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MINING AT ADAMSFIELD.

The Adamsfield Osmiridium Field was inspected during the week commencing 12th October, 1942, in order that the present condition of mining on the field could be investigated, and to consider any plans whereby the production could be increased.

The Geology of the district has been mapped and described by P. B. Nye (1929) and at a later date (Geological Survey Report 1930 p.60) he wrote a "Report on the Osmiridium 'Lode' at the Head of Main Creek, Adamsfield." Most of the relevant references to Adamsfield are listed in the first mentioned publication.

Although differing on minor details from Nye, on purely geological questions, the main principles of the occurrence and distribution of the Osmiridium are as described by that writer.

The occurrence is intimately associated with the outcrops of an ultrabasic dyke mapped under the general term of Serpentine. So far, only one line of 'reef' which bears osmiridium has been found. Although it is extremely likely that other 'reefs' exist, most of the occurrences of osmiridium around Adamsfield itself and to the west, are apparently derived from that reef.

THE OSMIRIDIUM LODE. -

The general nature of the lode formation is a fault system usually with a well defined nearly vertical eastern wall, while the western side is not so well defined. Sometimes, the wall dips slightly to the east, or to the west. The strike of the lode system is a little to the west of north, but when followed in detail, the curvature of the fault line is complicated by small offsets due to transverse faults. The line of reef has been partly sluiced and then stoped, and its course is marked by a line of open cuts.

The western wall is not as well defined, and in Byrne's workings several west dipping faults with pug can be seen. The Osmiridium (Tasmania) Company's Shaft, about 700 feet to the north, has an underlie to the west and is near the western side of the lode formation. The Eastern Wall is not well defined in the open-cut, but just north of the shaft, a transverse fault throws the junction of the Silurian and the Serpentine to the east. This eastern wall, I was informed, was not seen in the workings.

Towards the south the lode is in the serpentine, but further north, near the collapsed tunnel, the eastern wall is of steep west-dipping impure limestones and shales, which are fossiliferous.

The Osmiridium (Tasmania) Company's Shaft is now full of water, so no inspection could be made. The small winch and a 5.6 H. motor for driving the winch are still in the engine room.

Byrne's Shaft is further south and is over 50 feet from the western side of the lode formation. On this section of the reef, there are several shallow shafts, but apart from Byrne's Main Shaft (78 feet deep) and the Tributers' Shaft the others were not available for inspection.

At 60 feet in Byrne's Shaft, the crosscut extends about 50 feet to the east, where a short oblique drive extends south to the part of the reef now being mined. Off the main crosscut, two short cuddies prospected the flat west dipping puggy seam, which is similar to the occurrences seen on the west side of the rill stope. The end of the main crosscut is now mullocked, but is stated to extend ten feet to the footwall, which was driven on northwards for 40 feet. Part of the south drive has collapsed, accounting for the oblique south drive to the footwall. The reef is being worked by rilling and underhand stoping. The work, at the time of inspection,

was confined to that portion north of the Tributers' Shaft in the opencut. This shaft is about 30 feet deep and the level is connected with McAteer's Shaft, further south.

Most of the workings are on a fault breccia in which rounded portions of the breccia are joined by puggy material. The puggy material is put through the battery and is, apparently, what carries most of the Osmiridium. Some of the 'boulders' are stated to carry Osmiridium but some are stacked underground and others stacked outside the Battery House. In composition, the boulders vary very considerably. Some are full of olivine nodules, others are mostly chromite, while some are made of various varieties of 'Serpentine' that are present.

The Mine is equipped with a balance pump, a friction hoist and a five head battery. All these are oil driven. A water wheel is also connected to the pump, and can be used when water is available. As the material which is being crushed is soft, the dies are not being used, and the clogging of the screens is giving some trouble.

The reef workings offer possibilities of development. A more efficient method of treatment and recovery would be of great help. In the actual mining, water soaking from the side of the hill and into the opencut is troublesome. As the general nature of the lode is known, a vigorous developmental programme is necessary in order to prove the lateral and vertical extent of the lode at a greater depth. Mining in rock of the nature of 'Serpentine' is always difficult, but conditions are generally better when out of the zone of surface water. A proper system of mullocking would also help towards decreasing the amount of water entering the workings.

It is unfortunate that the Osmiridium (Tasmania) Company's Shaft was not accessible for inspection. The arrangement of tipping the ore at the shaft, then shovelling on to a sledge, or cart, and carting it to the battery, which is situated some distance down the hill, was both costly and inefficient.

