011117	Title Bralorne Mines Ltd.	
	Author JSS	
ANTNE	Date and Typist. May 11, 1953. nb	
9251		

BRALORNE MINES LTD., (N.P.L.)

The property, consisting of approximately ninety-

two Crown-granted mineral claims and four recorded claims, extends for approximately 3 miles up Cadwallader Creek from the property boundary near the junction of Cadwallader Creek from the property boundary near the junction of Cadwallader -Creek with Hurley River; most of the claims are on the northeastern side of this creek, but none extend southwesterly across the creek.

The ground near the mine slopes down to Cadwallader Creek, and is in part steep and bluffy, and in part flat and terrace-like. Advantage has been taken of the flatter areas in the construction of mine-buildings and establishment of townsites. A bench at elevation approximately 4,200 feet, above the main camp, extends for about one half mile easterly to the foot of Mount Fergusson. The steeper hillside near the mine is covered

Title	Bralorne	Mines	Ltd.	2.
Author	S			
Date and Ty	May	11/53.	nb.	

with jack-pine and poplar and the flatter section easterly from the mine, is covered principally by pine, but also by some large fir.

Power is obtained principally by purchase from the Bridge River Power Co. but some is obtained from the Bralorne company's own dam and plant on Cadwallader Creek.

Most of the employees live in the three company townsites, Townsite Nos. 1 and 2 and Bradian (Fig. No. 1). Single employees live in bunk houses in Townsite No. 1 and Bradian and employees with families live in company houses in the three townsites. The company provides liberally for the accommodation of married men and during the last three years, fifty-five modern houses have been built. Modern change houses are provided by the company, these include separate rooms for working clothes and aluminum dust treatment; street clothes and a solarium. In 1948 the mess houses were

Title	Bralorne	Mines	Ltd.	
Author	S			
Date and Typi	st. Ma	y 11/5	3. n	ıb.

converted to modern restaurants. Modern and well-stocked stores and recreational facilities are found in Townsite No. 1.

<u>History</u> - Most of the ground held by Bralorne was staked between 1897 and 1900 and was held for many years by several small companies. These companies made a small production using, at first home-made arrastres, as on the Lorne mine and later, small stamp-mills. Three of the veins, the 51, 55 and 77 veins in those early years, are currently or were until very recently being mined.

For a detailed account of the early history of the mine, including that of the earlier companies, the reader is referred to Cairnes' (1937, pp. 76-78) and only a summary of the more outstanding features of that history will be given here.

The present Bralorne property represents the

Title Br	alorne	e Mines	Ltd.	1
Author S				
Date and Typist	May	11/53.	nb.	

gradual amalgamation over a period of years of the holdings of several smaller companies. Lorne Gold Mines Ltd. took over the King, Empire and Coronation properties in 1928 and did extensive underground development. In 1931 the present Bralorne Company was incorporated and acquired the In 1934 the Empire and Coronation mines were property. transferred to Bradian Mines Ltd., and in 1935 Bralorne Mines Ltd. took over the assets of this company. In 1932 a 100-ton mill was completed and the present period of production started. The officially recorded production from the early operations, recovered in several small mills including an arrastre, amounted to approximately 18,000 tons of ore from which recovery totalled 11,000 oz. gold and 1,100 oz. silver. The capacity of the mill was very materially increased in In 1939 Bralorne reached its all time high milling 1934.

1 abo Dalein	1 Arite	Bralorne Mines Ltd.	5.
2 con line -	Author	S	
wit 1	Date and Typist	May 13, 1953.	nb.

of 500 tons daily. During World War II the company mined and milled at a reduced rate, and because of continued shortages of supplies and labour the milling rate has not yet reached the previous high. The rate in 1947 averaged a little more than 11,000 tons per month.

Production - The production up to

Production from the individual veins has been given later in this vein, under descriptions of the individual veins.

Principal Workings - The underground workings are very extensive and have a combined length exceeding 50 miles. For convenience, they are customarily referred to in three principal sections, namely, from west to east, the King, Crown and Empire. These mines were first connected underground in 1935 by a 6,000-foot crossful driven by Bralorne Mines Ltd. The King section includes most of the

V

Title	Eralorne	Mines	Ltd.	6.
Author	S			
Date and Typist	May	14, 1	953.	nb

old Lorne workings and represents the oldest part of the mine. Work ceased in this section about 1937 but it is understood that the company plans further exploration of the King section on the 2,000 level from the Crown, when sufficient men and supplies are available.

