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ITEM 37

Report of Geological Work done for the Aurora Consolidated Mining Company during July 1915.

HUMBOLDT FAULT

This is a post mineral fault striking nearly parallel to the Prospectus fault, dipping east at angles varying from nearly vertical at the surface to 60° or 70° in the lower levels, cutting the tunnel level about eighty feet west of the shaft. (See block diagram).

At the outcrop near the Wampus quartz and down to the second level the fault is practically on the foot wall of the Wampus vein. It has no definite walls here but is a wide fract~~ion~~ure zone. From the second level down it dips less steeply to the east and forms the western end of the Humboldt vein. The workings have not found the faulted continuation of the Humboldt vein beyond this fault, but it probably does not lie far from the timber siding in the main tunnel.

The fault is not strong when found in the Juniata tunnel and probably fades out to the south.

The probable movement is difficult to determine but the resultant horizontal displacement of the Humboldt vein is not great. If the buttresses on the west side of the Wampus vein are the faulted continuations of the forks of the Humboldt vein as seems probable, then the west side of the fault has moved relatively north about 150 feet.

It does not seem probable that this fault cuts the Wampus vein across the dip. It apparently lies entirely east of it.

The Wampus vein is nearly vertical near the surface but on the second level is seen to be dipping west. The quartz now visible on this level is probably not the main vein but fingers or branches from the foot wall which dip west at angles from 60°-70°. The main quartz

is farther west and probably steeper as shown in the accompanying block diagram.

In depth the vein may be cut by the Prospectus fault. The termination of its buttresses against this fault is strikingly visible above the Humboldt tunnel.

HUMBOLDT VEIN

This vein in the vicinity of the shaft has several minor branches striking off to the west from the hanging wall. They do not appear to be junctions with other large veins but finger out into the country and are lost. They appear to be confined to the region of the shaft where the vein thickens and tends to the south west. It does not seem probable that such branches will occur to the east.

The main vein gets weaker to the east and finally near the base of the hill divides into two east pointing forks. The outcrop of the strongest fork is about three feet wide.

BANDING. Two kinds of banding are prominent in this vein. One is in solid quartz and is due to the difference in grain of the quartz layers. The other more prominent is more closely banded and the thin laminae of quartz can be often easily separated with a hammer. It is this last sort that seems to indicate the higher values ($10 to $20) although this is not infallible. This banding is in general confined to the vein walls particularly to the foot wall. The best values while following this banding are not consistent along strike or dip and no definite ore shoots could be outlined. No other condition visible to the eye could be found to indicate where values might be expected.

JUNIATA MINE

The two veins opened here have been called by Spurr Vein #1 (the northern one) and Vein #2 (the southern). The first strikes N 85° E and dips 70° south. The second strikes N 60° E and dips 75° south.

The outcrop of Vein #2 lies entierly within the Juniata and Martinez claims, but Vein #1 while not certainly visible in outcrop probably apexes for part of its length on the Rambler claim as shown in the accompanying map. The assays show that part of the best ore in the vein lies down the dip from this part of the outcrop. The pile of quartz boulders about 100 feet south of the entry to the lower tunnel may rẽsonably be an outcrop of Vein #1.

Vein #2 is not a single vein but consists of two or possibly three veins parallel in strike and close together, they vary in dip from 45° to 75°.

Both #1 and #2 grow weaker to the west and do not hold much promise to the east. They have been faulted and much broken in a fault zone near the west end of the Juniata claim.

This fault as shown on the map strikes N 27 E and dips steeply westward. It has displaced the east block about 50 feet to the north, but the movement was not horizontal as both veins are not equally displaced.

The continuation of the Juniata and Humboldt veins to the east towards the New Esmeralda does not promise much judging by their habit in their most eastern outcrops. The rhyolite in Gregory Flat, particularly east of the Juniata is probably of no great thickness. The contact of the andesite and the rhyolite dips steeply to the northwest and

may be seen on Granite mountain just above the Juniata outcrop. Hence no great thickness is to be expected in the flat below to the east.

WIDE WEST MINE

Two vein forming periods separated by a period of faulting are clearly visible on Last Chance Hill. The veins of the earlier period strike about east and west and dip south at angles from 80° to 30°. These are the principal veins and the only ones mined. They range in thickness from thin stringers to four feet and are very numerous.

The veins of the second period strike N 40° E and are all nearly vertical or dip steeply east. They distinctly cut the veins of the first period and occur as thin stringers along the faults and slips which displace the older veins. Fluorite, which was not found in the earlier veins, was deposited late in this second period of mineralization and is common in these fissures often forming veinlets in the fault gouge or lining the druzes of the quartz stringers. A later thin layer of quartz often covers the fluorite. These slips and quartz stringers are called in this report the Willow fissures or Willow quartz. They are not found east of the Prospectus fault.

The vein which is reported to have contained the rich ore shoots, known as the Last Chance vein, is marked in outcrop by a line of caved stopes only two of which can now be entered. The western workings ave above the Wide West tunnel reveal two veins parallel in dip and strike and not more than 20 feet apart. The biggest stopes are on the upper vein.

This vein is opened in the Johnson Chamber and the big stope east of it. The lower vein is opened in the big "Foot Wall Stope" east of

the Johnson Chamber and is exposed in the short cross cuts from the Wide West tunnel west of its junction with the Willow tunnel (This higher tunnel - eight feet above the Wide West tunnel - is called the Willow tunnel in this report for want of a better name). Whether or not these two veins are forks of a single vein to the east could not be determined but seems likely.

