

The Mining World

Jan. 19, 1907 p.75-76

Ballarat.

Ballarat is receiving quite a stimulus due to the Skidoo and Greenwater excitements. Prospectors are coming into the field and new finds are being reported. Lying on the north and west side is the Argus range of considerable extent; on the south and east the Panamint range of early fame. Old properties in the Panamint are now about to be reopened.

The World Beater, a gold property, about 8 miles from Ballarat in Pleasant canyon, is equipped with a 10-stamp mill and cyanide plant. The Radcliff has stamps and cyanide plant. Both of these properties have paid handsomely, plating an average of \$27 for a number of years. The veins lie in Syenite and vary from 4 to over 40 feet. Besides these properties there are others that have recently changed hands. The Trojan company of Seattle, has bought and bonded a number of copper, gold and silver properties in both the Panamint and Argus ranges. A smelter and town site have been laid out and the smelter is expected to blow in some time before summer.

The old Panamint and Modoc mines are again to be opened and last week pay ore has been found on the Miuretta. The small veins of the Argus range offers fine opportunities, the veins invariably being rich; the porphyry dikes formerly overlooked are large, numerous and gold bearing, being an ideal rock for coarse crushing and cyaniding. The values ranging from \$4 upward. The Arondo mine is of this class. It has a milling capacity of 80 tons, dry rolling and direct cyaniding.

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Bishop.

An era of great mining activity is apparent in Inyo county. This part of California lying east of the Sierras is in a topographical, geological and mineralogical sense, a part of the great west-Nevada bonanza region, that section which is now attracting the attention of the world. Inyo is one of the most important counties of California, leading all others in the production of lead and soda.

Extending the entire length of the county are mountain ranges literally ribbed with mineral awaiting development. A notable instance of what mineral wealth may be obtained from a single claim is illustrated by the Cerro Gordo silver mine in this county, which though only worked to a depth of 700 feet, yielded \$17,000,000. It is about to be reopened and worked on a more extensive scale than ever before. And this is only one of scores of gold, silver, copper and lead showings with indications which justify expectation of possibilities almost if not equally great, and which have been lying dormant for years.

The Black Canyon Gold Mining company is actively engaged in exploiting its property in the White mountains, about 10 miles southeast of Bishop. The work so far done has been confined to following the vein. The directors of the company are A. S. Kilpatrick, president; M. T. Stovell, secretary and treasurer; Frank V. Drake, attorney; Dr. G. P. Doyle and William L. Smith, all of Bishop. Frank V. Drake is in charge of operations.

Big Pine.

John Selsbury of Tonopah, accompanied by J. E. Borden of the Gail Borden Milk company,

New York, recently passed through Big Pine enroute to Saline valley. A personal examination is being made of the rich Ubehebe copper district and it is reported that the copper properties held by Salisbury in this district are to be transferred to eastern people, the deal involving ultimately over \$5,000,000. Development work on these properties has been in progress for several months and large bodies of native copper, bornite and chalcopyrite have been opened up.

The Mairs property in the same district consisting of 7 claims is under bond to Haywards and Pugh of Goldfield. The first payment has been made and the work being done on this property by these people has shown large bodies of very high-grade copper oxides carrying as high as 30 per cent copper, \$34 gold and 14 ounces silver per ton.

W. H. Snider and F. E. Rockwell returned to Chrysoopolis to resume work on their gold properties in that district. The severe storms of a month past have seriously interfered with development work in this section.

Outside parties represented by Walter P. Jenny have made the first payment on the McAfee copper property located on the west side of Eureka valley, 22 miles east of Big Pine. Large bodies of high-grade copper ore are already blocked out and every miner that Supt. Eva can hire is being put to work at the mine. At a depth of 147 feet the lower tunnel cuts the ledge which shows values of over 6 per cent copper for 50 feet across. The same people have bonded and made a first payment on the famous old Brinker Hill lead mine which several years ago was shipping some very high-grade ore of which not a single carload lot went less than 72 per cent lead. Six thousand tons of lower-grade carbonate ores are in sight. A scarcity of good miners is retarding work in this district.

P. L. Oddie and Capt. Rose of Tonopah are perfecting arrangements for the expenditure of \$25,000 in development on a property recently bonded from Black and Lockrie at Chrysoopolis, 15 miles southeast of Big Pine. The surface in this district shows high values in gold, copper and silver. It is not unusual to get assays of 5 to 20 ounces in gold to the ton.

Walter P. Jenny has returned to Big Pine from Tonopah to push development on properties of companies he represents.

Ballarat.

Development is being performed on the copper properties in the Argus range west and north of this camp belonging to U. S. Senator Nixon and associates of Nevada and a fine showing of copper ore is the result. Examination of the Argus range goes to prove the existence of a very large copper zone or belt extending for many miles. Development on the Trogan company's copper and silver properties, as also that on Williams and McNaughton's, is proving highly satisfactory.

About 16 miles south of Ballarat in Goler and Coyote canyons are the several properties of Judge Gorseline and Messrs. Pilson, Lamberson, Gray and Thurman. All are gold propositions with the veins large and strong and high-grade in character. Gray and Thurman are preparing to ship their ores a distance of 75 miles to the Red Dog mill at Johannesburg. The Desert King, owned by Los Angeles parties, and the Gold Crown, with owners at Salt Lake, are to renew operations at once. Both propositions are equipped with stamp mills and cyanide plants.

On the Anthony property in Pleasant canyon, a body of high-grade ore has been encountered in development.

Owens valley, Inyo county, runs parallel with the Nevada state line. It is bounded on the east by the White mountains and on the west by the Sierra Nevadas and both ranges are seamed with gold, silver, and copper-bearing ledges. The western slope of the White mountains fringing Owens valley is thronged with prospectors and many promising prospects are being developed which indicate the existence of great free-gold mines and especially is this true of the Southern Belle group, the Dunlop group and the splendid showing on the Black Canyon Gold Mining company's claims.

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The Golden Argus, owned largely by Tonopah, Nev. mining men, is located in Snows canyon in close proximity to the famous Minietta property. Active operations recently begun under the superintendency of J. Cress were suspended because of nearby excitements in Nevada. The main shaft is down to a depth of nearly 200 feet. The ore veins are of good size and high-grade free-milling to water level where sulphides are found and values increase.

Mr. J. Slide has disposed of his valuable mining interests in this locality to Tonopah capitalists who will proceed with development at once.

Ballarat is some 70 miles from Johannesburg, the terminal of a branch of the Santa Fe running from Kramer on the Mojave desert. It is reached daily by O. E. Chesebrough's stage line from Johannesburg and from Ballarat daily stages run to the old and once wonderful Darwin silver producing district and from there stages run daily to and from Keeler, the terminal of the Nevada & California railroad, which runs the length of the Owens river valley, crosses the northern end of the White mountain range and connects with the Tonopah & Goldfield railroad at Mina. Calloway's stages make tri-weekly trips each way between Ballarat and Skidoo, at north end of the Panamint range. The postoffice name of Skidoo is Horeck.

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Crescent.

The Gold King Mining company, composed of leading business men of South Omaha, Neb., own 3 important and promising groups of claims, 1 being situated near Lucky Dutchman properties, 1 near the Lone Tiger and the other adjoining the Nippons mine. Development under efficient management is in progress.

The strike of specimen ore made by Supt. Sherrer on the property of the Ohio mining company has caused considerable excitement in the Crescent district. Investigations of the reported strike have proven that the ores of the Crescent district are rich with free gold above the water level; while at depth they invariably turn into sulphides. Many rich pieces have been taken from the vein exposed in the workings, and five assays ran \$28, \$372, \$4,530, \$781 and \$66.40 in gold with silver values running from 9 to 22 ounces per ton. The formation is a diorite, porphyry and schist or altered granite; values appearing in the contact of these formations. There are 2 vein systems, a north-south and east-west, the intersections of the veins forming the contacts wherein the best values are usually found. A majority of the ores are semi-refractory and susceptible to the cyanide treatment.

Crescent is very fortunate for a Nevada camp in the matter of transportation. The Salt Lake system has a station at Nipton, Cal., 5 miles distant on a down grade, while the Santa Fe system which is rapidly building into Searchlight, will have a station on the east of the Crescent mills. The cost of transportation of ores has been placed at a minimum to the Salt Lake smelters at 85 cents per ton, while on the Santa Fe, the rate from Ivanpough to the Needles smelter is \$1 per ton. Water for milling and domestic purposes has been developed in quantities sufficient for a camp of 10,000 inhabitants, and the building of an electric light and power plant is now contemplated by Los Angeles capitalists.

The Golden Crescent company is confining the present development work to running the adit tunnel on the vein that crops prominently on the north side of the Crescent hills. The adit is now in 225 feet and the vein is gradually showing increase in values and size. The management has done over 500 feet of work along the vein and has opened up good milling ore in several places for over 1,000 feet. Supt. A. J. Waddleton states that he is gradually getting into the ore shoot. This mine has been working continuously for the past 2 years.

The Red Star group, consisting of the 3 claims situated 2 miles south of Crescent, has been purchased by Samuel McMillen and associates of Goldfield. An immense outcrop of mineralized quartz, several hundred feet in width, can be followed along the Red Star claim for a distance of 2,000 feet and from careful sampling the assays show that the bulk carries values in gold and silver. On the hanging wall of this gigantic fissure there is a mixture of quartz and porphyry that pans good gold.

A carload of hoists for different mines in Crescent arrived at Nipton, Cal., several days ago. The Crescent-Searchlight, Superior-Nevada, Wathena, Golden-Crescent and Oro-Nevada all have machinery about to be installed.

Five parallel veins are traceable on the Calavada property that are from 12 to 400 feet in width. The ore is similar to that found on the Tiger and Nippeno mines and assays on the surface show values up to \$36 in gold.

The Superior-Nevada is developing its King Solomon mine under the management of G. W. Huntington and has 10 feet of ore exposed running from \$8.20 to \$23. The management is about to install the machinery necessary to sink to water level. The shaft is all in ore at a depth of 135 feet, and the presence of galena at this depth gives every indication of a deep seated deposit. Supt. Jas. Sword has started another shaft on the property several hundred feet north of the present shaft for water. The main shaft has attained a depth of 165 feet and is rapidly approaching the 200-foot mark.

Supt. M. H. McClure is working 2 shifts of miners on the estate of the Monte Cristo. A crosscut tunnel is in 35 feet and the management expects to intersect the vein at a distance of 110 feet. The country rock is porphyry and the values occur in the granite and porphyry contacts.

The Searchlight Gold Extracting company is sinking a shaft on the Jumbo group, with the intention of going straight down to water level. On the Santa Rita claim the vein has been prospected and stripped for a distance of over 100 feet. The vein is 5 feet in width and the values on a check assay average \$13 in gold across the fissure. The veins have an east-west trend and form a contact of diorite and porphyry. The mineral is a silicious quartz carrying hematite and copper.

Sinking is being accomplished on the Wathena mine of the Ajax Bullfrog company under the management of Supt. Geo. Straub of Denver. The shaft is being sunk on the vein which dips at an angle of 45 degrees.

The Ohio Mining company, operating south of Crescent, has one of the best prospects in the Crescent district. Supt. Sherrer has been working on the property for the past 2 years and has done upwards of 300 feet of work alone.

The Pride of the West group of 6 claims has been purchased by the Nevada-Crescent Mines company of Denver. General Manager Stanich has been developing this property for the past year. Assays from the vein clear across for 3 feet average 2 ounces in gold and 7 ounces in silver. A 15-h.p. gasoline hoist has been ordered to sink to water level.

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On the Quaker City group, P. G. Toberg has a force of men sinking a shaft and prospecting the surface. A big lead was encountered recently while doing the annual work and further developments still show greater values.

G. N. White and associates are doing extensive development work on the Comstock group of 7 claims. The Excelsior group, adjoining the Double Standard of 2 claims, Florence group, on Calico hill of 3 claims and the Crescent Giant group south of Crescent. An immense lead of iron-stained quartz can be traced for 2,000 feet on the Comstock group, from which assays have been taken as high as \$56 in gold, silver and galena.

Systematic development work is progressing on the Oro-Nevada under the supervision of Geo. H. Morrison. This property has opened up 3 feet of rich ore and the management has been doing considerable work on this lead to ascertain the extent and value of this find. A shaft is being sunk on the vein.

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Los Angeles.

The Globe Metals Extraction company is planning to erect a customs and demonstration plant in this city, using the Motter automatic ore furnace and system of treatment. The president of the company is Johnstone Jones, and the secretary, W. H. Motter.

Two or three plans for the erection of smelting plants at Los Angeles are under way. E. H. Wedikind is investigating the situation for a syndicate of Nevada capitalists.

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Crescent.

Three shifts of men are busily engaged in sinking the main shaft to the 300 ft. level on the Big Tiger mine. Since water was encountered in the shaft, buckets have been used in keeping the workings clear, but it appears now that pumps will have to be installed in the near future.

Extensive development work is being carried on by C. M. White on the Floradora group, adjoining the Double Standard, Homestake and Florence claims extensions on the Wyoming, Nevada, and on the Yaqui mine, where the recent strike was made. On the Homestake an immense lead traverses the property, north and south, from which assays can be had in gold and silver from the surface.

Supt. R. W. Moore is developing three properties within the district with good success. On the Lida, some fine looking copper ore has been encountered, that assays 12 per cent in copper and fair values in gold and silver. The showing on the Belle of Granite claim is commendable for the amount of development done.

Supt. A. J. Waddleton of the Golden Crescent Mining Company is preparing for active development on the Happy Year group, situated south of the Boulder mine. A double compartment vertical shaft is to be sunk to the water level and hoisting machinery capable of development to great depth will be installed.

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The Ajax Bullfrog has let a contract to R. H. B. Warburton for sinking its present 160-ft. shaft to the water level. The contract also calls for station at each 100 ft. and levels to be run on the ore body. There is at present 3 ft. of good shipping ore opened up which gives promise of developing into a large ore body.

Another good strike has been made in the Crescent district 4 miles from the town of Crescent. This new find was made by Frank Tur-

sick while exploring the Merrimac. The vein is traceable for 3,000 ft. on the surface, 2,000 ft. showing an average value of \$17 per ton.

Through the payment of \$5,000, which is believed to be 10 per cent of the purchase price, Isaac Stevens of New Salem, Ind., becomes half owner in a group of five claims at Crescent. The purchase was made from Supt. T. F. Gibbons of the Crescent Peak Gold Mining Company. The five claims are located on the north side of Crescent Peak.

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Twenty-two miles to the southwest of Needles is a section coming into prominence because of many new gold discoveries. The general formation is granite and porphyry dikes with the ledges cutting through the granite, and are from 2 ft. to 30 ft. in width with all the rock more or less mineralized, free milling, carrying values of from \$1 to \$10 per ton, select samples assaying up into the hundreds of dollars. H. E. and F. M. Woods and the firm of Bennett & Myers of Los Angeles are quite largely interested, the latter firm having located, and taken over from prospectors about 50 claims. They, under the superintendency of H. M. Phinney, have 10 men at work. A townsite has been platted and a good wagon road constructed to the camp. The altitude is about 2,000 ft. above that of Needles. An automobile line is to be established between Needles and Gold Bend townsite.

The 10 claims of the Copper Basin Mining Company are located 45 miles south of Needles in the Whipple mining district and about 5 miles from the new Arizona & California Railroad, building from Wickenburg, Ariz., to Amboy, Cal., on the Santa Fe system. The general formation for many miles around is porphyry, limestone and granite, the ledges 3 to 20 ft. in width and the ore a porphyritic quartz carrying values in gold, copper and silver, being a concentrating proposition. In the ledge is a 5-ft. vein of sulphide ore with values of 7.12 to 14 per cent copper, \$4 gold and a few ounces of silver. Development consists of a 150-ft. crosscut tunnel with 60 ft. drift, a 30 and an 80-ft. shaft with several shafts varying from 10 to 30 ft. and all in good ore. The main office of the company is at Los Angeles and the officers and directors are: General E. Bouton, president; George W. Stockwell, vice president; W. W. Fisher, secretary and treasurer; F. M. Drennan, F. Marshall; J. L. Curtis, manager.

The 10 claims of the Colorado River Gold and

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Needles.

The construction and putting into successful operation of the copper and lead smelting plant of the Arizona-Mexican Mining and Smelting Company at Needles has caused this locality to become a supply point for numerous surrounding mining districts and a central location for the receiving of ores for treatment. This plant has a capacity of 100 tons daily and is constantly busy. By April 1 it is expected that a second 20-ton furnace will be in operation. Dr. L. D. Godshall is manager.

In connection with the Needles smelter mention may be made that its construction undoubtedly led to the purchase and putting into operation of the once well-known Copper World mining proposition some 15 miles from Ivanpah, the terminal of a branch of the Santa Fe system in San Bernardino county, a locality known as the Vanderbilt mining district. This property, consisting of 180 acres, has been taken over by Dr. L. D. Godshall, manager of the Arizona-Mexican Mining and Smelting Company, and Messrs. Ripley, Wells and other officials of the Santa Fe system and are developing the same, having in use eight freight teams hauling ore to Ivanpah station. The average value of this ore is from 6 to 15 per cent copper. Many important improvements at the mines are in contemplation.

Needles is the headquarters of the Orange Blossom Mining and Milling Company, whose property consists of 11 claims located 77 miles westerly from Needles and 14 miles from Bagdad station on the Santa Fe railway. In this section of California are many promising gold and copper mining propositions, several of which have been developed into paying mines. The ledges of the Orange Blossom group are large and well defined, the ore carrying values in copper, gold and silver ranging from a total of \$7 to \$200 per ton, the copper down to nearly 200 feet being principally oxides and carbonates. Present development extends to a 210-ft. shaft with drifting each way from the two levels. The company contemplates the piping of water a distance of 6 miles from springs at the base of Old Dad mountain and the erection of a 10-stamp mill. Fifteen men are at present employed with W. J. Coaplin, secretary of the company, as manager. The other officials are John Denair, Needles, president; J. A. Hodgman and C. L. Williams, both of San Diego, Cal., vice-president and treasurer, respectively.

Copper Company are located about 4 miles from Mt. Whipple, San Bernardino county. The ores carry gold and copper values. The outcroppings are immense, being 150 ft. in height and about 100 ft. across on apex of ledge. By the use of a gasoline hoist a shaft is being sunk to reach sulphide ores. General E. Bouton is president of the company; F. M. Drennan, secretary.

The Mt. Whipple Gold and Copper Company with headquarters at Los Angeles owns in the Whipple mining district a group of 12 claims. The ledges are from 2 to 10 ft. in width and the ore is a lime and spar quartz carrying average values by assay of \$42.13 to the ton in copper, gold and silver. A 70-ft. drift tunnel, a 40 and three 30-ft. shafts, all in good ore, comprise the extent of the workings, although development is being vigorously pushed. Capt. J. L. Curtis is president; General E. Bouton, vice president; F. C. Austin, secretary and treasurer; J. G. Haley and F. F. F. Griffith, directors.

Among the most promising mining propositions in the Whipple mining district is the group of 7 claims owned by the Alton Mining Company, a strong organization with headquarters at Alton, Ill. The ledge matter is a porphyry and granite contact and the 3 ft. of ore, copper sulphide. Several ledges course in regular trend through the property. Five hundred and forty pounds of ore from the bottom of the 65-ft. shaft, tested at the smelter at Needles, gave return values of 11 per cent copper and \$4 gold to the ton. H. Hamilton, Alton, Ill., is president, and E. Forbes, St. Louis, secretary.

Lone Pine.

The property of the Key Note Mine and Milling Company is located on the eastern slope of the Sierra Nevada mountains and the company has recently let a contract for building a wagon road to the property. It also has negotiated for the installation of a milling plant within the next few months. The developments and improvements of this company have produced considerable activity in this section and prospectors and mine operators are making efforts to secure good locations. The Key Note property has been a great producer and owing to primitive methods of transportation were unable to make profitable shipments. The company's property has been opened up by over 3,500 ft. of tunneling and an excellent showing by mill tests made, the same running from \$23 to \$300 to the ton. Recent development has opened up thousands of tons of very valuable ore, there being upon the dump over 20,000 tons. The property is now owned by Los Angeles and Chicago people, O. S. Williams of the former place being president.

This section is known as the Beveridge mining district at an elevation of 7,500 ft. and approximately 12 miles due east from Lone Pine on the Carson & Colorado railroad. Veins in this district usually have a north and south course with a westerly dip into the Sierra Nevada mountains, the ledges being from 2 to 6 ft. in width and the ore a quartz, brittle and friable, and largely oxidized. Pyritic iron and sulphides of copper appear in many localities. There are many thousand tons of fine first-class free-milling ore of a plate value of over \$8 per ton in gold already mined and awaiting milling facilities for treatment.

Bishop.

Inyo county during 1907 is likely to come before the public much more prominently than ever before. Many prominent mining men of Salt Lake, Tonopah, Goldfield and the far east have made visits to nearly every portion since the first of the year. One of the attractive features of this portion of the county is the presence of lead values in the ores.

The Bishop Creek Gold Company owns on the eastern slope of Sierra Nevada mountains a group of 13 claims, three mill sites and 160 acres of placer ground. Also 6 miles of water rights on the middle fork of Bishop creek. The lowest elevation at the mines is 8,500 ft. and the ore body reaches from that to an elevation of 12,000 feet. The portion of the lode covered by the company's properties is from 1,800 to 2,000 ft. wide and at least 1,000 ft. is ore. The company's claims cover 7,500 ft. in length of this lode and all the width; the elevation from the lowest to the highest ranges nearly 2,000 feet. The surface indications are the same on all the claims. The ore carries values of \$5 to \$7 to the ton in gold.

Eight miles below the Bishop Creek Company's property the Nevada Power Company completed a power plant and is transmitting 2,000 h.p. 100 miles to Tonopah and Goldfield. Development up to the present time consists of open cuts and

four short tunnels. The last tunnel, in ore all the time, is designed to crosscut the lode to the hanging wall 450 ft. distant. James Gillilliam is president of the company, Gaylord Wilshire secretary and treasurer, A. A. Hassan consulting engineer and manager.

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Independence.

The group of five claims owned by the Pacific Gold Mining Company is located in the Kear sarge mining district on the eastern slope of the Sierra Nevadas and near to Independence. This district has long been noted for its high-grade gold and silver ores and aside from this there are immense bodies of comparatively low-grade ore in each claim of this company's property varying from \$10 and upwards to the ton. The trend of all the veins is northeast and southwest, traversing a granite, porphyry and diorite formation. Disintegrated and porphyritic quartz forms the ledge matter, which contains the gold values. The claims of the Pacific Gold Mining Company can be successfully worked by a tunnel which will cut at right angles many veins at a depth below the surface is from 500 to 1,000 feet. The mill site is from 1,200 to 2,000 feet from these claims, through which flows a stream of sufficient volume, which with its fall will furnish sufficient power for mining and milling purposes. The tunnel on the property is in 225 ft., 30 ft. being on high-grade ore or ore above \$40 in value. The officers and directors of the Pacific Gold Mining Company, with headquarters at Independence, Cal., are P. W. Forbes, president; J. Gunn, vice president and treasurer; M. H. Naylor, secretary.

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Nipton.

The group of 11 claims owned by the Nippeno Mining Company of Los Angeles are situated at an altitude of 5,000 ft. above sea level, on the western slope of Mt. Crossman and about 7 miles from Nipton station on the Salt Lake railway. The holdings comprise two groups and a millsite which cover 225 acres. The upper workings, which include several springs of water developed by tunnels, are at an elevation of 6,000 feet. The development consists of shafts, open cuts, tunnels and trenches. No. 1 shaft is 100 ft. in depth; No. 2, 94 ft., and No. 3, 330. From the different levels drifts have been run to an extent of several hundred feet. From shafts No. 1 and No. 2 and from the two drifts north and the two drifts south of shaft No. 3, 5,350 tons of ore was mined which with 1,875 tons of ore from the Cumberland lode claim an average value was had of \$30.99 to the ton in gold. The average value of the ore from the south drift of the 200 level of No. 3 shaft was \$37.08 to the ton. With regard to the Cumberland lode, the ledge with good values has been traced for a distance of 5,000 ft. and to depths of 50 feet. The office of the Nippeno Mining Company is at 339 H. W. Hellman building, Los Angeles.

Independence.

On the western slope of the Inyo mountains and about 6 miles from Citrus station on the Carson & Colorado railroad, the Inyo County Con. Copper Company owned until recently 12 full copper claims and 5 gold claims. Not long ago the New York & Inyo Copper Company took over 100 acres of the ground and will at once develop the same. The copper claims cover about 1 3/4 miles a well defined and traceable ledge being a lime and granite contact. Surface showings indicate the ore to be a carbonate and oxide, but there are silicious and some sulphide ores. Bodies of sulphide ores will be reached at greater depth. A tunnel is now in over 100 feet. Assays of ore from various points give values of 2 1/2 to 17 per cent copper, with \$1.50 to \$7.50 per ton gold and silver. F. S. Gordon, M. E., of Big

Pine, is consulting engineer for this company. The general character of the formation of the company's gold claims is lime and granite interspersed with dikes of quartzite and diorite. The main outcroppings are large masses of micaceous hematite of iron, in places solid for a width of 20 to 30 ft. and often to 200 and 300 feet. The iron capping and quartz in many tests

give values of \$5 to the ton. Five miles southwest of this property is the Green Monster copper mine; 14 miles north, the Montezuma, a producer of gold, silver, lead and copper. The Reward gold mine is about 8 miles south and the Yhebebe copper and gold belt, fast coming into prominence, about 15 to 20 miles southeast. The main office of the Inyo County Con. Copper Company is at 254-256 Wilcox building, Los Angeles. G. J. Lang, president; A. G. Lang, vice president; F. S. Gordon, consulting engineer; A. N. Francisco, secretary; T. G. Gordon, treasurer.

Big Pine.

