

R E P O R T

On

THE MAXWELL LAND GRANT GOLD MINING DISTRICTS

by

L. S. Preston,

NM Mine File No. 517

November 1895.

The Baldy Range of mountains, located some ten miles east of and parallel with the Taos Range, which latter forms the western boundary of the Maxwell Grant, is the center of the Maxwell Land Grant Gold Mining Districts.

This range is a direct southern extension of the Costilla, or Sangre de Cristo Range, eruptive series, while the sedimentary rocks bear to the south-west from Costilla Peak and appear in the Taos Range on the West side of the Moreno Valley.

Old Baldy Mountain (attaining an altitude of 12,541 feet above sea level) dominates this range of the same name, and is the dividing point of the Moreno drainage to the west, the Ponil to the north-east and east and of Ute Creek to the East and south-east, all of which streams eventually find their way into the Cimarron River.

The geological features of this range are comparatively simple the formation consisting of dark shales of the Colorado and sand stones of the Laramie group of the Cretaceous, all more or less metamorphosed, the action of trachytic dykes and intrusive sheets changing the shales to slate and the sandstone to quartzite.

These strata have a general dip to the east-north-east but are greatly disturbed locally.

Old Baldy is the center of this eruptive area. The top of the peak exposing the center of a great trachytic dyke, the debris of which covers the north and western slopes while slate, or shale formation, appears on the eastern slope extending nearly to the top of the mountain. These slates contain numerous fossil *Ostrea* and *Inoceramus* characteristic of the Colorado series.

Great dykes of trachyte extend from Baldy south and south-east as far as Clear Creek Mountain and the Rayado, and to the north as far as Costilla Peak, and north-north-east crossing the eastern portion of Ponil Park and extending to the head of the Cerrososo canon. Numerous dykes also extend to the north-west and west, a few of which cross Moreno Valley and reach nearly to the top of the Taos Range, while numberless smaller dykes extend in all directions cutting through and displacing the original strata of the immediate Baldy Range.

The mineral occurrences are of two distinct classes, both evidently having a common origin:

First: True fissure veins having a general strike to the north-west and dipping to the north, north-east or east at an angle of 10° to 20° from the vertical, and,

SECOND: Contact or intrusive veins interbedded between the slate and trachyte, slate and quartzite, or quartzite and trachyte and also often between the bedding planes of the slate itself.

Ores are nearly all of a ferruginous character highly oxidized from the original sulphides on the surface and for a depth of from 200 to 400 feet but below that point considerable pyrites are found.

The vein filling or gangue in nearly all cases is of an eruptive character and often containing large quantities of clay from the decomposition of feldspars. While in veins entirely in slate the vein filling is partly eruptive and partly from the decomposition of the slates, often slightly calcarious.

The ore chutes are comparatively continuous and uniform in their auriferous character and one ton of ore from the same vein will run very nearly the same as another, but when it comes to hand samples it is evident that the distribution of gold is very irregular locally, one sample running up into the thousands of dollars to the ton and the next giving but a trace. In this respect these ores are very similar to the Gilpin County ores but differ again from the Cripple Creek occurrences where the rich bodies are followed by large areas of barren

A Z T E C M I N E.

This mine was discovered by Matt. Lynch and Tim Foley in the summer of 1868 and has been worked more or less continuously ever since having produced over One Million Dollars in gold up to date.

It is situate on the top of Aztec Ridge which extends due east from Old Baldy, is about one mile distant, and 2,000 feet lower than the top of the peak. The ore occurs in large intrusive or contact veins between a slate, or often shale foot-wall, and a hard close grained quartzite hanging wall. The strike of this contact is north 66° west and pitches to the north-east at an angle of 30° to 45° from vertical. This vein has a thickness of 15 to 30 feet and is accompanied by several small veins in the slate foot-wall. A well defined vertical fissure vein comes up through the slate, it passes through the contact vein and up through the quartzite hanging-wall to the surface, a distance of some 200 feet above the contact. This fissure vein is 2 to 4 feet between walls and probably was the original vent or chimney which brought up the auriferous materials and on striking the hard sandstone, now quartzite, hanging wall deposited the vein matter in intrusive sheets along the line of contact both above and below the point of intersection. This vertical vein has not been worked below the point where it intersects the contact vein but doubtless contains large deposits, or sands off other intrusive veins of ore at greater depths. The slate foot-wall of the Aztec shows a vertical section of over 500 feet, on the surface between the contact on the top of Aztec Ridge and the bed of Ute Creek to the south. These shales are evidently of the Colorado series, while the quartzite at the line of contact is the base of the Laramie. This 500 foot section shows a few mineral veins or feeders for the first 100 feet below the contact, but below that only dark shales are exposed with two small strata of clay, iron-stone nodules.

The Aztec has been worked to a depth of about 300 feet and for 1200 feet in length along the vein. There is a 600 feet of shafts and 1,000 feet of drifts with large areas of ground staked out. This

a 1600 foot gravity tram-way and a 40 stamp mill.

The ore bodies from 2 to 30 feet wide, give returns on the plates of \$4.00 to \$10.00 per ton and assays, from large samples, of \$10.00 to \$60.00 per ton, and from hand samples \$1.00 to \$10,000.00 per ton from ore of exactly the same appearance. The stamp mill saves from 25% to 50% of the gold on the plates, the balance going over with the tailings. At present some 15 men are at work taking out ore from a 15 foot vein, which gives returns of \$5.00 to \$6.00 per ton on the mill.

This vein has been opened on the surface for a length of 4,000 feet, extending the full length of the claim, and 1,000 feet east on the Ben Hur claim. The openings on the eastern end, some 2,500 feet from the old workings, disclose a vein 8 feet wide and giving mill returns of \$6.00 and \$8.00 per ton. The lower levels of the Aztec carry refractory ore containing considerable copper but these levels were abandoned several years ago on account of their non-free-milling characters, and are not now accessible.

