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REPORT ON THE OCCURRENCE OF QUARTZ CRYSTALS AT TEETULPA, WADNAMINGA AND KINGS BLUFF, SOUTH AUSTRALIA

by

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DEPARTMENT OF SUPPLY & SHIPPING

Mineral Resources Survey Branch

REPORT ON THE OCCURRENCE OF QUARTZ CRYSTALS AT TEETULPA, WANANINGA AND KINGS BLUFF, SOUTH AUSTRALIA.

Report No.1943/31

INTRODUCTION.

The investigation was carried out on July 6th and 7th in company with Mr.S.B.Dickinson, of the South Australian Mines Department, and Mr.Kevin Smith, of Broken Hill Pty.Ltd., whose services were made available by courtesy of the Company. Mr.Smith had worked on the Teetulpa goldfield in 1913 and the visit was the result of his recalling that he had seen quartz crystals in some of the workings at that time.

TEETULPA.

The Teetulpa goldfield lies 20° east of north from Yunta and 55° west of north from Hannahill, both of which are on the Adelaide-Broken Hill railway. The field is equidistant from either township, approximately 26 miles, by passable, unmade road. The road from Yunta continues on to Mount Victor. Nearest habitation to the field is the homestead of Kovige's holding a mile or so to the southeast. Terrain is generally fairly flat, with low ridges. Some of the deeper shafts contain water and one at the southeast end of the field has been fitted with a windmill.

The country rock at Teetulpa is schist, which strikes east-west and dips usually at a low angle to the south. Two series of quartz reefs outcrop prominently, one striking north-south and dipping steeply to the east, the other striking east-west, parallel to the country rock but dipping at a steeper angle. A few reefs strike obliquely to these two main directions.

The north-south reefs were worked for gold in many places, while the east-west were apparently barren. The former contain calcite, siderite, hematite and pyrite in addition to quartz. They are usually 6 to 12 inches wide, though greater widths are known. In one place they were observed to displace the east-west reefs lefthandedly, showing that the east-west fissures were formed before the north-south.

The east-west reefs are usually wider and marked by many conspicuous white quartz outcrops. These contained the best indications for quartz crystals, though numerous crystals were also found on the dumps of old workings on the north-south lodes. Mr. Smith's original locality, where an inclined adit was driven to cut the junction of an east-west with a north-south reef, was not rediscovered and it is quite likely that these workings may have fallen in. The best crystals found, including specimen T1 sent to Amalgamated Wireless of Australia for their opinion, were from a small cut on an east-west lenticular reef up to 4 feet in width, which appears to have been displaced left-handedly for several feet by a thrust fault. This reef is fairly centrally situated, but promising indications were noted in unworked east-west reefs at the southern end of the field. The quartz of the reefs tends to assume a crystalline habit very frequently and crystalline quartz is especially noticeable in the wider reefs. Narrow veins less than a foot thick were seldom observed to carry quartz crystals. As only the north-south veins were worked for gold and these are mostly narrow, information on the occurrence of quartz crystals is limited, but the area is well worth a practical test and it is recommended that arrangements be made to place an adequately supervised working party on the field as soon as possible and that special attention should be given to the cut in the lenticular reef from which the best specimens were obtained. No mining tenements are at present in existence.

Numerous crystals were collected from the field, but especially from the central locality mentioned above. Many of the crystals are reasonably clear, though seldom flawless, and with one good termination. Length of the horizontal axes of the specimens found varies up to more than two inches and length up to about four inches. Patches of different texture on the prism faces of some of the crystals suggest composite structure, but twinning, if present, is seldom obvious on visual examination. Three specimens from Teetulpa were sent to Amalgamated Wireless of Australia Limited, for their opinion as to suitability and general characteristics.

KING'S BLUFF.

The King's Bluff workings are situated 3 miles west-northwest of Olary, on the northern side of a prominent east-west quartzite ridge which rises to a height of about 150 feet above the plain to form the Bluff itself. The quartzite and underlying schist dip south at 30° and are crossed by a series of vertical cracks which strike 10° east of north. The workings have all followed the quartzite, at or near its base, down the dip along one of these vertical cracks which in places open out into vugs filled with brecciated material in which is an intergrown mass of quartz crystals. The vugs themselves are lined with crystals and the fissures in places are filled with crystalline quartz, 2 to 6 inches thick. The main shaft is said to be 443 feet deep down the dip, but much of it is under water. The accessible portion is inclined at 30° from the horizontal.

