REPORT ON THE
RED ELEPHANT MOUNTAIN GROUP OF MINES,
LAWSON, COLORADO.

by
B. F. WEBSTER, JR., E. M.
Location:— The Red Elephant Mountain Group of mines are located at the edge of the Town of Lawson, Colorado, which is reached by the Colorado & Southern Railroad, operating between Denver and Silver Plume, Colorado, or by auto, the property being located on the Midland Trail, a transcontinental auto road or highway from coast to coast.

Lawson, Colorado, being forty four miles by railroad from Denver and forty eight miles by auto highway, is located in the Downieville Mining District, Clear Creek County, Colorado.

Property:— The Red Elephant Mountain Group of mines are the result of a consolidation of several of the better properties located on this Red Elephant mountain which rises to the north of the Town of Lawson, extending from the depot to the top of the mountain, with a south slope which makes the year around mining a certainty, as very little snow lies on this property during the winter months.

The property consists of sixty one mining claims and two mill sites which are patented, mill (50 ton capacity) transportation tunnel, blacksmith shop, powder magazine, compressor, rails and cars such as are necessary to start operations.

The transportation tunnel is thirty five hundred feet in length and cuts the vein systems at depths varying from four hundred feet to eight hundred and fifty feet in depth and is connected with the upper workings with two raises which gives good ventilation for the mine throughout, these two raises connecting with the thirteenth level of the Schwarts shaft. This tunnel which is known as the Commodore Tunnel, is a bore eight by ten feet in the clear and has been run on a straight course for the entire length and is equipped with thirty pound rails and a four inch air line from the compressor for a distance of twenty eight hundred feet which is the point where the main workings are reached from the tunnel level.

The mill is of wood construction with corrugated iron covering, located about four hundred feet from the portal of the main transportation or Commodore tunnel and connected with the tunnel level by a trestle from the end of the dump, so that all ore from the mine can be dumped into the mill ore bins at the top of the mill and gravitated down through the mill with the necessary treatment en route. The mill is in very good condition throughout as is the machinery, same having been operated for only a short time, prior to their closing down. It is equipped with boiler, corless steam engine, water pumps, concentrator tables, flotation machine, ball mill, ore feeder, crushe and find ore bins, as well as the compressor being in the mill building, and all are piped or belted up for resumption of operations, the building is spacious and there is ample room for the addition of another unit of fifty tons under the present housing. At the lower end of the mill, has been provided a bin for the smaller ores that are not to be milled, but bypassed the crushe and sent to this loading bin and from which it is loaded direct onto the railroad cars, as the mill is so located that it has the advantages of having a railroad switch running the full width of the lower end of the mill, where fuel can be unloaded and the smelter ores and concentrates loaded direct into cars.

The following "flowsheet" of the mill, is as it is now installed, and the writer would only advise very few changes to
History: There various properties that compose this group of mines have been worked extensively during the early days of mining in Clear Creek District and at one time, the writer is told, experienced two very prosperous towns, one which is now the Town of Lawson and the other up on the hill at a point known as the first bench, where it is claimed that at least two hundred people were living. These properties at that time were being worked by several companies some of which were operating on company account while others were operated by lessees, but at this time there was not a mill on the property and all ore mined, had to be milled in Idaho Springs or sent to the Smelter at Denver, so one can readily appreciate that only the better and higher grades of ore could be extracted, the balance either being hoisted from the mine and wasted over the dumps or used in filling old stopes.

The following tabulated list of producers, is the only list of same which the writer could find in going over the office files, which would appear to be about correct as regards to the dumps, maps etc. This production would indicate that this production was computed at the time these many companies were operating under separate managements and with talking to many of the old timers in the district, would believe that these figures are not far from correct.
In Mr. Frank Fossett's report on this district, he has set forth some very interesting data such as, "In two weeks of June 1878, four men took from the Boulder Nest, 11 ½ tons of ore selling same for $8,689.00. "For some time the White paid profits of $10,000 per month. "From the Free American Extension, two men mined in one day, ore selling for $1,000. The Tinker lease on the Boulder Nest in six months ending April 30, 1878, yielded 2192 tons of ore that sold for $186,451.00, the expenses averaged thirty per cent of the receipts. During the year the leases cleared about $72,000.00 and paid the owners about $27,000.00 royalty. He also states at this time there were around 160 to 200 men working on Red Elephant Mountain.

