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Q73 No1.

ADAMSFIELD REPORT FOR LIPSCOMBE
(incomplete report)

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Adamsfield Rep for Lipscomb. by S.W. Carey. 1957 ?

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SUMMARY.

New geological understanding of the source of the Adamsfield osmiridium, suggests that several million ounces of osmiridium may be available in clearly defined placer bodies, at depths less than 1000 feet, worth several hundred million pounds at present prices.

The value per ton is to be proved, but may be between 4 and 8 dwt. which would allow a profitable margin above mining costs. This is equivalent to £6 to £12 Australian per ton mined for a very large orebody of simple stratigraphic type. The mining conditions are exceptionally good.

A programme to test this proposition should consist of geological field work, sampling and drilling. Financial commitments involved would be:

1. Initial cost of £2000 for sampling and surface testing.
2. Commitment for £25,000 for diamond drilling and geological investigation if justified as result of (1).
3. Commitment for £200,000 for development of mine if justified by (2).

In addition there would be cash payment to secure options on stage (1) and a vendor payment on stage (3).

The areas are all covered by leases or applications, but all are accessible to negotiation.

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1957?

anticline again shows the conglomerate thinning out very rapidly to a minimum where Main Creek crosses, where the conglomerate is entirely missing, and the lower parts of the limestone have gone over to a sandy facies and rest directly on the serpentine. Southwards the conglomerates reappear and again thicken progressively further south. Again the highest point of the ridge of the island is near the Adamsfield township and this point seems to have projected higher originally than the crestal point of the eastern section line at the head of Main Creek. Still further to the west the Ragged Mountains show the conglomerate thinning down to a minimum where Main Creek joins the Adam River. This point is again on the axis of the island but this point is lower than the peak of the island near Adamsfield township and here the main ridge is slate not serpentine. Under this interpretation the axis of the Adamsfield serpentine island in the Ordovician sea trended roughly east and west with its highest point near the site of the old Adamsfield township.

ECONOMIC ASSESSMENT

Price of Osmiridium

Local quotations for Tasmanian osmiridium have been and still are between £80 and £100 (Australian currency) per ounce and small packets are purchased at these prices. On the other hand osmium and iridium metals have been quoted for some time and are currently quoted (e.g. Mining Journal, (London) at £25 and £28 (sterling) per ounce. This is equivalent to an osmiridium price of from £32 to £35 per ounce (Australian)). The large discrepancy seems to be due to the particularly favourable grainsize of the Tasmanian production which goes under the trade name of "point metal". The South African production is too fine-grained for these specialised uses. If the Tasmanian production were substantially increased would the price be £80 to £100 per ounce or would it drop to £30 (Australian)? I do not think it would be safe to assume other than the latter.

General market trends for the platinoids as a whole indicate stability with steadily increasing industrial demand. Iridium is used for hardening platinum for jewellery and industrial purposes. Platinum-iridium alloys have high melting points and great resistance to chemical corrosion, and are being used increasingly in electrodes, electrical breaker points, dies for synthetic fibre plants and other chemical industries, crucibles and special vessels. Natural osmiridium of the grainsize found at Adamsfield is still the standard tipping for fountain pen nibs. The catalytic properties of iridium are attracting increasing attention. Osmic acid is the standard reagent for fingerprint mictoscopy and recording. Osmium compounds are used in medicine and as a stain in microscopy, and osmium metal for increasing the life of electric lamp filaments.

The melting points of the noble metals are:

		Hardness	Specific Gravity
Osmium	2700°C	400	22.5
Iridium	2454	170	22.4
Ruthenium	2450	220	12.20
Rhodium	1966	122	12.44
Platinum	1773	39	21.45
Palladium	1554	38	12.0
Gold	1063	33	19.3
Silver	960	25	10.5

The high melting point combined with great hardness and chemical resistance of osmium and iridium ensure that their industrial use will continue to grow and will only be limited by their high price. Because of the firm and steadily rising industrial demands, and the price trends over recent years, I consider that it is safe to assume that the price is likely to remain £30 Australian or better, even with some increase in production. For the present study I will assume that the probable production price would be £30 (Australian) not £80-£100 as at present quoted.

There would be some by-products, although I cannot say at this stage of the investigation that they would be an important consid-

eration. The basal beds contain chromite, which might be worth collecting. Gold is certainly present, but the higher gold values appear where the osmiridium falls. However some of the gold is cognate with the osmiridium, because I have examined one slug consisting of chromite, heavily intergrown with encrusting osmiridium, but also containing visible gold. Rutile is also present in some of the sands and may warrant collecting. Further study of the range and concentrations of the heavy minerals is necessary.

