PAP. & PROC. ROY. SOC. TASMANIA, VOL. 86. (15TH SEPTEMBER, 1952)

The Occurrence of Pillow Lavas near Penguin, Tasmania

By

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WITH 1 PLATE AND 1 MAP

ABSTRACT

Spilitic pillow lavas associated with laminated shales and tillite occur near Penguin, North-West Coast, Tasmania. These are correlated with similar rocks at Smithton and on King Island, which are considered to belong to the Dundas Group and thus to be Cambrian in age.

Nye in 1931 reported the occurrence of dolerite of Lower Palaeozoic age at Groom's Slip, just east of Penguin along the north-west coast of Tasmania. The reference to this report which appears in the Geological Index of Tasmania was brought to the notice of the author by Miss E. M. Smith, Geological Indexer for Tasmania, of the Bureau of Mineral Resources. It was decided to investigate the occurrence, especially as it appeared likely that it might be similar to the so-called dolerite of Smithton which has recently been re-interpreted by Carey and Scott (1952) as a suite of volcanic rocks similar to those outcropping along the south-east coast of King Island and elsewhere on the west coast of Tasmania.

The dolerite at Groom's Slip has also proved to belong to a volcanic suite which, as elsewhere in Tasmania, is associated with tillite and laminated shales. The association of pillow lavas, tillite and laminated shales is so characteristic that taken with their structural and field relations the author has no hesitation in correlating them with the Dundas Group of Cambrian age.

Commencing a little east of Watcombe Beach, Penguin, the tillite and volcanic rocks outcrop as far east as Lonah Point, a distance of about two miles. The width of outcrop is no doubt due to a series of small anticlines and synclines and minor faulting but it also seems that the volcanic rocks are of a considerable thickness. The greatest development is at Groom's Slip.

Evidence that the rock is extrusive and not intrusive is revealed by the occurrence of well developed pillow structure. The pillows range in diameter from one to six feet and are stacked one on top of the other, the overlying pillows often being bulged over those underneath as illustrated by Figure 1. Mostly they are ellipsoidal in shape but some have a tendency to an elongated twisted form as has been described by the author from King Island (Scott 1951). Some of the pillows bear the characteristic cavity in the centre. (See Figure 2).

Associated with the pillow lavas are normal massive lavas, which as at King Island and Smithton seem to overlie the shales and tillite but underlie the pillow lava, volcanic breccia and tuff. Vulcanicity must have begun before the deposition of the tillite and shales was complete because minor flows of lava are interbedded with the sediments.

In the hand specimen the pillow lava is the usual fine grained greyish green rock already described from the other areas. Microscopically, it consists of tiny laths of albite with intergranular augite and grains of ilmenite scattered throughout the rock. Occurring in the spaces between the plagioclase laths and augite granules are patches of pale green chlorite containing granules of secondary sphene. The albite has a composition Ab_{98} An_2 and in some parts of the rock is partly sericitized and chloritized. The augite is quite fresh and often has simple twinning.

Petrographically the rock is very similar to a basaltic type from King Island the analysis of which is similar to those of the pillow lavas from King Island and Smithton. These analyses have been listed for comparison with that of the Groom's Slip lava.

	I	II	III	IV	V
SiO_2	48·35	50·01	52·61	50·16	53·20
Al_2O_3	16·82	15·38	13·03	18·01	19·15
Fe_2O_3	2·85	4·86	3·90	13·98	7·72
FeO	10·21	9·21	8·48	4·15	3·87
MgO	4·46	5·85	5·10	1·84	2·89
CaO	9·55	6·35	7·26	1·40	1·24
Na_2O	3·78	4·77	5·60	4·43	5·17
K_2O	0·42	0·40	0·42	0·83	0·58
H_2O+	2·32	2·60	1·65	2·10	4·00
H_2O-	0·32	0·23	0·10		
CO_2	n.dt.	0·13	0·05		
TiO_2	0·78	0·73	0·72	2·00	1·74
MnO	0·10	0·21	0·19	Tr.	Tr.
P_2O_5	n.dt.	0·09	Tr.	0·25	0·30
S	—	—	0·08	Tr.	0·05
Total	99·96	100·82	99·19	99·15	99·91

I. Spilite, Groom's Slip, Penguin, Tas. Anal. B. Scott.
II. Spilite (Basaltic type), King Island, Tas. Anal. B. Scott.
III. Spilite (Pillow lava), King Island, Tas. Anal. B. Scott.
IV. Mugearite (Pillow lava), Smithton, Tas. (Bulletin 41, p. 69).
V. Mugearite (Pillow lava), Smithton, Tas. (Bulletin 41, p. 69).

(Note: The variation in the CaO, MgO, Fe_2O_3 content of the Smithton rocks is probably due to the replacement of the ferromagnesian mineral by iron ores, particularly haematite.)

It seems that the Groom's Slip lava has a chemical composition comparable with those at King Island and Smithton and as such would fall into the category of a spilite.

Locality Index

Locality	Quadrangle	Latitude	Longitude
Groom's Slip	Devonport 29	41° 7′	146° 6′
King Island	—	39° 35′ — 40° 16′	143° 50′ — 145° 17′
Lonah Point	Devonport 29	41° 7′	146° 7′
Penguin	Devonport 29	41° 7′	146° 4′
Smithton	Smithton 21	40° 41′	145° 6′
Watcombe Beach	Devonport 29	41° 8′	146° 5′

REFERENCES

CAREY, S. W. & SCOTT, B., 1952.—Revised Interpretation of the Smithton District, Tasmania. *This Journal* 1952.