One peculiarity of this mine is the presence in the ore bodies of an impure graphite occurring in the plates near the contact and evidently the result of great metamorphic action on a small seam of coal occurring in the base of the Laramie, or possibly this impure graphite might have been obtained from highly carboniferous shales.

It is very evident from the above that the surface croppings only of this great vein have been explored up to the present time. A cross-cut tunnel 1,000 feet long run into the ridge from Ute Creek would cut this mine at a depth of over 200 feet below any present workings and would not only develop entirely new ground but would greatly economize the handling of the ores already exploited.

BLACK HORSE GROUP

This is the next mine of importance in Ute Creek District after the Aztec. The claim is 4,500 feet long and includes two veins, parallel and some 90 feet apart. These veins extend along the top of Black Horse Ridge, or mountain, having a course of north 66° west

true fissure veins and show trachyte walls to a depth of 350 feet in the shaft and for 1700 feet in length in the main drift. This trachyte is evidently a large dyke as the southern slope of the mountain shows a vertical section of some 400 feet in thickness of stratified slate and limestone, while the northern slopes consist of a succession of intrusive trachytes between slates.

This mine has been developed by 3,000 feet of workings, has a 10 stamp mill and 1200 feet Gravity Tram-way. The ore bodies are 2 to 6 feet wide and give returns on the plates of \$6.00 to \$12.00 per ton, and assays of \$10.00 to \$100.00 per ton.; probably from 50% to 75% of the gold goes over with the tailings. No great area of ground has been stoped out on this mine but large ore reserves have been blocked out/^{and} all ready for immediate stoping when the question of treatment or transportation has been satisfactorily solved.

T H E P A R A G O N .

Is evidently the western continuation of the Black Horse vein; is a fissure in trachyte 2 to 4 feet between walls and carrying ore 25% to 50% higher grade than the Black Horse but in much smaller bodies. This mine has been developed by 400 feet of workings on the vein and the ore is being treated on the Aztec Mill.

T H E M O N T E Z U M A .

This mine is second in date of development and discovery on the Grant; it was discovered the same season as the Aztec and was a producer within a few months thereafter and has been worked on a small scale almost continuously ever since, having produced something over \$300,000.00 up to date; it is located on Montezuma Hill, really on the northern slope of Black Horse Mountain and is a true fissure vein nearly vertical and cuts through the hard black slate and two or three intrusive sheets of trachyte. The slate strata dip to the north-north-east at 10° to 30° from the horizontal, the intrusive trachyte following these bedding planes. Towards the west end of this

tilted up from the south and have a dip to the north of 30° or more from the horizontal. Small intrusive mineral veins occur on all the contacts between the slate and trachyte, but, in the Montezuma ground these veins are very small, less than one-half inch, as a rule, except in one case about 200 feet west of the east end of the claim where a 6 inch intrusive vein crosses the Montezuma fissure, carrying ore rich in gold and evidently is the western extension of one of the Rebel Chief contacts. The Montezuma vein is 3 to 6 feet between walls and carries a highly oxidized ferruginous ore running \$10.00 to \$20.00 on the stamp mill and as much more going over with the tailings. Development consists of 2,000 feet of drifts on the vein and 300 feet of shafts. 20 years ago this mine had a tram-way to Ute Creek and a 15 stamp mill in operation but for the last eight years the ore has been milled on an arastra, or at one of the stamp mills. The western half of this mine only has been worked to any considerable extent and that to only a depth of 200 feet, while the vein still contains large reserves of good ore.

T H E B U L L O F T H E W O O D S

is the western extension or continuation of the Montezuma and the character of the vertical vein is identical. The eastern half of this claim has been worked through some of the Montezuma ground and, in fact, the boundary line between the claims had been almost obliterated when I went on the ground to establish the boundary lines a few years ago. This claim, like the Montezuma, still contains large reserves of good ore, and like all the other claims in the camp, the question of successful treatment or cheap transportation is of vital importance.

T H E R E B E L C H I E F G R O U P

consists of six claims, covering an area of 4,500 feet long by 1200 feet wide and is situated on the north slope of Black-Horse Mountain, north-east of the Black Horse and East of the Montezuma. The formation is slate; in many places still a shale, probably of the upper or

thick and dipping to the north-north-east at an angle of about 30° from the Horizontal. At least two distinct veins have been exploted, one an 8 to 24 inch contact vein between slate and trachyte and carrying ferruginous ore running \$74.00 per ton in gold by the car lot, as several cars were recently shipped to the Denver smelters, but giving returns of only \$10.00 to \$20.00 per ton on the stamp mill. This intrusive vein continues north-west and crosses the Montezuma vertical vein as mentioned in the notes on that property.

A second vein cuts through the slate and trachyte and is evidently a fissure vein, in the slate it sends out many feeders and small parallel veins, the ore running \$5.00 to \$10.00 on the stamp mill and as much more going over with the tailings. Development consists of some 2,000 feet of drifts and several small shafts. This mine has a grinding mill with puddlers and settlers, having a capacity of 15 to 20 tons per day, but it has not been in operation for several years, the richer ore having been shipped out and the low grade ore treated on local stamp mills with the usual result of 50% to 75% of the gold being lost with the tailings.

A contract has been recently let to Messrs. McFarlane & Co., of Denver, for a ten stamp mill and concentrating tables to be erected at the site of the old Rebel Chief mill, the intention being to run these ores from the stamps through a 40 mesh screen, catching the coarser gold on the plates and concentrating the tailings, either for shipment or for treatment with the Cynide process.