There is no doubt that increased production would result from the development of the mines, but as no authentic figures are available as to the average grade of the ore or to cost of production, no opinion can be expressed as to whether such work would be payable under present economic conditions.

ALLUVIAL DEPOSITS -

None of the plans that are available show the position or extent of the alluvial workings, but I have sketched accompanying
the general location of these on the plan. To investigate fully the factors underlying the distribution, it would be necessary to map in detail the areas already worked. While the principal workings to the west of the Thumbs are shown, the extent and position of these have not been accurately determined.

The evidence obtained shows that the distribution of the osmiridium is closely connected with that of the Pleistocene and recent Gravels, and a logical explanation of the alluvial deposits can be formulated. It will be seen that most of the alluvial osmiridium was obtained to the west of the Serpentine belt, except for that part of the field along Tiger Creek. Even the latter occurrence can be explained by consideration of the cycles of erosion to which the district has been subjected. The earlier cycle deposited a big area of gravels in the valley of the Adam River and probably also in the valley of the Tiger.

The outlet for this early cycle as far as the area west of the Thumbs is concerned may have been by the present one over the Falls, but there is a possibility that it could have been down the gap now occupied by Webster's Creek. This is feasible as the extent of the button grass plain which has some placer deposits at the head of Webster's Creek is very suggestive and the

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level of the 'High Level' osmiridium-bearing gravels is roughly what one would expect under those circumstances. A great deal of the accumulation of gravels was due to the fact that a local base level of erosion was formed by the hard beds of Silurian Conglomerates. Above this, the rivers had to widen their valleys and deposit their load of gravel. The rivers at that time probably also carried greater volumes of water, due to the increased rainfall accompanying the Pleistocene glaciation.

The second cycle of erosion was initiated when a sudden change of conditions took place. The volume of water diminished, and a sudden lowering of level of the local base line of erosion, enabled the Adam and Eve River and their tributaries to cut into and erode the gravels of the first cycle.

This may have been due to the diversion of the river system to its present outlet at the Falls where undercutting of the Cambro-Ordovician beds beneath the hard Basal Conglomerates would help in lowering the local base level. Whatever may have been the cause, the result has been the erosion of the gravels of the first cycle, and a re-distribution of their contents. The map shows plainly that the gravels lie beneath the 1,400'contour, except for that part of Main Creek which is near the 'lode'.

Remnants of these gravels remain along the flanks of the Ragged Mountains. e.g. at the top of Webster's Creek and Welsh Gully and on several other Gullies to the South. A feature of some of these is that no"bottom"is present but that most of the wash contains a little Osmiridium. e.g. claim of Jans to the south of Lumsden Creek.

In other places, most of the gravels of the first cycle was washed away leaving the bare rock exposed. In these areas, most of the small creeks contain Osmiridium. e.g. on Football or Sand Hill, with a marked concentration near the base of the hills and in the little gullies.

The surface of the rocks beneath the gravel was of assistance in the gradual elimination of the gravels in certain areas. In these areas, the bedrock dips at very flat angles or in places is horizontal. Small flat folds are present, and the bedrock surface is closely related to the folds. e.g. the limestone along Adam River occurs in a flat syncline, while the underlying sandstone and shale are exposed on the side of Ragged Mountain and near Football Hill, forming a flat anticlinal structure.

The resorting of the old gravels gave enrichments along parts of the present day creeks, particularly those coming from the Reef at the head of Main Creek and in the area between this and the outlet of the rivers at the Falls.

I have dealt at length with the distribution of the gravels, as these form the deposits containing alluvial osmiridium. Most of the osmiridium produced in the Adamsfield district has been obtained from the gravels or from the bared rock originally beneath the gravels and most of the easily accessible deposits have been worked out. At present, there are only a few prospectors at work but the total amount produced by these is very small.

However, there are two Hydraulic Sluicing Plants in the flat of Adam's River and they produce most of the osmiridium now being obtained.

1. Clark and Party.
2. Roach and Son.

The former are sluicing on the north east of Marriott Hill where the Adam River runs from north-north-westerly course to a westerly one. They commenced work near the falls and worked upstream in a very narrow channel. They then went back part

of the way and are taking another cut alongside the first. The total distance worked has been about 60 chains. They claim to treat between 150-200 cubic yards a day in shallow ground, and that each small paddock averages between 2-3 oz. of Osmiridium. It is their stated intention to continue their cut into the Adam River and divert that stream into their cut before sluicing up the present channel of that river. Between their present workings and the river is a narrow belt of forest. The cost of shifting that timber will be high and they doubt whether they will work that part.