Present Conditions:

The entire property has been idle the greater part of the last three years, with exception of an occasional lessee, who will go under for high grade and make a few shipments, this however does not do a property any good unless, it is through a very rigid agreement and the parties owning the property, being in a position to advise them and to see that things are kept as should be, consequently the main workings on the surface, which are located about half way up Red Elephant Mountain, are inaccessible and while they have the appearance of having caved from the surface, believe that only the collars of those shafts have give way allowing the sides to slough in.

Many of the main shafts have not been operated for nearly thirty years, these however may be in a caved condition for the entire depth, but as these are filled in so tightly with caved material from the surface, they may not have caved badly below the point where they are blocked as this ground does not cave readily unless submitted to air, causing it to slack.

Development:

The property is developed by tunnels and shafts, the main ones of which are, the Commodore Tunnel, Tabor Tunnel, St. James Tunnel, White Adit, Franklin Tunnel, and Flat Iron Tunnel, besides the Schwartz Shaft, Tabor Shaft, Young America Shaft, Desbro Shaft White Shaft, Boulder Nest Shaft, Little Giant Shaft, Free America Shaft, Free America Extension Shaft, and the Lula Shaft, and Bush Willis Shaft. There are also many other short tunnels and shallow shafts, which the writer has not mentioned as they have not been sufficiently developed to consider them in the productive class, while the others above mentioned, have had extracted or are in the ore zones.

Ore:

The ores occur in fissure veins in the altered granite gneiss which shows a pronounced crushed condition appearing in the sulphides.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Boulder Nest</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Free America and Free Am. Extension</td>
<td>400,000</td>
</tr>
<tr>
<td>Little Giant</td>
<td>80,000</td>
</tr>
<tr>
<td>Flat Iron</td>
<td>200,000</td>
</tr>
<tr>
<td>White</td>
<td>1,500,000</td>
</tr>
<tr>
<td>White Extension</td>
<td>100,000</td>
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<tr>
<td>Lincoln</td>
<td>300,000</td>
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<tr>
<td>Tabor</td>
<td>100,000</td>
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<tr>
<td>Lula</td>
<td>100,000</td>
</tr>
<tr>
<td>St. James</td>
<td>60,000</td>
</tr>
<tr>
<td>Young America</td>
<td>60,000</td>
</tr>
<tr>
<td>Total</td>
<td>$4,370,000</td>
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and pyrites as sphalerite, galena, siderite and tetrahedrite which also carries the silver values.

The ore bodies are found to be of prominence, where two veins junction, although the better ore does not always appear at the junction, but rather a short distance from the junction on the stronger of the two vein systems, while other parts of the veins carry low grade values, many of which are of a milling grade.

As above mentioned, these properties have been mined for their better grade of ores; as now under the present conditions any ore having a value of better than six dollars per ton would be sent to the mill whereby a great deal of the mining expenses would covered by much milling.

Mining:

On all of the veins examined, the writer found that the vein fill can be very easily mined and with the pronounced walls of the vein, would not require expensive mining, other than timbering which will be required whenever a schist dyke is encountered as when such dykes appear, there is also a blocky hanging wall, which must be taken care of.

With the four inch air line, from the compressor to the intersection of the White vein, there is ample capacity to run such machines as may be needed for the mine under present milling capacity and later should additional machines be desired and additional compressor capacity added, then by installing two receivers within the mine, all the machines desired could be operated.

Advantages:

With a south slope as this property has, it is possible to operate any part of the mine or surface workings the year around, which is not true in many of our mining districts in this State.

The most important however is the fact that this property has a railroad switch, which parallels the lower end of the mill and affords the economic receiving of material and the discharging of concentrates and Smelter Ores at a nominal cost as compared with most mines of this State.

Another advantage of importance is the fact that there is a good live stream of water passing over the lower mill site, the year around which will afford ample water for any and all purposes desired and too, this creek does not have a debris law which does not permit the dumping of mill tailings into it, but allows you to waste this material into the creek, which is an important item in milling.

Ore Probabilities:

The surface deposits have been worked by lessees so that many of these are not in the proper shape and condition for Company work, but in a few of these places there are good showings of ore, for instance, the Comstock Lode, which is located at the extreme east end of the property, shows a considerable amount of lead ore, a portion of which would be good enough to ship to the Smelter, while most of it is of a milling grade, but this ore chute is at a hand- leap by not having a road to it, however lessees could do well by using pack animals and having it milled.

