

Nuggets from the Western States

Brief items covering the mining industry in the Western United States and Mexico.



ARIZONA

M. A. Hanna Company and subsidiaries, G. M. Humphrey, president, 1300 Leader Building, Cleveland, Ohio, in its report for the quarter ended June 30, 1940, subject to audit and year-end adjustments, has shown a net profit of \$714,069 after interest, depreciation, and federal income taxes. This is equal, after dividend requirements on \$5 preferred stock, to 54 cents a share on 1,016,961 shares of common stock. The figure compares with \$315,105 profit or 15 cents a common share in the June quarter of 1939, and a net profit of \$390,238 or 22 cents a common share for the quarter ended March 31, 1940. Net profit for the first six months of this year reached \$1,104,308 or 76 cents a share on common stock as against \$487,211 or 16 cents a common share in the corresponding period of last year.

Discovery of a manganese deposit in the Long Valley mining district of Coconino County, Arizona, has been reported by Bruno Valazza, Box 185, Cottonwood, Arizona. Valazza is interested in five claims in the Thanksgiving group, six in the Black Eagle group, and the Buzzard No. 2. Besides these claims, about 40 others cover the deposit and approximately 30 men are employed in their development. On the Black Eagle group considerable crosscutting has been done to determine surface deposits, which have proved extensive. An inclined shaft is being sunk on what is thought to be a vein of ore. A depth of 35 feet has been reached and a body of metallurgical ore 15 feet in thickness has been opened up. Plans include installation of power hoists, and drifting in three directions on the ore body. Following installation of power equipment, shipments of ore are expected to be made via rail at Winslow, Arizona.

Old stopes and shafts at the **Gorham and Hall** group seven miles southwest of Superior, Arizona, are being cleaned out preparatory to putting the mine on a steady production basis. At present approximately 50 tons of ore per week is being mined and shipped along with gob and dump material. Values are in silver, lead, gold, and copper. The property is owned by Pat Gorham of Superior and is under lease to E. N. Perkins, also of Superior. The Woodpecker claim, adjacent to the Gorham and Hall group, is also under lease to Perkins. It is owned by Pat Gorham.

Arical Mines, Inc., has been incorporated by Alfred B. Carr and Howard Cornick, Box 830, Prescott, Arizona, with a capitalization of 2,000 shares, no par value. The company, headed by Gordon Cronkhite, Pasadena, California, plans to carry on dredging operations in the Big Bug district.

The building at the **Moss** mine, Oatman, Arizona, which had been used as an office, store room, and living quarters, was destroyed by fire recently with almost total loss. Only a portion of the maps and records of operations at the mine was saved.

The **Samat Mining Company**, Julius Keller, Jr., general manager, Box 64, Yarnell, Arizona, is engaged in cleaning up an old mine near Yarnell which has not been operated since 1903. The main shaft is being retimbered from the surface to bulkheads over the water level. Upon completion of that work it is planned to unwater, preparatory to extensive sampling and assaying. If the findings warrant, commercial operations will be initiated. For the time being, ore will be sent to a custom mill for treatment. A crew of eight men is employed and operating officials at the mine, in addition to Keller, include J. W. Georgenton, assistant general manager, and A. L. Bass, general superintendent. The company is headed by W. M. Robinson, 151 South Poinsettia Place, Los Angeles. Keller's Los Angeles address is 733 Burnside Avenue.

A drill hole started about June 1 at the **Swansea** mine north of Bouse, Arizona, is reported to have encountered a hitherto unknown ore body at a depth of 370 feet. It is expected that further drilling will be carried on to determine the extent of the deposit. The property is under lease to Ernest C. Lane, Bouse, and associates. It is owned by the Clara Swansea Mining Company.

Approximately 250 tons of gold, silver, and copper ores have been shipped from the **North Star** mine located 30 miles northeast of Bouse, Arizona, on the north side of the Bill Williams River in the Owens mining district, Mohave County. One hundred and sixty tons have been shipped to the Hayden smelter and the balance to various points. The shipping material is taken from a 12-foot vein opened by a 75-foot tunnel and open cut. Assays are stated to average \$20 a ton. A five-ton shipment of gold ore sold the latter part of April ran \$117.60 a ton. The mine is owned by L. Marks and James Becker, both of Bouse.

Phoenix, Arizona, interests have taken over the lease on the **Mystery Hill** group, Bouse, Arizona, formerly held by the **Townsend Mining Company**, and plans are being made for erection of a new flotation mill. The Townsend company worked the claims for about two years, treating the

All news appearing in The Mining Journal is obtained from sources believed to be reliable, but the accuracy cannot be guaranteed. However, every item has been sent to the person or company mentioned for verification before publication.

ore in a 35-ton gravity concentration and plate amalgamation plant. The **Mystery Hill** group is owned by Mrs. M. A. Reynolds of Bouse, and the ore carries values in gold, silver, and copper. A number of veins, from one to five feet in width, are developed by about 1,000 feet of shafts, tunnels, drifts, and other workings.

Between 300 and 400 tons of ore, reported to assay between \$30 and \$50 in silver alone, have been shipped to the smelter from the **R. and A.** silver-lead mine, 16 miles southwest of Vicksburg, Arizona. The shoot of shipping ore is 2½ feet wide while the entire vein, carrying smaller values, but believed to be of milling grade, is said to exceed 12 feet. A crosscut tunnel, 95 feet long, is connected with lower workings by a 40-foot shaft. John L. Ramsey, Vicksburg, is the owner of the mine.

A California group, composed of E. M. Cregar, D. C. MacGregor, and Earl D. Wilcox, has taken over the old 40-ton **Harrisburg** mill located at the old town of Harrisburg, six miles south of Salome, Arizona. The group is said to be considering the purchase of a mining property in the Ellsworth district to supply ore for the mill. The flotation process of recovery is employed and consists of a ball mill, followed by plate amalgamation and flotation. A rod mill handles the rejects from the Amalgamation operation. A 60-horsepower Diesel furnishes the necessary power. George Dillard is directing rehabilitation of the plant.

The **Secret Pass Mines, Inc.**, R. C. Ferguson, superintendent, Box 534, Kingman, Arizona, has installed a compressor, hoist, blacksmith shop, and other equipment on the King of Secret Pass group and sinking on the ledge is now in progress. It is planned to sink to the 200-foot level. The property was acquired by purchase from Walter Harrison of Kingman. The company, a New York concern, is headed by J. T. MacEvoy, 50 Broadway, New York City, president; W. MacEvoy, vice-president; and G. L. Spence, secretary-treasurer. L. H. Dunham is consulting engineer.



CALIFORNIA

Installation of a new 30-ton amalgamation plant at the **Little Butte** mine, Johannesburg, California, is nearing completion, and the mill will be in operation soon. The property is being operated under lease by Stewart and James Fraser, Randsburg, California. It is owned by the Little Butte Mining and Milling Company, headed by E. L. Riggs.

The **Del Norte Mining Company**, J. W. Stivers, resident agent, Mojave, California, is preparing to operate its mill on ore from the Del Norte mine. The property is located near the old town of Skidoo in Inyo County. It is planned to handle 25 tons of ore from the mine, together with lessees' ore, and the company will also treat a minimum of 300 tons monthly from the



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Gold King mine, operated by C. O. Mitten-dorf, Box 321, Randsburg, California.

The **Mountain King** gold mine at Hod-son, via Copperopolis, California, has sus-pended operations. The shutdown, which affects about 55 men, is said to be due to a strike at the smelter. W. B. Phelps, 1494 Brae Burn Road, Altadena, California, is general superintendent, and L. V. Chancel-lor is mine superintendent. The property is operated by the **Jumbo Consolidated Min-ing Company**.

Robert W. Lea, vice-president of the Johns-Manville Company of New York, and Spencer Grant of Grant Birkholm and Company, Inc., 206 Sansome Street, San Francisco, California, have leased, on a royalty basis, 325 acres of ground in the Panoche district near Hollister, California, with a view to extensive quicksilver min-ing operations should the property prove sufficiently rich in the ore. Lily Berg of Hollister is the owner of the ground. The property has never been worked and E. H. T. Mitchell, mining engineer of San Francisco, is in charge of a crew of three men engaged in preliminary testing.

James Fitzhugh of Alturas, California, is reopening the old **Gearhart** mine on Indian Creek about 10 miles north of Happy Camp, California. The property was pur-chased from Lon Collins, Sam Sargent, Carl Adamson, Henry Erhart, and Genr Newton. It is comprised entirely of un-explored ground and will be worked by hydraulic mining, following completion of the ditch system to supply water for the giant. One and one-half miles of road to the mine were constructed in July from the McClimans ranch on the South Fork of Indian Creek.

O. T. Dennhardt, 4565 Oregon Street, San Diego, California; John Wilson; and A. E. Place of Nelson, Nevada, have leased the **Noble** mines in the Laguna Mountains, Pine Valley District, San Diego County, California. The property has been tied up in an estate and has been idle for over 20 years. Work has been started on a small scale with Dennhardt in charge.

Eight and one-half to 10 tons of ore are being shipped daily from the **Monte Cristo** mine near Mammoth Lakes, California, to the Mineral Reduction mill near Benton Station with encouraging recovery values reported. C. A. and Raymond Collins and associates began prospecting work on the property in 1937, and recent development has disclosed a vein which had been lost by former operators. The mine is opened by a 1,550-foot tunnel driven in earlier operations. A crew of 12 men is employed under the supervision of Raymond Collins, Bishop, California.

F. F. Thompson, 600 South Sullivan Street, Santa Ana, California, and his part-ner, Vaughn Maynard, also of Santa Ana, have reported discovery of a five-foot vein carrying commercial tin ore at their mine 40 miles east of Baker, California, and about seven miles north of Cima, Califor-nia. The property was formerly known as the Bernice claims and was worked two years ago by C. E. Hammett and Trig But-ton just prior to being taken over by the present owners.

W. C. Nichols, Bank of America, San Francisco, California, is operating the **Cen-tennial** placer mine on the Klamath River near McConnell Bar, using a dragline, trommel, and sluices. John Vogler, Klam-ath River, is in charge.

The **Submarine Mining Company**, A. W. Wickman, manager, Stockton, California, is working the K. S. S. property on the Tuolumne River above the Stevens Bar bridge. A diver, working on the river bot-tom, directs the suction nozzle of a six-inch gravel pump. The operators plan to construct a \$6,000 floating boat to carry their surface equipment. It is estimated that five years will be required to work out the ground under lease. Associated with Wickman in the enterprise are Ben Lamping, W. H. Farren, and Bert Knapp.

Extensive changes are being made in the milling plant of the **Central Eureka Mining Company**, James Spiers, superintendent, Sutter Creek, California. The 40 stamps are being reduced to 20, and the battery screens are being increased to four-mesh for preliminary grinding. A new six by seven Joshua Hendy ball mill then takes the pulp and grinds to 60 mesh, working in conjunction with a multizone Dorr clas-sifier fitted with a 12-foot bowl, which effects a better separation of finer grind-ing. The new plant will have a capacity of 200 tons per day. The present plant is treating 130 tons daily. A new all-steel change house, capable of accommodating 200 men, is also under construction at the mine. It will be fireproof, and will be steam heated for winter weather. Mining is in progress between the 3,000 and 2,650 levels, while a development program is be-ing carried out between the 3,000 and 3,500 levels.

The **Erin Go Bragh** mine near James-town, California, formerly operated by the California Standard Gold Mines Corpora-tion, and more recently by the Delgold Corporation, is now under lease to Stephen Rowe, Jr., the original lease-holder and first superintendent under California Standard. He is employing a small crew in retimbering the old workings.

New plates and a concentrator have been installed at the **Jumper** and **Golden Rule** mines north of Jamestown, California. The mines are operated by the **Lobicasa Com-pany**, Box 812, Sacramento, California, and work at the property is directed by Frank Moyle and Charles Smith.

Two dredging projects are being worked by **Larsen and Harms Brothers**, Route 4, Box 2220, Sacramento, California. Work at the Scandia mine on Horse Creek began in December, 1939, while operations at the Moccasin mine on the Klamath River above the confluence of Horse Creek began in February, 1940. Equipment at the Scan-dia includes a 2¼-yard Northwest drag-line and a 40 by 48-foot Bodinson floating washing plant. An average of 4,000 yards per day is handled at the Scandia opera-tion. At the Moccasin mine, about two miles of ground on both sides of the Klamath River are available and it is expected that 2½ years will be required to work the material. Moccasin equipment includes a Bucyrus-Monighan dragline with a 4½-cubic yard bucket, and a Bodinson float-

ing dredge, capable of handling 400 yards per hour. Emmett Miles is superintendent of the Scandia, and work at the Moccasin is directed by R. H. Wallace, superintendent.

The three draglines and two washing plants of the **Panob Gold Dredging Company**, operating near Lincoln, California, are handling more than 5,000 cubic yards of material daily, working two shifts with a total of 15 men employed. Walter E. Pantle, Box 307, Auburn, California, is co-owner and superintendent of the company. His associate is C. L. O'Brien.

A portion of the new mill under construction at the **Sulphide Queen** mine, Mountain Pass, via Nipton, California, was destroyed by fire recently, causing approximately \$5,000 damage. Repairs are to be made at once. A crew of 20 men is employed at the mine and mill. Harry Lee Martin, 117 West Ninth Street, Los Angeles, is purchasing agent for the mine. Work at the property is directed by Fred B. Piehl.

Active operations began about August 1 at the **French Bar** placer mine on the east branch of the North Fork of Feather River, two miles above Belden, California. Preparations for working the property were begun May 15 under the direction of C. A. Cooley, Belden, and a 900-foot flume has been built, which will make it possible to work about 1,000 feet of the present river bed. Equipment includes a 10-ton power derrick with 60-foot mast and boom, 16-inch gravel flume with three-inch block riffles, a 10-inch centrifugal pump, and another small pump. At present 10 men are employed. The project is backed by a group of Tacoma, Washington, business men.

The **Davenport Mining and Milling Company**, Auburn, California, is making arrangements to extend one of the tunnels on the property for an additional 100 feet. Upon completion of this work, the company will decide as to a further program of development. B. N. Rosenbaum, 565 Fifth Avenue, New York City, president, will be at the Freeman Hotel, Auburn, on July 29 and 30, to direct arrangements for the work.

Wilson J. Parks, Happy Camp, California, has secured an option on a large chrome deposit near Slate and Camp Creeks in the Orleans district, and development is expected to start in the near future. Parks has also acquired large chrome properties in the Moffit Creek district in Scotts Valley, and he is interested in asbestos and mineral deposits in the vicinity of Happy Camp. He is president of the **Curley Jack Mining Corporation**, which operates the Davis hydraulic mine one mile west of Happy Camp. Parks' headquarters are at 468 Colman Building, Seattle, Washington.

The **B-H Company**, headed by T. M. Geretty and associates of Jacksonville, Oregon, has secured a lease and bond on several hundred acres of gravel lying along Indian Creek eight miles above Happy Camp, California. Work began July 15 with two crews sinking test pits, and all gravel removed is being run through a test plant which is a replica of the washing

plant to be used on their dredge. The company, which is at present operating a dragline dredge on Forrest Creek near Jacksonville, Oregon, has six months in which to complete testing on the California ground. Lands included in the lease are the Sedros, Huey, Wadell, Bryan, Hockaday, and Blockwell.

Gravity concentration equipment at the **Carson Hill Gold Mining Corporation**, Melones, California, has been converted to flotation in an effort to reduce tailings losses. The change over was handled by the **Western-Knapp Engineering Company** of San Francisco. Flotation cells were installed to replace table concentration, jigs were put in for the recovery of free gold,

and a concentrate regrind mill was added. Sixteen hundred feet of extra pipe line was installed from the concentrator to the cyanide plant, together with the necessary additional pumping equipment. John A. Burgess is general manager at Melones.

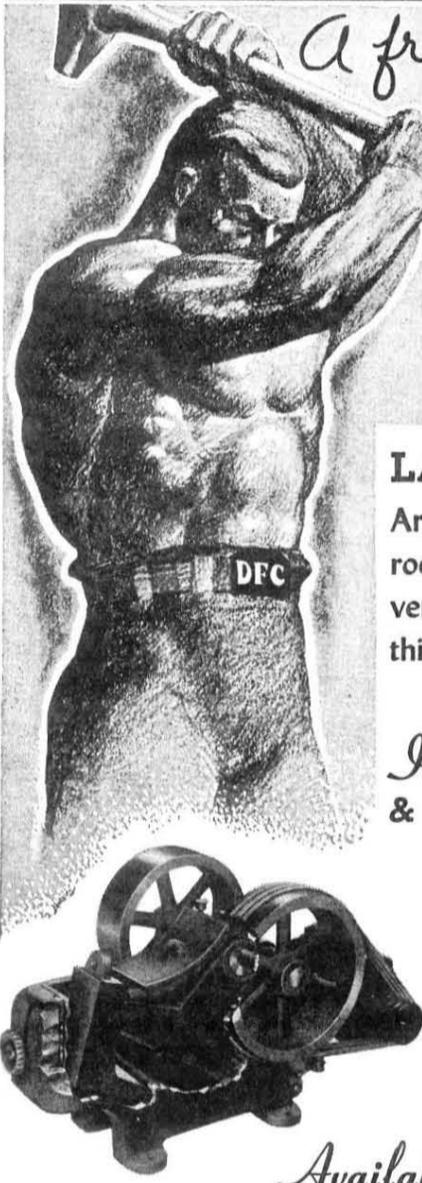
Three hundred and forty feet of development work are being done at the **Silver Top** mine in the Fingerboard area 25 miles southwest of Quincy, California, under the direction of J. Buren Evans. The ledge is approximately 20 feet wide. A small assay office has been installed at the mine.

Mining operations have been started on the **Birchim-Shively** group of tungsten claims west of Bishop, California, by the **Western Tungsten Corporation**, Ralph P.

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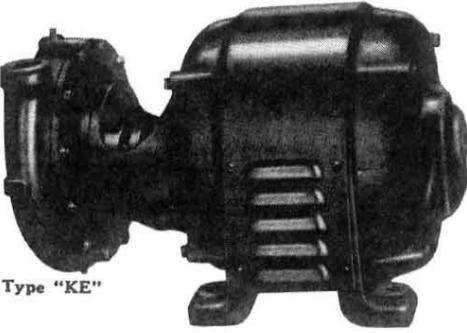
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Merritt, president and general manager, Ballarat, California. The company has secured a seven-year bond and lease on the property, which is comprised of four claims, and has also purchased the 100-ton mill and other mining equipment from the Pacific Tungsten Company, former operator. Additional equipment has been installed in the milling plant. The Western Tungsten Corporation has offices at 802 Bartlett Building, Los Angeles, California. Other officials of the company are Joe E. Riley, vice-president, and Clifford H. Marker, secretary-treasurer. L. C. Penhoel, Los Angeles, is chief engineer.

Yuba Consolidated Gold Fields, Ltd., F. C. Van Deirse, vice-president in charge of operations, 351 California Street, San Francisco, California, has leased a total of 336 acres of Feather River bottom land in the East Biggs district of Butte County for dredging purposes.

The Omega hydraulic mine near Washington, California, one of Nevada County's largest hydraulic mines in the early days, is being prepared for a resumption of operations following completion of the Narrows debris dam in 1941. A purchase option has been secured by K. R. Nutting, Salinas, California; J. E. Little, Whittier, California; Harry F. Wolfinger, Stockton, California; and Louis L. Harris, San Francisco, California, all of whom are officials of the Northwest Development Company, operating at Sumpter, Oregon. Preparatory work is being done by that company for the individuals, under the direction of Little. It is probable that a California corporation will be formed shortly to handle the operation. Theodore A. Larsen is superintendent at the mine and G. B. Little is assistant superintendent. According to a report on the gravel deposits made in 1914 by Errol MacBoyle, 13,000,000 cubic yards of gravel were mined up to 1914 with average returns of 13 1/2 cents a yard.

Work is progressing on construction of the new cyanide plant at the property of the **Lava Cap Gold Mining Corporation, Otto E. Schiffner, general manager, Nevada City, California.** The new plant will include four tanks 30 feet in diameter and three tanks 50 feet in diameter. A new building is also under construction to house the ball mill unit which will further crush the material before it is sent to the tailings plant. The latter plant will be built soon on a site below the cyanide unit. Development is also under way at the Banner and Central shafts of the mine. At the Central, sinking has been completed to the fourteenth, or 2,750-foot, level and a station is being constructed at that point. At the Banner, the diamond drill hole has been run more than 1,600 feet on the 800-foot level, but results so far have been negative. Drifting at the Banner is progressing on the fifth and sixth levels.

Extensive metallurgical tests are being made on manganese ore bodies in Calaveras County, California, to determine whether treatment and refining will prove economically profitable. The tests are being made by a group headed by Col. Carson Angel of Berkeley. John T. Martin,

Sheepranch, California, is field scout for the group.

The **Boston California Mining Company, Edward McMahon, superintendent, Box 709, Sonora, California, is preparing to reopen the Louise mine south of Coulterville, California.** There is said to be a large tonnage of ore opened up, which will be trucked to the company's Malvina mill for treatment. The milling plant at the Malvina recently completed its second year of operation and is handling approximately 3,200 tons of ore a month.

A crew of five men is employed at the **Kirkpatrick mine near Goodyears Bar, California, and a tunnel is being driven to cut a gravel deposit.** The mine is owned by Charles G. Johnson, state treasurer, Sacramento, California, and work at the mine is directed by his son, George.

Nielson and Company, Inc., Philippine mining firm, has acquired two properties in the United States and operations are expected to start within a short time. Names of the properties taken over have not yet been announced. Work will be carried on from the company's offices at 329 Bush Street, San Francisco, California. Mark Nestle is in charge of the San Francisco office. George T. Scholey, Jr., general manager of the company, has recently returned to the Philippine Islands following a trip to the United States, during which he investigated various properties.

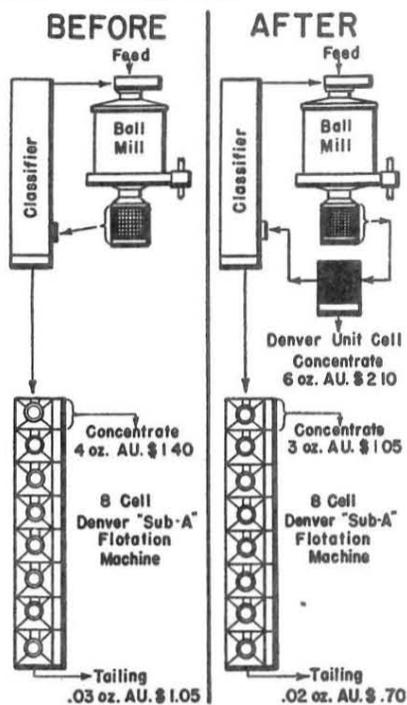
Installation of a 500-ton precipitation plant has been completed recently at the property of the **Rosekrip Mines Company, Henry S. Sweet, general manager, Bodie, California, to treat reclaimed solution from a tailings pond.** Additional transformers, power lines, and a pumping plant were also installed. The plant was built by the Western-Knapp Engineering Company of San Francisco.



The first shipment of high-grade in several years was made recently from the North Burns shaft of the **Free Coinage Gold Mining Company, Cripple Creek, Colorado.** The shaft is under lease to J. W. Manning, W. P. and Penn Asbury of Cripple Creek, and Charles E. Joslin of Victor, Colorado, and the ore was taken from a split of the Maloney vein at the surface. A drift is being run to cut the split of the Maloney at the first level.

It is reported that the **La Florecita Mining Company** has been organized to operate a gold-silver-lead property in Chaffee County near Granite, Colorado. O. K. Fotheringham of Magna, Utah, is president and K. E. Neugebauer of Pueblo, Colorado, is superintendent.

The **Eureka Mines Company** has been organized to lease and operate the Eureka tungsten property of the Gold, Silver and Tungsten, Inc., in Boulder County, Colorado. The later company has leased all of its tungsten holdings, located in Boulder County, to the C. and G. Leasing Corpora-



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John Hageman and Alice Stone, both of Stockton, California, are operating the Relief mine near Douglasflat, California, and have started driving a new tunnel 225 feet in length which will run parallel with an old caved tunnel. The property was known formerly as the Montezuma mine.

The Lafayette mine in the Hunter's Valley district near Hornitos, California, formerly operated by the Gold Valley Mining Company, has been taken over by the Specimen Hill Mining Company. The latter concern also operates the Iron Duke mine in the same district. A new five-stamp mill and a 20-ton Straub ball mill have been installed recently at this property, where nine men are employed under the direction of L. G. Thompson, engineer and manager.

An amalgamation and concentration plant has been installed at the Last Hope mine in the Bear Creek district, Mariposa County, California, and some ore has been treated. The property was recently purchased by John Owsley of Seattle, Washington, from John Lukasko of Mariposa, California.

A 20-mile private power line from Monticello, California, to the Knoxville quick-silver mine has been completed at a cost of approximately \$26,000. A new rooming house for 20 men has been constructed at the mine and four cottages to house employes are to be built in the near future. The property is owned and operated by George E. Gamble and W. V. Wilson, both of Palo Alto, California. A crew of 40 men is employed under the direction of T. S. Scribner of Monticello, superintendent.

L. V. Storrs, Box 592, Barstow, California, is reported to have encountered a vein of commercial gold ore on the Rivera property near Neenach, California, which he has under lease.

The San Andreas Gold Dredging Company, Charles H. Thurman, managing partner, 235 Montgomery Street, San Francisco, California, has moved its dredge from Vallecita in Calaveras County to a new location north of San Andreas. Several years' supply of commercial gravel is said to be available at the property.

The C. and E. Dredging Company is operating a dredge on Littlejohn Creek on the Jack West Ranch where it expects to be for at least six months. A. B. Cutler, 512 Southeast Mill Street, Portland, Oregon, is president of the company; S. L. Eddy, 1002 Pacific Building, Portland, is secretary; Alton L. Collins, Box 939, Oakdale, California, is general manager; and Hugh Williamson, R. F. D. 1, Oakdale, California, is dredgemaster and general superintendent. The company formerly operated on the Rolleri Ranch near Angels Camp, California. The present location is near Knights Ferry. Seventeen men are employed.

Mining has been suspended at the Ruck-a-Chucky dam site where employes struck a rich vein of gold ore last spring. The mint has refused to pay for the gold shipments until a ruling can be received from Washington, D. C. A question of the status of the miners is involved, since the ground on which the strike was made is stated to be owned by the federal government. The workers on the dam are said to have recovered an estimated \$20,000 from a surface deposit which they mined during leisure time.

William J. Cook and William G. Bonelli, 2552 North Vermont Avenue, Los Angeles, California, have leased the Shadow mine in the Shadow Mountain district, San Bernardino County, California, from Anna R. Lang, Eva L. Davis, and Byron Romig, all of Los Angeles, and Ethel Greenfield Stracke and Ray Greenfield of Stuart, Nebraska. Terms of the contract provide for a minimum rental of \$2,000 for 14 months, \$3,000 for the next 12 months, and the yearly rental afterwards to be not less than \$5,000. Milling royalties also were stipulated on a monthly receipt basis.

The Red Hill hydraulic mine, Junction City, California, has been closed down, and one of its operators, C. H. McCartney, Junction City, has been investigating other hydraulic mining ground on the North Fork of the American River. He is said to be interested in the Adams pit of the Mayflower group owned by Richard Detert of Forest Hill. W. M. Gilzean directs operations at the Red Hill, and it is estimated that one more season of work is available on that property.

The Calmich Mining Company, Mack C. Lake, president, 74 New Montgomery Street, San Francisco, California, has subleased all of its Tertiary gold-bearing gravel properties in the Smartville district of California to Yuba Consolidated Gold Fields, Ltd. During the past two years the Calmich company has merged and consolidated important gold-bearing gravel areas in the district, and, through its engineering investigations, determined that a large yardage of gravel containing sufficient gold is available, which could be worked profitably by large-scale mechanical methods of open-pit mining. Approximately 45,000,000 yards of gravel are stated to have been mined from these properties by hydraulic methods prior to 1887. The Yuba company, of which F. C. Van Deirse, 351 California Street, San Francisco, is vice-president in charge of operations, will systematically drill the channel gravel still remaining and develop engineering studies to determine the best method of operating the deposits by mechanical methods. Recently the Calmich Mining Company subleased to the Sunmar Dredging Company of Oroville, California, ground containing a substantial yardage of the old hydraulic tailings. These are being reworked by dragline, with approximately 3,500 yards being handled in a day.

