HARRISON GROUP (Windsor, Psyche, Big Johnny) Greenhorn District Grant County

Owners: C.L. Harrison Seattle, Washington
M.S. Riechert Seattle, Washington
Walter C. Fellows and Donald Kempfer engineers in charge of development.

Location: E½ sec. 17, T 10S R. 35 E. WM.

Area: 16 unpatented claims.

History: See J. E. Allen report of 9/25/39.

Equipment: Windsor: Hoist powered by 10 HP Novo gasoline engine. 2B Copper blower run by a 2 HP. International Harvester gasoline engine. 2-one ton mine cars. Blacksmith forge and equipment. 200 feet of 12 lb. double rail.

Development: Psyche: Lower tunnel over 1100 feet. Upper tunnel about 300 feet.
Big Johnny: Tunnel 1200 feet (About 200' in 1939).

Windsor: 700 feet tunnel. 62 foot - 60 degree incline shaft and 200 feet of drift running N 22° W.

Geology: See J. E. Allen report 9/25/39.

Remarks: Don Kempfer believes that the development ore will pay most of the development costs.

Informant: Don Kempfer 8/15/40

Reported by H. K. Lancaster

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Harrison Group (Windsor, Psyche, Big Johnny)

Greenhorn District Grant County

Owners: C.L.Harrison, Seattle, Washington
M.S.Reichert, " "
W.C.Fellowes and Donald Kempfer, engineers.

Location: E½ section 17, T 10 S, R 35 E.W.M. An.6500-7000'.

Area: 14 unpatented lode claims.

History: Psyche said to have produced about $90,000 (several thousand tons of $200 ore) in 1905. Some ore from the Big Johnny shaft milled up to 1904. Production from other claims little or none. Property has been idle since then until August, 1939, when new work on the Windsor claim struck very high grade ore, which is being sacked for shipment at the present time (9/25/39).

Equipment: Windsor: hoist, car, track, etc.
Johnny: car, track, blacksmith shop.

Developement: Psyche: Lower tunnel over 1100'.
Upper tunnel about 300'.
Big Johnny: tunnel 1200' (about 200' in 1939).
Windsor: Tunnel 700', new prospect shaft 60'.

Geology: Country rock is serpentine, with occasional intrusions of meta-gabbro. Ore occurs along fault zones as pockety lenses, very highgrade, and consists of primary chalcopyrite, usually mostly altered to hematite and chrysocolla. The iron oxide is vitreous, sub-opalline and more or less massive; the crysocolla is in narrow seams and stringers. Patches of white to pale green clear talcose material, calcite, and manganese also occur.

The new Windsor veinlet strikes N 30° E, dips 52° NW, and the ore varies from 2 to 6 inches in width high grade. The walls are well defined, from 4 to 6 feet apart, with values across the entire width of from $5.00 to $10.00. Small chromite and magnetite kidneys occasionally appear.

Miscellaneous: Climate is rigorous with 10 feet of snow, season open from June to November. Water from Blue Gulch. Transportation 55 miles to Baker; nearest post office Whitney; Sumpter Valley Railroad at Austin.

Informant: Don Kempfer

Report by: J.E.A. 9/25/39

BEN. HARRISON MINE (1)

GREENHORN MT. REGION No. SIDE Ag-Au DIST.

NORTH SIDE SILVER-GOLD DISTRICT

On the opposite side of the Greenhorn range from Granite Boulder creek and near or within two miles of the main ridge are several silver-gold properties of which the most important mine is the Ben Harrison, and the most important prospects are the Morris, Bimetallic, and Intermountain groups. In the Ben Harrison the gold and silver values are about equal, while in the others silver is of chief importance.

THE BEN HARRISON MINE

The Ben Harrison mine is located near the headwaters of Clear creek close to the northwest corner of Sec. 36, T. 9 S., R. 34 E. It is 23 miles by wagon road from Whitney and 28 miles by wagon road from Sumpter. These are stations on the Sumpter Valley, a narrow gauge railroad.

The general topographic and forest conditions are well illustrated in the view of the mill. The elevation of the working tunnel is about 6,500 feet. The country rock is a medium-grained slightly porphyritic "tonalitic" granodiorite. The granodiorite is cut by what are probably granodiorite porphyry dikes. About a mile northeast of the mine on the same branch ridge of the intrusion which extends out toward the Red Boy mine is an exposure of badly altered rock. The roughly parallel attitude of the hornblende crystals and the glassy nature of its feldspars suggest that this rock may have been a flow

BEN. HARRISON MINE (2)

GREENHORN MT. REGION No. SIDE Ag-Au DISTRICT

of dacite, the effusive equivalent of granodiorite. In any case it is genetically connected with the granodiorite intrusion and may have been caused either by a volcanic eruption or else to a foundering of the roof of the Greenhorn intrusion which had stoped its way so close to the then existing surface that a portion of the roof of ancient rocks broke loose and was submerged, permitting the molten rock to flow out.

