

OSMASTON OIL SHALE AREAIntroduction

A seam of tasmanite, apparently the southern extension of that so well exposed in Latrobe district was unearthed at Osmaston about six years ago on properties owned by A. Bakes and J.F. Hennessey. The discovery created excitement in the minds of local residents at the time, and search for the bed was carried into contiguous areas with, however, little success. From time to time investigators from other fields visited the area and a little exploratory work was performed to determine the thickness and quality of the material. Last year the Osmaston Shale Syndicate was formed to acquire the mining rights of the shale-bearing alienated lands and leases of adjoining properties south and east. The Sybdicate, on the advice of Field Superintendent Whittle, has since performed valuable exploratory and developmental work proving the unbroken extent of the seam to be far greater than at first anticipated. Moreover, the Syndicate collected bulk samples of the shale for testing in the Crozier Retort. The results of these tests, both as regards quality and quantity, exceeded expectations.

Area. Situation, etc.

Osmaston Shale Syndicate has acquired the mining rights of an area one mile by five miles east, including Bakes' and Hennessey's properties. Of this area the shale is known to extend over 300 acres, and, as the same series of containing rocks continue over half a mile further south eastward, it may be safely accepted that the potential area is not less than 500 acres. Moreover, there is sound reason to believe that the shale measures, dip underneath the great sill of diabase forming the highlands eastward. North of Osmaston and separated by a mass of diabase half a mile wide is the Eden Rivulet area where buff-coloured Upper Marine mudstones occupy the surface. No development works have been performed there to determine the extent of the seam in that direction.

Osmaston lies north-east of Quamby Bluff, a mile from the base of that mountain which rises to an altitude of 4200 feet. Deloraine, the nearest important settlement on the Western Railway route, lies 7 miles by road to the north-east, and Exton, another town served by the railway, lies northward 7 miles. Deloraine is equidistant from the ports Launceston and Devonport which are 60 miles apart. The district generally is well served by roads, and supports a people chiefly engaged in agriculture.

Geologic Relations

The seam outcrops in a ploughed field of A. Bakes' property and in the bed of Quamby Brook where it passes through J. Hennessey's land. It has been exposed in a number of shallow pits and in bore holes on Bakes' land. The strike is a little west of north, and the dip an equal amount north of East at an angle of 7 to 10 degrees. On the east side the ground rises steeply into a high diabase-capped hill, the axis of which is north-westerly and which is a northern projection of Western Tier.

The shale (tasmanite) seam is a member of the Permo-Carboniferous formation and lies between the Upper and Lower Marine members conforming in position to the coal seam of that age; but whereas the coal seam is terrestrial, the shale seam is marine. The shale is directly overlain by 40 feet of pebbly mudstone, then by over 300 feet of very fossiliferous brownish-black mudstone, which weathers to a yellow sandy clay; it is underlain by pebbly mudstone, sparsely fossiliferous, with occasional bands of coarse sandstone. The Permo-Carboniferous formation is in some parts capped with a great thickness of diabase of Mesozoic age, and it rests unconformably on the tilted edges of Ordovician, Cambrian, and Pre-Cambrian formations. All members of the Permo-Carboniferous below the Lower Marine pebbly mudstone are missing here because this base was at a higher elevation during the early stages of that period of sedimentation.

The Permo-Carboniferous were laid down in regional synclinalia developed in order rock formations. In the case of the shale member deposition took place in long shallow inlets of the Permo-Carboniferous sea on a gradually sinking platform. Sedimentation continued long thereafter until interrupted in a later period by the great intrusion of diabase which penetrated the soft sediments in the form of bosses, dykes, sills, and irregular masses. This molten mass, by virtue of its greater specific gravity, insinuated its way between the layers of soft strata uplifting and dislocating them in an extraordinary manner. In places the bigger sill-like bodies furrowed deeply into the underlying beds. All these phenomena are exemplified in Osmaston area and the country to the south of it. East of Osmaston the diabase appears in the form of a sill with a very irregular floor, and northward the intrusive body has furrowed below the shale bed almost to the basal rocks of Ordovician to Pre-Cambrian age. Eastward the Upper Marine Mudstones dip underneath the diabase and may remain little disturbed a great distance in that direction. In this event the shale seam should prove to be of very great extent.

The terrestrial member corresponding in position to this seam is, probably, the thick bed of Carboniferous shale outcropping on Berne's property south-westward. A difference in altitude is accounted for by faulting a north-trending fault also gave rise to the idea of two seams of shale, the seam having been found at different levels along the strike in Bakes' and Hennessey's properties

#### The Shale Seam.

The shale is of the tasmanite variety similar in character and appearance and mode of occurrence to that of the Latrobe Field. Here the seam is made up of two bands, each 2 feet 6 inches thick, separated by a 1 foot band of mudstone, which also contains a proportion of Kerogenous material, variable and much less in amount. The seam is encased in hard mudstone which forms a strong roof and a firm floor. The presence of the intercalated band of mudstone suggests that this is the disconnected extension of the Latrobe bed.

#### Conditions affecting Mining

The shale seam lies on the east side of Quamby Brook and dips eastward underneath the high forest clad-hill of diabase jutting out from the great east-trending wall of Western Tier. The dip-adit method is the only

means of entry necessitating the haulage of material against the grade and artificial means of drainage. Otherwise the conditions for economical mining are decidedly favourable. The outcrop is 400 feet above Deloraine allowing of easy transport of crude oil through pipes to that railway centre.

#### Development

Development work consists of a number of shallow shafts (10 to 28 feet deep) and two bore holes, one 63 feet deep. It was then realized that further works of that character were not economically sound. On the resumption of operations it is the intention of the Syndicate to open the seam by adit at a point midway between the north and south limits.

#### Quantity of Shale Available

This estimate is based on the area proved to be shale-bearing and the area over which the upper marine mudstone member is known to extend. On that basis the actual reserve is calculated to be 1,800,000 tons with a probable reserve of 1,200,000 tons.

#### Quality of Shale

Samples of the shale were submitted to Mineral Oils Extraction Limited (Crozier Retort) the following are the results of the tests:-

Yield of Crude Oil 45.9 gallons per ton; the crude oil, subjected to fractional distillation on the Engler principle, boiled at 69 degrees Centigrade and was found to be composed of:

2.3	per cent	No. 1 petrol	at Temperature of 69° - 130°
4.8	" "	No. 2 " "	" " 130° - 175°
8.0	" "	No. 1 Kerosene	" " 175° - 250°
11.8	" "	No. 2 " "	" " 250° - 300°
73.1	" "	fuel, lubricating oil and pitch	at temperature of over 300°

Bulk samples of crude oil distilled from tasmanite were tested in all types of engines manufactured by one of the leading English firms with excellent results. Two samples of shale were submitted to L.H. Bath of the Government laboratories, Launceston, and produced 41.3 gallons of oil per ton, and 12.7 gallons of oil per ton. The latter, evidently represented the crude oil produced from a sample of the mudstone band between the two layers of shale.