Natomas Company, Thomas McCormack president, Forum Building, Sacramento, California, has reported a net profit of \$316,433 after depreciation, depletion, and federal income tax for the quarter ended June 30, 1940. This amount is equivalent

to 32 cents a share on 975,750 shares of capital stock outstanding and compares with a net of \$312,550 for the three months ended March 30, 1940, equal to 32 cents a share on the same number of shares outstanding. For the first half of 1940, the net profit after all charges totaled \$628,982 or 64 cents a share as compared with \$562,006 or 57 cents a share in the corresponding period of 1939.

The Vulcan Mercury Mining Company, George H. Canfield, general manager, 660 Boulevard Way, Oakland, California, is producing at the rate of two flasks of quicksilver daily from the Mercey mines near Dos Palos in Fresno County, California. The plant consists of a crusher, rotary furnace, and one retort. The mine is opened by a 40-foot shaft and 600-foot tunnel. Purchase of an electric hoist and air compressor is planned by the operators. Thirteen men are employed under the direction of R. M. Brookins, foreman, Box 545, Dos Palos.

A production in excess of \$70,000 is reported from the Pioneer mine of the Gwalia Gold Mining Company, Pine Grove, California. The company installed a 25 to 40-ton flotation plant in October of 1939 which has been in operation since December of that year. The Gwalia company is also developing the LaDuke mine, an old property which has been idle for several years. T. A. Monahan, Pine Grove, is superintendent at the Pioneer.

The Newman mine in Amador County near Pine Grove, California, recently op-

erated by the China Garden Mining Company, has been leased by new interests. The 1,000-foot tunnel is being extended and mill-grade ore is reported in the workings. The property is owned by Charles Fyke of Kansas City, Missouri.

A 25-ton ball mill is being installed at the Red Cloud mine in the Confidence district of California, which, when added to former equipment, is expected to step up production to 50 tons daily. C. R. Cartmell, Confidence, via Sonora, California, who has operated the property for the past six years, estimates sufficient ore to be in reserve to supply the plant for 18 months. Development work is being continued with the driving of another tunnel on the vein now being mined. A crew of seven to eleven men is employed.

The Floyd Mining and Milling Company is reopening an old mine in the Washington district in Riverside County, California, eight miles from Twentynine Palms and near the San Bernardino County line. The property was worked many years ago but was closed down later with little ore having been extracted. Several test shipments and assays are said to have indicated ore of a satisfactory grade and to warrant further development. Production is expected to start in the near future. A new track has been laid in the lowest adit and a chute for loading trucks has been constructed. The company plans purchase of a three-drill compressor, equipment and tools for a blacksmith shop, and erection of a bunkhouse with kitchen and mess room. Construction of a mill, which will

employ amalgamation and gravity concentration in recovery, is also planned when production is underway. The plant probably will be erected near Twentynine Palms and handle custom ore, according to reports. Frank B. Howe, Twentynine Palms, is president of the company; Erle F. Skadan, vice-president; and A. L. Weiss, 4024 Tennyson Street, Denver, Colorado, is secretary-treasurer.

The Golden Feather Dredging Company, E. A. Wiltsee, general manager, Pacific Union Club, San Francisco, California, is seeking permission from the city council of Oroville, California, to dredge on the Oroville side of the Feather River within the city limits, in return for levee work to be done by the mining company. The dredging company has been operating a 6,000-yard dredge fed by a five-yard dragline on the river near Oroville in Butte County.

Mount Bolivar Mines, Inc., Mt. Shasta, California, is developing a gold-bearing vein on Mt. Bolivar, and has installed a ball mill recently.

Herman Anderson and associates of Randsburg, California, have shipped recently 40 tons of ore to the Kelly mill from their Granite Contact mine in Copenhagen Gulch of the Panamint Mountains. The ore was the first milled from the property.

The Western States Gold Mines Consolidated, Clifford McClellan, president, Box 164, Angels Camp, California, is sinking a new shaft at the Crystal tunnel on its property with the intention of intersecting a ledge from which high-grade crystal ore

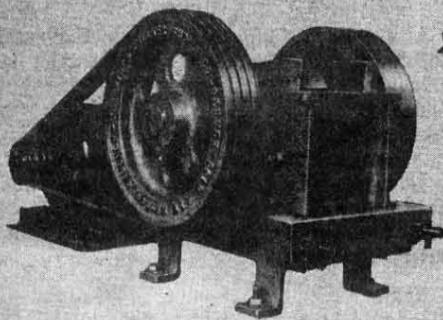
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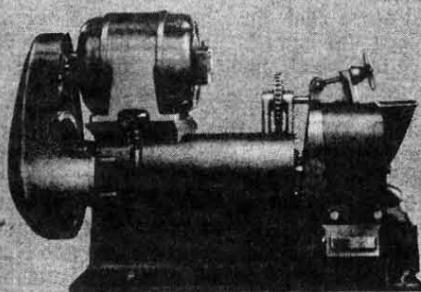


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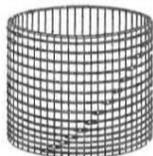
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was taken in former operations. A cross-cut will be driven into the hanging and footwalls to determine the width of the ledge, and milling ore bodies will be opened up. Several hundred tons of ore have been milled which are said to have averaged \$24 to \$27 a ton. The property is owned by the German Ridge and Jupiter Gold Mines, a California corporation, and is under bond and lease to the Western States company.

Yuba Consolidated Gold Fields, Ltd., F. C. Van Deirse, vice-president in charge of operations, 351 California Street, San Francisco, California, has leased from the Interstate Land Holding Company extensive mining grounds in the Mooney Flat, Timbuctoo, and Smartville mining areas, including the old Blue Point mine. Test drilling operations are to be started immediately. Mining is expected to be by dragline, open-pit, deep-dredging, and other methods. The lands are located in Yuba and Nevada counties about 25 miles northeast of Marysville, and were the scene of much mining activity in the gold rush days of 1848.

Mining interests headed by P. D. Burt, Mills Building, San Francisco, California, have announced an expenditure of between \$40,000 and \$50,000 to be used on the Valley View quicksilver mines in the Panoche Valley of California, which they have under lease and option. Construction of a 100-ton Gould rotary furnace, crushers, conveyor belt lines, necessary buildings, etc., will be started immediately. Mining is expected to be by tunnel and open pit and to give employment to about 30 men. A crew of nine is employed at present.

J. H. Scott, 634 Merchants Exchange Building, San Francisco, California, has purchased the Riverside mining property at Hyder, British Columbia, and will start rehabilitation work. The property, which has not been worked for 12 years, will be examined for scheelite values as a carrier of tungsten. Scott is also one of the owners of the Washington mine at French Gulch, California.

A tin deposit is reported to have been uncovered at the gold mine of the **Caliente Rainbow Mining and Leasing Company**, Bakersfield, California. The largest amounts of the ore containing tin are found at the 150-foot level in the mine. C. M. Hart is superintendent.

Irvin Carpenter and Edward George, both of Ukiah, California, have reported the discovery of a deposit of manganese at the old Busch mine on Foster Mountain 16 miles east of Willits, California. The operators took over the mine last October and since that time have cleaned out one of the old tunnels and cleared away two cave-ins which had been standing for 25 years.

J. D. Dankoff, Burnt Ranch, California, has discovered a deposit of commercial asbestos, the face of which is stated to be 200 feet wide, on his **Trinity Asbestos Number 1 and 2** mine in Trinity County, California. He also owns the Magelo Number 1 and 2 quicksilver mine in Humboldt County; the River Channel mine, com-

prised of 120 acres of placer ground in Trinity County; and a copper-silver-gold mine, also in Trinity County. The latter has not been opened, but it is thought that it contains a large quantity of ore.

Anglo American Mining Corporation, Ltd., Walter Lyman Brown, president, 206 Sansome Street, San Francisco, California, has reported a net profit of \$34,499 before deductions for depletion, depreciation, etc., for the second quarter of 1940. Revenue from the sale of gold and silver bullion amounted to \$98,795. Dividends received from the Carson Hill Gold Mining Corporation totaled \$14,074.

In a preliminary unaudited report of operations for the three months ended June 30, 1940, **Carson Hill Gold Mining Corporation**, 206 Sansome Street, San Francisco, California, shows an operating profit before deduction for depreciation, depletion, etc., of \$26,515. Tonnage milled totalled 94,843, and revenue from sale of bullion reached \$210,033. Operating costs, including all expenditures for development, repairs, and renewals, amounted to \$183,808.

St. Joseph Lead Company, 250 Park Avenue, New York City, has reported a net profit of \$2,576,820 for the six-month period ended June 30, 1940, after depreciation, depletion, federal income taxes, etc., equivalent to \$1.32 a share on 1,955,680 shares (par \$10) of capital stock, excluding 41,157 treasury shares. This amount compares with \$1,415,028 or 72 cents a share in the first half of 1939. The company operates the Sheepranch mine near Sheepranch, California.

Operations at the **Pennsylvania and Jefferson** mines, Browns Valley, California, are being maintained on a semi-limited basis pending final outcome in the state supreme court of the suit brought against the **Empire Star Mines Company, Ltd.**, by Worthington Ames. The case involves a dispute over priority of claims on the two properties. Robert J. Hendricks, Nevada City, California, is manager of the company's property at Browns Valley.

James Braden, 30 Raymond Street, Santa Cruz, California, has taken a five-year lease on the **Pasatiempo Estates** property along the west fork of Branciforte Creek with a view to mining gold and other minerals. Herman Wynn, 54 Fairmount Avenue, Santa Cruz, will be associated with Braden in operation of the property.

The **Walker Mining Company** has resumed the practice of shipping ore by aerial tram from its property at Walkermine, California, to Spring Garden, California, where it is transported by rail to the Utah smelters of the company. For the past two years, trucks have been used for conveying the ore to Gulling, from where it was shipped to the smelters. H. M. Hartmann is manager of the company at Walkermine, California.

Exploration and development work is progressing at the property of the **Oregon Hill Gold Mining Company, Inc.**, near Placerville, California. A crew of men under the direction of L. F. S. Holland,

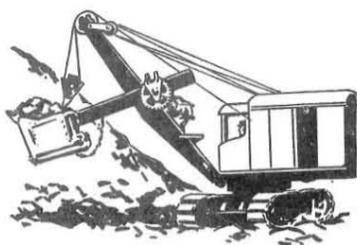
secretary and manager, is engaged in running a drift from a 100-foot tunnel. Three veins are on the property, and in early days, two shafts were sunk, one 100 and another 200 feet deep. Reginald Owen, screen star, is president of the mining company. Holland is addressed at Box 427, Placerville.

Equipment installations are being made in the custom milling plant on the McDow holdings in the Diamond Mountain district, six miles from Susanville, California, with test runs to start in the near future. Operation of the mill will be under the supervision of Ralph Bartholf, general superintendent, who was formerly with the Indian Valley Mining Company. A. G. Lantz 1115 Delmas Avenue, San Jose, California, is owner of the plant, which will serve all mining properties in the district, but chiefly the lessees on the McDow properties managed by Geo. N. McDow, Jr., of Susanville.

Alonzo Layman, Hayfork, Trinity County, California, has purchased a mill to be installed on his mining property at the Layman-Mueller quartz mine in Kingsbury Gulch, near Hayfork.

The Smith and Terrill Mining Company, Nevada City, California, is drilling test holes on the Del Norte placer property along the Klamath River above Happy Camp, California, with a view to installing a dragline gold dredge. The property is under lease to the company.

Bert Harden, Nevada City, California, and Albert Hoagland have given a sublease



on the Midnight mine on Deer Creek to a group of Grass Valley and Nevada City miners. The sublessees are Richard Haddy, Henry Conti, Barney DeVeto, and Peter Marcsheto. The new operators plan to drive a 400-foot tunnel with the expectation of going below the old workings in the mine. Work has been started, using two shifts. The Midnight is stated to have been a good producer in former days.

The Alliance Mining Company, M. C. Williams, president, 129 North Broadway, Los Angeles, California, plans construction of a nonmetallic mill southeast of Lone Pine, California, which will cost approximately \$50,000. The company owns talc deposits near Darwin, California, next to the Sierra Talc property. A good grade of the product is being produced and bins with a capacity of 120 tons have been built for the ore. Drifting has progressed for a distance of 90 feet and five men are employed. The company also expects to open up several lead properties, and hopes to erect a custom smelter in the Inyo County district, which will accommodate many properties now lying idle because of

the difficulty in shipping ore to Salt Lake City.

The Plumbago mine near Alleghany, California, Ralph Youtz, superintendent, is reported to be closed down pending a decision as to future work. Until recently approximately 38 men have been employed at the property. The property is operated by Allied Mines, Inc., Sidney B. Wood, Jr., president, 9176 Sunset Boulevard, Los Angeles, California.

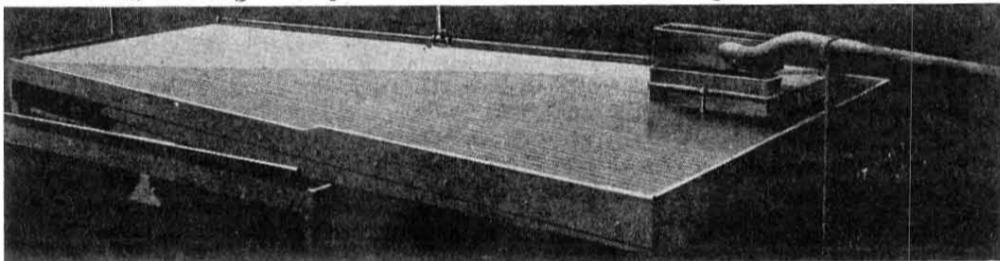
A recovery of over \$1,500 from 14 tons of ore produced from the 450-foot level of the King Solomon mine in the district near Randsburg, California, has been reported by Max Hess, mill operator. This is said to be the highest value per ton obtained from the ore in more than three years' operation. Hess, Emil Schultz, James Nosser, and James Christianson are operating the property.

Weekly shipments of from 40 to 50 tons of ore are being made from the GB mine near Randsburg, California, under lease to Milt Movald, Percy Wegmann and Bert Wegmann. The operators are stoping on the 300 level. The ore is treated in the Kelly mill in Red Mountain.

Work at the Ancho-Erie mine near Graniteville, California, is progressing at the rate of nine feet a day in the No. 4 tunnel, which is being extended south for a distance of 2,200 feet to contact the Ancho vein. More than 650 feet have already been driven. Ten men are employed under the direction of Bob Harris, acting superintendent for Fred Anderson.

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The Rupley Brothers, Placerville, California, are hauling 100 tons of ore daily to the plant of the Marshall Mining and Milling Company near Kelsey, California, from their holdings in the Kelsey area. The property is being subleased from Robert Dahlberg of Auburn, California, and adjoins the Dalmatia mine. A bulldozer is being used to strip off the brush and overburden and a gasoline shovel loads the material into trucks. Jackhammers are used to drill the harder material. One shift is employed in mining and three in milling operations. The Rupley Brothers, with Emil Pardi, are also leasing the Alex Revaz property near Placerville. One shift is employed in development work, following the sinking of a winze from the 100 to 150 level. A portion of the fines in the mine-run ore is being treated in a trommel screen at the property with a good recovery reported. Ore is being stored on the dump while development work is continued.

Clarence Cummings, operating the Merry Mountain mine 20 miles west of Redding, California, has struck a body of ore said to average better than \$65 a ton. Removal of the ore has been complicated because of a slip and faulty rock body. Heavy timbering is necessary to hold the top and walls of the tunnel, and the work has been delayed several times because of large slides. In a second tunnel Cummings has been extracting ore containing large gold flakes, but recovering the metal has been difficult. The ore occurs in balls of clay which clog the mill and go through without releasing the gold. The clay ore now is being washed under high water pressure instead of being run through the mill. Ore is hauled by truck to the 50-ton ball mill about two miles from the mine. Several shipments of gold have been made to the San Francisco mint in the past month.

Lessees are working the Kennebec Consolidated gravel mine near Lake City, California. The property is owned by Lon Paine, Nevada City, California, and Herbert and Henry Paine, who formerly developed the property.

Frank Palmer and Harry Lorraine, Taylorsville, California, operators of the Enos B mine in the Lucky S mining district 15 miles northeast of Taylorsville, have installed a 10-ton ball mill and erected several new buildings. The property, consisting of 200 acres, belongs to Palmer.



Lorraine is a partner in the operation of the mine. Mill-grade ore has been encountered in the upper tunnel at a distance of 80 feet from the portal. A lower tunnel is being driven 135 feet into the hill with about 15 feet to go to strike the ore body. Mill tests are being made in order to determine the method of treatment required.

John Laberity, Kelsey, California, is down about 35 feet at his Gold Ridge mine and has struck a blue-white quartz vein. The ledge is said to carry satisfactory values and to be about two feet wide. Installation of a 25-ton mill is planned. The property is about a mile and a half south of Spanish Flat. Laberity also has several other claims in the district.

COLORADO

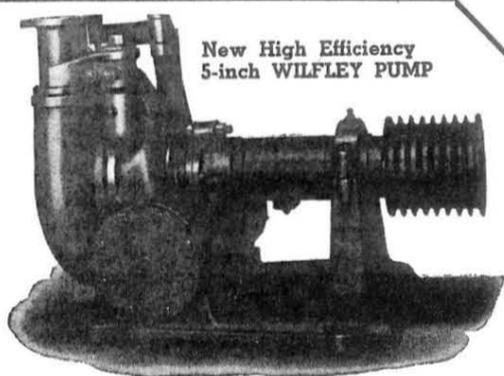
George H. Teal, 951 Grant Place, Boulder, Colorado, has secured a sublease from the Continental Mining Corporation on the Millionaire Gulch group and the Larson mill at Boulder. He will use equipment of the Continental company. The mill is being revamped to Teal's specifications. He is resident agent for the Mining Company of Colorado, Inc., wholly owned subsidiary of Continental, which recently suspended operations at the property when it was found that the tungsten concentrates were carrying too much phosphorus.

The Rico Argentine Mining Company, which operates at Rico, Colorado, reports a net income of \$36,000 for the second quarter of 1940, which compares with

\$14,000 for the first quarter of the current year. Profit for the six months, before taxes and depreciation, totaled \$50,467 and expenses amounted to \$128,822. Of this, \$66,519 was for mine and mill labor and \$27,681 for mine and mill supplies. The grade of lead-zinc ore now being mined is stated to be improving. Diamond drilling done early in the year indicated commercial ore to a depth of 300 feet below the tunnel level. The mill is treating 110 tons of ore, operating seven days a week, and the mine is being worked six days a week. During the third quarter the company expects to have completed mining and milling the copper ore and to be entirely in lead-zinc values. J. C. Johnson, 132 Main Street, Salt Lake City, Utah, is president. At Telluride, Colorado, Ralph L. Shimmin is in charge of the mill and Edward Baer of the mine.

The old mill at the Lead Carbonate mine in the Eureka district of San Juan County, Colorado, is to be modernized and enlarged to handle ore recently developed on the 300-foot level of the mine. Mine development is being carried on in both new and old portions of the property, formerly operated by the El Banco Mining Company. Vaughan Jones of Silverton, who was connected with the El Banco concern, is in charge of operations. Ore values are in gold, silver, lead, and copper.

The Alma Lincoln Mining Company reports a net profit of \$44,034 for the fiscal year July 1, 1939, to June 30, 1940, out of which \$40,174 was paid in dividends. During the period 38,166 tons of ore were mined, compared with 30,324 tons the preceding year. Mining costs were reduced from \$2.37 a ton to \$2.10 and milling costs were lowered to 97 cents a ton from \$1.05. The company has bought and paid for a quarter interest (\$12,500) in the new Silver Spruce Gold Mining Company. Over 100 tons of ore are being mined and milled steadily from the Alma Lincoln property in Clear Creek County near Idaho Springs, Colorado. C. M. Lyon of Idaho Springs was reelected president and general manager. Other officers for the coming year are Count Harvey of Denver, vice-president; George Donnelly of Idaho Springs, secretary-treasurer; and Lewis M. Shaffer of Idaho Springs and William A. Larsen of Denver, additional directors.



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KING SOLOMON MINE OPENED IN NEW COLORADO AREA

AN OLD, but inaccessible and therefore undeveloped, mining area in Park County, Colorado, near the Lake County line is being opened and the King Solomon property will soon be in production. For the past several years Major Sam has been interested in the area and has done considerable work, using hand labor.

Three months ago a scientific study of the district was started and test shipments were made to determine the requirements and values of the ores. The claims can be classified as both lode and placer and work to date shows the richer ground to lie between Mount Silverheels and Lookout Point.

The King Solomon group lies within these confines at the head of Dry Gulch. The district as mapped is several miles in extent and is intruded by wide, nearly vertical dikes of quartz-monzonite-porphyr, with a north-south strike. It is within these dikes that the important ore bodies are found.

Eight major veins have been exposed so far and tested by assay, mill-run, smelter, panning, and with the spectroscope. While the length of the ore body has not been determined, a heavy mantle of high-grade, triturated vein material is stated to overlie it, covering a tested width of 450 feet and a length of 500 feet. There is estimated to be at least 100,000 cubic yards of this material which is expected to carry gold values varying from \$10 to \$40 a

yard. This mass will probably be handled by glory-hole methods eventually.

Recently a 10-yard G-B placer machine was taken in for testing purposes and the results were reported to have been very promising. A railway tram is now contemplated to handle at least 200 tons of ore from either the placer or lode claims. There is a mill site on Montgomery Creek, 3,500 feet away, where abundant water and timber are available and which may be reached by truck road.

In considering the formation geologically, it is believed that the alteration of the porphyries by hydrothermal action may account for much of the ore deposition. The porphyritic intrusions evidently took place prior to the principal faulting, as may be observed in the extruded sills of the sedimentary series and dikes of the deeper placement as shown on the map of the field survey. It is thought the principal mineralization antedated the formation of the main faults.

The altitude of the area is about the same as that at Climax, around 12,000 feet, which, with the rigorous winters and inaccessibility, have combined to hinder the development of the King Solomon group of claims. C. C. Coulter, 1165 Pennsylvania Street, Denver, consulting geologist, has been directing work at the property for the past three months. Present owners are understood to be adequately financed and able to carry on the development started under the direction of Major Sam with pick, pan, and burros.

GOVERNMENT SEARCHING FOR SOURCES OF QUICKSILVER

PROSPECTS for mining additional quantities of quicksilver in Nevada and California for the defense program are good, according to a recent announcement by the United States Department of the Interior. Surveys conducted by the geological survey and bureau of mines in the Bottle Creek district of Nevada and the Mt. Diablo region of California have recently been completed.

Although there are no proved reserves in the Bottle Creek district, past production records indicate a probable reserve of approximately 3,000 flasks of 76 pounds each.

No estimate was made of the probable supply in the Mt. Diablo area, but the interior department stated that the geologic setting is such as to encourage the hope that new supplies of the mineral can be mined in addition to that already taken out. The area was productive from 1936 to 1939.

MEXICAN MINE LABOR GROUP QUITS WORKERS CONFEDERATION

THE Mexican Mine Workers Syndicate has withdrawn from the Mexican Workers Confederation, according to a recent announcement, charging politics and radicalism in the parent organization. Three other labor unions are understood to be considering like action. The mine workers syndicate claims a membership of 125,000.

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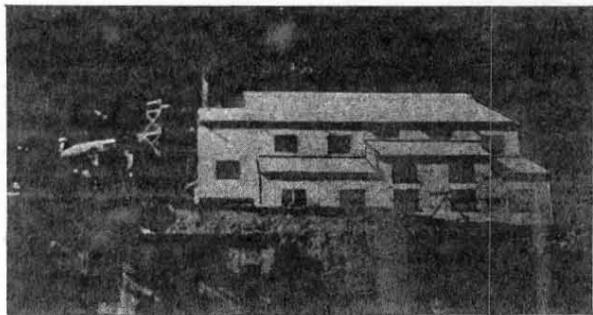
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WKE Engineers a Mill*

On July 1st WKE crew arrived at millsite, 15 miles from Bishop, Inyo County, California, to equip and erect a plant to concentrate a scheelite ore for the TUNGSTAR CORPORATION.

On July 31st the building is 90% completed. EVERY PIECE of equipment to be installed has been delivered. Excavations and concrete work are completed, and the machinery is partially erected on foundations.

By September 1st we plan to have installations completed and by September 10th this mill will be wholly completed and producing concentrates.



Includes coarse crushing, 2 stage crushing rolls, screening, regrinding, concentrating, magnetic separating and drying equipment

WESTERN KNAPP ENGINEERING CO.

CONSTRUCTION ENGINEERS - COMPLETE MINE AND MILL INSTALLATIONS

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USED Equipment offered for 2 Complete Mills

For 40 to 50 Ton Flotation and Cyanide Plant

8x10 Wheeling Type Jaw Crusher driven by 10 HP, Type "Y", Oil Engine, Fairbanks-Morse
60 ton capacity Ore Bin
10"x4" WEMCO Feeder
4x4' WEMCO Ball Mill, with clutch pulley
35 HP, Bessemer Oil Engine Trommel Type, 10 mesh Screen for Ball Mill
Esperanza Drag
Deister Plat-O Concentrating Table, with new linoleum & riffles, belt driven
7-12x7' Redwood Leaching Vats—filter bottoms—sills—one unloading gate each bottom
Butter's type Feed Distributor and trolley & track for loading leach vat
14x6 Pregnant Solution Tank and cover & sills

7-Steel Zinc Precipitate Boxes, with stand
14x6 Barren Solution Tank and cover and sills
14x10 Mill Solution Tank, cover and sills
14x10 Water Storage Tank, cover and sills
400 lineal feet of 1½" and 2" pipe and fittings
1½" Gas engine driven, all iron pump—¾ HP, 20 GPM at 25' head
1½" Gas driven cast iron pump, 20 GPM at 80' head, 1½ HP BR515, bronze fitted, gas engine driven pump, for 155' head, 10 GPM, 1½ HP
300 lineal feet of Wood Launderers and Chutes
All necessary piping, fittings, float valves, belting & shaft-

ing to service the mill & units
1500 Watt Delco Lighting Unit
All necessary wiring and light fixtures
Mill Building
750 lineal ft. of pipe of suitable size from spring to water supply tank, necessary sump box & pump foundations
20'x7' WEMCO Thickener, serial 381613-2 complete with super-structure, lifting device, main shaft assembly, suitable 110 volt DC motor drive & 20'x7' Redwood tank
27'x16' Type ASM, Simplex, WEMCO Classifier, complete with 110 volt DC motor drive

54"x16" ABD Duplex WEMCO Classifier
2-38"x44" Denver Sub-A Flotation cells, complete with 110 volt DC motor drive
12"x12"—2-compartment, Pan-American Jig
1-Compartment K & K Reagent Feeder
2-Compartment, 3x4 WEMCO Pan Filter
8 Ft. Callow Cone
1-¼" Kimball-Krogh Sand Pump, complete with 110 volt DC motor drive
1½" Kimball-Krogh Sand Pump, complete with 110 volt DC motor drive
2" Kimball-Krogh Sand Pump, complete with 110 volt DC Motor drive

Located at
Humming Bug Mine,
near Yreka, Calif.

For 75 to 100 Ton Flotation Plant

10x20 Wheeling type Jaw Crusher with belt, no motor
16"x68" belt conveyor with motor drive and switch
Ore Feeder with motor drive and switch
5'x8' Hendy, Grate Discharge Ball Mill with liners, motor drive and switch
54"x16' Classifier with motor drive and switch
2" Sand Pump with motor drive and switch
8-Cell Denver Sub-A Flotation Machine with motor drive and switch

3-Compartment Reagent Feeders with motor drive
1½" Sand Pump with motor drive and switch
Assay Pulverizer—no motor
5 HP Motor with pulley, base and switch
6-16 cu. ft. 18" gauge, roller bearing Mine Cars
2—Ingersoll-Rand CCII-WI Stoppers, 1" Q.O.