The Montezuma Mining and Smelting Company, with headquarters at Pasadena and Los Angeles, owns on the western slope of Inyo mountain, which is the southern end of the White mountains, a group of 5 promising claims now under active development. The distance from Big Pine is about 9 miles directly across Owens River valley, and 1 1/2 miles from the Carson & Colorado railroad. The other land holdings comprise a millsite and 20 acres and a water claim of 20 acres. The ledges are about 30 ft. in width being a contact between lime and shale and the ore a carbonate of lead with values ranging from \$10 to \$75 to the ton in gold, silver, lead and some copper. Development consists of 4 tunnels of 2,000 ft. in all, with drifts and winzes disclosing large bodies of ore, 24 samples of which gave an average value by assay of \$27.50 to the ton. Improvements on the property are a mill of 100 tons capacity per day equipped with a Blake crusher, 50-h.p. boiler, 45-h.p. engine, Cornish rolls, etc. The company is preparing to drive at a certain point on the mountain a 1,400-ft. tunnel to tap the ledges of ore at 800 ft. below the apex. It is the intention of the company to very shortly begin the construction of a 50-ton smelting plant. The office of the company is at 254 Wilcox building, Los Angeles, and the officers and directors are: J. E. Nolan, Pasadena, president; F. S. Gordon, Big Pine, vice president and general manager; T. G. Gordon, Los Angeles, secretary and treasurer; Dr. Henry A. Wolf, New York, director; Louis Joseph, Big Pine, director.

Ten miles south of Big Pine and 4 miles from the Carson & Colorado railroad, is situated the property of the Buckeye Mining Company, an organization composed of Ohio people. During 1907 the property is to be put on a paying basis. The geological structure of the complete property is porphyry and basalt and the ore a mineralized porphyry with values of \$4 gold and free milling. The indications are that the whole 1,500 ft. of the Ophir claim is of the same character of ore which contains a certain amount of free-milling quartz and hematite of iron. The company proposes the installing of a 30-stamp mill with a capacity of 4 tons per stamp daily.

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Cadiz.

Near this point, a station on the Santa Fe Railroad, in San Bernardino county, the Cadiz Marble and Mining Company, a Los Angeles corporation, has acquired 800 acres of a marble quarry and there are a full score of different varieties and colors and of the very finest quality, red, blue, light, dark blue, all tints and shades. There is the black shell marble that bears on its surface beautiful and also highly polished the figures of many sea shells. It is stated that only along the banks of the Nile are some of these varieties to be found outside of Cadiz. The face of the marble at a point one mile north of the railroad covers a distance of about one-half mile of various thickness. One deposit, known as Black Mountain, covers a space of 340 acres and is a hill about 400 ft. in height. This deposit has been more or less developed with dynamite and the workings show remarkable soundness. The marble from both the principal locations are of the expensive varieties and similar to those imported from Belgium, Africa and Egypt. The late Dr. Stephen Bowers, when state geologist of California, made a thorough examination of all this section and reported very favorably on the extent and quality of the deposits to the company. The officers and directors are: C. S. Miles, president; D. H. Imler, vice-president; J. G. Williams, secretary; R. P. Smith, treasurer; J. F. Blakeslee, director; D. W. Blakeslee, director.

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San Bernardino.

The California Gem Mining Company is a San Bernardino corporation owning 54 claims in the Mojave desert, San Bernardino county, 100 miles north of San Bernardino and 15 miles from Hinckley Station on the Santa Fe railroad. Forty-nine of these claims are located in one group covering an opal-bearing belt, several hundred feet in width by about two miles in length. The formation consists of large, well-defined and alternate veins or beds of indurated clay and opal jasper, which lies in and along a heavy bed of light colored tufa. Fire opals of fine quality and tint, of various shades of color, are found in veinlets and nests imbedded in the indurated clay, which is of a blue grayish color, and opal glass and common opals of all shades occur in the light colored tufa. The matrix and fire opals are similar to the formation and stones of Australia and equal in hardness and tint. The opal jasper lies at rather a flat angle inclining slightly to the south, being apparently in two distinct veins, one being about 50 ft. above the other and varying from 6 to 50 or more feet in thickness and showing immense outcropping for about two miles in length. Evidences are sufficient to show conclusively the jasper veins are continuous. A prospect shaft 50 ft. in depth in the opal-bearing ground shows a marked improvement in the quality of the gems. At present the development work is being done on the end section of the almost horizontal vein of jasper on which an

open cut has been run into the hillside exposing a solid vein of jasper 6 to 15 ft. in thickness. The company will shortly procure machinery for sawing and polishing the stone. The main office of the company is at San Bernardino and its officers: H. S. Mourning, president; J. S. Moore, vice-president; John T. Reed, general manager; E. J. Gilbert, secretary and director; W. S. Boggs, treasurer; A. M. Ham, and Louis Deck, directors.

John T. Reed, general manager of the company, for many years has been conversant with the different mining sections of the Mojave desert, and recently with H. S. Mourning and J. S. Moore located about 9 miles from the Gem Mining Company's property, an area of many acres covering quarries of fullers earth said to be the most extensive in this country.

The location of the group of claims of the Taylor-Sullivan Mining Company are at 29 Palms in the Colorado desert, a part of which are in Riverside county, but the greater portion being in San Bernardino county, being in Queen Mountain and White Tank Pass—and contiguous to the Gold Park range. In the same range and within a radius of 10 miles there may be found 12 mines that are being run continuously with a force of from 2 to 10 men each. Among the most prominent are the Lost Horse with 10-stamp mill; the Queen with a 5-stamp mill; the Gold Park, working 18 men; the Hexie, Mayflower, El Dorado and the Porcupine. The ledges of the claims of the Taylor-Sullivan group are from 3 to 5 ft. in width in a formation of granite, quartzite, diorite, syenite and porphyry. The ore generally is a free milling proposition averaging \$35 in gold to the ton. At depth sulphides will obtain. Development is progressing under the superintendency of Mr. P. T. Sullivan, who has been mining in the desert for the past 12 years. The 140-ft. cross tunnel at about 15 ft. further in will tap the ledge at a depth of 150 feet. The officers of the company are R. H. Swinney, president; Phil J. Sullivan, vice-president and superintendent; Charles Test Taylor, secretary and treasurer; C. W. Roach and Mrs. Anna B. Mareau, directors.

The Gold Park Con. Mining Company's properties, $1\frac{1}{2}$ miles south of the Taylor-Sullivan, are being worked with a force of 18 men and the 10-stamp mill is producing gold bullion daily. Forty samples of the ore of this property gave an average value of \$37.27 in gold. The office of this company is in the Union Trust Building, Los Angeles.

MISCELLANEOUS CAMPS.

Greenwater.—Great activity is being manifested in and around this district. Two railroads are vying with each other in an endeavor to obtain entrance to the camp ahead of one another. The Schwab operators, those representing the Butte capitalists, Patsy Clark of the Furnace Creek Copper Company, and the Greenwater Furnace Creek Copper Company, are all pushing work vigorously. The latter company has secured the services of John Richey, formerly superintendent of the Tonopah Mining Company at Tonopah, and he has already assumed the direction of affairs on the company's property. Three shafts are developing the vein and the tunnel has already attained a distance into ledge matter of some 200 feet.

The Mining World

April 27, 1907 p. 543

Independence.

Skidoo is enjoying a period of great activity, the population of the camp at the present time numbering 1,000. A number of transfers of mining properties have been made recently and active development of the properties has been started.

Sixty men are employed by the Skidoo Company and as development work permits, additional men will be employed. A prospecting tunnel, 1,800 ft. in length, is under headway, of which 300 ft. is complete. This tunnel will tap the main veins at a depth of about 500 feet. Several shafts are being sunk, one of which is down about 300 feet. The surface showings on this vein are exceptionally good, croppings for 600 ft. showing an average of \$30 per ton in free gold. There are several other companies working a number of men in and around Skidoo and the showings are excellent. The Granite Company, under the management of A. V. Carpenter and John Sellers, is operating the Granite Contacts group consisting of seven claims. Upon No. 5 the vein is exposed upon the surface 600 ft. and in places is 40 ft. wide, giving an average of \$6 per ton free gold.

Oaks and Simpson are working several men on the Sneakers group of 8 claims adjoining the Granite Contacts. A shaft is being sunk on one of the main leads and shows an average of \$58 per ton. S. K. Adams has organized a company to work the Three Lucky Swedes, the Three Germans, Kankakee and the Pearl mines. These claims join the Skidoo property.

Seibert and Gocher, owners of the Three Bars claims, are working a number of men at different places on their property. The main vein is from 4 to 5 ft. wide, giving an average value of \$66 per ton. This is a strong vein traceable for several hundred feet on the surface. Another vein 18 in. wide upon which considerable work has been done, shows better than \$100, and stringers, which are numerous on the same claims, give even higher values.

The Florence group, a silver and lead property, owned by Jack Hartigan, has a great showing. It is traceable on the surface for over 700 ft. and in places the vein is fully 50 ft. wide. Assays made from different places along the ledge shows values from \$5 to \$150. Mr. Hartigan is also interested in several other properties, one of which is the Queen group, lately incorporated. The veins on these claims are strong, well defined and values strictly gold. Several samples taken on minor veins show values as high as \$1000

in Eureka valley, is working from 20 to 30 men. This property consists of 42 claims, situated about 30 miles east of Bigpine and belongs to W. A. Sanger. Some very good lead prospects are being worked by the company and have developed beyond all expectation. The main property of the company, which is being worked, is a gold vein traversing the country, which is exposed for some distance, averaging 8 ft. in width and \$15 per ton in gold.

Brant.—The northeastern portion of San Bernardino county is one of the most promising mining sections of the state and important developments are under way. This section includes the northern end of the Providence mountains, the New York mountains and the entire country northward into the Greenwater copper district. Two and a half miles from Brant station on the Salt Lake railway the Garavanza Mining & Milling Company of Ann Arbor, Mich., owns 11 claims on which a 100-ton reduction plant has just been installed. In this plant is a Blake crusher, 3 revolving screens, 3 ore pulverizers and 2 automatic ore feeders, all furnished by the National Ore Pulverizer Company of Detroit, Mich. The gasoline engine is from the Western Gas Engine Company of Los Angeles and the two Standard concentrators from P. B. McCabe & Company, Los Angeles. There are two 25-h.p. engines to run the mill plant. The general geological formation in this locality is massive granite cut by dikes of genuine birdseye porphyry. The development on the Garavanza group amounts to over 1,000 ft. of tunnel work and several shafts, one to a depth of 120 feet. This shaft is to be sunk to a depth of 500 ft. unless heavy bodies of high grade ore are encountered. The largest tunnel is in 300 ft. giving a vertical depth below apex of 700 feet. There are four big parallel veins coursing through the property and anticipating the coming together of two of them the longest tunnel is being driven. The ores of the several leads are iron, lead and copper sulphides with values in gold and silver running from \$20 to \$100 to the ton, silver predominating. The several prominent mineral characteristics of this property are identical with those two great mines, Silver King and Silver Queen of Pinal county, Arizona. A force of about 20 men is now employed, which is to be increased as development progresses. The main office of the company is at 302 South State street, Ann Arbor, Mich. C. G. Darling is president; C. E. Godfrey, vice president; E. S. Gilmore, secretary; P. S. Bonfield, treasurer; Thomas Hapwood, director; Harry M. Bonfield, manager and superintendent.

Cima.—Near the great Copper World mine, San Bernardino county, Joe Le Cyr, formerly of Searchlight, Nevada, is working the old Vulcan mine on which is over 4,500 ft. of development, one tunnel in 300 ft., a 400-ft. shaft and two shafts of 100 ft. in depth each. The ore is a heavy sulphide of copper and about 50 tons per month is being shipped to the smelter at Needles. Near Ivanpah is situated the old Alley silver mine, a property that won fame as a producer in the early days from 1863 until 1883. A carload of ore shipped at the time the price of silver was \$1.18 netted over \$27,000 a ton. The Alley is said to be the richest silver mine in California and it is estimated that there is over \$130,000 worth of ore on the dumps averaging over 100 ounces to the ton. Messrs. A. W. Winberg and George E. Greening have lately completed the purchase of this property and propose to resume active operations at once.

Ironwood District.—The Blew But Copper Company, operating the Crescent group of mines

in the Ironwood district about 65 miles from Salton and 30 miles northwest of Ehrenberg on the Colorado river have begun active development. The ore is copper and carries gold and silver, samples of which show values from 11 per cent up in copper with good gold and silver values. The veins have great continuity on the surface and width varying from 6 ft. to 50 ft. They occur in mountains ranging from about 1,500 ft. to 3,000 ft. above the plain level. A carload of ore, 14½ tons, recently shipped to the El Paso smelter netted, after paying railroad freight of \$13 per ton, and smelter charges, \$1,382. The company is now engaged in hauling ore to the railroad for shipment, and will continue so to do with all teams available.

The Mining World

May 11, 1907 p. 606

Skidoo.

There is a marked progress shown in the development of prospects in the Wild Rose mining district. At a depth of 35 ft. on the Hoyt Bros. claims the ledge is 3 ft. wide. The ore of the entire ledge assays from \$40 to \$200 to the ton. The general formation of Skidoo is granite with a lime contact, bands of quartzite being intruded into the granite.

J. R. Warren of Denver, Colo., has taken an option on the 13 claims comprising the Monterey and Arctic groups. The surface shows outcropping ledges carrying good values in gold.

At a recent meeting of the miners connected with the Wild Rose Mining District Association, resolutions were adopted that all location notices, monumenting location work and recording must conform to the laws of the United States and be completed within 90 days. An arbitration committee was also appointed consisting of Messrs. Matt Hoveck, A. V. Carpenter, B. K. Stroud, J. C. Miller, Thos. McNulty, James Arnold, James Sweeney, James Glendonning, H. W. Thurman and J. C. Miller.

The Blue Jay Skidoo Mining Company, composed of S. C. Pierce, H. J. Drummond, Alonzo Church and E. S. Pierce of St. Louis, Mo.; J. R. Tapley, Colorado Springs, and William Clark of Pasadena, Cal., has lately taken over the Blue Jay and Fresh Beef claims from Ramsey and Halliday. The property is considered one of the most promising in the district with numerous 3 and 4 ft. ledges carrying values of \$75 to the ton in gold, and is to be actively worked.

The Gold Eagle or Skidoo strike was made in January, 1906, by John L. Ramsay and John A. Thompson, who in prospecting on Tin mountain near Emigrant Springs were practically lost. The second day of prospecting from Emigrant Springs gold was discovered on the Saddlerock now owned by Sherwood Aldrich of Colorado Springs. Ramsay and Thompson proceeded to locate about 30 claims.

When E. A. Montgomery and Matt Hoveck bought the Gold Eagle claims they took 217 samples from the outcroppings of ledge No. 2, a distance of 1,500 ft. and an average of \$43 to the ton in gold was obtained. Work was begun in November, 1906, and up to date over 1,600 ft. has been performed.

The locations of the Granite Contact Mines Company were made in March, 1906, by E. H. Goodpaster and taken over by the company in July, and at that time six ledges had been exposed and all mineral bearing. Two samples from ledge No. 4 give values as follows: No. 1, \$117.20 gold, \$1.95 silver; No. 2, \$94.40 gold, \$1.82 silver. At 50 ft. in sinking on the ledge of No. 5 claim, with few feet of crosscutting, there is 5 ft. of ore with assay values of \$4 to \$25 in gold. The company is negotiating for water with which to operate a mill. The headquarters of the company are at Rhyolite, Nev. John W. Seller is president; Clay Tallman, vice president; J. J.

Fagan, secretary; George V. Keenan, treasurer; A. V. Carpenter, director.

The Skidoo Contact Mining Company is a Rhyolite organization with O. O. Kincaid, president and treasurer; John W. Seller, vice president; E. T. Wayle, secretary. The company's 5 claims adjoin the Granite Contact ground. The ledge of the Doctor claim is well defined and strong with surface values in gold of \$200 to the ton.

The Skidoo Mines Company is a close corporation, capitalized at \$5,000,000. E. A. Montgomery, president; Capt. W. R. Wharton, vice president; Matt Hoveck, treasurer and general manager; Charles M. Schwab and A. L. Davis, additional directors. This company is installing an 8-in. pipe line from Telescope Peak to bring water for power and milling purposes, a distance of 18 miles. An 80-stamp mill is contemplated to be erected near the mouth of tunnel No. 2 and is to include concentrators and a cyaniding process. Tunnel No. 3 will be run 1,800 feet. The 200-ft. shaft is equipped with a 25-h.p. gasoline hoist and the double compartment shaft will be equipped with a 40-h.p. hoist now enroute. Fifty miners are employed.

Much of the development at Skidoo is by leasers whose contracts expire April 1, 1908. The size of each plat is 400 by 600 feet.

About 7 miles from Emigrant Springs is the Harrisburg camp, where in the summer of 1905 "Shorty" Harris and Pete Augunbury made important locations and afterward incorporated the Cashier Mining Company. The principal ledge on the Cashier claim is 70 ft. in width. A cross-cut tunnel driven 165 ft. penetrated 69 ft. of quartz, 25 ft. of talc, 30 ft. of lime and then cut 4 ft. of quartz carrying values of \$70 to \$100 gold to the ton.

Sandy McDonald, Voorhes & Taylor, Clements & Keene and other Rhyolite citizens own several of the old deserted silver mines near Harrisburg and get good values from the old workings and dumps. Years ago the silver ores of these properties were shipped overland over 300 miles to reduction plants and averaged good returns.

The Kimball stage line for passengers and mails makes daily trips between Rhyolite and Skidoo, the route being a climb of 4,000 ft. to Daylight Springs, an altitude of 4,000 feet. It is then a run of 16 miles to Stovepipe. Then an uphill pull of 28 miles to Skidoo which has an elevation of 6,000 ft. above sea level. The elevations are marked by iron posts established at frequent intervals by U. S. Geological Survey.

The district of Skidoo in the Panamint range has many characteristics indicating permanency, although it suffers under many natural handicaps, the lack of water, the poor transportation facilities and no smelting nor milling methods.

Among the promising prospects of the camp besides the Skidoo mine, are the Cocopah, owned by the same people, the entire property embracing 23 claims; the Saddle Rocks, owned by Sherwood Aldrich, Colorado Springs, and Russ Sutherland and Hector McKenzie of Rhyolite; the Lunar group, owned by the Southworth Bros and Ben Epstein; the Granite Contact, by J. J. Fagan, Clay Tallman and others of Rhyolite; the Skidoo Contact by John W. Seller, Al. V. Carpenter and others; the Skidoo Queen and many others.

The Mining World

May 25, 1907 p. 667-668

Crackerjack District.—Ex-Governor Mitchell of Idaho and Martin & Flaherty of Los Angeles, representing eastern purchasers, have taken over a group of nine claims in the Crackerjack district, Arawatz mountains, San Bernardino county, paying therefor the sum of \$150,000.

The Tecopa mine is located on the boundary line of San Bernardino and Inyo counties, 10 miles east of China ranch and the Tidewater & Tonopah railroad. This mine was extensively worked during the silver days, and with its decline work ceased. At present a force of 50 men is employed with most of the development progressing on the 700 and 800 levels. The big tunnel is in 1,400 ft. and connects with the 800 level of the shaft. H. G. McMahon, superintendent, recently stated: "We have just installed two new 40-h. p. hoists and now have three in operation. The 12-drill compressor is also in commission and the dozen drills are distributed throughout the underground workings. We have 600 tons of ore awaiting cars for shipment and regular shipments of 50 tons daily will be made."

Echo Lee District.—This district is in Inyo county and within its limits the Daddy Lee Gold Mining Company of Rhyolite owns a group of three claims and two fractions, located only 1,200 ft. from the Hayseed property. Prospecting and development shows the same three ledges that courses through the Hayseed, with surface values showing an average of \$14.60 to the ton in gold. The main office of the company is at Rhyolite, with Samuel Tracey, president; Wm. Parker, vice-president; F. B. Anderson, secretary and treasurer; Dr. W. J. Campbell, Rome, Mo., director.

June 1, 1907 p. 701

Cima.
Cima, located on the Salt Lake railroad, 254 miles east of Los Angeles, is rapidly becoming of importance as a distributing point for supplies for various copper camps to the north and west and to silver and gold producers now being developed in the northern portions of the New York mountains. These mountains are largely made up of granite and lime with extremely large porphyry dikes coursing through. The ledges trend northeasterly and southwesterly, being both fissure and contact with gold and silver values. The silver values in general predominate and under proper development have proven to be high-grade shipping ore with good bodies of a medium grade suitable to treat by amalgamation and concentration at the properties.

Three miles east of Cima and among the low foothills of the New York mountains the Death Valley Gold Mining Company of Denver is developing in a systematic manner the several ledges coursing through a group of 6 claims. These ledges, 4 to 6 ft. in width, are made up of a white quartz carrying cerargyrite and sternbergite of silver, a hematite of iron with light silver values and all more or less oxidized to a depth of 100 feet. The values may be estimated from the shipments of 300 tons of the low grade ore to Salt Lake, which gave a return average of \$50 to the ton, \$3.50 being gold. The high grade ore averages 300 ounces silver and \$16 gold to the ton. On the property is a 40-h.p. boiler, 25 h.p. double cylinder hoist, assay laboratory, office and other buildings. A 40-h.p. double cylinder hoist has been ordered from Denver. Twenty-five men are employed. The officers of the company are: B. N. Dawson, president; Benjamin Dawson, vice president; L. F. Dawson, secretary and treasury; C. F. Durell, superintendent.

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The 6 ledges coursing through the Death Valley Gold Mining and Milling Company's property extend to the southwest for several miles as no less than four companies, owning several claims each, are doing development. The Arcalvada with headquarters in the Mercantile building, Denver, owns in the district 20 claims, several of which are extensions of the Death Valley. One shaft is 75 ft. in depth and the other 165 feet. A Leyner air compressor has been ordered from Denver. Leopold Hastings is president; S. C. Johnson, Denver, secretary; Chas. A. Tarbel, general manager.

One other company doing development is that of the Greenwater Con. of Los Angeles. The claims are an extension of the Arcalvada. W. C. West of Los Angeles is president; S. Ward Martin, secretary and superintendent.

About 15 miles northerly from Cima and 11 miles across the valley from Leastalk is located the old Bullion mining district. The formation is a granite schist and lime with copper ore as a rule intruding into the lime. One mile east of the old Bullion mine W. T. Field and Charles L. Merrill of Leastalk own a group of six claims, through which courses a ledge of 30 ft. in width with an iron gossan capping. Values are about \$40 in copper and gold and a slight percentage of silver.

Three miles from the Standard copper mine in the Kessler and Ivanpah mountains, W. H. Orterson, a freighter between Cima and the mines and Cornelius and Carpenter, has located a group of five claims, from which at the bottom of a 90 ft. shaft ore is brought to the surface averaging 41 ounces silver and \$2 in gold to the ton.

June 1, 1907 p. 702

Leastalk.

The old New York mine on the eastern slope of the New York mountains has been purchased by N. P. and H. T. Sloan, who are largely interested in the Tecopa mine, another one of the old former producers of 25 and 30 years ago. The New York mine was worked by Mexicans over 30 years ago for gold, treating the ore by an arrastra. It was later bought by A. E. Blake of Denver, who built the railroad from Gaffs or Blakes on the Santa Fe to Manvel, five miles from the mine. Mr. Blake shipped, before his death, \$700,000 worth of ore. Over \$100,000 has been expended in the development of the property, seven tunnels having been run from 300 to 1,200 ft. and 12 shafts sunk from 50 to 200 feet. The ore exposed in the mine will run from \$20 to \$100 to the ton gold and silver. Shipments are to be commenced at once and a concentrating mill is to be built. J. M. Kennelly is superintendent.

On the western slope of the New York mountains is the mammoth property of the Giant Ledge Gold and Copper Company of Los Angeles. The giant fissure vein cutting through the granite is over 60 ft. between walls. The main crosscut tunnel, in over 700 ft., crossing the giant ledge, is being pushed to reach 820 ft., tapping a 15-ft. contact between granite and lime. This contact on surface shows to be over 30 ft. in width. In driving the long tunnel two new veins in the granite were encountered with gold and silver value—a concentrating proposition. The Hard Cash, in close proximity to and belonging to the Giant Ledge Company, has been developed to an extent of over 3,000 ft., there being one 800 ft. tunnel. The ledge 80 ft. in width is a lime smelting proposition with an 8-ft. quartz concentrating ore. The office of the company is 500 Frost building, Los Angeles. L. M. Gregory is president; Andrew Glassell vice president; H. S. Stoddard secretary; R. W. Kenney treasurer.

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The Mining World

June 1, 1907 p. 702

The Castle Peak range is a series of peaks trending northward from Manvel, Cal., to near the Crescent range in Nevada, and is about 6 miles southeast of Leastalk, where the Manvel branch of the Santa Fe crosses, going into the Ivanpah district. The ledges trending north-easterly are numerous and from 40 to 80 ft. in width, the ore a quartz porphyry and a silicate of copper with other characteristics such as chalcocopyrite, peacock and azurite.

The Virginia, a group of 15 claims, owned by Judge E. M. Ross of the U. S. Supreme Court; H. Lowenthal, manager Los Angeles Examiner, and George Noble Todd, all of Los Angeles, located on the northeastern slope of the range, has a ledge 40 ft. in width with a remarkable showing of values at grass roots. Development is by numerous open cuts, with one shaft 60 ft. and another 300 ft. away of nearly 60 ft. and a cross-cut of over 20 ft. at bottom of 60-ft. shaft. The average value of the ore so far as tested has been 10½ per cent copper, \$3.80 gold and 8 ounces silver to the ton. As is the case in the New York mountains, water exists at various points, a plentiful supply to be had only 1½ miles from the Virginia property.

The White Cross Gold Mining Company's property is located about 5 miles northeast of Leastalk in the foothills of the Castle Peak range.

Upon this property is considerable development performed under the management of Geo. Noble Todd, who disposed of the group to this company. The formation is a diorite and lime, with ledges of reddish quartz carrying values in gold, silver and lead. A gasoline hoist and other improvements have been ordered. The office of the company is at 402 Laughlin building, Los Angeles. Frank R. Woods, general manager.

Four miles from Leastalk Gus Williams and A. P. McCulloch own two very promising claims—developed by a 100-ft. tunnel with a backing of 100 ft. with values of \$10 gold, 10 per cent lead and 40 ozs. silver to the ton.

Marrs & Tabor of Leastalk own 4 groups, containing in all 15 claims, the formation of which in general is a lime, granite and schist, with the ore a contact covered with a capping of iron gossan. Coursing through the property are two well-defined ledges over 100 ft. in width and on which the development consists of two 100, one 60 and two 40-ft. shafts with a drift of 125 feet. Values are from 8 to 48 per cent copper with an \$8 to \$10 value in gold and silver.

