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DEPARTMENT OF SUPPLY AND SHIPPING.

MINERAL RESOURCES SURVEY.

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(Plan No.1165)

PRELIMINARY REPORT ON THE CRYSTAL KING MINE,

TALLANGALOOK, NEAR MANSFIELD, VICTORIA.

By

H.B. Owen, Geologist.

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PRELIMINARY REPORT ON THE CRYSTAL KING MINE, TALLANGALOOK NEAR MANSFIELD, VICTORIA.

(Report No.1944/48-Plan No.1165.)

I. INTRODUCTION.

A. General - The presence of quartz crystals in the dump of an old gold mine, known as Black Charlie's mine, in the Strathbogie Ranges led to the reopening of part of the workings in the search for crystal suitable for piezo-electric applications. To date the search has met with success, and has resulted in the discovery of a second crystal deposit adjacent to the old workings. The project is being conducted by a syndicate of five members, two of whom (Messrs. E.E. Hughes and E. Terry) are engaged in mining. Another member of the syndicate, Mr. J. Tilly, prepares finished piezo-electric plates from the recovered crystal in Melbourne.

The mine which is now named the Crystal King mine was visited in the company of Mr. P. Canavan on 9th December, 1944. Mr. Canavan's notes have been used in the compilation of this report and his assistance is gratefully acknowledged.

B. Locality - The mine, is situated in the parish of Tallangalook, County of Delatite and is about 11 miles a little east of north from Bonnie Doon. Bonnie Doon is a small township on the railway between Tallarook and Mansfield and is 118 miles by rail northeast from Melbourne, and by good roads via Alexandra 117 miles, or via Yea, 100 miles. From Bonnie Doon to the mine there is a good road for 7 miles but the remaining 4 miles is by a steep and narrow track which passes near the old Golden Mountain mine.

C. Topography - The mine is on the northern slope of the Strathbogie Ranges at the head of Black Charlie's Creek, tributary to Broken River (probably this is a local name only and the creek under consideration is Dry Creek). The elevation at the mine is approximately 2900 feet above sea-level, and about 50 feet below the crest of the divide.

D. Geology - The area is occupied by granite which is intrusive into Silurian sediments. The contact lies about 1½ miles south from the mine and trends easterly.

The granite is a light-coloured coarse-grained rock. Hand specimens show abundant orthoclase associated with translucent quartz and biotite.

II. ECONOMIC GEOLOGY.

A. General - The quartz crystals occur in pipes of aplite in the granite which occupies the area. Both the aplite and the granite are considerably weathered to the accessible depths of the workings but the original fine- and coarse-grained textures ~~respectively~~ of the rocks are still retained. The aplite contains less mica than the granite and displays in part graphic intergrowth of quartz and felspar. The crystals are reported to occur mainly in vughs of large dimensions but a few are found scattered sporadically throughout the weathered aplite.

B. Description of the Pipes - Two pipes are being mined for crystal and prospecting for further deposits is conducted as circumstances permit. The two pipes are shown in section on the accompanying plate.

It has been mentioned above that both the aplite and the granite are deeply weathered and it is noteworthy that weathering of the granite extends for some distance in the vicinity of the pipes and no outcrops of fresh rock occur within a radius of about 200 feet. For this reason the pipes themselves do not outcrop and are obscured by soil. The presence of crystals or fragments in the soil is the only guide for surface prospecting and cannot be regarded as a very reliable aid. (See also E1 on page 3.)

1. No.1 (Southern) Pipe. This pipe has been developed from a vertical shaft 100 feet deep sunk from a site a few feet north of the pipe. This shaft was put down many years ago in a search for gold which apparently occurred in narrow quartz veins following joints in the granite. The early miners extracted 20 feet of the pipe from below a flat fault which intersects the pipe at 43 feet from the surface, and from this it appears that auriferous veins extended into the pipe for portion of its depth.

The whole of the pipe has been stoped to a depth of 90 feet, that is 20 feet below water-level, and consequently its original dimensions can be gauged only approximately from those of the workings. The pipe had a diameter of about 8 feet and was circular in plan. It is nearly vertical with a steep pitch to the south. At 43 feet it has been displaced about 8 feet in a southwesterly direction by a fault which dips 20 degrees to the northwest. At the surface the northern edge of the pipe is 4 feet from the south wall of the shaft. At 90 feet this distance has increased by 10 feet of which 6 to 8 feet is due to displacement on the fault.

One vugh above the fault was discovered and it is reported that it yielded about 2 tons of crystals including one stated to have weighed about 50 lb. The present owners continued sinking in the pipe below the old workings and recovered another ton or more of crystal. It is now proposed to sink the shaft to 150 feet and cross-cut south to the pipe at this level thus providing between 50 and 60 feet of pipe which can be exposed by a rise adjacent to it.

