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GEOLOGY

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The area covered by this preliminary survey is a strip of country on the western side of the Snowy River, between Suggan Buggan in the north and W Tree in the south. A description of the geology of this area is included in the excellent reports by Howitt (2) and (4), who spent many months in northern Gippsland, and also by Ferguson (1). It is not felt that very much detailed geology can at present be added to these reports, as it was not possible to make more than a hurried visit to most of the localities mentioned. However some interesting, if somewhat disconnected, observations are recorded.

Description of Area.

Most of the rocks exposed in this area belong to the series known as the Snowy River Porphyries—these consist mainly of volcanic rocks of Lower Devonian age having a total thickness of some 2,000 feet. On the relatively flat-topped plateau between W Tree and Wulgulmerang, the porphyries are covered in places by remnants of Tertiary basalt flows. To the west, the land rises gradually to a ridge running north and south between Mt. Wom-

bargo and Mt. Statham, and extending south towards Buchan, while to the east it drops very steeply to the valley of the Snowy River.

The porphyries are very hard, and their resistance to erosion has resulted in the development of steep rocky gorges along many of the swiftly flowing rivers in the area.

At Suggan Buggan, and along the Snowy River at the junction of the Deddick River and at Campbell's Nob, older granitic rocks are exposed. In these areas, the river valleys open out, becoming relatively broad and flat, and the topography is much less rugged.

The older sedimentary rocks (Ordivician) which underlie the Snowy River Porphyries were not examined during this preliminary survey.

Notes on Rocks Collected

Granitic Rocks.

The rocks exposed at Suggan Buggan, at the junction of the Deddick River and at Campbell's Nob are grey, even-textured, plutonic rocks containing quartz, white felspar, and abundant biotite, with a little hornblende in places. Sections have not yet been cut, but in hand specimens, the rock resembles granodiorite. Microscopic examination of a crushed specimen revealed abundant plagioclase felspar, but the ratio of plagioclase to orthoclase cannot be determined without sectioning. Xenoliths of sedimentary rocks in all stages of assimilation are common at Suggan Buggan and at the Snowy River Bridge.

These grey granitic rocks are older than the overlying Snowy River Porphyries. Evidence for this can be seen in road cuttings above the Suggan Buggan River, where sections have exposed at least one large mass and a few small rounded boulders of the granitic rock embedded in the porphyries. On the western bank of the Snowy River, just north of Campbell's Nob, similar boulders can be seen embedded in fine-grained porphyry—(Plate 13, lower.

Snowy River Porphyries

This series includes many types of rock, most of which appear to be of volcanic origin. They have been described in detail by Howitt (2), and only specimens collected on this survey are described here.

(a) Quartz Porphyry.—Massive quartz porphyry occurs south of Currie Creek, approximately two miles west of the Gelantipy-Wulgulmerang Road. This rock is very uniform, and con-

tains phenocrysts of quartz and felspar, up to ½ inch long, set in a salmon-pink ground mass. Xenoliths, if present, are very rare. Many large boulders show evidence of spheroidal weathering, similar to granite. The rock decomposes to a poor gritty soil, which does not support a dense vegetation on the hillsides. The western limits of this quartz porphyry are not known; a track south of Currie Creek was followed westwards for at least one mile without any apparent change in the nature of the rock.

This outcrop is probably similar to quartz porphyry described by Howitt from the Cobboras, Mt. Wombargo and Mt. Statham; and, as he suggests, these masses are probably "the denuded stumps of volcanoes" which lie on an old meridional fissure extending from the Cobboras to Buchan.

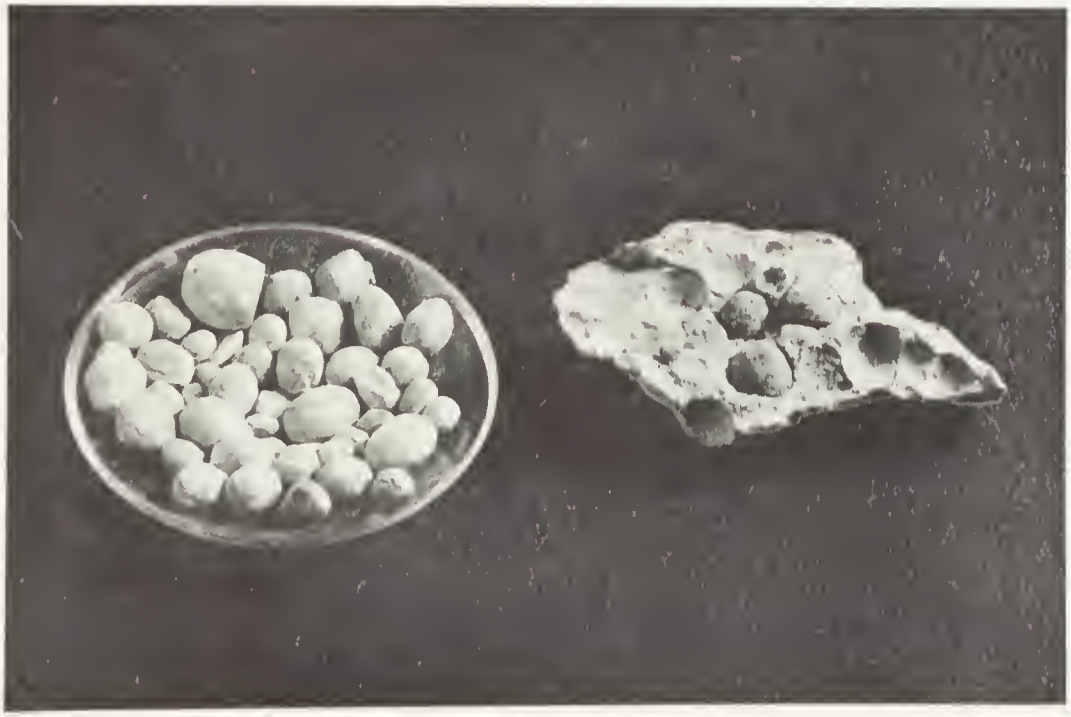
(b) Volcanic Rocks.—South of Currie Creek, approximately 1½ miles west of the road, the quartz porphyry described above is in contact with a fine-grained volcanic rock, containing phenocrysts of quartz in a fine-grained ground mass which, although altered, shows a well defined flow structure (Plate 12, upper). Angular xenoliths are common, and in places the rock shows evidence of secondary silicification.

