

"Mt. Dick, which is about five miles north of Northam, is upon the line of ferruginous quartzites, but close to it are some outcrops of limonite with veins of semi-opal which have been opened up. The opal is much weathered, but is apparently of the fire variety and should be worth a further trial.

"There are also some veins of ligniform asbestos, but this mineral is too brittle in the fibre to be of any value.

"About six miles north of Northam, upon Mr. Morgan's property, T. 1, gold is said to have been discovered many years ago, and to test this the Government sunk a shaft over 100 feet deep upon the top of a hill at some little distance from the point where the discovery is said to have been made.

"A number of small holes have been sunk with the object of discovering the reef, but so far although a considerable quantity of quartz was met with, no definite body was encountered.

"The quartz from these holes varies considerably in character, but an average sample was taken of the whole, No. 3, the assay of which yielded a trace of gold. If a selection of the most promising stone had been treated alone there is no doubt but that a much better result would have been obtained.

"In the bend of the river immediately north of Northam, two pits have been sunk on two small parallel reefs by Mr. Cohen. This land is now under cultivation, but samples were taken from the stone raised, Nos. 4 and 5, neither of which yielded any gold.

"Taking the district as a whole it does not present any promising mineral character, but it is highly probable that gold may be discovered in small quantities, but it is extremely questionable whether these will prove to be payable. Small low-grade lodes are of absolutely no value, therefore without large auriferous formations are discovered there is no hope of a gold mine being worked at a profit in this district.

"The following is a return of assays made in the Survey Laboratory, under the supervision of Mr. E. S. Simpson:—

1293—No. 1	...	...	...	Gold— <i>nil</i> .
1294—No. 2	...	...	...	Gold— <i>nil</i> .
1295—No. 3	...	...	...	Gold—trace.
1296—No. 4	...	...	...	Gold— <i>nil</i> .
1297—No. 5	...	...	...	Gold— <i>nil</i> ."

**Recent Mining Developments at Greenbushes.**—A visit of the Assistant Geologist, Mr. Campbell, in the month of December to Mullalyup in connection with a question affecting the alienation of mining lands, afforded an opportunity for acquiring some information regarding the recent developments at Greenbushes. On his return, this officer submitted the following notes on the observations made:—

"I have the honour to report that, in accordance with instructions, I visited Greenbushes on the 13th December and obtained from Warden Geary some particulars of the localities where tantalite had been obtained.

"The principal one is M.L. 369, the Enterprise, held by Messrs. Jones, Grey, and Marsh, and is on the main road about three-quarters of a mile south of the post office. An open-cut about 12 feet deep has been made on the west side of the road; the upper seven feet shows a wash of tin and tantalite (*see* Mineral Specimens [6507, 6508, 6509]); below this is kaolinised gneiss containing a micaceous lode formation, 18 inches wide (*see* Mineral Specimen [6506]), slightly greenish in tint, but in places slightly ferruginous, carrying particles of tantalite and tourmaline from coarse dust to chunks; one inch in diameter. A drive has been put on the lode 30 feet. The lode is seen for 18 feet when it tapers out, but the micaceous formation continues and appears to be making again at the end of the drive. The strike of the lode is 323 degrees and the underlay 22 degrees to the south-west. A shaft, about seven feet deep, has been commenced a few yards further south to reach this lode further on the underlay. A pothole one and a-half chains north-west of the last spot shows a somewhat similar wash; *see* Mineral Specimen [6508]. Sample [6509] is the washed ore, ready for the market.

"A little tantalite is said to have been found in wash with tin on the next lease to the north, No. 370, The Wills, held by Alfred Seabrook, and a claim, No. 755, the Dill-McKay, held by Messrs. Hille and O'Farrell, adjoining the east side of M.L. 369, and also in M.L. 379, the Galtimore, held by Messrs. Marsh and Galt; this is one mile south-westerly from the Greenbushes Well Reserve 13811; it adjoins part of the south side of M.L. 313, The Battler's Hope; the workings of the latter were not accessible at the time of my visit. Several shafts have been put down in a line bearing 235 degrees at a depth of 40 feet in kaolinised granite; a micaceous lode containing tantalite is stated to have been found. (*See* Mineral Specimen [6375] given by Mr. Galt.)

"The remainder of the day I devoted to the examination of several leases where it appeared that tin-bearing lodes were being worked. Most work has been done in the Cornwall, M.L. 356, formerly No. 40, when it was held by the Greenbushes Tin Development Co., a Kalgoorlie syndicate I understood. The old workings comprised several shafts from 60 feet to 120 feet depth on the various lines of lode, of which there appear to be four in number (*see* Mineral Specimens 6510, 6511, 6512), striking about 161 degrees with a westerly underlay of 84 degrees. The two western lodes at least are in decomposed granite, and either one or two of the eastern lodes are probably in the dark mica schist [6514] showing in the dump of the 120-feet shaft. Very little stoping appears to have been done by this company, their chief endeavour being to go deeper. The mine was reported on by Mr. Maitland, the Government Geologist, on the 26th of October, 1901, in connection with an application of several mines for Government subsidies, shortly before the mine was abandoned. The present owners, Messrs. Woodgate and Meagher, have been stoping and driving from the old workings at 60 feet to the surface of the decomposed rock, which is overlaid by about 7 feet of tin wash and gravel. They state that they found rich patches of ore. They have also sunk several minor shafts with drives and stopings, and have been very well satisfied with the mine.