OTHER MINES in the Ute Creek District are the Puzzler, Claude, Maid of Erin, Homestake, Monarch, Little Jessie, Little Monarch, Sweepstakes, and a few others; all of which have been developed to some extent and are small producers. Besides these there are many more small prospects carrying some ore but have not been sufficiently developed to determine their true value.

P O N I L D I S T R I C T .

lies to the north of Old Baldy and the Aztec Ridge and the rock formation is quite distinct from that of the Ute Creek District. American and French Henry Mountains are the prominent peaks of this district lying on the north side of South Ponil Creek. Both of these mountains are capped by hard conglomerate quartzite, having a thickness of 200 or 300 feet. The southern slope of French Henry Mountain exposes a section about 1,000 feet in thickness, the strata lying nearly horizontal, having a slight dip to the north-east, below the conglomerate capping appear hard highly metamorphosed slates and quartzites, the latter often conglomerate in the upper portion of the strata.

The highly metamorphosed character of the rocks and the lack of fossil remains renders it extremely difficult to determine the series to which these rocks belong but they are probably of the Laramie group. The uptilted Laramie sandstones on the top of Aztec Ridge have flattened out to the north and underlie French Henry Mountain in a nearly horizontal position. A number of small dykes of trachyte cut the north and north-east slopes of French Henry Mountain and extend nearly due north from American Mountain but no intrusive sheets are exposed, except three small but well defined intrusive, or contact mineral veins which underlie French Henry Mountain half way down its southern slope and are exposed for a distance of 2,000 feet along the mountain side.

T H E F R E N C H H E N R Y M I N E

is the oldest discovery in this district; it was discovered in 1869 and the ore has been worked on an arastra until about 5 years ago, since which time a 15 stamp mill has been erected in the South Ponil and an ariel tramway 2,700 feet long connects the mine, near the top of French Henry Mountain, with the mill.

The French Henry is a fissure vein, cutting through the sedimentary formation, having a width of 4 to 8 feet between nearly

vertical walls. The vein filling is of an eruptive character and consists of two grades of ore, one high grade ferruginous ore running from \$50.00 to \$25.00 per ton; the second consists of the whole of the vein filling which carries from \$5.00 to \$10.00 per ton. Development work consists of some 400 feet of drifts and 160 feet of shafts. About 5,00 tons of ore has been treated on the stamp mill, giving returns of \$5.00 to \$25.00 per ton, and a much greater amount has gone over with the tailings.

THE SMUGGLER MINE

is located on the small contact or intrusive veins on the south slope of French Henry Mountain. This claim, however, is located at right angles across the veins and hence includes but 300 feet in length along the apex of the same, a Maxwell Company extension covering 1500 feet of the veins running east from the Smugler.

A tunnel has been run a length of 300 feet on the lower vein showing a continuous streak of ore from 4 to 8 inches in thickness between a quartzite hanging and a hard slate foot-wall. The ore contains a large per cent of iron pyrites and considerable copper pyrites; these have been partly oxidized. Some 20 tons were mined and treated on a Huntington mill this fall giving returns of \$75.00 in gold per ton on the plates while a 500 pound sample shipped to Pueblo gave returns of \$180.00 per ton.

THE BLACK JOE

is a fissure vein lying to the south of the French Henry about 100 feet distant and parallel with it. Development consists of 500 feet of drifts on a vein 2 to 4 feet wide, containing a ferruginous ore running \$5.00 to \$10.00 per ton on the plates and assaying up to \$100.00 per ton.

THE GORRILLA MINE

parallels the French Henry on the north and lies about 500 feet to the north-east on the east slope of the mountain, is evidently a

by 200 feet of drifts and a 60 foot shaft showing a vein two to three feet wide and assaying from \$10.00 to \$200.00 per ton.

THE HARRY LYONS GROUP

consists of the American, Big Jim, Little Jim and Harry Lyons claims, is located on a sharp ridge running north-north-east from American Mountain and about 4,000 feet north-west of the French Henry Mountain.

The formation is evidently of the Laramie series consisting of shales and coarse, often conglomerate, sandstones, partly metamorphose. A small dyke of trachyte forms the core and apex of the ridge, tilting the strata up on the west side and giving it a dip to the east of 60° to 70° from the horizontal. The western slope consists of slates and shales of the lower Laramie and upper Colorado series. The veins occur along the contacts between slate and quartzite on the eastern slope of the ridge, evidently of an eruptive origin and from 4 to 8 feet in thickness, carrying numerous small seams of rich ferruginous ore while the whole vein filling is charged with mineral to some extent. Mill run tests of this ore give returns of \$50.00 to \$260.00 per ton, a large percentage of which is refractory.

Development consists of a 650 foot cross-cut tunnel and 600 feet of shafts; quite extensive ore bodies have been opened up but the mine has not been worked for the past five years, transportation and successful treatment of the ores is here, as elsewhere, the unsolved problem.

The Harry Bluff, Mount Vernon, Noonday, Eureka and Red, White & Blue are parallel veins located on the north slope of North Ridge about one mile due west of the Harry Lyons Group. These are all prospects developed by twenty to 60 foot shafts and drifts showing veins of from 1 to 4 feet in thickness of eruptive material, probably trachytic cutting through Colorado shales and intrusive sheets of trachyte. Assays from the Harry Bluff and Mount Vernon

W I L L O W C R E E K D I S T R I C T

covers the head waters of Willow Creek, located south-west of Old Baldy and on the eastern edge of the Moreno Valley drainage. This area is cut up by numerous dykes running south-westerly from Old Baldy and sending out numerous lateral spurs or dykes each of which forms the apex of a ridge and tilting up the original strata at all manner of angles and in different directions.