Located at
Red Banks Mine,
near
Bagby, Calif.

This equipment is for sale at reasonable prices. Please direct communications to our San Francisco office for prices and further information.



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MILL SUPERINTENDENT, METALLURGIST — 36, M.I.T. graduate. Employed in foreign country as superintendent lead-zinc mill doing excellent work. Wants work in U. S. Fifteen years experience: large copper concentrator, differential flotation, coal breakers; operation, experimental, supervision. References. Available 30 days notice. Address: Box S-68, The Mining Journal, Phoenix, Arizona. 9-15

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ELECTRICIAN-MECHANIC—Armature winding and maintenance d.c. and a.c. Experienced in installation of electrical machinery and switchboards. Can operate lathe and drill press. Good man for small property. Valid Mexico passport. Address: E. F. George, Box 181, Duncan, Arizona. 8-30

MASTER MECHANIC AND ELECTRICIAN — 25 years' experience in gasoline, Diesel and steam, acetylene and electric welding, electrical installation and maintenance. Precision machinist. Available 10 days' notice. Will go anywhere. Address: Box H-66, The Mining Journal, Phoenix. 9-15

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Master Mechanics (2), Mine Mill\$250
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Cyanide Superintendent\$200
Mine Foreman\$200
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Asst. Chief Mine Electrician, Fgn.\$200
Mine Carpenter, Fgn.\$250
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CYANIDE MILL SHIFT BOSS \$225
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ASSISTANT ELECTRICIAN \$250
STRUCTURAL STEEL DETAILER \$200
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OPENING FOR ALL-AROUND MINER. Opportunity for advancement right man. Also opening for able **FLOTATION MAN** take charge mill. State experience, qualifications. References. 6039 - 30th N.E., Seattle, Washington. 9-15

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FOR SALE—Cripple Creek producing gold mine and fine equipment. Clear title. Include your bank reference in first writing. C. Krug, Krug Building, Cincinnati, Ohio. 9-15

PLACER—for hydraulic or dragline—values all very fine—approximately 3,000,000 yards at 75¢ a yard, marine sand—for operators only. 1,000 yards a day or over—10 per cent royalty. Address: J. W. Owner, 1724 N Street, Sacramento. 8-30

FOR SALE—Privately owned gold preferred prospect now in active development. Fully equipped; no debts; no obligations. Also modern amalgamation mill in operation this time on ores from this property, and doing some custom work. Complete assay office included. Address: Box M-70, The Mining Journal, Phoenix, Arizona. 10-15

GOLD—low grade free milling easily crushed. Huge tonnage extensively prospected; four levels showing 1,500-foot backs 600 feet wide—natural facilities available for low-cost open-cut operation, values \$4 to \$7; placers below produced millions. Address: Box 552, Olympia, Wash. 8-30

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FOR SALE OR LEASE—Stewart Lepidolite mine at Pala, California. One of the largest and best deposits in the United States. Write Leo J. Mies, Oceanside, California. 8-30

ARIZONA PLACERS—15,000,000 yards, 25-60¢ tested; 8,000,000 yards, 40¢; 3,000,000 yards, 35¢. Water. Also good Colorado lode mines. Continuous veins to 20 feet wide. Address: Wilson & O'Bannon, Durango, Colorado. 8-30

WILL LEASE proven gold mine extensively developed to capable operators. Dr. E. Westberg, 4th & Pike Bldg., Seattle Washington. 9-15

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DIAMOND DRILLS—One "C" type hydraulic feed Sullivan make. One "H" type hydraulic feed Sullivan make. Both machines shop reconditioned. Two thousand feet "A" rods, eight hundred and fifty feet "N" rods, slightly used, in splendid condition; one thousand feet "AX" casing New never used. Address: N. Bertrand, Bisbee, Arizona. 9-15

BALL MILL—6-Foot by 50-Inch Hardinge Conical Ball Mill with Herringbone gears and pinions, counter shaft and bearings, clutch and drive pulley, standard scoop feeder. Bargain. Pratt-Gilbert Hardware Co., Box 2230, Phoenix, Ariz. 8-30

MISCELLANEOUS

PLACER PROPERTY—Property well equipped—\$7 yard, 50,000 yards blocked out—1½ miles yet to block. Need \$20,000 to put into operation. Investigate. Address: Box L-19, The Mining Journal, Phoenix, Arizona. 9-15

WANTED—Party who will sink shaft four hundred feet (400 feet) on one of this group of claims. Will give 40 per cent interest in the group of fifteen claims, five are patented. This will stand the strictest investigation. Address: Robt. P. Thompson, Box E, Tyrone, New Mexico. 8-30

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Will buy Tungsten Concentrates 50% WO₃ or better; especially those containing sufficient objectionable materials as to make them unsalable in usual markets.

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PLACER PLANT FOR SALE

Used 4-bowl placer gold washing plant. Trommel screen 44" O.D. x 22'6" long. Drag washer. Stacker belt 24" wide x 40'0" long. Four rubber lined Ainalay bowls. Gravel hopper and grizzly. 45 HP gas engine. Plant mounted on steel wheels. Exceptionally low price for immediate shipment.

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GOLD MINE for SALE or LEASE

Developed proven property with modern 50-ton counter-current cyanide plant, Fairbanks Morse Diesel electric power, 5x4' Marcy ball mill in closed circuit with Akins-type classifier. Two portable Ingersoll-Rand compressors, mining and milling equipment complete. Now operating.

The owners are willing to lease on royalty basis. Lessee to purchase operating equipment, or outright sale of mine and equipment.

Present owners are short of the necessary capital to operate mine efficiently.

Location of property—24 miles southeast of Victorville, California. Address:

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LUCERNE VALLEY CALIFORNIA

MINE FOR SALE!

New Discovery

6 Claims in new district. Deposit 400 feet wide. 1000 feet long. Veins 2 to 16 feet wide.

GOLD & COPPER ORES

Gold Values \$7 to \$30

Copper 1% to 4%. 14 surface trenches to sample from. 8000 feet up, 6 miles west of Lake Tahoe, California. 2 miles from road, ample water, good mill site. Write

E. F. SCHULTZ

"Old-Time Prospector"

GOLD HILL NEVADA

LEON W. DUPUY* gives details of

New Method for Sampling With Rock Drills

SUCCESSFUL operation of mining properties is dependent, to a considerable degree, upon accurate sampling. Therefore, one of the most important duties of a mining engineer is to sample a property correctly prior to exploration and development work. There have been many instances where the uninitiated built great hopes on assays made from specimen samples, only to find later that correctly taken samples proved the originals to be worthless.

Exploration work consists of ascertaining the location of commercial ore, or of enrichment that may become ore at a later date (protore) when and if economic conditions change sufficiently. Development work includes laying out and driving a system of drifts, crosscuts, raises, and winzes to extract the ore to the best advantage.

The advent of various methods of drilling has greatly simplified and lowered the cost of prospecting, for it is cheaper to test the ground by drilling than to drive exploratory crosscuts and drifts. Exploration by drilling permits the most economical placing of openings for the development work that will follow. For example, in many vein mines, important lenses of ore have been found to lie parallel to the original ore body. Crosscutting of the hanging and footwalls, therefore, has become common practice. Attention now is being directed to the obvious saving in cost by drilling over that of crosscutting and drifting.

In the past, it has been difficult to drill, to any great depth, downward-pointed holes using water. One of the functions of water, in rock-drill work, has been to transport the rock cuttings from the bottom of the hole. But rock cuttings have a greater specific gravity than the water and hence tend to settle to the lowest part of the hole. This slows up drilling speed and decreases the effective work that can be accomplished with each bit.

Mud, such as is used in rotary drilling in the oil fields to increase the density of the drilling liquid, is impracticable for a number of reasons, but principally because of extra equipment needed, and in the case of sampling, it would vitiate the results. The rock driller, therefore, is limited to two mediums, air or water, for transportation of the cuttings.

For sampling, air has several advantages. Rock has certain inequalities of structure which cause slight ribs or ridges to occur in all drill holes. In flat holes these ridges will act as riffles when water is used while drilling by the method customarily employed. Any heavy mineral will tend to deposit behind these ridges or

The system of sampling by means of rock drills with vacuum collectors, as developed at the Picacho mine, is being employed at a number of other properties. All report important reductions in exploration costs as well as accuracy of sampling which has exceeded expectations.

riffles in a manner similar to that of gold in the riffles of the sluice box, or the concentration of galena behind the riffles of a Wilfley table. In vertical down-holes, the lighter particles tend to pass off with the water and the heavier particles settle to the bottom, again creating a concentration difficult to clean out of the hole and collect by ordinary means. Therefore, it is necessary to increase the volume and velocity of the transporting medium. If water is used for this purpose the equipment for filtering, pumping, and handling samples would be prohibitive in size and cost. The simplest, easiest, and cleanest way to accomplish the desired result is by the use of air. Furthermore, air will not dissolve any of the minerals and hence prevents collapse of the hole when such substances are present.

A VERY successful system of sampling, using rock drills together with vacuum collectors, was developed at the Picacho Mining Company's property in Southeastern California.

Briefly, in this method standard 1½-inch hollow-round drill steel is actuated by a rock drill, operating dry. Air at 100-pound pressure is conducted through the hollow drill steel. This air is permitted to expand through a side orifice in a standard detachable rock-drill bit. This expanding, high-velocity air stream continuously sweeps the bottom of the hole and clears it of cuttings. Drilling speed is increased, because at each blow the bit

strikes through air onto a clean, solid rock-face, instead of through cuttings. This fact increases the life of the drill bits. The air thus introduced into the drill hole carries the cuttings toward the collar where they are picked up by the vacuum and deposited in the collector. The air, after depositing its load, passes through the centrifugal exhauster and is discharged dust free into the atmosphere. Samples may be taken at any time by emptying the sample collector.

Accurate and economical sampling of low-grade gold deposits, particularly those comparable in character to the porphyry coppers, has been one of the great problems which has delayed the exploration of many properties. The Picacho mine experienced this difficulty. In the early days the high-grade veins had been worked through numerous shafts, but about 30 years ago operations ceased. It was well known that a considerable quantity of low-grade ore was available. When efforts were made to test this ground by diamond drilling, it was found impossible to secure sufficient core and it became necessary to consider the sludge. Concentration of gold in the bottom of the hole and the inability to properly check results caused the abandonment of this method. Churn drilling was subsequently tried and discarded for similar reasons.

About this time the vacuum drilling system was devised and proved to be a great success. The development of the equipment by the Worthington Pump and Machinery Corporation resulted from an incident that occurred in a Los Angeles hotel. E. Lansing Jones, managing director of the Picacho Mining Company, observed a porter pick up a nickel with a vacuum cleaner nozzle. Knowing of Worthington's work with deep-hole drilling, Jones consulted that company in regard to his problem and the suggestion of a combination of vacuum and rock drills for sampling, involving among other things equipment based on high velocity air-flow, was worked out and then adapted to the actual sampling in the field.



General view of the Ruth mine, near Trona, California, where the vacuum method of sampling was utilized.

*Consulting Engineer, Los Angeles, Calif.

An important element in the successful use of the equipment is the free floating piston or hammer designed in the Worthington drill. This piston has but one function to perform—that is, to hammer the drill steel. The rotation of the steel is entirely independent of this piston or hammer action. A simple, balanced-gear air motor is employed, a feature commonly called "independent rotation." The ability of the hammer to continue functioning, even should rotation stop, supplies the means for driving the steel backward out of the stuck position, enabling the independent rotation to immediately pick up its function and keep the steel free. The possibility of "stuck steel" is lessened to a point where it might be said, for all practical purposes, to be non-existent. The operator soon learns all these desirable peculiarities of this independent rotation and hammering action and by understanding it avoids "stuck steel."

At Picacho the equipment included Worthington WD-33 Tower wagon drills each equipped with the special vacuum sample collector and operated by Worthington 315-cubic foot, two-stage, air-cooled full Diesel portable compressors.

It readily can be understood that as the work progressed, experience was gained which resulted in modifications not only in some of the equipment, but in the method pursued. In this work the Worthington staff cooperated with the Picacho organization to develop and perfect the vacuum sampling method.

The original vacuum sample collectors were redesigned and improved and, today, a sample collector to fit practically any condition is available. Likewise, many improvements in the technique of drilling and the utilization of accessories were made and adopted.

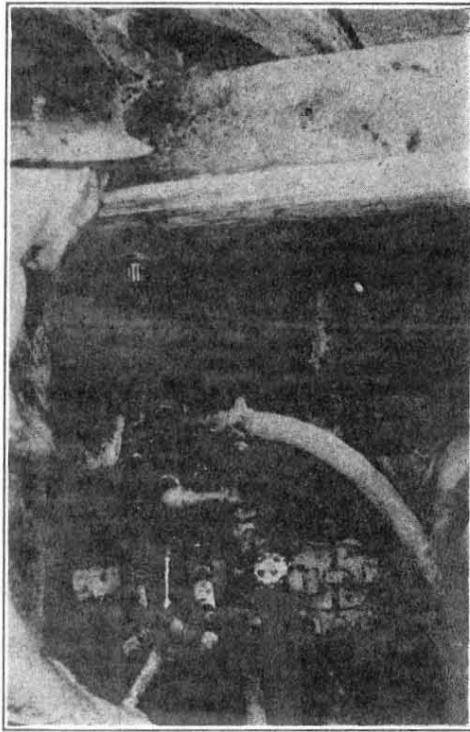
WHILE the Picacho problem was principally to develop ore for an open pit, new applications of the vacuum sampling system are rapidly being made. One of the most important of these is its adaptation to underground sampling.

At Picacho there were 45,536 feet of vertical holes drilled. There also were drilled some 656 feet of hole from underground setups, using one of the rock drills from a Worthington WD-33 wagon drill placed on a screw-feed shell. Setups were made using a tripod.

Operators have been quick to grasp the importance of underground applications of vacuum sampling.

Surface drilling was carried out successfully by E. L. Jones and E. H. Page at the Blossom mine near Ogilby, California. At this property the equipment consisted of a Worthington WD-33 Tower wagon drill, vacuum sample collector, and 315-cubic foot compressor similar to those used at Picacho.

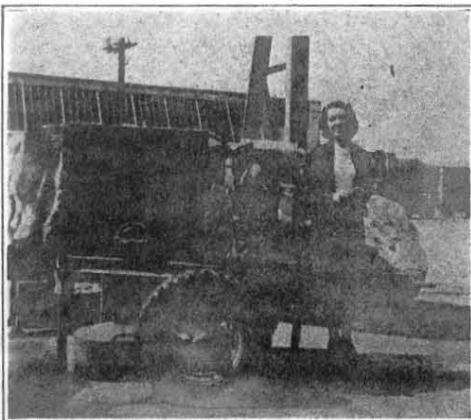
Another user of the outfit for surface drilling was Jack McIver of Oatman, Arizona. McIver drilled 16 test holes on the Indian Springs mine near Kingman, Arizona. Test-pit checking proved the method remarkably accurate and satisfactory. The



A Worthington 521 drill operating at the Fortuna mine. In the collar of the hole the collector hood is in place and to it is attached the suction hose which conveys the cuttings and dust to the vacuum sample collector.

cost of operation was low. The total cost, including purchase of equipment and operation expense, was at least \$35,000 less than would have prevailed if the work had been done by standard underground methods.

A number of deep holes were drilled horizontally at the old Fortuna mine 18 miles southeast of Yuma, Arizona. The famous old Fortuna mine with its myriad of faults in schist and other complex geological features is a geologist's paradise. The property produced roughly \$2,500,000 some years ago and provided a handsome profit to the stockholders. The ore was cut off by two faults, one on the strike of the vein and another on the dip, which resulted finally in closing the mine. The present operators have opened up the Suicide Shaft and have encountered some ore



Late model sample collector for surface use.

which has paid for a portion of the development work being done. The drill holes were put in to compile geological data, and otherwise check the formations. Drilling conditions were adverse to the Nth degree. The ground was heavy, fitchery, and damp. However, drilling proved to be far more economical than previous drifting costs and supplied the necessary geological information required for the solution of the problem at hand.

The Burton Bros. (Clifford Burton and Cecil Burton) of Rosamond, California, are at present engaged in a program of drilling and sampling at their several mines, utilizing the vacuum method of sampling. Work has been started at the Ruth mine near Trona, California, and is to be followed by work at the Davenport and at the Tropic mines.

The Ruth mine is still in the development stage but treats, by the cyanide leaching process, approximately 70 tons of gold ore per day. The gold occurs in a quartz vein, carrying iron oxides. The country rock in the area is granite with intrusions of monzonite porphyry. These intrusions some times carry subsidiary quartz veins with values in gold. The drilling qualities of the ore may be described as medium hard.

The equipment used in drilling and sampling underground at the Ruth mine consists of Worthington Model-240 hammer drills (air motor feed) and vacuum sample collectors. Air is supplied by Worthington full Diesel, 315-cubic foot, two-stage compressors.

Similar steel and bits are used as at Picacho (1¼-inch hollow-round steel with detachable cross bits) except that lengths are provided for steel changes to meet underground conditions. Lengths of rod now in use include 1½ feet, 2½ feet, 5 feet, and 10 feet. Attention is given to maintaining a minimum number of couplings in the hole.

Holes may be drilled at any angle through a full circle of 360 degrees. The different angles require different technique, both in drilling and in taking the sample.

When a horizontal hole is desired, the hole may be drilled more easily by pointing the hole up at a small angle. Underground, for steep holes, it is sometimes necessary to cut out head room for the drill in order to handle the rods.

Holes drilled from the surface also may be at any angle provided the proper wagon-drill mounting is used.

THE following procedure is used to secure accurate samples. In ordinary rock a 3-inch cross bit is used to start the hole. The suction hose from the sample collector is held at the face while starting the hole, to catch all the dust and cuttings. When the hole is about 18 inches deep a metal dust-hood, which holds the suction hose and catches the cuttings, is inserted in the hole. In the event the ground at the collar is soft or very ravelly, a larger bit is used to start the hole, in order to permit insertion of a 4-inch casing to provide a good working collar.

Detachable bits of sizes greater than 3 1/2-inches are not available at present on the market. Large bits may be hand forged, but more often a 3 1/2-inch detachable bit is used and the body of the bit is built out with a torch. The bit is then ground to shape and retempered. One or two large bits will last for some time since they are required only when soft ground is present at the collar of the hole.

Drilling is continued to whatever depth is desired, keeping bit gauge as large as possible throughout the operation. The depth of hole securable is limited by the number of changes of bit available, until the diameter of the couplings is reached. It is advisable to try to keep the diameter of the hole greater than 2 1/2 inches in order to permit use of fishing tools in event of broken steel, plugged bit, or other troubles that will occur in spite of all precautions that may be taken.

Fishing tools used underground are the same as those used with the wagon drill and are known as "overshots." With a little practice the driller usually becomes quite adept at recovering the tools when a rod or coupling is broken. Fishing requires considerable patience and experience in order to meet all conditions, but once the driller becomes skilled in the art no holes nor tools are ever lost.

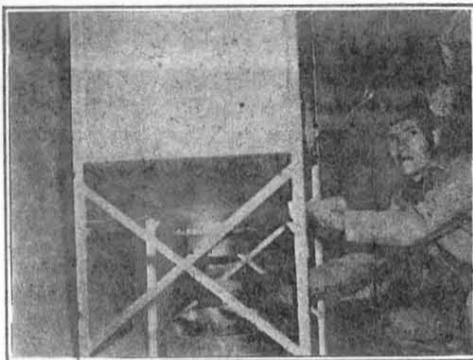
Worthington has worked out the proper heat treatment of rods and couplings together with suitable alloy for the couplings and as a result the number of fishing jobs is kept at a minimum.

Costs so far compilable show that the average expense, including overhead, is approximately one-third that experienced in similar ground with diamond drilling.

Cleaning of a hole for sampling purposes is most important. Drillers are cautioned that it is better to drill 50 feet and sample correctly than to drill 100 feet in the same time and sample poorly. This is a feature that makes the contracting of footage inadvisable.

Samples may be cut at any interval desired. The sample generally is taken over five feet of hole though it has been run 10 feet. The driller always can tell the minute the formation changes and often it is desired to start or stop samples at these changes in rock character. When it is desired to cut a sample, the drill rods are extracted from the hole. A one-inch blow pipe is inserted in the hole, if it is a flat hole or one pointing upwards. A wrapping is made around the pipe at the dust hood to prevent any "blow by." The air is turned on gradually until a full head of 100 pounds of air is passing through the blow pipe to the bottom of the hole. The current of air thus introduced carries the dust and cuttings to the collar of the hole where the vacuum picks them up and deposits them in the dust collector as previously described. The hole is blown thoroughly clean by this method as the volume and velocity of air is sufficient to carry all the particles out.

With holes dipping downward at 45 degrees or steeper, a one-inch garden hose, in lieu of a blow pipe, is utilized to blow the hole since it is more easily handled



Sampler removing gate at the bottom of vacuum collector to obtain sample.

and remains in one piece at all times. Such hose is light, cheap, and wears sufficiently well.

During actual drilling, the vacuum is connected to the drill hole and is pulling on the hole at all times. The air that is entering the hollow drill-steel at 100 pounds pressure during this drilling is thus exhausted, carrying cuttings and dust to the collector. There is no dust of any sort in the air at the heading if all the equipment is properly handled.

The sample collector may be powered either by an electric motor, an air motor, or a gasoline engine, according to the requirements of the job at hand.

Emphasis should be placed on the fact that with this method holes are drilled dry and the sample taken dry. While it is possible to use water in the drill hole and to use the vacuum filter wet, results to date with wet sampling have not been as satisfactory as dry sampling. Small amounts of moisture in the drill hole do not interfere with the operation of the sampler; it is only when water in appreciable amounts is present that difficulty is encountered.

The crew required for this work on each shift consists of three men: driller, helper, and sampler. The driller is in charge of the crew and is responsible for accurate sampling, as well as for the conduct and efficiency of his crew.

The sampler must keep all records, usually runs all errands, and otherwise assists the driller to get results. The helper is the "chuck tender" and is usually the understudy of the driller, though both sampler and driller have their eyes on promotion. Wages paid are generally a little

more than regular mine pay since intelligence, initiative, and general ability contribute greatly to the success of test-hole work. Training of a crew to the most efficient operation requires from two weeks to a month depending on the experience, ability, and intelligence of the men. Selection of men for the crew is a matter that should be given careful consideration. It is a responsible job on which the management depends for reliable information with which to plan its future work.

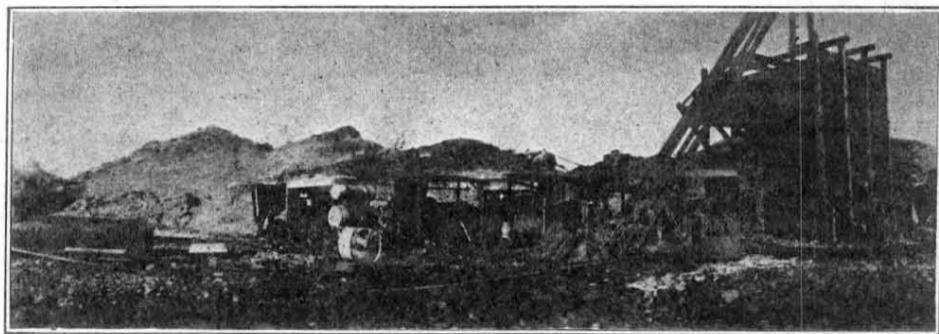
As previously mentioned, one of the most important features in securing deep holes promptly is the use of independent rotation in the various drills utilized in this sampling work. The automatic feed, whether pneumatic or air motor, must be powerful on both retraction and on advance to handle the heavy weight of steel rods. The power and rugged construction of the Worthington drills have contributed largely to the success of these various undertakings.

The accuracy of vacuum samples was checked thoroughly at Picacho. Underground, the horizontal holes were drifted on, the up-holes raised on. On the surface, on some of the vertical down-holes, "test pits" (shafts) were sunk. The average gold value of all holes, versus average value of channel samples cut in these larger openings, checked to less than \$0.01 in value or an error of approximately 0.5 per cent. Individual channel samples versus individual drill samples checked well within the limits of error of sampling and assaying. Each of the properties now using the vacuum collector for prospecting has its own method of checking the accuracy of the samples. At this writing the results are not available though it is understood that the accuracy exceeds expectations in each case.

MEXICAN GOVERNMENT WILL ERECT ORE TREATMENT PLANT

PRESIDENT LAZARO CARDENAS has issued orders to the Mexican commission for stimulation of the mining industry to erect a 25-ton ore treatment plant in the Chapultepec section of Mexico, D. F. The commission has been apportioned 250,000 pesos (\$50,000) for the project.

The plant will occupy five acres and will treat ore from the various parts of the republic, employing cyanidation, concentration by flotation, concentration by gravity, amalgamation, and smelting systems.



The Suicide Shaft of the Fortuna mine, near Yuma, Arizona, where a number of deep holes were drilled horizontally.

town as a monument to the necessity of excess production of one or more primary commodities demanded by the outside world.

To recapitulate, the social value of mining as the state's No. One primary industry cannot be measured merely by determining its initial release of purchasing power. Each new dollar of wealth it creates and distributes to employees, to suppliers, to the government, and to stockholders is, in turn, passed on to others, except what is saved, and the cumulative effect of this passing-on process is such that the population supported is ordinarily from six to eight times the number of the mine's own employees.

To every citizen in Arizona the fact should be brought home that in the economic functioning of this commonwealth mining is the greatest single generating force because it creates such a high proportion of the essential exports needed to balance our trade and to acquire those things which we cannot advantageously produce for ourselves; and that in so doing it finances, as we have seen, much of the state's important secondary economic structure.

THERE is yet another way to demonstrate the economic contribution of mining enterprises to the general welfare, namely, by presenting their operations in a manner which emphasizes the cardinal fact that mining enterprises are primarily creators, not of financial profit to the owners, but of economic wealth to the world.

Several years ago I drew up a statement covering the operations of one of our small producing mines and which was designed to crystallize and emphasize this viewpoint. It showed that in the year analyzed the company brought into being new wealth in the form of gold, silver, lead, copper, iron, and zinc valued at approximately \$130,000, and that this was distributed to the following beneficiaries:

- 49 per cent to employees, for labor performed;
- 19 per cent to public utilities, for power and transportation;
- 16 per cent to merchants and manufacturers, for supplies, materials and equipment;
- 5 per cent to management, for directing operations;
- 2 per cent to tax collectors, for direct taxes other than payroll taxes;
- 1 per cent to lenders, for the use of capital;
- 8 per cent to stockholders representing the return of capital, which fell short by over \$2,000 of being enough to return their money, without profit, if the mine lasts as long as anticipated.

In other words, the stockholders lost \$2,000, but since operating receipts still exceeded out-of-pocket operating costs it paid to continue to work the mine and, as a consequence, benefits to others amounted to 12½ times the operating margin. A consolidated statement of the wealth created and distributed by all the small mines of the state would emphasize this

(Continued on page 36)

HYDRAULIC OPERATIONS PROVE SUCCESSFUL AT POVERTY HILL

THE old Poverty Hill mine on the west branch of the "La Porte Channel"—between Scales and Port Wine in Sierra County, California, is the site of a unique hydraulic operation being carried on by A. J. Oyster and associates. The property was last worked in the eighties when it was one of the larger hydraulic operations.

About four years ago interests headed by A. J. Oyster, 650 Russ Building, San Francisco, California, acquired the property from R. H. Kingdon of La Porte and the Judson Estate Company. Since that time development and experimental work has been carried on in an effort to handle the gravel without extending a new, 11,000-foot tailings tunnel.

The greatest operating handicap has been the intensive wear on the two pumps used, resulting from the abrasive action of the gravel. However, with a 90-foot cut bank paying from the grass roots down, and a channel 150 feet wide on bedrock, the operators were reluctant to sacrifice any overburden until recent tests convinced them that a much greater return could be obtained by washing only about the first 15 feet of gravel above bedrock. A contract was then let to J. N. Tedford and Son of Fallon, Nevada, to remove 70 feet of overburden on a sliding scale of from 9 to 11 cents a yard. This is being accomplished by Caterpillar tractors and large carryalls.