Aplite dikes abound in the granodiorite and vary in size from an inch or less up to a foot or more in width and some of them, probably the last ones formed, have such a decreased amount of feldspar that they approach quartz veins in composition, but are not mineralized.

About one-half mile south of the Ben Harrison mine and crossing the saddle of this north and south branch of the main ridge is a body of older rocks which at the apex of the ridge is nearly one-half mile wide. This older rock is greenstone and greenstone schist. Its contact with the granodiorite on the north and south sides was not fully observed, but underground in the Ben Harrison mine inclusions of greenstone were noted in the granodiorite, proving that these greenstones are the older rocks.

This greenstone is a very fine-grained, badly kaolinized and sericitized rock containing considerable secondary quartz and chlorite.

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It was probably originally a basalt. The schists are fine-grained, consisting chiefly of biotite and apparently secondary quartz with a few garnets. This rock is probably also of igneous origin. This greenstone schist is surrounded on all sides by granodiorite, indicating that it was a downward projecting portion of the roof of older rocks, the main body of which has since been eroded. A great many good-sized veins are found exposed in this greenstone which have been prospected from time to time, the oldest of which is the "Potosi."

The Ben Harrison vein strikes N. 3° E. and dips 67° E. and is lenticular in shape both along its strike and dip. Its minimum width of gouge and altered rock is about 18 inches and its maximum 21½ feet.

The length so far stoped above the 200-foot level is about 400 feet; above the 350 and 500-foot levels the stopes are about 300 feet long. On the 600-foot level the vein has been drifted upon for 350 feet, which at the south face is 12 feet wide and the north face 6 feet wide and averaging 68 inches for the 350 opened up. This is the same average width for the length of the drift as is the 500 stope on that level. The average stoping width for the entire mine so far opened up is 77 inches, and the lowest level, the 600, has good faces of ore both north and south and will likely exceed all other levels in tonnage-feet. Its average value is between 19 and 20 per cent higher than the average value of the ore in the rest of the mine, which averages a little above $10 a ton for the 87,000 tons blocked out on at least three sides above the 500-foot level.

The vein, a brecciated replacement, between the gouge on both walls is made up of fragments of granodiorite up to a foot or so in diameter surrounded by vein quartz up to six inches wide. The fragments themselves are much silicified and cut by minute reticulate veins. The ferro-magnesian silicate minerals are entirely decomposed and the

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feldspars largely kaolinized. Calcite, probably derived from the country rock, is present. The same alteration occurs in the wall rocks to a lesser degree, but this alteration of the wall rock is greatest next to the widest part of the vein.

The outcrop of the vein is inconspicuous and is at a narrow portion of the lens, where it is only about two feet wide. At the surface it shows a typical sheared character and mineralization. Quartz, limonite, and kermesite, the red oxide of antimony were observed there.

The ore minerals are pyrite, stibnite, a little chalcopyrite and sphalerite. The silver sulphides are pyrargyrite and stephanite with gold of about equal value to the silver in the ore. The gold values in the various parts of the shoot so far opened up, remain reasonably constant, but the silver values are quite variable. The good silver ore is in horizontal layers, a streak of lean and a streak of fat as it were. The silver values vary also greatly between the foot wall and hanging wall. There are many thin lenses of considerable wall area more often on the foot wall, though frequently on the hanging wall and occasionally between walls or else in branch veins into the hanging wall. Sometimes these sulphide sheets are almost pure stibnite with only a moderate silver content, while in other places they consist of quartz and disseminated stephanite, the black brittle sulphide of silver and antimony, in which there is present a small amount of pyrargyrite.

There is also a wide variation in the silver content along the strike of the ore shoot. For instance, upon the lowest level which is only partially developed the average gold content north of the shaft compared with that south differs only 14 per cent, while the silver content has fourteen times as much in one as in the other.