2. No.2 (Northern) Pipe. At the time of inspection this body had been extracted to a depth of 30 feet and had yielded 1½ tons of quartz crystals from one vugh. The pipe is about 6 feet in diameter and is nearly vertical. At about 6 feet from the surface the top of a vugh was encountered. This vugh occupied the whole of the pipe and extended down it for 20 feet. The section of the pipe containing the vugh had been completely removed at the time of the visit, but was described as having the form of a hollow cylindrical body of massive quartz 20 feet long by 6 feet diameter. The thickness of the wall averaged about 1 foot and the central cavity (about 4 feet in diameter) was partly empty but it is stated to have contained numerous loose quartz crystals lying at the bottom in brown mud. The inner surface of the quartz wall was lined with quartz crystals except at those places from which they had fallen to the bottom of the cavity.

At 28 feet from the surface the pipe is filled by a horizontal floor of massive quartz which is believed by the operators to be the top of a second vugh similar to the first. The hollow sound emitted by the quartz when struck with a hammer tends to confirm this view.

C. Production - The question of production has been covered largely in the foregoing notes describing the pipes, and accurate figures are not available as the crude quartz crystals are not weighed.

The following figures for crystal are approximate estimates by the owners -

Crude crystal recovered		Tons of pipe-rock broken.
No.1 Pipe - above the fault	2 tons	170
below " "	1½ "	65
No.2 Pipe -	1½ "	55
	5 tons.	290

D. The Quartz Crystals -

1. Size, shape and colour. Only crystals from No.2 pipe were seen and these ranged in size from one with a diameter of 11 inches and weighing about 100 lb. to sizes less than 1 inch diameter. Crystals with diameters from 3 inches to 6 inches formed the bulk of those seen. In shape the crystals are short and stumpy; the prism faces are poorly developed and many individuals consist of rhombohedra (pyramids) projecting from 'tangled' quartz with only minor development of the prismatic body of the crystal. This, however, is not always the case but the length of prism rarely exceeds its diameter.

In colour the crystals range from colourless to smoky grey and brown. Some of the latter are black by reflected light and greyish brown by strong transmitted light.

2. Defects. The crystals contain numerous defects and twinning is common. Prevalent blemishes include bubbles, veils, ghost structures and inclusions of foreign minerals. The principal form of twinning is shown by the presence of irregular areas of different texture developed on the rhombohedral faces.

In some crystals bubbles occur in parallel streaks and sheets and two or more sets of streaks may cross each other forming a network or lattice. The streaks do not appear to be arranged in any simple relationship to the crystal axes. Rosettes of muscovite with a diameter of about half an inch also occur with in the crystals or attached to boundaries and partly embedded. Some crystals also enclose tufts of fine radiating needles (grass stone). These needles commonly radiate from a point on the surface of an enclosed ghost crystal.

The Secretary of the syndicate stated that the proportion of the crude crystal which was usable amounted to 2 or 3 per cent. but it is not quite clear whether the figure refers to uncut crystal which has been selected as worth cutting, or slabs cut from suitable crystal. Preparation of finished plates has been undertaken by the syndicate only during the part few weeks and it is yet too early for conclusive results to be known.

E. Future Production. -

1. Prospects of discovery of other deposits. Surface indications are not common especially in those areas where pipes might occur owing to the cover of soil and clay. Whole crystals and fragments have been found on the slopes to the north and east of the present workings but these may have been derived from the known pipes as the equidimensional shape and lightness of the mineral combined with the steepness of the slopes would bring about wide distribution.

At about ¼ mile northeast of the workings a tunnel was driven many years ago to prospect narrow vertical quartz veins for gold. The spoil from the tunnel consists of granite, clay and fragments of milky quartz. In Black Charlie's Creek, which flows north past the toe of the dump quartz crystals showing little trace of damage occur amongst the gravel and boulders in the creek bed. It was at first thought by Messrs. Hughes and Terry that these crystals had been washed from the tunnel dump but inspection after a fire had destroyed the thick scrub showed that this is not so. The crystals are practically confined to an area of about 200 square feet of the creek bed, and it may be reasonably inferred that a pipe containing crystals occurs in or near this area and could be located by careful search.

2. Future production from the known pipes. Definite conclusions regarding the continuance of the pipes with the regularity of size and direction so far displayed cannot be drawn owing to the relative shallowness of the workings and the incomplete information relative

to the old workings for gold. The same factors also limit any forecast regarding the abundance or otherwise of the quartz bodies within the pipes, but the results achieved to date indicate a fairly regular and close spacing of the quartz vughs.

If the quartz exposed at 30 feet in No.2 pipe is found to be the top of another vugh, immediate production of a second batch of crystals will follow, and the occurrence of further vughs in similar manner could be expected with some confidence.

Production is severely hampered by lack of labour which also militates against prospecting in the neighbourhood. Only three men are engaged at the mine and two of these are members of the syndicate. Two or three more men could be usefully employed.