Two monitors with 2¼-inch nozzles are used in the pit and water is furnished by a Fairbanks-Morse six-inch high-pressure pump, powered by an Atlas-Imperial 90-

horsepower Diesel. The pump is operated under 70 pounds pressure. A Patterson concentrator is being tested on tailings, and indications are said to point to profitable results. All electric power at the mine is furnished by a Caterpillar Diesel generator.

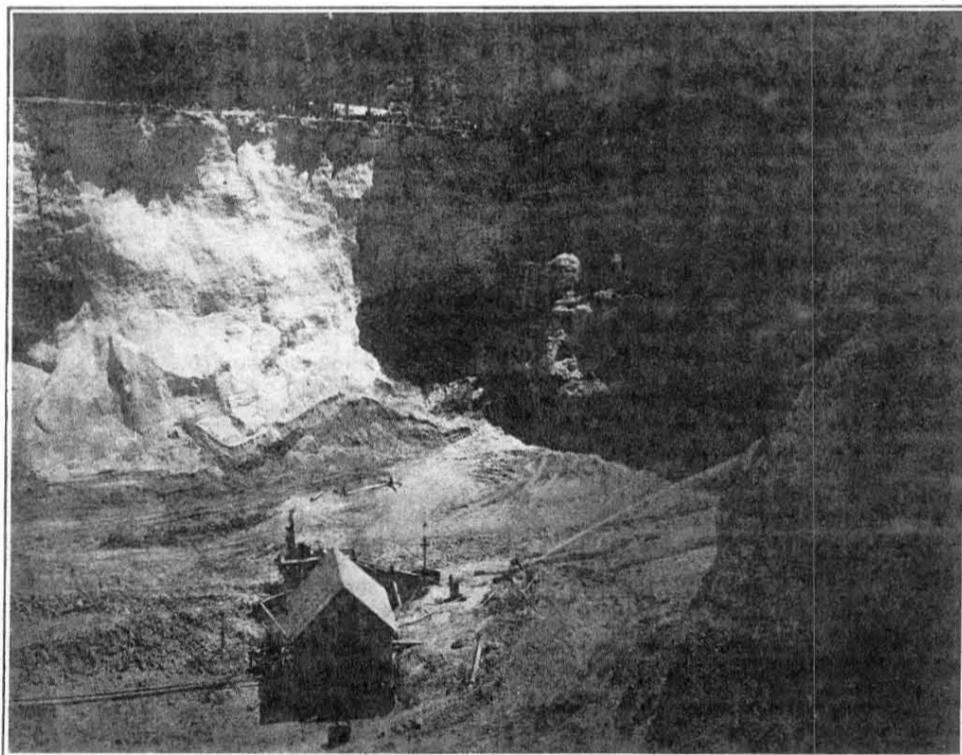
A crew of approximately 30 men is employed under the direction of Army Adams, general superintendent, 714 West Main Street, Grass Valley, California. Jack Ehrhorn of San Francisco is consulting engineer.

CONGRESS TAKES STEPS TO LIBERALIZE CLASS B LOANS

THE House of Representatives has acted favorably on the bill introduced by Congressman John R. Murdock of Arizona which would extend the lending powers of the Reconstruction Finance Corporation in making Class B loans. The bill was known as H. R. 9996 and was identical with S. 4008 which was substituted for it immediately after its adoption.

Under present conditions, Class B development loans are limited to \$20,000. Signature of the new measure by the President would permit an initial loan of \$20,000 to be increased to \$40,000 when, in the opinion of the RFC, there is sufficient reason to believe that through the use of such loan there will be developed a quantity of ore of sufficient value to pay a profit upon mining operations.

This legislation would also authorize the RFC to make loans on strategic and critical minerals in addition to gold, silver, and tin. As the law now stands, the RFC can make such loans only to producers of the latter three metals.



Pit of the Poverty Hill mine in Sierra County, California. A high-pressure pump furnishes water for the monitor and the gravel washed down is pumped by a gravel pump to sluices.

Photograph by Phil Burch.

OBITUARIES

Donald M. Holmes, 26, mining engineer, died August 28, 1940, at Bisbee, Arizona. He was employed in the engineering department of the Copper Queen branch of Phelps Dodge Corporation.

Arthur J. Cushion, 56, of Superior, Arizona, died recently of an acute heart attack. He was a well-known mining man and was interested in claims in the Superior district. He had been a resident of Arizona for 38 years.

Dr. John E. Wolff, 83, geologist, associated with Harvard University for more

than 50 years, was found dead at the wheel of his automobile in the desert east of Lancaster, California. He was on one of his field trips when his car stalled in the sand.

Warren Allison, 82, early mining man and pioneer resident of Arizona, died August 26, 1940, in a Tucson hospital. Going to Arizona from California in 1874, he engaged in real estate and mining. With his brother, he developed the Allison gold mine in the Baboquivari Mountains about 50 miles south of Tucson.

Robert J. Cary, Sr., 83, died in Harlingen, Texas, July 30, 1940. Born in Louis-

Earl K. Nixon returned August 10 from Peru where he spent most of the past two months engaged in technical work. He is resuming his position as director of the State Department of Geology and Mineral Industries with headquarters at 702 Woodlark Building, Portland, Oregon. He was on leave of absence from the department.

Jack Lewis of Roslyn, Washington, mine boss for the Northwestern Improvement Company, has been appointed by Governor Clarence D. Martin to the 42-member state defense council which the governor created to "coordinate the work of all local military, naval, and civilian agencies in furthering Washington's part in the national defense program."

H. S. Worcester of Sutter Creek, California, has gone to Telluride, Colorado, where he has taken the position of manager of the Veta Mines, Inc. Worcester, who was formerly superintendent of the Rico Argentine Mining Company at Rico, Colorado, has more recently been with the Fremont Gover Company in the Mother Lode district of California.

George W. Kerr, formerly consulting engineer for Marsman and Company, Inc., in the Philippine Islands, returned to the United States recently after spending several months at a placer property in Burma. He also revisited properties in the Philippines and Sumatra. At present he is associated with James O. Greenan, 206 North Virginia Street, Reno, Nevada.

H. Victor Burgard, 2453 North Beachwood Drive, Hollywood, California, consulting engineer, is now associated with Ankerite Products, Inc., producers of Duro paints, and the Dieselizer Corporation. He recently was consulting engineer at the Skookum group of mines in the River Range near Kingman, Arizona, operated by a syndicate of New York and Connecticut interests.

Charles M. England, dragline operator of California, who recently moved to Superior, Montana, is now working out of Pierce, Idaho. He was formerly manager of the Pilot Dredge Company at Oroville, California, and of the Western Dredging Company. With his brother, Harry England of Prairie City, he is starting operations at the Independence placers in the Moose Creek district at Clearwater County, Idaho, near the Montana line.

OREGON PUBLISHES PAMPHLET ON FIELD IDENTIFICATION

The State Department of Geology and Mineral Industries, with headquarters at 702 Woodlark Building, Portland, has published an elementary reference book, which contains, as far as possible, the essentials of field identification of minerals by simple physical means. The pamphlet, known as Bulletin No. 16, is titled: "Field Identification of Minerals for Oregon Prospectors and Collectors."

The bulletin was compiled by Ray C. Treasher of the department and will be sent postpaid for the purchase price of 50 cents. The department may be addressed at the Portland office or at either of the state laboratories in Baker and Grants Pass.

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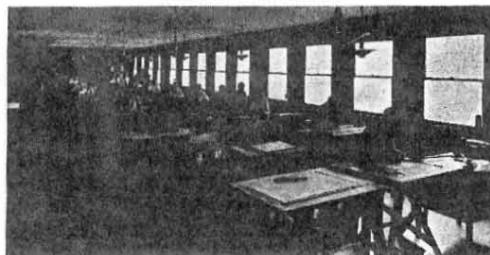
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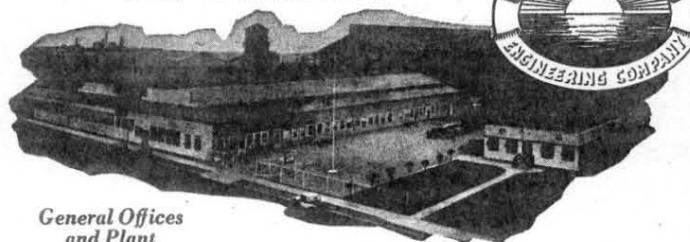
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to Alaska, with side stops in most of the land-grant states. He holds a prominent position in the American Legion, Veterans of Foreign Wars, and the Forty-and-Eight. With this background he is especially interested in the search for strategic minerals which the war department pronounce essential to a successful defense program. He is tall, with thinning hair, sharp blue eyes, a typical Scottish nose, the frame of a stevedore, capable of a hard day's work. His speech is quiet, but forceful when necessary. Mining men proclaim his safety record to be exceptional. Looking at Art Campbell, one would immediately identify him as a hardrock miner; listening to him, one would recognize the sound education and intelligence underlying his words.

Stewart Campbell, mine inspector for 12 years, also is a graduate of the University of Idaho, receiving his B.S. in mining engineering in 1907. Until 1910 he worked for various concerns, mostly mining companies, and then he opened a private office at Hailey. Always an exponent of fair dealings, his



Stewart Campbell

tenure of office was highlighted by the exposure of eastern fraudulent interests. It is to him principally that thanks are due for the present form of the state mine inspector's report, which is outstanding in the clarity, brevity, and thoroughness, with which the mining activities of the year are reviewed. His long record of re-election testifies to his ability and the people's confidence in him.

The race between the two men is expected to be interesting, especially so since the primary elections resulted in 29,556 votes for Stewart Campbell and 29,977 votes for Arthur Campbell.

OREGON MINES EXPECT 50 PER CENT INCREASE

THE State Department of Geology and Mineral Industries of Oregon estimates that during the current year the mineral production of the state will be increased by 50 per cent over the 1939 figures. In 1939 the state showed an increase in production of metallic minerals and ores of 16.6 per cent over the 1938 figures. The actual value of gold, quicksilver, lead, and copper produced in 1939 in Oregon was \$3,828,243, against \$3,282,970 for the previous year.

The rapid advance has been due mainly to the greatly increased production of quicksilver and to the increased number of gold dredges operating in the state. Oregon now has one of the largest producing quicksilver mines in the United States, the Bonanza mine near Sutherlin.

In 1939 there were 116 underground gold quartz producers; 15 gold dredges; 13 non-floating washing plants; 76 hydraulic gold producers, and 13 underground drift placers and miscellaneous operations.

NEW JERSEY ZINC REPORTS INCREASED PROFIT IN 1940

THE New Jersey Zinc Company reports for the quarter ended June 30, 1940, a net profit of \$1,553,156, equal to 79 cents a share, which compares with \$971,382 or 49 cents a share in the June quarter of 1939. A report for the March quarter of the current year showed a net profit of \$1,765,112 or 90 cents a share.

For the six months ended June 30 the company showed a net profit of \$3,318,268, or \$1.69 a share, against \$2,047,648 or \$1.04 a share in the 1939 period.

In the western states the company's activities are under the Empire Zinc Company, which operates at Gilman, Colorado, and Hanover, New Mexico.

A.I.M.E. HOLDS SUCCESSFUL MEETING AT SALT LAKE CITY

MORE than a thousand members of the American Institute of Mining and Metallurgical Engineers—the men who know where the strategic and useful minerals are and how to win them from the earth's secret hiding places— assembled in Salt Lake City, Utah, for the 153rd meeting of the Institute, September 10-13, to discuss—on the record—the latest methods of mining and treating ores; and—more or less behind the scenes—the sources and availability of the strategic minerals needed for defense purposes.

The Utah Section of the Institute was host at the 153rd meeting, which was the first to be held there since 1927, and D. D. Moffat, vice-president of the Utah Copper Company, whose world-famous mine is located in Bingham Canyon, right outside of Salt Lake City, was general chairman. D. C. Jackling, president of Utah Copper Company—the man whose genius for mass production mining methods made it possible to mine profitably the 1 per cent porphyry copper ores—predicted that the Salt Lake meeting would eclipse all previous meetings held in the west and he was right.

The first official meeting was a luncheon at Hotel Utah, at which Henry H. Blood, governor of Utah, and Ab Jenkins, mayor of Salt Lake City, welcomed members of the A.I.M.E. to Utah and Salt Lake City. Herbert G. Moulton, president of the Institute, responded.

A feature of the meeting was a number of air-view reconnaissance trips over the Utah mining districts, personally conducted by leading mining geologists who practice this method of prospecting for new mining fields. The United Air Lines' 21-passenger "Mainliner" planes were used, and the flights were made over Bingham, Midvale, Park City, Tooele, Ironton, and Tintic mining districts. In recent years aerial geologizing has developed rapidly through the aid of color photography. Maps made by this method show various ore outcrops in regions devoid of vegetation, and even where the vegetation is heavy, as in the tropics, the differences in color revealed by the photographs indicate the presence of petroleum and various minerals.

On the technical program were outstanding papers on the Climax-Molybdenum

field—the newest large mining enterprise in the Colorado area. Molybdenum is an essential war metal for every country in the world and the United States, producing 95 per cent of the world's supply, is fortunately situated. The metal is a necessity for high-quality steel. Another paper, on the "Future of the Lead-Zinc Industry," by Clinton H. Crane, president of the St. Joseph Lead Company, pointed out the significance of that industry in our defense and industrial economy.

On Thursday evening the visiting mining engineers were taken to Bingham Canyon, one of the world's most unusual mining

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The **Crescent Gold Mining Company**, owned by Roy R. Ventura, Box 552, Lincoln, California, and Lee Wolff, also of Lincoln, is operating a dredge three miles east of Lincoln on the C. M. Newell property. The equipment is handling approximately 45 yards an hour, using sluices for recovery. The dredge was constructed by the operators who have built three others in the past four years.

Five claims of cinnabar ground, located eight miles northeast of Markleeville, California, have been taken under a three-year lease and option by Ollie Barrett of Fallon, Nevada, and L. H. Rogers of Markleeville. Mine development includes a 200-foot tunnel, a 120-foot drift, a 25-foot inclined shaft, and two 25-foot crosscuts. According to Barrett, satisfactory values in cinnabar have been disclosed in a week's examination, and some ore is in the dump. The ground is owned by A. Brune and Wesley Crathers of Markleeville, who had partially developed the mine.

Installation of a suction-type dredge is nearing completion on Chowchilla Creek, eight miles east of Mariposa, California, and the trial run will be made soon. The gravel and all sand are drawn up by the suction method and everything can be cleaned down to bedrock. The gold, being

very fine, is said to be easily saved by this process. Engineers estimate approximately 500,000 yards of gravel available which will average 30 cents a yard. If operations prove successful, a second dredge may be installed at a later date. Homer Blackman of Chowchilla, California, is working the ground.

The **Mariposa Commercial and Mining Company** has taken over the **Ortega** mine near Mariposa, California, and has started dewatering of the mine. A number of options have been held on the property in the last five years, but all have expired and the present company is planning an extensive development program. Dennis Mullins, who has been general superintendent for 18 months, will continue in charge. Electrical equipment, a new hoist, and a compressor were installed a year ago at the mine. This is the only property being operated at the present time by the Mariposa company. Judge Charles W. Slack, Alaska Commercial Building, San Francisco, California, is president.

Development and prospecting, with some mining, are being carried forward at the **Morning Star** mine, known in early years as the **Stella**, by **Mogul Mines, Inc.** The company, which is a close corporation composed of a few men, reopened the property about 18 months ago. A 50-foot winze has been sunk to the 335-foot level, with drifts and crosscuts driven at this depth. An extension of a vein of ore, which had been mined out on upper levels, was encountered at this depth. Values are in copper, gold, and silver. The higher

grade ore is being extracted in development and being stockpiled for future shipping. Walter B. Hester, Markleeville, is general superintendent. The property is in Alpine County, California, six miles from the Leviathan mine and 11 miles southeast of Markleeville.

The **Climax Dredging Company**, James F. King, manager, Orange Hotel, Gridley, California, has recently started mining operations on Greenhorn Creek near Chicago Park, California.

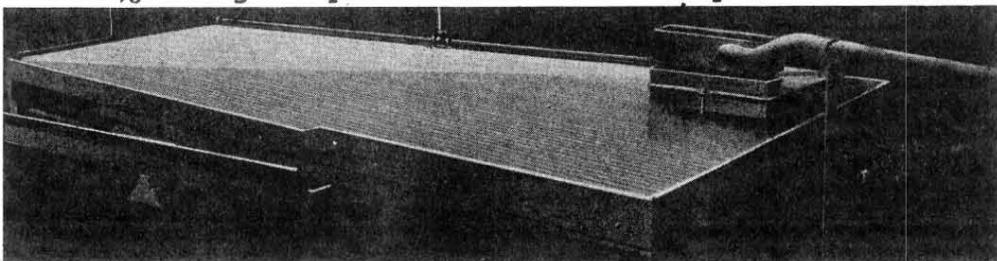
Newmont Mining Corporation, 14 Wall Street, New York City, has declared an extra dividend of 12½ cents a share to be paid, together with a dividend of 37½ cents on the common stock, September 16 to stockholders of record August 31. The dividend will total \$531,646.

The **Carlyle** mine near Twentynine Palms, California, has been taken over on a short-term lease by Paul Nett and Pliny Murphy of Twentynine Palms. Ore is being taken out near the surface and shipped to the Gold Crown mill for treatment. The workings are on the edge of a steep hill and the mineral is brought to the loading platform over an aerial tramway.

The **Atoliaburg Placer Mining Company** will construct a dry-washing plant at the Vienna claims in the Stringer District, near Randsburg, California, which will be equipped to handle 400 to 600 yards a day. This will be supplemented by a wet-method operation to be located in the district where water is available. Five men are now employed and it is expected to require

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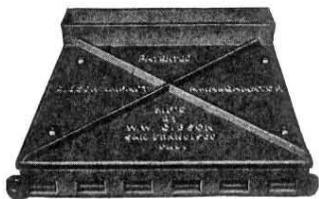
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about 30 days to complete the assembling of the equipment. A No. 4 Diesel Caterpillar tractor will be used to power an eight-yard Carryall for feeding the material into the plant. Nicholas Baxter and C. C. Mayfield of Randsburg are in charge. The company has been conducting extensive sampling on the Vienna and Black Hawk properties, the Max Hess ground, and the Carr property. The latter includes the Gold Coin, Orphan Boy, Stanford, and White Dyke claims.

A gold quartz strike of commercial value is reported to have been made in an unexplored section of the **Cherokee** mine near Greenville, California. Sinking of the main shaft to a depth of 400 feet has been completed, and this will be followed by drifting to explore ground thought to contain extensions of known ore bodies. The property is owned by Alfred L. Merritt, 200 Bush Street, San Francisco. Frank Humphrey, Box 215, Greenville, is general manager.

Work is scheduled to start immediately on a new flotation mill at the **Pennsylvania** mine at Browns Valley, California, operated by **Empire Star Mines Company, Ltd.**, Robert J. Hendricks, manager, Nevada City, California. The ball mill from the company's Murchie mine will be brought in to replace the stamp mill now in use. Underground operations at the Pennsylvania consist mainly of development work with about 65 men employed.

The **Rustless Mining Corporation**, subsidiary of the Rustless Iron and Steel Company of Baltimore, Maryland, has purchased a large chrome deposit in Siskiyou County, California, which is estimated to contain 500,000 tons of commercial ore. The company operates mining properties in Eldorado County, California, under a two-year agreement which it has with United States Chrome Mines, Inc., and also works in Oregon. H. F. Bryam, 924 Twenty-second Street, Sacramento, California, is vice-president and general manager of the Rustless corporation.

A. T. Wilkerson of the **Bishop Tungsten Company**, Bishop, California, has reported a rich strike of tungsten ore in the **Phelps** claims on Hilton Creek, 30 miles north of Bishop, on which his company has an option. According to Wilkerson, the material will require only washing before being shipped. A crew of 12 men is employed at this property and the company has 25 men working on a tungsten claim in the Chidago district.

Glenn Coburn and Walter E. Austin of Mariposa, California, are completing a 100-ton cyanide plant at the **Diltz** mine in the Sherlock district 10 miles northeast of Mariposa. They recently completed treating the old mill tailings at the **Yellowstone** mine near Coulterville, California, and are moving that equipment to the **Sunshine** mine near Mariposa, operated by Chris P. and W. O. Merrill of Mariposa.

Jack Meek, Twentynine Palms, California, has reported a rich gold strike on his **Meek's Flat** group of mining claims in the Dale district, Riverside County, California.

William R. Biaggi, 47 West Santa Clara Street, San Jose, California, and his associate, L. J. Timpany, have leased the **New North Almaden** quicksilver mine, sometimes known as the Santa Clara County mine, to Robert S. McGoughy, of the same address. The property is located approximately 2½ miles east of Edenvale in Santa Clara County, directly across the valley from the old Almaden mine. Operations have been started with a crew of four engaged in the erection of an experimental five-ton retort, which McGoughy plans to replace at a later date with a 25-ton Herreshoff furnace. Twenty-two hundred feet of tunneling had been completed and 10,000 tons of ore blocked out at the time of the transfer. These workings include the original tunnel started in 1910 by the Miller estate, from which Biaggi leases, and three prospect tunnels. Biaggi and Timpany have operated the property on a small scale since March, 1938, and Timpany plans prospecting farther south where the presence of additional ore bodies has been indicated. Present work is under the supervision of Lewis Buck, mining engineer of Monrovia, California.

A labor strike is reported to be still in effect at the Selby, California, smelter of the **American Smelting and Refining Company**. A. H. Richards, 405 Montgomery Street, San Francisco, is general manager of the company, and W. S. Reid is superintendent at the Selby plant. The strike was declared over two months ago.

According to John M. Sheedy, Downieville, California, owner of the **Telegraph** mine nine miles north of Downieville, rehabilitation of the mine has been started prior to extensive operations. A survey is being made preparatory to driving a cross-cut tunnel which is expected to make available 1,200 feet of back. In 1937 high-water, the result of a cloudburst, caused severe damage to the property, and work has been suspended since. A gold nugget weighing 30 ounces and worth about \$1,000 was found recently in an old river channel near the Telegraph, and has been purchased by Sheedy.

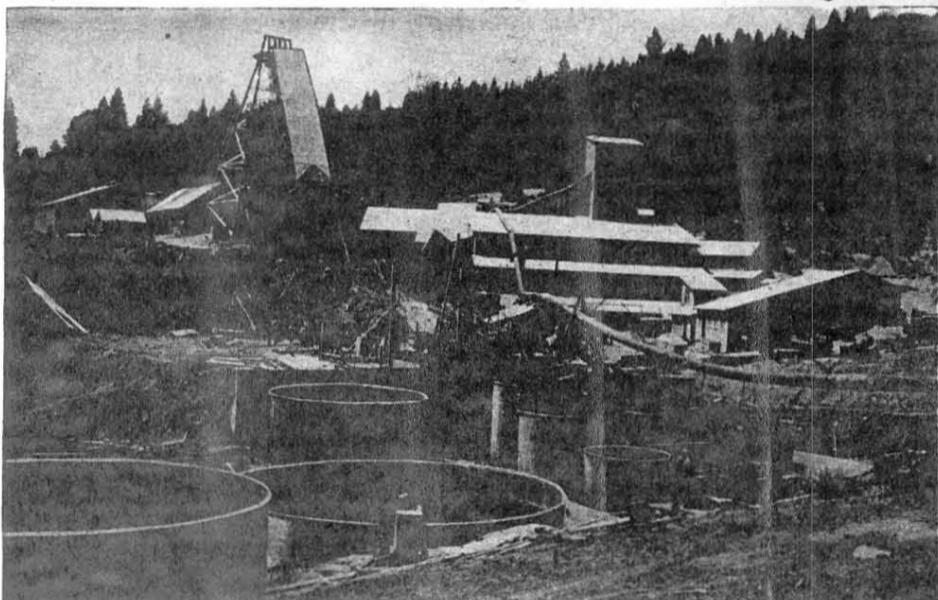
George Rotsler of Los Angeles, California, has acquired a lease from Ted Janss and Hal D. Draper, both of Nevada City, on 40 acres of ground in Wolf Creek about 13 miles below Grass Valley, California, on the Auburn-Grass Valley highway. Work will be started on a small scale using a trommel mounted on iron tires, fed by a dragline. The pits will be dried, and bedrock will be cleaned thoroughly as there is a considerable bedrock concentration. The recovery plant is comprised of a Draper mineral jig, a 36-14 duo jig, which roughs and cleans in a single pass. The unit is mounted on a separate skid, the trommel fines being pumped to the jig. The operation will be known as the **Wolf Creek** placers.

The Kennedy shaft of the **Kennedy Mining and Milling Company**, E. C. Hutchinson, president, 519 California Street, San Francisco, California, is to be sunk an additional 170 feet which will give the mine a vertical depth of 5,850 feet. Mark Eudey, Jackson, California, is acting superintendent for the company.

LAVA CAP again goes WEMCO

For the Third Time WEMCO Equipment

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MINE



THE Lava Cap Mine near Nevada City is not only California's second largest silver producer, but its gold production rates it as the third most important producer of this metal in the State.

When the mill was first built in 1934, the milling equipment was purchased from WESTERN MACHINERY COMPANY.

As production increased, WEMCO supplied additional major equipment items.

When an experimental program was adopted to make metallurgical tests, and a complete Pilot Mill erected, WEMCO again supplied the major equipment items.

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The consistent selection of WEMCO equipment by this outstanding company is a splendid tribute to the dependability and performance of WEMCO products.

Send for our bulletin AR-740.

WEMCO Equipment

. . . now being installed

This new addition to the Lava Cap Mine will be completed and in operation as of September 15th.

The following WEMCO equipment was used:

AGITATORS	— 5 — 14'x16'	
"	— 3 — 20'x16'	— Model PM
THICKENERS	— 5 — 20'x12'	— Model LOHM
DIAPHRAGM PUMPS	— 8 — 2"	— Model PSM
BOWL CLASSIFIERS	— 1 — 16'	— Model BJB
"	— 1 — 12'	— Model ASBM
SAND VAT DISTRIBUTORS	— 3	— 50' leaching tanks



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Sept 30, 1940

Serpentine as a Source of Magnesia

WHILE traversing Lake County, California, recently, our party was held up by a road repair job and I inquired of an elderly workman standing near regarding a mill building about 100 yards off the highway. Very willingly, and most intelligently, he advised that it was a quick-silver mill and proceeded to give us expert advice on how the "quick" bearing formation was sort of sandwiched in between a footwall of serpentine and a hanging wall of slate.

We had just passed through some two miles of serpentine formation and I could not resist the temptation to inquire whether serpentine was good for anything. His reply was quick and emphatic, "Not good for a d--- thing."

I could not blame him for an opinion held by men perhaps far better trained than he; nonetheless, serpentine is a mineral of magnesium, and, though many of us may be but little aware of it, the metal magnesium, its oxide, and diverse compounds enter into many phases of our every day life.

Don't be surprised to find that luscious steak that later graces your table sizzling in a "Magnalium" frying pan. Or the basement heater transmitting its welcome warmth through magnesia base insulated pipes. Even the concrete foundation of your home may have been compounded with cement once burned in kilns lined with magnesia brick. The versatility of magnesium products could be enlarged upon, ad libitum.

The magnesium industry of today, by whatever yardstick we measure it, is "big business." Like any normal industry it endeavors to forge ahead by improvements in processing, cheaper sources of supply for raw materials, and so forth.

In this latter connection the possibilities of the vast serpentine formations of the Pacific Coast appeared particularly intriguing to the writer; there seemed to be but one stumbling block embodied in the generally accepted maxim "that it is impossible to treat the silicate rocks of magnesium except at prohibitive expense." This view has been held consistently throughout the years and is one, as we shall see, that is a mixture of fact and fancy.