About 11 miles from Leastalk in the Bullion district W. T. Field located 11 claims, two being for water, and all of them were taken over by the Desert Mining & Reduction Company. The formation of the district is largely lime with granite and porphyry. Values of the Elk group are \$22 gold, 31 ozs. silver and 27 per cent copper; of the Northern Belle \$18 gold, 14 ozs. silver, 18.18 per cent copper per ton. Headquarters of the company are at Leastalk; Arthur Woods, president; C. W. Braden, superintendent.

Three miles from Leastalk and directly at the base of the northern end of the New York mountains is situated the claims of the Leastalk Gold-Copper Company of Los Angeles. L. M. Gregory is president. Development consists of over 300 ft. by shafts and drifts upon a contact ledge between lime and schist. Assay values are 30 ozs. silver, 19 per cent copper, 27 per cent lead and \$2 gold to the ton.

About 7 miles from Leastalk is situated the old St. George mine, formerly owned by Mackay and Flood. The property, idle for several years, has development to the extent of over 4,000 ft. with a depth of 550 feet. The ledge, 15 feet in width, produces ore carrying values averaging \$33 to the ton in gold, silver, lead and pyrites of copper. On the property are two complete 10 stamp mills.

The old Vanderbilt mine, near the St. George, now known as the Big Five Mining Company's property, is under development with Mr. Taste of Los Angeles superintendent.

The Fortune group, two miles and a half from Leastalk, at the base of New York mountains, consists of four claims, the ore, a copper proposition, being found in a 100-ft. ledge between lime and granite with porphyry dikes cutting through a carbonate of copper turning to sulphides, with depth values \$47.90 to the ton. The Red Cross and Bay Horse group adjoining the Fortune are being prospected and developed by open cuts and shafts.

Three miles east of Leastalk, adjoining the St. George mine, lies the Oro Fino group of nine claims, in granite and porphyry, the property of George Noble Todd, and developed by shafts and open cuts. Values, \$40 to the ton in gold, galena and silver.

In close proximity is the Yellow Jacket group, with the ledge 40 ft. in width in a rhyolite formation, the ore free-milling at surface, with values of \$6 in gold. This property is about 4 miles from Manvel and is easily developed by tunnels as well as shafts.

Daggett.—Twenty-five miles northeast of this point, reached by good wagon road, H. Galleon of San Bernardino owns a group of claims giving under development promises of becoming a good producing property. The ledges, some 10 to 12 ft. in width, cut through mica schist surrounded by granite and porphyry. The ore is an oxidized iron quartz with values ranging up to \$25 in gold to the ton. Development is by shafts and drifts. On the property is a 5-stamp mill. L. A. Blackburn of San Bernardino, is superintendent of the mine and mill.

The Mining World

July 6, 1907 p. 33

Bishop.

Mining is very active in the northern part of Inyo county and the present season promises to be one of the best in the history of that section.

The Inyo Mines Syndicate is about to begin active operations on the Red Rose group, where very high grade values have already been found.

W. D. Clair has closed a deal for the Stone & Pendry claims in Sherwin district. He is most favorably impressed with the mineral features of that section, especially with the strength and permanence of the ledges, and intends pushing development on his purchase. From all accounts it is likely to prove a valuable property.

Los Angeles parties have purchased a group of silver-lead claims at Pine mountain and organized the Golden Gate Mining Co. Considerable ore is in sight which carries 55% lead and 20 ozs. silver and it is expected that the company will begin shipping within 60 days. The building of a mill is promised at an early date.

At the Climax group, Messrs. Brown and Hoskins are making excellent headway on their gravity tunnel contract, driving for the main ledge, where they expect to tap at a considerable depth a very favorable shoot of ore already exposed on the surface.

At the Pah-Ute Jumbo the Inyo Mines Syndicate has just awarded to M. H. Marshall a contract for further driving of the main development tunnel, which is showing marked improvement as progress is made into the mountain.

The great ore body recently encountered in tunnel No. 2 in the Black Canyon property is developing into a bonanza. The tunnel has been entirely in ore for 50 ft., with an unknown width of ore still ahead. Numerous assays show average values of from \$45 to \$56.

Some very flattering assays have been made from ore taken from the footwall of the Bullion shaft of the Southern Belle Mines Co. The ore was taken from a

depth of 225 ft., that level being as far down as the pay shoot is opened. From a streak which varies from a few inches to 2 ft. wide and lying on a footwall assays were taken showing values of from \$86.81 to up in the hundreds. The New Year shaft of the company is being opened up as fast as possible.

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On the Bishop Creek Gold Co.'s property Manager G. W. Wilkins has a large force of men doing preliminary work preparatory to beginning a season of active operation. A number of new buildings are being erected which include boarding houses, company and assay offices, power houses, etc. One shift of miners is employed in running an open cut to crosscut the ledge. Diamond drills are to be installed as soon as possible. Extensive tests are being made to decide on the best method of treating the ore, and when this is ascertained a plant will be erected.

Work has been started on the Ash Meadows system which is to supply water and power for mining and milling purposes. A 15,000,000-gal. reservoir will be built at the top of the Funeral range, and from it gravity lines will radiate to the different camps in that section. The enterprise is financed by a Pittsburg syndicate with a \$5,000,000 capitalization.

July 20, 1907 p. 116

MISCELLANEOUS CAMPS.

In the foothills of the western slope of the White mountains, the eastern boundary of Owens valley in Inyo county, are located 13 mining claims forming a group of claims owned by the Southern Belle Mines Co. of San Francisco. This property has been under active development for some time, having at the 250-ft. shaft of the New Year claim an electric hoist and an air compressor house. At the bottom of this shaft the ledge is 27 ft. in width. One thousand feet southeast is the Bullion shaft 400 ft. deep on a 20-ft. vein and the same is equipped with an electric hoist, exhaust fan and an air receiver and drill. This vein at the surface is 4 ft. in width, and with depth values increase ranging from \$5 up into the hundreds of dollars to the ton. There are seven other veins coursing through the various claims with numerous prospecting shafts varying from 20 ft. to one of 1,100 ft. on the Southern Belle where the ore body is 3 ft. in width at the bottom of the shaft, averaging in value by assay of \$20 in gold to the ton. The ore of the several ledges is a free-milling gold proposition and over \$300,000 in bullion was produced previous to the taking over of the property by the Southern Belle Mines Company. The main office of the company is in San Francisco and the board of directors are: A. E. VanderCook, E. M., president; William Roslington, San Francisco, vice president; W. J. Gleason, San Francisco, secretary; G. Gall, treasurer.

The Mining World

June 22, 1907 p. 790

San Bernardino.

In the "29 Palms" district, situated on the county line dividing Riverside and San Bernardino counties and being 60 miles distant from Banning, the general trend of the vein is from the northeast to the southwest, being really a part of the great lode that can be traced from the states of Colorado and Utah through Nevada and as far south as Mexico. The rock is igneous, with granite predominating, and great dikes of porphyry traceable for miles are found. Surface averages range anywhere from \$3.00 per ton as high as \$12 to \$15.

In the "29 Palms" district the altitude ranges from 2,700 to 4,500 feet. The climate is ideal and work can be carried along the year around. The water supply from the 29 Palms itself is plentiful while upon a number of properties wells have been sunk from 15 to 40 ft., all of which give forth bountifully.

There are 10 to 12 active camps at present and numbers of teams line the trail from Bagdad enroute from Goldfield while the western contingent from Los Angeles and Frisco are enroute via Banning. Among the active camps are the Gold Park with 18 men employed, and power drills now being installed. This group has been developed almost continuously the past two years and at the 200 level a 16-ft. ledge has been struck with values better than \$20 per ton.

One of the latest companies in the field is the Taylor-Sullivan Mining Company, composed principally of San Bernardino and Phoenix, Ariz., stockholders. The company's holdings consist of two groups of claims, the Desert Lilly and the Top Notch. On the first group is a 65-ft. shaft showing a 4-ft. ledge averaging over \$15 to the ton, and a tunnel 105 ft. long is being worked to tap the main ledge at 125 feet. On the Top Notch group two shafts have been started the past month, both of which are in values better than \$13.50 per ton. Besides the above the company owns 10 mill sites and a water location covering the 49 Palms canon.

Among the older properties being worked in the neighborhood are the Hoxie, Eldorado, Lost Horse, Queen, Mayflower and Sunflower.

The Whitewater district lying on the road to the 29 Palms district and only three miles from the Southern Pacific railway station of Whitewater is also coming to the front rapidly. A new Arizona corporation, the Whitewater-Mohawk Mining Company, recently organized, has started work on a group of seven claims and is sinking a shaft. Surface croppings averaged over \$3 per ton. The ore is free milling, with Whitewater river running at the foot of the properties and the Southern Pacific railway only three and a half miles distant.

June 29, 1907 p. 809

Death Valley Mariners.

Are mariners adrift on the desert of Death Valley, or is the "penny-a-line novelist" gathering material for a Lawsonian magazine article which will describe in glowing terms the possibilities of irrigating that sun-baked, supposedly rich mineral land? Judging by a press dispatch from Greenwater, the prospectors and resident scientists are "up in the air" in an effort to explain the phenomenon of a lime-like substance, high in moisture, which has proved a good substitute for natural water in quenching the thirst of animals. If the poor beasts continue their unique banquet much longer we fear their carcasses will become admirably suited for fertilizer, for if we mistake not they are feasting on nitrate of soda.

Some years ago the state mining bureau made an exhaustive examination of the saline deposits of California and reported the occurrence of nitrate of soda in quantity in the Death Valley districts. At the time Eastern capital was invested with the hope of developing the deposits in competition with Chile, which supplies the world, but so far no nitrate of soda from California has entered the consuming markets.

Wonder if the enterprise will be revived, now that prospectors in search of gold and copper have again "discovered" the nitrate of soda deposits? The time seems opportune for another boom in this industry—in working the deposits (if they are really large enough), not the stock market by floating heavily capitalized companies. The United States imported from Chile last year, duty free, 372,222 tons of nitrate of soda, valued at \$14,115,206, the record. Here is a chance to make a fortune.

June 29, 1907 p.

Cima.—Two more carloads of ore have been shipped to the American Smelting Company at Salt Lake City by the Death Valley Gold Mining and Milling Company. These cars are expected to result better than the last shipment of the company, which yielded net returns of nearly \$60 a ton. The main shaft of the Arcalvada Company is being sunk at the rate of 2 ft. a day by the company's new equipment of machinery and ore of a shipping quality is being taken out. The shaft is now 120 ft. down. The first level or station has been cut and drifting will be commenced. C. T. Durrell is manager of both properties.

The Mining World

Aug. 10, 1907 p. 244

White Mountain District.—J. C. McMillan and W. A. Carlin have arrived from Long Beach to arrange for the reopening of the once promising Eva Bell mine, which is located northerly and across the White mountain summit about 25 miles from Bishop. Those familiar with the claims have much confidence in its becoming a profitable producer. Water and timber are both in easy reach. The mine is reached by a trail over Piute canyon, but as it is but a few miles from the Bishop-Goldfield toll road, improvement of communication need not be very costly.

Superintendent Vandercook of the Southern Belle has lately returned from San Francisco where additional machinery was purchased. Work on the Bullion shaft is progressing rapidly. The pay streaks in the vein contain very high-grade ore.

Drifting on the veins of the Dunlop property has produced very satisfactory results, the orebodies showing good values considering the size of the vein. This property is controlled by Colonel Stovall.

The Bishop Creek Mining Co. is now working a large force. Work has been somewhat retarded by the heavy snow in the early spring, preventing the delivery of the stamps.

High water on Bishop creek destroyed the dam at the power site of the Nevada Power & Light Company. Work on plant No. 2 which is to transmit electric power to Bullfrog is progressing rapidly. It is expected that by October 1 the company can furnish the mines at Bullfrog all power needed in that district.

James W. Neill, M. E., whose headquarters are in Salt Lake City, recently visited the Black Canyon property, thoroughly investigating the general situation and sampling the exposed ore bodies. The ore to a large extent is identical with that at Tintic, Utah, where the orebodies are principally found in the line formation.

Tonopah and Goldfield people are exploring in the neighborhood of Bishop. The Casa Diablo rich finds have demonstrated that capital can find profitable investment in Mono and Inyo counties.

Aug. 24, 1907 p. 325

San Bernardino.—The Hecie mine is 25 miles from Indio and it is reported a ledge of \$25 ore 4 ft. in width has been encountered. A 5-stamp mill is in full operation treating this ore.

Big Pine.—A credited report is to the effect that the Mount Whitney Gold Mining Co. at Lone Pine has started up its 200-ton milling plant. A recent test run of 200 tons proves the mill to be in good condition after an enforced idleness of several months. Development consists of a 1,600-ft. tunnel which runs into the mountain 700 ft. below the apex. This tunnel has opened up some fine ore bodies containing in values from \$20 to \$27 to the ton in gold. An air shaft is being sunk and when this is finished it will be possible to handle about 1,000 tons of ore of values varying from \$5 to \$140 to the ton. In a second tunnel is rock with values of \$20 to the ton gold. The office of the company is 461 I. W. Hellman building, Los Angeles. Wilbur H. Dean, secretary.

Nov. 23, 1907 p. 941

The gem belt of southern California is about 130 miles in length by 30 in width and extends in a southeasterly and northerly direction across San Diego county. Its northwestern extension being into Riverside county and southeasterly it goes down into the desert portion of Baja California. It is only here and there that gem-bearing ledges are found. The first grade of tourmaline crystals is worth three or four times the weight in gold.

Several other varieties of gems mined in San Diego county are as valuable as the tourmaline.

The Mining World

Nov. 23, 1907 p. 941

At Crucero, the junction point of the Salt Lake and the Tonopah & Tidewater railroads, 45 miles east of Daggett, in San Bernardino county, the Pacific Reduction Co. will build a smelter plant, which when completed will be of two 100-ton lead stacks and one 700-ton copper stack. The company owns or has control of 300 acres of ground with ample switching privileges on the two roads. The survey for the smelter site has already been completed and within 90 days ground will be broken for the beginning of improvements. In connection with the smelting operations will be the building and operating of a Lowe system coke plant. The supply from this plant will be about 25 tons daily of the best grade of metallurgical coke, which will increase the capacity of the smelter to very nearly 500 tons daily. It will also furnish power sufficient to operate a 3,500-h. p. electric plant and in addition to all this there will be a residue of distillate in the form of gasoline sufficient to meet the needs of all the camps of the desert. Within a radius of 50 miles of Crucero, 500 tons of ore are shipped daily to Salt Lake. The company owns valuable mining properties 12 miles east of Silver Lake and also in the New York mountains.

Dec. 28, 1907 p. 1145

Yuma.

The Picacho and Eureka districts are about to become the scenes of much of that activity which made them rich and famous camps in years gone by. The Picacho people are dismantling their huge 1,400-ton mill by the river, and are transplanting the major portion of it to their present mill site, three miles inland on the California side. The old mill was the largest in the west. At the mines 23 men are employed.

Los Angeles.

The property of the Skidoo Mines Co. is situated on Truckee mountain, 45 miles southwest of Rhyolite, Nev., and 50 miles

Recent Developments at Furnace Creek Copper Mines.

BY FRANCIS C. NICHOLAS.

Economic Geologist and Mining Engineer.

During the active trading in mining stocks a few months ago, probably no greater interest was developed in any proposition than that which the public accorded to Furnace Creek copper. Now that the boom has collapsed, the extreme feeling is shown, with the result that the stock has gone down to 25c a share bid, whereas it was eagerly purchased at \$4 to \$5 a share a short time ago. The low bid for the stock is being made, not because the great surface exposures are less extensive, nor the



FRANCIS C. NICHOLAS.

at places very rich, and below a completely leached zone.

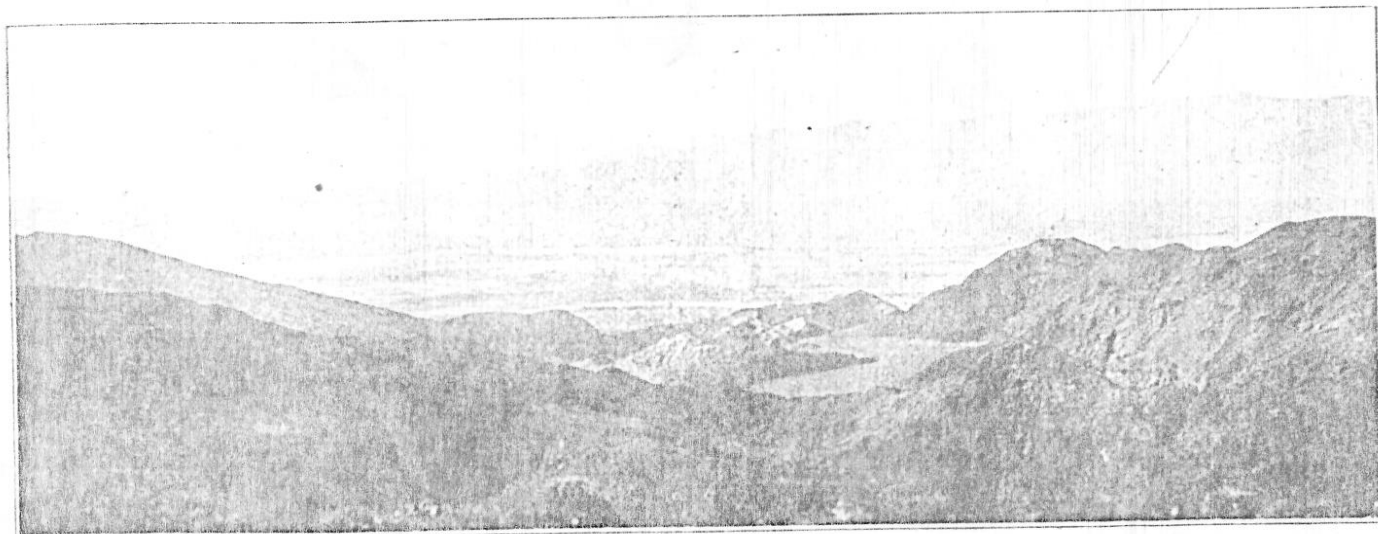
This seems a natural sequence, for how could water dissolve mineral out of a lower zone and not attack the upper portions of an ore deposit? Is it an anomaly, or is it the manifestation of a peculiar condition incident to this formation? Two explanations are possible; one is very unfavorable to the future of mining at Furnace Creek, and the other gives hope that the property will be as great as anticipated.

These questions have been suggested: (1) Has Furnace Creek an example of a vein formed and then locally enriched at the surface by lateral secretions? (2) Is there a vein which has been influenced by mineral bearing solutions from depth and afterwards leached of its mineral in levels below the surface by some process or physical action which attacked the

The ore bodies are not so found, for they are located in veins of porphyry with andesite dikes appearing as later eruptives and rhyolite flows on the surface, which apparently originated from the eastward, at places entirely covering the andesite dikes, granite and porphyry.

Had these flows developed the influences leading to surface mineralization the ore bodies would not be found confined to iron stained porphyry of older formation, but would be found among the limestone and along the drainage zones of easy access, and to some extent at least, as contacts between these later developments and the older rocks. But the ore is not so found; it is in the porphyry dikes, and would seem to have originated with them or during subsequent developments while the heated activities were subsiding and before the later outbreaks which caused the rhyolite flows.

Surface lavas and recent eruptions are not greatly productive of mineralizing influences, and it would seem that indications pointing to surface influences for local lateral enrichments are not pronounced in the Greenwater district. The



Panoramic View of Death Valley.

management less efficient, but because the zone of permanent sulphides is found not so near the surface as the engineers had thought. But at the 500-ft. level the ore deposits occur exactly as early indications had promised. The walls are strong, and although the characteristics of the vein material have not changed it is found to be leached of all values, due to the subsiding waters.

The scientific interest in the developments at Furnace Creek is mainly in the traces of atmospheric influences and the action of subterranean waters through various stages of subsidence in this most rainless region in the Furnace mountains and Death Valley.

For atmospheric influences to leave a record behind such as is seen on the properties of the Furnace Creek Copper Co. suggests circumstances and incidents of formation which must have been favorable to an unusual degree; otherwise there would not be a great upper oxidized zone, which is mineral bearing and

formation below while leaving the surface exposures free from its influences? The second problem seems impossible.

The Greenwater district in which the Furnace Creek mines are situated consists of intrusive formations which disturb granite and limestone, and at places rhyolite covers the intrusive rocks and portions of the granite exposures. If these intrusions have exerted the influences for mineralization, the ore bodies will be deep and not superficial, because intrusive rocks come up from the depths. If the ore bodies are to be considered superficial, however, we must look to the rhyolite flows and exposures for the source of the ore formations. Mineralization could hardly have come from the limestone, for it would have exerted a precipitating influence, and ore bodies if they originated from solutions formed by waters percolating among lava flows or among rocks containing copper would have developed ore bodies as replacements precipitated among the limestone.

indications suggest deeper mineralizing causes, but it must be explained how the lower levels of a formation could be leached of ore while the upper exposures are still mineral bearing.

Were surface waters and accumulations from rains the only waters which drained through the earth this condition—the greatest leaching at the surface—would invariably be the case. But exceptions are possible, and subterranean waters may have caused the leaching. It would seem that where the formation of an ore deposit is indicated to be of deep origin and uprising solutions, as are indicated at Furnace Creek, influences other than surface drainage might reasonably be considered as having caused the leaching some distance below the surface. Before accepting such a conclusion, however, we must consider what evidences there are to suggest mineralization by uprising solutions, rather than by local and lateral enrichments. For these evidences we must look beyond the limits of one mine

and examine the development of the ore deposits in general in this district.

The whole country is mineralized. The veins occur in porphyry dikes, together with quartz and barite with values in gold and copper—a typical vein formation due to uprising solutions. It is distinctly different from the surrounding rocks and has characteristics of its own. If this vein material, or the mineral

followed a period of seismic disturbances which shattered and fissured the rocks and formed the ore bodies. At a later period came the activities which may not have brought mineral, but which have exerted a segregating influence on the great mineral deposits, developing the veins within veins which have attracted attention.

Apparently the mineralization will ex-

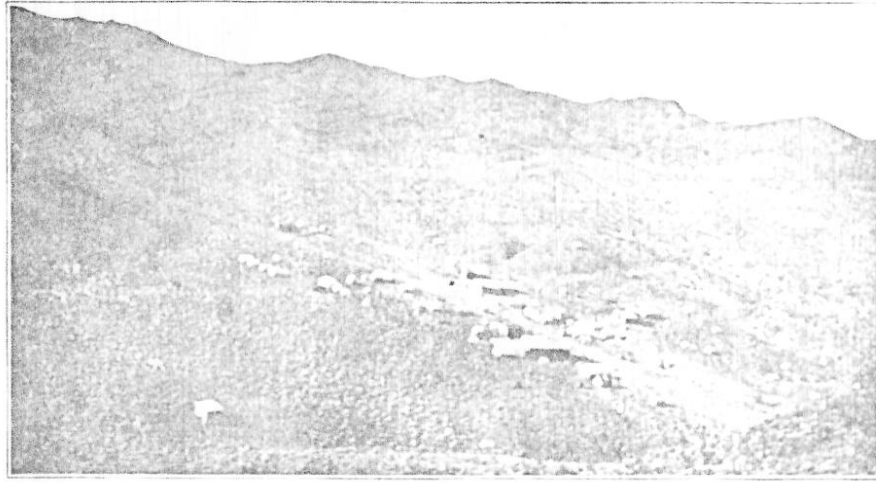
first the leaching process took place and had gotten only as far as the point of oxidation; then came the drying up of the rains spreading little by little to the surrounding country, till a great, almost rainless region was formed. The rains dried up, and the water levels retired much more slowly. Naturally, the springs continued for a considerable time and left water in the cracks and fissures of the rocks.

The portions of the ore bodies which were influenced by atmospheric waters rapidly became dry, but the subterranean waters still leached much more slowly.

Even at this late period water comes to the surface at isolated springs in the Greenwater district, but at widely distant places. In the course of time these springs will dry up with the sinking of the water levels of adjacent regions.

When this development began the water at and near the surface simply dried up, but the subsidence of the subterranean waters was slow and as it sank lower in the ore bodies at Furnace Creek, setting up a leaching process during the passing ages and carrying the mineral down with it, the water sometimes rising, sometimes falling, carrying up atmospheric moisture, affected with varying degree the surrounding country. Slowly with the lapse of centuries the welling up and subsiding of the waters within the earth, and in seeking with almost imperceptible progress lower and lower levels, these subterranean waters leached out the mineral and carried it down with them. The drier portions of the veins nearer the surface were not reached by this influence, hence we have the peculiarity at Furnace Creek of ore on the surface with leached measures underneath it.

As a natural inference we may believe

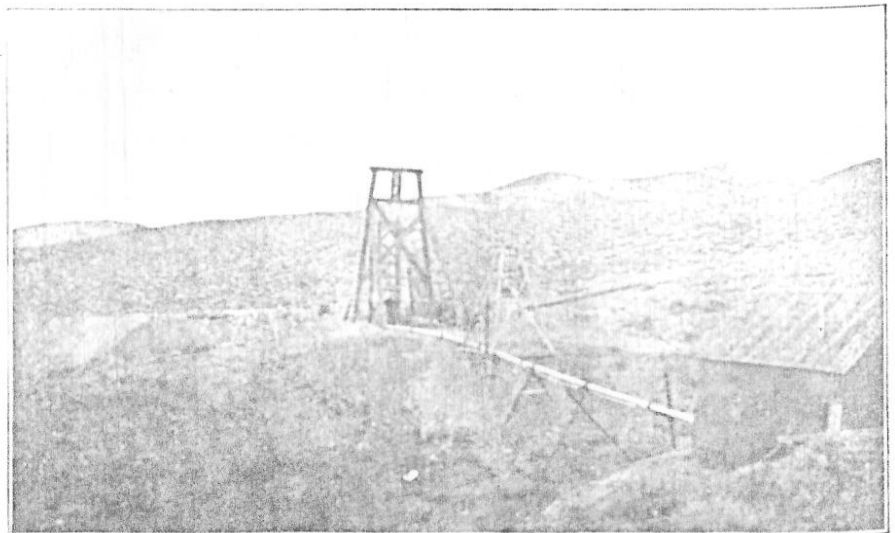


View of Greenwater District, California.

found in it, were derived from lateral seclusions, reaching as far only as the surface rhyolite flows penetrated, its composition would be largely of materials which would have been derived from rhyolite. Rhyolite is a highly silicious and acidic rock, solution from which will not deposit barite, though it would have attacked the alkaline limestone formations, resulting in the development of replacement deposits among the limestone. Instead, the veins and ledges are distinct, characteristic and having in general a resemblance one to another, which indicates a much deeper mineralizing cause than simply the heated influences from surface flows of rhyolite. Other mineralizing causes must be looked for, which are probably indicated by the intrusive dikes themselves. These dikes became mineral bearing during their intrusion through and accumulation in the fissures, and the more recent activities have not brought mineral into them, but have probably readjusted the mineralization so that it is not now found distributed equally through the dikes. Rather is the mineralization as segregates within the dikes themselves, developing a series of veins, and mineral deposits within veins; a fact that has caused confusion of opinion, some reports being that there are several veins in a great intrusive dike, and others that the whole is one vein. Both opinions are correct, because later activities of heated influences have caused the development of segregates within the formation, so that we have veins indicated within veins.

