Mt. Barker Quartzite of lower Cambrian age is a hard clean ortho quartzite and has been sampled at Mt. Barker and Macclesfield. Results are shown in Table 1 (4,5).

No systematic survey of the widely developed Adelaidean quartzites of the Flinders and Mt. Lofty Ranges has been undertaken for sources of silica.

Partial analyses of a Torrensian quartzite at Mt. Magnificent, 40km south of Adelaide, are given in Table 1 (8,9,10).

Friable kaolinitic sandstone was formerly washed for glass sand at Longwood, 20km southeast of Adelaide (table 1 (6)). Near Nuriootpa in the Barossa Valley a sample of a similar rock contained 20% of material less than 300 mesh B.S.S., the remainder assayed only 0.03% Fe_2O_3 (Hiern, 1969).

Clean white quartzites from the A.B.C. Quartzite flank the standard gauge railway near Nectar Brook, 50km north of Pt. Pirie but have not been sampled.

A quartz reef, 18m wide, outcropping over a length of 9km near the Iron Knob-Whyalla railway, 35km from Whyalla on northern Eyre Peninsula, is worked for ferro-silicon (Miles, 1955). An analysis of a sample from a 500 ton bulk parcel is shown in Table 1 (11).

Quartz core material from zoned pegmatite is rejected during felspar mining operations in the Olary district.

Siliceous duricrust (silcrete) is widespread in northern South Australia and deposits could be found near the standard gauge railway. Partial analyses of silcrete from near Oodnadatta, which performed satisfactorily in trial silica bricks, are shown in Table 1 (12-14).

Number	Location	Sio	Al_2O_3	Fe_2O_3	TiO_2	Na_2O	K_2O
1	Normanville sand-feed	93.9 [redacted]	1.3	0.40	0.10	0.28	0.40
2	Normanville sand-treated	99.0 [redacted]	0.1	0.05	0.02	0.06	0.10
3	Birdwood Quartzite	-	0.44	0.29	0.10	0.03	0.34
4	Mt. Barker quarry	98.0	0.94	0.59	0.02	-	-
5	Macclesfield	98.3	0.55	0.52	0.03	-	-
6	Longwood washed sand	98.3	0.90	0.02	-	-	-
7	Nuriootpa + 300 B.S.S.	98.6	1.05	0.03	-	-	-
8	Mt. Magnificent	97.4	0.33	0.54	-	-	-
9	" "	98.8	0.50	0.27	-	-	-
10	" "	96.9	0.78	0.59	-	-	-
11	Iron Knob	98.2	0.45	0.43	0.02	-	-
12	Oodnadatta	-	0.44	0.89	1.02	-	-
13	"	-	0.57	0.81	1.25	-	-
14	"	-	0.62	0.87	1.32	-	-

Table 1. Partial analyses of sand and quartzite

Flint pebbles occur on beaches and in banks up to two metres thick above high water mark at several localities on the coast around Pt. MacDonald (Willington 1956). Up to 100 tonnes per year are won by hand selection for use in the ceramic industry. Reserves are large but further study of coastal erosion effects

are necessary before production could be expanded.

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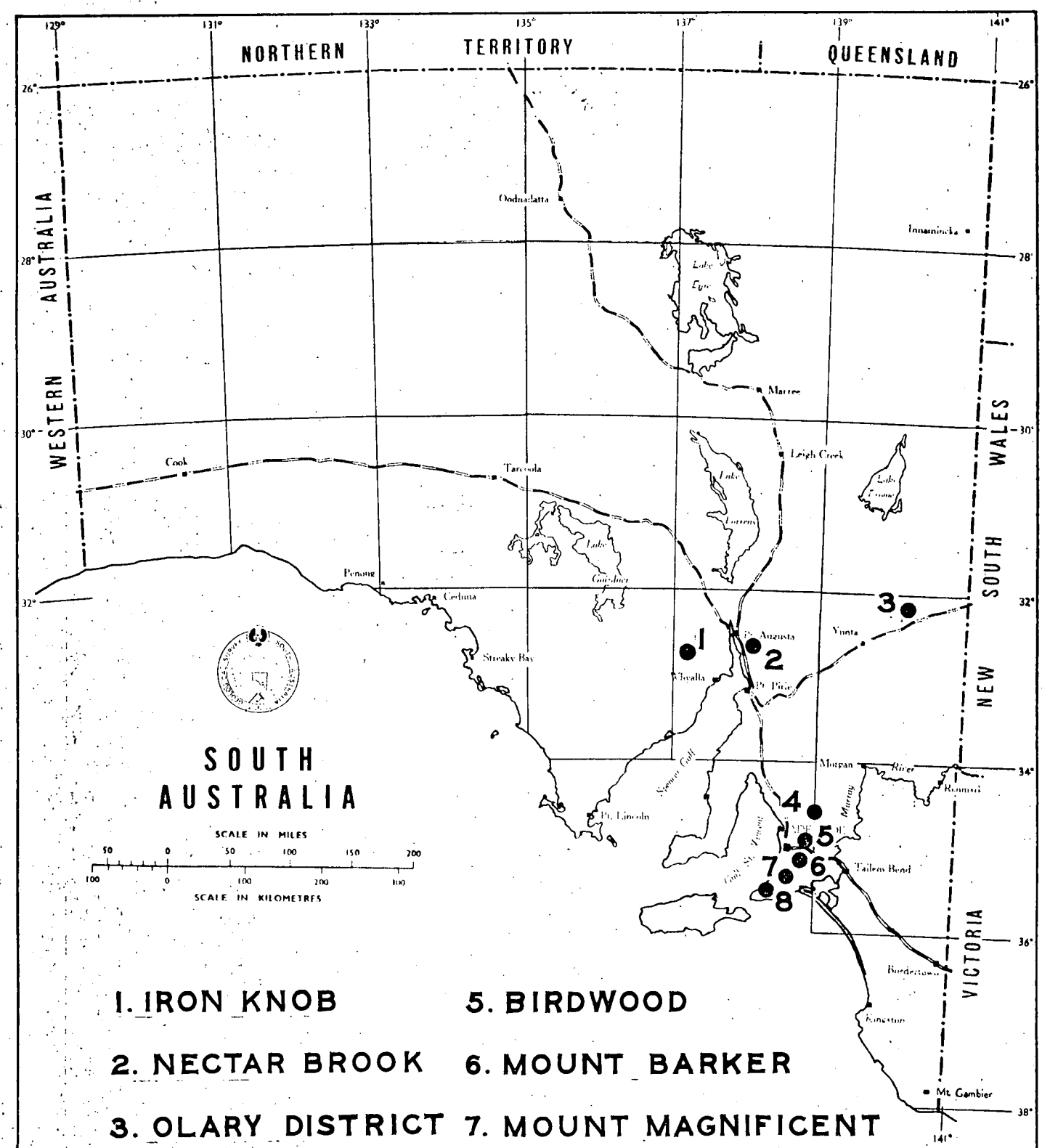

1. IRON KNOB
2. NECTAR BROOK
3. OLARY DISTRICT
4. NURIOOTPA
5. BIRDWOOD
6. MOUNT BARKER
7. MOUNT MAGNIFICENT
8. NORMANVILLE

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