The work of the writer on serpentine dates back to some desultory experiments engaged upon first in 1934; since then the work has steadily grown in scope and magnitude. Because something quite contrary to prediction has been accomplished it is believed that the mineral industry will be interested in a brief review of the work and processes that promise to convert here-

The recovery of magnesia from such silicate rocks as serpentine has been considered impracticable in the past due to the expense involved. However, in view of the expanding use of magnesium and its compounds, serpentine cannot be ignored and a method is here-with presented for the extraction of magnesia from such sources.

tofore valueless rock formations into deposits of distinct economic value.

Under patented and patent pending processes it is now possible to extract magnesia and magnesium compounds from certain chemically unbalanced and inherently unstable magnesium silicates, of which the mineral serpentine is a classic example. Moreover, many serpentine formations carry an accessory mineral content which it is possible to extract in conjunction with these processes.

The initial work proved that it was possible to dissociate a serpentine by a rather simple process of low temperature heating and that magnesia was liberated in the process. True, this could not be done haphazardly, but further efforts developed the fact that the magnesia thus liberated attained maximum value at a conductivity point (electrical) characteristic for each particular type, or formation, of such unstable magnesium silicate rocks; thence to recede again. It is therefore possible to control the dissociation with this object in view and to do so wholly automatically.

For my early researches I developed a novel, but positive, analytical method for evaluating the extent of the reactive processes by subjecting the raw materials, and in their various stages of calcination, to the action of a solution of benzoic acid in strong alcohol wherein liberated, or available, magnesia was soluble whereas undissociated magnesium silicates remained unaffected. Recourse was also taken to calorimetric and other means of investigation for studying the mechanism of the reactions involved.

To guard against errors and misconceptions not only serpentine but many other types of magnesium silicate minerals were imported from various parts of the country; in fact, from many parts of the world. By virtue of this work I eventually was able to establish firmly the correctness of a hypothesis which I had formed regarding dissociation of chemically unbalanced forms of hydrous magnesium silicates.

Taking the compound composition of a "pure serpentine," as given by Dana, for the base of criterion the correctness of the

herein given reaction, expressed in its simplest form, was decisively proved:

$$3\text{MgO}\cdot 2\text{SiO}_2\cdot 2\text{H}_2\text{O} + \text{heat} = 2\text{MgSiO}_3 + \text{MgO} + \text{H}_2\text{O}$$

Under this equation it appears thus possible to liberate somewhat in excess of 14 per cent of magnesia (MgO) from a serpentine; actually the amount so liberated may be either smaller or larger depending upon the composition of the particular mineral undergoing treatment, and other factors.

The heat needed to effect the dissociation is far from being excessive—about 1,200 degrees Fahrenheit. With the foundation of the processes involving the treatment of such minerals once firmly established it was not difficult to build further.

Thus, beyond the preparation of a caustic calcine containing in excess of 10 per cent of available magnesia which can, as such, find ready application in various industrial processes and products, the production of magnesia, magnesium compounds, and even that of metallic magnesium in a more or less direct manner, appear as conceivable possibilities from such raw materials which are not now considered to be economic.

It is not difficult to visualize the extraction of magnesia from such a calcine by suspending the same in water; subjecting the slurry to the action of carbon dioxide gas in order to form bicarbonate of magnesium, a water soluble compound; filtration in order to separate waste matter; and then condensing the filtrate to obtain the water insoluble form of normal magnesium carbonate. And such, in fact, can be accomplished and the resulting magnesium carbonate will be of virtually U.S.P. grade.

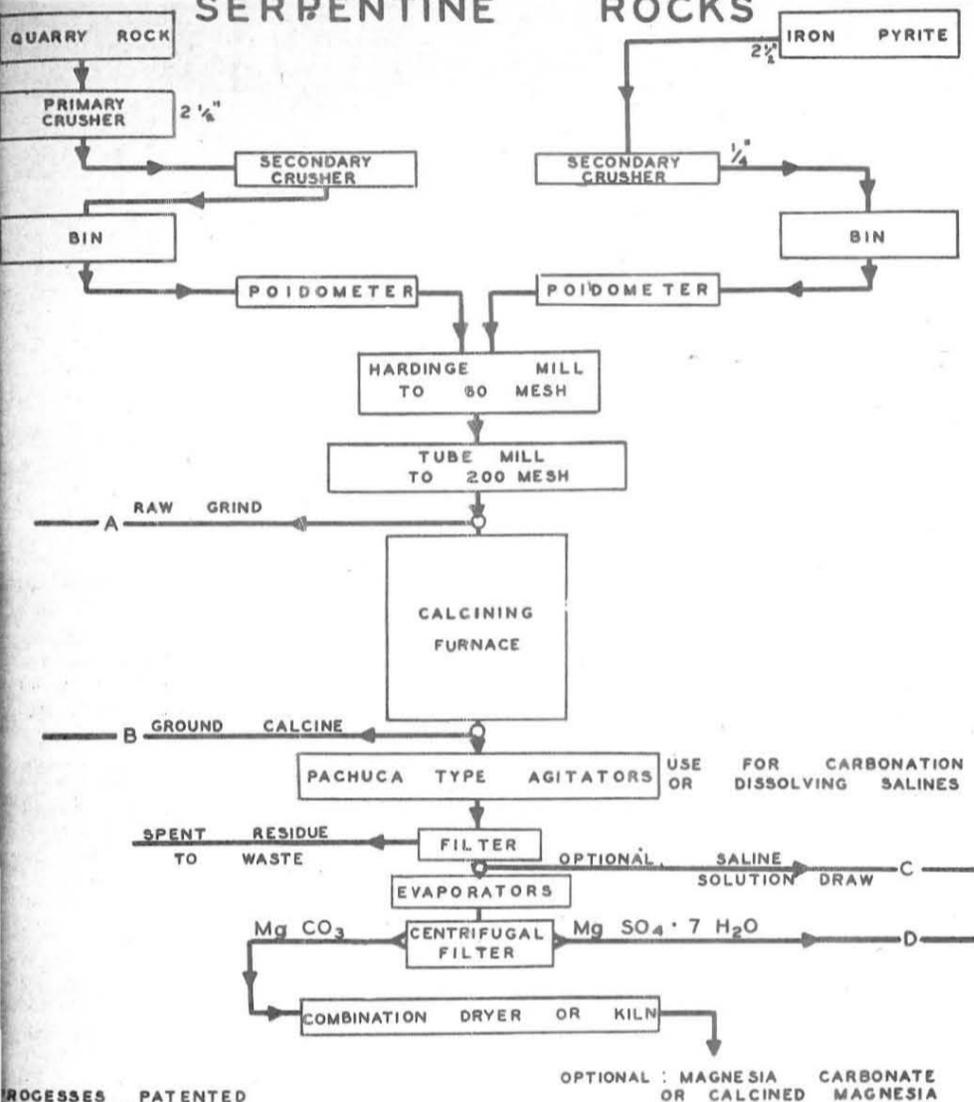
HOWEVER, there are still better procedures for taking advantage of the fact that magnesia is liberated by the process first described herein. One such a method is to form simultaneously and coincident with the calcining operation an anhydrous, but eventually water soluble, salt of magnesium; namely, magnesium sulfate.

For contrary to past precept I have found that magnesium sulfate heated within the moderate temperatures employed in this process is not converted into a water insoluble variety of anhydrite. Thus, by subjecting, for instance, a properly proportioned blend of serpentine and iron pyrites to a well controlled calcining operation a water soluble form of magnesium sulfate is produced.

Due to the enormous heat energy released by the pyrite in the course of its oxidation, the process, once started, becomes practically self supporting and the actual fuel requirement is almost a negli-

*Chemist and Metallurgist,
Concord, California.

FLOW SHEET FOR PROCESSING SERPENTINE ROCKS



By omitting the use of pyrite in the above flowsheet a raw ground serpentine may be withdrawn at (a); for this certain industrial uses exist. A ground calcine may be drawn at (b) which is expected to find use in the asphalt, insecticide, and other industries. Magnesium carbonate, resp. oxide, forms the end product. With the use of pyrite, a magnesium sulfate liquor may be drawn at (d) or epsom salt obtained as the end product.

gible one. The magnesium sulfate is brought into solution by suspending the calcine in water, a contact of less than an hour being required to dissolve over 99 per cent of the total magnesium sulfate formed.

The solution is then filtered to remove waste products and when suitably concentrated will yield crystals of magnesium sulfate with seven molecules of water of crystallization; a salt which is well known to commerce under the name of epsom salt. The salt is iron free and of high purity; the purity seldom falling below 99.75 per cent. Such a salt is now produced in the San Francisco Bay area (under orthodox methods) to the reputed extent of about 3,500 tons per year with a sales value of \$32.00 per ton.

Other suitable magnesium minerals may be substituted for serpentine, and providing the processing operations are closely and properly adhered to (as per specifica-

tions) a salt of equal purity, readily soluble in water, can be produced.

Due to the high solubility of epsom salt in water it is possible to operate at extremely high saline concentrations; a decided advantage in that the ratio of liquid to saline matter can be kept at a minimum. For some purposes of use it would not even be necessary to first separate the saline matter in the form of salt.

In my work on the serpentines of the Pacific Coast I have found that most of them carry a nickel content varying from a trace on up to amounts warranting their recovery as a by-product; some also carry traces of mercury and even an occasional trace of platinum has been encountered.

The processes have been described in sufficient detail to enable one skilled in the arts to closely approximate the relative costs between the usual raw materials consumed by the magnesium industry, and their accessory requirements, as against

the materials and methods herein proposed.

Raw materials serving the magnesium industry embrace the following minerals and other sources of supply: magnesite—a carbonate of magnesium; dolomite—a double carbonate of lime and magnesia; brucite—a hydrate of magnesium; sea water bitterns—waste solution from salt manufacture; natural bitterns—saline lakes and similar concentrations.

The metal "magnesium" is finding an ever extending use in the manufacture of various magnesium-aluminum alloys since it has been found that these possess characteristics far superior to those of their respective constituents in the unalloyed state. These embrace greater tensile strength, resistance to fatigue, higher resistivity to corrosive effects, and so forth.

In view of these facts it is but logical to conclude that the market for magnesium and magnesium products will be a constantly expanding rather than a diminishing one; in this economic expansion serpentine will soon prove itself a not to be ignored factor.

EXTRACTION OF ALUMINA FROM CLAY IS ANNOUNCED

A PROCESS for the extraction of alumina from common clay is stated to have been evolved by John Henry Walthall, supervisor of the chemical engineering laboratory of the Tennessee Valley Authority at Wilson Dam, Alabama. After joining the TVA staff in 1935, Walthall became interested in the problem and now has a pilot plant which is said to be producing one ton of alumina daily. The question of whether or not the process is of commercial value will not be answered until a larger plant is constructed.

Aluminum metal is produced in this country solely by the Aluminum Company of America, which employs the Hall process on which patents are stated to have expired. The metal is classed as one of the strategic materials by the Army and Navy Munitions Board, chiefly because of the limited quantities of commercial-grade bauxite available in the United States. Our principal imports of bauxite come from Dutch and British Guianas.

In 1940 the Aluminum Company of America started the construction of a new aluminum reduction plant to be completed on or before January 1, 1941, at Vancouver, Washington. This plant, first of its kind in the western United States, will utilize alumina shipped from the corporation's Mobile, Alabama, plant, and produced by the Bayer process from South American bauxite.

However, the supply of bauxite is much more limited than is the alumina-bearing clay supply. Scientists have worked on this problem for years, knowing that alumina is present in common clay, but being in the form of silicate has not been recoverable.

Walthall is of Roanoke, West Virginia, and is a chemical engineering graduate of Massachusetts Institute of Technology of the class of 1924. He has been with TVA for the past five years.

COLORADO TRIES TO ASCERTAIN WAGE-HOUR JURISDICTION

A RULING has been made by the Wage-and-Hour Administration, at request of the Colorado Mining Association, regarding the jurisdiction of the administration over Colorado mines. According to this ruling, mines within the state shipping ore to the custom mill of the Golden Cycle Corporation at Colorado Springs do not come under the wage-hour law; those shipping ore or concentrates to the Leadville smelter of the American Smelting and Refining Company are required to comply with the provisions of the law. The basis for this decision is the finished product of the two plants. That of the Golden Cycle is sent to the U. S. mint at Denver, while the Leadville product is sent to Omaha, Nebraska, or Perth Amboy, New Jersey, for further refinement. The shipment of lead-gold-silver bullion from Leadville out of the state makes the ore shipper to Leadville a party to interstate commerce, according to the Wage-and-Hour Administration ruling, bringing him under the wage and hour jurisdiction.

There are still points in the question which have not been made clear, such as the status of a mill receiving ore from out of the state and sending the recovered values in the form of bullion to the Denver mint.

COPPER MINERS TO GET 5 PER CENT WAGE INCREASE

PHILIPS DODGE CORPORATION has announced a 5 per cent wage increase for all classes of mine labor, under terms of agreements which provide for a sliding wage scale based on the price of copper. Officials of the Inspiration Consolidated Copper Company have announced a similar action, and it is understood that employees of the Shattuck Denn Mining Corporation at Bisbee also will receive an increase.

Employees of the Anaconda Copper Mining Company in Montana have received an advance of 25 cents a day for all classes of labor, and mining companies in other western copper producing camps are expected to take similar action shortly.

BOULDER CITY TEST PLANT ELIMINATED BY SENATE

WORD has been received that a \$2,000,000 item intended for the development of new processes for recovering manganese from domestic ores has been eliminated by the senate appropriations committee from a \$1,482,000,000 supplemental national defense appropriation bill. The bill had passed the house. The item eliminated had provided among other things for the construction of a \$325,000 test plant in the vicinity of Boulder City, Nevada, for the treatment of domestic ores and for the laboratory study and field investigation of affairs pertaining to the development of supplies of strategic and critical materials in the western states. The matter will be reconsidered by a joint committee representing both houses and recommendation made for final action.

MANAGEMENT OF WHITE PEAK VESTED IN FRANK A. CRAMPTON

MANAGEMENT of the White Peak Mines, Inc., was taken over early in August of the current year by Frank A. Crampton of Nevada City, California, who is carrying on an extensive development program and producing about 1½ flasks of quicksilver daily from ore taken out in development. Crampton is the senior member of the firm of Crampton and Crampton, which acquired control of the property in August. The White Peak company was organized last February by Anthony Lebecki



Frank A. Crampton

and Eugene Frenke, both of Los Angeles, California, who will remain a part of the concern.

The property is located in the Bottle Creek district of Humboldt County, Nevada, and was acquired from James and Arnold Scossa of Winnemucca for the reported price of \$75,000. The mailing address of the mine is Box 68, Winnemucca. The present mill is a 25-ton Gould rotary kiln furnace which is handling from 10 to 15 tons of high-grade ore daily. It is located at the No. 1 shaft and ore from other parts of the property is trucked to it. Various adjustments and improvements have been designed to increase milling capacity. New pumping equipment has been installed in the No. 1 160-foot shaft, where the 150-foot level is being opened. When work on this level is sufficiently advanced, the shaft will be deepened 50 feet. Production is coming chiefly from the 60 and 100-foot levels. A hoist and compressor have been installed at the No. 2 shaft where development is also in progress. On the Red Ore fraction a new shaft is being sunk.

Crampton is well versed in various phases of mining. Born in New York City, he received his engineering education in the east. He came west to engage in the mining activity during the boom days of Goldfield and in 1907 was put in charge of the Bear Quicksilver mine near Kings City, California. Subsequently, he operated in Utah and in Colorado, and in 1910 he and his brother, the late Theodore H. M. Crampton, established the firm of Crampton and Crampton. He soon became an active mine operator and consultant in the problems of the small mine. At the Boss mine in Nevada he conducted successful experiments in assaying metals of the platinum group. After serving as an engineer during the World War, he returned to mining in California, Nevada, and Idaho. In 1923 he went to the Orient, returning in 1927. He has contributed substantially to mining literature and has been active in California in efforts to put through legislative measures concerning compensation insurance,

debris disposal, control of stock selling, licensing of hoistmen and engineers, and other matters vital to the mine operator.

PUBLIC MINERAL LANDS WITHDRAWALS

(Continued from page 5)

standing resources for their most profitable development without excluding other uses."

Let us hope this presages a tapering off in the campaign to establish national parks which have boundaries that go beyond all rhyme or reason. We also must hope that glorifying and protection of natural grandeur will no longer mean that rivers are not available for irrigation and power, forests for lumber, meadows and hillsides for grazing, and mineral pockets for the myriad metallic products of modern society. There is no valid reason why a prospecting claim at the base of a great mountain peak should entirely exclude that peak from classification as a citadel of recreation and scenic majesty.

We who live in this troubled age have a mighty responsibility. One of those responsibilities is to make democracy work. I believe that democracy can be helpful to work in the west if we use our resources to keep people at work and to provide useful things. With that in mind, I am an advocate of using our frontier, both for recreation and for economic development, and I do not think that one need by any means exclude the other.

Genuine conservation is that conservation which not only protects the enduring qualities of our outdoors, but also permits the development of its valuable qualities. Both of these may be hard to accept simultaneously, but accept them we must if we are to attain the best which is in our civilization. The people who want complete conservation and the people who want complete development both have good talking points and worthwhile arguments. If we blend those arguments in a forward looking program, I am sure they will be the best thing for our country. There may be some flaws and mistakes in the forest service's ideas of multiple use. Yet, I think there are less flaws in that program than in any program which acts to set aside huge areas restricted to a single use.

A long time ago when he sent Lewis and Clark westward on their great journey into the unknown, Thomas Jefferson said he visioned "a great free and independent empire" in the west. He was a man who believed in the development of an economy in the hinterlands which took care of all the people. I am sure that his dream would best be realized by allowing our natural resources to be used. You who are vitally interested in mining and mineral development can do your part by adopting standards and methods which will not encroach on the natural beauty of any regions which are tapped for their mineral wealth. With that cooperation, the miners and the mining interests of America will be advancing our program to make democracy work at home and to protect it against anti-democratic forces from abroad.

plans to begin immediate operations on gold placer ground in the Weaver Creek district of Arizona. The property was owned formerly by Frank Gillick of Octave.

Arical Mines, Inc., Box 830, Prescott, Arizona, expects to begin operations about October 15 at its Cilker and Lawson placer properties in the Big Bug district near Mayer, Arizona. Installation of a washing plant on a barge fed by a dragline is planned. Gordon F. Cronkhite, Box 923, Pasadena, California, is president of the company, and E. R. Mattson, formerly with the Lynx Creek Placer Mining Company on Lynx Creek, is superintendent.

Production at the **Miami Copper Company** has shown an increase since resumption of operations on a six-day week schedule. A record of 17,000 tons excavated in one day is stated to have been made recently. Full production has been possible since an adequate water supply was made available through an underground pipe line system from the Old Dominion property purchased last spring by Miami Copper. Arno S. Winther, Miami, is general manager of Miami Copper Company.



Operations are progressing at the **Alhambra mine of Alhambra-Shumway Mines, Inc.**, Kelsey, California. The shaft was sunk from the 225-foot level to the 400-foot level. Miners have driven a cross-cut for a distance of 60 feet from the shaft and operators estimate another 40 feet to go before reaching the vein. Cross-cutting on other levels is being continued. Ray Henricksen, Kelsey, California, is general superintendent of Alhambra-Shumway Mines.

Mining has been suspended at the **Atolia Rand** placers west of Atolia, California, awaiting the arrival of an additional unit for the dry placer equipment. In the interval, a crew of 12 men is employed in overhauling the machinery now on the ground. The new equipment is being manufactured in Philadelphia, Pennsylvania, and is expected to arrive about November 15. With

AVERAGE PRICES OF METALS (Figures by American Metal Market)

	Copper Per Lb. Conn. Valley	Lead Per Lb. New York	Zinc Per Lb. St. Louis	Silver Per Oz. New York
1924	13.024	8.097	6.344	66.781
1925	14.042	9.020	7.622	69.065
1926	13.795	8.417	7.337	62.107
1927	12.920	6.755	6.242	56.370
1928	14.570	6.305	6.027	58.176
1929	18.107	6.833	6.512	52.993
1930	12.982	5.517	4.556	38.154
1931	8.369	4.244	3.638	28.701
1932	5.792	3.181	2.881	27.892
1933	7.276	3.870	4.031	34.723
1934	8.658	3.8595	4.162	47.973
1935	8.830	4.0648	4.331	64.273
1936	9.710	4.7091	4.903	45.088
1937	13.391	6.0085	6.517	44.805
1938	10.225	4.7338	4.613	43.222
1939	11.197	5.0531	5.117	39.082
1940				
Jan.	11.25	4.826	4.676	42.75
Feb.	11.25	4.8045	4.50	42.75
Mar.	11.25	4.8241	4.50	42.75
Apr.	10.469	4.782	4.50	42.75
May	10.058	4.75	4.50	42.75
June	10.00	4.80	4.50	41.955
July	10.220	4.854	4.517	34.944
Aug.	10.491	5.0426	4.724	35.951
Sept.	11.930	5.454	6.150	36.956
Oct.	12.442	5.50	6.50	35.726
Nov.	12.50	5.50	6.50	34.75
Dec.	12.50	5.50	6.012	34.956
Ave.	1939-11.197	5.0531	5.117	39.082
1940				
Jan.	12.216	5.4712	5.644	34.75
Feb.	11.405	5.0761	5.543	34.75
Mar.	11.385	5.1923	5.75	34.75
Apr.	11.327	5.0712	5.75	34.75
May	11.324	5.0154	5.808	34.949
June	11.375	5.00	6.24	34.825
July	10.812	5.00	6.25	34.75
Aug.	10.954	4.8537	6.298	34.75
Sept.	11.536	4.9292	6.937	34.75

this addition it is expected that three shifts will be employed. James H. Kennedy, Box 316, Randsburg, California, the general manager, has been in the east attending to purchase of the machinery.

Natomas Company, Thomas McCormack, president, Forum Building, Sacramento, California, has reported estimated net earnings for the quarter ended September 30, 1940, as \$270,000 after all charges. This amount is equal to 27 or 28 cents a share on the 975,750 shares of capital stock outstanding. In the preceding quarter the company realized a net profit of \$316,433 or 32 cents a share. Net profit for the first six months of this year aggregated \$628,982 or 64 cents as compared with \$562,006 or 57 cents a share in the corresponding period of 1939. The decrease in earnings for the quarter just ended is attributed to the fact that the company had only six dredges in operation in July instead of the usual seven and that poorer ground was

being worked during the quarter by dredges en route to richer ground.

The five-stamp mill at the **Kentucky Ridge** mine in the Newton district near Grass Valley, California, is being operated on a basis of two shifts daily, and is handling ore supplied by a group of lessees. A. B. Adams, Grass Valley, is owner of the mine and mill.

C. E. Gruwell of Sacramento, California, has purchased a new dragline dredge which he will operate on Clear Creek in Shasta County, near Igo, California. Cost of the equipment is stated to have been \$25,853.

A vein of high-grade gold ore has been discovered at the **Ontop** mine in the Bucks Lake district near Quincy, California. Forty tons have been mined from the vein, and, when the amount has been doubled, the operators will start operation of the three-stamp mill installed at the property last fall. Howard E. Fowler, Bucks Lake Lodge, Quincy, and D. H. Mitchell, also of Quincy, have been developing the property for the past six years. A 1,000-foot tunnel has supplied a good run of commercial ore.

A 40-ton mill is being installed at the **La Honda** mine near Meadow Valley, in Plumas County, California, and bunk houses are being constructed to accommodate the mine and mill crews. The property was purchased recently from J. W. McKay, Meadow Valley, by H. D. Cowden of Dawson, Alaska.

Extensive mining activity is under way at the **Scotia** shaft of the **Golden Center** mine, Grass Valley, California. A depth of 1,600 feet has been reached, and commercial ore has been encountered in drifting on that level. The Golden Center shaft has been abandoned and the headframe dismantled, while a new headframe and surface buildings have been constructed at the Scotia. A crew of 120 men is employed. Cooley Butler, 745 Rowan Building, Los Angeles, California, is the owner of the Golden Center.

The **Placer Development Company** and the **Lemroh Mining Company** have two dredges in operation 24 hours a day near Oroville, California. The Placer dredge is equipped with Bodinson-built jigs of 5,000 yards capacity every 24 hours. The Lemroh equipment is a riffle Bodinson-built

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Oakland, California

dragline dredge of 3,000 yards capacity in 24 hours. Twenty-six men and a relief crew are employed under the direction of A. J. Molinari, superintendent, Box 723, Oroville. The two companies are controlled by the Bodinson interests. Officials include F. W. Bodinson, president; H. B. Bassett, secretary; B. P. Little, consulting engineer; and E. B. Kelly, general manager; all of 2401 Bayshore Boulevard, San Francisco, California.

The Indian Wells Valley Mining Company has completed tests which it has been conducting on the volcanic dry-lake deposits of China Lake near Brown, California, according to a report from Irvin B. Scrimger, metallurgist in charge. The pilot mill used is designed to recover the gold, platinum, silver, and mercury by the Metaltron separation process. Preparations are being made to increase the daily capacity of the plant. Among those interested in the company are George Parkes, Maurice Harbach, Paul Tanner, Dan Jund, and Earl Carr of Lone Pine, California; Earl Standard of Inyokern; H. L. Nixon and Earl Farley of Bakersfield; and Horace Martin of San Diego.

International Metals Development, Inc., Mark Ewald, president, 2227 Water Street, Olympia, Washington, has been organized to reopen the Abbott quicksilver mine near Wilbur Springs, California. Equipment has been moved in, camp buildings are being constructed, and development work has been progressing at a rapid rate. A crew of 35 men is employed. J. W. Wenzel of Williams, California, is superintendent.

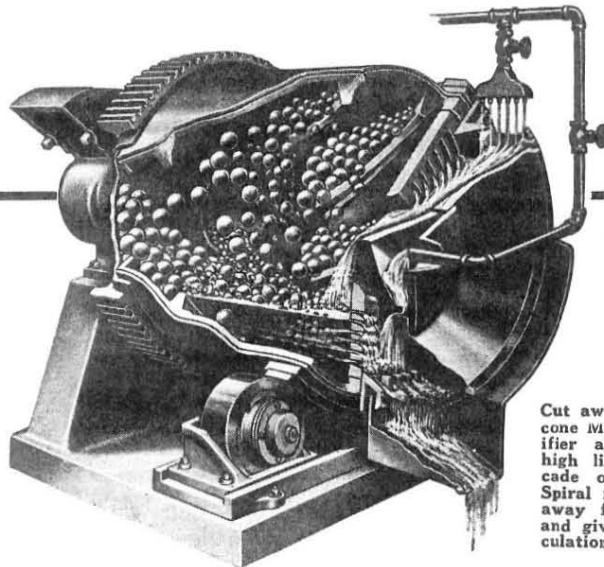
Milling operations are in progress at the Develter mine of Long Valley Mines, Inc., 1010 Pershing Square Building, Los Angeles, California. The property is located six miles northwest of Greenville, California, and comprises nine claims. Equipment includes ball mill, crusher, and amalgamator. The ore contains gold and some manganese. H. W. Schrader, Greenville, is in charge.

Operations will start soon at the Sulphur Queen mine at Mountain Pass in San Bernardino County, 17 miles from Nipton, California. Approximately 40,000 tons of ore have been blocked out, a 100-ton cyanide mill constructed, and a four-mile water line laid from McFarland, California. Fred B. Piehl, 117 West Ninth Street, Los Angeles, is the owner.

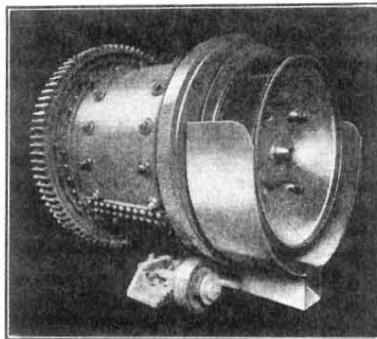
Approximately 500 feet of development work have been completed at the Monte Cristo mine near Mammoth Lakes, California. Ore is being trucked daily to the Mineral Reduction mill near Benton Station, California, with encouraging recovery values reported. Twelve men are employed. The mine is operated by C. A. and Raymond Collins, R. L. Warren, and W. R. Cowan, all of Whittier, California, who incorporated in July, 1940, as the Monte Cristo Mining Company, capitalized for 300 shares with \$100 par value.