Quantity and Quality of Ore

A reconnaissance study of the folded structure shows that about six square miles of the unconformity is shallower than a thousand feet below the surface and about half of this is close to the axis of the Ordovician island where osmiridium values at the unconformity may be expected to be high. About a square mile of it is sufficiently close to known workings for one to have reasonable expectation that the ground should carry economic values. The crux of the position is of course the tenor of this ground.

The lode is in the form of a bed, formerly a marine placer now folded up to stand almost vertically. Its thickness varies from 2 feet to nearly 20 feet. The hanging wall (original upper surface is relatively regular. The footwall (the original bottom) is more irregular, representing ridges and troughs in the original floor. Values occur as chromite rich streaks and rill channels particularly on the footwall. In taking samples one might happen to catch or just miss these streaks so that bulk samples are necessary to test the body properly. This has not yet been done. The only reliable sampling so far available is that carried out by me, but that consisted of 25 samples totalling about ¾ ton. Attached is the plan showing this detailed sampling of an old drive intersected by Pollards new shaft, and also of the shaft bottom. Ore was still present under foot in part of this old drive. The old rails were lifted and the floor

cleaned off to a depth of a foot into virgin ore. A footwide sample trench was then cut across the body, and the sections bagged separately. The samples were sent to the Department of Mines laboratory for official assay. The results of this sampling (19 samples from 4 cross trenches, indicates the erratic occurrences of the values. Sample no. 8 on the footwall of the second trench happened to catch a pay streak and showed 7¾ oz. to the ton. Sample no. 16 on the other hand, on the footwall of the fourth trench assayed nil, although the next shovel taken after the sampling and washed on the spot showed a promising tail of osmiridium equivalent to several dwt. to the ton. The same thing holds on the shaft where sample no. 25 on the footwall assayed nil whereas immediately adjacent shovel-full washed a slug, and Pollard reported consistent showings down the footwall here during the sinking. It is quite apparent that bulk samples are necessary to assess the tenor of the ore. If the 25 samples are taken together and measured they average 6½ dwt. to the ton. It cannot be claimed however that this represents the value of the body even in this drive, because it contains one very rich sample which one might discard. On the other hand it is known that other samples just missed rich values.

I am therefore unwilling to base anything on this sampling beyond strongly recommending that bulk samples (one ton each) be taken at many points as the formation can be exposed at reasonable cost.

If six dwt. were averaged over the area which looks geologically favourable, there would be between ten and 20 million ounces of osmiridium, which at £30 Australian would be worth between £300 million and £600 million Australian.

Mining Conditions and Costs

Mining conditions are very favourable. There is good stopable width, of a continuous body like a coal seam, without rapids bends or folds to complicate mining. The ground stands exceptionally well. Where accessible at present there is an excellent hanging wall. A leg is normally placed on the footwall side, and a cap set on it and on a

hitch cut into the hanging wall. Nowhere is the hanging wall supported. The ore examined is easy to dig but it may become harder at greater depths, perhaps comparable with the yellow ground and blue ground of the Kimberley diamond mines. Concentration is exceptionally easy. The pay mineral is exceptionally heavy (23) and hard and does not slime in crushers. Associated serpentine is an ideal matrix, but accompanying pyroxenite boulders will be tougher. Recovery is cheaper and as complete as in gold mining. Under these conditions at £30 (Australian per ton the minimum workable grade might be from 4 to 2 dwt. per ton according to the scale of operations.

The evidence before me justifies the conclusion that expenditure to sample thoroughly is warranted. This would cost at least £2000, probably £3000. If this programme yields attractive results, a diamond drilling programme would be warranted to prove the structure at depth. I estimate this at £20,000. This would only be spent if the surface sampling indicated that a big mine was probable.

POTENTIAL DEVELOPMENT

The pattern of the potential development as indicated by present information is largely governed by the folding of the unconformity by the Tabberabberan orogeny.

EASTERN ZONE

The eastern zone consists of the eastern limb of the Adamsfield anticline which trends southward and northwestward from the head of Main Creek. This is steeply dipping from 80° to the east through the vertical to an overturned dip to the west. The lode must eventually flatten off to the east but it is not yet known how far down the steep dip persists. I do not expect it to persist to the limit of mining. It should begin to flatten within a few hundred feet. The length of lode for three quarters of a mile northwestward from the head of Main Creek has been mined continuously by holders of miners' rights right along the outcrop. These were all essentially surface workers, and although they sank small shafts and did some driving none of the workings has gone down more than 60 feet. All worked under heavy overhead, since they had to pay premium prices for their supplies which were brought in by pack-horse for 22 miles from rail-head. Nothing has yet been proved south of the head of Main Creek although the unconformity persists. There are no streams draining this line so it is not impossible that values occur there with no leaders to draw the prospectors to them.

FOOTBALL HILL ZONE

Throughout the whole area from the junction of Main Creek and