The country we are considering is primarily of granite and limestone with diabase in great intrusive masses, which probably disturbed and caused uplifts among the other rock formations. With the cooling of these intrusions naturally

tend below the level in which mining can follow it. But how comes it that at the upper exposures mineral is found and that at some distance below there is a development of leached ore bodies? If the mineralization took place with the formation of the dikes, or by reason of the subsidence of igneous activities subsequent to their intrusion, the ore must have been on the surface as well as at depth. The surface, however, is not



Property of Furnace Creek Copper Co.

leached; it is simply oxidized, so if a deeper portion of the ore body is leached, why not the surface?

This can be answered only by inference, based on the evidence that in a region like Death Valley and the Funeral mountains the subsidence of the water levels after the drying up of atmospheric moisture is gradual. In this section at

that this gradual leaching has created a zone of great enrichment near the present water level, but where it can be is a speculative theory.

The Mining World

Aug. 24, 1907 p. 325

San Bernardino.—The Hexie mine is 25 miles from Indio and it is reported a ledge of \$25 ore 4 ft. in width has been encountered. A 5-stamp mill is in full operation treating this ore.

The Brown Bear mine at Deadwood on the western slope of Trinity mountains in Trinity county and owned by the Brown Bear Mining Co., is not keeping up its reputation of former days. It was discovered and began being worked in the '80s. To the depth of 1,400 ft. it produced over \$8,000,000. The company keeps only a small force of men employed, the product of the mine coming from leasers, of which at present time there are about 25, and the result in many cases not satisfactory. The 10-stamp mill is running only on day shifts with J. S. Satterlee in charge.

Big Pine.—A credited report is to the effect that the Mount Whitney Gold Mining Co. at Lone Pine has started up its 30-ton milling plant. A recent test run of 150 tons proves the mill to be in good condition after an enforced idleness of several months. Development consists of a 1,600-ft. tunnel which runs into the mountain 700 ft., below the apex. This tunnel has opened up some fine ore bodies running in values from \$20 to \$27 to the ton in gold. An air shaft is being sunk and when this is finished it will be possible to handle about 1,000 tons of ore of values varying from \$5 to \$140 to the ton. In a second tunnel is rock with values of \$20 to the ton gold. The office of the company is 461 I. W. Hellman building, Los Angeles. Wilbur H. Dean, secretary.

Nov. 9, 1907 p. 863

The Atolia Mining Co. of San Francisco, operating the Randsburg tungsten mines, which have in the past been large producers, have closed down the mines indefinitely.

Dec. 28, 1907 p. 1145
Yuma.

The Picacho and Eureka districts are about to become the scenes of much of that activity which made them rich and famous camps in years gone by. The Picacho people are dismantling their huge 1,400-ton mill by the river, and are transplanting the major portion of it to their present mill site, three miles inland on the California side. The old mill was the largest in the west. At the mines 23 men are employed.

On the Arizona side of the Colorado river in the Eureka district, the Anita Lead & Silver Mining Co. is preparing to develop into shippers three claims which it has bought outright from a Mexican who had the luck to stumble upon them less than a year ago. This is a company of Yuma people who have been more or less interested in that district for years and who know its possibilities. James Kilgore of Yuma is secretary, W. E. Topham, president; Henry Levy, vice-president; Max Czuczka, treasurer, and J. M. Polhamus, agent. They have a considerable amount of good ore on the dump, but will not try to ship until they can put in hoisting machinery. To a depth of 25 ft. of development that has been made, ore has been brought to the surface from three different pay streaks, which average from \$76 to \$107 a ton. The claims have both horn silver and galena.

Los Angeles.

The property of the Skidoo Mines Co. is situated on Truckee mountain, 45 miles southwest of Rhyolite, Nev., and 50 miles

northeast of Keeler, Cal. It consists of 245 acres, together with valuable water rights, pipe lines and a telephone line connecting with Rhyolite and the Western Union telegraph. All the machinery is properly housed and consists of engines, boilers and hoists necessary for the sinking of two separate shafts. Twelve miles of 8-in. pipe have been laid and four miles of trench dug and pipe being laid from springs owned by the company. A plant will be erected at an intermediate point and electricity generated and conveyed to mine and other points. There are four ledges coursing through the property. Surface assays showed \$12 to the ton in gold. A shaft 300 ft. deep shows an average ledge width of 6 ft. and \$12 to the ton values. An incline has been sunk on one of the ledges to a depth of 100 ft. and a tunnel driven 250 ft. The average width of this ledge is 3 ft. with ores giving gold values averaging \$14 to the ton. The company is also sinking a triple compartment shaft which will intersect the tunnel about 200 feet away where it strikes ledge No. 2. The principal office of the Skidoo Mines Co. is at Los Angeles; E. A. Montgomery is president; W. R. Wharton, vice president; Matt Hoveck, Skidoo, general manager; A. S. Davis, secretary.

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The Mining World

Dec. 28, 1907 p. 1145-1146

It was in the '60s when Haivle was the county seat of Kern county that near there the Rands, Haggins and Hearst, the Hansons and others were taking out more than a million a month. That center is now known as the Piute mining district and is enjoying a steady growth. The Mammoth mine is opened up with a 300-ft. tunnel, has 7 ft. of ore and is installing a Nissen 4-stamp mill. The Piute mine is owned by Los Angeles people. The vein in tunnel No. 3 is 14 ft. in width. This property has over 9,000 ft. of exposed vein cropping and a tunnel running into the mountain in such a manner as to give 300 ft. in depth of ore all the way above the tunnel level. The property is covered with heavy timber and has ample water power for 10-stamp mill.

The Whitney View mine, lying adjacent to the Piute, is now installing a steam hoist and pumps, while the Hidden Treasure is now taking out ore and crushing it in the Old Burton arrastra.

The Orange Blossom Extension Mining & Milling Co., owning and operating properties 10 miles north of Bagdad and adjoining the Orange Blossom mines in San Bernardino county, is working 25 men steadily sinking its shaft. The shaft is down over 400 ft. and will be sunk to the 800 level before crosscutting.

The Blue Jenny adjoins the Crackerjack Bonanza on Bonanza mountain, San Bernardino county, and the owners, Los Angeles people, have lately increased the working force. The showings are among the best on Bonanza mountain, a 6 ft. body giving milling values on the surface. A tunnel is being driven into the mountain to cut the ledge which trends nearly north and south and apparently cuts through the Emigrant claim of the Bonanza group. While no great amount of work has as yet been done in that part of the district, mining men consider the chances excellent for the opening up of great bodies of milling ore on the Blue

Jenny and adjoining claims. The values are found in practically the same character of ore as in the Bonanza ground and under the same surrounding conditions. Well defined walls have been found on both sides of the ledge matter.

A rich strike has recently been made in the Rose lease on the Crackerjack Bonanza. A seam of from 5 to 8 ins. in thickness, on the footwall contains considerable free gold. Where this streak was encountered the ledge was 3 ft. in width and the leasers assert that the entire ledge averages \$100 in gold to the ton.

On the eastern slope of Bonanza mountain is situated the Blue Bell group of Baker & Rose, from the ore of which the assay returns average near the \$100 mark, and this from the bottom of a 25-ft. shaft where the ledge is 3 ft. in width.

Work has been started on the Todd lease on the Owl claim of the Crackerjack Bonanza. A crosscut will be run from a point lower on the mountain to cut the ledge on the Todd ground. Good pan-nings are said to have been obtained from the croppings. The lease will soon be sacking ore and add to the output of the Bonanza.

Jan. 4, 1908 p. 37

Los Angeles.
Bonanza mountain is located in the Red Pass section of the Crackerjack mining district, which is situated in the north central portion of San Bernardino county, California. The prospecting and developing of the last two years show unmistakably that the entire district is characterized by large, rich bodies of gold, silver, copper and lead ores, yielding splendid returns.

The Crackerjack Bonanza Co. owns in this district six full claims and besides doing extensive operations itself the company has six sets of leasers at work. The shaft in the Arizona claim is down 100 ft. with a 50 level. The equipment includes a powerful hoist and the intention is to reach a shaft depth of 1,000 feet. For several weeks the company has been shipping \$100 to \$300 ore to Salt Lake for treatment. At a very conservative valuation the ore of the property will average \$50 a ton.

Daggett.
The Daggett Lead Mines Co., Cassatt C. Davis, president has ordered from the New Century Mill & Reduction Co. of Los Angeles, a 50-ton dry ore crushing and concentrating plant, and the same is to be installed immediately five miles from Daggett station on the Santa Fe railroad.

Jan. 18, 1908 p. 114

The Avawatz range, which lies to the westward of Silver Lake, a station on the Tonopah & Tidewater railroad, is mineralized to such an extent as to give promise of becoming a great gold, silver and lead bullion producer. It is in this section is situated the Crackerjack Bonanza and other properties including those of the Avawatz Mining & Reduction Co., a corporation composed of leading citizens of Long Beach, where are located its principal headquarters and main office. This company owns three groups of claims near Crackerjack which will soon become known as Avawatz, as application has been made to the government for a change of name of the postoffice. The general production throughout the district is mainly lime and porphyry, although dikes of rhyolite and diorite are often found. In portions of the district the ores carry gold and others copper and lead and still others lead and silver. A copper-bearing deposit of the Avawatz

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The Mining World

Jan. 18, 1908 p. 114

Mining Co. gives 30% copper and 1 oz. gold to the ton. Another of its properties has given assay values as high as \$700 to the ton in gold. Development is principally by shafts and open cuts. The company will do much development work this year. Its officers are Fred Heath, president; Bert Paul, secretary; Harry Faust, treasurer, and Wm. H. Heath, consulting engineer and general manager.

Feb. 8, 1908 p. 264

The Ponderosa Copper Co. is developing a copper property in San Bernardino county, about 14 miles from Bagdad. J. H. Canavan, Delta building, Los Angeles, is president, and J. W. Green superintendent.

The Palms Milling Co. is erecting a 30-ton mill at Twenty-nine Palms, San Bernardino county. The mill is equipped with crusher, Freeman rolls, Standard concentrator, and Bryan mill. It is located eight miles from the Gold Park mine, which has been extensively developed recently and which has a contract for treatment at the mill.

Feb. 15, 1908 p. 303

Bishop.

The annual report of Gaylord Wilshire, president of the Bishop Creek Gold Co., shows that the company has expended during 1907 in labor, machinery and material the sum of \$91,107.33. A separate company, to be known as the Bishop Creek Milling Co., has been incorporated with a capitalization of \$200,000, one-half of the stock to be held permanently by the company.

Southwest of Buena Vista and two miles north of Silex the Nichols prospects have been taken over by people of Carson, the final payment of the bond having been made. The most striking feature of this property is the 100-ft. dike of low-grade ore averaging \$4 to the ton.

Al Stevens, of Buena Vista, secured two months ago a lease on the Brownie property and began taking out rich ore from a shoot which the shaft cut through at 18 ft. below the surface. One assay showed \$7,000 value per ton, and others varied from \$100 to \$1,000 each. In leaving the shoot the shaft kept on in ore of good milling grade, some worth \$50 and much worth \$20 or over. At 85 ft. it is still in this class of rock. At 100 ft. depth a drift will be run to again tap the shoot which will be found 50 ft. distant, it is thought.

Jan. 18, 1908 p. 113

San Diego.

On the eastern slope of the San Jacinto mountain, 75 miles northeast of San Diego, is a section known as the Grapevine mining district and which under development gives promise of becoming one of the great gold-bearing sections of California. This section of San Diego county was quite active in the days of the early eighties. The San Jacinto mountains form a connecting link between the peninsula range of Lower California in Mexico on the south and the Sierra Nevada and coast ranges on the north. On the famous Dewey ledge in this district the Colorado Mining & Milling Co., of San Diego, owns five promising claims and then to the north six claims and on the south 10 additional claims and all contiguous, making over 400 acres of mineralized ground. The Dewey ledge is exceedingly well defined and recognized as being one of the most prominent vein systems in the peninsula range of southern California, the strike being northwest and southeast, a mammoth contact fissure, lying between a granite hanging and a schistose footwall with the actual width unknown. A large portion of the Dewey ledge consists of fine-grained sulphide quartz carrying gold in paying quantities. Out of many assays made from the surface to the bottom of a 55-ft. shaft values were obtained to the average of \$21.10 in gold per ton. A contract has been let by the company to drive a crosscut tunnel from a point on the mountain south of the 55-ft. shaft a distance of 900 ft. and this will tap the ledge 300 ft. below the Apex. Water for milling purposes is above the mill site and comes from flowing springs on the ground. The main office is at San Diego; Benton Canton is president; Capt. W. R. Farnsworth, vice-president; J. P. McClerken, secretary and treasurer; James L. Patterson, general manager.

Feb. 15, 1908 p. 303

Orange Blossom.—This camp is one of the busiest of camps on the desert in San Bernardino county. On the Breigal mine, owned by San Diego people mostly, the main shaft is down to nearly 500 ft.

where the ledge is 25 ft. wide. From the 120 level gold is visible to the naked eye in every piece of ore taken out. The workings of the Moonlight and Cadiz, owned by the same parties, are also in rich ore.

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Feb. 29, 1908

Near the old mining camps of Ivanpah is located the Royal Antimony mine, owned by T. Y. De Lay and D. I. Obadie, of San Francisco. The ledge matter is about 2 ft. in width. Development shows an 80-ft. shaft, a 50-ft. tunnel and considerable drifting and surface openings. The ore carries values of 55% to 60% antimony, as shown by returns of shipments made to Oakland and St. Louis. The next shipment will be to smelters at Salt Lake.

The Queen Esther mine is located in the Soledad mountains, within 5 miles of Mojave. This mine has been operated 4 years and has paid regular dividends. The ore is a gold bearing porphyritic quartz found in a true fissure vein, in porphyry varying from 4 to 30 feet in width and with an average value of between \$7 and \$10. Sixty men are employed, the property being equipped with a dry crushing and cyaniding plant of a daily capacity of 130 tons. An electrical plant furnishes light and power. The property is owned by the Queen Esther Mining and Milling Co., of Los Angeles.

March 7, 1908 p. 419

Daggett

The Ord district is situated about 35 miles south of this railroad point and for many years has been quite extensively prospected. J. M. Osborn, locator of the Osborn mine in the northern portion of San Bernardino county and recently sold

by him, first began making locations upon the Ord mountains over 30 years ago, during which time he has prospected and developed 30 claims, eight of which have had patents issued. The main ledge, 10 ft. in width, prospects for over two miles and upon this ledge is located the Rio Vista (River View) claim developed by a 150-ft. shaft, with considerable drifting and two tunnels, one in 300 ft. and the other 70 feet. The ore, generally between porphyry and diorite, with lime and granite in close proximity, is of a quartz iron character, carrying values of 10 to 18% copper, with \$1 in gold to each unit of copper. At points along the ledge are found sulphides averaging 17½% copper and \$1 in gold to the unit of copper. The course of the main ledge is northerly and southerly, and at the lowest point in its course, is an off shot, traceable for over 3,000 feet. The installation of considerable machinery is contemplated.

Amboy.

At this point the Pacific Cement Plaster Co. of Los Angeles has a manufacturing plant and two miles away is the company's quarry of pure gypsum, the two being connected by a rail tramway. The gypsum as mined is both hard and soft and passes through an Ehram crusher, thence through a rotary dryer into a pulverizer, reaching a 50-mesh, elevated and conveyed into 14-ton kettles, where it is relieved to within about 10% of its moisture. The material then goes to four sets of emery burrs, forced through a 200-mesh cloth into the warehouse, where it is packed as Holdite plaster and shipped to Los Angeles and other coast points. A. D. Mulyane is general superintendent and J. L. Kenney is in charge of the milling plant.

C. M. Walker and G. M. Benjamin have recently on the southern end of Bristol mountains, a connecting link of the range of mountains upon which are located the Orange Blossom and Orange Blossom Extension mines, located a group of six claims, the surface showings indicating a silver and lead proposition of much magnitude. The ledges are in a granite, schist and porphyry formation with assay values of the ore 68% lead, 10 ozs. silver and 4% copper. Adjoining this group of claims Walker & Benjamin have located upon a large body of iron which when sampled gave a return of 40% iron and \$4 in gold to the ton.

Maurice Spellman, a section foreman of the Santa Fe railroad, located nearly 14 years ago the vast gypsum quarry now owned by the Pacific Cement and Plaster Co. and permitted the same to go by default. Associated with him in the locating of the Great Renown group of three claims are Messrs. Chestnut and Johnson. These claims are contiguous upon a 40-ft. ledge and situated about five miles from the Orange Blossom mine. The ore is a white quartz with values in gold and silver. Outcroppings on one of the ledges gave assay returns of 27½ ozs in silver and 86-10% copper.

San Bernardino.

The seven gold quartz claims of the Whitewater-Mohawk Mining Co., with headquarters at San Bernardino, are located three miles from the Southern Pa-

cific railroad on the Colorado desert in Riverside county. The ledge, fully 25 ft. in width, between granite and porphyry walls, was discovered and located by two prospectors following rich float up the canyon. This company after taking the property sunk a shaft and drove two tunnels, one of 135 ft. and the other of 40 ft., disclosing ore carrying values of \$3 to \$15 in gold and a fair per cent in copper. The Whitewater river runs at the foot of the claims, giving an almost inexhaustible supply of water for all purposes. The officers of the company are Cramer B. Morris, president; W. H. Motter, vice-president and general manager; Charles Taylor, secretary and treasurer.

The Mining World

March 14, 1908 p. 456

Bagdad

Nearly every station along the lines of the Santa Fe and Salt Lake railroads, crossing the great Mojave desert, is rapidly becoming not only a supply, but also a shipping point for the mines being prospected and opened up in the nearby mountains. Bagdad, 219 miles east of Los Angeles and 81 miles west of Needles, will become an important factor in the mining industry of California.

John Denair, late coast division superintendent of the Santa Fe system from Needles to Los Angeles and Bakersfield, is largely interested here. Something over a decade ago, Hikorum, a Clumehuevis Indian, brought to Needles rich samples of gold ore. Two years afterward, upon investigation Mr. Denair, N. E. Rich and W. J. Coapman of Needles became owners of a group of claims covering a large portion of the ledge from which the samples had been taken and afterward organized the Orange Blossom Mining & Milling Co. This group is located about 9 miles northeast of Bagdad and 5 miles west of the Old Dad mountain. The ore bodies occur in a schistose and granite contact which is 100 ft. in width. The ore is gold and copper.

Each year since their purchase, persistent development work has been done. In sinking shaft No. 1 to a depth of 55 ft. and driving a crosscut 30 ft., a streak of high grade ore was met with which gave assay returns of \$78.08 gold and copper. In drifting the ledge was found to be 8 ft. wide with the ore carrying average values of \$17. At the 120-ft. level drifts north 85 ft. and south 65 ft. showed the ledge to be from 30 to 50 ft. wide with a 7 ft. vein averaging \$17 in gold. The shaft with an incline of 75 degrees left the ledge at the 120 level, so that at 20 ft. it was necessary to drive a crosscut backward 25 feet where the pay vein was 4 ft. in width. Drifts 60 ft. north and 54 ft. south disclosed ore with an average value of \$12 in gold. From the bottom of the shaft a crosscut was driven backward 57 ft. to the ledge, which, by still further crosscutting, was found to be 2 ft. through. The walls at this point are perpendicular, perfect and smooth. Drift

80 ft. to the north and 110 ft. to the south, with crosscuts, determine the pay ore to be 10 ft. in width, averaging \$5 in gold. About 1,000 ft. to the north of these workings is the shaft house of the Orange Blossom Extension group, which is down 600 ft., on the same ledge. Superintendent Frank P. Seburn estimates the condition of the workings of the Orange Blossom to be such and with the ore already blocked out, that the new 20-stamp mill ordered can easily be kept continually running for many years to come.

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The Orange Blossom Co. has placed a contract with the Tracey Engineering Co., of New York, for a complete 10-stamp mill. After saving on the plates the bulk of the values, the tailings will be run over Deister tables. Also a complete assaying outfit. The power will be furnished by a gasoline engine of 75 h.p. The mill will be lighted by electricity. Water is obtained in abundance from springs brought to the property through a 7 1/2-mile pipe line. The mine hoist is a Fairbanks, Morse & Co. gasoline engine of 12 h.p. The district is easily and quickly reached from Bagdad by a well appointed stage line.

The Orange Blossom Co. maintains an office at Bagdad. The officers are: John Denair, president; Norman E. Rich, vice-president; W. J. Coapman, secretary; C. S. Williams, treasurer, and Frank P. Seburn, superintendent.

The American Flag mine, in southeastern Riverside county, will soon be on the producing list. Superintendent C. L. Austin reports ore blocked out to keep the new mill running for a year.

The Wiley-Stanchfield property is being systematically developed. A new gasoline hoist is to be installed and arrangements made to treat the ore at the American Flag mill.

March 21, 1908 p. 497

Blake

C. W. Hayes of Goldfield has recently purchased the Orient and Rusty Pick groups, in the Ibez mining district, 15 miles west of Needles.

The Turtle Dove group of 5 claims, 4 miles south of Blake, are in a porphyry and granite formation. The vein has been opened up for several hundred feet by open cuts and 10 to 12-ft. holes. Assays show a value of \$79.10 gold. Two hundred feet to the north is a parallel vein dipping to the southeast, and at no great depth the two ledges should connect. Assay values of this ledge are \$25.25 to the ton. The property is owned by the Nevada-Cons. Mining Co. of Los Angeles.

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The Mining World

March 21, 1908 p. 497

In the district surrounding Goff's Junction are many promising mining propositions. Twelve miles westward is the Gold Cone, consisting of 18 claims opened up by a tunnel over 400 ft. in length, and also by a 50-ft. shaft. The ores carry values in gold, silver and copper. One and a half miles south of the Turtle Dove, H. A. Chauffer and H. P. Ware own the Gold Fest group, which at 60 ft. gives good gold values. About 9 miles northward and in close proximity to the railroad are located the 9 claims of the California Gold & Copper Co. The formation in this section is diorite, lime and porphyry. Three parallel ledges, the main one at 350 ft., being 40 ft. in width. The property is equipped with gasoline hoist and other improvements. Water is brought by pipe line from South Hackberry, 7 miles northwest. The main office of the company is at Riverside, Cal. Thirty miles north of Fenner station

and about 40 miles west of Goffs, and on the east end of Providence mountains, the White Syndicate of Joplin, Mo., has taken over a group of claims and under the management of Col. Tom Ewing is placing a 20-stamp mill to be run by power from an electric plant now under construction at Fenner. Water is taken at Fenner from wells sunk 860 and 950 ft., by John Denair, late division superintendent of the Santa Fe railway.

On the Providence mountains C. W. Caddigan, A. A. Irish and Charles Trumpler of Los Angeles own a group of 5 claims, a lead and silver proposition, with over 1,500 ft. of development work, equipped with gasoline hoist.

The great Bonanza King is also in the Providence mountains. The ledge at the surface was only 2 ft. wide and at 200 ft. and continued so to a depth of 600 ft. Over 4 miles of underground workings have been driven. Ore is treated by stamps and pan amalgamation. Quite a large amount has been shipped to the smelter at Needles. The litigation in which this property has been involved is about settled and C. W. Caddigan will hold the controlling interest.

Hart.

The past week witnessed a number of good strikes at Hart, the six weeks' old gold camp in San Bernardino county. Striking pay ore is a common occurrence on the two dozen leases now operating.

The Big Chief lease is making a splendid showing, the tunnel having penetrated a 25-ft. ore body, the pay streak on the foot wall of which yielded high values.

The Oro Belle and Oro Belle No. 1 lease, the original discovery and locations made by Hart and Hiit, have been conveyed to Col. Hopkins of the Quartette mine of Searchlight. The price of the bond is \$200,000, and of that amount \$25,000 has been paid in cash. A large body of high grade ore was recently uncovered in a tunnel driven by the owners.

The most important strike in the short history of the camp was made on the Bell and Freeman lease, when free gold in large quantities was uncovered. Rich ore is being sacked on the Mahana and Maguire lease.

Among the most important of the recent developments is the assurance of custom mills, which will be installed this month.

A pipe line from springs four miles from camp was completed last week and water is flowing into the town.

A promising flow of oil has been struck in the vicinity of Mono lake, and prospects for the development of important oil fields are very bright. Several prospect wells are being put down, and two or three are in oil of fair quality. Large California oil interests have become interested and are completing arrangements which will conclusively demonstrate the actual value of the discovery.

Kelso.

South of Kelso about 10 miles the Lucile Gold & Copper Mining Co. own a property. Surface samples give an average value of \$27 gold and silver. The company has also acquired three additional claims, a mill site and water right. A tunnel in 107 ft. cuts a ledge, crosscutting it 27 ft. to the hanging wall. The walls are porphyry and quartzite and the ore largely of hematite of iron averaging \$21.20 gold and silver. A second tunnel being driven will cut the ledge at 300 ft. below the surface. The office of the company is at Los Angeles.

Los Angeles.

The Southern California Cement Co. is erecting a \$1,000,000 cement plant near Riverside. Over \$300,000 has already been expended in this plant's five miles of railroad built from Riverside to the property.

The Mining World

April 4, 1908 p 573

Breyfogle.

This camp is located on the western lode of the Funeral mountains, six miles from Borax Smith's Farnace Creek ranch. Several promising mining propositions are under active development by Los Angeles men. The ledges are well defined and traceable for several miles. The J. & C. Gold Mining & Milling Co. shaft, on a 40-ft. ledge, is in ore showing values as high as \$867 in gold to the ton. Samples taken from throughout the properties give an average value of \$46.62 in gold. The company is driving two tunnels further up the canyon to tap the main ledge. A 5-stamp mill and other machinery is to be installed.

