Section

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

REGIONAL SURVEYS DIVISION

A REVIEW OF POST-MIOCENE VOLCANIC CENTRES IN SOUTH AUSTRALIA

by

NOLA C. WALKER
GEOLOGIST
REGIONAL MAPPING SECTION

30th March, 1967

D.M. 1310/66

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CONTENTS PAGE

Table

Data on South Australian Volcanic Centres.

Plan No.	
67-141 HL	Post-Miocene Volcanic Centres in South Australia.

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A REVIEW OF POST-MIOCENE VOLCANIC CENTRES IN SOUTH AUSTRALIA

ABSTRACT

The extent of the post-Miocene volcanics in South Australia is small; the volcanics are restricted to the South East and Kangaroo Island. Where volcanic cones exist they are of the explosive type and on Kangaroo Island there are remnants of flows. The rock type is mainly olivine basalt.

INTRODUCTION

This report originates from information collected for the International Association of Volcanology (I.A.V.) which is planning to compile a world-scale map showing the distribution of young volcanoes, mostly Pliocene and Quaternary in age.

The literature includes unpublished reports of the South Australian Department of Mines, maps, and other published reports. The more recent reports have been written from the economic point of view, and deal with rock material for roads and railways. The writer has not visited the area, and as the information is second hand, inaccuracies especially as regards type of volcano could well be present. Most heights are only approximate. The South East area is on the programme of the Land's Department for 1968, so more accurate heights may later be available.

The accompanying table provides a summary of some of the available data.

AIV - IAV = WORLD VOLCANOLOGICAL MAPS

INFORMATION FORM

SOUTH AUSTRALIAN DEPARTMENT OF MINES

Name of Volcano	Name of Country or region	Latitude and Longitude	Height above sea level	Edifice Height	CLASSIFICATION			
					A, B or C	Type of Volcano	Main Rock Type	Other Remarks*
Mt. Schank	S.E. OF SOUTH AUSTRALIA	37°56½' 140°44'	401'	4300'	Category C	Agglomerate cone	Microporphyritic olivine basalt	Lava and agglomerate
Mt. Gambier		37°50' 140°45'	621'	500'		Tuff cone - 3 calderas		Stratified tuffs and agglomerate - olivine nodules to 30 cm.
The Bluff		37°44½' 140°34½'	661'	550'		Composite cone		Lava, agglomerate, scoria and ash.
"Unnamed"		37°43' 140°29½'	small	small				
Mt. Watch		37°41½' 140°31½'	310'	70'		Composite scoria cone		Unconsolidated ash, bedded scoria, lapilli and olivine basalt bombs.
Mt. Lookout		37°40' 140°29'	709'					Agglomerate in soil.
Mt. Lyon		37°38' 140°38'						Agglomerate in soil.
Mt. Frill		37°57½' 140°31'		25'				Agglomerate in soil.

Name of Volcano	Name of Country or region	Latitude and Longitude	Height above sea level	Edifice Height	CLASSIFICATION			
					A, B or C	Type of Volcano	Main Rock Type	Other Remarks*
Lake Edward	S.E. OF SOUTH AUSTRALIA	37°37½' 140°36'	400'(?)	100'	Category C	Ash cone-caldera	Micro porphyritic olivine basalt	Ash, scoria and olivine bombs.
Lake Leake		37°37' 140°35½'	325'(?)	small		Ash cone-caldera		Ash and scoria.
Mt. Burr		37°36' 140°29'	789'	520'		Composite cone		Ash and agglomerate.
Boyces Hill		37°35' 140°33½'		50'				Agglomerate.
Mt. McIntyre		37°34' 140°33'	619'	420'		Composite		Basalt, vesicular basalt, well bedded ash and agglomerate.
Campbells Hill		37°33' 140°31'	-	50'		Ash cone.		Ash and agglomerate.
Mt. Muirhead		37°33½' 140°24'	491'	400'		Ash cone		Well bedded ash and agglomerate.
Mt. Muir		37°33' 140°28'	-	-		Ash cone		Ash and agglomerate.
Mt. Graham		37°31½' 140°27'	596'	400'		Composite cone		Ash, agglomerate and lava.
Submarine flow near Beachport					Category A	Flow		

Name of Volcano	Name of Country or region	Latitude and Longitude	Height above sea level	Edifice Height	CLASSIFICATION			
					A, B or C	Type of Volcano	Main Rock Type	Other Remarks*
Kingscote and Gap Hills	Kangaroo Is. S.A.		500'(?)	100' thick		Flow centres unknown	Category C	Mainly enstatie basalt and some olivine basalt.

*"Catalogue of Active Volcanoes" etc. not available so composition of cones given as a check on the type of volcano.

**

A: active volcanoes or those with historic records of eruption.

B: volcanoes suspected to have erupted during the last 2,000 years.

C: older volcanic accumulations.

SOUTH-EAST PROVINCE

Olivine nodules ranging from a few cm. to 30 cm. in size occur in the ash beds overlying the basaltic flow at Mt. Gambier. They are mostly coated with a layer of vesiccilar olivine basalt or tachylyte.

The volcanism occurred in two definite periods. The earlier group in the Mt. McIntyre-Mt. Burr region is late Pliocene and early Pleistocene and the later group, Mt. Gambier and Mt. Schank, is late Pleistocene (Sprigg, 1952). But according to one carbon dating (Fergusson and Rafter, 1957) the volcanic ash at Mt. Gambier is not older than 5,000 years.