The Crown and Empire sections, lying easterly from the King section, are named from vertical shafts of the same names that give access to them. The two shafts are connected on most but not all levels. Further connections are being made or planned for the near future. The Crown and Empire sections develop some of the veins that have been known for many years, but it was only after work ceased in the King section that these sections became the principal sources of ore.

A shaft sinking program was started early in 1949 to sink both the Empire and Crown shafts 900 feet siy from the 20 level, and to make provision for & additional

Title	Bralorne	lline	es Ltd.	7.
Author		S		
Date and Typis	t	May	14/53.	nb.

levels, each 150 feet apart. The Empire shaft had reached the 2600 level by the end of the year and work started on this new level early in 1950. The Crown shaft was completed to the 2600 level in May 1951 and a connected by a crosscut to the Empire shaft.

The Empire shaft has been sunk from the 300 level to a short distance below the 2600 level, a distance feet of 3,405 ft., the Crown shaft has been sunk from the 800 level to a pocket below the 2600 level a distance of fect 2,634 ft. Other shafts in the mine include two in the King section, the King No.1 shaft, an incline on an angle of 78 "Trom the 400 adit to the 1100 level with/sump, a feet depth of 2,057 Et. and the King No.2 vertical shaft, from the 1100 level to the 1400 level, with, including, sump, teet One shaft has been sunk in the Coronation a depth of 508 ft. section; this shaft vertical from the 400 level in the section

Fitle	Bralorne	Mines	Ltd.	8.
Author		S		-
Date and Typist	May :	14/53.	nb.	

to the 1000 level, is, including sump, 708 ft. deep.

When working conditions permit, it is planned to join the old King workings by driving from the Empire on the 20 level from the 55 drift.

<u>Scope of this report</u> - This report is concerned principally with the currently producing part of the mine, namely the Crown and Empire sections. For a description of the King workings, the reader is referred to the earlier report by Cairnes (1937, pp.82-85).

Title	Bralorne	Mines	Ltd.	8a
Author		S		
Date and Typist.		May 1	4/53.	nb

## GEOLOGY

The veins strike easterly and northwesterly, and cut diagonally across a northwesterly (to northerly) trending intrusive body of augite diorite<sup>1</sup> soda granite about 11,000 3.35 Kz feet long with a maximum width of 2,500 feet. The diorite 0.76th lies to the southwest of the granite and comprises about one-half the total width of the intrusive mass. Greenstone of the Pioneer formation lies along the northeast contact of the intrusive, and a northwesterly trending body of serpentine about 200 feet wide lies along the southwest contact. Black, thinly/bedded argillites of the Noel Formation occur southwest of the serpentine and are found in the King section but not in Crown or Empire sections of the mine.

The writer has previously explained the reason for using the terms augite diorite and soda granite instead of the more mineralogically descriptive terms sodie diorite and sodie quartz diorite or sodaclase tonalite.

8ъ

Only one outcrop of greenstone has been found on the surface above the workings, but it has been found underground at the eastern end of several drifts on the "51" vein. As the drifts were stopped shortly after entering the greenstone, only a small amount of the greenstone could be seen, and this was usually badly sheared material. However, it appears to possess features characteristic of lava of the Pioneer formation.

Title

Author

Date and Typis

In the eastern face of 451 drift on the 400

TitleBralo1	ne Mines Ltd.	
Author	S	
Date and Typist	May 14/53.	nb.

level the greenstone contains nodules of chert that suggest eruption of the greenstone under water and intermingling with limy sediments which were subsequently silicified to chert. In the eastern face of 551 drift on the 500 level the greenstone, although badly sheared, contains irregularly, outlined areas of quartz that appear to have been lava-flow amygdules. Plagioclase of intermediate comrosition and chlorite are abundant, and quartz is scarce; and therefore the greenstone, at Bralorne before alteration was probably of andesitic composition similar to most of the other lava in the Pioneer formation.

The most widespread rock underground is diorite, found in all the levels from the 200 level down, extending from granite on the east in the vicinity of the Empire and Crown shafts, westerly to the western ends of the drifts. At Bralorne, the diorite is massive, and where fresh, consists of glistening black hornblende crystals, frequently

(

Title	Bralorne	lline	es Ltd.	10.
Author		S		
Date and Typist		May	14/53.	nb.

with kernels of augite, and large white plagioclase crystals, and as elsewhere, it is cut by numerous hair-litre veinlets of clinozooisite and quartz.

