REPORT

on the

OIL SHALE AT QUAMBY BLUFF

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OBJECT OF THE PRESENT EXAMINATION

The discovery of oil shale in the Quamby Bluff district, providing as it does a completely new oil shale field, was considered of such significance that it was desirable to, at an early stage, determine the size and value of the discovery, and also to make such observations as would ensure that prospecting would be carried out efficiently and be controlled on a scientific basis. This examination was necessarily a short one and is merely a preliminary to a complete geological survey of the area to be carried out subsequently.

CHARACTER AND MODE OF OCCURRENCE OF THE SHALE

The general character of the shale is the same as that of the oil shale of the Mersey District. The mode of the occurrence in the Quamby Bluff District is exactly similar to that which is characteristic of the Mersey field. Its mode of occurrence, therefore, is that of an approximately horizontal bed, occurring at one horizon in the Permo-Carboniferous series. This latter series consists of fossiliferous marine mudstone conglomerates and limestones. The shale itself is also a marine formation, the basis of the oil content consisting of minute vegetable spores. These Permo-Carboniferous beds pass upwards to Trias-Jura sandstones and shales which contain coal seams or carbonaceous shales. This combined approximately horizontal rock series abuts in places against Pre-Cambrian quartzites and mica schists rising up like islands through the series containing the oil shale. The whole series also is intruded by diabase which cuts off portions of the oil shale field and thus makes the occurrence discontinuous. By the intrusion of this diabase and also by subsequent block faulting the oil shale horizon has been lifted or dropped to different levels, and consequently it is found at various levels having a considerable variation above sea level.

THE DISTRIBUTION OF THE OIL SHALE IN THE QUAMBY BLUFF AREA

It had been claimed that the oil shale had been found both in the vicinity of Quamby Brook and extending westwards for as much as six miles. This examination has definitely determined that the discovery of oil shale outcropping on the surface is limited to the Quamby Brook area. The discoveries of so-called shale on Hewitt's property and as far west as Berne's property (due west of Quamby Bluff) have not been substantiated by this examination as the substance taken for oil shale is really a carbonaceous shale occurring in the Trias-Jura series. This carbonaceous shale has no value as a source of oil and is totally different in character to the Tasmanite or oil shale.

The area definitely known to carry oil shale is in the Quamby Brook valley extending southwards from William Bakes' property. This occurrence is restricted to the eastern side of the Quamby Brook, being cut off on the western side by its abutment against the Pre-Cambrian mica schists. Northwards it is also cut off by the same rock series. To the eastward and southward its extension is not at present definitely determined as in these directions it is obscured by diabase.

Whether there is any extension of the oil shale eastwards and southwards of the beginning of the diabase is dependent on whether that diabase is a sill overlying the oil shale or whether it is a transgressive igneous mass which would definitely limit the eastern extension of the sedimentary beds. The evidence seems to point to the latter conclusion, but a final decision must await the complete geological survey.

Assuming the tentative conclusion to be correct, there is in this locality an area of approximately 1¼ square miles which can be regarded as potentially shale bearing.

The thickness of the seam as disclosed in the various outcrops or holes varies from 2 feet to 5 feet. In this thickness the shale is not of uniform quality, but the various beds differ in oil content.

The country between the Quamby Brook and the Permo-Carboniferous outcrops to the south of D.J. Mahony's residence consists of Pre-Cambrian mica schists and diabase, and cannot be expected to contain any oil shale. In the country extending from the State School around the northern and north-western foothills of Quamby Bluff, the horizon on which the oil shale occurs is below the surface and prospecting for the oil shale can only be effected by boring. Portion, however, of this area consists of a diabase intrusion and further limits the prospective area of oil shale. Further up the mountain slope both behind Hewitt's property and also behind Retter's property towards the Meander River, a considerable fault exists which has thrown the Permo-Carboniferous beds up to the level of the Trias Jura. There is a further area, therefore, around the higher slopes of Quamby Bluff in which the Permo-Carboniferous rocks outcrop wherein a search for oil shale is justified. As yet, however, no discovery of undoubted oil shale has been made in this area. Search for it, however, is justified.

The area to the east of the oil shale in Quamby Brook Valley now occupied by diabase is not worthy of surface prospecting. The oil shale horizon, however, may be expected to recur on the slopes towards the Eden Rivulet and in the valley of the Liffey River.

HINTS TO PROSPECTORS

The following general hints to prospectors will help them in their search for the oil shale:-

1. Where Pre-Cambrian mica schists and quartzites outcrop there is no prospect of locating shale.

2. The shale is associated with fossiliferous mudstones and mudstone conglomerates.

3. The oil shale does not occur in association with the sandstones. Where the sandstones outcrop search should be made in the underlying Permo-Carboniferous fossiliferous beds and at a vertical distance of approximately 350 feet below the

horizon in the sandstones in which the carbonaceous shales occur.

4. Search higher up the mountain than the outcrops of sandstone should be made to locate the recurrence of the fossiliferous Permo-Carboniferous beds which have been raised above the sandstones by faulting. Prospecting in the gullies cutting through these higher level Permo-Carboniferous beds is desirable in order to locate the oil shale horizon.

5. In the flat country north of Retter's, the oil shale horizon is below the surface and must be searched for by using a hand boring plant.

6. In any area occupied by diabase, search the lower lying country on the slopes. It is very doubtful in this district whether any surface outcrop of diabase has oil shale underneath it, but there may possibly be oil shale on the flanks of the diabase occurrence.

CONCLUSION

If prospecting is carried on for the next few months on the lines indicated above then further data will be obtained which will enable a comprehensive report to be prepared after the complete geological survey has been made.

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