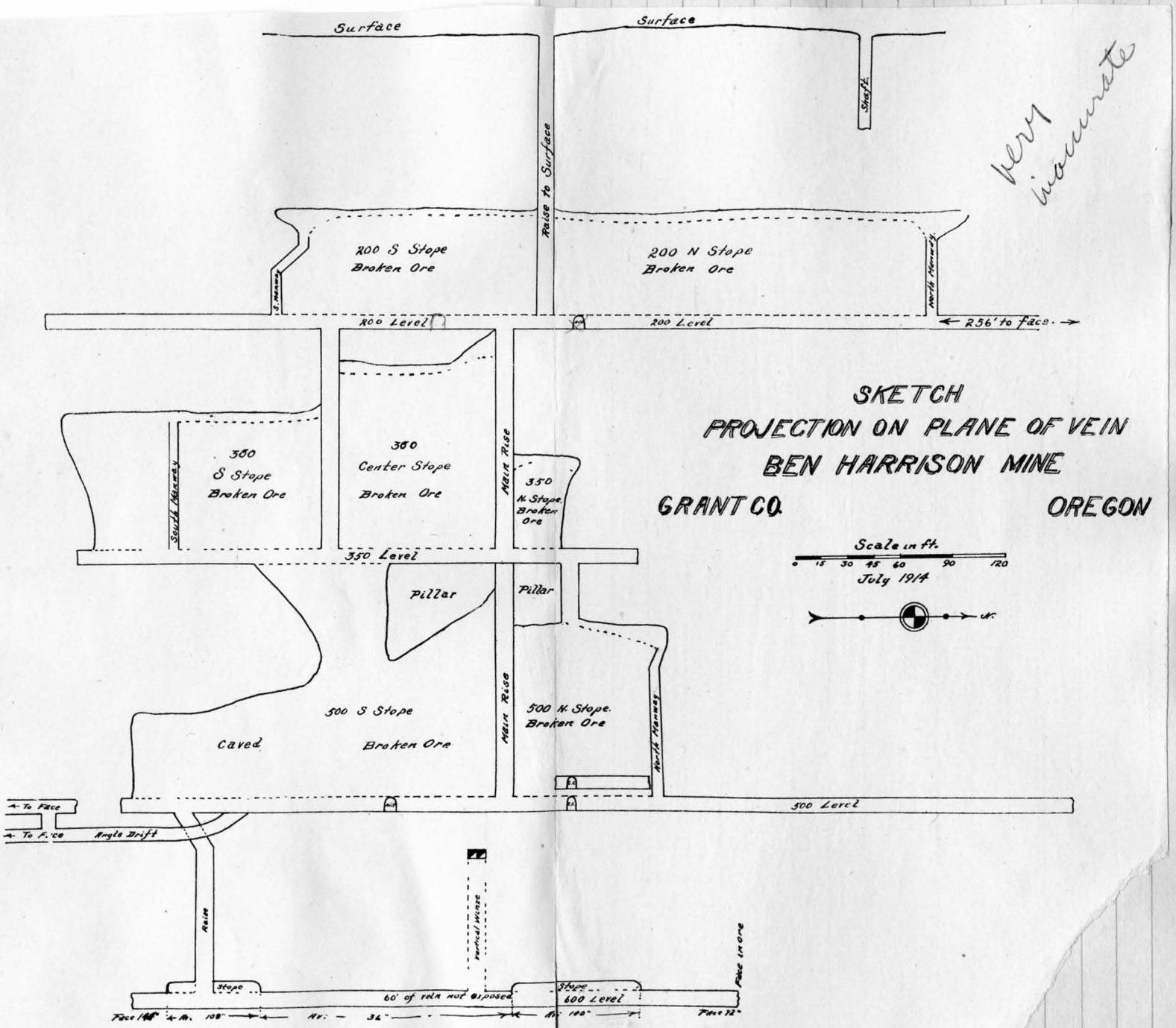

Fig. 84. Underground development Ben Harrison mine.

BEN HARRISON MINE

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This vein was formed by hot waters coming directly from the interior of the intrusion. This hot water, using the fissure as a channel, percolated through the brecciated rock in it which at the beginning was unaltered. The moderately high-temperature ascending water together with the material in solution, brought directly from deep-seated sources or extracted from the deeper parts of the channel, possessed a vigorous altering effect upon the fragments of granodiorite and the wall rock. They kaolinized the feldspars and the ferro-magnesian silicates were broken down so that now we have the softened badly altered fragments and wall rocks. At the same time that the hot ascending waters were metamorphosing the wall rock and brecciated granodiorite in the vein, it was also depositing the quartz in between the fragments and silicifying their interior, and was also bringing iron, antimony, silver, some copper and zinc, and gold in solution. Lessened temperature and pressure together with changes in the nature of the solution itself when it reached the upper few thousand feet of the vein caused a deposition in the vein of the gold and various other metals in their present form as sulphides.

