

TR 10-51-5A

## 10. D. HAYES'S TIN PROSPECT

by G. Urquhart

### Introduction

Tin workings in the Storeys Creek region were examined on the afternoon of Friday, 17th December, 1965, in the company of D. Hayes and field assistant A. Bottomley.

D. Hayes's Prospect is situated about 300 feet to the NW of the Great Republic Mine, between this mine and the North Republic section of excavations (figure 14a). Access is by way of Gipps Creek road for a distance of 2.6 miles from the Storeys Creek-Avoca Road. The turn off is six miles from Storeys Creek. A walking track about 200 yards long then leads to the site.

### Geology

The topography in the area covered by Figure 14a is subdued. Maximum relief is about 90 feet. The prospect lies near the bottom of a shallow valley which separates low hills to the SE and NW where the Great Republic Mine and the North Republic section are respectively situated.

The country rock is a pale, grey or white medium-grained granite which is porphyritic in places, carrying sporadic white feldspar phenocrysts up to an inch in size.

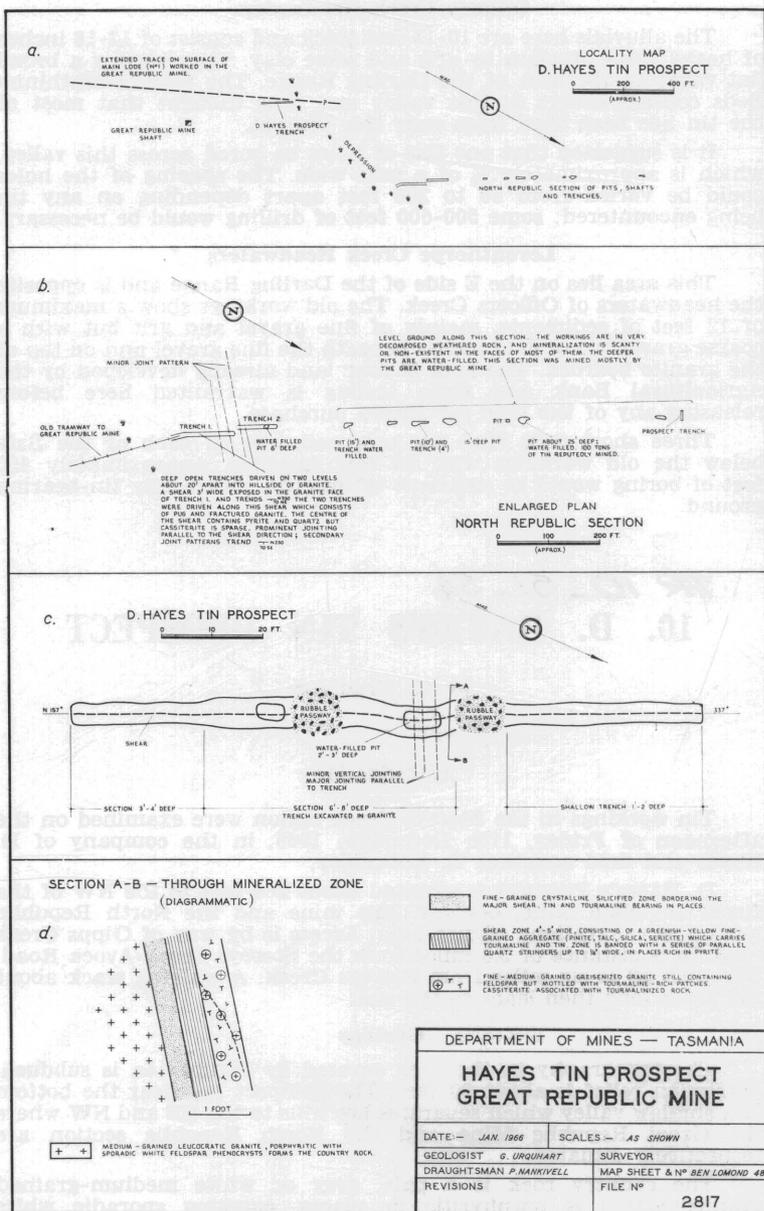


FIGURE 14.

5 cm

A prominent joint pattern in the area trends consistently in a direction which varies only slightly between  $330^{\circ}$  and  $337^{\circ}$  mag. and dips to the NE at an angle between  $70^{\circ}$  and  $80^{\circ}$ . Less prominent jointing trends  $50^{\circ}$ - $70^{\circ}$  mag. and dips to the SE at an angle ranging from  $75^{\circ}$  to vertical.