The greater portion of this area is evidently of the Middle Colorado or Niobrara series, as numerous impure limestones sandy shales and sandstones are exposed.

The mineral occurrences of this district are practically identical with those on the eastern slope and belong to the Baldy system of dykes.

The principal mines and prospects developed to some extent are

T H E L E G A L T E N D E R

an old discovery located on Legal Tender Hill in a bend of Willow Creek; is a contact vein between slate and trachyte some 6 to 10 feet wide between walls and an ore streak of 1 to 4 feet assaying from \$20.00 to several hundred dollars per ton in gold, some silver and a small percentage of lead.

The strike of this contact is nearly due north and south and has been traced by other claims for fully one mile extending from the south foot of Legal Tender hill north to Humbug Gulch; the dip is to the east at 10° from the vertical and the vein filling contains both eruptive and calcarious matter, including some carbonate of lead. Development work consists of 6 or 7 hundred feet of drifts on the vein, besides numerous old tunnels and other workings since caved in.

A large percentage of this ore is refractory and cannot be treated successfully on local mills.

T H E H I D D E N T R E A S U R E

extending north-west to the head of Grouse Gulch; the vein is from 2 to 24 inches wide, all a hard ferruginous quartz and occurring in a soft, decomposed trachyte, probably on immense intrusive sheet or overflow. The vein dips to the south-west at an angle of 30° to 45° from the horizontal. The ore gives assays of from \$60.00 to \$100.00 in gold per ton. About five tons of ore have been milled on an arastra giving returns of \$20.00 per ton not over 25% of its assay value.

Present developments consist of 300 feet of drifts and a shaft 110 feet deep. The vein is evidently a spur or feeder from a strong fissure vein not yet discovered but to which this spur will doubtless lead.

T H E A J A X

This is another recent discovery. The claim was originally located on a small fissure vein running nearly east and west and crossing the legal tender on the south-west side of Willow Creek, but an ore body was opened last summer occurring in a hard metamorphic rock, evidently an impure limestone of the Middle Colorado, underlaid by large strata of slate and capped by the trachyte overflow in which the Hidden Treasure occurs.

The extent of this impure limestone is of great area, several miles in fact, extending down Willow Creek and pitching up to the north-west at about 10° from the horizontal, but its mineral bearing area is quite limited as far as known. It has been opened by a tunnel 60 feet long and cutting the ledge about 25 feet deep, while the surface has been stripped for a width of not over 40 feet. Throughout this area the rock shows a small amount of iron pyrites and magnetic iron scattered through it, and also a great quantity of black and blueish black hornblend, doubtless derived from trachyte when the mineral was deposited. A small seam of highly oxidized ore 2 to 4 inches thick also occurs along the bedding plane of the limestone.

to the Black Horse and French Henry Mills giving returns of \$15.00 to \$20.00 per ton, and assaying \$40.00 per ton. In the immediate neighborhood of the above area opened, the surface is covered with debris which has not yet been removed, but at from 300 to 500 feet distant the impure limestone belt is again exposed but carries very little or no gold. The auriferous deposit seems to be confined to the proximity of the small fissure vein, doubtless the source from which the mineral came.

T H E M Y S T I C

is a prospect located about 500 feet below the top of Baldy and at the extreme head of the Willow Creek drainage. This claim is interesting not because of its mineral character but because it exposes an ancient vent of volcanic origin and the so-called vein matter consists of red and pink pumice stone and a dark gray ash which on exposure to the atmosphere slacks to a fine soot-like appearance. A tunnel about 100 feet long has been run into this material but was blocked with snow when I visited it so I had no opportunity of making an examination. The prospectors report some 40 feet of this ash mixed with pumice stone and the whole is cut off on the east side, evidently not far from the center of Baldy, by a hard wall, probably the great trachytic dyke.

The Victor, Indiana, Grandview, Specie Payment, North and East Pacific Grand Duchess, Faro Bank, Metropole, Aristocrat, Only Chance Ophir, Gold Dollar are all prospects of Willow Creek District developed by 50 to 100 feet of workings, and all showing well defined mineral veins of a promising character.

M O R E N O D I S T R I C T

This district includes all of the eastern drainage of the Moreno Creek, except Willow Creek district, but the principal mines which have been developed lie between Humbug Gulch on the

half of the valley, exposed in the extensive placer workings, consists of a slate, probably of the Colorado series, and higher up occur strata of impure limestone, sandstone, and shales. Numerous dykes cross the valley from east to west extending from Old Baldy toward the Taos Range. Many of these dykes have been eroded and covered by debris and glacial drift across the bottom of Moreno Valley, but two or three distinct dykes are to be seen, and a large strong one, with many parallel and lateral spurs, crosses the valley one mile below Elizabethtown, a smaller one just above the town, and another a mile or more up the valley.

Nearly all of the auriferous veins developed in this district are of an eruptive character. The Red Bandana Group, of six claims, lying between Humbug and Grouse Gulches, have been the most extensively exploited. These consist of

T H E R E D B A N D A N A

A trachyte dyke 50 or 60 feet wide cutting through the slate and extending in an easterly and westerly course. This dyke has numerous gold bearing veins from 2 to 6 feet wide and assaying from \$10.00 to \$100.00 per ton. This claim has been developed by a 120 foot shaft, 600 feet of cross-cut tunnel and 1,000 feet of drifts on the vein. Six men are now taking out from 10 to 12 tons per day, which is being run through a Huntington mill. This has been running for nearly six months and Mr. Lynch has not yet made a cleanup but the plates evidently show satisfactory results or some changes would have been made before this.

T H E E M P I R E

is a parallel vein, or possibly a spur from the Red Bandana carrying a highly ferruginous ore in a small eruptive vein.