The Tabor has showings of good milling ore in the filled stopes to the west of the shaft and also some good milling ore a small streak of good grade of ore in the east drift of the Tabor vein in
the Tabor tunnel. To the west of the Tabor tunnel on the Tabor vein which connects with the Tabor shaft, it has caved for a short distance to the east of the shaft, but would not be difficult to catch up, and in examining this condition, the writer found some ore in this caved area, but was impossible to estimate on the quantity, or grade.

On the Free American and Flat Iron veins which were examined through an opening from the surface, which enters into the original tunnels, ore was found in several places and considerable ore has been extracted where the Little Giant vein has junctioned with the Flat Iron vein, but owing to the fact that both of these tunnels are in bad condition, these ore bodies would have to be mined through the Free America Shaft, also known as the Free America Extension shaft.

In the Commodore Tunnel the Girt vein crosses the tunnel at a point about eight hundred fifty feet from the portal and shows from two to six inches of smelting grade of ore for a distance of about fifteen feet. The drift has caved and as it has been left for some time and other large slabs from the hanging wall have caved down on top of it, it would be cheaper and better to drive a new crosscut to cut this vein and as the vein is crossing at about sixty degrees, would not require a long drive, possible thirty feet.

There are many veins and dykes crossing this tunnel from this point on in, but none of which carry any values until the St. James vein is reached at a point twenty two hundred feet from the portal of the tunnel. Here a strong vein crosses and has been stopped for some two hundred feet to the east and about forty feet in height. The tunnel level drift has caved as this vein has a very heavy and blocky, hanging wall, but the vein can be reached by going up over a distance of about one hundred and fifty feet, where there is a seam of iron eight to ten inches of a good smelting ore, but if taken with the rest of the vein as it would have to be stopped economically, would average up very well for milling ore. To operate this vein successfully, a new drift should be run from a point about fifty feet back in the tunnel, than when within about twenty feet of the vein, start a raise, thus keeping out of the vein proper which would require heavy timbering and also would allow for a good loading pocket as well as doing away with the reverse ore that had to be contend with as the drift was originally run. This vein should make a very good starting point for operations as this ore body would undoubtedly keep the mill running for some time. To the west of the tunnel on this St. James vein, there has been some two hundred feet of drifting on the veins and while the vein is strong and has very good walls, it does not carry ore of commercial value, therefore proving that the junction of veins or near the junction of veins makes the ore as is done on the east side.

Going on into the tunnel from this point, many more dykes and crossings are noticed but not of commercial value until the White vein is reached at about twenty seven hundred feet from the portal of the tunnel where a drift is run out to the west on supposedly the Boulder Met vein, but this is, as was the St. James vein to the west, very strong in appearance, but low in values. To the east there has been a crosscut to a point where a raise was put up to meet the thirteenth level or bottom level of the Schwartz shaft. From this point on in for two hundred feet there has been several crosscuts and drifts run to try to locate the ore bodies on this level and while some ore has been developed, it has not been dev-
eloped on a commercial scale and will require more work on this level before ore can be depended upon to supply the mill, but with the indications and from assays, believe that there can be considerable ore developed.

From this White vein raise above mentioned one can go up on the thirteenth level and from examinations on this level, believe that some very large bodies of good grade ore have been extracted and the stopes are very wide and well timbered, some of which have caved due to the fact that a great deal of the over-head is filled stope ground and with time and settling the timbers have given away. Assays of these filled stopes where samples could be had, indicate that these can be milled if milled on a large scale, but would not advise milling these as a whole on a low tonnage basis. The twelfth level as far as examined, indicate about the same conditions as those existing on the thirteenth level.

On both the thirteenth and twelfth levels are small bodies of fair grade ore which would mill to a profit, but as these only have little development done on them, would not venture on tonnage, but believe that they will open into very good chutes.

Might mention at this time, there being two upraises which connect with the thirteenth level, this one mentioned above being the older one and about one hundred feet from the newer one which connects with the bottom of the Schwartz shaft. This older one as well as the newer one is equipped with ore chutes for lowering of ore. The newer raise is out of commission at this time, due to a slab from the hanging wall breaking down through at some point above the twelfth level, taking the ladders out.

