TR1-12-14

RADIO-ACTIVE MATERIAL IN THE HEEMSKIRK DISTRICT

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On the 21st November last, Mr. W. Pitulej, in a letter to the Director of Mines, stated that he had located radio-active material in the vicinity of Mt. Agnew, in the Heemskirk district, west of Zeehan. In subsequent letters, dated 25th November and 5th December, 1955, he recorded further occurrences of radio-active material in the same general area. Mr. Pitulej also made statements to the Press and forwarded copies of the letters to the Atomic Energy Commission.

Recently, in company with Mr. Pitulej and Mr. G. Lee, I examined the various places where they claimed to have discovered radio-active material.

The south Heemskirk district is essentially a tin field and has been the subject of numerous geological reports, of which the principal is Bulletin No. 21 by L. L. Waterhouse, and the most recent a typewritten report in 1943 by H. G. W. Keid. This area is situated on the southern slopes of Mt. Agnew and the Heemskirk range, about 10 miles west of Zeehan and only a mile or so from the coast and Trial Harbour. A fair motor road leads from Zeehan to the district.

The rock types exposed over the whole area belong to the Devonian granitic group. The most normal type is a pink granite, its colour being due to an abundance of orthoclase felspar. This rock grades into a white granite, containing little orthoclase, but being the more normal host of the tin deposits. These granites are intruded by later derivatives of the magma consisting of large pegmatite and smaller aplite and granite porphyry dykes, mainly trending in a north-easterly direction to conform with the general joint pattern of the granite. A feature of these granitic rocks is the abundance of tourmaline, usually black but often green or blue, and the characteristic development of quartz tourmaline nodules, some of which contain appreciable percentages of tin.

Three separate uranium finds had been reported by Mr. Pitulej and one by Mr. Lee. All these were visited but in none could any uranium material be detected by the naked eye.

1. Coleman's Lease. These workings are situated some 20 chains south-east and several hundred feet above the old Federation Mill site. The uppermost working is a small open cut situated right on the ridge top. From the bottom of the cut, about 12 feet below ground level, openings have been put out for short distances to the north and south. The northern opening is put into a "pipe" of ferruginous clay which has doubtless accumulated in a vugh in the granite. Here this rock is a hard silicious variety with much quartz and tourmaline. The main jointing is at 10° with a steep easterly dip. The maximum reading obtained on an Austronic PRM 200 Counter was 600 c.p.m. This was obtained in the ferruginous clay in the northern "tunnel" well under cover.

2. **North-Western Workings.** Sixty chains north-west of the old Federation Mill and at the base of fairly steep granite hills are some old workings consisting of an open cut from the floor of which (now filled with water) a collapsed adit leads. The cut is in soft hematitic material enclosed in very decomposed aplitic granite carrying much pyrite. The maximum count obtained here was 450 c.p.m.

3. **Old Federation Mine Workings.** Near the top of the old inclined haulage up the hill from the battery is an adit which is probably the one known as Yates Adit. Here, Mr. Pitulej stated, he had obtained the maximum reading on his counter of any of the old main Federation workings. There is some greisenisation in the granite here and the rock contains some quartz tourmaline. Iron oxide is plentiful. The maximum reading I could obtain was 200-250 c.p.m.

4. **The Birthday Mine or Sweeney's Mine.** An application for a lease by Mr. Lee covers these old workings. Most of the tin obtained from here was alluvial in character and was obtained from the creek by sluicing, but an adit has been put in for 245 feet and there are numerous surface cuts and trenches. About a mile and a half on the Zeehan side of the Federation turn-off a track leads from the Trial Harbour road across the plains for half a mile and then climbs a thickly wooded hill for another half mile. A detailed report on this mine was prepared by A. M. Reid in 1927. The country rock is the typical pink granite of the district and it is traversed by veins of quartz and pinite, containing abundant sulphides as well as tourmaline and fluorite. The principal sulphides visible in a small cut are marmatite and pyrite. The maximum count obtainable here was 250 c.p.m. Good tin values have been ascertained in various sampling campaigns in these workings but the count obtained shows that it is little higher than the normal background count of the granites.

Samples from locations 1 and 2, that is, those showing more than the normal granite background, were brought in to the office and roughly tested for the Beta over Gamma ratio on an Austronic Beta-Gamma Ratemeter. That from location 1 showed a ratio of 0.7 and that from location 2 one of 0.4. Although these values are only approximate, they do tend to indicate that the radio-active material is thorium rather than uranium. Considering the material in which the counts were obtained, that is, very decomposed, with secondary iron oxides, the presence of thorium (in monazite) would be much more likely than that of uranium. It has been recorded, too, that appreciable quantities of monazite occurred in the old Montagu workings and these are located just below Coleman's lease.

While in Zeehan I took the opportunity of interviewing other men, notably Messrs. Maskell and Bradshaw, who had prospected this same area with Geiger counters. They informed me that although in several places they had obtained counts above the normal background count, these counts never exceeded 500-600 c.p.m.

It would thus appear that the radio-activity recorded by Messrs. Pitulej and Lee is very slight and may be mainly due to thorium. It is not considered that at this stage the results warrant the taking of samples for chemical analysis.