

REPORT XXIII OF THE STATE MINERALOGIST, MINING IN CALIFORNIA DURING 1927

GOLD (QUARTZ MINES).

Quartz mining began in the county in the fifties, there being at present on the Pioneer Mining Company's property near Damascus the ruins of an old mill with square stamps, which was one of the earliest in the state. In spite of the immense sum recovered from its placer mines, the quartz mines have never been developed to such depths nor on as important a scale as in the counties north and south.

Beginning with the western part of the county, the most important group of quartz mines so far developed were in the Ophir District, two to four miles west of Auburn. The contact of granodiorite and amphibolite schist strikes west of northwest. Veins occur both in the granodiorite and amphibolite near the contact for several miles. They strike usually a little north of west and dip south. A great number of small 'pocket' veins occur in the amphibolite at Auburn and for several miles northwest of the town. The ore in the Ophir District shows considerable silver. Pyrite and galena are the principal sulphides, but a little zinblend and copper sulphide are seen at times. The greater number of mines at Duncan Hill and Ophir have been typically 'pocket' mines in which very rich ore has been found in bunches or small ore shoots. The occurrence of such ore in the amphibolite appears to have been affected, if not controlled, by the presence of zones in the schist which are richer in pyrite than the ordinary rock. But there have also been several mines which have contained moderate sized orebodies of milling ore. The more important of these were the Oro Fina, Hathaway, Gold Blossom and Crater. The greatest depth reached is about 1000 feet. The veins average about two to three feet in width, but swell and pinch, especially in the amphibolite, as is characteristic with this rock.

The granodiorite intrusive undoubtedly underlies the amphibolite in the vicinity of the contact, so it may be expected that the veins will pass downward from the amphibolite into the granodiorite. Under proper geologic conditions, the veins should continue in the granodiorite. The deepest developments here have been in the granodiorite. All of the deepest work at Grass Valley, Nevada County, has been in granodiorite. None of the quartz mines in the district are active. The Oro Fina was the last operated, and is described as an example. About a mile east of Penryn is a group of small quartz mines which were active between 1860 and 1885. These are in the granodiorite and produced low and medium grade ore. The deepest work was about 600 feet at the Chicago.

The Mariposa slate of the Mother Lode belt enters the county near Weimar. The Black Oak Mine has been profitably worked there, but development has been limited. There have also been some 'seam diggings,' where free gold occurs in the slate in quartz seams and has been mined by hydraulicking the soft upper oxidized zone, as was done in the nearby Spanish Dry Diggings and Georgia Slide districts in El Dorado County.

The most important quartz gold producer in the county was the Rising Sun, a mile and a half west of Colfax. A long tunnel is being run there to give drainage preparatory to new prospecting.

From the Middle Fork of American River, three miles south of Bath, there extends northward with interruptions a belt of peridotite and serpentine derived from it. West of it lies a belt of amphibolite schist. The two rocks may be traced almost due north to Alleghany and Downieville, Sierra County. Along their contact, and in the amphibolite schist near it, pocket mines have been opened in a small way with profit. Probably this pocket belt, of which a large part was undoubtedly covered by later andesite flows, enriched the gravel of the ancient streams which flowed across it. The Garbe and de Maria Mine in Ladies Canyon has produced many thousands of dollars worth of beautifully crystallized gold and is still operated. The Four Aces Mine is also active in Volcano Canyon. The serpentine contains bodies of

talc schist, mariposite and barite. Finely divided gold occurs in places in the talc, but is difficult to recover.

Four miles southeast, of Towle in the large area of Carboniferous rocks locally called the Blue Canyon formation, are found many prominent veins of quartz. Most of these have been prospected and many have been productive. The Blue Canyon formation is composed principally of black clay slate and quartzitic sandstone. Igneous dikes are often to be seen accompanying the veins. The Pioneer Mine on the Pioneer and Lynn veins, has been the largest developed. The Black Hawk and American Eagle mines are active now on a small scale. The Pioneer operations are described herein. The American Bar, and the Herman, Black Canyon and Canada Hill mines, farther east in the high mountains, are in the Blue Canyon formation, which is the bedrock formation of most of the higher eastern part of the county. The first and last named are active.

American Eagle Prospect is in the canyon of North Fork of American River, a mile and a half upstream from the mouth of Humbug Creek, and reached by a trail from Towle or from the Pioneer Mine. There is a quartz vein four feet wide where opened in prospecting five years ago. The footwall is black slate and hanging wall gray schist. A little work has been done at intervals by a stock company, under different names. A 10-stamp Straub mill has lately been installed. A total of about 240 feet of underground work is reported.

Big Ben Mining Company was not successful in developing free-milling ore on its property five miles north of Lincoln. A large sum was raised from the sale of stock and considerable prospecting done to a depth of 360 feet. The prospect is in amphibolite schist near the granodiorite contact.

Black Hawk Mine is on the North Fork of American River, four miles southeast of Towle by trail. A. B. Chase and others of Roseville have moved 10 stamps of the old Southern Cross mill to the claims and were erecting them in July, 1927, preparatory to crushing ore. The property was first developed years ago, and Chase believes some of the quartz then broken will pay to mill and that there are good prospects in the adit workings.

Canada Hill Mines comprise two groups of claims, the Beauty Group of ten claims and Nob Hill Group of seven claims, each covering 4500 feet on the strike. They are at Canada Hill, 44 miles from Auburn via Forest Hill, and the elevation is 6225 feet at the Beauty shaft. A 30-ft. shaft and an upper adit 200 feet long gave good prospects in a quartz vein one and one-half to three feet wide and striking northeast. In 1919 and 1920, Metals Exploration Company prospected it under lease and option. A lower adit was run 800 feet, of which 600 feet was a crosscut. They gave up their option in 1920. Since then Snyder has resumed work and some ore is reported being crushed in a 10-stamp mill during the present year. The Nob Hill claims have been prospected by adits. The veins are of fair size and assayed well at the surface.

Centennial Mine on Duncan Hill, two miles southwest of Auburn, is an example of a type common in the district. The vein is about 30 inches wide, in amphibolite schist, but pinches down at intervals. It strikes N. 80° W. and dips 70° south. The ore occurred in small rich shoots, from two to fifty feet long, the formation of which appeared to have been influenced by 'iron crossings,' the miners' term for zones rich in pyrite and chalcopyrite in the amphibolite schist. Ore was mined in 11 or 12 shafts, the deepest 180 feet. After this, adits were run from each end of the claim, one 700 feet long and the other 900 feet, connecting a few feet apart vertically at one of the shafts. The plan was to mill the entire vein, but this was unsuccessful. The total production was \$150,000 or more. The estimated value of ore in the rich shoots was \$8 to \$12, but the vein as a whole is low grade. The Booth, Conrad and Crandall are

nearby mines which have all made some production, but are all idle. The ore of Duncan Hill contains gold, silver, lead and copper, the sulphides being rich at times,

Chicago Mine was an example of mines in the granodiorite near Penryn. Several small quartz mines were worked between 1860 and 1885 about a mile east of the town. A vein of solid quartz two to three feet wide strikes N. 20° to 30° E. and dips from 70° east to vertical at the Chicago. On the north end it breaks into stringers. A shaft was sunk 500 feet. For the first 200 feet the ore is stated by a former superintendent to have averaged \$7 a ton. Ore was mined for a length of 400 feet on the 300-ft. and 400-ft. levels, but ran as low as \$4 a ton there. Around 500 feet deep the vein was breaking into stringers. The walls were hard and stood well without timber. All mining was by hand. A 10-stamp mill was operated. The Alabama and Elizabeth were nearby mines worked at the same time. The placer mines along Secret Ravine, which drains this district, were enriched by erosion of these veins.

Four Aces (formerly Three Queens) Mine is part of a group of 14 claims, said to cover 10,500 feet along a dike of serpentine and its contacts with schists, and extending from the Spanish Mine southeast of Forest Hill to the Middle Fork of American River. A road three miles long from Forest Hill drops 1800 feet in reaching the camp, which is on Volcano Canyon at an elevation of 1360 feet and one mile north of the river.

Some work was done here and about \$45,000 was produced a number of years ago by George Wingfield. The pay arc was taken from a small 'pocket' orebody only a few feet underground. The area mapped as peridotite and serpentine contains strips of black, graphitic schist and completely altered rock, evidently igneous dikes originally. The serpentine is also altered to talc and mariposite in places. To the west lies amphibolite schist, and strips of this also occur in the serpentine, the graphitic schist probably also being a phase of it.

A total of 550 feet of underground work had been done here to July, 1927, entering near the level of Volcano Canyon. Of this, 430 feet was drifting. A quartz vein three to four feet wide where stopped, strikes northwest and dips 30° to 40° northeast. It has the black graphitic schist and altered dike on the hanging wall and mariposite on the footwall, in those places where the best ore is reported. Three stopes, the longest being 90 feet, have been opened. High-grade ore occurs in small bunches showing considerable free gold in this vein. This high grade evidently formed along the hanging wall, by repeated opening, and gold was precipitated by graphite and carbonates in the schist. Orebodies will probably be confined to the veins at the contact of amphibolite, black schist or dikes with the serpentine, the last named alone being unfavorable for vein formation. Near the southeast end of the drift, 348 feet, from the portal, a floor dips N. 20° W. Gold occurs in the tilling of this flat seam. It appears as if such seams might be caused by the slipping of the hillside and the presence of gold in them might be due to secondary, downward enrichment.

About 1000 feet southeast from the face of this drift there is a winze 148 feet deep on the Scorpion claim. To the northwest, 1250 feet away, 120 feet of workings were run along the contact and good assays reported.

The equipment includes a 5-stamp mill, 40-h.p. semi-Diesel engine, air compressor and several good buildings. Ten to 15 men are employed.

Oro Fina has been the only important producer in the Ophir District in the past ten years. It is about four miles by road west of Auburn. The vein as a rule is about two feet wide, but pinches in places, forming lenses. Both walls are amphibolite schist to between the 600-ft. and 700-ft. levels, where the vein enters the granodiorite, which on the surface lies a short distance south. The vein was of lower grade in

the contact zone, but reported of good grade where it entered the hard granodiorite, and was not displaced laterally.

The new shaft on Bullion No. 1 claim was sunk 730 feet and six levels were opened at 100-ft. intervals. The last owners, Oro Fina Mining Company, began work in 1913 and continued until January, 1922, when the death of the manager resulted in closing the mine and shortly after all machinery and equipment were removed.

The vein strikes a little north of west and dips 65° south. Levels were run east from 300 to 1400 feet and from 130 to 500 feet west, developing ore shoots on both sides of the shaft, one of them 150 feet and the other 250 feet long. The larger of these is east of the shaft, and No. 7 level was being driven to reach it, with several hundred feet still to go at the time of closing. This section is still well above the contact zone. The sulphide content of the vein averaged 1% pyrite, worth \$60 a ton. The ore averaged within a few cents of \$8 a ton between 1915 and 1921. The production for five years ending December 31, 1920, was \$430,000. There was a good profit from operation until high prices incidental to war conditions ensued. The total cost of operation and development rose from \$5.55 in 1916 to \$7.85 a ton in 1917. The mill used (since removed) contained rock breaker, ten 1000-lb. stamps, and one each sand and slime concentrators. It had a capacity of 35 to 40 tons a day and made a satisfactory recovery, most of the gold being free. The ore of this mine appears to differ from that of many of the mines in the granodiorite nearby, which carry sulphides of lead, copper, zinc and silver. One small body of rich ore at the Oro Fina produced \$90,000.

Pioneer Mine, on the south side of the canyon of American River, five miles south of Towle, is probably the deepest and most extensively worked quartz mine in the county. The steep topography permitted the use of adits, giving a depth of 1440 feet below the apex. Little work has been done in the past four years.

There are two veins, the Lynn and Pioneer, but most of the work was on the Lynn. It strikes N. 32° W. and dips 70° NE. The vein follows a strong dike most of the way, and this favors persistence in depth. This vein is one to ten feet wide, but averages four to seven feet wide in most places and is composed of good-looking ribbon rock. The footwall is hard black slate and the hanging wall grey slate and slaty schist.

No. 3 crosscut adit cuts the Pioneer vein at a distance of 390 feet and the Lynn vein at 1400 feet from the portal, and at a depth of 700 feet, and follows the latter 2525 feet. No. 7, 525 feet below No. 3, is a crosscut 2800 feet long to the Lynn vein and is drifted on that vein for 1475 feet. A winze is sunk 242 feet below No. 7 adit, showing the vein to be two to 98 feet wide on the bottom level, where it was drifted 225 feet. Thirteen levels in all were run. Between No. 3 and No. 4 levels, the vein was stoped nearly continuously for about 1200 feet. The North Lynn stope was 300 feet by 700 feet long and 1 to 4 feet in thickness was stoped; Lynn stope was 325 feet by 450 feet by one to six feet. There has been little mining below No. 5 level.