NYE, P. B., 1931.—Report and Supplementary Report on Groom's Slip near Penguin. *Tas. Dept. of Mines Typewritten Report (Unpublished)*.

NYE, P. B., FINUCANE, K. J. & BLAKE, F., 1934.—The Smithton District. *Bull.* 41, *Geol. Surv. Tas.*

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Locality Map of North-West Coast of Tasmania

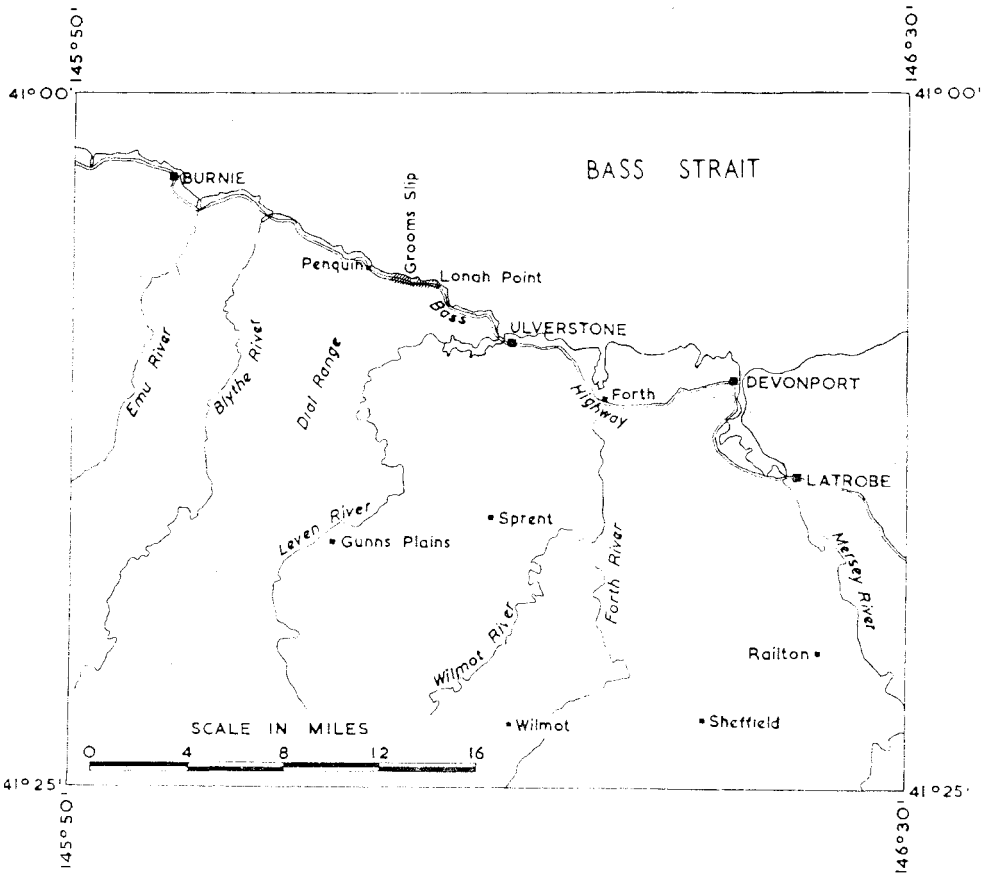

FIG. 1.—General view of pillows of lava illustrating the bulging effect of the pillows over each other.

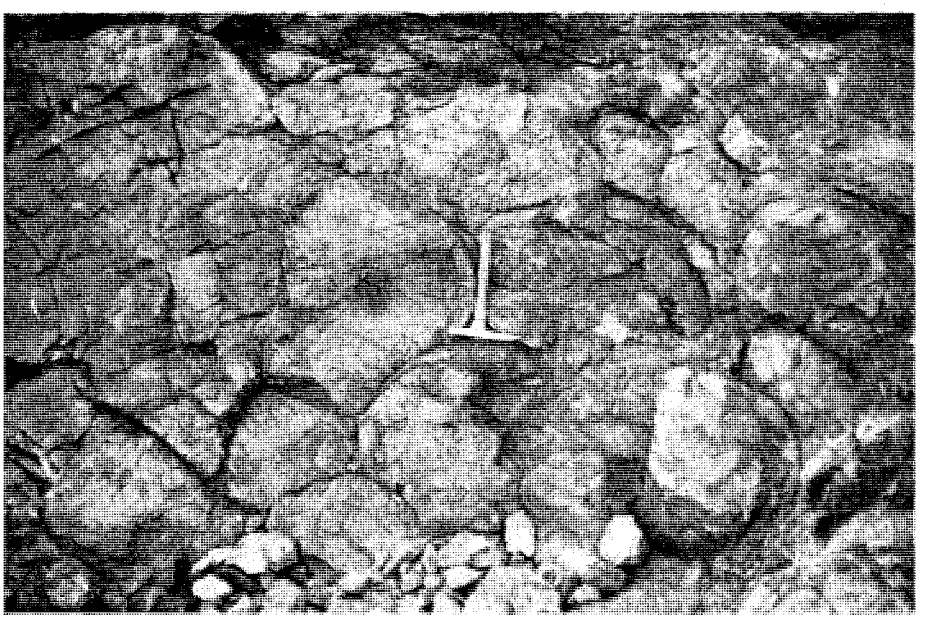

FIG. 2.—Pillows of lava, one (near hammer) of which shows a central cavity.