Dumps:

There are many dumps on this property which can be milled according to a rough sampling of same and checks with other engineers who have sampled with about the same results. The writer believes that the following dumps will mill as per the following:

| Comstock Dump | 7.0 oz. Silver | 1.0% Lead | 500 Tons |
| Tabor | 12.0 | 5.0 | 300 |
| Desbro | 13.4 | 3.0 | 1500 |
| Boulder Nest | 10.2 | Trace | 2000 |

Ore Visible:

With the four above dumps, filled stopes in mine, ore that is in sight and probable ore, where mining has been discontinued on ore of value, believe that you have at least 31,500 tons of ore that will average better than 7 ounces in silver and 1½% lead, this is very conservative as many of my samples were a great deal higher in values, one running as high as 117 ounces in silver.

Cost Estimates:

To repairing roads to the Tabor, Desbro and Boulder Nest dumps, where 22,500 tons of mill dirt may be obtained, including other necessary to American economical conditions:

- 25 ft. crosscut to Dirt Vein - 1,500.00
- 50 ft. T. and 25 ft. upraise St. James vein - 1,000.00
- Repairing Station at St. James vein - 100.00
- Old " the White " Raise to 13th level - 200.00
- New " 11th " Raise to 13th level - 100.00
- New " 11th " - 800.00
Repairing two stations of 13th level - - - - $200.00
Repairing stope timbers N. and W. 13th level - - 700.00
" " N. Norton stope - - - - 100.00
" Crosscut to Free America on 13th level 100.00
Installing chutes for drawing filled stopes - - - 500.00
Retimbering main tunnel as necessary - - - - - 500.00
Repairing collar of Free America extension shaft, and installing such machinery as necessary to un-water same and replace such timbers as may be needed 2000.00
Repairing caved area in the east end of the east drift on the Tabor vein in the Tabor tunnel - - 500.00
Getting up the caved drift, connecting the Tabor tunnel with the Tabor shaft - - - - - - 1000.00
To repairing of the White Adit where caved between the portal of adit and the Schwarts shaft to allow air passage throughout balance of mine - - - - 2000.00
Repairing air line in Commodore Tunnel - - - - 100.00
Making necessary changes and repairing in and about the mill - - - - - - - - - - - - - - - - 1000.00
Changing the motive power in mill from steam to electrical driven - - - - - - - - - - 2000.00
Building and equipping an assay office - - - - 300.00
Miscellaneous expenses in starting of mine and mill - - - - - - - - - - - - - - - - - 1000.00
Purchasing two machine drills and steel for same 600.00
Payroll for first month, mine and mill - - - - 5000.00
Repairing bunk house, office and blacksmith shop 600.00

$22,000.00

Estimate of Milling Costs:

3 men @ $4.50 per day (boiler) - - - $13.50
3 " 5.00 " (millmen) - - - - 15.00
1 man 4.00 " (crusher) 4.00
1 " 3.50 " (utility) 3.50
Coal as fuel - - - - - - - - - - - 20.00
Electric Lights - - - - - - - - - - - 1.00
Assaying - - - - - - - - - - - - 2.50
Liners and Balls (Ball Mill) - - - - - 3.00
Flotation Oils and Grease - - - - - - 3.00
Miscellaneous - - - - - - - - - - - - 4.50

$ 75.00

At 50 Tons of ore per day costing $75.00, would equal $1.50 per ton of ore milled.

Would not estimate supervision in milling costs, as this is generally prorate with the mines and development accounts and would have to be added after operations were started.

Mining Costs:

Believe that all ores from the many places on the property can be mined at an average cost of about $2.00 per ton and trending ore through the Commodore Tunnel with average around 75¢ per ton while hauling dump ores from the upper surface workings will average about $1.50 per ton. These costs however depend upon the method and tonnages mined.

Timber:

Timber is not plentiful on this property for other than that which will be needed from time to time on the upper and surface workings of the property, but there is ample timber in very short distances from the property which is on the National Reserve and this can be purchased through the local Forest Ranger at small cost.
so that better timber than that on this property can be secured at
about the same costs as cutting this timber which would be of
benefit to the upper workings.

Recommendations:

Would advise, that at least $25,000.00 be at your managers
command, before operations are started at all and a larger sum
would be much better as things will undoubtedly develop into such
a shape that you will wish to enlarge your mill capacity and pro-
bably arrange for a greater capacity from the mine, which will
cut down the mining and milling cost materially.