The Mountain View Mining Co. of Los Angeles owns five claims in the district. Assays of samples from all the claims gives an average value of \$26.45 to the ton. High grade ore in Bull Run tunnel gives values of more than \$600 a ton. The company is running two tunnels and will install a 3-stamp mill and a cyaniding plant.

April 13, 19; 1908 p. 611

Silver Lake.

From this station, on the Tonopah & Tidewater railroad, 244 miles from Los Angeles, stages go to the mining camps of Arawatz, Bonanza Camp, Cave Springs, Crackerjack Bonanza, Deming Spring and Riggs Camps, and is also a distribution point for many other localities. In every direction from Silver Lake, the mountains give evidences of being heavily mineralized. Prospectors report nearly every mountain to be a series, or net work of veins, the values in the various metals being in keeping with the general formation, gold predominating in some, silver, lead and copper in others. The Silver Lake district embraces an area 20 by 30 miles.

Thirty-five miles northeast of Silver Lake, at the base of the Kingston range, are located the 22 claims of the California-Calumet Copper Co. of San Francisco. The general formation is granite and decomposed quartzite, the ores a

sulphide of iron and copper; the values are in copper. Short shafts have been sunk upon various stringers with values in copper. A 20-h.p. gasoline hoist is to be installed at once. W. R. Cunningham is superintendent.

A few miles away from the camp, William Hyten owns a group of five claims, that he located 25 years ago. The ledges, true fissures, are nearly vertical and course through a granite formation. The ore is a copper stained quartz; mill values \$32 to the ton. On the property is a 5-stamp mill.

Four miles from the Wanderer group is the Jumbo, owned by Jim Hyten. The ledges are easily discernible by outcroppings several hundred feet in length, in a gneiss and decomposed granite, and average over 2 ft. in width. The ore is an iron quartz with average values of \$25 to the ton in gold and 7% lead. Development is by a 106-ft. tunnel.

In the northwest portion of the Silver Lake district are located the five claims of O. J. Fisk, who has prospected the desert for over 30 years. Three of the claims are contiguous on strike of a 5-ft. ledge, cutting a granite formation. On this ledge are four distinct shoots of ore the longest of 300 ft. The ore is a copper-stained quartz with assay values of \$22 to \$38, mostly gold.

Six miles west of Silver Lake in the Five Point mountains are located the 25 claims of Amos Bros, whose home is in Texas. The formation of these mountains is lime and porphyry, the ore rather of a spar quartz with values in carbonate of copper, gold and silver. The shaft is 100 ft. in depth, with considerable drift work, all in ore. Values, \$20 silver, \$12 gold and 3% copper, by assay.

In the Crackerjack section, 21 miles away, J. Y. Anderson, in connection with Los Angeles parties, owns a group of 10 claims. The formation is a porphyry, the ledges 100 ft. wide with copper-bearing ore, showing at points manganese of iron. Development consists of a double-compartment shaft, 140 ft., and also a 30-ft. shaft.

In the Arawatz mountains the Arawatz Crown Mining Co. of Los Angeles, J. W. Provard, consulting engineer and manager, owns a group of claims rapidly developing into a promising mining proposition. The ledge is from 5 to 14 ft. in width. The 300 ft. shaft has levels at 200 and 300 ft. The ore between lime and porphyry, carries values in lead and silver, high grade in character. On the property is a small gasoline engine which is to be supplanted by one of 40-h.p.

In these same mountains Buffalo, N. Y., people own a group of claims being developed by a 300-ft. shaft and levels at 200 and 300 ft. John Harper is superintendent.

Four miles west of the Bonanza group is the Sylvanite group of three claims. The ledge outcrops in a porphyry formation for 30 ft., the ore being arsenical iron with \$2.45 gold and 60 cents silver values.

T. L. Henderson, J. Y. Anderson and Ollie Johnson of Silver Lake owns a group of claims 14 miles west of Silver

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April 11, 1908 p. 612 (cont.)

Lake on which is a 60-ft. shaft. Values are \$19.71 gold.

Jack Good of Hill City, S. D., with G. F. Hicks of Silver Lake, own in the Crackerjack section the Homestake group of 10 claims. The veins are a contact of porphyry and slate. The ore is free milling with values of \$6 to \$21 to the ton. A crosscut tunnel is being driven which at 100 ft. will cut the ledge at about 225 ft. below the surface. Near this property is the Morning Star group, owned by G. F. Hicks and George Parker.

The Rose-Heath-Fisk Mercantile Co. at Silver Lake, are doing much toward the development of the Silver Lake mining district in developing properties and assisting in the construction of roads.

The Crackerjack Tomboy group is developed to the extent of a 60-ft. shaft. Ore to the value of \$5,000 has been taken out of the property.

The Cracker Jack Bonanza, 26 miles west, owned by Los Angeles parties, has a 20-ft. ledge, 400 ft. of underground workings, shafts and drifts, with a porphyry and slate contact. Values, \$20 gold to the ton.

Seventeen Mile Point is a district tributary to this railroad point, and is adding much to its activity. Recently a mining sale of considerable importance was made there. Robinson & Ward, locators of the Paymaster, Red Boy and the California groups, disposed of the same to Los Angeles mining men. The Paymaster is a silver-lead proposition in quartzite and lime, with values at the 100 level of \$66 to the ton, lead and silver. The Red Boy and California groups are situated about one mile from the Paymaster. The ledges are from 2 to 8 ft. in width, with gold values up to \$100 per ton.

The Big Bonanza group of four claims has about 350 ft. of tunnel development. The vein is quartzite, about 32 ft. in width and gives assay values across its entire width of \$18 in gold to the ton.

The Eaton group of six claims has two shafts of 100 ft. in depth, each with crosscuts and levels. In one of the shafts a crosscut exposes a vein 33 ft. in width, the ore of which averages \$26 to the ton in gold.

The Palmyra group of four claims owned by Yeoman & Yance is one from which, many years ago, beautiful free gold specimens were obtained and exhibited. Since that time much development has been performed and in one of the shafts at a depth of 100 ft., 5 ft. of a quartz ledge is exposed, averaging \$25 in gold to the ton. In a prospect shaft at a depth of 36 ft., assays of ore from a 6-in. streak on the hanging wall gave a return of \$300 in gold.

May 2, 1908 p. 732

Keeler.

About five miles southeast of Keeler, on the western border of the valley at that point, and east of the south end of Owens lake, is a mineralized belt several miles in length by nearly two miles in width. Shafer, Thompson & Dickman are owners of 16 claims, and after sinking a 25-ft. shaft on the Woodpecker claim, shipped 15 tons of ore to Goldfield, the milling returns being \$82 gold and \$6 silver to the ton. The general country rock is porphyry with reefs of upturned slate, the croppings are invariably decomposed quartz, the larger ledges carrying values averaging \$20 to the ton.

May 9, 1908 p. 769

Hart.

The Hart district is advancing steadily and there are now 30 leasers and companies at work. The first milling plant is being installed on the property of the Big Chief Co., and another is to be built by the Garavanna Mining & Milling Co., in which custom ore will be treated. There are large bodies of medium grade ore opened up in the district, and the operation of a custom mill will afford the smaller operators an opportunity to dispose of their ore.

On the Pfunder lease on Oro No. 1 a good strike was made in a 25-ft. crosscut, the ore showing values of better than \$50 a ton.

Drifting on the 50 level of the Surprise has exposed the vein for a width of 7 ft. This property is under lease to Goodwin, Todhunter & Felix, and sinking has been resumed. The ore averages about \$25 a ton.

On the Big Chief the south crosscut in the shaft is in \$50 ore, while the upper tunnel shows some good values. The west side tunnel is in 85 ft., having cut through an 8-ft. vein of low grade.

The Hart Mining & Leasing Co. is one of the latest companies to organize, and it is the intention to take over several good leases for extensive development.

The new hoist at the Quartette shaft on the Jumbo is running smoothly and three shifts are at work in sinking the shaft to the 100 level.

G. F. Sloan has purchased a hoist for the Sloan lease on the Jumbo. The ledge on this leasehold has been prospected for a width of 45 ft. at the 50 level, which is all in a good grade of milling ore.

Blackburn, Ross & Weaver, lessees of block 1 on the Oro, are again taking out a good grade of ore. At a depth of 35 ft. some high-grade ore was sacked and the same body has been encountered at a depth of 50 ft. through a 20-ft. crosscut.

The Hart & Hitt tunnel has reached a distance of 160 ft. and is fast approaching the ore zone opened in the upper workings where some high-grade ore was taken out.

The Mining World

May 16, 1908 p 806

Randsburg.

The Yellow Aster mine is under option to Albert Ancker, cashier and manager of the Bank of Tehachapi, Kern county, at a price stated by him and Vice President C. A. Burcham of the present owning company to be \$1,500,000. Ancker will reorganize the holding concern, a close corporation with \$1,000,000 capitalization, and greatly extend the scope of operations. John Singleton, president; C. H. Mooers, second vice president, and Dr. R. L. Burcham, secretary, are the other present directors. All reside here, where the stock is held. Since Singleton, C. A. Burcham and Fred Mooers discovered the mine, 13 years ago, it has shipped to the mints over \$5,000,000 gold bullion, of which \$1,000,000 was paid in dividends and \$1,500,000 expended on mills, water plants, machinery and development. The property has been worked continually day and night, with the exception of a three months' shut-down four years ago, due to labor troubles.

May 16, 1908 p. 805

Keeler.

The Four Metals Mining Co., eight miles from Keeler, has 35 claims, lead, silver and copper. Up to last fall the company worked 50 men, but now the mining has stopped in part while the smelter is being remodeled and a tramway is being built from the mines to Keeler. A force of from 300 to 400 men will be employed as soon as these improvements shall have been completed.

The Thompson-Briggs group of 16 claims, four miles south of Keeler, is now being worked by half a dozen leasers. Pannings of gold have been taken from 50 different places. No workings are deeper than 50 ft., but the values so far revealed run from \$8 up into the hundreds. Buildings are now being erected and the group will be worked on a larger scale within a few weeks.

The H. A. Shaffer group of three claims joining the Thompson-Briggs estate has a shaft down 60 ft. This group

June 16, 1908 p. 921

Hart.

A large amount of development work has been in progress at Hart during the past four months, and a number of properties are opened to a depth of about 100 ft. At the Oro Belle No. 1 a rich streak of free-gold ore has been opened up in the 175-ft tunnel at a depth of 100 ft. Values seem to be increasing with depth. Sinking on the Big Chief is being pushed as rapidly as possible since the discovery of rich ore in the 10-ft. winze just north of the shaft. The vein is 4 ft.

wide. The driving of the two tunnels is making good progress. The upper tunnel is now in 175 ft. and prospecting is going on at that point.

H. M. Banfield, manager of the Garavanza Mining & Milling Co.'s property on the north end of the New York mountains, contemplates the erection of a custom milling plant at Hart. At the beginning it will have a capacity of 25 tons per day, but will be so arranged that additional capacity up to 100 tons can be added without much extra expense. It is thought possible to treat ores, including transportation charges from the various léssecs to the mill, at a rate of \$7 or \$7.50 per ton. A 2-ton sample of Hart ores is being tested at the Garavanza mill.

June 13, 1908 p. 963

Los Angeles.

A rich strike is reported at a point about 30 miles north of Daggett and eight miles south of Indian Springs of a ledge 5 ft. wide and traced for 1,000 ft. said to show values of from \$14 up to \$300 to the ton. The result is that a large area has been located.

Eagle City is a new mining camp, situated about 35 miles east of Victorville, in San Bernardino county. It gives promise of becoming an important gold producing field. Development is progressing rapidly and new discoveries are being made daily. The War Eagle claim, which is the leading one of the War Eagle group, has a

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June 13, 1908 P. 963

tunnel 90 ft in, about 70 ft. of which is on the ledge which shows free gold and horn silver. The group comprises eight claims owned by Daniel J. Wheeler, John P. Walsh, George G. Dewey and C. R. Thompson.

Between the War Eagle and Red Jacket claims is the Mountain Queen, owned by Lord brothers, who are driving a tunnel, now in 75 ft. The ore is similar to that of the War Eagle.

East of the War Eagle, Charles Martin, Lee Perdeu and others have the Tip Top group under tunnel and shaft development.

East of this group is the Gesford-Melbourne group, owned by Charles R. Thompson, J. F. Monaghan and C. Casey. Considerable work has been done on these claims. A shaft is being sunk and the ledge is improving with depth. In this same group is the Mildred claim, where a ledge has been uncovered showing rich silver ore and pockets of horn silver.

Bishop.

Eight miners are at work stoping ore in the 325 level of the Bullion of the Southern Belle Mines Co. The ore goes direct to the mill. The next important work will be the sinking of the 250-ft shaft of the New Year to a further depth of 250 ft. The station at that new (450-ft.) level will be a center from which will radiate tunnels to tap several important veins. Of these, four, and possibly five, of the best known will be cut within 500 ft.; they are the Golden Wedge, at 100 ft., High Line, at 150 ft., New Find, at 250 ft., and the 20-ft. Harriet vein at about 500 ft.

A new hoist has been installed over the double compartment shaft of the Bishop Creek Gold Co.'s property and a new Leyner drill is in service. The diamond drill working in the canyon recently struck at 150 ft., 2 ft. of sulphide ore assaying \$34 a ton, while the neighboring ledge carries milling values.

Ore is being sacked at the Black Canyon mine for transportation to the Southern Belle mill.

The Mining World
Feb. 20, 1909 p. 363-364

The Arica mine in the Parker district has been sold. At a depth of 190 ft. there is a ledge 6 ft. wide that gives average assays of \$17.

Los Angeles.

The Kern River Milling & Power Co., owned by Jacob Fieber of this city and associates, is working 13 quartz claims. The company has two mill sites, six miles north of Havilah and between it and Rodfish. The surface ore is from 18 in. to 20 ft. wide in Kern county. A crosscut is in 700 ft. It is estimated that ore will be struck in another 200 ft. The ore assays from \$21 to \$58.

In the Avawatz mountains, near Death valley, San Bernardino county, the Avawatz Mountain Gold Mining Co. owns a group of three claims which has been leased to Edward Bahlen and associates of Los Angeles. A force of men will at once be put to work in the Pathfinder, where, at 30 ft., a 3-ft. vein with well-defined foot and hanging walls, has been encountered. This ore gives values from \$2.31 to \$96.19 in gold.

Two prospectors, while panning at the head of Rush creek, Plumas county, struck a rich deposit which washed from \$50 to \$100 per cubic yard.

On the Anaconda mine, belonging to the Mohawk-Herald Co. of Los Angeles, but located five miles south of Twenty-Nine Palms, San Bernardino county, some high-grade bodies of free gold ore 3 ft. wide are being opened up. The vein is a fissure contact and can be traced for nearly a mile. Necessary machinery is to be installed at once.

In San Bernardino county are located the Providence mountains with the Santa Fe railroad paralleling them on the one side and the Salt Lake railroad on the other. On these mountains are a number of groups of claims owned by various companies and all producing gold, silver or copper, as the case may be.

The Lucille Gold & Copper Mining Co. owns a group of four claims, one claim alone covering a strongly-mineralized dike fully 15 ft. wide at the surface and widening with depth. The upper tunnel is in 175 ft. cutting a ledge for 50 ft. without reaching the hanging wall. The second tunnel, at a level 300 ft. below, and in 80 ft., will at 500 ft. cut the ledge at 375 ft. below the surface. A third tunnel may be driven 600 ft. farther down the canyon. About a mile from this claim on another one belonging to the company, is a 2½-ft. ledge from which a shipment to Murray, Utah, gave returns of 3.88 oz. gold and 8.35% copper. Water is abundant in many localities. The officers of the Lucille are N. E. S. Pillsbury, president; Frank R. Pitney, vice-president; H. W. Boyd, secretary and treasurer, all of Los Angeles.

The Mining World

April 17, 1909 p. 752

Bishop.

The Tecopa mine of the Tecopa Mining Co. is situated six miles from the Tonopah & Tidewater railroad in the old Tecopa district. It is a silver-lead proposition with some gold values. About 3000 ft. of development work has been done, but no ore has been shipped for over a year and it is probable that no shipments will be made until the property is equipped with a plant. It is believed that a complete smelting plant will be erected in the near future.

The Tecopa Chief mine in Happy canyon has recently been leased by Br Bros., for a term of 18 months, to N

Richards and W. V. Skipner of Goldfield, Nev. The lessees have constructed a burro trail to the mine and established a camp for the miners now employed. There is a strong ledge on the property, varying from 2 to 20 ft. in width and outcrops across three claims. The vein carries several streaks of rich ore from 6 to 8 in. wide that carry silver chloride.

The new cyanide plant at the Keane Wonder mine is now in operation. It is expected that the plant will yield from \$8000 to \$10,000 per month. From now on production of the mine will be practically doubled. There is 20,000 tons of tailing impounded at the mill, which will keep the plant busy for a year. It is the plan to double the capacity of the present 20-stamp mill to keep pace with the cyanide plant. The present production of the Keane Wonder will be about \$20,000 per month. An increasing quantity of ore is being developed in the mine.

W. C. Rice has filed suit in the district court at Independence to try the title to certain parts of Little Lee's property, and also that of valuable property adjoining, all located in the Capricorn belt of the Lee district. The defendants are John Carlon and George Barton of Rhyolite, Nev., and W. C. Smith of Leeland.

The Skidoo Mines Co., which owns 240 acres in the Panamint range, has been equipped with 15 stamps and a cyanide plant, and a pipe line 23 miles long from Telescope peak. Ten stamps have been operating since last July and five since Feb. 15. During the last six months of 1908 the bullion output was \$110,000, \$4186 of which was derived from cyaniding about one-half of the tonnage milled. The ore reserve is estimated to be worth from \$800,000 to \$900,000.

The smelter at Keeler has been blown in and is producing about 15 tons of bullion daily from about 150 tons of ore.

President Fitzhugh of the New Coso Mining Co., which owns the Lucky Jim near Darwin, has placed an order for mining machinery with Leece & Water-son of Bishop. The order consists of a 30-hp. air compressor and air drills, pressure air pipe, etc.

Silver Lake.

A carload of gold ore was recently shipped from the Jumbo & Wonder property, owned and operated by James Hyten. Shipment was made to the Selby smelter and regular shipments will be made as fast as the ore can be taken out and hauled to the railroad.

The first car will soon be shipped from the Avawatz Crown.

Extensive development work is now being done on the property formerly owned by Henry Ward and associates, but recently sold to eastern people. A good showing of ore is already uncovered and shipments will soon be made.

At the Blue Bucket, where a 15-hp. gasoline hoist has just been installed, a good body of shipping ore is in sight and shipments will soon be made.

William D. Allen is doing extensive development work on a property 13 miles northwest of Silver Lake, owned by David D. Allen and associates of Buffalo, N. Y.

Amos Bros. are sinking a 50-ft. shaft on their Golden West property and have an excellent showing in free gold.

The California Turquoise Co. of Los Angeles, which owns the Blue mine, is shipping from 20 to 50 lb. of turquoise every week.

May 8, 1909 p 899

Tecopa.

It is currently reported that the American Machinery & Construction Co. of Los Angeles has entered into a contract with the Tecopa Mining Co., operating in San Bernardino county, for the construction and erection of a 4-furnace lead-silver smelter of 600 tons daily capacity. Should this smelting plant be completed it will prove a great boon to this portion of California and southern Nevada, even to many of the properties at Goldfield.

A railway survey has been made of 7 and 10 miles from Tecopa to the Gunsight and Nooday mines, and it is the intention of the Tecopa Mining Co. to build a railroad to these mines and develop them. It is understood this plant will be the result of failure of the company to purchase the Needles smelter, owing to not being able to obtain favorable freight rates.

The Mining World

May 8, 1909 p. 900

Hayes & Monnette of Los Angeles have for many months had the Desert Queen group of four claims on Soledad mountain under bond and have expended \$40,000 prospecting. The ore contains much manganese and spar. Values run from \$5 to \$6. A crosscut of 400 ft. is being driven from the 400-ft. level to cut the main vein in the hopes to obtain high values in gold and silver. The property is equipped with a 25-hp. Alamo hoist and Ingersoll-Rand air compressor and drills.

Silver Lake.

A 20-ton shipment was recently made to the Selby smelter from the Avawatz Crown mine. It was taken from below the 200-ft. level by Fred Greives and partners, lessees. The last 20-ton shipment from this mine went about \$60 per ton. The management is about to put on an increased force of men.

About 25 men are employed at the Blue Bucket gold mine at Cracker-jack and shipments will commence soon.

The Amos Bros. have opened up a good gold property near Fivepoints, about 15 miles southwest from Silver Lake.

John L. Witney and Fred Ferris purchased the Ward property at Seventeen Mile point for \$18,000. The Silver Lake district is improving, and development are going on in all directions.

Johannesburg.

About eight miles from Randsburg is the Sidney Group Mining Co.'s property, owned principally by V. A. D. Williams. The characteristics of the surroundings are the same as of the Stringer district, of which this virtually is a portion. The general formation is lime and porphyry with contact veins. The values are in a pay streak of from 6 to 18 in. At the 200-ft. level of the 275-ft. shaft a drift runs 250 ft. west, and at the 100-ft. level 150 ft. of drifting has been done. A winze on the drift from the 200-ft. level produces the richest ore. There is also good ore in the drift of the 275-ft. level. Four thousand tons of this ore shipped to and treated at the Phoenix 5-stamp mill and cyanide plant at Johannesburg, leased to Mr. Williams, gave net returns of \$43.50 in gold. The property is equipped with a 25-hp. gasoline hoist, 50-hp. Giant air compressor and three drills.

Ever since the booming days of Randsburg has the Red Dog 10-stamp mill at Johannesburg been in operation. It is owned by the Stanford Mining & Reduction Co. of Los Angeles and is being operated on ores of the company's properties, the Gold Coin group of five claims and Stanford group of four claims, on the verge of the Stringer district, about five miles away. The Gold Coin has a 350-ft. shaft with five levels and 3000 ft. of underground workings. The Stanford has a 300-ft. shaft and 1500 ft. of underground workings. The ore is a siliceous quartz with values up to \$60 a ton in gold. The property is equipped with a 15-hp. Fairbanks-Morse gasoline hoist. The Red Dog mill, with a 30-ton cyanide plant, treats much custom ore. The officers of the company are: F. D. Mann, president, and J. W. Montgomery, secretary and treasurer.

The Atalia Mining Co. in last October resumed operations on its Tungsten mines at Atalia and has been shipping about four cars per month of high-grade tungsten ore. From 16 to 20 men are employed. The property is under control virtually of De Galia & Atkins, of San Francisco.

Mojave.

The Soledad mountains, about five miles away, have several good propositions and from which several hundred thousand dollars has been taken. The general formation is porphyry and rhyolite and while the appearance of the ore is similar in all of the several mines, the values are different, some being entirely in gold and others with a large amount of silver with the gold.

The Queen Esther mine has a large amount of development and a large production to its credit. The ledges of the Queen Esther are from 4 to 40 ft. wide, the ore a quartz with gold,

scarcely any sulphides and too fine for amalgamation. The process of reduction is by dry crushing and leaching at about 100 tons per day. The values are \$6 per ton. A Blake crusher and Llewellyn rolls are used. Development is by six tunnels above the mill, 1000 ft. each in length and connected by raises, all ore going to the mill from the hill tunnel and raised by hoist from the seven tunnels below the mill. S. W. Mudd is president of the Queen Esther Mining & Milling Co. and G. W. Nicholson is superintendent.

The Soledad mine was formerly known as the Karma-Ajax and was closed down for quite a while previous to October, 1908, when it was taken over in settlement of a long-pending law suit by Wm. Oothout of New York and Arnold Becker placed in charge as manager, with E. B. Smyth, superintendent. While in close proximity to the Queen Esther, the conditions are entirely different. One shaft is 160-ft. deep and a 600-ft. drift connects with the Ajax ledge. There are three 1000-ft. tunnels. On upper Ajax there is 3000 ft. of workings. Values of the ore vary from low grade up to \$300 gold with 60% silver. With depth there is an increase of gold and a decrease in silver values. Equipped with 20 stamps, seven Frue vanners and cyaniding plant. No amalgamation is used.

The Queen Esther Co. has bonded a near-by property known as the Double Standard, put three shifts to work and put down tracks from mine to mill to handle the output more conveniently.

In the Soledad mountains are the Confidence, Justice, Gold King, etc., owned by C. C. Calkins of Los Angeles. All are making a good showing with development.

Near Rosamond, 14 miles from Mojave, A. M. Collins and associates are operating a 10-stamp mill. Other properties in the same district are making a good showing.

cont...

Mining in Western Arizona and Eastern California

By W. A. ROOT.