Frank Riley of La Porte, California, is leasing the Bunker Hill mine near La Porte from J. K. O'Brien, Smartville, California, and Ed Metcalf, Oroville, California, and

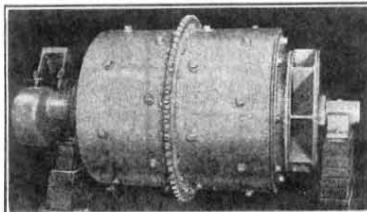
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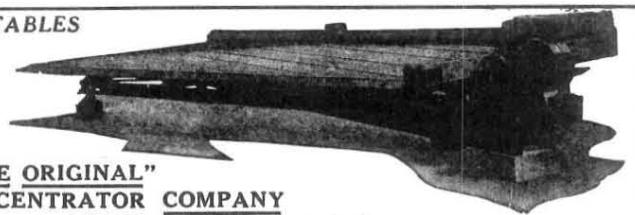
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is reported to have opened up gravel of commercial grade.

The Holmes and Nicholson Mining and Milling Company, K. A. Holmes, general manager, Ogilby, California, expects to enlarge its 100-ton mill, located five miles from Winterhaven, California, to 200-ton daily capacity. The plant will then be used to handle custom ore in addition to a large amount of low-grade ore which the company has already mined. An expenditure of \$50,000 is planned on the new construction program which will be started some time in October. About 100 men were employed in the mill during the last season, but, with the completion of the new addition, the number is expected to be doubled. Milling operations have been shut down during the hot summer months.

The King Solomon Mines Company, Forks of Salmon, California, is making progress with its development program started recently. A shaft has been sunk from the bottom of the pit to the old Cottrell level. Present work consists of cleaning out old workings and crosscutting and drifting in new ground to determine the extent of the pay ore. Open-pit mining and milling have been suspended while the underground development work is carried on. Wilbur H. Grant, 582 Market Street, San Francisco, California, is directing the operations temporarily.

The Aurora Mining Company is conducting extensive surface development at its Aurora quicksilver mine near Idria, California, and 50 flasks of quicksilver monthly are being produced. J. M. McDonald, Idria, is superintendent. The company is a subsidiary of the North American Mines Company of Boston, Massachusetts.

Martin B. Reed, Sierra City, California, owner of the Pride mine, has purchased a new Lorraine-Thew combination dragline and shovel. Two men have been employed in testing operations on the property and a crew is engaged in cleaning out the pit. Reed is reported to be backed by interests of the Central Penn National Bank of Philadelphia, and to have a working capital of \$100,000 for development of properties in Sierra County, California.

The La Honda mine has been purchased by H. D. Cowden of Dawson, Alaska, from



J. W. McKay, Meadow Valley, California, at a reported price of \$50,000. The property is stated to contain a rich vein 72 feet in width. McKay has been working the mine.

A new 500-horsepower General Motors Diesel plant with a General Electric generator will be installed at the Stockton Hill mine. A new 750-cubic foot Ingersoll-Rand compressor is to be added to replace the two smaller compressors. An extensive construction program has been under way for several months, and crews are now engaged in laying the foundations for the power, hoist, and compressor building, which will be 42 by 36 feet. Upon completion of its building program, the Stockton Hill Corporation will be entirely independent in the handling of its ore. Walter R. Woock, Box 449, Auburn, California, is president and general manager.

The Imperial Smelting and Refining Company, 811 West Seventh Street, Los Angeles, California, has secured an option to purchase the Darwin lead mine near Darwin, California, from the Wagner Assets Realization Corporation, 1 Wall Street, New York City. A crew of 12 men has been at work sampling and putting the camp in order preparatory to active operations. A second shift of men has been added and development work begun in the Thompson tunnel. The property consists of 68 patented claims and includes many of the old producers originally discovered in the 1870's. Additional equipment and men are planned as development progresses. Harry Kingsbury, Darwin, is in complete charge.

The Wilbur gold group, comprising six claims, has been leased to Los Angeles interests, represented by J. A. McCarthy, Box 73, Darwin, California, engineer in charge of operations. The property is owned by E. J. Wilbur, Darwin. Six men are at work developing the Number 4

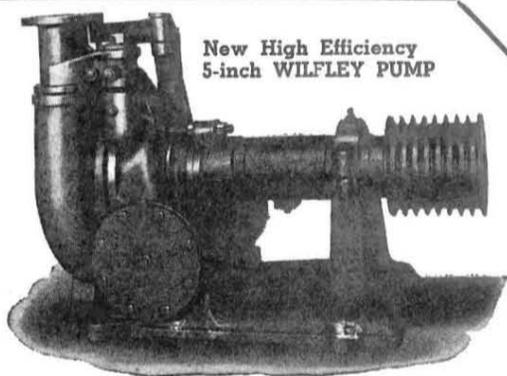
claim which is said to show promise of being a large, low-grade deposit of gold-bearing ore. An air compressor, hoist, pumps, and other equipment have been moved onto the grounds and new buildings are being erected. Construction of a 50-ton mill is planned for the near future.

According to L. H. Jockmus, president of the Lava Cap Gold Mining Corporation, the company was forced to pass its last dividend payment because of the thousands of dollars tied up in concentrates. Although sufficient money was on hand to make the payment, the directors considered it advisable to keep funds to meet current expenses. Resumption of operations at the Selby smelter is uncertain and the new Lava Cap plant is not yet ready for operation. It is expected to be completed in the near future, but several months will be required to handle all concentrates now stored. A total of 400 men is employed by the Lava Cap company. About 400 tons of ore are being milled daily. Underground operations include drifting on the the veins, opening new levels, and general development. Diamond drill activities are being continued at the Banner mine while production progresses steadily. Otto E. Schiffner, Nevada City, California, is general manager of the company.

The Kemmerer Exploration Company of Utah has taken over the Arctic mine owned by L. F. Utter, Washington, California. Exploration work is reported to be in progress preparatory to starting active production. The company plans installation of a Diesel power plant.

The Wyandotte Gold Dredging Company, which has been working on Greenhorn Creek near Nevada City, California, is dismantling its boat and will move to the Perrin and Pingree properties on Wolf Creek six miles from Grass Valley, California. Oliver M. Warren and N. M. Gibson have been directing work at Nevada City.

The Greenhorn Dredging Company is reported to have exhausted the profitable gravel at its location on Greenhorn Creek near Nevada City, California. It is now testing ground on the Middle Fork of the Cosumnes River in El Dorado County, California. The company is composed of Wilbard and Devine of the International Truck-



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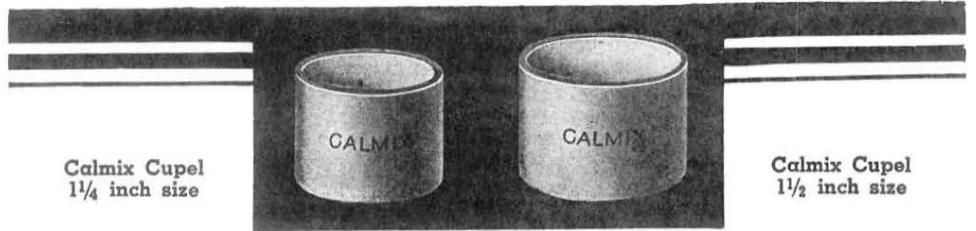
Drifting is in progress at the Ruby mine, Goodyears Bar, California, to connect the tunnel with the old Lowry shaft. The project is expected to be completed in December. A crew of 30 men is employed under the direction of L. L. Huelsdonk, resident manager. A nugget, reportedly valued at \$1,758 and weighing 52 ounces, was found recently in an ancient river channel by William Reed, Jr., foreman at the mine. It will become a part of the gold collection of C. L. Best of San Francisco, owner and operator of the Ruby.

Increased underground development work and a minor program of surface construction are under way at the Harvard mine near Jamestown, California, preparatory to erection of a 500-ton mill in the spring. A new compressor and other machinery are to be installed. About 1,500 feet of development are planned, including a 900-foot shaft. A crew of 35 men is employed in present work under the direction of P. R. Bradley, Jr., superintendent, Jamestown. The property is operated by the Harvard Gold Mining Company.

A fire of undetermined origin completely destroyed the crushing and scrubbing plants at the mine of the Roseklip Mines Company, Bodie, California. It is understood that the property destroyed was entirely covered by insurance and that plans are being drawn for reconstruction of the two units. The company is preparing to increase the daily capacity of its mill to 600 tons. Milling has been at the rate of 250 to 300 tons daily for several years, with production coming principally from surface deposits and old dumps. Recent operations are said to have exposed a large tonnage of low-grade ore in open cuts in working portions of the Standard Consolidated and other properties in the Bodie district. Henry S. Sweet, Bodie, is general manager.

Development work has been started at the Major Hoepfner mine near Brownsville, California, by Cecil Wyman, who is in charge for Sacramento interests. Fifteen hundred feet of tunnel are to be driven into old diggings made 20 years ago. The mine was closed a number of years ago because of flooding. A 50-ton mill is planned at a later date.

Approximately 150 tons of ore are being handled daily at the Sliger mine, operated by the Middle Fork Gold Mining Company, C. W. Plumb, superintendent, Greenwood, California. Additional sinking from the 1,400-foot level to the 1,600 is in progress under the direction of E. H. Syms, assistant superintendent, and C. J. Coquoz, engineer. Plumb recently has introduced a system of stope filling to take care of waste tailings from the mill. The slimes are separated from the sands which are in turn piped from the surface down to the desired level to fill the stopes. A new 250-horsepower hoist has been placed in operation. A new shaft has been sunk to a depth of 400 feet, and the collar concreted for 30 feet. Special lagging has been put in down to the lowest level.



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Sinking at the New Brunswick mine of Idaho Maryland Mines Corporation, Grass Valley, California, has passed the 2,860-foot mark and will be continued to the 4,000 level. A new surface plant is planned by the company for handling deeper development. The new steel head-frame will contain multiple ore bins and crushers and will be higher than the one at the company's Idaho Maryland mine. Other equipment will include a 480-horsepower Nordberg single-drum hoist, a 600-horsepower Ottumwa double-drum hoist, and two 425-horsepower compressors. Albert Crase, Grass Valley, is general manager.

Mining is in progress on the 1,000-foot level, 515 feet south of the Kerrick shaft of the Comanche mine southeast of Benton, California. A vein of high-grade silver ore was struck on this level last spring. One stope has been opened and another is being opened on the raise to the 850-foot level. The ore being removed from the first stope is said to average \$60 a ton. The property is leased by F. L. Main, 2875 Hollyridge Drive, Los Angeles, California. Eighteen men are employed. Ore from the mine is treated under contract in the Mineral Reduction Company's mill which operates on the property and handles custom ore in addition to that from the Comanche.

COLORADO

According to reports, the Wolf Tongue Mining Company has guaranteed its lessees the present scale of prices to January 1, 1941, the longest guarantee the company has ever given. William Loach, Box 25, Boulder, Colorado, is vice-president and general manager of the company. About 20 men are employed in the mines by the company, the other work being done by lessees.

Charles W. Strong of Jamestown, Colorado, has sold his interest in the Brock mine to the Ward United Mines Corporation, J. E. Emmons, 305 Denham Building, Denver, president. The shaft is being unwatered. The company's other holdings in the Ward district of Boulder County include

the Ward Consolidated mines, the Utica property, and the Baxter and Big Five mines. A small mill is under construction.

A. B. Cobb, Montana oil operator, is reported to have acquired the John A. Logan mine of the Stratton Estate and to be personally financing the return of this property to production. The property is fully equipped with mining machinery, electrically operated. Lynn Richmond of Victor is in charge for Cobb. A number of split-check leases are being granted and the company is working on its own account. The property was operated by the International Gold Producers, Inc., until late in 1936 when the Cripple Creek mill got behind on its payments for ore treated and finally closed.

The Mariposa Company reports a recent shipment of a carload of ore with a gross value of \$34.95 a ton in gold and preparations are being made for further mining in the portion of the mine from which this ore was taken. The company is made up of a group of stockholders of the United Empire Gold Mines Company and is leasing that concern's Osceola mine in Boulder County near Boulder, Colorado. M. S. Brandt, Boulder, is trustee and general manager of the United Empire company.

A compressor and machine drills will be installed at the Coming Wonder mine on Anvil Mountain north of Silverton, Colorado. The property is being reopened by Salt Lake City, Utah, men under the general supervision of E. M. Roberts of Silverton. Workings have been reopened and a trial shipment was made to a local custom plant.

Commercial gold values are reported to have been opened by A. A. Lee of Durango, Colorado, who is developing his Big Joe group of four claims on the east slope of Parrot Mountain, adjoining the Lucky Moon property on the southeast. Adjoining are the Cabin group of four claims owned by Andy Robinson of Durango who is planning to start production soon.

Every two months the Vanadium Corporation of America ships 40 tons of tungsten concentrate from its Conger mine and 30-ton mill near Boulder, Colorado. Two shifts are working in the mine and three in the mill. Development work is under

way in the Conger mine and in the Spider Leg property. Fifty men are employed at these two mines and the mill. Robert Sterling, 8 National State Bank Building, Boulder, is western division manager of the company, which also has extensive holdings in Montrose, Clear Creek, and San Miguel counties in Colorado, and in chrome mines in Guatemala, and titanium mines in Virginia, besides its property in Peru and Canada. At Boulder, J. M. Smith is general superintendent; William R. Nolan of Nederland is mill superintendent; and Tom McBride, Boulder, is mine foreman.

E. A. Wiltsee, Pacific Union Club, San Francisco, is reported to have set up a drilling rig on gold placer property near Kokomo, Colorado, where he is testing the gravel. If preliminary work is successful, equipment will be installed and regular production started. The equipment now being used was moved from the Silver Creek placers in Mohave County, Arizona, where Wiltsee did some shallow test work, operating as the Hoosier Gulch Placers.

The South Platte Dredging Company expects to have its new dredge completed and ready for use by October 15, 1940. The boat will be bucket-type and of steel construction. All necessary buildings have been put up at the company's holdings along the South Platte River in Park County southeast of Buena Vista, Colorado. About 30 men are employed at present. Jefferson J. Doolittle, Mills Tower, San Francisco, California, is president and R. W. Derby of La Grange, California, is manager. Charles Anderson, Buena Vista, is in local charge.

Two electric hoists will be installed at the Morning Glory property of the Golden Stars Mining Company, one at the surface and one underground to be used for additional sinking. The company is unwatering the property and will then remove an estimated 40 feet of broken muck at the bottom of the shaft before sinking 400 feet to the 1,200-foot level. As soon as the sinking program is completed, crosscuts will be run to the Doctor Jack Pot vein system and the Elizabeth Cooper zone. Fred C. Carstarphen, 721 Marion Street, Denver, Colorado, is consulting engineer and W. C. Benton, First National Bank Building, Denver, is president. The property is in the Cripple Creek district.

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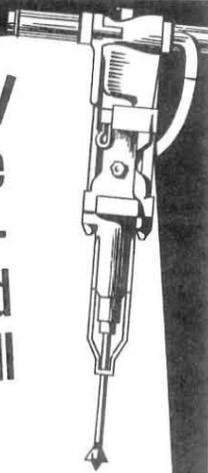
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Mining operations have been started by a new leasing group at the **Nancy Hanks** mine in the Garnet district of Granite County 12 miles north of Bearmouth, Montana. The property is under the trusteeship of F. T. Bellows-Graham, 278 Fisher Avenue, White Plains, New York. The claims included the Nancy Hanks, Dewey, and Midnight patented claims, opened by a 500-foot inclined shaft and over 4,000 feet of drifts and crosscuts.

According to reports, the **Star Pointer Exploration Company**, 718 Hobart Building, San Francisco, California, is planning a second dredge at its property near Bearmouth, Montana. The company holds about three miles of placer ground at Bear Gulch north of Bearmouth and seven miles of ground along the Clarks Fork of the Columbia River west of Bearmouth. The first dredge, a six-foot electrically-driven Yuba dredge, was started last fall. King C. Laylander, vice-president in charge of operations at Bearmouth, added a number of refinements and special features to the equipment being used. Year-around operations are possible as water from hot springs is available. About 9,000 yards of material are handled daily. Edwin F. Forbes of Marysville, California, is president. C. F. Patterson, Bearmouth, is dredgemaster.

Archie Burnett, Box 773, Helena, Montana, and R. A. Buzzard, also of Helena, have completed a considerable amount of development work at the **Lleiter** gold mine, which consists of 14 claims in the Sheridan district on Wisconsin Creek about 10 miles northeast of Sheridan, Montana. Equipment on the ground includes a compressor, gasoline powered, and a 20-stamp mill. The stamp mill is in poor condition, however, and will be replaced by a new ball mill when sufficient ore is developed to justify it. About six men are employed.



The **Standard Cyaniding Company** is reported to have given a contract for stripping, mining, and hauling ore to the mill to the **Isbell Construction Company** of Reno, Nevada. The property is in Pershing County between Imlay and Lovelock, Nevada. The Isbell company has brought in power shovels, large trucks, compressor, and other equipment and has started work. An average tonnage of ore mined and milled is reported for August. Since starting of the mill less than a year ago, approximately 166,000 tons of ore have been treated. Recovery is stated to be 84 per cent. The company's payroll numbers 19. H. L. Hazen, Lovelock, is president and general manager.

The **California-Nevada Tungsten Corporation**, owned by R. A. Stolle and J. E. Riley, both of Bishop, California, has completed its new 140-ton mill at Oak Springs

in southern Nye County, about 70 miles north of Las Vegas and 35 miles east of Beatty. Concentrates will be treated by a dry process of magnetic separation. Mining is done by open-pit methods and both mine and mill equipment are electrically operated. Milling machinery includes a 9 by 15-inch Ball jaw crusher, a Herman 4 by 2½-foot ball mill, two dry concentrating tables, and a Stolle magnetic separator capable of treating one ton of concentrate per hour. The company holds the **Wesley Koyen** and the **Allen Fitzpatrick tungsten** ground in the Oak Springs district.

The **Consolidated Chollar Gould and Savage Mining Company** is reported to have brought all mining operations above the ground, the only underground work being done at present is keeping the old workings in first class condition. The company expects to do further exploratory and development work underground to prepare for production in the future. Since last May mining has been done by open-pit methods. The property is the old **Overman** mine on the southern end of the **Comstock Lode** near Gold Hill, Nevada. About 36 men are employed, in addition to the 20 men in the pit who are employees of the Nevada Rock and Sand Company of Reno, which holds the contract for stripping, mining, and hauling. About 5,000 yards of overburden are stripped daily and actual mining is done by two Northwest shovels. The mill handles 450 tons of ore daily. F. V. Dempsey of Gold Hill is general superintendent and Thomas V. Barton of San Francisco is vice-president and general manager.

The **Black Mammoth Consolidated Mining Company** has declared a dividend of 1½ cents a share on capital stock to be paid from paid-in surplus, payable October 25, 1940, to stock of record October 10. Fred A. Vollmar, Jr., of Silverpeak is president and manager of the company, whose holdings are held under lease by the E. L. Cord interests.

Commercial ore is being taken from the 200-foot level of the **S. W. Extension** claim by J. A. McLaughlin and Charles M. Hoover of Fallon, Nevada. A strong ledge is said to be in sight and will be developed. Values are in silver and lead. This property adjoins the **San Rafael** ground in the Quartz Mountain district, 75 miles southeast of Fallon. Smelter shipments may be started soon.

A deposit of tin-bearing ore is reported to have been disclosed in the lower levels of the **Jumbo Extension** mine at Goldfield, Nevada, which is controlled by Henry P. Kervin of Los Angeles, California. Jumbo Extension ore has long been mined for its gold, silver, and copper content. Further exploration and test work will be necessary before the find has any significance. The property has been operated in recent years under lease by the **Goldfield Operators Leasing Company**, also headed by Kervin, and by independent lessees. Elmer Burt of Goldfield is superintendent.

Diamond drilling has been started by the **Dan Tucker Extension Mining Company**, J. Benjamin Parker, 233 East Plaza Street, Reno, Nevada, president and general manager, in order to further explore the ore

White Magic With Black Light

IMAGINE operating a gold mine for 50 years and then to find that there was enough scheelite in the tailings to have paid the operating expenses of the mine!

Imagine, too, the disappointment of the lone prospector in Arizona who had dug a tunnel for 50 feet along a vein (always hoping that the gold values would increase and that his prospect some day would become a mine) when he learned that he had thrown a fortune in scheelite on the dump.

Or again, imagine the prospector on a California desert who dug six prospect holes in the side of a mountain, three of which uncovered an extensive deposit of scheelite, but abandoned the holes as there was not enough lead in the property to warrant further assessment work. Yet the next man was in line for a fortune, because he used a fluorescent lamp and discovered the scheelite which had been discarded.

There are innumerable such cases which might be used to illustrate the value of an ultra-violet black light for mining purposes. Scheelite is used here as the example because scheelite is the most common fluorescent commercial mineral, but there are hundreds of other uses for the Mineralight black lamp.

Night prospecting is an unusual but a very profitable development of recent years. The old-time prospector considered his work done when the sun had set, but many modern prospectors are just beginning their work when the sun goes down. The instrument which has changed this procedure is the ultra-violet black light.

It might be best at this point to explain why certain lamps are of value and others are practically useless. In the first place, ordinary light will not create fluorescence. Fluorescence is the result of a stimulation to the atoms of the mineral. There are two general groups of ultra-violet wave lengths—the long wave lengths and the short wave lengths. The long wave length ultra-violet will stimulate fluorescence in a few materials, such as dakeite, semi-opal, wernerite, benitoite, and fluorite. On the other hand, the short ultra-violet wave lengths will cause fluorescence of over 300 minerals, including all the minerals listed above that fluoresce by means of the long wave lengths. Among these many minerals are barites, calcites, colemanite, hackmanite, halite, hydrozincite, kunsite, opal, pectolite, scheelite, wollastonite, and smithsonite.

While there are a number of ultra-violet light sources, there is only one source of the short wave lengths and that is a genuine quartz light equipped with a special filter which screens out the visible light and allows the transmission of only the ultra-violet. None of the other ultra-violet

The commercial application of ultra-violet light to mining, while only about five years old, has a number of noteworthy successes to its credit. It has proved to be of particular value in the prospecting for scheelite because scheelite is the most important commercial mineral which fluoresces.

light sources transmits the short wave lengths, and for this reason their use is very limited in the mineral field. The only type of light which can be used in prospecting for scheelite is the coiled quartz tube lamp.

Many prospectors have attempted to make their own black light lamp by using a filter in front of an ordinary flashlight bulb. This filter screens out the visible light, but there are none of the short ultra-violet rays formed by the bulb. As a result, the lamp is useless in the detection of scheelite. These long wave ultra-violet rays do not cause the fluorescence of any minerals which have commercial value and though this light source is the cheapest it is the most expensive in the end, because



For underground work a compact assembly for a Mineralight is provided by a Hot-Shot battery and a 6-volt transformer suspended from the shoulders. The picture illustrates an assembly of this kind being used in examination of a tungsten property.

a person would walk over a rich scheelite deposit and not know it was there.

Bulb lamps are used sometimes by collectors, but they have no value in commercial ores because they generate only the long wave length light.

THE explanation of fluorescence and phosphorescence is technical and involves a high degree of mathematics, but if we eliminate all technical details for the present and attempt to explain the problem in its main essentials we can secure a fairly good idea of how these phenomena are caused.

It is well known that all minerals are made up of atoms, and each atom is composed of smaller particles such as protons, electrons, neutrons, positrons, etc. The electrons are supposed to circulate around the nucleus and the simplified theory of fluorescence is that the ultra-violet energy which strikes the atom is absorbed in the electron, causing it to change its orbit around the nucleus. Once it has changed its orbit it proceeds to lose its energy and returns to its original orbit. This releases energy which comes to us in the form of light. The wave length of this light determines the color of the fluorescence.

While the entire process of collecting energy, moving into new orbits, giving up the energy, and returning to the original path takes place in a very small fraction of a second, we only see the light while the substance is being exposed to the stimulus of the ultra-violet rays, and this is the phenomenon we call "fluorescence."

Some minerals are much slower in their reaction, and the electrons remain in their unnatural orbits for an appreciable length of time. In such cases we continue to see the light after the ultra-violet light source has been removed. This is the explanation for "phosphorescence," and is illustrated by the minerals which glow after the light is taken away, the glow gradually diminishing. This simple explanation of "fluorescence" and "phosphorescence" is not technically correct, but it is near enough to give anyone an idea as to how the fluorescence does occur.

WE HAVE made considerable mention of the prospecting for scheelite because this is the most important commercial mineral which fluoresces. In most cases the scheelite fluoresces a bright blue and it is possible to determine instantaneously the probable extent and quality of the scheelite ore. The Mineralight lamp, which preferably is used at night, causes each scheelite crystal to fluoresce brilliantly and in locations where the ore is very rich a rock wall will stand out as though it were studded with millions of stars or diamonds.

In the prospecting for scheelite it is extremely difficult to locate the ore because of the wide variety of rocks in which it

*President, Ultra-Violet Products, Inc., Los Angeles, California.

appears. Ordinarily, it is found only in locations where a limestone-granite contact exists, but often these contacts are difficult to locate. It is strange, indeed, the type of rock in which scheelite is found. In the office of the Ultra-Violet Products, Inc., of Los Angeles are specimens of scheelite covering a larger variety of formations and deposits than are found in any other single collection.

The scheelite is found in limestone . . . in granite . . . in green matrix . . . in rusty colored matrix . . . in copper bearing ore . . . in gold bearing ore . . . in iron, lead, and molybdenum bearing ore. Some of the specimens include scheelite found in quartzite. One specimen has scheelite in gneiss. The fluorescent response varies from the usual light blue to dark blue, with at times cream and golden yellow. Some specimens are greenish yellow and some are decidedly pink. In this collection are specimens that look white and fluoresce blue; some that are cream and fluoresce yellow; some that are green and fluoresce yellow; others are brown and fluoresce yellow; one is black and fluoresces blue. The usual color, however, is gray with a blue fluorescence.

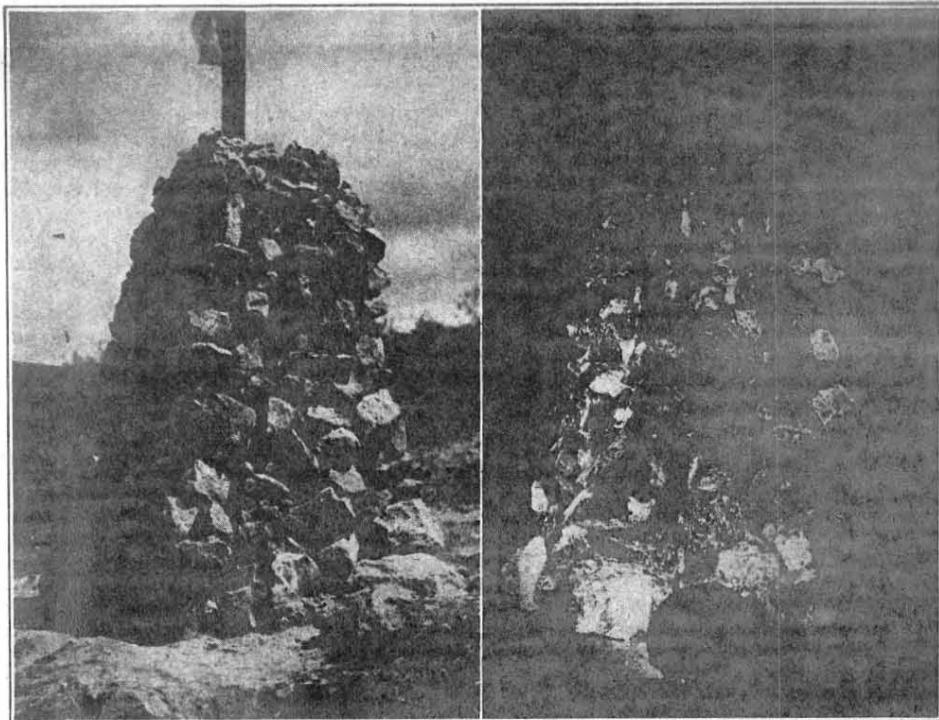
Before going too far on the assumption that a new discovery is scheelite, the fluorescent material should be checked by an assay to determine the exact composition. After the presence of scheelite has been proved by an assay or by the acid test, the characteristic fluorescent color of the scheelite can be noted and the ultra-violet rays used as an accurate means for the development of the area.