This locality is undoubtedly a glaciated basin. The oxidation in the vein is very shallow and every appearance of the hard silver ore in quartz leads one to conclude that this ore is a primary and not a secondary ore of silver, and, therefore, the development of this silver-gold ore is not in a zone of secondary enrichment which will, a short distance below the lowest level, become lean in silver values. We conclude rather that any changes in the silver content below the 600-foot level will be due to some other factor in ore deposition than to the leaching of silver from the upper part of the vein to deposit it below,

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forming what is called downward sulphide enrichment.

The mine is equipped with a gyratory crusher, 20 stamps, a tube mill, Richard-Jenney classifiers and Isbell vanners. The concentrates were hauled to Whitney at a cost of $8 per ton when the roads were good, but in the fall and spring the roads are almost impassable for heavy traffic, so that the five or six tons of concentrates produced daily accumulated too rapidly during those periods.

Although the pulp was carefully classified and the product of the first two spigots returned to the tube mill for regrinding, nevertheless the vanners had difficulty in maintaining a 75 per cent extraction. The difficulties in getting the concentrates to the railroad, the high cost of transportation and smelting together with the loss in the tailings of $2.50 to $3 per ton caused the owner, Mr. A. L. White, president of the Lima Locomotive Works of Lima, Ohio, to await the results of a series of tests made at the mine by Manager Walter C. Fellows, and by the Merrill Metallurgical Company at San Francisco, in order to work out an efficient process of extracting the values on the ground.

The experiments have gone far enough so that the probability of success can be confidently asserted. The process will probably involve the present mill and concentration plant, to which will be added cyanidation of the tailing and concentrates after the latter have been roasted. Utilization will be made of some of the recent successful methods followed in cyaniding the complex silver ores of Canada which have gone into use in the last two or three years.

BEN HARRISON MINE

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This has been dwelt upon at some length in order to give a considerable note of encouragement to many, although the successful extraction upon the ground is not yet a reality which possesses the advantage of a proved method. Those who have ores less complex than this one, too low to ship crude and frequently too massive to concentrate, may be able to successfully treat them in some such way.

(See letter to Baxter, Portland, Sept. 1937)

6/36

Harrison Ships Concentrates

The Ben Harrison, or Oregon Campbell Mining company which is the name of the new company now operating this property, has been milling ore for the past two months and shipping a carload of 30 tons of concentrates to the smelter each week. Three eight hour shifts are being worked at the present time with a crew of 50 men steadily employed. New equipment has been installed throughout the mill and a recovery of better than 90 per cent of the values in the ore is being made.

Work of reconditioning the mill and other buildings on the property was started last August and continued through the winter, despite heavy snows in the mountainous area in which the mine is located. A huge caterpiller tractor was used in transporting machinery and other equipment from Sumpter to the site of the mine, in the Greenhorn district, some 6200 feet in elevation. One of the chief obstacles to the former operators at this property was the matter of sufficient water for milling purposes. To overcome this handicap the present owners have installed a dam in the creek above the mine and pipe the water to a storage tank directly above the mill thus insuring a steady flow.

Ninety tons of ore are being milled in the three shifts, making this mine one of the heaviest producers in this district. A small sawmill is also included in the new equipment to be found at this mine.

THE PSYCHE MINE

GREENHORN MT. REGION VICINITY of GREENHORN CITY

VICINITY OF GREENHORN CITY

Mining in the region on the eastern side of the Greenhorn intrusion and in the older rocks into which it came can be placed roughly in two groups. This area is exposed to view because of the erosion of recent basalt which probably once covered it entirely. The region around the Red Boy and that around the Bonanza mine are in argillite, while those in the vicinity of Greenhorn are practically all in the greenstone series. The latter group extends from near the Morning mine through the town of Greenhorn and old Robinsonville to Quartz creek, two miles north of Greenhorn. There is an exceedingly large number of veins which are usually small, but are frequently productive of rich ore.

The Psyche, 1½ miles east of the Morning mine, is in serpentine with some altered dolomite. A fine-grained light-colored sericitized porphyry was also noticed. Considerable development has been done upon this property and a stamp mill was erected, but was removed in 1914 to Cable Cove. Only the old badly weathered surface workings were visited. At these points the true nature of the mineralization is not very apparent.

1938

Van E. Hallberg of Baker, Oregon, is reported to have found platinum values in a group of claims which he has been prospecting and developing. The property is located in the Greenhorn district near the old Psyche mine. 5/15/38