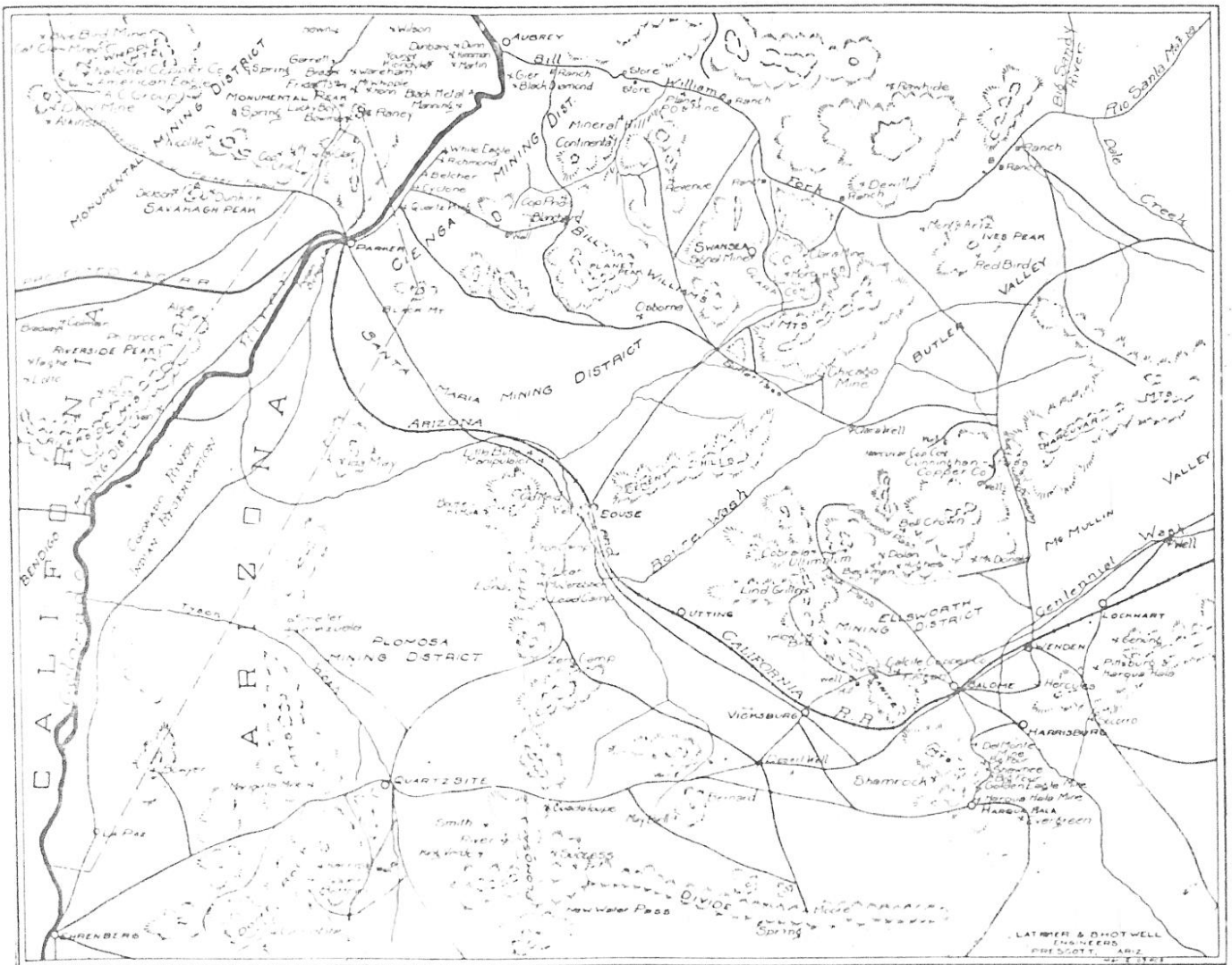
Parker, Ariz., is situated but a short distance from the Colorado river and about 60 miles southerly from Needles, Cal., upon a high mesa comprising about 40,000 acres. It is the present terminus of the Arizona & California railroad. The elevation of the broad mesa is 40 ft. above the general flow of the river, precluding the possibility of any great agricultural development until the Colorado river is dammed 6 to 10 miles northward and irrigation is undertaken.

The Arizona & California railroad has

length with 5 steel spans resting upon 6 concrete piers sunk from 65 to 110 ft. in the river bottom.

For many miles west from the river, as trips are made from Needles, are mountains of various altitudes, all containing greater or lesser bodies of minerals, the prevailing one being that of copper and, which, upon the surface, is in ledges beneath a hematite of iron-capping and all carrying gold values. Many

geles was organized August, 1906, for the purpose of taking over 10 promising copper claims in the Whipple mountains, San Bernardino county, California, situated about 40 miles south of Needles and 18 miles northerly from Parker. The surface showings, which are of two parallel ledges, give good promise. The native copper and black sulphide found in the neighboring property, the American Eagle, not 2 miles away, warrants the expectation of finding ore of the same character as in the D. & W. The perpen-



Sectional Map of Western Arizona and Eastern California.

been completed for 111 miles from Wickburg and it has been given out that rails will be laid from the river to Bengal, Cal., a distance of 90 miles, during 1909. The building of the road so far has been of great benefit to central western Arizona in point of population and in the number of new mining camps opened up. The completion of the road to Bengal will prove equally beneficial to eastern California. The Santa Fe bridge across the Colorado river, built at an expense of \$1,000,000, is 1400 ft. in

of the properties of these mountains will be greatly benefited by the completion of the railroad, by the getting in of machinery and supplies and the shipping of ores to smelters and reduction plants.

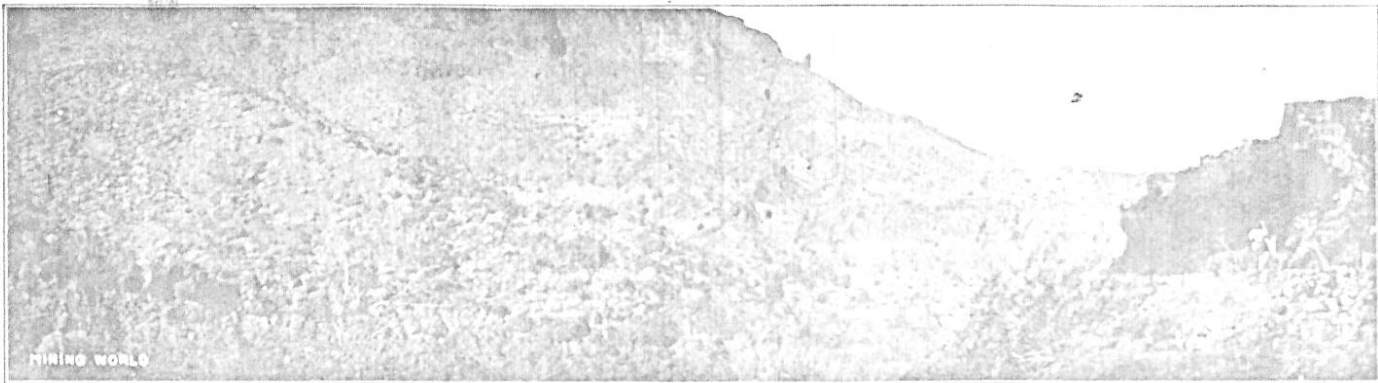
Twelve miles from the river in the Whipple mountains is the Azetic group owned by J. T. Raney, the formation of which is schist, lime and jasper on one side of the ledge and granite on the other. The ledge matter is nearly 1100 ft. in width, of red ochre and hematite of iron.

The D. & W. Mining Co. of Los An-

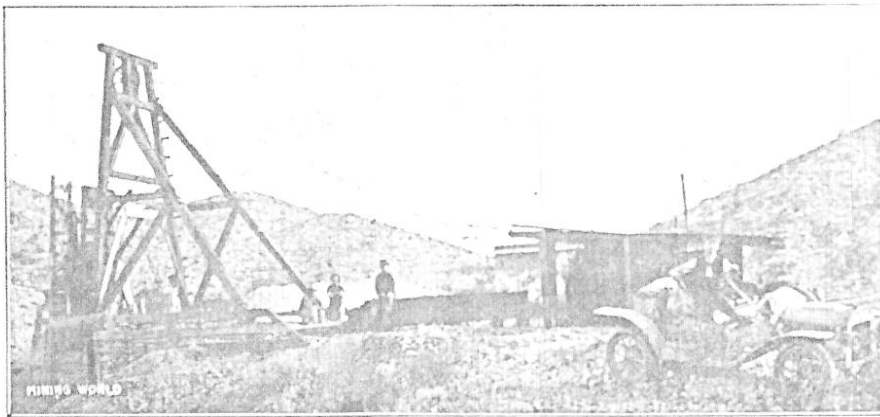
dular double-compartment shaft, down to 375 ft., and located between the two big parallel veins, will be sunk to 800 ft. unless sulphide ore is encountered sooner. After sinking to that depth levels will be established each 100 ft. and crosscuts made to encounter ore. Open cuts on several ledges show a prospect of a big low-grade copper proposition carrying gold values. The improvements consist of various buildings, 18 h.p. gasoline hoist, 42-h.p. gasoline engine for the air compressor and drills; a station and sinking pump



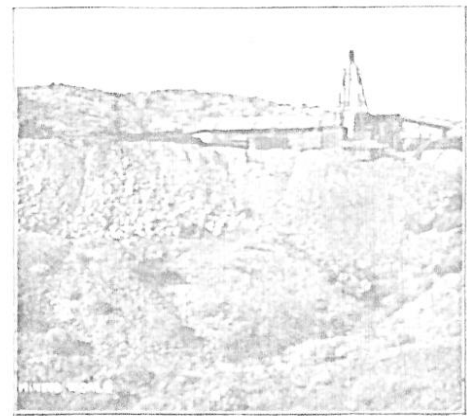
Copper Basin, Arizona.



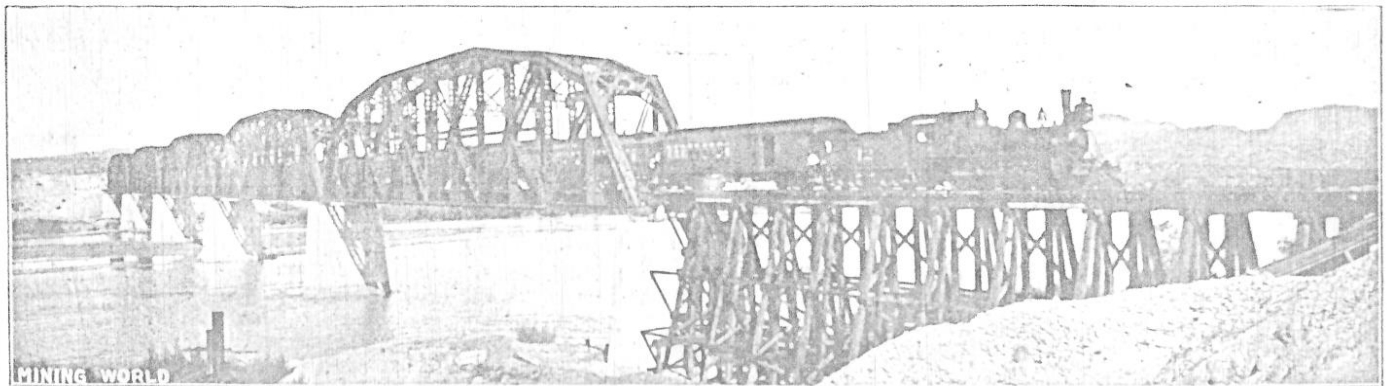
Mt. Whipple Basin, California.



American Eagle Gold & Copper Co., California.



D. & W. Mine, California.



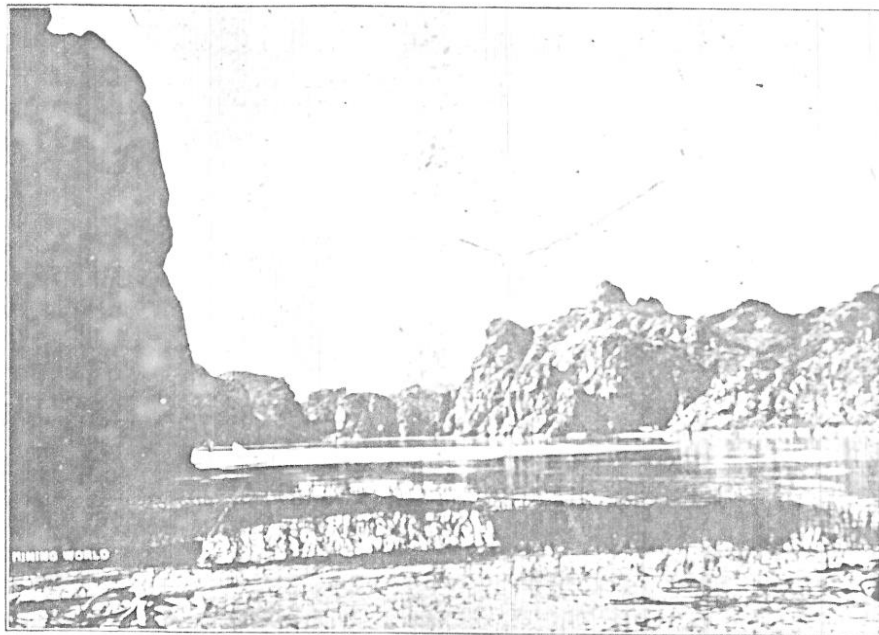
Arizona & California R. R. Bridge Over Colorado River at Parker, Ariz.

bearing quartz with values of 2 1-10 oz. gold to the ton.

The Quartz King mine is situated 5 miles east of Parker, and is on an elevation 350 ft. above the river. The ledge trends northwest by southeast and is over 1000 ft. in width, with an iron dike for footwall and lime for hanging wall. The vertical double-compartment shaft is down 300 ft. There are several levels with drifts from 60 to 180 ft. in length. Samples taken from these drifts give 9% copper and \$30 in gold. The shaft is to be driven to 500 ft. and a crosscut run north. The mine is equipped with a 60-h.p. gasoline engine and hoist; 60-h.p. gasoline engine for the 45-h.p. air compressor and drills and a 12-h.p. engine for operating a triplex plunger pump which supplies the mine and camp with water from a well 2 miles away. Theodore Bell is president and J. E. Herold, secretary.

The Billy Mack mine consists of 12

partenances. The main shaft is 300 ft. in depth and was in carbonates and oxides of copper and iron oxides all the way down. At 95 ft. water was encountered and sulphides came in. At 200 and 300 ft. crosscuts disclosed ledge matter 25 ft in width, with high-grade sulphide ore. The values are 8 to 10% copper and from \$1.50 to \$20 to the ton in gold. The main office of the company is at Needles, with A. L. Crew, president and treasurer; G. H. Berding, vice-president; H. Le Clair, secretary.



Colorado River Above Parker, Ariz.

claims, located by Billy Mack in 1880. A crosscut tunnel at 280 ft. cuts the dike at 80 ft. below the apex. Stopping to the surface netted \$62,000 and it is said \$20,000 was lost in the tailings. There are 3000 ft. of development. At various places large bodies of high-grade carbonates are to be seen and there are hundreds of tons of \$6 to \$8 quartz.

The American Eagle Gold & Copper Co. of Needles, Cal., is composed principally of railroad men connected with the Santa Fe system. The property consists of 160 acres in the Whipple mountains about 40 miles south from Needles, and in San Bernardino county, California. The ledges are true fissures crossing in a northeasterly and southwesterly direction, the main ledge being 10 to 20 ft. in width and traceable for more than 2000 ft. There are a number of smaller parallel veins. About \$20,000 has been expended in development and improvement, including a 20-h.p. gasoline hoist and ap-

and gallows frame. In February one car load of ore from various open cuts shipped to smelters gave returns of 30% copper. The building of the Arizona & California railroad from Parker to Bengai will bring this property within 5 miles of a good shipping point. The main office of the company is in the Johnston building, Los Angeles. J. W. Flink is president; Sylvester Marshall, vice-president; James F. Roach, secretary and treasurer.

Besides the American Eagle and D. & W. mines between Needles and Parker are the National Copper and Blue Bird. The National Copper is opened by a 100-ft. and a 75-ft. shaft with crosscuts from each. A gasoline hoist has been installed. The Blue Bird has a 200-ft. shaft with 700 ft. of crosscuts and drifts and equipped with a gasoline hoist and air compressor.

Thirty-six miles south of Needles and

Clure, John Hobdy and R. A. Martin have numerous claims and also have performed considerable development.

In the Riverside mountains, California, H. D. Bradley and C. Morgan own 12 claims with ledges 12 ft. in width, with values from \$4 to \$40 gold and 8 to 15% copper.

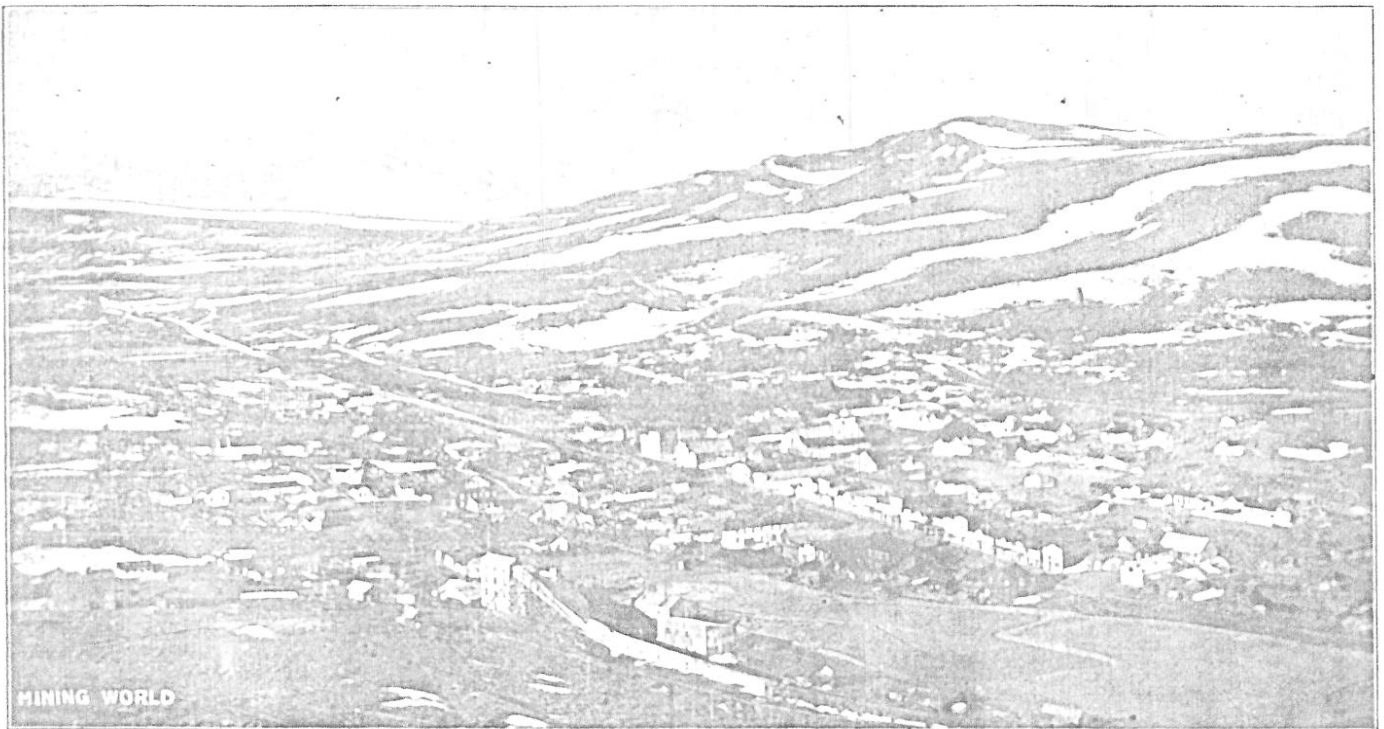
Twelve miles from Parker and 7 miles from the Colorado river is Copper Basin district, one mile in width by 6 miles long, and considered a vast network of mineralized ore veins. The general formation is lime, gneiss and porphyry, with cappings and blowouts of iron, with the mineralized rock from 30 to 150 ft. in width and traceable to the river and crossing over at Empire Flat. This mineralization extends eastward from the river to the Signal district. In these mineralizations the veins from 20 to 100 ft. apart are parallel and from 2 to 10

and copper, the latter being from 4 to 8%.

Four miles east of Copper Basin is located the 6 claims of the Parker Gold & Copper Mining Co. The ledges are from 6 to 25 ft. wide, with values in copper and gold, in a lime, granite and schist formation.

Eight miles north the Gray Eagle Mining Co. owns 10 claims developed by several tunnels, one 350 ft., and a 100-ft. shaft. This property has a body of ore 25 ft. in width with values varying from \$5 up into the hundreds in gold and 5 to 40% copper. General E. Bouton of Los Angeles is president and James H. Watson, superintendent.

The Carnation Mining Co. of Los Angeles owns in this section a group of 14 claims. A shaft is down 300 ft. and at the 200 level a crosscut has been run 60 ft. and at the 300-ft. the crosscut has been extended 60 ft., all in ore. A cross-



Birdseye View of Parker, Ariz.

5 miles west of the Colorado river, is the George Roth property of 18 claims. The ledges, trending northeasterly and southwesterly, are in a schist and andesite formation, showing a great oxidization, the ore being an iron-stained quartz with copper pyrites. It is developed by two 100-ft. shafts and considerable drifting.

Sixty miles west from Parker in the Turtle mountains and about 8 miles from the proposed railroad, J. U. Nesbit has located and performed considerable development upon a group of claims where the ledges are in granite and schist formation with values up to \$60 per ton in gold. The ore is an iron quartz. The development consists of an 80-ft. tunnel and 75-ft. shaft.

In the Santa Maria mountains 40 miles from Parker, where the formation is granite, lime and schist, and the ore copper sulphides and black oxides, up to 60% copper and \$3 to \$12 in gold. C. H. Mc-

ft. wide. The ore in gneiss is an iron quartz with gold and copper values.

The Copper Basin Mining Co. owns a group of 10 claims with 2000 ft. of development. At the bottom of the 80-ft. shaft, with 150 ft. of drifting, is a 5-ft. face of ore, no walls, that gives returns of 16% copper and \$8 in gold. Ore from this property years ago was hauled to the Colorado river and shipped across the river to Swansce.

The Mt. Whipple Mining Co. is a close corporation, Capt. J. L. Curtis and a few others, being principal stockholders. The property consists of 10 claims in the Basin district with a 1500-ft. tunnel and other development. Ore of \$98 values in gold and copper, the latter 6%, has been shipped.

The Intrain owned by Capt. Curtis, the Al. Wareham, and the Cornelius groups, are all considerably developed and give values of \$60 per ton and upwards in gold

cut tunnel, 500 ft., cuts at 307 ft. below surface, 25 ft. of ore with values similar to the Gray Eagle. George H. Watson is superintendent.

Between the Gray Eagle property and the Carnation is located the 10 claims of the Juniata Gold & Copper Co. The ledge on this property is 100 ft. in width with average values of \$20. Assays up to \$100 per ton have been secured. Development consists of a 200-ft. shaft with drifts and crosscuts. P. W. Powers is president; D. S. Patterson, secretary; T. W. Phelps, treasurer; H. B. Ailman, superintendent.

The Twilight group of 9 claims, just east of the Quartz King and northwest of the Billy Mack, and about 6 miles east of Parker, is owned by T. M. Drennan of the Colorado River Supply Co., and C. F. McMahan. A crosscut tunnel cutting the big ledge at 50 ft. below the surface shows a big ore shoot of gold-

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Jan. 13, 1912 p. 86

Silver Lake.

Frank Riggs shipped high-grade silver ore to Salt Lake smelters.

Tom Cunningham shipped 24 tons of silver and lead ore to the Needles smelter that averaged \$75 per ton.

Wilkie Garrison of Pasadena has a force of men working at Hytens camp, sacking ore that averages \$60 per ton in gold.

The Stevinson & Kleinbeck Co. at Riggs has its tunnel in 1200 ft.; the cut a large ledge 70 ft. wide, of good values, carrying from \$7 to \$10 in gold.

The Nevada Gold & Copper Co., composed of Nevada City men, is about to secure patent for their Gold King property at Hytens camp. Dr. C. L. Muller and J. M. Thomas of Nevada county are the leading spirits of this company. Many other small properties are shipping or sacking ore in this camp.

Jan. 27, 1912 p. 194

May 10.—One man was killed by a cave-in while working in a stope on the 200-ft. level of the Arondo mine, 50 miles north of Randsburg, Cal.

Jan. 27, 1912 p. 207

Inyo County.

With a gold production exceeding \$450,000, Inyo mines recorded a good season, despite lack of capital in many districts. The Skidoo Con. and Keane Wonder mines were principal producers, with a number of small properties swelling the total. Lack of finances has been keenly felt, and developments in many districts have been restricted as a result. Several deals, of fair proportion were consummated, and the outlook is generally considered excellent.

The silver yield for 1911 approximates \$200,000. The production of lead registered an increase with over 3,000,000 lbs. produced. Much of the silver came from the rich silver-lead mines developed in the Darwin and near-by districts. An important development was the closing of a deal whereby the zinc ore of the Cerro Gordo mine was worked by one company, while the gold, silver and lead ores were handled by another. Heavy shipments of zinc and silver-lead ore were made during the greater portion of the year. Several rich silver-lead mines were worked, and indications point to marked activity during the coming year.

Kern County.

Randsburg.—Considerable work has been carried on at the Yellow Aster and a fair production maintained. The prop-

erty heads all Kern county gold mines, and for years has been a consistent producer. Much of the ore is mined by the glory-hole method. Rich discoveries in the Butte, King Solomon, Little Butte and other properties stimulated interest and encouraged vigorous work. Several shoots of rich quartz have been opened at fair depth. Tungsten mining has continued to hold attention. Several small gold properties in outside districts chronicled a fair season. The gold yield for 1911 is estimated at about \$625,000, with \$35,000 in silver. This is about the same record as that established in 1910.

Feb. 3, 1912 p. 307

Randsburg.

The net billion return from the Keane Wonder mine for November amounted to \$30,000, the best record in the property's history.

The Consolidated Mines Co. is installing a 15-hp. hoist at the Good Hope mine. The shaft is down 120 ft., with the ore shoot showing values running as high as \$100 per ton. A recent shipment of 65 tons yielded \$35 per ton. The shaft will be sent deeper and drifts extended to open the vein at greater depth. E. Shippy is superintendent.

Feb. 24, 1912 p. 471

Bishop.

The Keane Wonder mill is turning out approximately \$30,000 per month, with net profits of about \$15,000. The deposits in the Whipsaw claim are reported to be showing improvement, with much of the ore mined by a modification of the quarrying system. Developments are progressing on the Big Bell group, recently acquired. It is stated electric power will be used as soon as arrangements can be made with the Nevada-California Power Co. The company expects to liquidate its \$150,000 indebtedness during the present year. Several payments have already been made.

Mar. 2, 1912 p. 522

Bishop.

The Keane Wonder Co. is devoting particular attention to the Whipsaw claim. A 200-ft. adit has intersected a strong body of quartz carrying fair values. On surface the indications are particularly encouraging. The 20-stamp mill has been operating exclusively on ore from the Keane Wonder in the past, with about 75 tons treated per day. It is stated the production during the last 6 months ranged from \$20,000 to \$30,000 per month.

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and Engineering
~~The~~ Mining World
Mar. 16, 1912 p. 616

Bishop.

The Pannamint mine, 11 miles from Ballarat, has been purchased by Al. D. Myers of Goldfield. Myers has held a bond on the mine for 9 months, during which period the property underwent a thorough inspection by John K. Turner. The property has a productive record of \$2,000,000 to \$3,000,000, and was formerly operated by U. S. Senators Stewart and Jones of Nevada. Silver values predominate, and large reserves of good-grade ore are exposed in the old workings. The mine has lain idle since 1893, owing to litigation. Manager Turner states the work of rehabilitating the property will be vigorously pushed. The nearest railroad point is Randsburg, 70 miles distant.