THE MORENO & CENTENIAL

are located on one vein of an eruptive character and occurring in slate has an easterly and westerly strike parallel to the Red Baddana and about 900 feet distant to the south. The ore, similar to the Empire, is of a highly ferruginous character and occurs in a vein 8 feet wide and running \$20.00 to \$30.00 per ton. Development consists of a 120 foot shaft on the Moreno and 400 feet of drifts on the Centennial.

THE CALENA

is a vertical fissure vein carrying a small streak of galena ore one to four inches in thickness and assaying from \$100.00 to \$2,000 per ton. A recent shipment of 5 tons to Denver gave returns of \$124.85 cents per ton. Development consists of a shaft 65 feet deep and a 50 foot drift on the vein from the bottom of the shaft.

THE AMERICAN FLAG

completes this group, is located on the mountain side just north of Grouse Gulch and appears to be an intrusive vein between trachyte and slate. The vein carries 2 to 3 feet of highly oxidized ore and a small seam of galena. Development consists of two adits on the vein, one 250 feet and the other 80 feet. This group, like all the rest of our Mining Districts are badly in need of either successful treatment of the ores, or cheaper transportation to market.

The McGinty, North Star, Heart of the World, Iron Mask, Abraham Lincoln and Chester are all prospects which have been developed to the extent of 40 to several hundred feet, showing ore in quantities and of grade to justify further development.

IRON MOUNTAIN

This is the south-west spur of the mountain ridges which lie between Moreno Valley and Willow Creek. It slopes sharply to the south and west to Moreno Valley and is separated from the Moreno-

Annisetta Gulch. The top of Iron Mountain attains an altitude of about 1500 feet above the valley.

A vein of magnetic iron ore was discovered on this mountain over twenty years ago and up to date has been traced and opened on the surface a distance of 1500 feet, has two adits, one of 125 feet and the other 100 feet on the vein. The formation of the mountain is evidently of the Niobrara or middle Colorado series and the wall rocks and inter-stratifications between the layers of iron ore give a calcarious reaction with hydrochloric acid, its hardness is great and posder gritty, showing a large percentage of silica in its composition. The rock is evidently an impure limestone and was deposited in successive layers with the iron and has since been tilted up from the south, giving it a dip to the north of 35° to 45° from the horizontal. The strike of the vein is nearly due east and west, while the erosion of the western slope of the mountain gives the vein croppings a strike of north-west and south-east. The thickest strata of solid ore is 3 feet and the aggregate about 7 feet of clean, magnetic iron ore carrying from 60% to 70% of iron.

The lower portion of this vein carries free gold visable to the eye and assayed ore reported as giving \$16.00 and \$20.00+ to the ton. Other samples taken from across the whole ledge gave assays of \$7.00 to \$10.00 per ton in gold.

Whether worked for gold or for iron it is evidently a paying proposition and if all of its values can be economically obtained there can be no question as to the great value of this mine if once properly operated. The surface float from the vein can be traced to the north-west as far as Annisetta Gulch, a distance of some 3,00 feet from the lower tunnel, or a total distance of about one mile from its most easterly exposure, while the difference in elevation in that distance is fully 1,000 feet. The possibilities of this mine are certainly great, but, further development

With a very few exceptions the mode of occurrence of iron veins and deposits sustain the popular theory of either eruptive origin or that of segregation and replacement. But the occurrence of the Iron Mountain deposit, like a few others, as in the Penokie Range of Western Michigan, for example, can hardly be explained by either hypothesis.

The ore does not occur with eruptive rocks or even very highly metamorphosed rocks. Neither does it occur in lenticular masses, as far as yet determined.

The thickness of the several ore strata, and also of the interbedded limestone strata, appear to be uniform and continuous for a distance of 1500 feet on the surface, as far as at present exposed, and to a depth of 120 feet and 100 feet in on the deposit.

Future development of this vein may demonstrate an extensive and persistent replacement of the strata of purer limestones by iron ore, leaving the more silicious limestones as parting strata. But the present developments seem to indicate a sedimentary origin, similar to bog ore occurrences possibly, the ore having been magnetized during the later eruptive period.

THE WEST MORENO DISTRICT
or Hematite Camp.

This district lies on the west side of Moreno Valley on a south branch of West Moreno Creek some 5 miles north-west of Elizabeth town. This district has been organized and developed to its present extent within the past six months and I have had very little opportunity of examining it. Everything is 'porphery' 'syenite', or 'schist', according to the nomenclature of the prospectors, while Wheeler's map shows a large area of archeon rocks covering this district with a small band of carboniferous west and south-west of this region and trachytic rocks to the north-west.

The prevailing rocks are undoubtedly gneiss and mica-schist cut by strong veins of hard white quartz, while dykes and intrusions of Dioryte(?) extend from the Taso Range and a few small trachytic dykes reach across from Baldy.

In the south or south-western portion of the district occur small areas of highly metamorphosed slates and conglomerates.

The mineral occurrences are all in true fissure veins having a general strike to the west-north-west. The vein filling evidently of an eruptive character, often containing a high percentage of quartz. In other cases the wallrocks are of a hard, white quartz. The principal claims developed to a depth of over 20 feet are: THE GOLD BELLE which has a shaft 70 feet deep and 50 feet of drifts. The ore occurs in a hard, highly oxidized quartz containing some 'Hematite'. This class of ore is encountered in pockets or chutes from 6 inches to 2 feet in thickness and of unknown length, and usually from 4 to 6 feet in vertical thickness on the vein. These chutes are encountered at distances 10 to 15 feet apart and have a dip or strike upward to the west and downward to the east of about 30° from the horizontal. The vein also shows a white quartz averaging about 2 feet in thickness and extending the full depth of the shaft. The iron ore assays from \$50.00 to \$200.00 per ton, and the quartz is reported at about \$10.00 per ton.

