RADIOACTIVE PROSPECTS

by

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Storeys Creek Area

The two prospects inspected in this area occur in the Storey's Creek Granite which outcrops in a dissected table-land a few miles north of Avoca. The granite intrudes slate and quartzite of the Mathinna Group (Lower Palaeozoic?) and, in places, remnants of this sedimentary cover still remains. In some areas, granite or intruded sediments are overlain unconformably by Permian sediments.

The Storey's Creek Granite normally shows noticeably increased radioactivity compared to that of sediments and dolerite in the Avoca area and counts ranged from two to five times this normal background. The granite mass contains a number of related but distinct phases, - pegmatite, aplite, greisen and quartz veins, - but the most common type is a porphyritic granite with large phenocrysts of soda orthoclase and with subordinate mica. The geology and tin deposits of the area have been described in detail by Reid and Henderson (1929).

Both prospects visited are close to Storey's Creek in fairly rugged country along the dissected edge of the table-land and are about two miles south of Rossarden, a village on the road from Avoca to Aberfoyle. Access from Rossarden is by foot.

The area in which the prospects lie consists mainly of granitic rocks, dissected to about 300 ft. by Storey Creek and its tributaries but remnants of roof pendants occur on some of the ridges. Old tin workings indicate that some of the granite contains tin.

Chwalczyk's Prospect

This prospect is situated two miles south of Rossarden on the left bank of Storey's Creek which flows roughly south in this locality. Chwalczyk detected abnormally high counts close to water level and has now removed part of the soil and granite scree from the precipitous creek bank to expose rock in site. This shallow cut is the main exposure at the prospect although abnormal counts and some torbernite were observed at a shallow hole about 100 ft. upstream on the same bank. In the vicinity of both exposures the ratemeter gave a general count of about 2,700 counts per minute , - * $2\frac{1}{2}$ times the background normal for the granite in the immediate vicinity and about 9 times the background normal for sediments and dolerites of the Avoca Area.

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* With ratemeter type 1292A activity is read in microamperes on one of four ranges with no direct conversion to counts per minute. For convenience in these notes readings have been converted to approximate counts per minute.

The face of the cut consists mainly of medium to coarse-grained granite, porphyritic in feldspar, but a finer grained aplitic rock was exposed towards the bottom of the cut. Examination with the beta probe clearly indicated that significant radioactivity was confined to this finer-grained material which also yielded torbernite. The area of aplitic rock exposed in the face measured 5 ft long with a maximum height of 2 feet at the southern end. The rock, which is severely weathered, contained phenocrysts of quartz and some large weathered feldspars in an aplitic groundmass. Some of the rock, particularly at the southern end of the cut, contained flakes and patches of torbernite and, in places, soft black material - probably manganese. The aplitic rock was sheared in places and showed closely, spaced sub-horizontal lineations like joint plains which tended to dip gently south at the southern end. The contact between the two rock types in the face was made indistinct by weathering but fresher granite close by showed an intrusive (?) tongue of finer-grained rock with feldspar phenocrysts not unlike the aplitic material in the face.

Samples were taken from the finer-grained material at the southern end of the cut where the probe indicated maximum activity over an area of about 2-3 square feet which apparently extended downwards below the floor of the cut. Activity elsewhere in the finer-grained material averaged less than half the maximum activity.

A field assay (beta plus gamma only) of a small sample of about 120 grams was made near the prospect by comparing the sample with a standard sample of uranium. This indicated a grade of about .5%e U_3O_8. A more representative sample, assayed by field method at Canberra, gave .13%e U_3O_8 with a ratio of beta to gamma of .81. A smaller sample collected for petrological work assayed .16%e U_3O_8 with ratio .84. A sample from this prospect previously forwarded by the Mines Department, Tasmania, to the Bureau of Mineral Resources, Melbourne, assayed .17%e U_3O_8 with ratio .81.

Except for the first field assay, mentioned above, the grade indicated by these several samples is low and fairly consistent. The first field result probably indicates a small richer sample.

The ratio from these assays (about .8) is not conclusive for either uranium or thorium and indicates that the radio-activity could be due to either uranium out of equilibrium (uranium poor) or due to the presence of both uranium and thorium. This will be checked by laboratory tests but in any case the amount of uranium present is likely to be less than that indicated by the assays.

The source of the torbernite is not known. It could have migrated into the somewhat sheared aplite by the agency of meteoric waters but there seems insufficient reason for the aplite to be so favoured and present evidence suggests rather that the torbernite derives from uranium or uranium and thorium minerals introduced with the aplite or

by genetically related late magnetic fluids.

It seems probable therefore that radioactivity is linked with an intrusive aplitic body whose size and shape is not yet apparent. The existing exposure contains patchy values and evens the area of maximum activity is apparently below commercial grade. It is also possible that activity has been concentrated at the upper margin of the aplite against the granite roof and that grade may decrease in depth even if the aplitic material be found to persist.

Present evidence is only sufficient therefore to warrant some cautious development; drilling, extensive underground development and work on access roads should not be considered at this stage. It is suggested that the cut should be deepened at the southern end and the material showing maximum activity followed downwards. Possible lateral extensions upstream and downstream from the cut might also be further investigated.

RECOMMENDATION

Until more encouraging evidence is found, prospectors on Chwalczyk's claim should be advised against drilling or major development.

APPENDIX II

by

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The results of radiometric assays carried out by the Geophysical Section of the Bureau on samples from the three prospects inspected came to hand after the report was written. The samples assayed were those on which field assays were previously carried out at Canberra and quoted in the report and the results of both field and laboratory assay are shown below for comparison.

Chwalczyk's Prospect

Field Assay			Laboratory Assay (Geophysical Section)			
eU_3O_8						
Ub%	Ug%	Ratio	No.	Ub%	Ug%	Ratio
.13	.16	.81	TR55/136	.096	.094	1.0
Previous sample sent by Mines Department, Tasmania.			TR55/93	.17	.14	Fluorimetric Assay U_3O_8

REMARKS

The laboratory radiometric assay of the sample from Chwalczyk's Prospect is the first from that prospect to give a ratio of 1.0-uranium in equilibrium. This, in conjunction with previous ratios of about .8 and the fluorimetric assay, which is lower than the radiometric assay on the same sample, suggests that activity in previous samples is due to uranium out of equilibrium - uranium poor.