Three, possibly four submarine ridges lying transversely to the general contour of the continental platform opposite Beachport are interpreted to be submarine lava flows. A marginal submarine valley accompanies one or more of them. The heads of these presumed flows coincide closely with the epicentres of the 1897 and 1948 earthquakes. This activity may represent the last phase of the late Quaternary basaltic volcanicity in South East Australia (Sprigg, 1959).

There is however, a need for a more detailed echo sounding survey and perhaps grab sampling to establish this beyond doubt.

KANGAROO ISLAND

The basalt occurs as remnants of flows capping the hills; the centre or centres of these are unknown.

About 11 miles west of Kingscote Pliocene limestone has been baked by the basalt.

CONCLUSIONS

This literature survey suggests that a proper

appraisal of South Australia post-Miocene volcanic rocks is overdue. This would require renewed field examinations of all the known occurrences, together with a parallel laboratory study.

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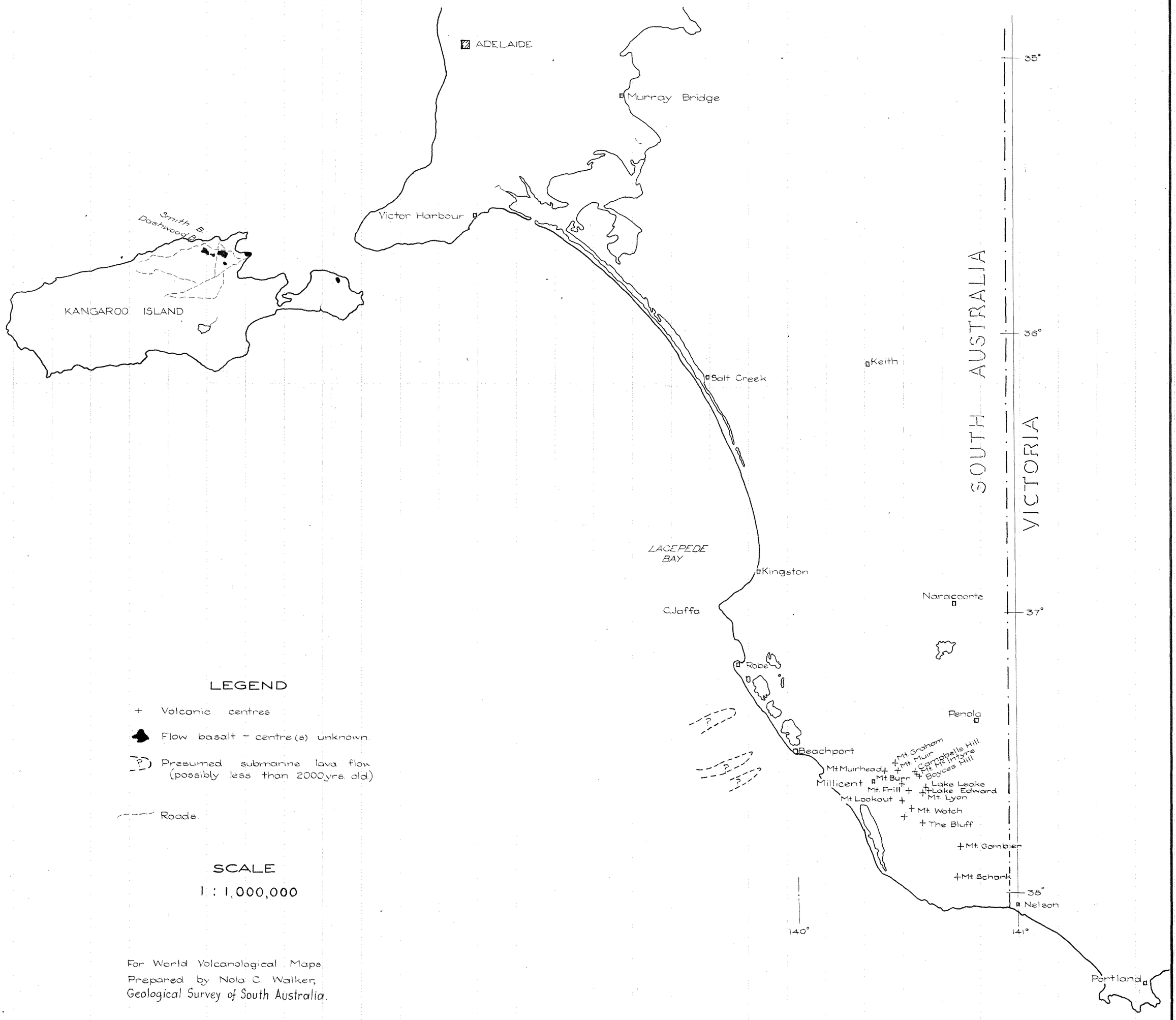

LEGEND

+ Volcanic centres

Flow basalt – centre(s) unknown

(?) Presumed submarine lava flow (possibly less than 2000yrs. old)

Roads

SCALE

1 : 1,000,000

For World Volcanological Maps
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DEPARTMENT OF MINES — SOUTH AUSTRALIA

POST – MIOCENE VOLCANIC CENTRES SOUTH AUSTRALIA

		Drn. N.C.W.	SCALE: 1" = 16 miles approx.
		Tcd. AM^cD.	67-141 HL
		Ckd. L.V.W.	
Director of Mines		Exd.	DATE: 21-3-67