THE IRON BIRD, The 'N.R.', the 'O.K.', the 'CHALLENGE' and the 'Kentucky' have each been developed to a depth of 20 to 30 feet and are all well defined fissure veins, carrying gold in varying quantities from fine pocket pieces showing native gold and running thousands of dollars to the ton to a mineralized quartz giving a few dollars only to the ton. The Yellow Jacket, Nashville and Black Jack are situated on the ridge between the west fork of Moreno and the south branch of the same called 'Hematite' Creek. These claims are located on a white quartz eruptive rock containing considerable magnetic iron and reported as assaying from \$4.00 to \$6.00 per ton. This particular rock seems to occur in a broad dyke 600 feet or more in width and has a general strike to the northwest maintaining its character for a mile or more.

T I N I T E

is a new discovery located on the north side of West Moreno about one mile above the mouth of the canon. It shows a 16 inch streak containing mica, magnetic iron and possibly tin. A yellow quartz also occurs some 20 feet in width and showing specks of tin ore. This vein has been traced to the north for about 3,000 feet and if it proves to carry tin in quantities of any commercial value it certainly has the appearance of being a strong, well defined, fissure vein and might prove of considerable value.

All that can be said of this district at present is, that the prospects are certainly favorable for ore bodies of great extent and continuite, whether they may prove of any very great thickness or not.

O T H E R D I S T R I C T S

All along the mountain range from Baldy to Costilla Peak small indications of mineral have been found at isolated places. Quartz containing gold, lead ores and copper ores have been found in small

To the south of Old Baldy, on the north and south slopes of South Baldy Mountain, in the Cimarron Canon and up Clear Creek nearly to Clear Creek Mountain some little prospecting has been done and a few veins of eruptive material have been developed to some extent, but none as yet of high grade or workable character. On the head of the Cimarroncito about 10 miles south-southeast of Baldy some five claims have been located, the veins occurring in the contact between slate and quartzite; about 300 feet of development work has been done showing veins from 2 to 6 feet wide, carrying a heavy iron ore assaying \$10.00 to \$80.00 per ton, some silver, a little lead and a little copper. The indications are that this district may yet prove of no small value as a gold mining region.

Respectfully submitted,

C. E.

A P P E N D I X

to

R E P O R T

on

M A X W E L L G R A N T G O L D M I N I N G D I S T R I C T S ,

by

L. S. P R E S T O N ,

November, 1895.

Catalogue of Ore Samples

A Z T E C .

U T E C R E E L A M D P O N I L D I S T R I C T S .

Owners, Aztec Gold Mining and Milling Company, Jas. Lynch, Manager,
Elizabethtown, N.M.

- A. From Stamp Mill, average of 15 foot vein now being worked. Eruptive Character.
- B. From Stamp Mill, average of 6 foot vein in Ben Hur shaft near East end of Aztec claim. Eruptive character.
- C. From drift on Cochran level, 100 feet of East of Cochran shaft, 4 foot vein. Eruptive character, evidently trachytic.
- D. From slope 50 feet above "C" on same vein and 2 feet wide.
- E. From 2 foot vein 40 feet east of Cochran shaft. One pound of ore from same place "panned" 1 ounce of gold only a week before this sample was taken. A decomposed trachyte.
- F. From old workings 100 feet East of Cochran shaft, and 20 feet below the level. Metamorphosed coal and shale, or possibly a highly carboniferous shale.
- G. From Cochran Level 50 feet west of Cochran shaft from lower 3 feet of a 30 foot vein.
- H. From 20 foot refractory vein, 120 feet West of Cochran shaft and between vertical and big contact vein. Partly metamorphosed shale. Slightly calcareous.
- I. From hanging-wall of big contact vein 150 feet west of Cochran shaft. Contains impure graphite.
- J. From 4 foot vertical vein 200 feet, 300 feet and 400 feet West of Cochran shaft. Eruptive material.
- K. From contact vein 15 feet wide, now being worked 400 and 500 feet West of Cochran shaft. Slate, graphite and slightly calcareous.
- L. From 700 ft. West of Cochran shaft. Bluish mud from a 20 ft. vein. Slate, graphite and slightly calcareous. Contains native copper. A

M. Sample of tailings from Aztec Stamp Mill.

U T E C R E E K D I S T R I C T.

B l a c k H o r s e.

Owners, Four Creeks Mining Company, Ph. van Zuylen, Manager,
Cimarron, N.M.

- A. Hard oxidized quartz from 2 feet vein in 230 foot level. West of shaft.
- B. Hard, white quartz, some lead from main tunnel East of shaft, 18 inch vein.
- C. Oxidized quartz from 120 foot level, 2 foot vein.

M O N T E Z U M A

Owners, Montezuma Mining & Milling Company, M.W. Mather, Manager,
Cimarron, N.M.

- A. Highly ferruginous quartz, characteristic of the Montezuma and Bull-of-the-Woods veins.
- B. Hard, red and white quartz, from 2 foot vein on lower level.

R E B E L C H I E F.

Owners, Rebel Chief Gold Mining & Milling Company
Col. W.D. Cameron, Manager, Room 47 Benedict Building,
Broadway, New York

- A. From 6 to 24 inch contact vein
- B. From 1 foot fissure vein in slate.

V I C T O R, now called Little Monarch.

Owner, C. L. Barker, Aspen, Colorado.

- A. Quartz from 20 foot shaft; vein 6 to 18 inches. Also has an 80 foot drift.

G O L D C O I N.

Owner, Charles Cyphers, Baldy, New Mexico.

- A. Quartz from 12 inch vein at breast of 35 foot drift.