Other substances that fluoresce similar to scheelite and which should be guarded against are powellite, a calcium molybdate that fluoresces a golden yellow color, and some forms of calcium carbonate which fluoresce light blue.

The distribution of scheelite is from Mexico to Canada on the west coast and from Connecticut to Nova Scotia on the east coast. Many prospectors today are finding valuable deposits in unsuspected places entirely through the use of the ultra-violet black light.

IN ORDER to see the fluorescent rocks the lights must be used at night or in a darkened room. In the day time there is too much visible light which outshines the fluorescent effects caused by the ultra-violet rays. When using these lights at night the wise prospector is careful in his handling of fluorescent specimens. It has been said that all is not gold that glitters and it is equally true that all that fluoresces is not necessarily scheelite. There have been several actual instances where prospectors have reached over to pick up what appeared to be a shining nugget of scheelite, only to have the nugget come to life and squirm out of his grasp. Scorpions, horned toads, lizards, and snakes have a bright blue or cream colored fluorescence and can be mistaken for fluorescent rocks if a person is not careful. For this reason it is a wise precaution to step on the specimen before picking it up.

Fluorescent analysis may be used in many mines which do not contain scheelite. There are many forms of zinc which fluor-



(Left)—This pile of ore was erected as the discovery monument at the Shadow Mountain Tungsten Mines. By daylight it appears to be a most unpromising heap of very ordinary rocks. (Right)—A picture of the same pile of stones as it appears when photographed at night by means of light emitted by a Mineralight. Note the heretofore overlooked values in these stones. Each light spot is a deposit of rich scheelite crystals.

esce, and in certain gold mines the use of the Mineralight has proved of great advantage in grading the zinc and throwing it out. There are other mines which contain fluorescent calcites or minerals associated with the ore which is being mined, and in such cases the ultra-violet rays are used as a guide to locate the vein that contains the valuable ore. Hydrozincite, as well as powellite, is mined by means of the fluorescence in many cases. Hubnerite and wolframite are forms of tungsten and in nearly every instance there are small areas of scheelite associated with these minerals.

In years of experience with ultra-violet rays used for mining purposes there have been many interesting stories told concerning the application of ultra-violet rays. Four mining companies have discovered larger and more extensive deposits within a mile of the properties that they once had thought to be the best in the locality. Another group had stockpiled 60 tons of what they considered to be their best ore. After this work had been done they purchased a short-wave ultra-violet quartz lamp and found they had been working 40 feet from the richest part of the vein and they could have tripled the return from their labors if they had had a lamp to show them where the richest areas were located. Another company actually placed over 100 tons of non-bearing ore in its mill because it failed to use the ultra-violet light to check operations.

The presence of an extremely small quantity of mercury can very easily be determined with the Mineralight, a Willemite screen and a small flame for heating the substance to be tested. The method was discovered by Dr. Wesley G. Leighton of

Pomona College in 1935. He came upon this discovery by an analytical line of reasoning. After theorizing what should occur, he carried on the experiments and found that the facts actually were as he expected them to be. As little as 1/1000 of 1 per cent of mercury can be located by this very sensitive test.

Ultra-violet or black light fluorescence is a fascinating subject. It has long been used in crime detection and in many laboratory problems. Its use in mineralogy has been known for about 15 years, but its application commercially covers only the past five years. New substances and rocks are being constantly discovered and undoubtedly the commercial application of ultra-violet to mining will be greatly extended in the coming years.

GIVES ENDORSEMENT TO MINE INSPECTION BILL

PRESIDENT ROOSEVELT has endorsed the Nash-Keeler mine inspection bill and has urged its early passage by the U. S. House of Representatives. The President gave his approval in a letter to Majority Leader McCormack, democrat, Massachusetts, shortly after Secretary of the Interior Ickes said the measure had been "pretty effectively blocked."

Ickes has urged adoption of the bill as its passage would broaden the authority of his department to inspect mines. Western mining associations are opposed to the measure. The House Mines and Mining Subcommittee has had it under consideration and a petition to bring the measure to the floor of the house for action obtained only 200 of the 218 signatures required.

Borax Company's Golden Anniversary

WITH the completion of a half century of service in one of America's most colorful industries, the Pacific Coast Borax Company celebrated its golden anniversary during October. At the same time, the company observed the tenth anniversary of its radio program, "Death Valley Days," oldest half-hour dramatic program on the air.

"Coincidentally, the fiftieth anniversary will celebrate the famous company trademark which has captured the imagination of generations of Americans," F. M. Jenifer, president, stated. "The 'Twenty Mule Team,' inextricably associated in the public imagination with the pioneer days of our country, is as familiar to millions as the names of great Americans. It is equally a symbol of the leadership assumed early in the history of the borax industry by the Pacific Coast Borax Company.

"In the span of 50 years since the company was incorporated, the use of borax has steadily increased from drug purposes until today this product of the desert has countless uses in the home, in agriculture, and in industry. In fact, it would be difficult to name an important industry to whose products borax does not contribute, from leather to pottery, from glassware to metals, from enamels to textiles. Due to constantly greater demand for borax, greater production, and improved mining, refining, and transportation methods, bulk prices of borax for industrial uses have been progressively lowered; borax prices in the latter part of the nineteenth century were 1,200 per cent higher than they are today. Total consumption has increased from only a few hundred pounds a year to thousands of tons annually. The company is proud of its record and that of the borax industry."

Although incorporated in 1890, the history of the Pacific Coast Borax Company may be said to have begun on a day in 1881 when Aaron Winters, an aging prospector, together with his half-Spanish wife Rosie discovered borax in the dry desert marshes on the floor of Death Valley. Trembling with hope, Winters fired the chemical used to identify borax, then shouted, "She burns green, Rosie! We're rich!" Winters sold his claims to W. T. Coleman of San Francisco who established the Harmony Borax Works near the mouth of Furnace Creek. It was to carry the precious borax ore from Death Valley across more than 160 miles of blistering desert to the railroad at Mojave that the great 20-mule team trains were developed. They probably used the largest wagons ever built for two of them together were capable of transporting 24 tons of borax, equal to a railroad carload.

From the time borax works were established in Death Valley, the history of the Pacific Coast Borax Company has been the story of the search for new and richer ore deposits and the development of efficient means of borax transportation and of improved mining and refining methods. Sub-

sequently, new deposits of borate of lime called Colemanite were discovered in ore form which was purer and also more easily worked than surface deposits, and the company moved its operations to Borate, California, convenient to the Santa Fe railroad in the Calico Mountains southwest of Death Valley. Here what is believed to have been the first calcining plant in California was established, ore being carried over a narrow gauge railroad from mine to plant in small cars drawn by a sturdy little locomotive named "Francis."

When the borate deposits at this location had been worked out, the company moved back into the vicinity of Death Valley, mining borate minerals in the Black Mountains and Funeral Mountains in and around Ryan, California. With the construction of the Tonopah and Tidewater Railroad which skirts the eastern rim of Death Valley, first railroad to penetrate the Death Valley region, a 20-mile narrow gauge railway was built from Death Valley Junction to the company's mines. Known as the Death Valley Railroad, it was considered one of the engineering marvels of its day because of the steep grades, the rough character of the country, and the dangers from cloudbursts which had to be overcome.

It was not until 1927 that the Pacific Coast Borax Company moved to its present location at Boron, near Kramer, California, more convenient to the seaboard, where a large deposit of borate of soda known as Rasorite had been discovered by C. M. Rasor, the company's field engineer. From the calcining plant at Boron, borax ore today is transported to one of the country's largest borax refineries at Wilmington, California, where it is refined, manufactured into 20 Mule Team products, and shipped throughout the world.

PHELPS DODGE PLACES ORDER FOR MARCY MILLS

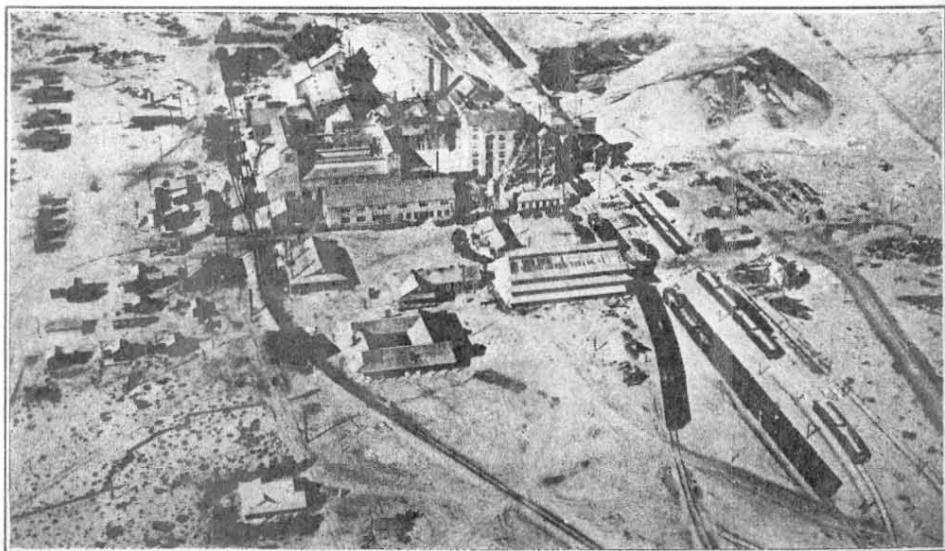
AN ORDER for 18 Marcy ball mills has been placed by Phelps Dodge Corporation with the Mine and Smelter Supply Company, according to O. H. Johnson, Denver, vice-president of the manufacturing company. These mills are for installation in the new concentrator which Phelps Dodge is erecting at Morenci, Arizona, as a part of its \$30,000,000 development and construction program at the Morenci open-pit mine.

In themselves the mills, exclusive of motors, represent an expenditure of over a third of a million dollars and will be the largest ever manufactured by Mine and Smelter Supply. Each Marcy mill will have a capacity of from 1,500 to 1,650 tons of ore every 24 hours. The plan of Phelps Dodge calls for operating 16 of the mills at a time, leaving two for spares. Working together the 16 mills will have a total daily capacity of 25,000 tons or more, reducing the ore from three-quarter inch size to 65 mesh. Each mill will be 10 feet by 10 feet in size, and will be driven by an 800-horsepower motor.

According to Johnson, more than four million pounds of steel will go into the manufacture of the mills and more than 100 freight cars will be required to transport the equipment to Morenci. Work on the mill order will start as soon as patterns can be prepared. The first unit is to be delivered March 1, 1941, and the schedule then calls for delivery of two units each month until the order is completed.

Actual construction of the mills will be handled in the plant of the General Iron Works in Denver, the largest jobbing mill for this type of work between Chicago and the Pacific Coast. General Iron is owned jointly by Mine and Smelter Supply and several other Denver machinery and equipment concerns.

The mills will be housed in the building being constructed by Kansas City Bridge



Pacific Coast Borax Company's modern calcining plant is located directly above the company's borate of soda deposits. Ore, hoisted from the mine in two huge skips, is automatically dumped into storage bins, passed through the calcining process, and shipped by rail to the company's refinery at Wilmington, California.

Company. Contract for all concrete work at the new plant site was awarded recently to W. A. Bechtel Company of San Francisco and consists of an estimated 50,000 yards of concrete for foundations. Completion of the entire concentration plant, which will put the Morenci open-pit mine on production, is scheduled for January 1942.

Mine and Smelter Supply Company has the exclusive rights to the manufacture of Marcy Mills, the patents to which are held by F. E. Marcy, formerly Salt Lake City manager for the supply company, and now a consulting engineer for the firm.

In a recent statement, Louis S. Cates, president of Phelps Dodge, said that stripping of waste at Morenci is proceeding at the rate of more than a million tons per month, over half of which is being handled by the trains hauled by Diesel engines. The principal new work in recent months has been at the site of the new metallurgical plant. At the company's Douglas branch, construction of the new 565-foot stack, dust chamber, and dust settling apparatus are progressing and it is hoped to have this work completed by the end of November. The new stack is at present being brick lined.

AMADOR COUNTY MINES PROPOSE BUILDING OF CUSTOM PLANT

MINE operators of Amador County, California, are considering plans for erection of a custom plant, according to W. D. Manning, purchasing agent for the Argonaut Mining Company, Ltd., Jackson, California. Other cyanide plants have been built in the district already.

The entire project is a result of the continued shutdown of the Selby smelter of the American Smelting and Refining Company, the workers of which have been on strike since July. Mine operators have been storing their concentrates for several months and are finding the immediate disposal of the product necessary. Many smaller mines have been forced to suspend operations entirely since the strike.

The capacity of the proposed plant has not been determined, but it has been estimated that with the construction of the new plants in the district, the Selby smelter, when it reopens, will suffer a loss of more than 1,500 tons of concentrates a month.

NEW MEXICO ASSOCIATION PLANS MINING CONVENTION

PLANS are under way for a convention of the New Mexico Miners and Prospectors Association which will be held in Albuquerque, January 25, 1941, according to a recent announcement by A. S. Walter, president of the group.

The local Albuquerque chapter will be organized to cooperate in the meeting and in the greeting of all incoming members. Projected plans include a parade, exhibits featuring various sections of the state to be displayed in stores, and rock drilling contests. An attempt is being made to have silver dollars used in all transactions during the convention week.

High-Grade From the Philippines

THE DEFINITE tendency toward further expansion in the mining industry in the Philippine Islands is considered significant. While a number of mines are now operating at increased capacity, others are embarking on additional construction work to improve or accelerate operations of their plants. Many of the companies report record breaking production figures for August. Also, the list of properties to be included in the ranks of producing mines as soon as construction work on the mills is completed is indicative of progress in all branches of the industry and will result in increased production during the latter part of 1940.

Nielson & Company, Inc., announces new production records for several of its properties, among them being Paracale Gumaus Consolidated Mining Company, the only gold mine producer of the group, and Lepanto Consolidated Mining Company, the largest copper producer in the Islands.

Marsman & Company reports new all-time high production records for two of its gold producers, United Paracale Mining Company and Itogon Mining Company.

Haussermann interests advise that the outstanding performer among their properties in August was Balatoc Mining Company, with Benguet Consolidated Mining Company and Ipo Gold Mines a close second.

Of the Soriano group of gold mines, Masbate Consolidated Mining Company was stated to be the largest producer.

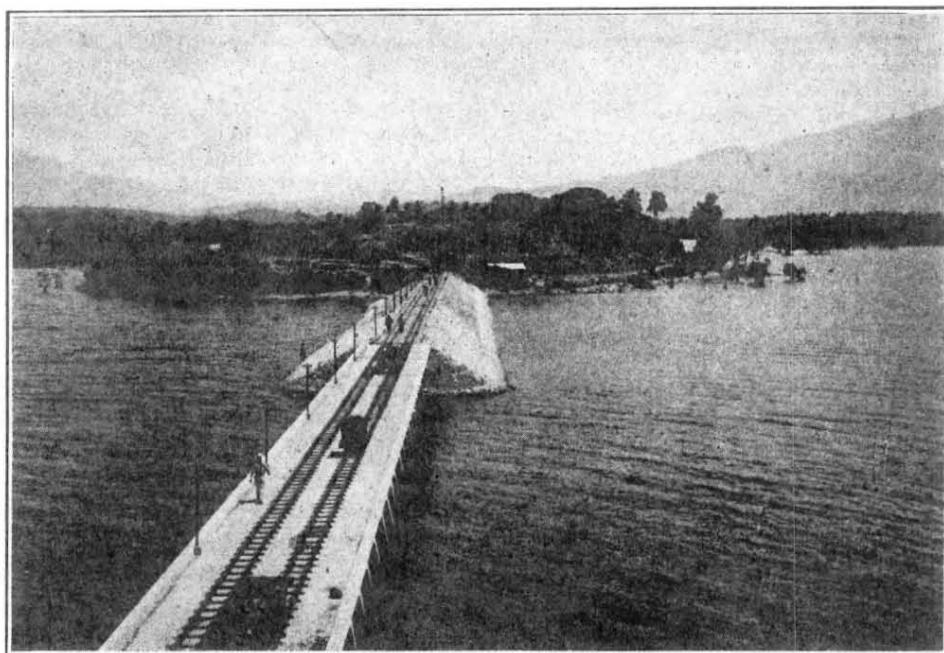
IT is interesting to note the increased production of the independent group of mines. *East Mindanao Mining Company*, Placer, Surigao, the first of the larger mines to open in Surigao, has completed

installation of its Tinupan power house, started sinking operations, and accelerated stope production, delivering sufficient ore to the mill to keep gold and silver recovery at a slightly higher level. H. Gasser is president and general manager and Dennis Karl Scott mine foreman.

Surigao Consolidated Mining Company states that its total output to date is approximately 50 per cent above last year's showing, recovery during the first eight months having passed the million peso mark for the first time since operations at the property were started. This company in 1935 took over 210 claims in the Surigao gold district near the barrio of Magpayang, Mainit, Surigao, Mindanao. Exploration work was pushed and sufficient ore was indicated to warrant the purchase of a mill, construction of which was started in 1937 and operations commenced in February 1938. During the last two years the milling plant has been increased to its present capacity of 340 tons daily. In the first half of the current year the company produced P931,727 in bullion from 57,161 tons of ore milled, net profit, after a provision of P145,715 for depreciation and mine amortization, being P217,896. J. B. Harrison is general superintendent.

For the third consecutive month *Pan Philippines Corporation*, Lahuy Island, Caramoan, Camarines Sur, topped its previous best monthly production figures from its Treasure Island mine with an output of P156,873 for August. Expansion of the milling plant, recently completed, and treatment of a much better grade of ore is stated to be the main reason for the all-

(Continued on page 29)



The pier and storage bin of the Masinloc chrome deposit in Zambales, owned by Consolidated Mines, Inc., and operated by Benguet Consolidated. From 75,000 to 80,000 tons of ore can be stored here, and loading can be effected at the rate of one ton a minute.

designed to produce gold-silver concentrates with a ratio of approximately 20 to 1 and at a rate of around 60 tons a day. No attempt is being made to save the values in lead, molybdenum, or vanadium at present. Two shifts a day are employed in the mill, and it is expected that operations will be made continuous in the near future. Larry Burton, Box 2587, Phoenix, Arizona, is one of the owners, and Tom Russell, Box 502, Mesa, is superintendent.



Production is expected to begin within 60 days at the property of the **Panoche Quicksilver Mining Company**, 1018 Mills Building, San Francisco, California. Gould furnaces capable of handling 75 to 100 tons of ore a day are being installed. The property is in San Benito County about 42 miles south of Hollister, California, on the Hollister-New Idria county road and about 25 miles north of the New Idria quicksilver mines. The mine is stated to contain a surface ore body approximately a mile long and from 25 to 100 feet wide situated on top of a ridge. The operating company was incorporated recently in California with a capitalization of \$100,000. P. D. Burt, Mills Building, San Francisco, is president and general manager.

El Oro Mining Company, organized as a corporation in 1935, has been dissolved and succeeded by El Oro Mining Company, Room 817, 68 Post Street, San Francisco, California, a partnership. General partners in the firm are Lester Moses, D. M. Donnelly, and Henry Mueller. The company controls a drift mining property in the New York mining district of Nevada County, California, and operations are expected to be under way by October 15. Development has been by tunnel in an old channel believed to be of Neocene origin. The ground was first worked in the late 60's.

Operations have been resumed at the property of the **Carson Hill Gold Mining Corporation**, Melones, California, following a forced shutdown while making hoist repairs. Fifty miners were out of work temporarily during the interval. John A. Burgess, Melones, is general manager.

The **Midland Company**, dredge operators, will work property of the **Elra Exploration and Mining Company** on the North Fork of the Salmon River in Siskiyou County, California. Operations were scheduled to start about October 20 on a three-shift basis, handling from 2,000 to 3,000 cubic yards every 24 hours. Leases covering several properties were held originally by the Elra Company, R. R. Stevens, manager, 105 Montgomery Street, San Francisco, California, and have been transferred to the Midland Company, which now has complete mining rights on several miles of the area. It is estimated that sufficient material for three to five years' work is available at the site.

The **Standart mine** of the **Indian Valley Mining Company**, G. L. Johnson, general

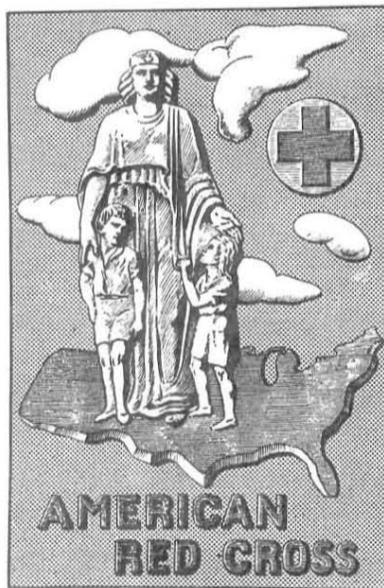
manager, Greenville, California, has been shut down after six years' steady operation. C. L. Hibbard, 1210 Western Avenue, Seattle, Washington, is president, of the Indian Valley company.

Klau Mine, Inc., plans installation of a larger plant at its quicksilver mine near Paso Robles, California. At present ore is treated in a 50-ton Gould rotary furnace. Development work is continuing with 40 men employed and a 175-foot shaft is being sunk to the 400-foot level. The mine is operated by H. W. Gould, 10 Penthouse, Mills Building, San Francisco, California, and associates. Work at the property is directed by B. A. Gould, general manager. F. A. Bachich is mine superintendent.

The Gould interests, headed by H. W. Gould, president, 10 Penthouse, Mills Building, San Francisco, California, are reopening the **Helena quicksilver mine** in Lake County, California. A crew of 20 men is employed. A 30-ton plant is on the ground and expected to be in operation early in 1941.

Production is averaging between 125 and 150 flasks of quicksilver a month at the **Oat Hill mine** near Middleton in Napa County, California, with a crew of 40 men employed. One hundred tons of ore are treated daily. The property is operated by the **Oat Hill Mine, Inc.**, H. W. Gould, general manager, Mills Building, San Francisco, California.

The shaft at the property of the **Kennedy Mining and Milling Company**, Jackson, California, has been completed to the 5,850-foot level and an exploratory drift is being run at that point for the purpose of opening up the extension of an ore body worked on the 5,700-foot level. The milling plant is handling about 45 tons of ore daily, using 10 stamps. The 1,500-ton tailings retreatment plant, which discontinued operations some time ago, has been sold, and the equipment is being dismantled. Work at the mine is directed by Mark Eudey, acting superintendent. E. C. Hutchinson, 519 California Street, San Francisco, California, is president of the company.



Dredging operations have been undertaken by the **Gerlinger Mining Company** on the C. R. Moser property along Hayfork Creek near Hayfork, California. The dredge will operate along the creek bottom for four miles, moving from 1,500 to 2,000 cubic yards of gravel a day. Albert B. Ogilvie is in charge and a crew of 11 men is employed.

Maurice Harbach, Lone Pine, California, and associates are engaged in treating material from China Lake, one of the dry lake beds in the Indian Wells Valley district. A bulldozer is used to handle the material but it is probable that a dragline will replace this method later. Sands are washed out, leaving slimes for further treatment by amalgamation. The present daily capacity of the plant is 500 tons, which is expected to be increased to 2,000 tons. Water is obtained from wells of 100-foot depth, and the number of these will also be increased, it is understood.

Sonoma Quicksilver Mines, Inc., operating the Mt. Jackson quicksilver mine near Guerneville, California, recently made the first shipment of quicksilver from its new plant. The plant is said to be functioning satisfactorily and it is at present handling about 70 tons of ore daily. A large scraper hoist has been installed and a dump left from the previous operations is being run through the furnace in order to get it cleaned up before wet weather sets in. Construction work at the mine is practically completed and mining of ore will begin as soon as the dump has been run through the plant. S. F. Wickham is superintendent at the mine. H. D. Tudor is president of the company, with headquarters at 58 Sutter Street, San Francisco.

Mammoth Mines Corporation, A. G. Mahan, president, 224 Board of Trade Building, Los Angeles, California, has resumed operations at the original Mammoth mine four miles southwest of Mammoth Lakes, California, and it is planned to operate throughout the winter. Ore values are said to run as high as \$100 a ton in gold. The mine has been idle for many years.

A new mill has been installed on Kearsarge Mountain near Independence, California, to treat ore from the old **Kearsarge Mountain mine**, which has been idle since 1880.

Crusader Gold Mines, Inc., William E. Payne, president, 3055 Richmond Boulevard, Oakland, California, has been organized to operate the old Crusader mine near Diamond Springs, El Dorado County, California. Machinery has been purchased and work is to begin at an early date.

The **Panoche Quicksilver Mines Company** has been organized to operate a quicksilver project in San Benito County, California. J. R. Wilson, 1028 Mills Building; H. R. Cossitt, Hobart Building; A. R. Swanson, 2150 Twenty-first Avenue; and G. Goszulak, 248 Hale Street, all of San Francisco, head the new company.

Alaska Juneau Gold Mining Company, P. R. Bradley, president, 1022 Crocker Building, San Francisco, California, reports a 16.4 per cent improvement in estimated profit for September over that of August, although earnings were below Sep-

tember, 1939. The improvement is due to the increased per-ton operating revenue combined with lower operating expenses. Operating profit, after expenses but before provision for income tax, depletion, and depreciation, mounted to \$113,500 in September, against \$97,500 in August, and \$147,100 a year ago. Operating revenue totaled \$350,500 in September as compared with \$355,000 the preceding month. Operating expenses in September were 61 cents per ton, the lowest in the past two years.

Hydraulic mining machinery is being installed at the **Indian Bottom** property in the Salmon River district, controlled by Lester Lee Findley of Los Angeles. Roads have been built, bridges and buildings constructed, and two giants will be ready for operation when the season opens. Luther Hickox, Somesbar, California, will direct work at the mine.

The **Curley Jack Mining Corporation**, Wilson J. Parks, president, 468 Colman Building, Seattle, Washington, is preparing to resume hydraulic operations at the Davis mine one mile west of Happy Camp, California. Extensive gold deposits were disclosed last year by a bedrock cut 1,300 feet long. The company is also testing prospective dredging ground in the Happy Camp district, which it holds under lease and option.

The gold dredge of the **Angels Creek Gold Dredging Company**, A. H. Ferrin, superintendent, Angels Camp, California, has been refloated after having been under 60 feet of water for nine months. The boat, which has a capacity of approximately 1,800 cubic yards, has been reconditioned and restored to service. It sank near the mouth of Angels Creek last year during a heavy rainfall. There are thousands of tons of mill tailings on the property being dredged, in addition to a large deposit of gravel and material washed into the creek from gold-bearing ledges.

A crew of 19 men is employed at the **Royal** gold mine near Milton, California, operated by Frank S. Tower, owner. Satisfactory ore is reported in newly opened ground, while sampling indicates that old workings contain large reserves of commercial quartz.

Empire Star Mines Company, Ltd., Grass Valley, California, has applied for a license to buy and smelt gold from concentrates. The company's purpose is to aid the smaller mine operators who have been deprived of an outlet for their mill concentrates by the prolonged C. I. O. strike at the Selby smelter of the American Smelting and Refining Company. Several small companies have announced that they will be forced to suspend operations unless they can market enough of their concentrates, or secure loans, to cover operating expenses.

The mill at the **Alaska** mine, Pike, California, has been rehabilitated and stamps were dropped for the first time October 1. The mine is under option to H. L. Sorensen, 685 Sixth Street, San Francisco, and work is directed by Colonel B. P. Miller. R. J. Kohlen is in charge at the property and Dallas Becker is assayer.

G. T. Vanciel, H. Hamerick, and John F. Meyer are operating a 1¼-yard Northwest dragline on Dry Creek near Oregon House, California, for **Battle Mountain Placers Company**. The company also operates the Vail placers near Battle Mountain, Nevada.