At many places within the Empire fault-zone, the diorite and unreplaced greenstone are minutely cross-fractured and the fracture surfaces are coated with films of glossy, brownish black chlorite so that the rock looks very much like serpentine.

Granite lies northeasterly from the diorite and is found in most of the drifts easterly from the Crown and Empire shafts.

The contact between homogeneous granite and diorite is not sharp, but is marked by a zone up to about 400 feet wide, in which both diorite and granite are found. Within this contact zone the diorite is cut by many granite dykes, from a few inches to 50 feet wide and by a few tongues

Title	Bralorne	lines	Ltd.	11.
Author		S		*
Date and Typist		May 1	4/53.	nb.

of granite up to 400 feet wide as on the 2,000 level along the western part of 51 vein. In many places as on the 800 level, 200-400 feet west of the Empire shaft, or on the crosscut south from the Empire shaft on the 1,400 level, the rock of the contact zone possesses a foliated structure caused by alternating bands, a few inches thick, of dark coloured diorite and lighter coloured granite. In some places within the contact zone, as around the Empire shaftstation on the 1800 level and on the 1000 level in a crosscut northeasterly from the "77" vein, the granite brecciates and replaces fine-grained greenstone, which probably represents greenstone that had not been replaced by the earlier diorite.

Serpentine is found southwest of the diorite, and has been encountered at the western ends of many of the drifts. As the veins end in the serpentine, the drifts do not extend across its full width. However, the serpentine

FitleBralorne_Mines_Ltd.	14x ]
AuthorS	
Date and Typist Nov. 15th 1953	e1

responsible for the formation of talc forms from serpentine were not present at all places along the "77" vein.

The presence of talc-rock appears to have been significant in the localization of high-grade ore at the western ends of some of the veins. High-grade ore shoots are found in several of the veins where they are in the talc-rock close to the serpentine.

Light coloured felsite dykes, which **XYEXEN** are locally referred to as albitite dykes, are numerous. They range in width from a few inches to several feet, in colour from white to **pla** pale green and from even grained to porphyritic in texture. They are all very fine/grained and as a result are usually closely jointed. The close spacing of the joints in the "albitites" is a feature useful in distinguishing these rocks from light coloured phases of the granite or even diorite.

Along many of the vein-shears the albitite dykes are altered to platy quartz-sericite schists.

Albitite dykes that cut the talc-rock are themselves altered to fine-grained talc for a few inches to a foot from the contact.

Title	Bralorne	Mine	s Ltd.	12.	
Author		S			
Date and Typist		Hay	14/53.	nb.	

appears to be about 200 feet wide, as the entry crosscut on the 800 level in the King section cuts through about this width of serpentine. The serpentine is cut by many slips and cross-joints and where unsupported, sloughs readily.

A grey talc rock, which has not been mentioned in previous publications occurs along the northeastern side of the serpentine. Because of its apparent significance in the deposition of gold the talc rock was studied in detail by the writer.

The talc/rock is well developed on the 1200 level along the western part of the "53" vein; on the 1300 level along the same vein, and particularly toward the eastern end, where the vein is near black serpentine; on the 1400 level at the western end of the "55" footwall vein; and on the 1600 level toward the western part of the "53" vein.

The talc rock is up to 150 feat wide and follows the northwesterly trend of the main body of black

Title Bralo	rne Mi	nes 1	Ltd.		 13.
Author					 
Date and Tynist	May	15th	1953	-	g1.

serpentine but is separated from it by a north-westerly trending fault. The rock is grey and consists principally of fine-grained talc with minor amounts of carbonate and chlorite. It represents the alteration of black serpentine by hydrothermal solutions.

The talc-rock contains small grains of magnetite and chromite. The latter can usually be crushed and the resulting brown powder, characteristic of chromite, may be seen with the aid of a hand lens, and may be used in the megascopic recognition of the talc-rock. In places, nodules of unreplaced black serpentine from a few inches to several freet in diameter occur in the grey talc-rock.

The physical difference between the hard unsheared nodules and the enclosing sheared rock of shear-zones has been retained by the replacing talc-rock. This feature may be seen along the "53" vein on the 1300 level and along the "55" footwall vein on the 1400 level.