"The Statist's returns for the year 1904 give the output as 2·33 tons value £163. This is the total value for that date. I inspected part of the workings down to 50 feet depth; the next level at 65 feet was partly flooded, so that I could not see that part. The lodes are somewhat sinuous, and vary from 18 inches to 5 feet in width, and are approximately parallel, though probably not all continuous through the lease. The formation in which the tin accompanied with tourmaline occurs is more or less decomposed granite slightly ferruginous in places and represent probably impregnations of the granite adjacent to a line of weakness caused by either fracture or pressure as is frequently the case in the Cornish mines in England.

"At M.L. 300, the South Cornwall, adjoining a portion of the west boundary of the previously described lease, another parallel lode is being worked. The main shaft is 80 feet deep, and the lode adjacent is stoped from 63 feet to the surface, for a width of eight feet from the western side where the schist is more decomposed there is a crosscut east for 78 feet which the owners state is tin-bearing all the way. This shaft is to be deepened 50 feet more, the country rock is mica schist.

"About 100 feet further north the lode has been opened up by a 50-foot shaft and is stoped from 50 feet to surface for about 250 feet in length.

"The Statist's return for the year 1904 gives for South Cornwall leases, M.L. 300 (315), 4·50 tons value £330; total to date, 13·10 tons value £931.

"Another lease, No. 374, the Lost and Found, which comprises portion of the extinct M.L. 56, Amanda, is now held by Messrs. Andrew, Winter, and McGowan, and is situated  $1\frac{1}{2}$  miles south of the Post Office, at the Bunbury end; here a shaft 54 feet deep in kaolinised granite has been sunk on a lode composed of four veins or bands of about five inches each, in a total width of four feet, having an underlay of about 25 degrees to the east and a strike of 40 degrees. The formation is gneissic and slightly ferruginous in places; no lode mining has previously been done here. See Mineral Specimen [6516]. This formation carries crystals of tin and tourmaline, and resembles the lode in the Cornwall lease. I was informed by Mr. Andrew that, in the lead of tin-wash near here, a solitary specimen of gold was found, weighing  $1\frac{1}{2}$  grains, at 24 feet depth.

"In Dumping Gully, three-quarters of a mile north of the post office, another lode said to be five feet wide has been opened up in M.L. 375, the Glasgow, to about 30 feet depth. I did not visit the locality but obtained samples from 30 feet depth and near the surface from Warden Geary. The name of White Lode has been given to it, as it is not ferruginous; see Mineral Specimens [6517, 6518].

"I also visited M.L. 313, the Battler's Hope, held by W. and J. Johnston, already referred to, where two shafts of 113 feet and 110 feet have been put down in a mica and tourmaline schist [6515]. The wash level at the 113-foot shaft, the easternmost shaft, is at 93 feet; here, a drive, I was informed, goes 100 feet west. The wash contained numerous water-worn boulders of quartz up to six inches diameter. The 110-foot shaft is 91 feet to the wash; a drive goes 970 feet to the west. I understand that a Government subsidy of £115 7s. 6d. was paid for sinking and driving. Unfortunately no payable wash was found. Generally in regard to the floor on which the wash occurs in this district, I was informed that it is frequently on the smooth surface of the undecomposed rock. Great activity prevails on the various leases owing to the high price of tin, which was 27s. 6d. per unit at the time of my visit.

"Since my return, I find on inquiry that the monthly returns of tin won discriminate between lode and stream tin, but the Statist's published returns give only black tin. I would suggest that the two kinds of mining be distinguished in the same way that alluvial gold is shown distinct from reef gold, and enable the change in the character of mining in this district, that is coming about, to be appreciated."

**Boring for Coal near Mullewa.**—Reference was made in the Annual Progress Report of the Geological Survey for the year 1903 to the Carboniferous Rocks of the Irwin River Series, and it was suggested that as the discovery of commercial coals along any portion of the Murchison Railway would be of the utmost public importance, some experimental boring should be carried out in that district.

In the month of November, 1903, arrangements were made with the Goldfields Diamond Drilling Company to bore at the  $47\frac{1}{4}$  mile peg on the Geraldton to Cue Railway Line; the position of the spot may be found by reference to Lithograph C 55 issued by the Department of Lands and Surveys.

Operations were duly commenced, and despite the many causes which stood in the way of boring, a total depth of 1,418 feet was reached.

The following is a description of the strata pierced, so far as can be ascertained from the data and cores in this office:—

Strata.	Thickness of Cores.
	Feet.
Sandstone and grit...	405
Light grey mudstones and bands of fine sandstone ...	195
Pebble grits, ferruginous sandstones, grey shales, fine sandstone, grits, shales, and pyrites, and fine sandstones	150
Light grey mudstone with carbon and dark shales with pyrites, light grey micaceous sandy shale	80
Grey mudstone with bands of pyrites and quartzites ...	120
Light grey mud stones, dark grey shales with pyrites and coaly particles ...	85
Yellow grit, carbonaceous shales, black grit, dark grey micaceous shale coal ...	285
Dark carbonaceous shale with pyrites and bands of hard, dark dolomitic limestone	40
(No record) ...	58
Total depth ...	1,418