The ore milled has ranged from \$3 to \$16 a ton, running \$10 to \$16 a ton in the upper levels. It contains 2½ % of pyrite, worth about \$50 a ton. One section of vein 2½ inches wide above No. 7 level is reported to have yielded some ore worth \$120 a ton.

The mill is 550 feet below No. 7 adit. It was built 40 years ago and it contains 9" by 12" breaker, twenty 1050-lb. stamps and six 4-ft. belt vanners. There is also a cyanide plant with a capacity of a ton a day for treating concentrate. Electricity brought from Towle was used for power in recent years. The later operations have been intermittent and the tramway from No. 7 to the mill, the electric power line and the

mill are in need of repairs. The mine's production can not be definitely stated, but is believed to have been between \$600,000 and \$900,000.

Rising Sun Mine is a mile and a half west of Colfax. It was opened in 1866 and was operated until 1874 with a 5-stamp mill, and from then until 1880 with a 5-stamp mill, which crushed 12 to 15 tons a day. The production was over \$2,000,000.

The vein averaged 18 inches wide in the upper levels and lies between hard diabase walls. It strikes northeast and dips 85° south to the seventh level, where it rolls over and reverses its dip in 20 feet. Below this roll the vein increases in width to four or five feet and becomes softer. The deepest shaft is 749 feet deep on the dip with ten levels. There are two other shafts to the west, one sunk to the fifth level and the other to the third. On the west of main shaft there was a pay chimney about 40 feet long, which is reported by a former superintendent to have been so rich in free gold near the cross fault that the gold literally held the quartz together. A north and south crossing or fault apparently bounded the rich ore on this side and had probably influenced its deposition. East of the shaft, pay was in stringers. On the west it paid well to the 700 level, where the roll occurred, but below there it is said to have milled \$5 a ton.

The mine lay idle from 1854 to 1919, when a stock company erected a modern plant with a new 10-stamp mill and unwatered the mine. They were unable to keep the water out of the lowest level long enough to do any work and failed to find any new ore. They quit in 1921 after milling a few tons. Subsequently E. C. Klinker began further work and lately a long drain tunnel, planned and started 12 years or more ago, has been continued, and it was expected that this would be finished the present summer.

Spanish Mines, lying north of the Four Aces property, show a vein of barite, silica and talc in the form of a blanket divided into floors in which free gold occurs. It has a 2-stamp mill.

Snowbird Mine, near the old Sugar Pine mill 12.5 miles northeast of Forest Hill, shows free gold in talc and serpentine with a little quartz. It is equipped with a 50-ton ball mill, five light stamps and a small cyanide plant. The company that put this equipment on it was unable to make it pay.

Following the plan used in our new set of county reports, the writer has not considered it necessary to enter into a description of each quartz mine in the county. This would involve the repetition of many details covered in past reports. It is also true that many mines in the same district or in the same geological formations have many characteristics in common, so that a description of one or two of each type, with the results obtained in their operation, gives the reader a good idea of what may be expected from others of the same type. The above notes summarize the results of quartz mining in the county since the reports of 1915 and 1920. The following table shows in compact form the name, location and ownership of all quartz mines and prospects and a bibliography of articles concerning them in our past publications. The quartz mines of the Ophir district were described in the Fourteenth Report of the U. S. Geological Survey, part two, and the areal geology of the county was mapped by that survey in its Sacramento, Placerville, Colfax and Truckee folios.

TABLE OF QUARTZ MINES AND PROSPECTS, PLACER COUNTY.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography
	Sec.	Twp.	Range				
Adams	20	12 N.	8 E.	Calvin T. Adams, Newcastle	1,050		R. XIII, p. 272; XV, p. 331.
Alameda	25	14 N.	9 E.	J. F. Wise and Martin Partridge, Colfax	1,400		R. XV, pp. 331-332.
American Bar	33	14 N.	11 E.	American Bar Quartz Mining Co., John McCandless, Pres., Harry A. Kuntz, Secy., 858 Mills Bldg., San Francisco			R. XII, p. 204; XIII, p. 273; XV, p. 332; XVIII, pp. 261-262; XIX, p. 141; XX, pp. 13, 81-82, 179; Pre. Rep. 8, p. 31.
	4, 5	13 N.	11 E.		1,800		R. XII, p. 204; XIII, p. 273; XV, p. 332; XVIII, pp. 261-262; XIX, p. 141; XX, pp. 13, 81-82, 179; Pre. Rep. 8, p. 31.
Anchor Mining Co.				C. N. Parmenter, Roseville			See Dorner.
Andy Farrier Diggins				Young & Major, Mrs. V. M. Weimer			See Langstaff and Storey.
Annie Laurie	24, 25	14 N.	9 E.	Australia Quartz Mining Co., c/o Eleanor Meeks, 1202 Arguello Blvd., San Francisco	2,000		R. XV, p. 332.
Australia	25	15 N.	10 E.				R. XV, p. 332.
Bazaco	22, 26	13 N.	9 E.	Sheridan Brothers, Butcher Ranch	1,700	77	R. XV, p. 332.
Beauty	9	15 N.	13 E.	Henry Sawyer, Grass Valley	6,200	40	R. XV, p. 332.
Belle Union	26	14 N.	9 E.	D. Jones, Clipper Gap	2,000		R. XIII, p. 273; XV, p. 332.
Bellevue	7, 8	12 N.	8 E.	J. Kaiser, Ophir	1,000		R. XIII, p. 274; see Oro Flies.
Belvoir	18	12 N.	8 E.	Big Ben Cons. Mining Co., Lincoln		67	R. XV, p. 332.
Big Ben Cons.	25	13 N.	6 E.	Ed. Bigley, E. B. Odell, M. I. Odell, E. H. and Moody & Garety, Gold Run	3,050		R. XIII, p. 274; XV, p. 332.
Big Blue	3	15 N.	10 E.	M. A. Hinchoy, Weimar	2,200		R. XV, pp. 332-333.
Big John	25	14 N.	9 E.	Wallace Werry, 2215 H St., Sacramento, and D. A. Russell, Colfax	2,300	9	R. VIII, p. 463; XIII, p. 274; XV, p. 333; XX, p. 179.
Big Oak Tree	33	15 N.	9 E.				R. XIII, p. 274.
Bishop				Black Canyon Quartz Mining Co. of California, c/o E. B. Quigley, Forest Hill			R. XIII, p. 274; XV, p. 333.
Black Canyon	2, 3	15 N.	12 E.	A. B. Chase, Towle, et al.	5,500		R. XIII, p. 274; XV, p. 333.
Black Hawk	8, 10	15 N.	11 E.	Black Oak Mine, c/o Elsie A. Drexler, 1068 Mills Bldg., San Francisco			R. XIII, pp. 274-275; XV, p. 334.
Black Oak	4	15 N.	9 E.	J. E. Walsh, East Auburn	1,875	80	R. XV, p. 334.
Black Spanish No. 2	35	14 N.	9 E.	A. Percival Childsden, Towle			R. XV, p. 334.
Blue Bell	7	12 N.	8 E.	W. A. Hilliard, Grass Valley	3,000		R. IX, p. 29; XV, p. 334.
Blue Jay	3	15 N.	11 E.				
Blue Jay	31, 32	14 N.	11 E.				
Blue Wine	28	15 N.	10 E.		2,800	40	

Bonanza.....	11	15 N.	11 E.	Jerry J. Sullivan, San Francisco.....	3,200		R. XV, pp. 334-335.
Bonnie Bee.....	3	16 N.	11 E.	Bonnie Bee Quartz Mining Co., 744 Lake Shore Ave., Oakland.....	3,450		R. XV, p. 335.
Bonnie Bell.....	18	16 N.	11 E.	Bonnie Bell Quartz Mining and Development Co., Dutch Flat.....			
Booth.....	8, 9	12 N.	8 E.	Slosson & Spinnery Estates, c/o E. P. Slosson, Auburn.....	1,380	10	R. XVII, pp. 442-443.
Boulder.....	16	12 N.	8 E.	Jack Smith, Ophir.....	950		R. XII, pp. 205-206; XIII, p. 273; XV, p. 335.
Boulder.....	18	12 N.	8 E.				See Julian Mine.
Boulder.....	2, 3	15 N.	11 E.	Wm. M. Bree.....			R. XVII, p. 301.
Brea.....	24	14 N.	9 E.	Ed. Bidley, Colfax.....	3,000		R. X, p. 426; XV, p. 335.
Buena Vista.....	7, 8	12 N.	8 E.	H. H. Bunker and J. A. Nhill, Michigan Bluff.....	1,240		R. XIII, p. 275.
Bullion.....	32	14 N.	11 E.	J. W. Burner, Forest Hill.....			R. XV, p. 335.
Bunker & Nhill.....	14	13 N.	9 E.				R. XV, p. 335.
Burner.....	21	12 N.	8 E.				See Halldway.
Burt.....							R. VIII, p. 461; XIII, p. 276; XV, p. 335.
Butte.....							R. XIII, p. 276; XV, p. 335.
Calf Pasture.....	34	13 N.	8 E.	W. E. Deann, Kohl Bldg., San Francisco.....	1,000		R. XIII, p. 276; XV, p. 335.
California.....	16	12 N.	8 E.	Mr. Hubbell, Auburn.....			R. XII, p. 276; XV, pp. 335-336.
Carter, Wallace & Augustine.....	33, 28	15 N.	13 E.	F. G. Albonos, Michigan Bluff, A. C. Lowell, San Francisco.....	5,900	62	Field Report.
Cash in Dump.....	17	12 N.	8 E.	H. M. Black and H. J. Elliott, Virginia City, Utah Wm. Walsh, Auburn.....	5,400	10	R. XV, p. 336; XVII, p. 443; XVIII, pp. 263, 301-302.
Central.....	3	15 N.	11 E.	Central Mining Co., H. T. Power, Pres., Berkeley Daniel Webster Mining Co., c/o F. A. Leach, A. Dibble and Mr. Hampton, Michigan Bluff.....	2,200	21	R. XV, p. 336.
Champion.....	15	14 N.	11 E.				R. XII, p. 206; XIII, p. 276; XV, p. 336.
Cherokee.....							R. XII, p. 206; XIII, p. 276; XV, p. 335.
Chicago.....	32	16 N.	14 E.	Tom Young, Cisco.....	5,200		R. XV, p. 336.
Chicago.....	35, 36	12 N.	7 E.	Estate of John F. Howard, Pennyn.....	1,800		R. XV, p. 337.
Christmas Hill.....	26	13 N.	9 E.	J. A. Ware, Butcher Ranch.....			See Three Stars.
Columbi.....							R. XV, p. 337; XVII, p. 443; XVIII, p. 302.
Conrad.....	17	12 N.	8 E.	Wm. Walsh, Auburn.....	1,150	15	R. XV, p. 337; XVII, p. 443; XVIII, p. 302.
Crandall.....	8	12 N.	8 E.	T. F. Jull, Auburn.....	950	37	R. XV, p. 337; XVII, pp. 443-444.
Crazer Hill.....	12	12 N.	7 E.	George A. Aldrich, Auburn.....	1,200		R. X, p. 433; XII, p. 207; XIII, p. 277; XV, p. 337.
Crosby.....	25	13 N.	6 E.	F. C. Crosby, Lincoln.....		17	

*Due to various legal complications which may arise regarding ownership of unpatented mining claims, we do not vouch for absolute correctness of this column. The names are mostly those appearing on the tax rolls. To save space, frequently only one of several owners is listed.