Because of the formation of talc along slips in the sheared diorite near the vein-shear, and also a spreading of talc along microscopic veinlets into the main body of the diorite, it

(

Title Brale	orne I	lines	Ltd.		1	4
AuthorS						
Date and Tunist	May	15th	1953	-	gl.	

is difficult to establish a contact between sheared or schistose diorite in which some talc has formed and serpentine that has been completely altered to talc-rock. However, it is usually possible to find patches of relatively fresh, recognizable diorite in the slightly talced diorite on the diorite side of the contact and to find patches of black serpentine in the talc-rock on the serpentine side of the contact, or if no black serpentine can be found, it is usually possible to find grains of chromite and magnetite in the grey talc-rock.

This grey talc-rock appears to have formed abundantly veins in serpentine, where the black serpentine is close to xentex and therefore close to mineralizingx solutions. It is not always present where a vein strikes towards the serpentine, as may be seen on the 1000 level (have the "77" vein extends from diorite to black serpentine without any intervening talc-rock. The absence of the talc-rock here may be accounted for either by faulting along a well-defined fault that follows the north feastern contact of the black serpentine, or it may be that there is a solutions

Title Brald	orne N	ines	Ltd.		355	: 16
Author	3					
Date and Tunist	May	• 15th	1953	-	gl	

Two black, hornblende-biotite dykes 10 to 30 inches wide, in granite, cut the eastern part of the "51" vein on several levels. The dykes definitely cut the vein/quartz, but have, themselves, been cut and displaced a few inches by late slips along the vein shear. The remarkable continuity of the dykes and their post vein age indicate that they are post-granite dykes and not just elongated inclusions of older volcanic rock in the granite.

## FAULTS

Empire fault. - This fault is the largest fault in the Crown-Empire section. The average attitude is, strike north 20 degrees west and dip 54 degrees southwestward, but locally the attitude of the fault departs considerably from the average.

Where intersected underground the fault is entirely within diorite or granite and the displacement along it (has to) be measured by the offsets on several veins and that the veins on opposite sides of the fault have been matched correctly may be difficult or impossible to prove. For the hanging wall, Cleveland (1940, p.120) has postulated a horizontal component of displacement

(......

Title\_\_\_\_\_Bralorne Author\_\_\_\_\_jss Date and Typist\_\_\_\_lay\_15/53\_cs\_\_17

northwesterly of 150 feet and vertical component upwards

of 550 feet. Later work by Mr. Alan Poole1, mine geologist

Personal communication.

**TRAM** in period - 1949, suggests a similar direction of movement, but resulting in displacement of 200 fect horizontally and 320 feet vertically.

In the upper levels the fault consists of a single shear zone, a few inches to as much as 10 fect wide, although on the 600 level the rock has been fractured for as much as 30 fest into the hangingwall. A short distance above the 1200 level, a break approximately parallel in strike with the main foult, branches downward from the brugin wall of the main Empire fault. The branch constitutes the hangingwall and the main fault the footwall of a block of ground referred to as the "E" block. This block contains faulted vortions of the "53" vein on the 1400 and 1000 levels, of the "5" vein on the 1300 and 1400 levels, of the "55" hanging 11 on the 1400 level. At their junction the reach cost

Title	Bralerne
Author	jss
Date and Typist.	May 15/3 cs 18

dips less steeply than the Empire fault, but the dip gradually steepens going down and on the 1500 level the branch has the same dip as the main footwall fault. On the 1300 level the distance between the hangingwall and footwall faults is about 75 feet and on the 1600, 200 feet. A working on the 2000 level crosscuts the footwall fault but on August 1, 1947 although driven about 300 feet toward the hangingwall, the working was still in sheared ground, and had not yet reached the true hangingwall shear.

Most of the rock within the fault zone has been slightly altered, mainly by formation of chiorite. In one rlace the east face of 1653 E drift, the rock has been blocched for 2 inches on either side of a slip. This alteration illustrates the effCect of post-Empire percolating solutions, either of deep-seated or largely of surface origin.

Cadwallader Fault .-- A fault, strike northwesterly and dip steeply northeastward, follows the northeastern side of the black serpentine. This fault is correlated with the Godwallader

Title	Bralorne
Author	jss
Date and Typ	ist May 15/53 cs 19

fault discussed in Chapter III. In places the fault omsists of only an inch of geuge accompanied b. a foot of bodly sheared rock but in other places it consists of a zone of aromethes gouge and intensely crushed rock(up to)l foot thick accompanied by sheared rock several feet wide. In places, as on the 1000 level, this fault separates, black perpending on the southwest from difforte on the northeast. In other places, as in 1253, 1353 and 1653 drifts, it separates black perpending on the southwest from tale rock, representing hydrother ally altered serpenting, on the northeast.