III. SUMMARY AND CONCLUSION.

Quartz crystals occur in aplitic pipes enclosed in granite in the Strathbogie Ranges, near Mansfield, Victoria. The extraction of approximately 290 tons of pipe-rock has yielded 5 tons of crude crystals which range in colour from clear to smoky brown. The crystals range in size from about 350 pounds weight to sizes too small for use. Twinning and other blemishes are common but the yield of quartz usable for piezo-electric purposes, though not yet accurately determined, is believed to be satisfactory. This is due to the size of many of the crystals which are large enough to yield plates from areas between flaws or twinning lines.

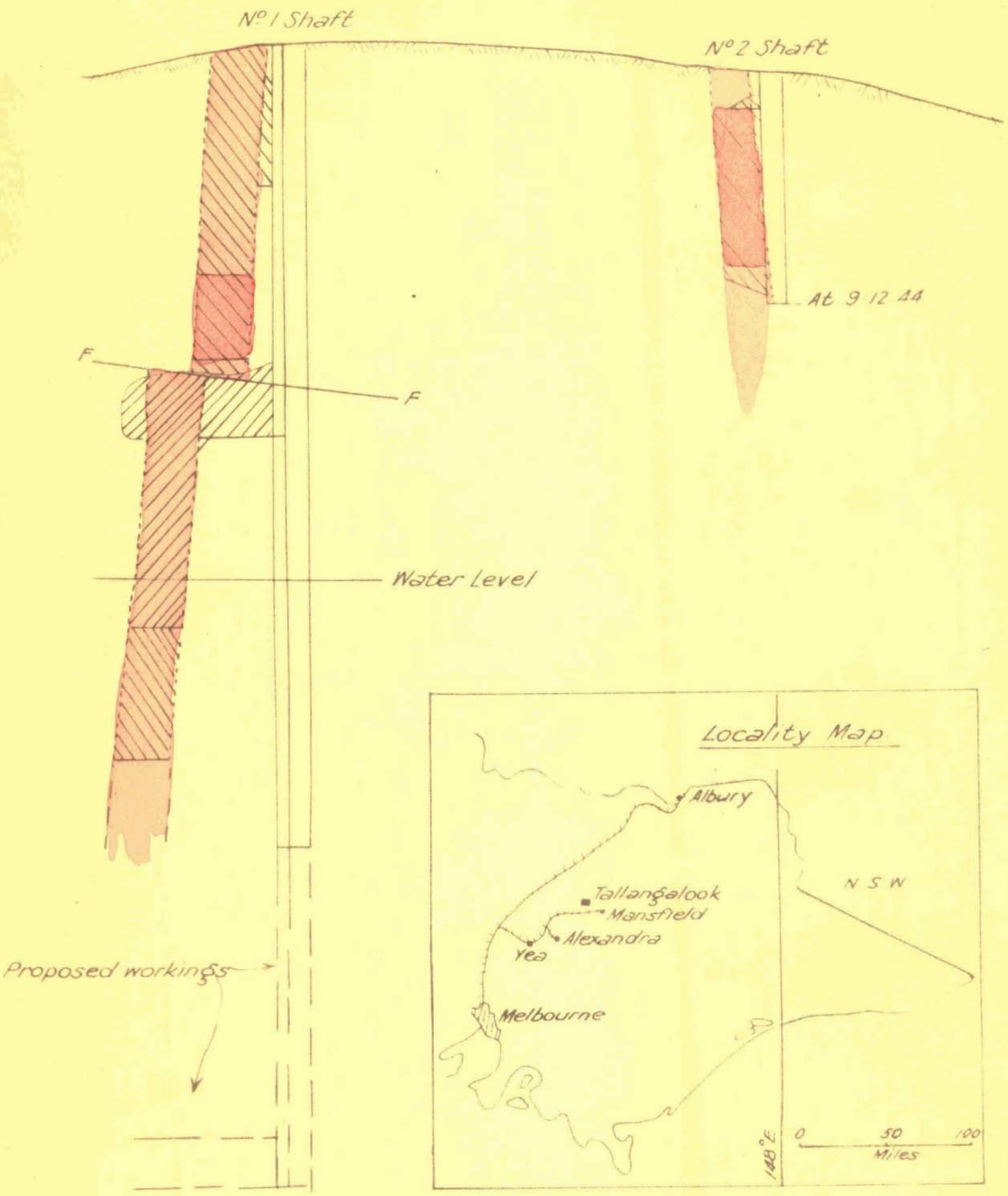
Two pipes have been discovered and prospecting, which will be difficult owing to lack of surface indications, might result in further discoveries. The prospects for future production from the known pipes cannot be stated in definite terms owing to the limited development which has taken place so far but are thought to be good. Production and prospecting are hampered by shortage of labour.

(H.B. Owen.)
Geologist.

CANBERRA.
20/12/44.

South

North



SKETCH SECTION
— OF —
THE CRYSTAL KING MINE
Par Tallangalook, Co Delatite, Vic
Scale 1" = 20 ft.

Pipes shown tinted pink with crystal-bearing rugths darker pink
Stoped ground thus:-
Old stopes ////
New " \\\\

Dec. 1944