TABLE OF QUARTZ MINES AND PROSPECTS, PLACER COUNTY—Continued.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography
	Sec.	Twp.	Range				
Cuckoo.....	16, 4 9, 10	14 N. 14 N.	12 E. 12 E.	} c/o F. N. Tiltonson, Michigan Bluff	5,350	6	R. XIII, p. 277; XV, p. 337.
Dahlonega.....	12	16 N.	11 E.				
Daniel Webster.....	15, 16 22	14 N. 14 N.	11 E. 11 E.	} Daniel Webster Mining Co., c/o F. A. Leach, A. Dibble and Mr. Hampton, R. H. Summers, Michigan Bluff	3,600	R. XII, p. 207; XIII, p. 277; XV, p. 337; XX, p. 13.	
Debb.....	4	15 N.	11 E.				
De Maria.....	22	13 N.	9 E.	} A. Perival Crittenden, Towle C. J. deMaria and Mr. Garbe, Spring Garden	3,850	R. XV, p. 338.	
Dewey & Staeker.....	30	14 N.	11 E.				
Don Prospect.....				} Mrs. R. B. Howell, Auburn; Mrs. E. S. Jensen, Sacramento John Laas and Walter J. Wren, Virginia City, Utah	6,700	R. XIII, p. 277; XV, p. 338.	
Dorer.....	3	15 N.	11 E.				
Drummond.....	1	14 N.	10 E.	} Estate of C. F. Reed; J. E. Walsh, Freeman Hotel, Auburn	3,600	R. XV, p. 338.	
Dry Hill.....	31, 32 2, 3	14 N. 15 N.	11 E. 11 E.				
Eagle.....				} Clementina deMaria, McKoon Wm. M. Bree and Eagle Gold Mining & Milling Co., 427 Western Mutual Life Bldg., Los Angeles	2,000	R. XVIII, p. 301.	
Eclipse.....	17	12 N.	8 E.				
Elizabeth.....				} John Watson, Penryn	1,000	R. X, p. 433; XIII, p. 277; XV, p. 338; Bull. 50, p. 207.	
Ellen Dip.....	13	12 N.	7 E.				
Eureka.....	1	13 N.	9 E.	} C. F., Wm. and G. Seever, W. A. Shepherd, H. Adams and G. CoEtn, Forest Hill	900	R. XVII, p. 445.	
Eureka Cous.....	31	14 N.	10 E.				
Falls Creek.....				} M. Seever, Forest Hill	2,000	R. XV, p. 339.	
Fall Ravine.....	14	15 N.	13 E.				

See Chicago.

R. XII, p. 208; XV, p. 339.

Flat Ravine.....	27	15 N.	13 E.	Flat Ravine Quartz Mine, 242 Polk St., San Francisco.....			R. XII, p. 208; XIII, p. 278. (Herein.)
Four Aces.....				M. Savage and Four Aces Mines Co., Forest Hill			
Galma, Patrick & Patrick extension, Tunnel Mine.....				Black Canyon Quartz Mining Co., c/o E. B. Quinley, Forest Hill.....			See Black Canyon.
Garbe.....	2	15 N.	11 E.	John Rabin, Dutch Flat.....	3,200		See deMerita.
Gen.....	12	12 N.	7 E.	Reed Estate, Auburn; J. H. Toler, Mett.; A. C. Lowell, executor.....	700		R. XV, p. 339.
Golden Eagle.....	5	15 N.	13 E.	Mrs. Thos. Bailey, Box 245; Nevada City, et al.			R. X, pp. 431, 433; XII, p. 209; XIII, pp. 278-279; XV, pp. 339-340.
Golden Reward.....	17	11 N.	8 E.	Mrs. Wm. Bell & Son, Westville.....	6,000	20	R. VIII, p. 484.
Golden Rule.....	3	13 N.	8 E.	Ed. Vore, Applegate and E. Eppheim.....	750		R. XV, p. 340.
Golden Scepter.....	27	14 N.	11 E.	Golden Sheet Mining Co., E. P. Thompson, Mett., Michigan Bluff.....	1,625		R. XIII, p. 279; XV, p. 340.
Golden West.....	25	16 N.	11 E.	Reuben H. Lloyd, San Francisco.....	3,000		R. XV, p. 340.
Gold King.....	8	16 N.	13 E.	Jas. G. Doidge, Elizabeth Bell and Neils Forthun, Westville.....	5,860	20	R. XV, p. 341.
Great Eastern.....	20	16 N.	12 E.	Great Eastern Quartz Mine, Emigrant Gap.....		15	R. XV, p. 340.
Great Western.....	41	15 N.	13 E.	Great Western Mining Co., Mr. Kelly, Pres., Martin Winters, Secy., Flat 36, North River, N. Y.....			R. XII, p. 209; XIII, p. 280; XV, p. 341.
Green.....	8	12 N.	8 E.	Wm. Kendall, Dutch Flat.....	5,000	270	R. XV, p. 341.
Green Emigrant.....	29	13 N.	8 E.	R. A. Nicol, 67 Sunshine Ave., Sausalito.....	1,600	10	R. XII, p. 209; XIII, p. 280; XV, p. 341.
Hancock & Watson.....				G. B. Hannaman, Auburn.....	1,200	120	See Dewey & Slooker.
Hannaman.....	18	12 N.	8 E.	J. T. Curry, Forest Hill.....	675	24	R. X, pp. 429-431; XIII, p. 280; XV, p. 341.
Herrman.....	16	15 N.	12 E.	John Laes, Summit.....	4,500	1,448	R. VIII, p. 472; IX, p. 29; XII, p. 211; XIII, p. 280; XIV, pp. 341-342.
Herritt.....	30	15 N.	18 E.	Andrew Johnson, Ophir.....	5,500	20	R. XV, p. 342.
Hope.....	17	12 N.	8 E.	Patrick McInnis, Butcher Ranch.....	1,142		R. XV, p. 342.
Huntville Cons. International.....	12	13 N.	9 E.	John Laes, Virginia City and L. D. Heath, Los Angeles.....			R. XIII, p. 281.
Joe Dandy.....				J. D. Sullivan and A. P. Crittenden, Towle.....	6,936		R. XV, p. 342.
Julia.....	3	15 N.	11 E.	Mrs. Martin Schnabel, Newcastle.....			R. XIII, p. 281; XV, pp. 342-343.
Julian.....	7	12 N.	8 E.				R. XV, p. 343.

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TABLE OF QUARTZ MINES AND PROSPECTS, PLACER COUNTY—Continued.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography
	Sec.	Twp.	Range				
Kittler.....	12	12 N.	7 E.	.....	1,000	.....	R. XIII, p. 382.
Lady Bedford.....	.....	.....	.....	.....	.....	.....	See Rip Van Winkle.
La Follette.....	7, 8	15 N.	13 E.	Henry Snyder, Grass Valley.....	5,930	20	R. XV, p. 343. Pre. Rep. 8, p. 32.
Langstaff & Storey.....	.....	.....	.....	.....	.....	.....	.....
La Trinidad.....	34	16 N.	13 E.	George Montgomery, Mills College P. O., California.....	6,000	.....	R. XV, p. 343.
Liberty.....	2	15 N.	16 E.	.....	.....	.....	.....
Little Banner.....	30, 31	15 N.	14 E.	C. W. Cross; Wm. Maguire, Nevada City.....	.....	.....	R. XV, p. 343.
Little Ginger.....	22	12 N.	8 E.	Charles Glover.....	.....	.....	.....
Live Oak.....	33	15 N.	9 E.	D. B. S. Wilcox, Colfax.....	.....	18	.....
.....	23	14 N.	9 E.	G. and W. P. Gelsendorfer, Weimar.....	2,000	.....	.....
Lost Emigrant.....	32	16 N.	14 E.	F. L. Heath, Donner P. O., Placer county, California, et al.....	6,700	.....	R. VIII, pp. 474-475; IX, p. 29; XIII, p. 282; XV, pp. 343, 364.
Lundquist.....	16	12 N.	8 E.	Mrs. Lundquist, Auburn.....	.....	.....	R. XV, p. 344.
Lynn.....	.....	.....	.....	(Part of Pioneer).....	.....	.....	R. XIII, p. 282; XV, p. 344.
Malmberg.....	16	12 N.	8 E.	J. Malmberg, Auburn.....	1,360	.....	R. XIII, p. 282; XV, p. 344.
Marguerite.....	3	12 N.	8 E.	Unknown—sold to state.....	.....	.....	R. XII, p. 210; XIII, pp. 282-283; XV, p. 344; XVIII, p. 45.
Mars.....	.....	.....	.....	Sam Wolford, Grass Valley.....	2,428	80	R. XV, p. 334. See Shady Run.
Midas.....	.....	.....	.....	J. E. Walsh, East Auburn.....	1,000	.....	R. X, p. 433; XV, p. 345.
Mimna Riobe.....	17	12 N.	8 E.	H. F. Adams, Forest Hill and estate of Ben Tabor, Auburn.....	.....	.....	R. XV, p. 345.
Mitchell.....	.....	.....	.....	.....	.....	.....	R. XV, p. 345.
Mollie or Mollie Stark.....	21	12 N.	8 E.	Mrs. Asa B. Eastwood, Newcastle.....	850	.....	R. XIII, p. 283; XV, p. 345.
Moore.....	17	12 N.	8 E.	J. M. White, Auburn.....	1,050	.....	See La Follette.
Nob Hill.....	.....	.....	.....	.....	.....	.....	R. XIII, p. 284.
No Chuck.....	.....	.....	.....	.....	.....	.....	.....
North Star.....	22	13 N.	9 E.	E. J. Power, E. J. Young and Henry F. Power, Berkeley.....	1,700	.....	R. XV, p. 345.
.....	.....	.....	.....	North Star Mining Co., c/o Chas. Thomas, Box 107, Truckee.....	.....	.....	.....
Number Two.....	10	15 N.	10 E.	E. A. Moody and Mr. Garety, Gold Run.....	2,875	.....	R. XIII, p. 284; XV, p. 345. R. VIII, p. 480.
Ohio.....	.....	.....	.....	.....	.....	.....	R. XIII, p. 211; XIII, p. 284; XV, p. 345.
Old Pacific.....	25	12 N.	7 E.	Mrs. Martin Schabel, Newcastle.....	.....	.....	.....

92	Oro Fino.....	7, 8	12 N.	8 E.	Mrs. Haines Gridley, Auburn.....	1,140	96	R. XIII, p. 274; XV, p. 346-346; XVII, pp. 445-446; XVIII, p. 7; Pre. Rep. 8, p. 32.
93	Osborne.....							See Herman.
94	Petrom.....							See Blue Wing.
95	Pacific Shab.....							See under Placer Mines.
96	Page & Buckman.....							See Rip Van Winkle.
97	Paragon.....							See under Placer Mines.
98	Patrick Cons.....	10	15 N.	12 E.	G. W. Snyder, Damascus.....	4,800		
	Pioneer Cons.....	3, 4	15 N.	11 E.	Pioneer Mining Co., Room 525 Clume Bldg., 519 California St., San Francisco.....	3,800	728	R. VIII, p. 468; X, p. 426; XII, pp. 211-212; XIII, p. 284; XV, p. 347; XVIII, p. 302; Pre. Rep. 8, p. 32.
	Prairie Flower.....	9	15 N.	13 E.	Mrs. Wm. Bell & Sons, Westville.....	5,800	40	R. XV, p. 347.
	President Wilson.....	20	15 N.	12 E.	J. W. Cairns, Weimar.....	5,200	120	R. XV, p. 347.
	Pritchard Gravel.....							See Blue Wing.
	Providence.....							R. XX, p. 179.
	Queen Salts.....	9	15 N.	13 E.	Peter Huest and J. G. Dadds, Westville.....	3,300	40	R. XV, pp. 347-348.
	Rawhide.....	4	15 N.	11 E.	Canyon Mines Corp., Hotel Sutter, San Francisco.....	3,400		R. XV, p. 348; XVIII, p. 302; Pre. Rep. 8, p. 32.
	Razale Dazale.....	20	12 N.	8 E.	G. L. Threlkel, Newcastle.....	930		R. XV, p. 348.
	Reedbrook.....	11	12 N.	7 E.	I. Meyer, Lincoln.....	595		R. XV, p. 348.
	Red Bird Cons.....	24	14 N.	9 E.	G. A. Tubbs, Colfax.....	2,000		R. XV, p. 348.
	Red Rock.....	24	16 N.	11 E.	N. B. Willey, Blue Canyon.....	4,200		R. XIII, p. 285; XV, p. 348.
	Rip Van Winkle.....	28	15 N.	12 E.	Martha S. Buckman, Shelbina, Missouri.....	3,200	42	R. XII, p. 210; XIII, p. 282; XV, p. 348.
	Rising Sun.....	33, 34	15 N.	9 E.	Benj. E. Valentine.....	2,290	440	R. VIII, p. 462; XIII, p. 285; XV, p. 349; XVII, pp. 446-447; XVIII, p. 7; Pre. Rep. 8, pp. 32-33.
	Roosevelt.....	4	15 N.	14 E.	F. L. Heath, Donner, et al.....			R. XV, p. 349.
	Rubbin.....	34	15 N.	12 E.	Messrs. Foley, McCarty & Caren, Chicago.....			R. XV, p. 349.
	Ruby.....	25	14 N.	9 E.	E. H. Hindeby, Weimar.....	2,200		R. XV, p. 350.
	Saint Lawrence.....	7	12 N.	8 E.	Reed Estate, Auburn.....	1,000		R. XV, p. 350.
	Salt.....	3	12 N.	8 E.	A. L. Smith, Auburn.....	1,200		R. XV, p. 350.
	Salsic.....	3	12 N.	8 E.	Smith & Fulweiler, Auburn.....	1,300		R. XII, p. 212; XIII, p. 285; XV, p. 350.
	Secret Town.....	10	15 N.	10 E.	E. A. Mooby and J. E. Everhart.....	2,875		R. XIII, p. 285; XV, p. 350.
	Senator Gold and Copper.....				J. W. Cairns, D. M. Kennedy, Weimar, and C. E. Van Giesen, Applegate.....	2,000	80	Field Report.
	Shady Run.....	27, 28	16 N.	11 E.	Shady Run Mining Co., Joseph Fyfe, agent and trustee.....	2,700	640	R. XV, p. 350.