Evidence of displacement along this zone of crushing was found by the writer in the presence of a large fragment of grey, ribbon chert dragged from an unknown source. This discovery, made in the face of the south drift along 1653 vein, 100 feet west of the forks in the drift, confirms the corlier belief that this crushed zone along the northeastern contact of the xex serienting 's a fault.

Veins followed to this serienting fault are cut off sharply and dog not extend westerly acress the fault into

Title\_\_\_\_\_Bralorno

Author.....jss

Date and Typist May 11/53 CS 20

the serpentine. The direction of offset of the veins along ( the fault can only be assumed from the tendency of the veins to curve northward against the fault suggesting that the southwestern block has been offset to the northwest, a direction of displacement similar to that along the Empire fault.

Small cross-faults cut the veins in several places and offset them a maximum of about 30 feet. Most of the cross-faults strike northerly northwesterly, dip x westward southwestward and offset the westerly continuation of the veins from 2 to 15 feet north to northwesterly. However, along some the offset is southeasterly. Later, intra-vein strike faulting has in turn displaced these diagonal faults.

## VEINS

A large number of veins have been found in the Crown and Empire sections and production has been reported from seven of them. It is of interest to note that half the total drifting on the veins has developed compercial one.

Title	Bralorne	
Author	jss	
Date and Typist	May 15/53 cs 21	

The grade of ore produced from the velns has ranged from J 0.576 to 0.79 oz. gold per ton. At about the same time, the mine began using the easily obtained serpentine for back-fill in sections mined by shrinkage and for fill in cut-and-fill sections thereby saving considerable mine timer. The increased pressure of wallrock with increased depth of mining has of recent years necessitated a gradual change from shrinkage to cut-and-fill mining, using Serpentine as fill. The stoping method used is mostly skrinkage, but in marrow veins as in parts of 351 F, out-and-fill methods are used, and in very wide sections of a vein or where leads are close enough to be mined together, as three leads along part of 451  $\Gamma$ drift, fill stopes are used. Square sets are used in particularly wide sections. Since 1947 much of the ore broken was in stopes designed for a retreating programme to eliminate maintenance of interslope vein section, this practice was almost general throughout the mine by the end of 1950.

As new veins are continually being found during underground development the older system of assigning names to Title\_\_\_\_\_Bralorno Author\_\_\_\_\_jss Date and Typist\_May 15/53 cs 22

the veins has been re; laced within the last ten years by a system of numbering the veins. Althoug the principal veins could be divided into two groups; those to the east, in footwall, of the Empire fault; and those to the west, in the hangingwall of the fault; the writer will describe them in numerical order.

The relative positions of the productive veins and several of the smaller ones are shown in map 6, a rlan of the 1400 level.

Maps 2, 4 and 5 are rlans of the drifts on the principal veins and of stoped areas. The levels on these plans are approximately the same vertical distance apart, 300 feet, and therefore the drawings very closely approximate contour plans of the planes of the veins and indicate variations in dip as well as in strike. Although some stopping has been done on the "53" vein, this vein is not shown because of complexities caused by faulting and uncortaint/y concerning the identity of the veins in some places.

, 7

Title Bralorne

Date and Typist. May 19-53 CS 23

The veins are (up to) 20 fect wide, but widths less

t widt than 5 feet are the more common. The veins are usually tabular but may however, narrow and thicken over considerable distances. Where narrow they are usually accompanied by 1 to 5 feet of sheared wallrock.

as much as

The vein quartz is usually wellribboned, with ribbons of quartz, from a fraction of an inch to 12 inches thick. In places a part of the voin is ribbound and the other part is massive quartz.

processo

Parts of x some of the veins possess a marked breccia texture. In places this consists of angular fragments or inclusions of wallrocks, usually highly altered, cemented by vein quartz, or in other places it consists of fragments of early vein quartz cemented by later vein quartz. The footwall of some of the veins is fractured and so laced by quartz stringers, that a breccia texture is formed.

Although much of the good grade ore is ribboned, much of the breccla-type and the mas ive gartz have also

Title	Bralorne	
Author	jss	
Date and Typist	May 17/13 05 24	

constituted good grade ore.

A doubling-up of the vein by intra-voin slips has been noted along some of the drifts.