First of all, I would advise the sinking of two shafts down
through the Boulder Nest Dump, two shafts through the Schwartz
Dump, two shafts through the Desbro dumps and the same on the
Tabor Dump to be assured that these dumps will average of a mill-
ing grade throughout, as samples that were taken by the writer
were channel cuts around the entire dump, as well as small scattered
holes dug into the dumps along the angle of repose.

Would rearrange the mill so that the ball mill be up high
enough to discharge into the classifier, and drop the concentra-
tor tables and flotation machine to a gravity feed from the class-
sifier and in turn put the entire mill under gravity flow, thereby
giving a constant feed which is always required for a good ex-
traction. Would suggest that the mill be changed over to elec-
tric drive instead of the present steam arrangement, leaving the
boiler installed, to be used for a heating plant during the winter
months; this change of motive power would necessitate the installing
of three motors, but with two power lines passing the mill, the cost
of wiring would only be trivial. These power lines are owned by
two separate companies, one being owned by the Central Colorado
Power Company and the other is a small generating plant owned by a
small company.

The White Adit, must be opened, to allow the passing of air
through the mine as this is the only opening to the surface from
the Commodore Tunnel which can be opened at a small cost.

The Free America Extension Shaft, would be opened and drained.
Believe that this eaving around the collar, will only extend down in
shaft about twenty five feet as there is an opening through this
cave at present, and as it is near the center of the creek passing
down this gulch, should be nearly full of water and in such an
event the lower timbers will be in good condition. By opening this
shaft and installing a small pump, hose and buckets, believe that
by going to the west at the first level driven that direction, you
will have good milling ore opened up as upper workings in the Free
America Extension tunnel and the Flat Iron tunnel show some very
good milling ore and at one place has been broken through from be-
low. This ore body as it appears from the upper workings is very
steady and consistent and should develop into a profitable under-
taking within a very short time. From all data obtainable the
first level in this shaft is fifty feet below the collar of shaft
and is the two hundred and fifty foot level of the Free America shaft
which are supposed to be connected at these levels and if in solid
ground as a part of it is sure to be, this would open the way to
getting into the other old workings where undoubtedly there is con-
siderable mill dirt of a good grade.

In the Tabor tunnel, the east drift on the Tabor vein should
be cleared of much which has sloughed in and new timbers put in where
necessary, so as to take out ore that is in sight at this time. The
The writer has taken three samples from the east end of this drift and have had as high as 117 ounces in silver with 3% lead, this higher grade ore mixed with the rest of the vein fill, should average well for milling ore and can be easily obtained if needed at any time for mill reserve.

In the Commodore tunnel, I would advise the drifting on the Girt vein for a short distance to the west as there are numerous stringers and feeders leading into this vein within a short distance and at the end of the present short drift where it is in a saved condition, the ore seems to be of a better grade than over the main tunnel and possibly in the beginning of an ore chute.

An excellent development project, would be the driving of a drift to the northeast from a point about 1600 feet from the portal of the tunnel, this drift to cut the large junction of many veins such as, the St. James, Lincoln, Silver Nest, and White Extension, which should junction at a point about directly below the old Wheeler shaft which has saved. Another way to make this drive and with the possibility of making this drive in ore, would be to cross-cut for the St. James vein at a point about fifty feet to the south of where the St. James crosses the tunnel, then drift in or near this vein as the formation will allow.

By driving the west drift on the Boulder Nest vein in this Commodore tunnel, you should junction with the St. James vein at a distance of about seventy five feet, with the probability of being in good milling ore before this junction is reached owing to the fact that the Boulder Nest vein is the stronger of the two vein systems.

Would strongly recommend that the two raises from the Commodore tunnel level to the thirteenth level of the Schwartzs shaft be repaired and put into such condition as to allow the moving of ore from the upper workings at this point to the tunnel level where it may be trimmed to the mill, as there is at this time, one stop that is of good enough grade to mill, or at least the greater portion of it, then too, a few feet to the west of the old upraise there is an old drift to the north which has some little ore showing and another drift to the south almost opposite which has a very good showing of ore and both of which are good enough to start machines on for milling ore.

Closing:

The above report is as the property appears to the writer and after mapping same and the taking of over sixty assays, believe that with the above mentioned amount of money, the property can be put into condition so as to be among the leading producers of Clear Creek County.

Any other information as may be desired will be gladly given.

Respectfully submitted,

E. F. Webster, Jr.

Mining & Metallurgical Engineer.

Colorado Springs, Colorado.

January 14, 1924.