The structural control of mineralization in the prospect trench is a shear zone up to 6 inches wide (figure 14d), which is similar in attitude to the major joint direction. The shear zone exposed in the face of trench No. 1 in the North Republic section (Figure 14b) is 2-3 feet wide and dips at an angle of  $70^{\circ}$  to the NE.

The intersection of the minor set of joints with the major set and, more important, with the shear in the prospect trench and in Nos. 1 and 2 trenches may provide a clue to the origin of the pipe-like rich shoots or "blows" of cassiterite-bearing rock.

The position of the prospect trench (Figure 14a) when plotted relative to the Great Republic mine shaft and to the main No. 1 lode worked in the mine (Blissett, 1959, Figure 17) indicates that the lode in the prospect trench is a continuation of the No. 1 lode in the mine after allowance is made for the dip of the lode and the lower altitude of the prospect trench. The extension northward of this lode from the mine area suggests that there may be two parallel lines of lodes, unless the North Republic section is a faulted offset of the Great Republic main lode. However, no field evidence to support this was seen in the rapid survey of the area.

The shear or fissure zones acted as channels for migrating mineralizing vapours and solutions which greisenized and altered the walls of the host rock prior to or during tin deposition.

Cassiterite may be present in the shears but enrichment is related to the width of alteration extending outward into the host rock and also to some extent on the degree of alteration. The width and the degree of alteration along the shear are not constant, thus "blows" consisting of richer and wider local concentrations of cassiterite are found strung out along the strike of the shear or fissure.

The prospect trench (Figure 14c) shows two such "blows" in the deeper pits which are water-filled, but in which the lodes are as much as 2 feet 6 inches wide and 8 feet long. Eight jumper holes drilled from the bottom of the trench to test the northern shoot indicated the presence of cassiterite to a depth of 8 feet (Hayes, pers. comm).

The North Republic section (Figure 14b) clearly illustrates the sporadic occurrence and size of the deposits over a distance of about 1000 feet, the width of some of the lodes having been apparently between 5 and 10 feet. The excavations along this section, except for the two deep trenches (nos. 1 and 2) are in weathered and decomposed ground and cassiterite on visual evidence is scanty or non-existent in the faces of most of the old workings.

The section (Figure 14d) across the lode in the prospect trench illustrates the alteration in the host rock adjacent to the shear zone.

The shear zone is 4-5 inches wide and is composed of a soft greenish fine-grained aggregate of pinite, talc and sericite, variably silicified and tourmalinized. It is banded with a series of parallel quartz stringers up to 6 mm in width which in places are rich in pyrite. The zone carries finely disseminated cassiterite.

The footwall rock is a finely crystalline, highly altered quartz greisen about 4 inches wide which is tourmaline and tin-bearing. Cassiterite tenuously impregnates the rock but segregations may attain a diameter of about 5 mm. The quartz greisen grades rapidly into medium-grained granite along a well-defined contact.

The hanging wall rock consists of an irregular border of fine to medium-grained granite-greisen which in places still retains the feldspar constituent. The rock is mottled with tourmaline-rich patches which are favourable loci for cassiterite enrichment.

Cassiterite in this portion of the lode occurs preferentially in tourmaline or in tourmalinized rock but elsewhere may be enriched in a siliceous greisen or altered granite free of this mineral. The cassiterite is generally dispersed in irregular fine-grained disseminations which may in places attain a size of 6 mm.

Fluorite crystals coat joint planes or may be interspersed in the matrix of altered granite.

An unidentified black mineral in coarse segregations as much as 25 mm in diameter was obtained from the ore shoot, associated with fine cassiterite in quartz greisen. The mineral, probably wolframite, is intergrown with galena.

### Conclusions

D. Hayes estimates that a bag of tin concentrates has been obtained from a ton of crushed rock from the prospect trench. The two shoots in this trench are narrow and less than 8 feet long. A number of larger shoots in the North Republic section have been extracted leaving only barren or low grade rock.

With these considerations in mind it is difficult to conceive that mining will be very rewarding after the initial stage or long sustained unless future prospecting along the extended lines of the two lodges reveals new shoots. The area NW of the prospect trench, the area SE of nos. 1 and 2 trenches and the area to the SE of the mine are logical targets for exploration.

In appraising deposits of this type (Great Republic) it is as well to remember that they are extremely variable in length, width and grade and that barren, low grade or narrow lodges at surface may increase in size or richness at depth. The writer considers the area ideal for concerted geochemical and geophysical prospecting.

### Reference

- BLISSETT, A. H., 1959—The geology of the Rossarden-Storeys Creek district. *Bull. Geol. Surv. Tas.*, 46.