The gangue is principally quartz, with minor amounts of calcite, mariposite, tale and scheelite. Calcite and mariposite are found along the vein partsings and in wallrock inclusions. <u>Mariposite is composite</u> if the veins near the sergentine, decreases away from it, and has been seen as far as 500 fect away from the sergentine. Foliated as much as occasionally masses of watery green tale (up to) several inches wide in

occur in wallrock shears adjacent to the veins where they out tale rock. The tale in these veins is much more connectly follated than that which replaces the serpentine to form tale rock or that which is found in small amounts in adjacent diorite. Pale orange-coloured scheelite is widespread in small amounts, and in one place towards the eastern end of "51" vein, between the 500 and 600 levels, and in the west end of "73" vein on 1400 level, small shoots of scheelite occurred and where mined during World War II, and the one, a few hundr 6 tens, con-

Title		Brol:	rne		
Author		jss			
Date and Typist	May	15/53	es	25	

centrated in a small plant built for that surveye.

Free gold is frequently seen in the value, and in places it has occurred in spectacular emounts. Fyrite and arsenopyrite are the principal sulphides, pyrite the more abundant. Sphalerite, galena, chalcopyrite, pyrhetite and tetrahedrite (grey copper) occur in small amounts. Warren, (1942, p. 30) reports bornite, stibulte, chalcocite, covellite and magnetite, but says they are rare. He also reports (1942, p. 30) microscopic, hair-like crystels of millerite, a sulphide of nickel, in a small cavity in quartz. In coveral sulphides are not abundant in the veins and constitute less than 1 per cent of the vein matter.

As the veins are principally within two rock types, granite and diorite, which are similar physically and both of which possess an isotrocic siructure, the veins may be considered as comprising a single fracture rattern. They are principally of two structural types: <u>shear veins</u>, which are long, relatively continuous and accompanied by shared wallrock; and tension veins, which are short, relatively fat

Title	Bralorne		
Author	<b>j</b> ss		
Data and Tunist	May 11/53	09 26	

veins, and either lacking sheared wallrock or are accounted only by a narrow width of it.

Shear veins are typified by the "51" and "77" veins, the two longest veins known on the property. These veins have also the longest stretches offairly uniform strikes. The strike of the "51" vein varies only 5 degrees in strike, from 70 to 75 degrees west, over a length of about 2,000 feet and "77" vein maintains a uniform strike of about morth 55 degrees west for about 3,100 feet. The "55" and "53", relatively long veins in the hangingwall of the Empire fault, have strikes generally similar to those of "51" and "77" and have been considered the faulted equivalents respectively of these veins. Shearing has been more prominently developed along these veins, particularly the "77", than along the shorter diagonal veins. The extreme distance over which these veins maintain a moderately uniform strike and the abundance of shearing suggest that they closely follow the direction of maximum shearing.

The tension veins strike from north 70 to 90

Title	Bralorne	<i>ب</i>	
Author	jss		
Date and Typis	May 15/53 cs	27	

degrees east, diagonal to the general north 55 to 70 degrees west strike of the longer veins. Shearing is less well developed along these diagonal veins and much of the voin matter consists of brecciated wallrock and early guartz cemented with later quartz. It is generally considered that a breccipted texture is characteristic of veins formed by tension rather than by shearing. Short gash veins that branch from the longer veins, in particular from the "51" and usually extend for not more than 50 feet into the wall, also strike in a direction similar to that of diagonal veins. The assumption t at these short, branching veins are gash veins, is based on their shortness, frequent brecciated texture and the lack of shearing along their walls.

The direction of movement prior to vein formation and therefore the movement responsible for the fracture pattern of the veins may be deduced from the attitude of the short gash veins relative to the shear vein. The chear veins strike in general north 55 to 70 degrees Weyt and dip northward; the gash veins strike in general northCeasterly and

Title	Bralorne			
Author	jss			
Date and Typist	May 15	/53 cs	28	

also dip northward. Therefore the trace of the intersections of most pairs of these veins plunges downward to the west, and pland In the hangin wall of the shear vein the direction of movement necessary to produce these gash veins would be at right angles to this trace and upwards in the hangingwall, then the hangingwall of the shear vein must have moved westerly and up with respect to the footwall.

Post-vein movement along the vein shears has been in the same general direction as the pre-vein movement. This is shown by the abundant fluting in vein quartz which ritches down to the east at from 50 to 70 degrees and by a similar direction of displacement of post-vein lamprophyre dykes that cut the "51" vein.

