

UR 1952/104-105

In his Underground Water Supply Paper No. 2, P.B. Nye has carried his mapping to the south west as far as Dromedary. While investigating underground water possibilities in the Dromedary District, opportunity was taken to extend the geological mapping as far as New Norfolk to the west and Broadmarsh to the North. The River Derwent was taken as the southern boundary. There are no Departmental reports or maps concerning this area, although limestone has been fairly extensively quarried in the past.

Except in the upper slopes of Mt. Dromedary, where some logging is carried on, the countryside is mainly a settled one and numerous roads traverse the area. From the North Derwent Road, two minor roads lead over the foothills to connect with the Brighton - Broadmarsh road. A car road may be followed from Upper Dromedary to a height of 1700 feet above sea level.

The district is dominated by Mt. Dromedary which rises to a height of 3245 feet. The River Derwent is tidal as far as New Norfolk so that the country rises from sea-level to over three thousand feet in a distance of three miles. The topography of this area is thus very rugged and the small streams are cutting down rapidly to the relatively mature Derwent and Jordan Valleys.

The geology of the district is fairly simple, the strata consisting of unfolded Upper Palaeozoic Sediments intruded by sills of Jurassic dolerite. The whole of the sediments have a regional dip to the west of about 5° and are interrupted by three main faults striking at about 340° . Two of these faults, in the vicinity of the Dromedary Hall, form the boundaries of a down-thrust block of Triassic Sandstone; the third runs just to the east of the New Norfolk bridge and brings Triassic sandstone, to the west against Permian mudstone. A fault striking at right angles to these occurs, probably wholly within the dolerite, to the north of the area.

Nearly two thousand feet of Permian Sediments are exposed in this area and consist mainly of the Cascades Formation containing the typical Granton Limestones and the Fern-tree Mudstones with their prominent sandstone basal beds. The thickness of this latter formation is about eight hundred feet. Beds in the vicinity of the limestone are rich with typical Permian marine fossils.

Apparently conformably overlying the Permian Sediments are the basal beds of the Triassic, the well known Ross sandstones. They have the same dip (5°) to the West and their greatest width exposed towards the upper slopes of Mt. Dromedary where they attain seven hundred feet in thickness. Down-faulted masses of this sandstone also occur to the North (about the Broadmarsh Road); to the west (about the Magra Road) and a narrow block to the east (about the Dromedary Hall).

The sediments have been intruded on two levels by sills of dolerite, which thus dip the same way, i.e. in a westerly direction. The top of the lower sill, which intrudes the Permian sediments about six hundred feet below the limestone beds, is 400 feet above the River level at Dromedary but reaches River level at

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Boyer. The River Derwent appears to mark the approximate southern boundary of this sill. To the east and west of Riverton, tongues of dolerite extend to the south of the River, but at Riverton and again at Dromedary there is a narrow width of mudstone between the River and the edge of the sill. The upper sill intrudes the Triassic sandstones seven hundred feet above their base and is prominent as the top ridge of Dromedary. To the north of the area, in the vicinity of the Broadmarsh Road, intrusions of the Triassic by dolerite appear to be more irregular.

From an economic viewpoint, the only substance of any importance is limestone. No production of lime is in progress at present, but in the past fairly large tonnages seem to have been obtained. About a mile to the west of the Upper Dromedary Road, and near the top of the hill is an old quarry, about three hundred feet in length and 25 to 30 feet high. In this the limestone occurs in beds one to two feet in thickness and separated by a few inches of richly fossiliferous shale. No attempt was made at systematic sampling of this deposit but a sample taken across one bed selected at random showed -

Insoluble	21.2%
CaCO ₃	76.8%

The limestone appears to continue up the hill for a further hundred feet above the quarry and to be then succeeded by beds of shales and sandstones.

A smaller quarry has been opened just to the East of the Upper Dromedary - Broadmarsh Road, where the beds are exposed showing about ten feet of limestone covered by up to five feet of marl and limestone. A sample of limestone taken over the ten feet showed -

Insoluble	28.9%
CaCO ₃	66.9%

On top of the hill, north of Dromedary are many small pits up to eight feet deep which have been worked for limestone. In the vicinity are remains of old kilns. Marl here, too, is overlying the limestone and has probably been formed by the solution of the CaCO₃ and its re-precipitation. An analysis showed that the marl contained 85% of CaCO₃ and it is in such a fine state that it should be immediately available for agricultural needs. A sample of limestone taken over six feet from one of these pits showed -

Insoluble	41.4%
CaCO ₃	55.2%

Supplies of underground water should be obtainable in any of the down-faulted Triassic areas but not in the sandstones near the top of Dromedary as here water will seep through the sandstone and emerge at the surface at its base.

No mineralization occurs in this area but Permian Limestones may be utilised for agricultural needs. The small surface thickness of the marl may, because of its fine state, good grade and ease of gathering, be worth considering for local agricultural requirements.

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25th September, 1952.