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TABLE OF QUARTZ MINES AND PROSPECTS, PLACER COUNTY—Continued.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography
	Sec.	Twp.	Range				
Sheridan							R. VIII, p. 468.
Smith & Fuldner							See Salata.
Snowbird	21	15 N.	11 E.	George McCollough & Lewis, Forest Hill	3,950	20	R. XVII, p. 447; Pre. Rep. 8, p. 33. See Prairie Flower.
Snowflake							R. XII, p. 212; XIII, p. 286; XV, p. 80.
Southern Cross	4	15 N.	11 E.	R. L. Ford, Towle; A. W. Nichols, Berkeley.			R. XIII, p. 285; XV, p. 351.
Spanish	7	12 N.	8 E.	Reed Estate, Auburn	1,050		R. VIII, pp. 461-462; XII, p. 212; XIII, p. 286.
Spanish	25, 26 30, 31	14 N. 14 N.	11 E. 11 E.	R. A. Garrison, Forest Hill	2,850	143	R. VIII, pp. 461-462; XII, p. 212; XIII, p. 286.
St. Lawrence	7	12 N.	8 E.		1,000		See La Trinidad. R. VIII, p. 475.
Starrett							R. XIII, p. 286; XVIII, p. 286; XV, p. 351.
Suniper							R. XII, p. 206; XIII, pp. 276-277; XV, p. 351.
Texas	20	16 N.	12 E.	Halsey Estate, Towle; J. L. Gould, Alameda, Pres.	5,600		R. XV, p. 351.
Three Stars	2	12 N.	7 E.	Columbia Gold & Silver Mining Co., E. H. Vance, 1911 Webster St., Oakland	650		R. XII, p. 206; XIII, pp. 276-277; XV, p. 351.
Tiger, Buena Vista and Ruby	25, 27	14 N.	9 E.	E. H. Hinckley, Weimar	2,200	23	R. XII, p. 206; XIII, pp. 276-277; XV, p. 351.
Tyron	1	15 N.	10 E.	Dr. W. M. Tryon, 409 Pacific Bldg., San Fran- cisco and W. N. West, Towle		23	R. XV, p. 351.
Two Orphans	30	13 N.	8 E.	Ed. Bell, Auburn	1,480	24	Field Report.
Tyler							R. XV, p. 351.
Van Avery	14	16 N.	11 E.	L. Balliet, San Francisco	4,625		R. XV, p. 351.
Van Giesen	10	13 N.	8 E.	C. E. Van Giesen, Applegate	1,800	41	Field Report.
Washington	30	14 N.	11 E.	A. M. Nihill, Nevada and Jack Nihill, Michigan Bluff	3,400		R. VIII, pp. 466-467; XII, p. 286; XV, pp. 351-352.
Westlake	14 mi.	SE. of Chico		M. Westlake			Field Report.
White Oak	14	11 N.	10 E.	J. N. Barton, Jr., Estate	2,810	80	Field Report.
Wubena	32	16 N.	14 E.	Herrman, Justice & Co., Woodland	6,500		R. XV, p. 352.

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Gold (PLACER MINES).

Claude Ghana is credited with the discovery of gold in Auburn Ravine (then Woods Dry Diggings) near the present town of Auburn, May 16, 1848, shortly after Marshall's discovery at Coloma. The shallow placers were often fabulously rich. Hundreds of bars along the North and Middle Forks of American River were worked, and numerous small streams in all parts of the county were highly productive. Beginning about 1857, after the surface placers were in large part exhausted, the rivers were turned from their beds, which have been thoroughly mined. Hydraulic mining began at Yankee Jim's in 1852, with a canvas hose and a small quantity of water, under a head of only about 50 feet. This camp, on the north side of Forest Hill ridge, and Michigan Bluff and Todd's Valley on the south side, were pretty well worked out by 1868. The opening of the series of buried ancient channels lying under the andesite which covers the Forest Hill divide and its northeasterly extension, followed closely on the working of the surface placers. Where the miner followed the gold-bearing gravel until it disappeared under the surface, circumstance would dictate the method of mining to be followed. Should a good supply of water be available, and the amount of overburden to be handled not seem too great in proportion to the gravel, it might first be hydraulicked and this method was also followed where the gravel was too low grade to 'drift.' But with a rich and perhaps small pay streak and with perhaps several hundred feet of overburden, often composed of volcanic material too hard to hydraulic, the only feasible method of working was to 'drift,' that is, to follow the pay streak by adits along the bedrock and the ancient stream, or in the hard bedrock below the gravel, which was extracted by means, of raises, cross adits and breasts. This method of mining reached its highest development in the mines of the Forest Hill divide and the adjacent districts, notably at Sunny South and Damascus. In many claims, both hydraulic and drift mining were resorted to. Michigan Bluff, Todd's Valley, Yankee Jim's, Dutch Flat and Gold Run were pre-eminently hydraulic mining camps, while Forest Hill and Iowa Hill were known for their drift mines. Forest Hill district has been the most productive drift mining camp in the state. It was stated in 1868 that the mines within rifle-shot of the post office there had produced \$10,000,000. In 1859 this camp shipped \$100,000 of gold dust a month.

The principal placer mining districts, their estimated gold production and the production of some of the more-noted individual mines, are as follows:

Forest Hill district proper _____ \$12,000,000

of which the following mines were the principal contributors prior to 1868, according to Rossiter W.

Raymond¹

Dardanelles (principally drift) -	\$2,000,000
Mayflower - - - - -	1,500,000
New Jersey - - - - -	850,000
Independence - - - - -	450,000
Deidesheimer - - - - -	650,000
Fast & Norlwood - - - - -	250,000
Rough & Ready - - - - -	250,000
Gore - - - - -	250,000
Jenny Lind - - - - -	1,100,000

¹ Raymond, R. W. Mineral Resources of U. S. West of Rocky Mts., 1868.

Bath (Paragon drifting, \$1,750,000; hydraulic, \$500,000) -	\$2,250,000
Todd's Valley (hydraulic mines) - - - - -	5,000,000
Yankee Jim's, Georgia Hill (hydraulic mines) - - - - -	5,000,000
Iowa Hill Divide (hydraulic and drift mines) - - - - -	10,000,000
Damascus district (drift) - - - - -	6,000,000
Hidden Treasure Mine (drift) - - - - -	3,500,000
Michigan Bluff, Byrd's Valley (hydraulic) - - - - -	5,000,000
Gold Run (hydraulic) - - - - -	3,000,000
Dutch Flat (hydraulic) - - - - -	3,000,000
Last Chance district (principally El Dorado Mine) - - - - -	2,500,000

The last large producer operated among the drift mines was the Hidden Treasure, which continued working until late in 1914. Since that time the placer gold production has come mainly from the dredgers operated along the Middle and North Forks of American River. Drift mining and gold production therefrom have been on a small scale in recent years. There has been some work near Forest Hill, Deadwood and along Duncan Canyon, the last named in the eastern part of the county in the high mountains. The keeping of definite annual statistics of gold production in California began in 1880. The figures for Placer County appear herewith. All of this except about \$3,500,000 from gold quartz mines and about \$1,000,000 from dredgers, came from placer mines. The last dredger operated in the county was being moved in June, 1927.

Geology.

The subject of geology of the auriferous gravel deposits, and especially the buried channels, has been covered in detail in the State Mining Bureau's past publications. The ancient channels of the Forest Hill and Iowa Hill divides were described in detail in the Ninth and Tenth Reports of the State Mineralogist, in articles by John Hays Hammond, Ross E. Browne and J. B. Hobson. These reports are accompanied by excellent maps, showing the geology of the districts, the location of channels, the location and extent of work done upon them at the various mines, and much other valuable information.

After seventy-five years of working such deposits, many of the drift mining districts of the county remain a baffling puzzle. In the popular mind, placer mining has always been considered simpler and calling for the exercise of far less technical skill than quartz mining. This is certainly not true as regards drift mining. In such districts as the Forest Hill divide, the drainage systems of hundreds of thousands and perhaps millions of years were finally blotted from sight by such covering of later volcanic effusions that the old topography was completely hidden. Subsequent erosion has greatly altered the face of the country, but the mantle of andesite, immense enough to conceal entire river systems, still conceals channel segments of possible value of which we know nothing. The amazing geologic complexity of the series of stream and volcanic deposits between the bedrock of the Cretaceous and the present surface is appreciated by few.

In addition to the channels whose gravel deposits are rich enough to work profitably, there are many others which will not pay under existing circumstances. The general conditions which governed this most important feature, the gold content, are wrapped up with the geology of the ancient bedrock surface of the country over which the now buried rivers flowed, and the sequence and interrelations of the channels. They may be summarized in a few words.

The most ancient of the deposits were in the large rivers which carried on their work of erosion for probably millions of years without interruption. They accumulated in their broad beds immense amounts of debris from the erosion of the Cretaceous surface, where were exposed the earlier gold-bearing rocks. While the parts of the county principally traversed by these streams have produced no very large rich quartz mines, there are numerous gold-bearing veins and pockets and auriferous schists. The amount of rock torn down and carried off in the streams was so tremendous that much gold was collected in the stream beds. The mountains were reduced to probably one-third their original height and most of the great central valley was filled with the lighter and finer-sized fragments. Most of the rocks were so susceptible to erosive agencies that they were carried off entirely and only the more resistant, of which quartz was the commonest, remained in the higher parts of the stream courses, and gave the deposits their character of 'quartz channels. These primary channels have been the most productive, as a whole. After their courses had been choked by the first of the volcanic outbursts, there began a period when erosion was interrupted frequently, as compared with the pre-volcanic era. The streams often did not have time to even cut their channels to bedrock before they were again choked by volcanic debris. But where they could erode deeply enough to reach the primary channel, they became rich in gold below the crossing, often richer than the original channel, as their gravel then was reconcentrated. But unless and until it made such a crossing, or reached bedrock, the later channel was apt to be disappointing to the miner. Another class of channel is the steep and narrow gulch deposit found in some of the higher districts. These resemble present-day streams in the same regions, but are covered by the later lava flows. Where present rivers removed miles of the primary channels, they in turn became rich in gold below the crossings, forming the deposits first worked by the pioneers. These streams cut trenches 2000 to 2500 feet deep, passing through the volcanic capping and eroding the bedrock formations, in which gold-bearing veins occur, to a depth of 2000 feet in places. The gold content of the primary ancient channels and of the present streams depended on the gold content of the bedrock, and the best mines were below the regions where these streams crossed the pocket and quartz veins.

There is printed herewith a directory of placer mines and prospects, giving the names, locations and ownerships of practically every placer mine in the county, together with reference by name of publication and page, to this bureau's reports describing past mining operations. The mines of the Duncan Canyon district were described, and a map of the district published in our "Mining in California" for July, 1925. The vexed question of hydraulic mining in this and nearby counties has been discussed in detail by Arthur Jarman in the report of the California Hydraulic Mining Commission, which was reprinted in our quarterly, "Mining in California," for January, 1927. There remains to mention only the few small operations not covered in other reports cited in the directory.

Big Dipper. The last work on this old drift mine near Iowa Hill! was done by A. D. Hadsel in 1920-21. Results were disappointing, and the property is idle.

