

A GEOLOGICAL SKETCH OF TASMANIA

by

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General Geology.

Tasmania represents an extension of the south eastern portion of the Australian Continent, its separation having been caused in recent geological times by the flooding of a low lying portion now represented by Bass Strait.

The general similarity of rock types, the occurrence of rocks belonging to the same systems and the continuity of structures in Tasmania and south-eastern Australia support the idea of general geological unity of these lands. There are ofcourse rock systems and rock types present in Tasmania and in south-eastern Australia that are not present in the other, but these do not necessarily disprove the unity of the two lands.

The surface of the State is extremely rugged and is for the most part covered with a thick growth of trees, shrubs etc. These features render the work of geological surveys very slow and arduous, while the undergrowth etc., effectively conceals outcrops and generally renders survey work difficult. In spite of these obstacles, great progress has been made during the past decades and the rock systems present can be described with a fair degree of accuracy and certainty. At the present time less knowledge exists with regard to the Proterozoic and Lower Palaeozoic Systems than the later ones and much detailed work will be necessary before stratigraphy of these systems and their attendant igneous intrusions, is elucidated. Nearly all of the rock systems of the world are represented in the State as will be seen from the following brief descriptions.

Proterozoic

Numerous types of schists are referable to this system and are restricted to the western part, and the south-western portion thereof.

Lower Palaeozoic (Cambro-Ordovician).

Between the Proterozoic schists and the base of the Silurian system there occurs a great thickness of sedimentary rocks. Cambrian fossiliferous rocks occur at Carolina Creek, Florentine Valley, Hatfield Plains and Arthur River. Fossiliferous Ordovician rocks are not so definitely known, but graptolites from western Tasmania and fossils from the Railton limestone suggest Ordovician ages. The great bulk of these rocks throughout north-western, north-eastern and south central districts have yielded no fossils nor has their stratigraphy been worked out, so that such series as the Dundas, Read-Rosebery, Balfour, Mathinna and other as yet unnamed cannot be correctly correlated. Some igneous activity may have occurred during this period.

Silurian.

Fossiliferous rocks of this age occur throughout south central, western and north-western districts. The system includes marine sandstones, limestones, shales, quartzites, conglomerates &c. and has been divided into several series viz. West Coast Range. Tubicolar or quartzite, Gordon River limestones and Queen River shales and sandstones.

Devonian.

Sedimentary rocks are not known, but the intrusions of granite, syenite, gabbro, serpentine &c. are referred to this period.

Permo-Carboniferous.

Fossiliferous rocks of this system are present throughout the State excepting the south-western and far north-western districts. They consist of conglomerates, sandstones, mudstones and limestones with seams of coal and oil shale. The system is divisible into such series as Basal conglomerates (chiefly of glacial origin), Lower Marine, Greta, Upper Marine, and Tomago.

Triassic.

Rocks of this system are confined to the eastern half of the State and are divisible into three series - Ross, Felspathic sandstone, and Upper. The rock types are conglomerates, sandstones, felspathic sandstones, shales and mudstones with coal seams. All fossils are plants except for a few fish and fragments of amphibians.

At the close of this period, the Permo-Carboniferous and Triassic rocks were intruded on a large scale by dolerite (diabase) magma. This rock now occupies about one quarter of the surface of the State.

Tertiary.

Lower Tertiary Marine sediments are restricted to the far north-western parts. Lacustrine and fluviatile sediments occur in many districts but are specially developed in the midland, northern and north-eastern districts. Basalt lava flows covered the above and were particularly prominent in the north-west. Small thicknesses of fluviatile or lacustrine sediments in places overlie the basalt. The interesting suite of alkaline igneous rocks at Cygnet were intruded during this era.

Pleistocene.

During Pleistocene times the higher parts of the State were subject to glacial conditions of the mountain type, especially in western, central and southern districts.

It is probable that most if not all of the marine sediments of Mowbray Swamp, Flinders Is. &c. were formed during this period.

Recent.

The only recent deposits are the alluvium and gravels along streams, raised beaches &c.

Economic Geology.

Tasmania contains deposits of many valuable minerals and metals. The primary deposits of metallic minerals include those of copper, tin, lead, zinc, gold, silver, osmiridium, tungsten, nickel &c., while the secondary ones include those of gold, tin and osmiridium. The non-metallic ^{mineral} deposits include coal, oil shales, limestones, building stones, asbestos, barite, talc &c.

The metallic and certain non-metallic mineral deposits are restricted to north-eastern, north-western and western regions. All these are genetically associated with the intrusions of igneous material in Devonian and possibly Cambro-Ordovician period. The osmiridium and copper nickel ore associated with the serpentine and gabbro rocks, while the remainder accompanied the granitic intrusions. As regards the intruded rocks, gold is associated with the Mathinna slates and sandstones, while the remainder are associated with the Cambro-Ordovician and Silurian systems in western and north western regions. Tin and tungsten deposits are most commonly associated with the granites. Only a few minor deposits occur in the Proterozoic schists, while (except at Cygnet) no primary deposits occur in rocks younger than the Devonian. Thus the favourable districts in the State for the discovery of primary deposits are those occupied by Lower Palaeozoic rocks with Devonian igneous intrusions. Such districts include the western, north-western and north-eastern regions. The secondary deposits are associated with the corresponding primary ones.

Coal is prominent in the Triassic and to a less extent in the Permo-Carboniferous, rocks systems. Oil shales are restricted to the latter systems. Limestone occurs in Cambro-Ordovician, Silurian, Permo-Carboniferous and Tertiary. Barite, talc, asbestos &c. occur under similar conditions to the primary metallic minerals.

The geological structure has a controlling influence on the agricultural industries. Thus cultivation is practically restricted to districts occupied by Recent, Tertiary, (basalt and sediments), Triassic, and Permo-Carboniferous rocks. The regions occupied by diabase are practically restricted to grazing. No cultivation and very little grazing occurs on the areas of Lower Palaeozoic and Proterozoic rocks.

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March 26th, 1931.