In the Record of the Mines of South Australia, 4th Edition, 1908, it is stated (p.224) that crystalline quartz and pyrite are found at the bottom of the shaft in joints and cleavages and that open cavities extend several feet beyond the face.

Quartz crystals are exposed at numerous places in the workings, especially in the main inclined shaft. Many of these are small - horizontal axes ½ inch in length - but well-formed, very clear, and often free from flaws and other obvious defects. It is known that usable crystals, including one now in the Museum of the South Australian Mines Department, have been obtained from these workings. Four specimens collected from the mine and dumps have been sent to Amalgamated Wireless of Australia Limited for their expert opinion on their general characteristics. The King Bluff mine possesses the following advantages:

(1) It is close to the railway station and township of Olary.

(2) A deep shaft is in existence, exposing numerous vugs which can readily be gouged out to give an indication of the proportion of usable crystals that may be obtainable.

(3) If found satisfactory, the fissure can be worked upwards from the back of the shaft and most of the broken ground left as filling.

It is, therefore, recommended that sufficient work be done in the main shaft to determine the likely proportion of usable crystals. If results are encouraging, the shaft could be dewatered and mining continued.

WADNAMINGA.

The Wadnaminga goldfield is about 25 miles by road from Mannahill in a general southeasterly direction and nearly 30 miles south-southwest from Olary. The last eight miles of the track from Olary are rough, but otherwise the roads are reasonably good bush roads.

This Branch's attention was drawn to the Buffalo mine, at the southwest end of the Wadnaminga field, by Mr.A. Boyd, now employed as shift boss at the Treasure Mine, Hatches Creek. The mine was worked in recent years by Mr.J.Allen, but the lease is now abandoned.

The country rock of the Wadnaminga field is a metamorphic series, slate, schist, etc., which strike north of east and dip at varying angles usually to the south. The strike of the main reefs is generally parallel to the country, though others at right angles to it were noticed, and they dip to the south at a low to moderate angle, averaging about 30°.

The Buffalo reef dips south at 30° and has been opened up by a main inclined shaft, the bottom of which is under water, and other shallower shafts. The reef, which occupies a strong fissure, is composed of white quartz up to four feet thick, sometimes continuous from wall to wall, sometimes split into a main seam and one or more lesser ones separated by bands of country rock. The quartz often tends to be crystalline and crystals have been found in several places, the best of which was about 40 feet down an inclined shaft, 100 feet or so east of the main shaft. A large vug here contains numerous well-formed crystals, some very clear, some cloudy. Many of them are covered with a coating of limonitic material. Although none was collected with horizontal axes longer than ⅝ of an inch, Mr.Allen, who last worked the mine and who happened to be on the property during our visit, maintained that much larger clear crystals had been obtained from this vug. Two crystals from this place were included in the parcel to Amalgamated Wireless of Australia Limited. It is recommended that this vug be mined out with a view to determining whether further work here is justified, but on present exposures Teetulpa and King's Bluff should take precedence over Wadnaminga.

SUMMARY.

Numerous specimens of well-crystallised quartz, mostly either not clear enough or too small for commercial use but including one crystal which is probably partly usable, were found on the Teetulpa field. The most favourable localities seem to be the wider east-west quartz reefs parallel to the strike of the country and it is recommended that a working party be put on the field as soon as possible.

At King's Bluff, good clear quartz crystals, mostly small, occur abundantly in vugs in a vertical fissure in quartzite. As suitable crystals are known to have been obtained from this locality and because the mine is favourably situated, it is recommended that sufficient work should be done to determine the proportion of usable crystals likely to be present.

Well-formed crystals are found in vugs in a south-dipping quartz reef at the Buffalo mine on the Wadnaminga field, and one especially favourable vug should be mined out when the opportunity arises, but prospects here are not considered as favourable as at Teetulpa or King's Bluff.

The conditions of deposition of the quartz seems to have been very similar in all three localities. In each case, granitic rocks outcrop, according to the State Geological Map, within a few miles, and the reefs are probably representative of the mesothermal gold-quartz reefs.

CANBERRA, A.C.T.
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