Blue Eyes Prospect in Duncan Canyon was prospected for several years by Gold Dollar Mining Company, under option to purchase. The Gold Dollar adit on the Gold Dollar claim near the southwest end of the 2580 acres in this group was run 2300 feet in a direction a little west of north. This was in search of one of the steep channels, similar to that mined at the Glenn. Several bodies of gravel were opened and worked in a small way in the past on the claims now included in the Blue Eyes. The last work failed to find any payable deposit, and developed no buried channel.

After driving this adit, the company advanced the Jack Robinson adit to a length of 1300 feet on the Jack Robinson claim, three-fourths of a mile east of the Gold Dollar adit. (See map, in "Mining in California," July, 1925.) There are heavy, water-worn boulders, indicating a large channel (which is

probably the Chalk Bluff channel) in the outer part of this adit, which was started years ago. It was above bedrock at the start, and, according to S. S. Caples, one of the owners, bedrock was never reached in the last work, which is reported 14 feet above the bedrock at the face. The company gave up the property early in 1927.

Boles Placer is a river claim of 100 acres about three miles upstream from Rattlesnake Bar on the Middle Fork of American River and five miles south of Auburn. This section of the river was extensively worked by damming the river and diverting the flow at the time of low water in summer and autumn through large flumes. It is believed that sections of the river on this claim were never worked out. The owners are using the same system of prospecting which was followed in 1924 and 1925.

A 40-h.p. gasoline engine and 6-inch centrifugal gravel pump and a small engine, air pump and air hose for a diver are installed on a barge which is anchored in the middle of the river by cables. An overhead cable spans the river and a hoist and engine on shore operate a steel scoop which can be lowered into the river and can be filled with coarse rock by the diver. The suction nozzle from the pump is directed by the diver, who wears the regular deep-sea outfit. Any rock small enough to pass the pump is readily handled. The pump discharges its mixed load

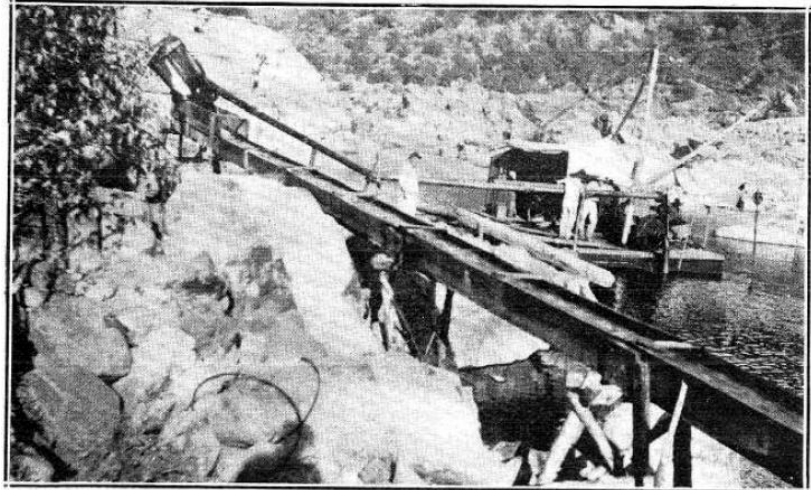


PHOTO No. 6.

Equipment used at Boles Placer Mine on American River to prospect under water. The diver worked under deep water near the point where the blocks and cable are suspended (right), directing the suction hose and loading the large boulders.

into the head of the sluice boxes, about six feet above water level, giving ample water for washing the gravel and sufficient dump room to permit discharging tailing on the bank downstream. Work can be carried on only when the water is clear and warm enough to permit a diver to remain below several hours. Two divers alternate under water. Some of the previous work here was done under 20 to 24 feet of water. On account of their loss in weight in water, large boulders can be handled much easier than on land.

Carmack Placer Mine, near Robertsons' Flat, will be prospected this season by Mrs. George W. Carmack, Seattle. No work except assessment labor has been done for several years, but a good prospect is said to have been found last season.

Double-0 Mining Company has been prospecting the old drift mines at Deadwood.

Excelsior Mine was last extensively prospected by the late Haines Gridley as trustee between 1915 and 1921. In the early days the Forest Hill channel, a front channel or bench system of the primary channel, which contributed a large part of the gold taken from the Forest Hill district, was worked in a number of claims through tunnels entering from the south side of the ridge. This bench system or earlier and higher channel of the primary system was cut off by the later and deeper blue lead and the work in later years has been for the purpose of finding the westward extension, if any, of the earlier channel, and also to prospect upstream on the Deep Blue Lead. The latter proved to be a much wider deposit than anticipated, and in the length of channel prospected, between 400 and 500 feet upstream, did not yield gravel rich enough to pay a profit according to Gridley. The west ward extension of the earlier channel

was not picked up, and Gridley's work did not reach the top of either rim of the wide channel. Some later work has been done without conclusive results. This holding includes claims along the south front of the lava cap from the Dardanelles to the Gore, also the Excelsior, Banner and Garland Mill Slope claims. An early resumption of work is planned.

Glenn Mine, in the Duncan Canyon district, has remained almost the only producing drift mine in the county for several years. The upper workings are still mined by lessees, while F. Tillotson and associates have continued operation of the lower workings. There has been little change since the report on the mines of that region in our "Mining in California," July, 1925.

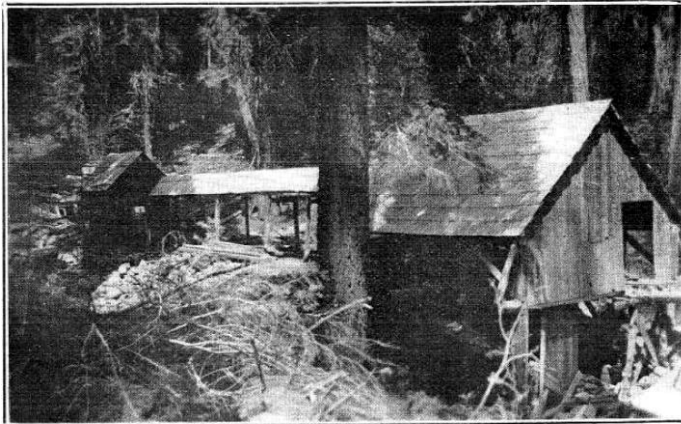


PHOTO No. 7.
Lower tunnel, Glenn Mine.

The Glenn channel is steep and narrow and the gravel is mostly of hard schist, with little quartz in it. In the lower workings on the Outlet claim the pay gravel is 12 to 15 feet wide and ranges from nothing to 2½ feet thick, being overlain by coarse volcanic sand, which in places closes directly down upon the hard, polished schist bedrock. The gold here was mostly in the crevices of the bedrock. In the upper workings, in the Shields tunnel, the bedrock; rises 140 feet in 1500 feet, there being many sheer drops of several feet, evidently waterfalls in the old

channel. The Moss crevice, in this tunnel, is said to have yielded \$9,000. In flatter stretches of channel, gravel accumulated, and one body 200 feet long and up to 35 feet wide was breasted.

Georgia Hill, Gravel Mine. near Yankee. Jim's, was prospected in 1919 and 1920 by Georgia Hill Gold Mining Company, Inc., headed by Anthony Crafton. A tunnel 1400 feet, long was run, a raise put up 206 feet and about, 200 feet of drifting done. Part of the ground had been hydrauliced in early days, and the object was to prospect the channel ahead of the face of the old pit. Results were disappointing. The claims under lease in 1920 included the Buchanan, Trafton, Kerr, Armbruster, Gillespie and Adams! and 757 acres were under option.

Grey Engle Mine, west of Forest Hill, was prospected by a subsidiary of Chief Consolidated Mining Company in 1915 and 1916. They reported a channel 50 to 80 feet wide, but that the value of gravel was not satisfactory.

Samuel Laird Ranch, east of Loomis, contains a shallow gravel deposit which was worked about, 1912 by one of the most complete hydraulic elevator systems ever used in the state. Electricity was used to furnish power for pumping water. On account of the fluted granodiorite bedrock, it was difficult to deliver gravel to the elevator. About 1922 A. F. Thebo installed a drag-line bucket outfit operated by steam, but was unable to handle the ground because of insufficient power.

On the **Smyth Ranch** at Horseshoe Bar on the American River, 5½ miles east of Loomis, Mark Cameron, J. H. and C. A. Gossett and others have just completed a test of gravel by methods illustrated in the accompanying pictures.

Water for a giant was pumped from American River with a 10-inch centrifugal pump, using a 75 h.p. tractor for power. The giant was used to pipe the gravel into a pit, from which it was drawn by an

8-inch centrifugal pump, which lifted it 25 feet into 80 feet of sluice lined with 2-inch by 3-inch iron-faced riffles. For

clearing coarse cobbles from the pit, and from the gravel before reaching the pit, a specially designed rake was used. It weighs 4700 pounds, consists of 11 curved prongs of 1½ inch by 5-inch iron spaced six inches apart, and measures about five feet wide by seven feet long. The gravel pump was operated by a 60-h.p. tractor. and another tractor of the same size operated the rake, which was fitted with a drag-line cable rig. The rake moved one-half to two-thirds cubic yard of boulders at a trip. The operation was of interest principally because of the equipment used, as the ground worked was disappointing

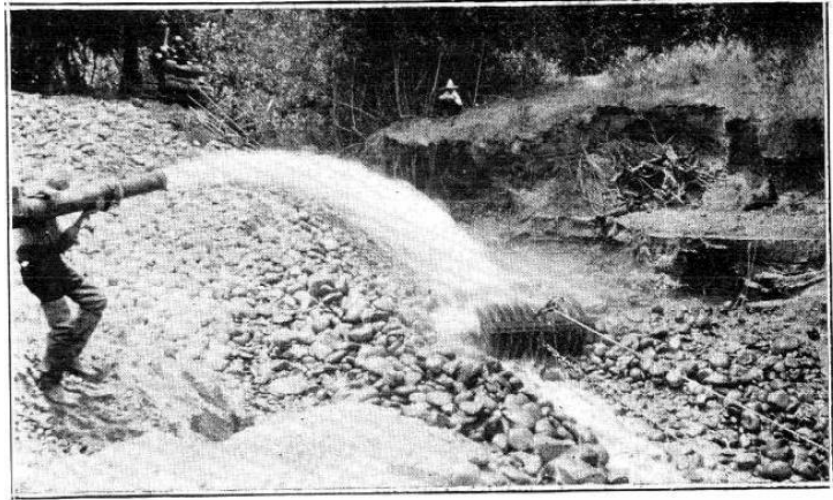


PHOTO No. 8.

New form of rake for moving boulders and cobbles, used by Cameron, Gossett and associates in placer mining at Smyth Ranch.

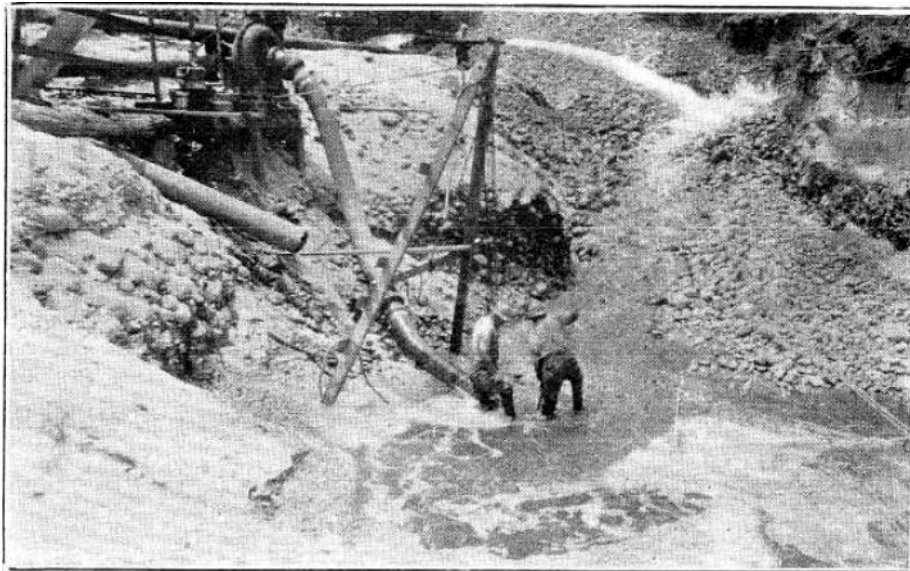


PHOTO No. 9.

Part of outfit used at Smyth Ranch for prospecting gravel.