To the east of this locality, all the Snowy River porphyries so far examined consist of volcanic rocks, and include tuff beds and great masses of agglomerate. The eruptions producing this great thickness of material appear to have been of the explosive type, rather than quiet eruptions producing vast flows of lava.

Huge masses of agglomerate stand out above the surrounding vegetation at a locality known as Bare Rock, situated south of Boundary Creek in the parish of Wulgulmerang East. These masses are composed mainly of boulders of quartz porphyry which stand out in relief on the weathered surface of the rocks. Many of the boulders appear to have been rounded before being incorporated in the agglomerate. Masses of similar agglomerate are exposed on the high rugged cliffs, where the colony of rock wallabies was located above the Suggan Buggan River.

In all cuttings on the road down to the Suggan Buggan River, the rock appears to be very uniform, and contains phenocrysts of quartz and pink felspar with abundant fragments of sedimentary rock set in a grey or pinkish ground mass. This rock is very hard and massive, and was responsible for considerable trouble during road building operations. The same type of rock occurs north of Little River, near its junction with Wombargo Creek, and also along the Forest Commission Road which is being cut from the main road just north of Boundary Creek westwards to a peak known as Seldom Seen.

"Porphyry" showing flow structure south of Currie Creek.



Volcanic Pisolites Gelantipy-Wulgulmerang Road near Boundary Creek.

Tuff Beds—Volcanic Pisolites

Volcanic tuff is exposed in cuttings along the Gelantipy-Wulgulmerang Road near Boundary Creek, where it forms compact fine-grained rocks of pink or yellowish colour. One bed of reddish coloured tuff exposed south of Boundary Creek contains small spherical pellets of hardened ash set in a cement of the same material. (Plate 12, lower). These pisolites vary in size from one-sixth inch to one-half inch in diameter, and appear to have been slightly flattened by the weight of the overlying strata. Joints in the tuff bed pass through some of the pellets. In section, these pellets have a concentric structure, and it is suggested that they have been formed by trickles of water, or by wind rolling some nucleus over a surface of soft volcanic mud. Their appearance does not suggest that they were formed in the atmosphere and fell as mud balls as was recorded at Vesuvius by Perret (5). The name Accretionary Lapilli in preference to Volcanic Pisolites has been suggested by Wentworth and Williams (6).

Middle Devonian Limestones

The Buchan limestones which overlie the porphyries further south were not examined during this survey.

Sub-Basaltic Deposits

(a) Carbonaceous Mudstone.—Boulders of black carbonaceous mudstone containing fragmentary plant remains were found in Butcher's Creek, about one mile above its junction with Back Creek. Time did not permit a search for the outcrop from which the boulders were derived, but in view of the soft crumbly nature of the mudstone, it cannot be more than a few chains distant. Quartz grains from 1-2mm. are common in the mudstone, and two almost perfect bi-pyramidal crystals were found in one small specimen. The plant remains, mainly stems and woody tissue, have not yet been determined.

This bed is probably of small local extent, and may be of the same age as a sub-basaltic plant bed described by Howitt (3) from a deep lead at Mayford on the Upper Dargo River, and identified by McCoy as Miocene.

(b) Quartzite and Opal.—Quartzite occurs directly beneath the basalt a quarter of a mile north of Currie Creek, and also further south between Gelantipy and W Tree. Small patches of common opal and wood opal occur at W Tree also beneath the basalt. Silicification of sediments forming the quartzite and opal was probably caused by solutions derived from the basalt at the time of its eruption.

The foregoing is a very incomplete record of the rocks occurring in the area, but it may serve a useful purpose in giving some indication of the great amount of work yet to be done there.

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