# GENERAL ACCOUNT OF THE GEOLOGY AND GEOLOGICAL STRUCTURE OF TASMANIA AS AFFECTING THE POSSIBILITIES OF THE OCCURRENCE OF LIQUID OIL AND A BRIEF HISTORY OF THE SEARCH FOR OIL



The geological structure of Tasmania varies considerably in the different parts of the island. The western part is occupied by Pre-Cambrian and Lower Palaeozoic sedimentary formations which have been intensely folded and faulted, and also intruded on a large scale by igneous rocks belonging to the Porphyroid and Devonian periods of igneous activity. The North-eastern portion consists of Cambro-Ordovician slates and sandstones together with intrusive granite of Devonian age. The Midland and South-eastern parts are occupied by horizontally bedded strata of the Permo-Carboniferous and Trias-Jura systems which have been intruded on a very large scale by Upper Mesozoic diabase. The same strata also occur along portions of the northern coast. Tertiary strata of lacustrine origin occupy the Macquarie River basin and similar strata of lacustrine and marine origin fringe the Northern coasts, and also the shores of Macquarie Harbour on the West Coast.

The earth movements affecting all strata up to and including the Silurian were principally of a compressional type resulting in intense folding and fracturing of the strata. Since the beginning of the Permo-Carboniferous period the earth movements have been as far as our present knowledge goes, entirely tensional with resulting block faulting and movements of direct uplift and downthrow.

The strata up to and including the Silurian have been found, up till the present, to be devoid of organic or carbonaceous matter.

The Permo-Carboniferous system consists of conglomerates, sandstones, limestones and argillaceous and arenaceous shales and mudstones. It contains beds of coal, oil-shales and carbonaceous shales at two horizons at least, viz. the Greta and Tomago Coal Measures as recognised in N.S.W. Humic-kerogenite coal occurs in the Barn Bluff, Preolenna, and Mersey districts, while a sub-anthracite occurs at Mt Cygnet. The oil shales are of two types, Tasmanite and black kerogenites. Tasmanite shales consists of small sacs of vegetable origin enclosed in a marine shale and on distillation gives an average yield of 27 gallons per ton of crude oil. It occurs in the Latrobe, Railton, Kimberley, Beulah, Quamby Bluff, Nook and Oonah areas, the estimated reserve being 42,800,000 tons. The black kerogenites (Pelionite, torbanite, kerosene, shales etc.) occur in the Barn Bluff and Preolenna districts.

The Trias-Jura system consists of conglomerates, sandstones felspathic sandstones, and mudstones. It contains coal seams in the middle or felspathic sandstones series, eight seams being present in some areas. The coal fields of this age occur throughout the Eastern, Midland and South-eastern parts of Tasmania. The coal is of a non-caking humic type.

The Tertiary strata are chiefly of lacustrine origin, but marine beds occur on the Northwest and possibly also on the West coasts. The strata are generally alternating clays and sands. Brown coal and lignite occurs in parts of the Macquarie River basin, at Macquarie Harbour and elsewhere, while carbonaceous clays also occur principally in the Sassafras district.

As far as known at present, the greatest thickness (up to 1000 feet) of Tertiary strata occur in the Macquarie River and Sassafras areas.

Pieces of asphaltum have been found at numerous localities around the coast, but the origin and source of these has never been satisfactorily determined.

Numerous seepages have been reported but in the majority of cases have been found to be films of oxides of iron. Within the past twelve months however, several definite seepages have been found and verified by Mr. A. McIntosh Reid, Government Geologist. These occur in the Latrobe and Sassafras districts.

Most attention has in the past been paid to the following districts: Bruny Island, Barn Bluff, Latrobe Railton Sassafras, and Macquarie Harbour.

Bruny Island consists of Permo-Carboniferous strata and intrusive diabase. Seepages were reported to occur but Dr Wade in 1915 reported adversely on the prospects of obtaining liquid oil. In spite of this, a borehole was drilled to a depth of over 400 feet, but was not successful in obtaining oil.

The Barn Bluff district received attention in 1921 as a possible oil field. Seams of pelionite and coal occur in the Permo-Carboniferous strata as developed here.

These strata however occupy only a small portion of the district, the majority of it being occupied or underlain by Pre-Cambrian rocks. No drilling was carried out.

Since 1921, the Mersey Valley (Latrobe-Railton district) has received a large amount of attention. Boring operations have been carried out by the Mersey Valley Oil Co. and the Adelaide Oil Exploration Co. The boring has been conducted principally in the Permo-Carboniferous strata of the district, but up till the present, the operations have been unsuccessful. Since the discovery of the seepages in the Sassafras area, the site of the boring operations has been removed to this area, and drilling in the Tertiary beds is now proceeding. An account of this district is given by Mr. A. McIntosh Reid, Government Geologist in an article in the Industrial Australian, 27th September, 1923. Recently the possibilities of the Tertiary beds around Macquarie Harbour are being investigated. These beds are now being inspected by the above companies prior to the commencement of boring operations.

P. B. Nye
GOVERNMENT GEOLOGIST

Mines Dept.,
Hobart.
31 January, 1924.