TABLE OF PLACER MINES AND PROSPECTS, PLACER COUNTY.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography
	Sec.	Twp.	Range				
Acadla.....	14	15 N.	11 E.	George McAulay, Auburn			R. XV, p. 379.
Alabama.....				Estate of P. D. Winter, 530 Twenty-second Ave., San Francisco			R. XII, p. 204; XIII, p. 272; XV, p. 352.
Allbright.....	36	12 N.	7 E.	Alta Gold Mining Co., 1118 Broadway, Oakland.	3,380		R. XII, p. 204; XV, p. 352.
Alta.....	36	16 N.	10 E.				R. XII, p. 204; XV, p. 352.
American Hill.....	24	15 N.	12 E.	C. E. Burns, Auburn			Abandoned.
Argonaut & Sunset.....	22	14 N.	11 E.		4,500		
Avallon.....	2	15 N.	13 E.	Attalus Mining Co., c/o C. F. Macy, Lowe Hill			
Atulias.....	26	15 N.	10 E.	c/o J. B. Knapp, Roseville	4,000	360	R. XIII, p. 275; XV, p. 352.
Azules.....	22	16 N.	11 E.	Baker Divide Mining Co., 156 Montgomery St., San Francisco			
Baker Divide.....	7, 8, 9 16, 17	14 N.	11 E.		2,838		R. VIII, p. 466; IX, p. 29; XIII, p. 273; XV, p. 352.
Baker Ranch.....	17	14 N.	11 E.	F. B. Ellsworth, Baker Ranch	3,700	160	R. XV, p. 353.
Bald Mountain.....	21, 22	15 N.	13 E.	Ownership in dispute	5,800		R. X, p. 426; XIII, p. 273; XV, p. 353; XXI, pp. 276-277.
Baltimore et al.....	28	15 N.	13 E.			2,000	See Director.
Banner.....	34, 35	14 N.	10 E.	Geo. McAulay, Auburn, et al.	3,100	110	R. XV, p. 353.
Bartley Conr.....	34	16 N.	10 E.	W. H. Rablin, c/o Wm. Rablin, 1405 J St., Sacramento	3,100		R. XV, p. 353.
Bear River.....	4	15 N.	10 E.	W. H. Rablin, c/o Wm. Rablin, 1405 J St., Sacramento	2,500		R. XV, p. 379.
Bear River.....	14, 23	15 N.	9 E.	Bear River Gold Mining Co., 401 J St., Sacramento			
Bear River and Texas Hill Est.....	12	15 N.	9 E.	memo			
Bear River and Texas Hill Est.....	12	15 N.	9 E.	Grace A. Gould, Fremont Ave., Mountain View			
Bear River Estenson.....	34	16 N.	10 E.	E. C. Uren, Nevada City	2,000		R. XV, p. 379.
Bear River Hill, Queen City and Dutch Flat Canyon.....	21	16 N.	12 E.				
Bear River Tunnel.....	34	16 N.	10 E.	Arthur W. Nichols			
	12	15 N.	9 E.	Mrs. Chas. Volzht, 1128 Tenth St., Oakland, and Wm. Nichols, Jr.			

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TABLE OF PLACER MINES AND PROSPECTS, PLACER COUNTY—Continued.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography		
	Sec.	Twp.	Range						
Bear River Tunnel Co.-----	6	15 N.	9 E.	} W. H. Rablin, c/o Wm. Rablin, 1405 J St., Sacramento.----- George H. Smith, Last Chance----- Mrs. I. Bellows, Dutch Flat----- Joe Gilbert and R. C. Barry, Forest Hill-----	2,200	80	R. XV, pp. 379-380. R. XV, p. 353.		
Belle Verne-----	5, 6, 7 26, 35	15 N. 15 N.	10 E. 12 N.		4,800				
Belvt and American Eagle-----	27	14 N.	10 E.		2,350	160		R. XII, p. 205; XIII, p. 274; XV, p. 353.	
Big Bar-----	20	14 N.	13 E.	} McGeheh Placer Gold Mining Co., Capital Nat'l Bank Bldg., Sacramento-----	2,700	162	R. XV, p. 353. R. VIII, p. 472; X, p. 423; XII, p. 205; XIII, p. 274; XV, p. 374; XVII, p. 447; Bull. 92, pp. 135-136. R. XIII, p. 285; XV, p. 354.		
Big Dipper et al.-----	3, 4	14 N.	10 E.						
Big Gun-----	22	14 N.	11 E.	W. S. Willey, Michigan Bluff Estate of James Abrams, c/o A. Dixon, 2322 W St., Sacramento-----					
Biglo-----									
Birds Flat-----	33	15 N.	10 E.	} Henry Del Rey, Iowa Hill, Foxcroft Bldg., San Francisco-----	2,871	639	R. XIII, p. 274; XV, p. 354. See Avastin.		
Black Hawk et al.-----	13, 14	14 N.	10 E.						
Blue Canyon-----									
Blue Channel-----	22 32	15 N. 15 N.	10 E. 13 E.	} Blue Channel Mining Co.----- S. S. Caples and Mrs. Emma Caples, 3634 Sixth Ave., Sacramento-----	2,800	2,550	R. XV, p. 354; XVII, pp. 447-448; XVIII, pp. 211, 603; XIX, p. 141; XX, pp. 13-14; XXI, p. 277; Pre. Rep. 8, pp. 33-34. R. XIII, p. 275. R. XV, pp. 354, 380.		
Blue Eyes Prospect-----	5, 7 8, 17	14 N. 14 N.	13 E. 13 E.						
Bob Lewis-----	33	15 N.	12 E.	} S. B. Caples, 3634 Sixth Ave., Sacramento.----- W. Fitch, E. J. Rene, Auburn, et al.----- Booth River Mining Co., c/o E. Booth, Iowa Hill----- Mrs. F. A. Bowen, 601 54th St., Oakland----- Estate of Wm. Rablin, 1405 J St., Sacramento, et al.-----	4,580	44	R. XV, p. 380. R. XIII, p. 275; XV, p. 354. See Paragon.		
Bogus Thunder-----	19	14 N.	13 E.			250			
Bolcs-----	34	12 N.	8 E.			100			
Booth River-----	29	15 N.	10 E.			1,300			
Bowen-----	10	14 N.	11 E.			3,400			
Bradley & Gardner-----									
Breece & Wheeler-----									
Brooklyn and Olympia-----	26, 35 36	15 N. 15 N.	12 E. 12 E.	} Messrs. Threlkeld and Blohm, San Francisco-----	4,580	235	R. XV, p. 354.		

all Run, North Fork and Bear River.....	35	16 N.	10 E.	Wm. Nichols, Jr. et al.				
Burns.....	22	14 N.	11 E.	Michigan Bluff Mexican Cons. Mining Co., Wm. Burns, Secy., Pleacer County Bank, E. Auburn	3,500	200	R. XIII, p. 276; XV, p. 384.	
California-Hawaian Dev. Co.....		13 N.	12 E.	California-Hawaian Dev. Co., 588 Mills Bldg., San Francisco.		4,223	See Ralston Divide Gravel.	
Cambridge.....	9, 16 17, 19 20	14 N. 14 N. 14 N.	10 E. 10 E. 10 E.	Mrs. Stemple, Colfax.			R. XV, p. 380.	
Canada Hill.....	4, 5, 9	15 N.	13 E.	E. Armstrong, Nevada City, et al.	6,300	310	R. XV, p. 85; XVII, pp. 444-445; XVIII, p. 602; XX, p. 13.	
Canyon Creek.....	10	15 N.	10 E.	Stewart Gravel Mines, Inc., c/o J. D. Stewart, Auburn.	1,310	10	R. XIII, p. 276; XV, p. 380.	
Canobus.....	23	14 N.	10 E.	James Gevin, Forest Hill.	2,950	39	Field Report.	
Carey.....	22	15 N.	10 E.	F. S. Bonham and Wm. A. Pelster, Iowa Hill.	3,200	120	R. XV, pp. 354-355.	
Carmack.....	4, 5	15 N.	13 E.	Mrs. George W. Carmack, Seattle, Wash.	6,320	430	R. XV, pp. 368-369; XVII, pp. 448-449; XVIII, pp. 263, 603; Pre. Rep. 8, p. 34.	
Cedar M. Cedar Creek.....	3	15 N.	10 E.	Martha Thomas, Towle, and John Thomas. J. L. Gould, Alameda.	3,500	430	R. XII, p. 206; XIII, p. 276; XV, p. 355.	
Collins.....	31	15 N.	10 E.	W. B. Fowler, Colfax.			R. XV, p. 380.	
Copper Bottom.....	27	15 N.	10 E.	J. D. Peters, 22 San Lorenzo St., Santa Cruz.			R. XV, p. 355; XVIII, p. 211.	
Dam.....	23, 26	15 N.	11 E.	Damascus Mining Co., Monadnock Bldg., San Francisco.	3,715	174	R. XV, p. 355.	
Damascus.....	14, 15 23	15 N. 15 N.	11 E. 11 E.	Hidden Treasure Mining Co.	3,748	1,548	R. VIII, p. 469; IX, p. 29, 120; X, p. 451; XII, p. 209; XIII, pp. 277, 281; XV, p. 355.	
Dardanelles Cons.....	2	13 N.	10 E.	T. L. Chamberlain, Auburn.	2,600	312	R. VIII, p. 464; IX, p. 29; X, p. 465; XII, p. 207; XIII, p. 277; XV, p. 355; Bull. 92, p. 136.	
Dayton.....	27	15 N.	10 E.	M. E. Poor, Iowa Hill.		10	R. XIII, p. 282; XV, p. 355.	
Devil's Bath.....	1 25	14 N. 14 N.	11 E. 10 E.	R. Lofrueth, Deadwood; J. E. Ferguson, Michigan Bluff. Under option to Double-O Mining Co.	3,700		XV, p. 356.	
Devil's Gate.....	33, 34	15 N.	10 E.	Chas. Pinotti, Forest Hill.		137	R. XV, pp. 356-357.	
Dewey Cons.....	9, 16	14 N.	13 E.	Joseph Scherer and John Franks, Last Chance; A. Morehead.	4,000	240	R. XV, p. 357; XXI, pp. 277-278; Pre. Rep. 8, p. 34.	
Double-O Mining Co.....	31, 32	15 N.	12 E.	Double-O Mining Co., H. R. Staples, Pres., P. O. Box 734, Oxnard.		573	Pre. Rep. 8, p. 34.	

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TABLE OF PLACER MINES AND PROSPECTS, PLACER COUNTY—Continued.

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	Sec.	Twp.	Range				
Dow.....	33	14 N.	10 E.	Mary Dow Stevens, 533 Bush St., San Francisco, et al.			
Dutch Flat Blue Lead.....	3	15 N.	10 E.	C. S. Jordan, Dutch Flat, and J. L. Gould, 16 Kinloe Ave., Alameda.		80	R. XV, p. 357.
Dutch Flat Canyon.....	34	16 N.	10 E.	Mrs. H. L. Beal, 123 Terminal St., San Jose.		20	R. XV, p. 357.
Dyer.....	35	16 N.	10 E.	Lewis A. Gould, Fremont Ave., Mountain View.	2,800		R. XV, p. 357.
Eagle Bar.....				Wm. Duffy, Forest Hill.			See Pacific Gold Gravel.
El Dorado.....				R. Monroe, Dutch Flat, et al.		425	R. XIII, p. 278; XV, p. 357
Elite.....	31, 32	16 N.	11 E.	Erle Mining Co., c/o J. W. Morgan's Estate, Auburn.	3,950		
Erle.....	25	15 N.	9 E.				
Fatzy.....	8, 9	15 N.	12 E.				See Rocky Bar.
	10, 17	15 N.	12 E.				
	18, 19	15 N.	12 E.				
Eureka Cons. Drift Mining Co.	20, 24	15 N.	12 E.	Eureka Cons. Drift Mining Co., 519 California St., San Francisco.	4,400	2,342	R. XIII, p. 278; XV, p. 357.
	25	15 N.	12 E.				
Excelsior.....				George McAulay, Auburn, et al.			
Federal Drift.....	34	16 N.	10 E.	Federal Drift Mining Co., W. T. Watson, Supr., Dutch Flat, Dr. W. B. Coffey, Pres.		125	R. XV, pp. 357-358.
Ferriter.....	16, 18	13 N.	10 E.	R. R. Read, 812 Broadway, Oakland.	3,000	240	R. XV, p. 358.
Phystrick.....	32	15 N.	10 E.	M. E. Poor, Iowa Hill.			R. XV, p. 359.
Florida & Tilton.....	25	14 N.	10 E.	A. Jones, 1615 Fifteenth Ave., Seattle, Wash.	3,550	109	R. XV, p. 359.
Flynn Fish.....	34	16 N.	10 E.	John C. and Ed. Treen, 1016 N St., Sacramento.	3,100	15	R. XV, p. 359.
Forest Hill Mining Corp.....	15, 16 et al.	14 N.	11 E.	Forest Hill Mining Corp., Box 734, Ornard, lessee, with option, of Murr Cons.			
Foss.....							See Maguire.
Franklin.....	10	14 N.	11 E.	Geo. V. Nichols, 2647 24th St., San Francisco.	3,400		R. XIII, p. 278; XV, p. 359.
General Grant.....	33, 34	15 N.	10 E.	S. M. Sprague, 418 Twenty-fifth St., Sacramento, 2½; Ben Rosel, Jr., 527 Twenty-eight St., Sacramento, ¼.			
Georgia Cons.....	9, 10	14 N.	11 E.	D. M. Burns, 614 Crocker Bldg., San Francisco, et al.			
Georgia Hill Gravel Mining Co., Inc.....	32, 33	14 N.	10 E.	Georgia Hill Gravel Mining Co., Inc., 207 Thayer Bldg., Oakland, J. F. Power, Gen. Mgr.	2,450	757	XVIII, p. 211; Pre. Rept. 8, p. 34.

