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REPORT ON THE

GOLD PROSPECTS OF THE KURUNDI GOLDFIELD

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by

B.T. Williams.

TENNANT CREEK, N.T.  DECEMBER, 1964.
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INTRODUCTION

The presence of auriferous quartz reefs in the Kurundi Goldfield was first noted by an expedition which carried out prospecting activities in the area during 1898-99. No deposits were, at this time, regarded as economic and no mining activity was undertaken in the area until after 1914. Since this time several small mines have been operated for short periods but no reef has proved of sufficient merit to substantiate the outlay required for the setting up of even a moderate sirid mine.

During the current programme of exploration, two prospects (the Cairns and the Great Davenport) have been investigated in detail and a further two (the Power of Wealth and the First Chance or Blundells) have been inspected and briefly mapped and sampled. This report sets out to show the similarity between these prospects and to conclude from the evidence now at hand, the likely potential of the auriferous reefs of the Kurundi area as a whole.
GEOLGY AND DISCUSSION

The four prospects may be briefly described as follows:

(a) The Cairns Prospect

Two quartz veins of maximum width 10 feet and 6 feet occur over a strike length of 722 feet marginal to a brecciated fault zone. They are separated by from 2 to 15 feet of sandstone and roughly parallel the strike and dip of these rocks. Gold occurs in both veins but reaches significant proportions only in the southern vein and then only over a strike length of approximately 70 feet. The overall grade of the reef has been calculated as 0.68 dwts per ton, the higher grade section averaging 4.0 dwts per ton.

(b) The Great Davenport Prospect

A steeply dipping reverse fault forks at its southern end giving a resultant narrow upfaulted block which has formed the host for the quartz veins. Veining is almost entirely restricted to zones of bedding plane shear in a shale sequence. Overlying and underlying sandstones are relatively undisturbed. Significant mineralisation occurs only within a small block, of length 100 feet, width 80 feet and depth 20 feet, near the centre of the exposed zone. The average gold grade computed for this block is 1.78 dwts per ton. Gold distribution is very patchy, in part probably due to irregular secondary enrichment of the veins near the surface.

(c) The Power of Wealth Prospect

A quartz vein of width 5 - 8 feet forms the infilling of a fault which transects sandstones. Outcrop of the vein is continuous over a length of at least 1500 feet. There is some doubt as to its persistence to any great depth at, at least, one point along its strike. Samples taken from both outcrop and underground (random samples of dump material) indicate an overall low grade for the deposit; the highest assay being 8.3 dwts per ton. The gold
(d) The First Chance (or Blundells) Prospect

Faulting has again been the dominant control for quartz emplacement. The fault has its start in a contorted zone near the contact between thin bedded, fine grained sandstones and a coarse grained gabbroic rock. It can be followed for over 900 feet through the latter rock type and varies in dip from 50 degrees to 70 degrees. Quartz has been intruded along the fault itself over a maximum width of 4 feet and also as small veins into the sediments and the gabbroic rock. Brecciation of the main quartz vein indicates continued movement on the fault after quartz emplacement. Samples taken at various points along the main vein revealed that the gold mineralisation is again patchy and of overall low grade. The only high grade assay (17 dwts per ton) was one from a small cut near the contact. A second sample taken only 5 feet away gave a result of only 0.2 dwts per ton.

Points of similarity between the prospects can be summarised thus:

1. Faulting has been an important factor in the localisation of the veins
2. Distribution of the gold within the veins is irregular and unpredictable
3. Although some high assay values have been recorded, the veins appear to be of overall low grade
4. Secondary enrichment has been a factor in producing high local grades at the Great Davenport Prospect and probably also at the other prospects.
5. In all four prospects the veins are relatively narrow and the potential reserves of quartz are small.

These prospects are by no means the only occurrences of quartz "blows" in the Kurundi field. A perusal of aerial photographs reveals the presence of possibly several hundred more. A great many of these are obviously related to faulting and, no doubt, many contain some gold. Thus there would appear to be no limit to the extent of exploration which could be undertaken in the area on this type of deposit.
Cairns and Great Davenport prospects has been costly (see Appendix) and exploration of these has been terminated at a relatively early stage because the preliminary investigation has shown their potential to be low with respect to both grade and size. If an investigation on another prospect proves it to the marginal stage where the building up of ore reserves is required, exploration expenditure would rise sharply. Drilling alone cannot be regarded as a reliable sampling tool on such deposits because of the irregular distribution of the gold and drilling results would have to be checked by bulk sampling. The latter would require shaft sinking, the opening up of exploratory drives and the setting up of a pilot plant in the area.

Another difficulty is the task of allotting priorities for investigation. Overall poor assays from initial surface sampling may well place a prospect low on the list, but high assays need not be significant because of secondary enrichment.

**CONCLUSIONS**

(1) The four prospects investigated are of a very similar nature

(2) Numerous other quartz reefs occur in the Kurundi field and these show at least some of the points of similarity which link the ones investigated.

(3) The Cairns and Great Davenport Prospects have been proved to have no economic potential. A preliminary investigation of the Power of Wealth and First Chance prospects indicates that their potential is small.

(4) These results do not reflect favourably on the field as a whole as a possible producer of economic gold reefs.

(5) Mining activities on the reefs in the past have not been on a large scale and no large deposits have been opened up.

(6) The investigations to date have been costly

(7) Much greater expenditure would be required on any prospect if it were proved by initial work to have some
underground bulk sampling.

It would appear, therefore, that the expenditure required for further investigation of the reefs is out of proportion to their indicated potential. This money could well be spent on other projects with probably much more rewarding results. In the Kurundi area there are several copper and lead prospects which should be investigated. The area has also been covered by an airborne magnetic survey and apparently none of the anomalies have received even cursory attention.

**RECOMMENDATIONS**

It is recommended that

(1) The investigation of the quartz reefs be suspended indefinitely at this stage

(2) Exploration activities be switched to some avenue of investigation which would appear more rewarding.

(3) Gold Mining Lease No.38F over Blundells Prospect be surrendered.

(4) Return the relinquish of phosphate leases

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Geologist.

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### APPENDIX

Expenditure on the Investigation of Quartz Reefs in the Kurundi Goldfield.

(a) **The Cairns Prospect**

<table>
<thead>
<tr>
<th>Item</th>
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<tr>
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<tr>
<td>Assays</td>
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<td>Costeining</td>
<td>576.17.10</td>
</tr>
<tr>
<td>Surveys</td>
<td>313.2.4</td>
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<tr>
<td>Access Road</td>
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<td>Oncosts</td>
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<td><strong>Total</strong></td>
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(b) **The Great Davenport Prospect**

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<td>Oncosts</td>
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<td><strong>Total</strong></td>
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(c) **Other Investigations**

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**Grand Total = £8,522.5.1**