The conditions controlling the deposition of the rich ore shoots can only be guessed at. The fact that the rich shoots have been confined to the west side of the Prospectus fault and that the fluorite bearing veins are also confined to the region reported to be rich leads to the suggestion that the second period of mineralization may have brought in the greater values. There is no further field evidence to bear this out. It is merely a guess.

If rich ore shoots such as those reported still exist they probably do not extend to any great depth and prospecting for them below the Wide West tunnel would seem useless. That they may exist is not to be denied but no amount of geologic study can predict their location and only through prospecting will reveal them if they exist. Such prospecting is a pure gamble.

There is no chance of finding faulted continuations of the rich ore shoots reported from the Johnson and Chihuahua Chambers. If such existed they have been worked out for the displacement along the Willow fissures is not great in any place and the dumps indicate that the vein near the surface along its whole strike has been gone over thoroughly in earlier days.

Considerable gouge has been developed along some of the Willow fissures, amounting to as much as twenty feet. But no displacement seems to have exceeded 20 feet. Oscillations or direct crushing with small

movement may have produced the heavy gouges.

The displacements could not be worked out with accuracy because none of the eastern stopes could be entered and the large number of parallel veins on either side of the Last Chance vein makes it difficult to identify two faulted portions of a vein along a given fault.

However the country has been roughly divided into four fault blocks in an attempt to get a clear idea of the situation. These are shown on the map of the Wide West Mine.

The two eastern Blocks (1 and 2) are assumed from the position of the two large caved stopes in them. Block #1 has moved north east a short distance relative to Block #2.

The fault zone between Block #2 and Block #3 contains the heaviest gouges. Block #2 has moved southwest a short distance relative to Block #3. The outcrops mapped in the Chihuahua and eastern stopes are not accurate but are inferred. This explanation therefore does not rest on actual observations of outcrop and must be taken accordingly.

The relative movement between Block #3 and Block #4 is more definite and seems to be very small. Here again however it is difficult to match veins on opposite side of the fault because the two veins look so much alike. However the movement has not exceeded the distance between the two parallel veins.

The vein in Block #4 exposed in the Wide West tunnel can be seen to end abruptly at the junction with the Willow tunnel against a Willow fissure that can be followed in along the higher tunnel. From a raise from the Willow tunnel just west of the junction an intermediate cross cut passes into Block #3 and reveals a vein of the attitude and appearance of one of the Last Chance veins. It is probably the upper vein. Its probable position on the Willow tunnel level is indicated on the

map. The vein might be prospected by drifting in from this point.

There is a wide fracture zone between these two Blocks which can be seen clearly in the Johnson Chamber, but there is no great displacement of the vein.

Here as in the Chihuahua Chamber the reported rich ground is where the Willow fissures are most numerous.

In general the blocks appear to have moved relatively northeast as we go from west to east, but with no great displacement at any place.

The faulting probably followed closely after the Prospectus fault.

RECOMMENDATIONS.

Make an entry into the old stope near the Prospectus fault either by raising from the Gladus #2 tunnel or going in from the surface by one of the shafts just south of the caved ground. This entry is desirable merely for the information to be gathered in the old workings.

Should it be desired to prospect the Last Chance vein it may best be entered from the Wide West and Willow Murphey tunnels. The ~~Murphy~~ and Gladus tunnels are probably not much below the downward limit of the old workings.

The vein in Block #3 may be drifted on from the Willow tunnel at the point shown on the map. This is probably the upper vein and its western faulted portion is probably not far from the winze on the opposite side of the tunnel.

Block #2 may best be prospected by drifting into the block from the end of either the Wide West or the Willow tunnel. The exact location of the vein cannot be given but if the assumed outcrop in the

in the Chihuahua Chamber is correct, then a drift to the east from a point one hundred feet up the raise from the end of Willow tunnel would not need much cross cutting to find the vein. It may best be located at the tunnel levels by drifting east from the Wide West tunnel and cross cutting to the south.

PROSPECTUS FAULT

This fault with a gouge from 20 to 40 feet wide appears as the soft clayey timbered country in the drainage tunnel south east of the Last Chance junction, again about 120 feet into the Humboldt tunnel, in the Gladus #1 tunnel, the Gladus #2 tunnel, on the surface near the top of Last Chance Hill, and in the face of the tunnel near the bottom of Willow Gulch southeast of the Del Monte shaft.

The strike is slightly east of north and the dip very steep to the east. At the outcrop on Last Chance Hill the polished wall shows strong nearly horizontal straie. Assuming the Prospectus vein to be the faulted continuation of the Humboldt the horizontal displacement is about 1,000 feet, the west wall moving north.

However such a throw if horizontal would place the faulted east portion of the Last Chance vein in the bottom of Willow Gulch. There is no evidence of it there. Spurr thinks, and it seems most probable, that the vein now being mined on the Philadelphia claims (he calls it the Del Monte vein) may be the faulted Last Chance, indicating a horizontal displacement here of only a little over 600 feet.

A movement of the east block downward to the south at an angle of 11° would produce such a difference in the displacement of the Humboldt and Last Chance veins.

Respectfully submitted

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Geologist.