P O N I L D I S T R I C T.

F R E N C H H E N R Y

Owners, Montezuma Mining & Milling Company, M. W. Mather, Manager,
Cimarron, N.M.

- A. White quartz, containing some copper from 2 foot vein in drift 100 feet east of shaft

- C. Talc from 12 inch vein 20 feet west of shaft.
- D. Hard quartz from 50 feet west of shaft.
- E. Copper ore from 12 inch vein 100 feet west of shaft.

S M U G G L E R.

Owners, San Salvador Mining Company, Trinidad, Colorado.

- A. Oxodized ore, 100 feet from mouth of tunnel on 6 inch intrusive ore seam.
- B. Iron Pyrites 200 feet from mouth of tunnel, 3 inch vein.
- C. Iron and copper pyrites, 300 feet in, 4 inch vein.

B L A C K J O E.

San Salvador Mining Company, Trinidad, Colorado.

- A. Ferruginous ore from 2 foot vein in main drift.

G O R I L L A.

Owners, Gorilla Gold Mining & Milling Company, Leopold Biddle, Manager,
Raton, N. M.

- A. Ferruginous ore from 3 foot vein 100 feet in on drift.

F L Y I N G D U T C H M A N.

- A. From Upper Smuggler vein, 3 inches thick, lies horizontal.

H A R R Y L Y O N S.

Owners, Four Creeks Mining Company, Ph. van Zuylen, Manager,
Cimarron, N.M.

- A. Hard oxodized eruptive quartz, characteristic of this group.

H A R R Y B L U F F.

Owner, Harry Lyons, Elizabethtown, N. M.

- A. Oxodized, eruptive ore from 60 foot shaft.

N O O N D A Y.

- A. Oxodized quartz from 20 foot shaft, also carries metamorphose and mineralized shales.

W I L L O W C R E E K D I S T R I C T.

L E G A L T E N D E R.

Owner, John Williams, Elizabethtown, N. M.

- A. Calcareous ore containing some carbonate of lead, from 18 inch vein in slope.
- B. Sample across 3 foot vein in 300 foot tunnel.

H I D D E N T R E A S U R E.

Owners, Rand, Head and Matkins, Elizabethtown, N.M.

- A. Characteristic quartz from 6 and 2 1/4 inch vein in drift connecting with working shaft.

A J A X.

Owner, J. A. Wolcott, Elizabethtown, N.M.

- A. "Rock" from impure limestone ledge.
- B. Soft oxidized ore from eruptive vein.
- C. Soft oxidized ore from intrusive vein between limestone strata.

I N D I A N A.

Owner, Henry Shearer, Elizabethtown, N.M.

- A. Sample from 2 1/4 inch vein at bottom of 85 foot shaft.

M Y S T I C.

Owners, Fergason--Stone, et al. Baldy, N.M.

- A. Brownish-black volcanic ash, and trachytic rock occurring with the ash in a 5 foot vein.
- B. Pale pink "pumice" or scoriaceous trachytes of different density, occurring in bands some 10 feet wide and associated with the ash.
- C. Bright Pink)
- D. Red Brown,) ("Pumice, occurring with B.
- E. Trachytic rocks containing gold.
- F. " " " "

Have had no opportunity to examine the Mystic, and can give no satisfactory description of the order of its occurrences.

M O R E N O D I S T R I C T.

R E D B A N D A N A G R O U P O F S I X C L A I M S.

R E D B A N D A N A.

Owner, James Lynch, Elizabethtown, N.M.

- A. From 4 foot vein in breast of working tunnel 1,000 feet in and about 200 feet west of shaft.
- B. Average sample of ore as it goes into Huntington Mill.
- C. From 120 foot shaft.
- D. Average sample from ore bin.
- E. Tailings from Huntington Mill.

E M P I R E.

- A. A hard red ore)
(- from 2 foot vein in 200 foot drift.
- B. Soft ore)

M O R E N O.

- A.)
(- from 4 foot vein in 100 foot shaft.
- B.)

C E N T E N N I A L.

- A.)
(- from 18 inch to 30 inch vein in 350 foot drift.
- B.)

G A L E N A.

- A. Galena, from 1 inch to 4 inch vein in 65 foot shaft.
- B. Oxodized ore from 50 foot drift 200 feet north-east of shaft.

A M E R I C A N F L A G.

- A. Red and white quartz from 18 inch vein in upper level, 250 feet.
- B. " " " " " 12 " " " " " 80 feet.

N O R T H S T A R.

Owners, Harry Masure, et al., Elizabethtown, N.M.

- A. Oxodized ore from 24 inch vein in 70 foot drift, contains 7% or 8% of platinum.

W E S T M O R E N O D I S T R I C T.

G O L D B E L L E.

Owners, Chas. Dold, Kansas City, Missouri.

- C. From 24 inch clay gouge in drift 30 feet west from bottom of shaft.

I R O N B I R D.

Owners, Gibson and Fitzgerald, Elizabethtown, N.M.

- A. 3 inch seam of white quartz with specular iron.
B. 24 inch vein of hard white quartz, from 20 foot shaft.

N. R.

Owners, Chas. Dold, Kansas City, Missouri.

- A. 12 inch seam of quartz containing iron and manganese ore.

O. K.

Owners, King -- Burns, et al, Elizabethtown, N.M.

- A. 6 inch vein of blue and white clay with broken quartz; all showing some free gold.
B. 12 inch vein of hard, white quartz.

K E N T U C K Y.

Owners, Bowman and Gysin, Elizabethtown, N.M.

- A. 2 foot vein of quartz in 15 foot shaft.

C H A L L E N G E.

Owners, A. W. Christian, Elizabethtown, N.M.

- A. From 12 inch vein in 20 foot shaft.