Operations at the Keane Wonder have been temporarily suspended pending the installation of a new cable. The old one, in use for 3 years, recently gave way, precipitating the chain of buckets into the canyon. The cable has a length of 2 miles and is employed in the transportation of ore from the mine to mill.

May 11, 1912 p. 1008

Los Angeles.

It is reported that control of the Keane Wonder mine has passed to Philadelphia people. The management has of late given out little information, but it is understood the monthly output has averaged \$20,000 from \$22 ore. The property lies on the border of Death valley and has been a consistent producer. It is stated Homer Wilson will continue as manager.

May 25, 1912 p. 1109

Los Angeles.

The extensive asbestos deposits near Randsburg were recently inspected by J. B. Thornton, representing the Western Asbestos Co. of Chicago. It is understood that the company plans activities in the district within a year.

The Skidoo Mines Co. is maintaining an approximate production of \$14,400 per month, and earning net profits of about \$1800. Nearly \$12,000 is recovered from the mill, and the balance by cyanidation. One thousand one hundred and seventy-five tons was treated in March. Ore developments are reported satisfactory.

It is probable the Standard Con. Mining Co., operating at Bodie, may commence the unwatering of the lower levels before the close of 1912.

July 13, 1912 p. 67

Parker.

The Clark copper interests have leased the Horn property in the Turtle mountains, about 20 miles southeast of here. Work on the property is to be started at once. The shaft is to be deepened and developments will be carried on in the tunnels, where excellent ore bodies have been opened.

Bishop.

Machinery for the 10-stamp mill of the Bishop Creek Gold Co. is arriving at the mine, and building of concrete foundations is about to start. Grading has been finished and the management expects to commence crushing ore before the end of summer. Eastern and English people are largely interested. Gaylord Wilshire is president.

On the Shaefer claims in the Kruger district near Keeler, rich ore has been opened near surface. Twenty-two tons running over \$95 per ton was recently shipped to the Midvale, Utah, smelter. Another consignment is being gathered. The vein is reported showing better strength as work advances. The strike has attracted attention to other claims in the vicinity.

July 27, 1912 p. 158

Riverside.

The Stanchfield Mining Co. has acquired several claims in the Palos Verdes district and plans the early installation of a mill and cyanide plant. Four shafts are under way, and several veins show which range from 2 to 6 ft. wide. The ore is largely free milling.

Aug. 3, 1912 p. 206

Randsburg.

The Four Ace Mining Co. reports the intersection of a rich shoot in the Santa Ana mine, Stringer district. About 25 tons of ore has been sacked and as soon as 100 tons is available a shipment will be made to the Red Dog mill. The Four Ace people are operating under a bond and lease. The discovery has encouraged holders of adjacent claims to press work.

The Lila C. Borax Mine at Ryan, California.

By HOYT S. GALE.*

The Lila C. colemanite mine in Inyo county, California, is situated at the eastern foot of the Black mountains of the Amargosa range, 11 miles in a due south-west course from the California-Nevada state line and 16 miles due east of the lowest point in Death valley. The settlement at the mine and mill is known as Ryan station, which is the terminus of a branch line, 7 miles long, joining the main line of the Tonopah & Tidewater railroad at Death Valley junction. Death Valley junction is on the main line of the Tonopah & Tidewater railroad, which runs from Ludlow, Cal., to Goldfield, Nev. Ryan is at an elevation of about 2500 ft., and lies at the extreme upper and western edge of the desert valley of Amargosa river at this place.

The Lila C. mine was developed by the Pacific Coast Borax Co. to replace the properties near Daggett which had been exhausted. The mine became a shipper in 1907, when the Tonopah & Tidewater railroad was completed to near this point, running north from Ludlow, where that road connects with the Santa Fe railway. The following note is quoted from the chapter on borax in Mineral Resources for the year 1906:

"The deposit at Lila C. mine is a colemanite vein known to be about 2000 ft. long and from 6 to 18 ft. wide with a very steep dip. It carries a high-grade ore that is now (1907) being shipped, carrying a boric acid content of about 40%. The development work accomplished during the last 3 years consists of about 3000 feet of shafts, drifts, and tunnels, and has blocked out an ore supply sufficient to last for years. The company will take its entire supply of crude material from this mine, shipping it to its refinery at Bayonne, N. J., and its production, according to present demands, is expected to be at the rate of 30,000 short tons of high-grade ore annually. The company looks entirely to its Death Valley holdings for the future, and its undeveloped supply is stated to be wonderfully large."

Production has been practically continuous since that time. The Pacific Coast Borax Co. also owns a number of extensive colemanite properties, situated along the south side of Furnace Creek wash between the Lila C. mine and the Furnace

Creek ranch in Death valley and elsewhere.

Nature and Extent of the Ore.—The greater part of the ore in the Lila C. mine is colemanite. It is locally described as found in three distinct beds, which are referred to as the "hanging-wall, main, and foot-wall veins." The upper two are said to be separated by about 25 ft. of strata. The principal mine workings are on the main bed. The other beds are reported as opened in some of the underground workings, but their relations are not always clear, owing to the extreme irregularity of the veins and wall rocks. That described as the "hanging-wall" bed was seen to be worked somewhat in one of the outcrop pits, and the "foot-wall" had been opened in some large stopes along the main level in the mine.

The main colemanite bed varies much in thickness, attaining 15 ft. or more in several parts of the mine. In outcrop it presents a rough crystalline appearance, in contrast with the evenly bedded shales which include it. As the outcrop is traced southward it rises in elevation toward the crest of the lava-capped ridge, the strike of the strata changing slightly. The continuation of the colemanite bed to the south, if it does extend farther than it has now been traced, is an unsolved puzzle. It may be cut off by a large mass of dike rock which apparently cuts in just about at that horizon, a little over half a mile south of the town site. The colemanite bed may pinch out or simply be offset by the transverse faults or slips. It appears from the trend of the known outcrop that its continuation would cross the crest of the ridge it extended south, but the general strike of the strata swings southwesterly with the direction of the crest, and it is assumed, without any very conclusive proof, that the vesicular lava capping this crest is interbedded with the sediments and thus marks a definite horizon above the colemanite bed, and that the ore bed might therefore be found in extension of the recognized outcrop by measuring to the appropriate interval below the lava. All of the lava rock here, however, does not belong to the interbedded flows, and this may lead to some confusion if used for tracing the ore.

All the ore beds contain clear glassy crystalline colemanite. There are occasional vugs of a chalky white mineral, reported as not breaking down with the other ore in roasting and as consequently rejected by the screening after the ore has been roasted. Furthermore, some of the ore beds contain mixture of clay fragments with the purer ore.

The colemanite occurs in massive, more or less distinctly crystalline form. The clear glassy crystals occur abundantly in the linings of the cavities common throughout the bed. These show well-formed short prismatic crystals ranging from a minute size to half an inch or more in length. These crystals are also found in radiating bunches, or show as a radiating or plumose structure in the mass of the bed. The more massive portion of the bed is in part crystalline, showing its distinct cleavage where fractured, the ore being in places more or

less mingled with earthy or shaly matter. Pure colemanite theoretically contains 50.9% of boron trioxide, 27.2% of lime, and 21.9% of water.

The best ore from the mine is hand sorted and shipped as mined, while the poorer grades are sent directly to the mill on the property, where it is roasted and separated from its waste before shipment. It is reported that the production of this mine is about 2600 tons of the ore as shipped per month, and is continuous except for about 2 months in the summer, when the works have lately been shut down on account of the excessive heat in that climate.

Mining Development.—The outcrop of the colemanite bed has been traced for about 2500 ft. by surface pits, and most of the mining development done consists of incline shafts run down on the ore from the outcrop, and also following the main bed as far as it could be traced in the various levels and stopes. There are several entrances to the mine, known as the "main shaft," nearest the mill, and in order south from the mill the "main-level tunnel," "No. 1 shaft," "No. 2 shaft," "No. 3 shaft" (now caved), and "No. 4 shaft." All the shafts are inclines either on or near the dip of the main colemanite bed. There are several levels run out from these shafts to a depth of three or four levels, including the so-called "main-level tunnel" as the first. Barometrically, the third level is less than 100 ft. below the first. The main level is said to extend about 3500 ft. underground. Most of the work in the mine is done by way of the main shaft and the main level tunnel.

Treatment of the Ore.—The best ore in the larger pieces is sorted by hand and goes to the bins for shipment in bulk; the larger part of the ore, consisting of mixed and finer material, is put through the mill at the mine before shipment.

The treatment in the mill consists of crushing and passing through rolls so that the ore is reduced to 1-in. size or finer. This is then passed through rotary roasters or kilns. The fuel used is oil, but the flame does not come in direct contact with the ore, the kiln being fitted with an inner chamber which carries the ore.

With the heat, the colemanite decrepitates, falling to a fine white flour. The temperature at the hottest point is estimated as about 1200°. The shaly particles and some portions of the ore do not break down and are separated from the powder by screening. The finer powder is sacked for shipment, the rest going out to the dump as waste. Thus, the roasted ore yields a high-grade product for shipment.

The total output of the mines is shipped direct to the refineries of the Pacific Coast Borax Co., at Bayonne, N. J., where it is manufactured into borax and boric acid.

*Abstracted from advance chapter from Mineral Resources of the United States, U. S. Geological Survey.

and Engineering
The Mining World
Aug. 10, 1912 p. 249

Los Angeles.

The report of the Skidoo Mines Co. for June is as follows: Milled, 1186 tons; time lost, 10 days; value of bullion produced, \$11,348.95; value of cyanide production, \$5,693.69; total receipts, \$16,952.64; cost of development, \$1399; cost of operation, \$7819.40; net profits, \$7734.24.

Bishop.

Charles M. Schwab and associates have commenced developments at the Loretta copper property, on the west side of Eureka valley. The group comprises claims covering an area 3000 ft. wide and over 2 miles long, and has been under intermittent development since 1896. Developments include two upper adits and an 865-ft. shaft. The main vein ranges from 30 to 80 ft. wide with numerous rich streaks running about 3 ft. wide. The ore of the larger deposit is said to range from 4 to 5% copper and \$3 in gold, while some of the richer streaks run as high as 50% in the red metal. Large reserves have been developed on the 400-ft., 550-ft. and bottom levels, and the company is arranging to send the shaft deeper and conduct more lateral work. The ore is siliceous, with some iron evident. The company has arranged with the Nevada-California Power Co. for the receipt of electric power and a 100-hp. electric hoist will be employed in place of the 25-hp. distillate engine now used. About 20 men are at present working, and it is expected to more than treble the force within a short time. The management has several plans for ore reduction under consideration, but it is probable a smelter will be erected near Oasis. As the mine lies in a fertile territory no attempt will be made to smelt ore at the property. It is understood \$2,000,000 has been set aside to conduct developments and install equipment. John G. Kirchen of Tonopah is manager.

Aug. 24, 1912

Randsburg.

The Placer Gold Mining Co. has acquired a group of gravel claims near the

Baltic mine, and has installed a concentrating plant. The placers have been extensively developed and carry gold and tungsten, but in the past a comparatively low rate of recovery has been attained. The new plant is particularly designed to save the elusive tungsten contents. The company is composed largely of Los Angeles people. Colonel E. Dunham is president, and J. R. Metcalf secretary.

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Developments at the Butte mine continue satisfactory. The Shipsey lease has 50 tons ready for shipment to the Red Dog mill. James Delaney and S. P. McKnight have taken a lease on the west end of the property and are driving from the 120-ft. level. The ore showing is improving. At other points on the Butte lessees report good conditions.

The Consolidated Mines Co. is pushing developments at the Good Hope claim. The shaft has gained a depth of 250 ft. and from the 200 and 250-ft. points east and west drifts are being extended on the ledge. A good body of ore is in evidence. In July 54 tons of ore averaging \$51.40 per ton was taken from these drifts.

Aug. 13, 1912 p. 398

Randsburg.

The Four Ace Gold Mining Co. is opening a small vein of rich ore on the 250-ft. workings of the Santa Ana mine. About 40 tons is ready for shipment. The Shipsey lease on the Butte recently milled 42 tons of ore and extracted \$6560. The ore was taken from the 250-ft. and surface levels.

Sept. 14, 1912 p. 506

Recent Mining Incorporations.

Big Chief Mining Co. Capital stock, \$1,650,000. Offices, San Bernardino, Cal. Incorporators, Hart, Cal., and Goldfield, Nev. Incorporators, Geo. A. Foster, Wm. L. Foster, Elmer Rogers.

Katy C. Mining & Milling Co. Capital stock, \$5,000; par value, \$1. Offices, Joplin, Mo. Incorporators, Hugh Friel, Jesse Phillips, Galena, Kans.; Wallace Phillips, C. C. Playter, Joplin, Mo.; H. S. Cook, Webb City, Mo.

Southwestern Mines Co. Capital stock, \$1,250,000. Property located at Hornsilver, Nev. Offices, Goldfield, Nev. Incorporators, C. B. Zabriskie, B. F. Edwards, Thor Thorkildsen, S. H. Brady, who will be general manager.

Mining and Engineering World
Sept. 21, 1912 p. 538

Los Angeles.

The Republic Smelting Corporation has been organized with a capital of \$7,500,000 to operate a group of copper properties 6 miles from Calzona, on the Parker branch of the Santa Fe railroad. Included in the holdings are the properties of the Calzona Copper Co., Corem Mining & Reduction Co. and Steece & Martin Co. The entire acreage involves 65 claims and it is asserted large reserves of ore assaying 4 to 5% copper are exposed. It is intended to erect a 1000-ton smelter in the near future and to operate the properties on a broad scale. The smelter is also planned to afford a market for custom ores. The properties lie in the Riverside mountains. F. C. Fenner is president and Rely G. Munn, secretary. The main office is in the Story building, Los Angeles. J. A. Chestnut is general manager; W. W. Wishon, consulting engineer; S. J. Gormby, metallurgist, and A. L. Engledow, superintendent.

Oct. 12, 1912 p. 677

Los Angeles.

The August output of the Skiddo Mines Co. totaled 1142 tons of ore, valued at \$17,613. Operating and mining costs amounted to \$8089, leaving a net profit of \$9545. Because of the excessively hot weather and other climatic disadvantages the mill ran only about 20 days. Vigorous developments are under way in the mine with results reported satisfactory. The advent of cooler weather is expected to result in a heavier monthly yield.

The Foreign Mines Development Co., London, has commenced work at the Borax Lake group of mines. The deposits cover 40,000 acres of unpatented lands in San Bernardino county and 800 acres in Inyo county. The properties have been affected by litigation for several years. The new owners have secured four traction engines to aid in transporting the material. The main holdings lie near Searles.

Good ore is coming from the Merced mine, in the Stringer district, a short distance from Randsburg. On the 235-ft. level 12 in. of milling ore has been intersected and shows well under development. Some of the quartz assays \$50 to \$200 per ton. Twenty-five tons have been recently extracted and are about to be crushed at the Sunshine mill. Thomas Atkinson and C. J. Wiklund are interested.

Loraine.

Conlin brothers of Los Angeles and Bartlesville, Okla., have purchased and are operating the following groups of properties located in Caliente canyon, Kern county: The Gold Peak group, with the 10-stamp mill and complete cyanide plant; the Krames Con. group; the Cowboy and Cowboy Annex, on

Oct. 19, 1912 p. 722

Randsburg.

Seventeen claims in the Panamint range, near Ballarat, have been merged into the Panamint Con. Mining Co. Twelve claims contain gold-bearing deposits, in the balance largely silver and lead predominate. Arrangements have been completed for active developments. P. A. Busch is manager.

Oct. 26, 1912 p. 770

Barstow.

The United Greenwater Copper Co. is pushing developments at the Supply and O. K. mines, near Dale. The Supply shaft has been sent to 1000 ft. while the O. K. has been deepened to 700 ft. Re-

timbering is under way at the Supply shaft preliminary to installing a 2-ton skip. A 50-ton cyanide plant is being installed. The management reports a good reserve of milling-grade ore in sight. Eastern people are prominently interested. John McGee is manager.

The mill of the New Eldorado, has been running part time during the summer. Water shortage has greatly handicapped work. Twenty-five dollar ore is handled, with all the quartz coming from the 100-ft. workings. The shaft is down 300 ft. but no ore has been stoped below the 100-ft. point. Lessees are working the mine, which lies about 40 miles northeast of Indio.

The Desert Mining Co. is operating the Edie placer property, 7 miles southeast of Kramer. MacCartney dry-washing machines are employed and good results are reported. The claim has been extensively prospected and the gravel carries a good gold content.

The Gold Peak mine and Cowboy and Cowboy Annex claims near Loraine, Kern county, have been taken under bond and option by the Conlin interests of Los Angeles and Bartlesville, Okla. The Gold Peak is situated in Caliente canyon and has been extensively developed. The veins are small but carry a fair gold average. The Cowboy claims have been worked along narrow lines, but some good ore is exposed. Ore from the three properties is being treated at the Gold Peak mill.

Mining and Engineering World
Nov. 2, 1912 p. 816

Randsburg

The September output of the Good Hope mine totaled \$7000 from 80 tons of ore. The October record is expected to be larger, as the vein shows increasing dimensions as depth is gained with values uniform. The shaft is down 300 ft. and is being sent deeper. The company is also vigorously developing the Galveston and Twin Brothers claims. It is reported the management has arranged for the early installation of a mill and considerable mine equipment. The operators on the King Solomon are about to make a shipment to a local mill. Sixteen tons of high-grade milling ore is stored in the bins and on the dump. The Butte mine is showing fair values and a shipment is being prepared. A number of claims are receiving renewed attention.

Nov. 2, 1912 p. 801

Plans of the Republic Smelting Corporation.

By W. W. WISHON.

J. A. Chestnut of Colorado, and F. C. Fenner of Bisbee, have secured mining property in the extreme eastern portion of southern California, upon which they are now developing copper-gold veins. They have organized a corporation under the laws of Arizona and interested with them a number of eastern capitalists.

The property comprises 45 lode claims, 13 mill sites, 640 acres of placer, in the East Riverside mountains, and skirting that range in the Colorado River basin, 8 miles from Calzona, a station on the recently completed Santa Fe cut-off from Los Angeles to Phoenix, via Cadiz. Therefore this particular section was accessible only by steambot from Yuma, in fact, a complete smelting outfit consigned to the Calzona mines group of this corporation was sunk in the Colorado river in sight of the mines, some years ago. Since the building of the railway this section has reported numerous discoveries, and prominent mining men have undertaken development of properties here; more particularly the development of the Horn mines, in the nearby Turtle mountains, by Senator Clark's United Verde Co.

This mining district is known as the Bendigo. The groups thus far controlled by the corporation are: the Ox Bow, Gold Dollar, Jack Knife, Jack Knife Extension and Calzona Mining Co. The smelter site adjoining the Calzona mines property is amply supplied with water from the Colorado river, with but a 200-ft. lift, and will be connected with the Santa Fe railway by a branch railway line $5\frac{1}{2}$ miles in length, as per survey just completed.

The properties are inclosed within an area of from 6 to 7 sq. miles which, with other well-mineralized sections within a radius of from 20 to 30 miles, are expected to contribute in supplying custom ores. The mountain uplift, which has been scored by deep ravines, proves the core a gneissoid schist of pre-Cambrian age, upon whose flanks lie beds of carboniferous limestone; the bedding planes of the schist have formed ducts through which the mineralization solutions descended and were redeposited at great depth, as revealed in the workings of the Silver Dollar tunnel, 125 ft. in depth, and the Jack Knife workings of 100 ft. in depth, whose difference in altitude, however, is 1000 ft. These two veins, while approximately of the same strike of northeast dip toward each other, and are intersected by porphyry cross dikes. There appears to be, in fact, two fault systems, the mineralization occurring in the secondary. It is proposed to sink a 1500 ft. vertical shaft between the two veins mentioned, from which both veins may be exploited at depth.

The writer took samples from the workings of the Jack Knife group which showed in a general average width of 20 ins.: copper, 12.8%; gold, \$7.80.

The two tunnels being driven on the

Silver Dollar group show encouraging values in copper and gold in goodly widths.

The Calzona mines group of this corporation have been exploited by numerous tunnels, and by 150-ft. shaft, under the direction of their consulting engineer, James W. Neill, in the nature of preliminary, systematic development. The large ore dump at the shaft is high-grade in iron, with low copper and gold values; evidently the leached portion of the commercial ore bodies that will be encountered in further depth have left behind a splendid smelting flux, with but the addition of sulphides. These are confidently expected in great depth in abundance.

The Republic Smelting Corporation believes it has highly promising properties which, owing to the encouraging values thus far found, should produce several large paying ore bodies. The corporation is fortunate in having a splendid water supply afforded by the Colorado river at its very door. Power will most probably be secured by utilizing the cheap fuel oils of the nearby California fields. A central power station will most probably be installed on the smelter site, and distributed to the several mining properties by electrical transmission. It is proposed that the smelter will be supplied with the ores from the different properties by aerial tram, for which the topographical conditions are satisfactory.

The corporation has obtained the services of S. J. Gormly as metallurgist for the proposed smelter, which will be built on the most modern lines.

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Mining and Engineering World
Nov. 2, 1912 p. 801 (cont.)

The corporation is capitalized for 750,000 shares of a par value of \$10 each, the entire amount being placed in the treasury. The principal office is at Parker, Ariz., with branch office at Los Angeles. The directors are F. C. Fenner, J. A. Chestnut, S. J. Gormly, A. Engeldow, R. G. Munn, James E. Kelly and W. J. Robinson. The officers are: F. C. Fenner, president; J. A. Chestnut, vice-president; R. G. Munn, secretary; W. J. Robinson, treasurer.

Nov. 9, 1912 p. 858-859

San Bernardino.

The Seal of Gold group of gold-quartz mines, Dale district, has been leased to the United Greenwater Copper Co. by H. A. Landwehr for a period of 49 years. The company has an option to purchase for \$2,000,000. The group embraces the O. K. and Supply mines, both of which have been developed to a considerable extent. Litigation among stockholders has affected the properties for years, and it was only recently that the case was decided by the supreme court in favor of Landwehr. The leasing company is a subsidiary of the Greenwater Mining & Smelting Co. The estate comprises 50 claims.

Natural Resources and the Federal Government

By R. W. Raymond.*

Under the names of Conservation, Social Justice, the New Nationalism, and Progressive Democracy, many earnest reformers are calling for a new system of federal government to replace the one which they ascribe to our fathers, and declare to have been outgrown. They are proposing the lease by the United States of certain natural resources on the public domain, for the profit of the U. S. Treasury, instead of the sale of such resources to private citizens or associations of citizens. I shall try to show that this notion is neither new nor good.

It is clear that the United States is owner, as well as sovereign, of public lands acquired through conquest or purchase from other nations, as it was owner of the public lands expressly ceded to it by the original 13 states. Its policy with regard to such lands involves, therefore, two entirely distinct questions: What shall it do as owner, and, what shall it do as sovereign? The latter question, it must be confessed, has played but a small part in our history. All the prerogatives of sovereignty which were not explicitly conferred upon the federal government by the original states were retained by them. The ownership or control of precious or other metals or minerals in the earth, for instance, was thus reserved to the several sovereign states—New York, South Carolina, and other states have passed laws on this subject, without regard to federal authority. As new states have been successively admitted to the union, the tacitly accepted theory has been, that they thereby acquired all the reserved rights of the original states. These newer states largely outnumber the first 13; and it is inconceivable that they would submit to any deprivation of sovereignty based on historical grounds. One of them—Texas—came into the union by its own voluntary act, as an organized commonwealth, already owning the whole of its territory; and Texas has always had its own land laws, agricultural and mineral, without regard or subordination to those of the United States. In other words, the United States, not being the owner of lands in Texas, has not asserted, on the ground of sovereignty, any right to the ownership or control of the agricultural, mineral, or dynamic (water power) resources of that state. Since any proposition putting the states of the union on any other basis, and determining on historical grounds the sovereign rights of each, would be absurd, we may assume that all the states possess the same sovereign rights as Texas, and that the federal government can constitutionally control within their borders only the administration of its own property.

This limit has been, in fact, carefully observed hitherto in federal legislation. The U. S. "mining laws" are not, strictly speaking, mining laws at all. They are simply statutes regulating the disposal of

*Transactions of the American Institute of Mining Engineers.

mineral lands belonging to the federal government; and they leave to local authority the regulation of the industry of mining itself. All put together, they affect nothing but the title derived by the miner, as tenant or purchaser, from the United States as owner.

With regard to the mineral resources owned by it in existing states, or in territories which are destined to become states, the policy of our government hitherto has been, since 1866, to treat such natural resources as the prospective property of the citizens of the states within which they are located, subject to the regulation, control, and taxation by those states; and the lands containing such resources have been either conveyed outright to the states concerned, or sold to individuals, to be thereafter controlled, as to their development, by the local governments.

The first public domain of the United States was acquired by cessions from some of the original 13 states, covering what is now Tennessee, Illinois, Indiana, Ohio, Michigan, Wisconsin, that part of Alabama and Mississippi lying north of the 31st degree of north latitude, and that part of Minnesota lying east of the Mississippi. Nearly all the public land in Tennessee was absorbed by the claims of North Carolina, and the remainder was subsequently ceded by the United States to Tennessee. The rest of the territory granted by the states and federal government included our first public domain, together with lands already owned by private persons."

The first federal legislation concerning the mineral resources of the public domain is found in the famous ordinance of 1787, concerning the Northwest territory (comprising what is now Ohio, Illinois, Indiana, Michigan and Wisconsin), which provided that one-seventh of the land should be given to the soldiers of the continental army, one-seventh reserved to the United States, one thirty-sixth set apart for the support of schools, and the rest allotted to the states "*pro rata*," and sold at auction by the state commissioners, who were to give deeds, excepting and reserving to the United States one-third of all gold, silver, lead and copper mines. The same reservation applied to the bounty and school lands also.

I do not propose to trace here the further course of this legislation, or the history of the Northwest territory, out of which Ohio was carved in 1800, Michigan territory in 1805, and Illinois territory in 1809, leaving (under the name of the Indiana territory) what became in 1816 the state of Indiana. Nor is it necessary to discuss here the Louisiana purchase of 1803, or the question whether Idaho, Washington and Oregon were acquired by that bargain, or belong to the United States by virtue of the discovery of the Columbia river by Capt. Gray (1792),

the exploration of Lewis and Clark (1805), the settlement of Astoria (1811), or the cession of "the Floridas" by Spain (1819).