Gillett.....	31	15 N.	10 E.	F. N. Gillett, Colfax.....	2,692	660	R. XV, p. 380.
Glendon.....	9, 10	14 N.	10 E.	Mrs. M. Glendon, Iowa Hill.....			R. XV, p. 389.
Glenn Cons.....	22, 27 28, 34	15 N.	13 E.	Glenn Cons. Mining Co., George McAdamy, A. K. Robinson, Auburn, et al.....	5,000		R. XIII, p. 278; XV, pp. 350-360; XVII, p. 449; XVIII, pp. 7, 603; XX, p. 13; XXI, p. 278; Pre. Rep. 8, pp. 34-35; Bull. 92, p. 140.
Golden Dipper.....				Golden Dipper Placer Mining Co., 232 Fairgreen Ave., Youngstown, Ohio.....			See Blue Dyes.
Golden Gate.....	22	15 N.	13 E.	L. & A. Borchart, 2413 I St., Sacramento.....			R. XV, p. 360.
Gold Dollar.....	1	16 N.	11 E.	J. W. Hyatt, Emigrant Gap.....	4,800	480	
Golden Channel.....	15	14 N.	11 E.	A. K. Robinson, Auburn.....			R. XV, p. 360.
Golden Gem et al.....	12	16 N.	11 E.	C. M. Eberhart, Gold Run.....	4,000	640	R. XV, p. 360.
Golden Nugget.....	12, 13	15 N.	11 E.				
	14, 23	15 N.	11 E.				
Golden River.....	15	15 N.	11 E.	J. A. Ferguson, Forest Hill, agent for Societe des Mines de Golden River, Paris, France.....	3,827		R. VIII, pp. 470-472; IX, p. 29; X, p. 456; XII, p. 208; XIII, p. 279; XV, p. 360.
	3, 4, 5	15 N.	12 E.				
	6, 7, 8	15 N.	12 E.				
Golden Shaft.....	18	15 N.	12 E.				R. XIII, p. 279.
	35	16 N.	10 E.				R. XV, p. 360.
Golden Star.....	24	15 N.	10 E.	Golden Star Mining Co., e/o N. E. Booth, Colfax.....	3,175	9	
Golden Streak.....	35	16 N.	10 E.	Golden Streak Mining Co., Estate of Henry Lohmer, F. H. and Walter Schulze, F. D. Kuenzley and P. W. Crider, Colfax.....		140	
Golden West.....	4, 5	15 N.	13 E.	Golden West Cons. Mining Co., Grass Valley.....	6,500	400	R. XV, p. 360.
	1	15 N.	10 E.	Mr. West, Towle.....	1,500	63	R. XV, p. 361.
Gold Ring.....	27	14 N.	11 E.	A. A. Gorman, Michigan Bluff.....		250	R. XIII, p. 279; XV, p. 360.
Gorman et al.....	23	15 N.	10 E.	Gold Placer Mining Co., o/o D. S. Steinhilber, San Diego.....	2,200		R. XV, p. 361.
Gould.....							
Gould Group.....	33, 34	16 N.	10 E.	Lewis A. Gould, Fremont Ave., Mountain View.....			
	3	15 N.	10 E.				
	23	16 N.	11 E.				
	5, 6, 7	15 N.	16 E.				
Great Channel.....							See Hermit.
Great.....	1	16 N.	12 E.	Martin Burner, Forest Hill, et al.....			R. XVII, p. 449; Pre. Rep. 8, p. 35.
Grey Eagle.....	5, 6	13 N.	10 E.	Amelia C. Couchlin, Dutch Flat.....	2,400		R. XIII, pp. 279-280; XV, p. 361.
Grizzly Canyon et al.....	10	14 N.	10 E.	Chauncey H. Dunn, Sacramento.....		176	
	4	14 N.	13 E.				
Haney Cons.....	33	15 N.	13 E.	Thomas F. Haney, Last Chance.....			R. XV, pp. 350-351.

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	Sec.	Twp.	Range				
Hard Climb.....	3, 9	14 N.	13 E.	Estate of McCullough Brothers, Michigan Bar, and Charles Hilton, c/o Chen Mine, Last Chance.....	4,000	400	R. XV, pp. 361-362; XXI, pp. 279-279; Pre. Rep. 8, p. 35. See Big Dipper.
Harmou.....							
Haskell.....	21, 28	12 N.	8 E.	Haskell Gold Mining Co., c/o Ed. Gaylord, Auburn, et al.....	1,300	180	Field Report.
Hazard.....	20, 21	14 N.	11 E.	Hazard Gravel Mining Co., M. E. McGeoghagan.....	222	222	R. XIII, p. 280; XV, p. 362.
Haub.....	28	16 N.	11 E.	Robert Watson, Blue Canyon.....	3,720	33	R. XIII, p. 280; XV, p. 362.
Hermite.....	3	14 N.	11 E.	Mrs. Bowen & Sons, Michigan Bluff.....	3,400		
Hidden Treasure.....	26, 27 34, 35	15 N.	11 E.	Hidden Treasure Mining Co., Harold T. Power, Secy., 625 Call Bldg., San Francisco.....	3,614	1,545	R. VIII, p. 469; IX, pp. 29, 120; X, p. 451; XII, pp. 209-210; XIII, p. 281; XV, p. 362; Bull. 92, p. 137.
Hogback.....	2, 3	15 N.	12 E.	Compagnie des Mines et Minerals, 26 Rue de Chateaudun, Paris, France; J. A. Ferguson, agent, Forest Hill.....	4,525	1,545	R. VIII, p. 472; XIII, p. 281; XV, p. 363.
Homestake.....	31	14 N.	11 E.	M. Savage, Forest Hill.....	1,260		R. XV, p. 363.
Home Ticket.....	26, 35	15 N.	12 E.	J. E. Thompson, Bath, or Box 178, Long Beach, et al.....	4,700		R. XV, p. 363; XVIII, p. 211; Pre. Rep. 8, p. 35.
Hooes, Garden Claim, You Bet and Brown.....	33, 34	16 N.	10 E.	George V. Nicholls et al.....		62	R. IX, p. 277; XIII, p. 281; XV, p. 382.
Horseshoe Bar et al.....	4	13 N.	11 E.	Horseshoe Bar Cons. Mining Co.....			
Iowa Hill and Byrds Flat.....	34	15 N.	10 E.	Mrs. J. McPherson, 1051 S. Flower St., Los Angeles.....			
Iowa Hill.....	26, 27	14 N.	10 E.	Wm. Muir, Oakland.....			
Indian Hill.....	9, 10	15 N.	10 E.	J. L. Spearhawk, Iowa Hill.....			R. XV, p. 363.
Irish & Byrne.....	3, 4	14 N.	10 E.	McGeochin Placer Gold Mining Co., Capital National Bank Bldg., Sacramento.....			
Jack Robinson.....	16	14 N.	13 E.	S. S. Caples, 3634 Sixth Ave., Sacramento.....	4,070		R. XV, p. 363.
Jarvis.....	14, 15	15 N.	11 E.	H. M. Jarvis, Mobile, Ala.....	3,850	160	R. XV, p. 363.

Jupiter Cons.....	11	14 N.	10 E.	McGeachin Placer Gold Mining Co., Capital Natl Bank Bldg., Sacramento.....	250	R. XV, p. 363. R. XV, p. 382. R. XV, p. 382.
Kelly.....	9	11 N. 15 N.	8 E. 10 E.	M. A. Kelly, Auburn. Estate of T. L. Schwab, Lows Hill. W. F. Ford, Forest Hill, e/o George S. Ford.		
Ladies Canyon.....				San Leandro, Loomis. Lebanon Mining Co., 404 Twenty-eighth St., Oakland; J. E. Walsh, Auburn.	2,928	Field Report. R. XV, p. 382. See Jarvis.
Ladri River Claim.....	3	14 N.	10 E.	J. F. Thompson, Bath.		
Lebanon.....				St. Clair.	2,080	
Lohisch.....	30	14 N.	11 E.	E. T. Rohle, Auburn; George F. Miller, Blue Canyon, et al.	4,500	R. XIII, p. 282; See Devil's Basin.
Bob Lewis.....						
Live Oak.....	22	14 N.	10 E.			
Lofruh.....						
Lost Camp.....	23	10 N.	11 E.			
Lucky George.....	16	14 N. 15 N.	13 E. 12 E.	M. Savage, 1242 Polk St., San Francisco. Kate F. Johnson, 2411 Hildale Ave., Berkeley; Mrs. Agnes Snyder, Forest Hill, et al.	5,000	R. XV, p. 364; XVII, p. 449; Pre-Rep. 8, p. 35.
Macedon.....	1				40	
Mad Canyon, New York Bar, Apache.....				Marcel Lowell, Auburn.		R. XV, p. 364.
Maguire.....				Mr. and Mrs. Wm. Maguire, Nevada City.		
Manhattan-Michigan.....	15, 16	14 N.	11 E.	A. K. Robinson, Auburn. Howard Davis, Auburn, et al.		R. IX, p. 280; X, p. 417; XII, p. 210; XIII, p. 282.
Manmoth Bar.....						R. XV, p. 364.
Marian.....	35	14 N.	11 E.	Estate of E. A. Hill, Michigan Bluff.	3,800	185
Mars Cross.....	31	16 N.	12 E.	Sam Wolford, Grass Valley.		
Marin.....	31	15 N.	10 E.	F. P. Gallaher, Colfax.		
Mascot.....	26	14 N.	10 E.	See Baltimore or Excelsior.		20
Masonic.....				Masonic Mining Co., e/o Alice McIntosh, Roseville.		R. XV, p. 382. R. XV, pp. 337-358; (Excelsior) XVII, p. 449-450.
Maus.....	36	15 N.	10 E.			
	22, 23	14 N.	10 E.	W. H. Craig, Forest Hill.	3,000	R. XV, p. 364.
Mayflower.....	24, 25	14 N.	10 E.	Mayflower Gravel Mining Co., Room 1210, 995 Market St., San Francisco.	2,700	2,000
	26	14 N.	10 E.			
McGeachin Placer Gold Mining Co.....	3, 4	14 N.	10 E.	McGeachin Placer Gold Mining Co., Capital Natl Bank Bldg., Sacramento.	2,500	1,600
McMaus River.....	9, 10	14 N.	10 E.			Includes Morning Star et al. See Burns.