Their water is obtained from a spring (Roaring Meg) on Lumsden Creek, which gives just under two sluiceheads of water. This is brought by race to a dam on Webster's Creek, from where it is led to another dam on Marriott Hill, which is about 150 feet above their workings. Eleven inch pipes go to the bottom of the hill and then 7" pipes along the plain, with a 6" Nozzle.

The ground that is being worked is of varying depth but would average between 6' - 10'. Some of the chief drawbacks to increased production are :-

1. Lack of sufficient water.
2. Need for some method for removing trees and stumps.

Water could be obtained from further up the Adam River, by cutting a race. The exact length and course of this would have to be determined by an accurate survey. The cost would depend a great deal on the course taken, as parts of the hill slopes are heavily timbered and others are precipitous.

For the quick removal of the trees some source of power, other than by hand, would be required. Transport difficulties limit the choice to some extent but a cheap method for the quick handling of the trees and stumps would be necessary in any scheme of increased production. To sluice higher up the channel requires more pipes. I understand that they have about 4,000 feet under order, but owing to war-time conditions there is some delay in obtaining these.

A race for some distance beyond Roaring Meg has been cut, but is not in use, as it remains uncut a long way from the source of water - the upper reaches of the Adam River.

ROACH AND SONS -

These workings are on the western side of Football Hill near the debouchment of Manning Gully and the swamp to the west.

Water is obtained from two races, one from the western slopes of the Thumbs from Lantan Creek and the second from the western side of the Saw Tooth Range. Their dams are near the township of Adamsfield.

The workings are extensive and are deeper than Clark's. The gravels are pumped on the ground to the west, where, they state, the Osmiridium values decrease. The bedrock dips west at about 15° and then gradually becomes flatter. Work has been extended along the southern flank of Football Hill but a decrease in values at their present site renders it unprofitable.

It is their stated intention to move further south, where alluvial holes on Statton's Creek points to the possibility of the existence of payable ground, in the flat near the mouth of the gully and up the bottom part of the gully.

To work this area it would be necessary to cut two races to the south - a distance of about 50 chains - at an estimated cost of £2 per chain.

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To a great extent, they are limited by deepening ground to the west, and by the fact that they are distributing their tailings over the ground to the west.

Most of the other prospectors are in a small way and apart from the possibility of striking rich patches, cannot be expected to be able to increase production in a large way, although they maintain they would produce more Osmiridium if the price were higher. Their productio however, depends on the amount of hard work and time they put into n their efforts.

Hopes for increased production must depend on :-

1. The Reef Workings.
2. The Sluice Plants.

In both cases, more equipment will be needed and more manpower on these schemes. The remoteness of the area and the difficult and high cost of transport, are factors that hinder the economic exploitation, while the fluctuating price of Osmiridium, in past years, has been no inducement for the expenditure of much capital. A guaranteed price and market for Osmiridium would be of great aid, and a necessity before large scale developmental work can be undertaken.

In the case of the Reef Workings, the re-opening of the Osmiridium (Tasmania) Company's Shaft might help production, but in any case, developmental programmes should be formulated so that the ore can be tested at greater depth and length. The present policy of reef mining appears to point to a hand to mouth existence.

The Sluicing Plants offer the best prospects for an increase in production at short notice. From what has been said about the mineral-bearing gravels, there is a large quantity of unworked alluvial deposits in the valley of the Adam River. There is no doubt that the values will be patchy, but a scheme that will have as its objective the recovery of this osmiridium by sluicing the whole flat and the older terrace wash has much to commend it. It would be necessary to hold such land under lease rather than under miner's right, so that such a scheme would have to be a comprehensive one. Many factors such as a quick and cheap method of dealing with the trees and stumps; the disposal of residues and the protection of the river courses; the construction of dams and races to guarantee a sufficiency of water power; and the accumulation of the necessary pipes can only be dealt with satisfactorily when there is security of tenure over a large area. The present method of the sluicers to dispose of their tailings over unworked ground is not in the best interests of the future of the field.

Finally, there is a vast quantity of chrome-iron in the flats and if a market could be secured for this, it would be of great help in reviving this field. Not only is there a large quantity of easily obtained alluvial deposits, but on the ridges in the Serpentine immediately to the west of the Osmiridium Lode there are bands rich in chromite interbedded with the igneous rock. These deposits extend for a considerable width and length and could be worked by open-cuts. This product is now thrown away, and to the miners is a liability rather than an asset.

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