Y E L L O W J A C K E T.

Owners, Garner Brothers and Kemper, Elizabethtown, N.M.

- A. From 20 inch vein of oxidized quartz in 25 foot drift.
B. White quartz containing "Menatite" from vein 600 feet wide and one mile or more in length, including Nashville and Black Jack claims and much vacant ground.

L A B O R E X C H A N G E.

Owners, Foster and Clauson, Raton, New Mexico.

- A. From 12 foot shaft containing 12 inch vein.

T I N I T E.

- A. 16 inch vein of white quartz, specular iron, mica and probably cassiterite.
B. 20 foot vein of yellow quartz containing primes of cassiterite and specular iron. This vein has been traced for 3,000 feet on the surface.

Owner, J. Carrington, Elizabethtown, N.M.

R E D U C T I O N W O R K S

in the Baldy and Moreno Districts consist of 78 stamps, 2 Huntington Mills and one double circle arastra as follows:

AZTEC MILL is of the Gilpin County pattern, forty 650 pound stamps, 14 inch drop, 28 drops per minute, and using 40 mesh screens.

The plant is operated by a new 40 H.P. Automatic cut-off engine of Stearns & Rogers make and 60 H.P. Boiler. A small electric plant has also been installed and is used for lighting the mill, office and residence buildings. A small saw-mill is also connected with this plant.

The usual amalgamated copper plates are the only provisions made for catching the gold. Room has been provided in the new building for concentrating tables but they have not yet been placed.

BLACK HORSE MILL is also of the Gilpin County pattern, ten 650 pound stamps 14 inch drop, 28 drops per minute and 40 mesh screens. A Gilpin County Bumping Table or Concentrator is also in use.

The power is supplied by an old style side-crank, 25 H.P. engine of the Erie Works, and 40 H.P. Boiler. A saw-mill with a capacity of 5,000 feet per day is also connected with the plant.

The cams have recently been changed on this mill to the California quick drop, 8 inch drop, 80 drops per minute.

FRENCH HENRY MILL is of the Gates & Scoville quick drop pattern, fifteen 550 pound stamps, 8 inch drop, eighty per minute, has 20 H.P. engine and 30 H.P. boiler.

THE GORILLA MILL, located on South Ponil Creek half a mile above the French Henry Mill, is a 3 stamp home-made affair but very useful as a prospecting plant. The stamps are 900 pounds weight, have 8 inch drop and are intended to run at 90 drops per minute but are being run at about 30 per minute.

The power is supplied by a 36 inch home-made Pelton wheel with a one inch nozzle on a 10 inch pipe and 60 foot head.

THE SAN SALVADOR MILL, connected by aerial tramway with the Black Joe and located between the French Henry and Gorilla Mills.

oxidized ores but of course the plates save only the coarser free gold same as the stamp mills.

THE REBEL CHIEF MILL. The new mill for this plant, furnished by McFarlane & Company, of Denver, was unloaded at Springer December 2nd, '95, and consists of ten 750 pound stamps, 8 inch drop, 80 per minute, 40 mesh screens and 2 Gilpin County Bumping tables.

The intention is to put in a cyanide plant and increase the mill to 20 stamps as soon as the development of the Rebel Camp Mine, or custom work, demands it, the buildings now erected having sufficient space for 20 stamps, tables and cyanide process.

Power is furnished by a 40 H.P. Porter Company engine and boiler, some 15 years old but still in good condition.

THE RED BANDANA MILL, located in Moreno District, is a 6 foot Huntington run by a steam plant and handles 12 to 15 tons of soft ore in 24 hours.

Chas. Rand's Arastra, located in Black Horse Gulch, is no insignificant affair. It has two 8 foot circles driven by a 32 foot, over-shot, water wheel and grinds out four tons of soft ore every 24 hours, runs night and day for eight months of the year without any attention whatever., except once a day to draw off the slimes and add a new charge of ore.

T R A N S P O R T A T I O N .

Baldy Post office the center of Ute Creek and Ponil Districts is 40 miles distant from the Santa Fe Railroad west from Springer or Maxwell City, and 18 miles west of Cimarron. Elizabethtown, the center of Willow and East and West Moreno Districts, is 50 miles west of the railroad and 28 miles from Cimarron.

The present rates are \$8.00 per ton for freight from Springer up to either camp and \$6.00 per ton for ore on the return trip. The railroad rate from Springer to Denver or Pueblo is \$6.00 to \$8.00 per ton, depending on the grade of ore, making an average of \$15.00 per ton for freight alone. Smelter charges average about \$5.00 per ton and extracting the ores and packing to the nearest wagon road will average \$3.00 per ton. for the large bodies of low grade ore, and \$10.00 to \$15.00 per ton for

getting these ores to market from \$23.00 to \$35.00 per ton.

\$3,000.00 expended on improvements of the wagon road up the canon between Cimarron and Elizabethtown and up Ute Creek to Baldy, would reduce the freight rates to about \$5.00 to Springer, or \$3.00 to Cimarron.

The gradient of Cimarron Canon, as determined by the Rock Island survey of 1887, and checked by the Maxwell City and Taos Valley survey of 1893, from Cimarron to Moreno Valley, a distance of 22 miles, does not exceed 2 per cent. The maximum of the Maxwell and Taos Valley being 1.85 per cent. The gradient from head of Cimarron Canon to Elizabethtown does not exceed 1%.

The gradient, however, from Cimarron Canon up Ute Creek to Baldy Post Office is over 300 feet per mile, or 6%, but the first four miles of this line can be covered on a 4% grade.

A wagon haul, however, even to Cimarron, if reasonable railroad rates could be secured from there, would insure the working of large bodies of low grade ores already opened up but now practically valueless.