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	Sec.	Twp.	Range				
Missouri.....	33, 34	14 N.	10 E.	N. E. Booth, Colfax.....	2,650	R. XV, p. 365.
Mohawk.....	26	15 N.	10 E.	Peter F. Hines, E. W. Smith and A. A. Biswell, Westville.....	3,200	R. XV, p. 365.
Monumental.....	5	15 N.	13 E.	Mc. Moody, Pacific Hardware Co., San Francisco	5,300	200	R. XIII, p. 283; XV, pp. 365-366.
Moody Ridge.....	3, 10	15 N.	10 E.	McCrachin Placer Gold Mining Co., Capital Natl. Bank Bldg., Sacramento.....	3,650	120	R. VIII, p. 472; IX, p. 29; X, p. 240; XII, p. 211; XIII, p. 283; XV, p. 366.
Morning Star.....	33, 34	15 N.	10 E.	McCrachin Placer Gold Mining Co., Capital Natl. Bank Bldg., Sacramento.....	2,700	163	R. VIII, pp. 472-473; IX, p. 29; X, p. 420; XII, p. 211; XIII, p. 283; XV, p. 366; XVIII, p. 45.
Mountain Chief.....	34	14 N.	11 E.	Fred Outhouse, Forest Hill.....	.....	220	R. XV, p. 366.
Mountain Tunnel.....	4	13 N.	10 E.	A. C. Bequette, Auburn.....	.....	469	R. XIII, p. 283-284; XV, p. 366.
Mountain Lily.....	15, 16	14 N.	11 E.	Estate of P. G. Ekberg, Auburn.....	.....	160	R. XV, p. 368.
Muir Tunnel Cons.....	23	12 N.	6 E.	See Forest Hill Mining Corp.....	.....	380	R. XV, p. 368.
New Basenat.....	2, 3	15 N.	12 E.	R. F. Moleed, 350 California St., San Francisco.....	4,900	64	R. XV, p. 368.
New Basil Cons.....	10, 11	15 N.	12 E.	T. L. Selwagh, Iowa Hill, et al.....	.....	.....	.....
New York et al.....	9	14 N.	10 E.	I. K. Develoy and Brother, Blue Canyon.....	.....	.....	.....
North American.....	28, 29	16 N.	11 E.	E. DeKrues; R. F. Cannon, Iowa Hill.....	2,500	.....	.....
North Bell.....	22	15 N.	10 E.	.....	.....	.....	.....
North Fork and Bear River, Bear River Tunnel and 1,000 Ft. Claim.....	4, 5 33	15 N. 16 N.	10 E. 10 E.	Estate of Wm. Rablin, 1405 J St., Sacramento; Mrs. Elizabeth Uren, Apple River, Ill.; Lewis A. Gould, Fremont Ave., Mountain View and Butte Eng. & Electric Co.....	.....	.....	.....
North Star et al.....	.....	.....	.....	North Star Mining Co., 404 Twenty-eighth St., Oakland.....	.....	.....	.....
Occidental.....	3	14 N.	10 E.	Occidental Mining Co., c/o C. E. Macey, Iowa Hill; J. E. Wrethman, Garden City Bank Bldg., San Jose.....	3,300	171	R. XV, p. 368.
Orion & Rule.....	32	15 N.	10 E.	Estate of C. F. Macey, Iowa Hill.....	.....	.....	.....
Oro.....	10	14 N.	11 E.	A. Dixon, Michigan Bluff.....	3,600	.....	R. XIII, p. 284; XV, p. 368.

Oro.....	14, 23	15 N.	10 E.	Oro and Mountain View Cons. Mining Co., c/o W. H. Russell, Colfax	221	R. XV, p. 368.
Outhouse Cons.....	24	15 N.	11 E.	Outhouse Cons. Mining Co., Fred Outhouse, Forest Hill, Pres.	960	See Carmack Placer Mines R. XV, p. 371.
Pacific Blue Lead.....	26	15 N.	12 E.	Placer Gold Gravel Co., Michigan Bluff	160	R. XV, pp. 346-347; 370-371.
Pacific Gold Gravel.....	27, 28 33, 34	15 N. 15 N.	12 E. 12 E.	Pacific Slab Cons. Mining Co., M. C. Threlkeld, Pres., 1007 Monahanok Bldg., San Francisco	512	R. VIII, pp. 467-468; IX, p. 29; X, p. 455; XII, p. 306; XIII, p. 275; XV, pp. 347; 370-371; Bull. 92, pp. 136-137.
Pacific Slab.....	19, 24	14 N.	11 E.	J. F. Thompson, Box 178, Long Beach, or Bath	500	
Paragon, Breese & Wheeler.....	30	14 N.	11 E.			
Park & Brown.....	21	15 N.	13 E.	C. D. McKinley, Auburn, et al.	160	R. XV, p. 377.
Pear Tree and Necessity.....	2	13 N.	9 E.	C. M. Langstaff, M. Savage, Forest Hill	120	R. XV, p. 371.
Penn Valley.....	27	15 N.	10 E.	Mrs. B. F. Jamieson, 415 Third St., San Rafael		
Pennsylvania.....	3	14 N.	10 E.	E. E. Freeman, Rose Nichols, 206 Foxcroft Bldg., San Francisco; J. E. Walsh, Auburn		See Gold Ring R. XV, p. 382.
J. D. Peter's.....						
Pine Avenue.....	25	14 N.	10 E.	W. H. Craig, Forest Hill		
Pioneer Slope.....				Placer Queen Gold Mining Co.	6,230	R. XV, p. 371.
Placer Queen.....				E. Kavanaugh, 40 J St., Sacramento		R. XV, p. 382.
Pleasant Bar.....	33	14 N.	11 E.			R. XV, p. 383.
Potato Flatiron.....						
Polar Star, Little Bear R. and Southern Cross.....	34	16 N.	10 E.	Geo. V. Nicholls, 2647 Twenty-fourth St., San Francisco, et al.		R. XV, p. 373.
Polar Star.....				Wm. Nicholas, Jr., Berkeley	3,100	R. XV, p. 379.
Powerty Bar.....	34, 25	10 N.	10 E.	Charles A. Fowler, 2129 I St., Sacramento	70	
Protection.....	34	15 N.	13 E.	Glenn Cons. Mining Co.	100	
Ralston Divide Gravel.....	15 different sections	13 N. 14 N. 13 N.	12 E. 12 E. 13 E.	California & Hawaiian Dev. Co., J. S. McCandless, Pres., 858 Mills Bldg., San Francisco	3,500	R. XV, pp. 371-372; XVII, p. 450-451; Pre. Rep. 8, p. 36.
Red Point.....					4,223	See Golden River.
Red Star.....				D. M. Ray, East Chance, and M. Savage		R. XV, p. 372.
Reed.....	8	15 N.	13 E.	Mr. J. D. Meredith, Capital National Bank Bldg. Sacramento	6,000	R. XV, p. 372.
Robinson Flat, Screw Auger.....	1	14 N.	9 E.	W. S. Edwards	150	R. XV, p. 383.
Rocky Bar.....				O. L. Patey, Colfax	1,050	
Rough and Ready.....	35, 36	14 N.	10 E.	Emma Williams, 3018 Euclid Ave., Alameda; G. H. Garrison, 715 I St., Sacramento, et al.		R. XV, p. 372.

*Due to various legal complications which may arise regarding ownership of unpatented mining claims, we do not vouch for absolute correctness of this column. The names are mostly those appearing on the tax rolls. To save space, frequently only one of several owners is listed.

TABLE OF PLACER MINES AND PROSPECTS, PLACER COUNTY—Continued.

Name of mine	Location			Last owner's or operator's name, address*	Elevation, feet	Area, acres	Bibliography
	Sec.	Twp.	Range				
Sacramento	34	16 N.	13 E.	Saltor Canyon Gravel Mining Co., W. H. Duffy, Supt., San Francisco			R. XVIII, p. 263.
Sailor				Supt., San Francisco			R. XIII, p. 285; XV, p. 372.
San Laird				San Laird, Loomis			R. XIX, pp. 140-141.
Santa Fe	4	14 N.	10 E.	Morgan Green & Co., Auburn	10		R. XV, p. 372
San Francisco				S. Dehn, Iowa Hill			R. XV, p. 383.
Schlettman				Mrs. J. P. Jusé, 1209 E. St., Sacramento			See Outhouse.
Seller				Debate of Shaw Brothers			See Shell Mine.
Shakleton				Perry and A. V. Shell, Blue Canyon			R. XIII, p. 285; XV, p. 372.
Shaw Brothers				John and Wm. Watts	211		R. XV, p. 372.
Shell	23, 26	13 N.	10 E.				
Strawberry							
Windred Shirley, Willow Bar and American Bar	4, 5	13 N.	11 E.	John A. Britton, 445 Sutter St., San Francisco		40	R. XII, p. 212; XIII, p. 285; XV, p. 373.
Small Hope	27	14 N.	10 E.	Mr. Federer and James Nicholson, Sacramento			
Smuth Ranch				Mrs. San Laird, Loomis, et al.			
Southern Cross	34, 35	10 N.	10 E.	Geo. V. Nicholls, 2647 Twenty-fourth St., San Francisco	3,000	40	R. XIII, p. 285; XV, p. 373.
Spring Garden	5, 6	13 N.	10 E.	N. W. Nash, Sterling		530	R. XV, p. 373.
St. George	7, 8	13 N.	10 E.	A. M. Colwell, Yankee Jim, Mer.			
Star United	33	14 N.	10 E.	H. Goshel, 111 Conway Ave., Grass Valley; Ben Rossel, Iowa Hill, et al.	2,700		R. XIII, p. 286; XV, p. 373.
Star United	27	15 N.	10 E.	L. C. Hines, Mer., Westville			
Starr	26	15 N.	12 E.	Stewart Gravel Mining Co., Mrs. G. A. Stewart, Pres., J. D. Stewart, Secy., Auburn	4,800		R. XV, p. 373.
Stewart	9	15 N.	10 E.	A. W. Hawkins, San Luis Obispo	3,000		R. XV, pp. 373-374.
Sucor Flat	24, 36	15 N.	10 E.	J. S. Vekford, Michigan Bluff			R. X, pp. 420, 422; XVIII, p. 211.
Sucor Flat	7, 10	16 N.	11 E.				R. XV, p. 384.
Sucor Angel	34, 35	15 N.	11 E.				R. XV, p. 374.
Swift Shore	2, 3	14 N.	11 E.	J. L. Sparhawk, Iowa Hill	5,500	280	R. XV, p. 374.
Swift Shore	6	15 N.	13 E.	Martin Theriss and P. C. Adams, Colfax	1,200		R. XV, p. 384.
Taspole Coue							
Thomas & Adams	1	14 N.	9 E.				

Truro.....	21, 22	15 N.	10 E.	Truro Placer Mining Co., c/o G. C. Hepburn, Applegate.....	1,650	106	R. XIII, p. 286; XV, p. 374.
Turkey Hill Consolidated.....	9, 10 15, 16	14 N. 15 N.	11 E. 11 E.	Turkey Hill Cons. Gravel Co., c/o Wm. Muir & Son, Michigan Bluff.....			R. X, p. 441; XII, p. 213; XIII, p. 286; XV, p. 374.
Twenty-One.....	3, 10	14 N.	10 E.	O. F. Goodum.....	2,900	9	R. XV, p. 374.
Union.....	28	15 N.	10 E.	Wm. Hales & Son, Will Hales, 3400 Forey-third St., Sacramento.....			
Urbson.....	35	16 N.	10 E.	J. H. Runckel, Dutch Flat.....			
Veteran.....	5 3 34	15 N. 15 N. 16 N.	12 E. 12 E. 12 E.	Golden Fleese Gravel Mining Co., 822 Foxcroft Bldg., San Francisco.....		640	R. XV, p. 374.
Volcano.....	15	14 N.	11 E.	Wm. Muir, Michigan Bluff.....			
Wakerhouse.....				John Watzel, Colfax.....		200	See Big Dipper; X, p. 423; XV, p. 374. R. XIII, p. 286; XV, p. 374. R. XV, p. 375.
Wakata Prospect.....	26	15 N.	10 E.	Ed. of T. L. Schwab, Iowa Hill.....			See Turkey Hill Cons., R. X, p. 441; XII, p. 213; XIII, p. 286.
Welcome.....							
Weake.....							
White Pine.....	27	15 N.	10 E.	Mrs. E. Entwisle, Roseville, et al.....	3,800		R. XIII, p. 286; XV, p. 373.
Wild Yankee.....				F. K. Deweely, Blue Canyon.....			
Willie, Bateelor, Bigelow, Wills.....	21	14 N.	11 E.	Mrs. Mary Dixon, 2322 W St., Sacramento Estate of Mavis Wills, c/o J. A. Wills, Michigan Bluff.....			See Dyer.
Wisconsin.....							
Wolverine.....	27	15 N.	10 E.	E. S. Davis, 615 Twenty-ninth St., Sacramento, et al.....		38	
X-Ray.....				F. Stevens, San Francisco.....		320	R. XV, p. 376.
Yule & Willey, A. & R., Franklin Zelma Bell.....	19	14 N.	10 E.	Alfred Dixon, 2322 W St., Sacramento Zelma Bell Mining Co.....		40	R. XV, p. 384.

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Note: This file does not include Asbestos, Chromite, Clay, Copper, Granite, Iron, Limestone Magnesite, Manganese, Marble, Platinum, Rock, Sand and Gravel.; Pp. 237 to 247 and Pp. 280 to 284.