In 1807, congress enacted that the lead mines in the Indiana territory (then comprising Indiana and Illinois) should be "reserved for the future disposal of the United States;" that any grant by the United States of a tract in which a lead mine had been previously discovered should be considered fraudulent and void, and that the president was authorized to lease for not more than 5 years any lead mine which had been or might thereafter be discovered in the said territory.

This act inaugurated the policy of leasing the public mineral lands. The leases executed under it covered tracts, at first, 3 miles and afterwards 1 mile square, and required the working of the mines with due diligence, and the return to the United States of 6% of the ore mined.

This policy was continued for 40 years, uninterrupted by any further legislation, except the Act of June 26, 1834, creating an additional land district in Wisconsin, which authorized the president to offer for sale certain public lands, "any law of congress heretofore existing to the contrary notwithstanding." Many acts between 1807 and 1834 had dealt with the pre-emption and disposal of public lands; but nearly all, if not all of them had continued the reservation of 1807 as to lead mines. But this Act of 1834, expressly nullifying previous reservations, seemed to permit the pre-emption and acquisition of the lands which it specified, whether they contained lead mines or not. At all events, this was the plea of the defendant in the case of *U. S. vs. Gear*. In that case, decided in 1845, the U. S. Supreme Court held defendant guilty of trespass, on the ground that the reservation not expressly contained in the act of 1834 was to be regarded as a part of it, because it had been for many years the consistent policy of the United States, and could not be set aside by inference from the terms of a law, the declared purpose of which was simply the creation of a new land district. In a previous case, the court had said in 1840:

"It has been the policy of the government, at all times, in disposing of public lands, to reserve the mines for the use of the United States."

The decision in the *Gear* case was reaffirmed in *Cotton vs. U. S.* (11 Howard, 229), which applied the same principle to the cutting of timber upon public land, declaring that, as the owner of the land, the government had the same rights as an individual owner to protect its property.

The constitutionality and equity of these decisions cannot be seriously questioned. They rest upon the ownership by the United States of the lands concerned, and therefore upon the common law right of a holder of the complete title—not upon the prerogatives of a sov-

erign. Yet there is, as Curtis H. Lindley says, no doubt that the reservation of part of the product of certain kinds of mines—for instance, in the ordinance of 1787, above cited—was suggested by the similar provisions in the Crown grants, upon which the titles of the original states were based. We do not find, however, that these regalia, or rights of the sovereign, as distinguished from the rights of the land owner, were ever seriously enforced. The policy of the government, so plainly adopted in 1787 and 1807, was applied to its own lands only.

It is interesting to note in passing that the doctrine of sovereign rights over mines has been at least twice asserted by single states against the United States, and not without some appearance of logical force. For, if the United States, being at once a land owner and a sovereign, does not possess, or has waived or ceded, its claims in the latter capacity, then, in the former capacity it can be dealt with by the sovereign state, like any other private land owner. Thus it was held, in 1853, by the courts of California, that the state, by virtue of its sovereignty, enjoyed all the *jura regalia* belonging, under the common law, to the King of England. The doctrine appears to have been that, whoever owned the land containing the mines, the sovereign only could control their operation. In the case of California, such a sovereignty could not have come from the King of England and must have come through the King of Spain and his assign, the Republic of Mexico, the rights of which had passed, through conquest, to the United States. The only ground of California's claim must therefore have been, that by its admission to the union it became a sovereign state, clothed (from whatever source) with the rights enjoyed by the original 13. Whatever merit this claim may have had, it was subsequently abandoned by the California courts.

But a similar doctrine was apparently followed by the legislature of Michigan, in its Act of April 28, 1846, which declared that property in all mines of gold or silver, or of other minerals containing gold in any proportion, is vested in the people of the state of Michigan by virtue of their right of sovereignty. Since the federal land laws applied to public lands in Michigan until 1873, this assertion of "sovereignty" over certain mines, if extended over such lands, could be based only on the theory that the sovereign rights of the original states which ceded to the United States the territory out of which the state of Michigan was subsequently segregated were somehow held in trust by the United States, and afterwards tacitly re-conveyed to the state at the time of its admission to the union. No conflict having arisen under this claim between the state and the federal authorities, it may be regarded as practically settled that neither party now asserts "sovereign" as distinguished from proprietary, rights to mines.

The policy established in 1807, of reserving from sale, and holding and leasing, the public mineral lands was, as I have said, maintained for 40 years—a considerable period, in view of the total length of our country's history.

In December, 1845, President Polk, in his first annual message to congress, reported that the results of the leasing of mineral lands had been in every respect unsatisfactory. The revenue to the government had been less than one-fourth the expense of administration; litigation and wasteful mining had been promoted, etc.; and he recommended the abandonment of the system. In 1847, this recommendation was adopted by congress, and the long experiment of leasing public mineral lands came to an end—not to be revived until, after more than 60 years, it was proposed as a new idea by a generation which had forgotten the experience of the fathers.

The discovery of gold in California, and the consequent rush of many thousand adventurers into the unsettled and unsurveyed territory acquired from Mexico by the treaty of Guadalupe Hidalgo, put a new face upon the question of federal ownership and sovereignty. The pioneers who thronged to the gold-bearing gulches not covered by any asserted private ownership were clearly, according to the previous decisions of our supreme court, trespassers upon the property of the United States; and, in all conflicts of title among them, the superior title of the United States would theoretically operate as a bar to such "equity" remedies as writs of injunction or ejectment. But the greater part of the disputes over mining titles in those regions involved just such remedies; and it was difficult to see, where both parties were trespassers, how one could ask protection against the other.

The courts solved this difficulty in a summary and sensible way, by leaving out all consideration of the superior title of the United States, and adjudicating the relative rights of possessory claimants to public mineral land, with the tacit proviso that the rights thus declared were subject to any future action on the part of the real owner. Under this *modus vivendi*, the treasures of the Comstock lode and of many other rich deposits were claimed, fought for, and won by individuals or corporations which had no original title to them, but only, according to local regulations, a better claim than their antagonists. Yet these regulations were made by communities of trespassers, without regard to the superior authority of the federal landlord.

This curious situation lasted until 1866, when congress passed an Act, declaring the occupancy and exploration of the public mineral lands free to all citizens, and confirming the rights which had been acquired in these lands under local regulations. In other words, the United States ratified whatever had been legally done without its assent, and agreed that its silence should be, within certain limits, interpreted as consent. This Act was confessedly crude and imperfect, and it was found to be particularly objectionable, in that it did not provide, either through possessory occupation and development, or through purchase and patent, for the protection of the occupant of a piece of mineral land (whether as tenant or as grantee of the United States) against predatory explorations and exploitations of his location. It was "the

lode" only, with its "dips, spurs, and angles," which was granted under this law. And, since the law recognized the conditions of title imposed by "local regulations," and the one universal condition of such regulations was priority of discovery and location, this became naturally the basis of possessory title.

It was not until 1872 that "the Law of the Apex" came. This was a crude attempt to remedy the defect of the Act of 1866, by protecting the occupants of mining claims against piratical trespass, through the grant to them of a right to the land, as well as the "extralateral" right. Unfortunately, these rights were made dependent upon a new and previously unknown condition—the "apex"—and subject to the similar rights of any neighboring "apex."

It is unnecessary to dwell here on the positive and negative defects of this law. It was a great mistake to make mining titles dependent upon future geological developments. The statute created greater evils than those it was designed to cure. And, in my judgment, it will never be too late to repeal it, and to substitute the simple and logical system followed by all other nations and by the majority of the states of the union.

Nevertheless, the Acts of 1866 and 1872, however defective and mischievous they may have been, possessed one feature, which their faults did not nullify: namely, they invited the exploration and occupation of the mineral public lands, and thereby stimulated a development unparalleled for rapidity and extent. This result would have been equally remarkable, and still more satisfactory, if the liberal policy of the United States had been so exercised as to give safe and definite titles to the occupants and purchasers of its mineral lands. The circumstance that a tenant or grantee of the government was liable to an interminable risk of losing title, by reason of geological developments concerning the "apex" of his lode, would not seem, at first glance, to be an additional encouragement to his enterprise. Still, it must be confessed that, during the period between 1866 and 1872, and for some years after the latter date, the "extralateral right" attached to a mining location was so attractive to prospectors and possessory owners as to counterbalance the two great statutory evils—namely, during the first period, the total lack of protection of the claim owner against trespass upon his claim, and during the second period, the uncertainty of title caused by basing all the locator's rights upon the location and course of the "apex" of the located lode, without regard to the first discovery thereof. The positive grant of the "extralateral right" loomed large in the eyes of the prospector and his assignees; while the precarious conditions of that grant, and the express reservation of the corresponding "extralateral right" of a neighbor—raising questions which could only be settled by litigation, future development, expert evidence, etc., during which the United States would simply stand back, and let its grantees fight out for themselves the exact meaning of its grant—were not realized at once as real defects

of title. These defects in our mining law have cost American citizens many million dollars. Yet, in spite of this huge, unnecessary handicap (imposed without the least benefit to the government), the policy of transferring the mineral public land to individual ownership upon terms so liberal as to amount practically to a gift, has resulted in the creation of a new empire, west of the Rocky mountains, with a rapidity unprecedented in human history. I think no one would venture to dispute the proposition, that, through its homestead law, its mineral land laws, and its grants in aid of transcontinental railroads, the United States has built up a new, rich, loyal western realm, which could never (or only after much longer processes) have been established in any other way.

It is now proposed to abandon the policy which has produced such results, and to revert to the plan which so conspicuously failed a century ago. The reasons for that failure still exist. The causes which produced confusion, corruption, and waste before are even more likely to produce them today. It is not easier to administer the mineral deposits of Alaska than it was to manage those of Illinois. It remains as true as ever, that the wealth, prosperity, and loyal union of our states is best served by placing their natural resources, as rapidly as possible, in the hands of their citizens, subject to local taxation and regulation. We have discovered no new principle in democracy which nullifies Spencer's famous declaration that a democracy is the worst form of government for doing those things which no government ought to do.

The following propositions concerning the proposed policy are submitted with considerable confidence:

1. It is never desirable, even though it be sometimes necessary, that private enterprise should be subject to governmental interference or competition.

2. If any government in this country must thus interfere, it should be the local (municipal or state), and not the federal, government. Among the many arguments for this proposition I may mention a few.

a. As a matter of statesmanship, the federal government cannot afford to put one state (or territory destined to become a state) on a different basis from others; and since it cannot legally administer the natural resources of New York or Texas, the attempt to do so in Idaho or Alaska would be unwise. This point I have already discussed.

b. It is a well-known teaching of experience that the government dealing with local interests and industries should be, if possible, a local government, easily watched and reached by the citizens affected. A central government attempting to perform such local supervision invariably fails to do that work well, and incidentally falls short of vigilance and efficiency in the functions more properly belonging to it. Take, for instance, the administration by the British Parliament of the internal affairs of Ireland, Scotland, Wales, and England, as well as India. The case is plain: Parliament has too much to do, and consequently delegates to committees and departments the

work for which it is nominally responsible. Another instance may be found in the government by congress of the District of Columbia, which receives perfunctory attention at a couple of sessions during the whole term. The necessary result is that the affairs of the District do not receive the vigilant attention and public discussion which they would get from a district legislature, not burdened with the management of national, international, and colonial questions, and the manufacture of party ammunition for presidential campaigns. Moreover, the actual and necessary business of the national government is neglected by those executive departments which are loaded with extra-constitutional duties. Administrations seldom claim much credit for the fearless exposure of long-continued department abuses which, in fact, they could have prevented if they had not been so much occupied with other people's business that they neglected their own.

3. Of all the methods of governmental administration of natural resources, that of leasing, as now widely advocated, is the worst. I refer to the system of short leases (the term usually mentioned being 25 years), coupled with the requirement of continuous operation. I could ask no better illustration than the history of the Pennsylvania anthracite region. In his paper on Alaska Coal Land Problems, Mr. Bain gives a summary of this history, which candidly confesses the beneficial effects wrought by the large corporations, so often ignorantly denounced. But he omits to mention the greatest cause of the confusion and waste which those corporations reformed, namely, the system of short leases prevalent throughout the anthracite region. No amount of stipulation, regulation, and inspection can make it the interest of a lessee to spend money on improvements for the benefit of his successor; to put up, at extra cost, machinery and buildings for permanent use, after his term; or to sacrifice immediate profit in favor of technical efficiency and economy. And no amount of governmental pressure can be reasonably or practically applied which will make a mine tenant do as much for conservation, scientific improvement, etc., as he would voluntarily do if he were the owner of the mine.

This is peculiarly true of coal mines. I notice that the advocates of a leasing system always propose to bind the lessee to operate continuously; yet this condition is fatal to economy. Mr. Parker, who has observed the evils of hot competition in the bituminous coal mines, thinks the government should interfere by ordering those mines to be shut down which do not pay! But why do they go on, if they do not pay? Doubtless because their owners would rather sacrifice some money for a while than incur a greater loss by stopping short. All sorts of reasons make a man go on for a while in a losing business; and operators possessing large capital can often afford to do so, for the sake of a more profitable future. But to make the title to the property depend on its continuous operation is to put large and small capital into common ruin, and to ordain deliberately

the waste of natural resources. If government leases were granted for very long terms, and (like many private mine leases) could be held by annual payments during periods when the mine was not worked, this objection would be measurably met. But that would be practically granting ownership of the mines—which is what wisdom and experience recommend, and not what our reformers want.

4. Why do we not hear of the leasing of gold, silver, and copper mines, and of agricultural lands? The argument for these applications of the system would be equally strong. I fear the reason for its conspicuous absence is, that coal mines require capital, and that capital is an easy mark for destructive attack. But, as has often been observed, capital does not fight, except when cornered. As a rule, it runs away.

This, I think, will be the probable end of the cycle into which we are entering. If we try this new system, which is not new, we shall find, as was found three generations ago, when it was new, that it is not good; and we may then be content to try once more the old-fashioned road on which our nation traveled to greatness. The men who laid out that road "did not foresee," we are often told, the development of the vast region of the future through which it was to lead. But they were skillful surveyors; they knew where the road should be placed—and historians tell us that roads are the most permanent works of man!

Uranium and Its Uses.

There is considerable popular interest in uranium in the United States on account of its connection with radium, the properties of which appear so marvelous when compared with those of more familiar materials. But very little uranium is mined in this country except as it is incidentally taken out in mining carnotite for vanadium, according to the U. S. Geological Survey. In 1911 the uranium mined amounted to about 21.2 tons. A few hundred pounds of pitchblende was mined from the German mine, at Central City, Colo., but this material was not sold, as it was said to have been used in experimental work. The extraction of radium has been attempted in the United States by several persons and firms. Some of these have given up their efforts, but others are still at work, with what success is unknown.

The uses of uranium and its compounds are comparatively few. It is employed principally for making yellow glass, for yellow glazes on pottery, and in a less degree as a chemical reagent. Yellow glass made with uranium oxide is known as "opalescent." Direct light shining through it gives a yellow color and indirect light a greenish yellow. Some of the firms which have attempted to use uranium in the manufacture of steel have abandoned such experiments, the claim being made that it apparently imparts about the same properties as tungsten and is very much more expensive.

Chalcopyrite, or copper pyrites, is the double sulphide of copper and iron having the composition CuFeS_2 .

Mining and Engineering World

Nov. 23, 1912 p. 961

Randsburg.

A shoot of \$40 ore is reported intersected on the 236-ft. level of the Good Hope claim of the Consolidated Mines group. Drifting is under way. The main shaft has reached a depth of 300 ft. and connections have been established with the old Kenyon shaft by a raise from the 135-ft. level. A shipment of ore was recently made to the Red Dog mill, and one battery of the plant is devoted exclusively to the quartz.

A 25-ton shipment of ore from the Teagle-Lamberson lease on the King Solomon to the Red Dog mill yielded \$1100. The quartz came from the 75 and 125-ft. levels. The shoots are reported showing uniform size and value with developments and another shipment is to be made shortly.

Dec. 7, 1912 p. 1055

Bishop.

The Tecopa mine, near Resting Springs, has been taken over by L. D. Godshall, and a large force of men will be employed shortly. The ore carries gold, silver and lead, together with considerable iron. Commercial values average around \$8 per ton. The ore will be shipped to smelters near Salt Lake.

It is reported the Tonopah & Tidewater Co. is considering the extension of a branch railroad from Silverlake into Death valley to develop the salt resources of the district.

Dec 14, 1912 p. 1100

Los Angeles.

San Bernardino county covers an extensive area. Within its boundary lines are numerous mountain ranges nearly all of them more or less mineralized. Near Barstow, on the Santa Fe, are ledges of vanadium which are soon to attract much public notice. The D. & W. mine is located in the mountains on the eastern portion of Riverside county, 30 miles northwest from the crossing of the Colorado river by the Santa Fe railroad at Parker. Here is a 700-ft. shaft with levels, drifts, crosscuts and numerous tunnels. Ore bodies are from 25 to 30 ft. wide, with values of \$12 to \$16 in gold. After several years of development, the management has decided to place upon the property a complete milling plant which is to consist of a Lane slow-speed mill of 50 tons capacity, every 12 hours, 4 Johnson tables and a 40-hp. engine to run the mill. There has been ordered a 3-ton auto truck to be used between the mine and railroad. Jno. W. Flinck will be in charge.

The D. & W. has recently taken over the Eagle American group, which at 300 ft. has large bodies of high-grade sulphide copper ore, averaging 7%. Ore from this mine has been hauled 18 miles to railway and then shipped to the smelter at Swansea, Ariz.

In eastern San Bernardino county and 12 miles to the northeast of Amboy, is situated the 35 claims and mill site of the Great Gold Belt Mining Co., mostly obtained by location. During the last 5 years on many of the claims, numerous shafts have been sunk, crosscuts, drifts and tunnels run, exposing good ore bodies with gold values predominating and lesser values in silver, copper and molybdenum. The vein in the San Antonia claim is a contact between lime and granitoids, and it is traced over 3000 ft. The country rock of the group is diorite with the vein

Showing for a distance of 4500 ft., and the mineral is exposed by several shafts, tunnels and open cuts, the 100-ft. shaft being in ore all the way down. Half a mile west of the mill is the Glorietta the ores differ greatly in character and manner of occurrence from those of the San Antonia; in the Glorietta vein system the country rock being an iron stained granite. The ores are close grained quartz, running heavily in iron, and carrying values in copper glance and carbonates. A well-defined mineral zone extends from the Glorietta No. 7 to the West End No. 4, being a large network of veins and fissures interlacing and running in every direction, varying in width from a few inches to 8 ft.

In addition to this contiguous group of 25 claims the company in this locality holds 6 more claims, and 50 miles to the north in the new York mountains, 4 claims where gold, silver, copper, tungsten and molybdenum have been found.

The Great Gold Belt mill is thoroughly and substantially constructed and has a daily capacity of 20 to 30 tons with power and auxiliary machines ample for two additional Lane mills, which can easily be installed, thus increasing the output. A 10-hp. engine, Dodge crusher, a 7-ft. Lane slow-speed Chilean mill, Traylor concentrator, constitute part of the equipment.

Mining and Engineering World

Dec. 14, 1912 p. 1101

San Diego.

Before the slump of 1907, San Diego county had at least over 80 good and fair mining propositions located at various points within its borders, and many with quite extensive development, and yet because principally of ruggedness of the country, transportation rates so great, that the output in bullion or results of shipments did not meet the average expense.

The Grape Vine and Rice mining districts, situated about 75 miles northeast of San Diego, taking in the San Ysido range of mountains, is as fully mineralized as any similar portion of California, and in reality it is not a hard region to traverse, excepting close proximity to some of its peaks. The country rock in general is eruptive and metamorphic granite, with the mineralized ledges cutting through, giving some truth to the assertion of being true fissures. The ledges, really are of extraordinary width, ordinarily 30 to 40 ft., and many of 200 ft. The high-grade ore occurs in streaks extending many feet lengthwise of the vein, while the entire vein matter is of value, principally gold. The district can be reached via a route from Los Angeles via Elsinore to Warner's ranch, but as most of money invested in mining there is under influence of San Diego the travel is by auto and stage from Foster, terminal of branch of Santa Fe.

The Montezuma Gold Mines Co. of San Diego, during the last 2 years, has taken over from original owners two groups of claims comprising 18 full claims, 13 in one group and 5 in another, about 2 miles apart, and located on Hot Spring mountain of the San Ysido range. The general formation, trend of the ledges and the characteristics of the two groups are virtually the same and the de-

velopment proposed and improvements made, principally upon the Eureka and Morning Star groups of 13 claims.

In the Eureka and Morning Star there are four shoots, two in each claim, and of comparatively high-grade ore. The ledges cutting through the granite from 5 to 25 ft. in width are termed true fissures, have a gneiss and granite schist for walls. The ore is a porous granular quartz with the principal values in gold, very little silver, and some carbonate of lead and galena. A shipment to stamp mill of 5 tons of ore from croppings 15 ft. above surface, gave a return value of \$52.64 to the ton.

At 12 different points on the ledge are developments to extent of 2500 ft. and 31 separate samples taken at different times gave average of \$42.90 in gold. Values at breast of 200-ft. tunnel average \$19.62 in gold. Thirteen samples from one of Lost Mine claims gave returns of \$22.85 to \$86.10. The Morning Star shaft is down nearly 300 ft.

cont...

The property is equipped with a 5-stamp mill, gasoline engines for power purposes, compressor, etc.

Randsburg.

Drifting east and west has been started from the 300-ft. level of the Good Hope shaft. On the 230-ft. level a strong shoot has been opened about 40 ft. east of the shaft, and a west drift is being sent out to explore the deposit. The quartz is said to assay well. Several rich shipments have been made recently to the local custom mill, and 25 tons of ore are on the dumps. Twenty-five men are employed, with two shifts active. The mine forms one of the Consolidated Mines group.

Electric power will be available for the mines and mills of the Rand district early in 1913. The transmission line is rapidly approaching completion, and the receipt of cheap power energy is expected to materially aid more vigorous work. Recent developments at the King Solomon, Good Hope and other mines indicates the veins persist to fair depth. Lessees are very active in the district and the general outlook is decidedly good. It is rumored the Yellow Aster Co. is planning prosecution of activities on a broader scale.

The Lone Star Con. Co. of Goldfield has commenced vigorous work at the St. Ives property, Chidage district, near Bishop. The shaft has been straightened and repaired and will be sent deeper. Several small shoots of ore assaying around \$40 per ton have been demonstrated by former operators. A new 12-in. shoot was encountered while improving the shaft. About 400 tons of \$15 ore are on the dumps. E. E. Green is in charge.

The old Aurora mine, near Landy, is being rehabilitated by a syndicate of Nevada and Utah men, headed by Jesse Knight of Salt Lake and Charles E. Knox of Tonopah. The property is a large low-grade proposition, and was recently under option to the Tonopah Mining Co. It is understood the engineers of this company advised against its acquisition because of the heavy expense attending reopening. J. E. Spurr was in charge of the examination, and it was on his report that the new syndicate was

formed to take up the work. Ample finances are said to be available for culmination of the enterprise.

Mining and Engineering World

Dec. 21, 1912 p. 1149

Los Angeles.

A rich strike is reported from the Tropic mine, near Rosamond, about 80 miles from Los Angeles. A 100-ft. drift has been extended on the shoot and a winze sunk to a depth of 25 ft. The mine comprises four claims and lies near the Lida property of the Antelope Valley Gold Mining Co. The Tropic Mining Co. of Los Angeles is developing the mine under bond and lease.

At Dale, 35 miles south of Amboy, on the Santa Fe, the Carlyle Gold Mining & Milling Co. of Los Angeles, owns a group of claims, where the development is all tunnel work, upon two well-defined ledges, 7 to 12 ft. in width, and porphyritic formation. The values in gold, some silver and a percentage of lead averaging \$12 to the ton. Contracts for tunnel work have been entered into which will require 2 years to fulfill. The 1350-ft. tunnel gives a depth below surface of 150 ft. The 200-ft. tunnel of 400 ft. depth. Bunches of high-grade occur. A very important matter in connection with mining in San Bernardino county is the leasing from E. A. Landwater of 30 claims near Dale by Chas. Schwab, and ostensibly in the interest of the United Greenwater Con. Co. and with option to buy at \$2,000,000. Development of this property has been under direction of John McGee and amounts to several thousand feet. There is a 10-stamp mill on the property and there are over 30,000 tons of ore blocked out. About 30 men have been employed and under new management will be increased to 150. Several hundred thousand dollars are to be expended in various improvements, including a new mill and cyanide plant.

Twenty-nine Palms in San Bernardino county boast of several good mining propositions in that locality. Nine miles southeast from 29 Palms is situated the property of the Gold Park Con. Mining Co. This property has been under development for many years, and is to be more extensively worked than ever before. The Trent Engineering Co. of Los Angeles has entered into a contract to place upon the property a mill of 100 ton capacity.

In the Providence Mountain range mining district 20 miles north of Fenner, on Santa Fe, Henry L. Stewart, while prospecting, discovered and located a deposit of silver ore, giving values of 100 ozs. to the ton. He has located and partly developed a group of claims of gold, copper and lead ores. Mr. Stewart has been prospecting in this district for nearly 3 years.

In close proximity to Barstow, there has been discovered ledges of vanadium ore. The several claims have been taken over by the Independence Mining & Milling Co. of Los Angeles, who propose development on a large scale.

In New York mountains Gus Hamstadt has been prospecting and doing much development for many years and on a group of 8 claims has performed 1300 ft. of tunneling. The ore is a contact between lime and granite and has values of 5% copper and \$12.30 in gold, with small percentage of silver. About 21 miles north from the New York mountains are the Clark mountains, and in close proximity to the old time Copper World mines, Hamstadt has the Empire group of 4 claims upon which he has sunk a 200-ft. shaft and driven tunnels of 130 and 135 ft. in copper ore. A 3-car shipment of closely assorted ore gave a return of 40%. The 130-ft. tunnel is now coming into an ore iron in character with small particle of galena and some sulphide of copper. This tunnel when reaching a point under a winze in a drift of the 200-ft. shaft will give a depth of 350 ft. below the surface.