P

The principal direction of shearing appears to be from morth 55 to 75 degrees west, followed wrincipally by the longer veins such as "51", "53", "55", and "77". The principal direction of tension appears to be in a morthersterly direction followed by short gash veins from these longer veins. An intermediate direction from morth 45 degrees eact,

Title	Bralorne	
Author	jss	
Date and Typ	May 16/53 cs 29	

but usually from north 70 degrees east, to easterly, is followed by those diagonal veins in whose formation tension was important, such as "53A", "59", "73", "75" and "77B". Veins of both types may vary in strike towards the direction either of shear or of tension. That is, veins which predeminantly strike along the direction of shear may have parts that strike along in the direction of tension, and tertions of the diagonal veins may strike more towards the direction of shear. but the general strikes of the veins seem to classify then as predominantly shear or predominantly tension weils. Because of more favourable conditions for deposition of vein matter, the wider parts of the veins and also the creshcots will tend to form in the veins, or in those parts of shear veins, which follow approximately the direction of the tension fracture. Predominantly diagonal veins/ are favourable to the formation of wide vein-sections but tend to be short both on strike and Veins which predominantly follow a shear direction will dip. possess wider vein-sections principally where they follow approximately the direction of tension, but the veins as a

Title	Bralorne				
Author	jss				
Date and Tunist	May	16/53	cs	30	

whole will be more persistent in strike and dip then the diagonals.

JEid

Features of strike, form and texture that relate the voins to the fracture pattern are mentioned in the individual vein descriptions to follow.

1B", and "518" Footwall veins .-- (see Fir. 4) This vein, strike usually north 70 to 75 degrees west and dip 45 to 70 degrees northeastward with occasional teeroning to vertical, in the footwall of the Empire fault, is the longest known and most extensively developed vein in the Crown and Empire sections. It is referred to as the Empire vein by Cairnes (1937, p. 85) and probably is the Ida May vein of still earlier reports. The vein has been developed from the surface to the 20 level, a distance down the dip of approximately 3,300 feet or a vertical distance of approximately 2,800 feet and is known to extend for an over-all strike length of about 4,800 feet. Towards the west the "51" vein is passo into faulted off by the Empire fault and towards the east it ? into sheared greenstone and peters gut within a short distance.

Title\_\_\_\_\_Bralorne\_\_\_\_\_

Date and Typist May 19/53 cs 31

"The vein has been stoped at several places from near the surface down to the 1400 level, but the full length of the vein on all drifts has not been stoped yet. Production from this vein, exclusive of production from drifts and development raises, to the end of 1951 has been 947, 810 tons of ore containing 555,541 oz. of gold.

The vein quartz, commonly ribboned, generally ranges from 1 foot to 7 feet wide but in places is much narrower and ranges from 1 inch to several inches wide. The narrower sections are usually accompanied by 1 to 4 feet of sheared rock. Inclusions of country rock are not particularly common, but have been seen as along 851 E drift.

The "51" vein is principally in granite, but in places, as along 651 E drift, it follows an albitite dyke, largely altered to quartz-sericite schist.

The larger part of the vein follows a strike of approximately north 75 degrees west (see Fig. 4), close to the general direction of shear. However, short sections

ALT BUT WAR		
Title	Bralorne	
to matt prover		
Author	ູ່ງອຣ	
Autor		

Date and Typist May 19/53 CS 32

strike approximately north 75 degrees east, which is the

general direction of the gash veins and therefore the general

direction of tension. It may be noted that much of the vein

on the most pronounced bend towards a strike of north 75

degrees east, in the eastern parts of the drifts from 600 to

1400 levels, has been stoped, and parts of 1200, 1300 and

1400 levels along this section are reported to be in very

good grade ore.

A shear vein, the "51B" vein, branches from the south side of the "51" vein a short distance from the western end of the "51" vein. The "51B" vein, strike north 60 degrees west and dip 80 to 85 degrees northward, consists of well-ribboned quartz and is usually of moderate width; but may, as in 1051 east drift, change in a few feet from a width of 3 feet to one-eighth-inch stringers of quartz. This vein has been followed for varying distances by drifts from 400 to 1400 levels, for 150 feet on 800, as much as 650 feet on

14:0, and possibly has been intersected by a drill-hole on 800 level wither 160 feet wither south. The sein has not been sloped.