The **Milton Gold Dredging Enterprise**, which recently completed 4½ years of work near Milton, California, is prospecting for additional ground. The company's plant includes a 37-B, Bucyrus-Erie dragline and a floating dredge, both electrically operated. Luther Hadley is superintendent.

Ollie F. Barrett and L. H. Rogers of Markleeville, California, plan the installation of an 8-ton to 10-ton furnace at their cinnabar property located eight miles

northeast of Markleeville. Mine development includes a 200-foot tunnel, 120-foot drift, 25-foot inclined shaft, and two 25-foot crosscuts.

Work has been started on construction of a 30-ton cyanide plant at the **Golden Center** mine at Grass Valley, California, under the direction of Wallace Butler, resident manager. Concentrates formerly were shipped to Selby, California, by truck for treatment. The plant is located at the Scotia shaft. Cooley Butler, 745 Rowan Building, Los Angeles, California, is the owner of the Golden Center.

The **Roberts Island Dredging Company** of Antioch, California, is completing plans for working the Marble Cone property one mile west of Bear Creek near Quincy,

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California. Jack Lowe is superintendent and he is directing the purchase of food supplies for the entire winter as it is anticipated that the mine will be snowed in for as long as five months. A shovel is being moved in over a new road recently built to the property and will be used in dredging the bar. It is believed that the mine will be operated for from 10 to 15 years. A camp for 30 men will be built at Marble Cone.

C. A. Lindsay and associates have acquired from H. D. Look the Argentine mine near the head of Squirrel Creek near Quincy, California, involving a total of 122 acres. The new operators propose to install a 150-ton mill if sufficient ore can be developed to warrant such a step. The mine was formerly known as the Gold Leaf.

H. F. McCan and Nevada associates have acquired a lease and option on 39 claims of the Southern California Gold Mines, Ltd., located north of Lucerne Valley, California, between Kane Springs and the Ord Mountains. The lease was secured from L. J. Bonnett, 656 Thirteenth Street, San Bernardino, California, and Stephen Turick. Values are in gold and copper.

The Union Consolidated Mining Company, 155 Montgomery Street, San Francisco, California, has levied an assessment of 2 cents per share on its outstanding stock, payable immediately. The company owns the Oro y Plata mine at Murphy, California. J. C. Scoles is president and general manager.

A production of \$175,000 over a six-month period is reported by the Cherokee



mine, Greenville, California, owned by Alfred L. Merritt, 200 Bush Street, San Francisco. The ore now runs \$25 to \$40, according to reports. An extensive development program is in progress and two veins are being developed. Frank Humphrey, Box 215, Greenville, is general manager.

Reopening of the Kleinsurge chrome mine and other chrome and manganese properties near Red Bluff, California, is reported to be planned for the near future. The Kleinsurge was operated in 1918 and is said to have produced a considerable amount of fairly high-grade chrome.

The United States Vanadium Corporation, Bishop, California, has recently completed its new laboratory and processing plant on Pine Creek. Blair Burwell is general superintendent for the corporation; M. N. Shaw is superintendent of the Pine Creek Unit; K. G. Link is mine superintendent under Shaw; and J. V. Galloway is mill superintendent.

An extensive construction program is under way at the Surcease mine 20 miles northeast of Oroville, California, including

the enlarging of the mill capacity, building of new roads, and increasing the water supply. The present mill capacity of 75 tons will be stepped up to 120 tons; twelve thousand feet of four-inch pipe line to Fraser Creek are being laid to obtain more water; the 75 men now employed will be increased to 100. About 110 men are working during the period of construction. The increased tonnage of the mill will bring about lower operating costs, and lower grades of ore can be treated profitably. The property is owned by Hoeffling Brothers, 1820 D Street, Sacramento, California. Allan E. Jones, Box 1204, Oroville, is general manager; W. E. Messner, mill superintendent; Kevin Malone, mine superintendent; Milo Horner, master mechanic; J. C. Lawton and William Lawton, underground foremen; all of Oroville.

A good-sized pocket of gold ore has been discovered in the Independent mine near El Dorado, California, according to reports. The property has been a producer of pockets of considerable size for some time. The extent of the present discovery is not yet known, but it was found at greater depth than any previous pocket. Madre de Oro Gold Mines, Inc., Forest Riley, president, Corcoran, California, operates the Independent, Starlight, and Church mines, all in El Dorado County. William J. Loring, El Dorado, is consulting engineer and general manager.

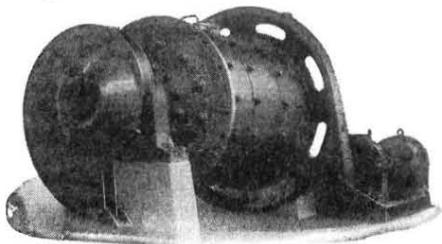
The Jack Ranch tungsten mine near Porterville, California, is operating at full capacity since replacing of the mining machinery destroyed by fire in August. No

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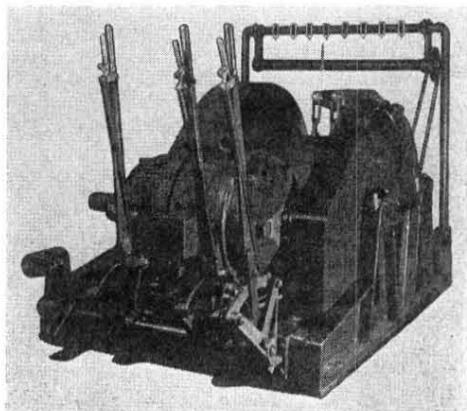


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insurance was carried on machinery and buildings which were burned. Three shifts are employed at the mine filling government orders for the tungsten. More efficient and improved equipment has been installed, and, according to C. A. Rassmussen, co-owner of the property, the operators expect to make up the entire \$50,000 loss before the end of the year.

The Droege mine near Greenville, California, has been reopened by North Canyon Mines, Inc., Walter H. Parsons, general manager, and development work is in progress. The property was operated a few years ago by the Round Lake Gold Syndicate.

The Jeanette Grant Mining Company is erecting a 50-ton cyanide leaching plant to handle the tailings dump at the old Bright Star mine in Kern County near Bakersfield, California. Work is directed by Chris Anderson, and Leon Thomas, who represents the owners, residents of Harrisburg, Pennsylvania. Richard Taylor, Lancaster, California, will operate the plant. In the mine a tunnel being driven to contact the Bright Star vein has crossed several smaller veins, and is expected to reach the objective soon. Newton Anderson is in charge of underground operations.

The General Dredging Corporation, O. Jack Boucher, general manager, 505 Bank of America Building, Sacramento, California, is handling approximately 75,000 yards of gravel a month with its Number 3 dredge along the shores of the American River near Coloma, El Dorado County, California. The Number 2 dredge is operating near Lotus and handling about 90,000 yards. Both boats have been in the district for the past year, and there is thought to be enough ground available for another year's operation. The company is also obtaining values from tailings left by earlier miners.

The Zaca mine, acquired several months ago by California and Nevada interests, has resumed production and the flotation mill is handling 50 tons daily of gold-silver-copper ore. The property, which is six miles northeast of Markleeville, California, has been worked intermittently for a number of years by the Zaca Mining Corporation, N. H. Bennett, president, Russ Building, San Francisco, California.

The Wieland mine near Jackson, California, has been taken over by the American Smelting and Refining Company, J. Fred Johnson, manager, western mining department, 609 McCornick Building, Salt Lake City, Utah. A crew of 10 men is employed in dewatering the mine, and a thorough examination is being made. James Williams, Box 103, Jackson, is superintendent at the property. The mine was reopened by Wieland's Mine, Inc., over a year ago. Before that it was owned and operated by the Wieland Brewing Company of San Francisco and also by Captain Matson of the Matson Steamship Company. It was the second largest operation in Amador County at one time, but had been closed down for 40 years until taken over by the Wieland Brewing interests.



Development of the Phillips mine near Alma, Colorado, is being continued by the Two-Three-Four Mines, Inc., under the management of Charles W. Jordan of Alma. The property, a consolidation of the Phillips mine and surrounding claims, has been in active operation under the present management since 1936. John Harvey of Leadville is president.

High-grade ore is being produced from the Sonny Boy mine near Alma, Colorado,

according to reports. The mine is owned and operated by Harry Hiner of Alma.

The contract for mining at the Amy Paul mine near Eldora, Colorado, is reported to have been given to J. A. Rooney of Eldora. It is understood that J. B. Kennedy of Eldora and associates are operating the property under lease from J. B. Rowley, Eldora. The property includes the Amy Paul No. 1, Compromise, and Window Point claims, commonly known as the Amy Paul mine.

High-grade silver ore is stated to have been opened in the Revenue property in Summit County near Montezuma, Colorado. Ted Dyer of Montezuma and associates are working the mine which is lo-

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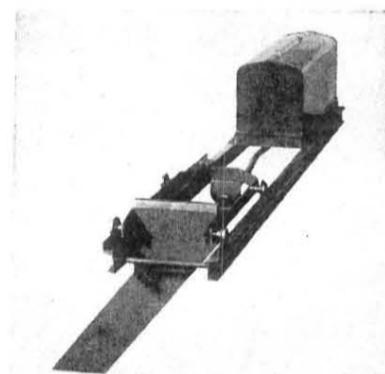
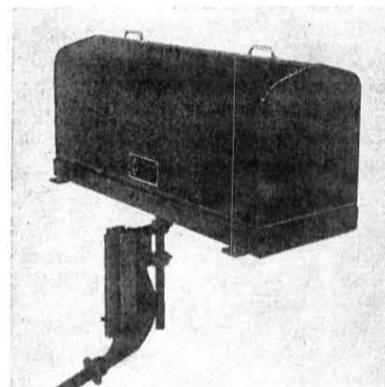
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Hatley of Wenatchee, Washington, is also composed of Gold Hill stockholders. The mine is in the Slate Creek district of Whatcom County. The contract for the \$100,000 aerial tramway was given to the City Electric Company of Seattle by the new operators and the installation is to be completed by August 1, 1941. The Ruby Creek road into the district is expected to be finished in two years.

Telford I. Moore, Paulsen M. and D. Building, Spokane, Washington, and associates have leased the Helena Johnson claim on Deep Creek north of Northport, Washington, in the same district as the Last Chance mine is located. The Moore interests recently completed installation of a 25-ton flotation plant at the Last Chance mine. Firmer Walkley of Northport is one of the associates and is in general charge at the property. A tunnel is being driven into the Helena Johnson property.

Production has been started by the Black and White Mining Corporation, which operates a group of mines, including the old Tip Top property, in the Blewitt district of Chelan County 31 miles from Wenatchee, Washington. A large compressor and two Diesel engines were recently installed and the mine crew now numbers 15. The 50-ton selective oil flotation plant at the mine was installed and will be operated by the Cemack Reduction Company of Seattle, Washington. It is understood that mining and milling operations will be carried on by the two different concerns on a 50-50 basis. Percy C. Pangborn and F. Rolek, both of Wenatchee, are supervising mine work.

BUREAU OF MINES PUBLISHES BULLETIN FOR PROSPECTORS

THE ARIZONA BUREAU OF MINES, Tucson, Arizona, has announced the publication of a reprint of "Field Tests for Common Metals" by George Fansett, bureau mining engineer. Five thousand copies of the bulletin, which is in its seventh edition, are available. Thirty thousand copies have been published since its original compilation, 25,000 of which have been circulated throughout the United States and mining districts over the world.

The new edition, besides all of the former copy, has additional material to aid the prospector in his field tests. It contains mining laws of the United States and Arizona, simple directions for taking up a claim or mill site, and describes equipment necessary for the prospector.

Fansett is conducting a series of demonstrations throughout the state on tests for strategic minerals and is using the bulletin as a basic text in his work.

EXCESS PROFITS TAX BILL ENACTED AFTER LONG DEBATE

AFTER months of debate by the United States Senate and House of Representatives, an excess profits tax bill has been enacted. The following are the provisions of the bill in brief.

1. The normal corporate income tax rate is increased by 3.1 per cent to 24 per cent on net profits above \$25,000.

2. A graduated tax of from 25 to 50 per cent is imposed on earnings defined as excess profits as follows: 25 per cent on excess profits not exceeding \$20,000; 30 per cent on the next \$30,000; 35 per cent on the next \$50,000; 40 per cent on the next \$150,000; 45 per cent on the next \$250,000; and 50 per cent on all over \$500,000.

3. Corporations can use two methods in determining their excess profits. One is by the average earnings basis in which excess profits are those above 95 per cent of the average earnings during the base period, 1936-1939, inclusive (not more than one deficit year is to be considered as zero in computing these average earnings). Excess profits may also be determined by the invested capital basis in which they are defined as the amount exceeding 8 per cent of the corporation's invested capital during the taxable year, including all capital equity and 50 per cent of the borrowed capital. In either case, the first \$5,000 of excess profits would be exempt from the levy.

4. Consolidated returns are permitted.

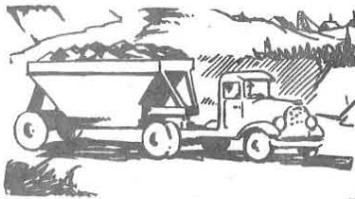
5. Provision is made for special relief in case of abnormality.

6. Corporations with incomes of \$25,000 or less are allowed to carry over the unused portion of the excess credit for a period of one year.

7. Corporations completing defense manufacturing facilities after June 10, 1940, are permitted to deduct from taxable income over a five-year period the cost of such facilities.

8. The profit limitations of the Vinson-Trammel Act are repealed.

9. No excess profits tax is charged against profits derived from the mining of tungsten, quicksilver, manganese, platinum, antimony, chromite, or tin by domestic corporations located within the United States.



The latter provision, which was first offered as an amendment by Senator Key Pittman of Nevada, was highly complicated in its final form as adopted by the Senate and House conference committee. The following is the amendment as adopted:

"In the case of any domestic corporation engaged in the mining of tungsten, quicksilver, manganese, platinum, antimony, chromite, or tin, the portion of the adjusted excess profits net income attributable to such mining in the United States shall be exempt from the tax imposed in this subchapter. The tax on the remaining portion of such adjusted excess profits net income shall be an amount which bears the same ratio to the tax computed without regard to this section as such remaining portion bears to the entire adjusted excess profits net income."

After the reading of the revised amendment, Senator Pittman, who stated that he could not tell from the reading what it meant, inquired of Senator Harrison, chairman of the Senate conferees:

"Does that mean there is no excess profits tax charged against the profits derived from that character of industry?"

Senator Harrison replied:

"Yes."

UPPER NARROWS DAM TO BE COMPLETED BY FEBRUARY 1941

CONSTRUCTION of the Upper Narrows debris dam, started about 19 months ago on the Yuba River near Marysville, California, is now approximately 80 per cent completed. There have been approximately 265,000 yards of concrete placed in the dam.

The outlet, which is about 100 feet above the river level, is a nine-foot, horseshoe-shaped tunnel, approximately 600 feet long. The outlet is operated through a shaft approximately 100 feet high, reaching from the tunnel to an operating house on a higher level. The outlet works were completed on September 30.

The primary purpose of the dam is for debris control in order to permit hydraulic mining, but the outlet tunnel is being installed with a view to future power development. The entire project is expected to be completed on February 1941.

The L. E. Dixon Company, 609 South Grand Avenue, Los Angeles, California, and the Arundel Corporation of Baltimore, Maryland, hold a joint contract for the dam. A crew of 190 men is employed steadily on a three-shift basis. Business offices are located at the dam site and E. M. Whipple is superintendent.

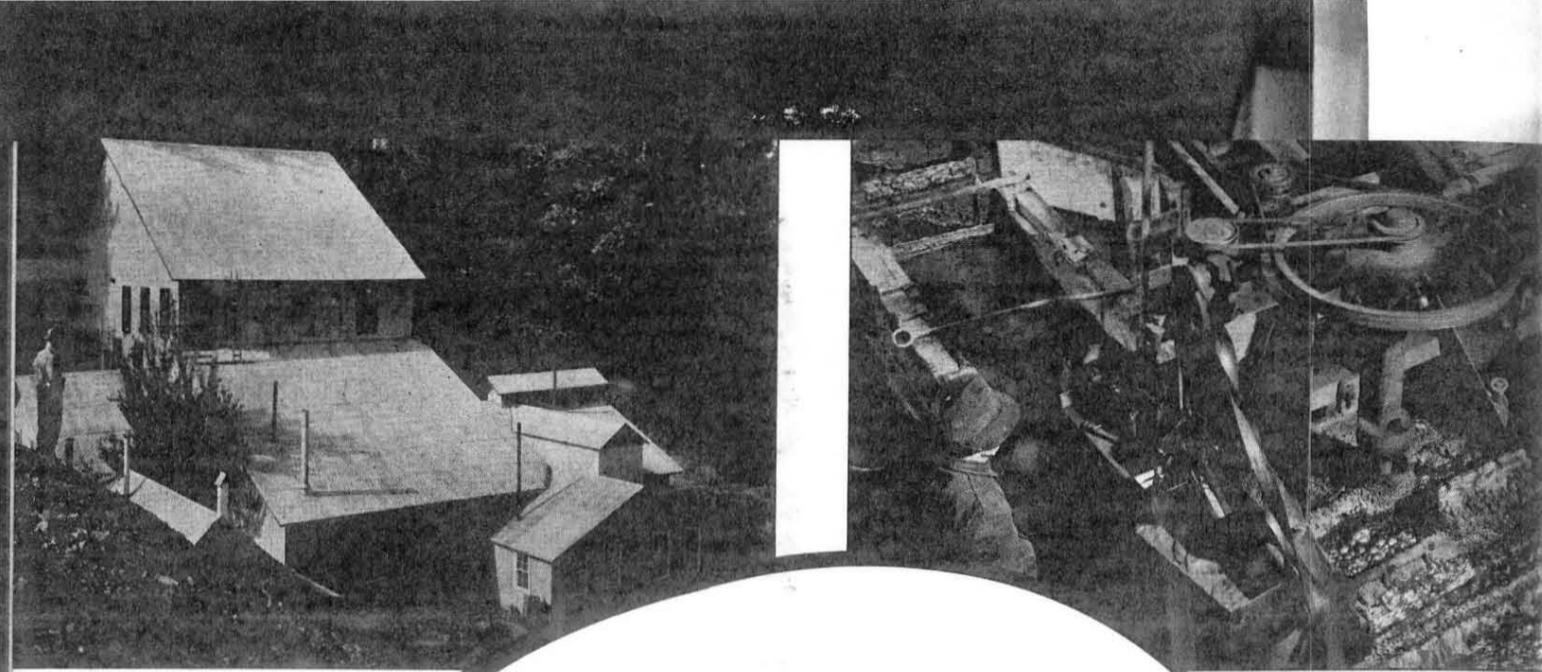
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General view of St. Joseph Lead Co. 150-ton mill at Sheep Ranch, Calif.

Classifier fines and jig tailings going to unit flotation cell. Reagent feeder, center, introduces Bear Xanthate.

Another "Small Mill" gets 90%-plus recoveries with BEAR XANTHATE: "ST. JOE" LEAD CO.

HERE'S ANOTHER highly efficient "small mill" that relies on Bear Xanthates to help maintain high recoveries. California Division of St. Joseph Lead Co. at Sheep Ranch, Calif., are using Bear Brand Z-6 to get better than 93% recoveries on their quartz, gold-bearing ore.

Small mills (and big ones up to 10,000 tons per day capacity) report recoveries as high as 98% with one or another of the Bear Xanthates.

Actual recoveries vary, of course, with each mill's problems. That's why you have SIX Bear Xanthates to choose from: to help solve recovery problems on a wide range of precious metal and base metal ores.

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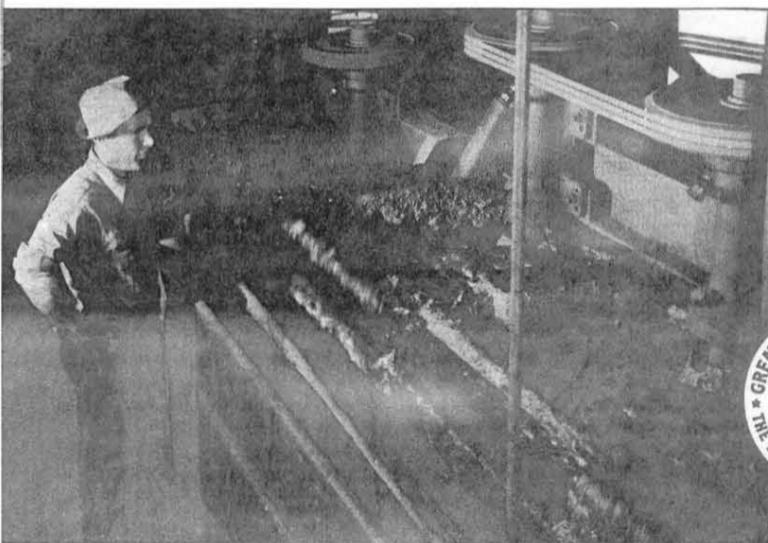
Z-9 Isopropyl Xanthate

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Mr. L. D. Yundt, mill superintendent, beside middling cells in general flotation circuit. Left, finisher cells.



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WILLIAM CARNIE, JR.,* reports

War Demands Boost Quicksilver Output

ALTHOUGH domestic quicksilver production has more than doubled in the last year, United States mine operators must increase their output still further if they are to meet the demand created by Europe's war.

Basis for this prediction is the fact that, with Spain apparently falling in line with the Axis powers, United States mines probably will be called upon to supply not only heightened domestic needs, but those of the British empire as well.

During the 10 years ending with 1937, consumption of quicksilver in the United States was approximately 28,000 flasks annually, and judging by the experience of the last World War, a step-up of about one-third in domestic needs can be expected during the national preparedness program. According to U. S. Bureau of Mines figures, the consumption of quicksilver in the United States during the war years of 1917 and 1918 jumped 38 per cent over the preceding five-year average.

Virtually without quicksilver resources of her own, the British empire has in recent years relied heavily upon imports from Spain. During 1936, 1937, and 1938, Spanish exports to the United Kingdom totaled 116,679 flasks, an average of 38,893 flasks a year. Loss of this source of supply must mean that Britain can look only to the United States for her quicksilver needs.

Normally, Spain and Italy have produced roughly 70 per cent of the world's quicksilver supply while the United States ranked third, contributing about 15 per cent of the world total. In 1938, the Italian quicksilver output was 66,719 flasks; Spain produced an estimated 40,000 flasks; and United States production was only 17,991 flasks. Mexico ranked fourth with 8,519 flasks; the Russian yield, for which figures are not available, probably was about the same as Mexico's; and other production throughout the world was relatively unimportant.

During the last year, however, the U. S. picture has changed completely. Production figures have followed closely the skyrocketing prices which, by mid-October, had risen to \$175 a flask as compared to slightly more than \$70 a flask in 1938. With numerous new properties going on production and producing mines stepping up operations, the domestic output has shot upward. Current estimates for the 1940 U. S. yield are 38,000 flasks.

CHIEF individual producer of quicksilver in the United States is H. W. Gould and Company, 1000 Mills Building, San Francisco, which operates six mines in California and Nevada, now accounting for approximately one-third of the total domestic output. The New Idria mine in San Benito

*San Francisco, California.

Improvements in mining methods and recovery equipment have made possible the treatment of ores with an average quicksilver content of 0.4 per cent, compared to the 10 per cent ore treated in the bonanza days of quicksilver mining in the United States. Estimates for 1940 indicate that U. S. production of quicksilver this year will more than double that of 1938.

County, California, largest of the Gould group, rates as the greatest single producing property in the western hemisphere, yielding an average of 550 flasks a month. Here, 250 men are employed under the direction of Superintendent C. Hyde Lewis, and the two special rotary furnaces of the recovery plant are burning 450 tons of ore daily. In addition to newly mined ore, a large tonnage of material from the dumps



A general view of the upper camp at the New Idria mine in San Benito County, California, operated by H. W. Gould and Company. All ore mined from the glory hole or from tunnels at the upper camp is transported by means of a gravity-operated cable tram to the lower camp where the reduction unit is situated.

of early-day operators is being treated. Henry Gould, company president, reports that with present equipment a recovery of 98 per cent is possible. Pioneer quicksilver miners were fortunate to recover more than 60 per cent of their values.

Development work at New Idria is being pressed in the No. 10 tunnel which, Gould states, will be opened for a distance of 7,000 feet.

Other Gould properties in California include the Helen mine in Lake County where lessees are busy reopening the old underground workings preparatory to placing it on production early next year; the Oat Hill mine in Napa County, now producing from 125 to 150 flasks a month; and the Klau mine in San Luis Obispo County, where 40 men are employed and the 175-foot shaft is being deepened to 400 feet.

Completing the Gould group are the Wild Horse quicksilver and Mt. Tobin mine in Nevada. Both properties are small-scale operations, each handling 20 tons of ore daily.

Probably the most important new development in the nation is the reopening of the famed New Almaden mine in Santa Clara County, California. Work at the property, once the fourth largest producing mine in the world, was started in 1939 by the New Almaden Corporation of Philadelphia, Pennsylvania. C. N. Schuette, 533 Call Building, San Francisco, is engineer in charge. Although only a small amount of surface work has been done in recent years, the New Almaden has produced more than one million flasks of quicksilver, or about half the total production of California, during its history.

JUST what will be the maximum yield attained by U. S. mines during the war emergency is still unpredictable, but it is interesting to note that this country once led the world in quicksilver production. The top domestic output was reached in 1877 when the nation's mines turned out some 80,000 flasks, or about two-thirds of the world's total.

Drastic curtailment of U. S. production was brought about by a rapid falling off of values in the major quicksilver areas. In the early 1890's, the average ore mined in this country contained only about 1 per cent quicksilver instead of up to 10 per cent as it had during the peak days of the 1870's. Bureau of Mines figures now give the average content as 0.4 per cent.

Improvements in mining methods and recovery equipment have largely offset this drop in values, but low prices kept production down during the last 20 years. Spanish and Italian mines, operating with cheap labor on reasonably high-grade ore, (Spanish ore runs 5 to 7 per cent quicksilver),

were able to supply the bulk of the world's needs, and during the 10 years ending with 1938 there was a general overproduction of quicksilver.

Since 1913, the number of producing quicksilver properties in the United States has varied from a low of 10 in 1922 to a high of 95 in 1932. However, 15 major California mines accounted for the bulk of the output. In 1938, these 15 mines yielded 90 per cent of the nation's total.

No estimate of the nation's quicksilver resources is available, but a Bureau of Mines survey records 125 mines, or groups of mines, and numerous other prospects in California alone. Nevada, Oregon, Texas, and Arizona also contain many operating properties and potential producers, and with the rapid growth of interest in quicksilver production during the last year, many new discoveries are being reported throughout the west.

Under the stimulation of this new wartime demand, quicksilver again seems destined to take a place of major importance in western mining.

IMPROVEMENT MADE IN MILLING FACILITIES AT SURCEASE MINE

MILLING operations at the Surcease mine 25 miles north of Oroville, California, have been resumed after a shutdown of seven weeks spent in reconstruction of mill and ore-handling facilities. The new mill capacity is 100 to 150 tons daily, which is nearly double the tonnage it was able to handle formerly. A concentrate reduction unit is being added to the plant and is scheduled to be in operation by the end of November. Sufficient capacity is being built into this section to permit gradual absorption of concentrates accumulated since the strike and shutdown of the Selby smelter on July 1.

The construction program was carried out under contract by the Miners Foundry of Nevada City, California, under the direction of F. S. Edinger. The new flow-sheet includes jigging in the grinding circuit, barrel amalgamation, flotation, and cyanidation of both sands and slimes.

Underground operations have progressed without interruption during the reconstruction period. The Surcease is owned and operated by Hoefling Brothers, 1820 D Street, Sacramento, California. Allan E. Jones, Box 1204, Oroville, is general manager.

EMIGRANT DREDGING COMPANY LETS DREDGING CONTRACT

A CONTRACT has been let by the Emigrant Dredging Company to the Yuba Manufacturing Company of San Francisco for construction of a 10-cubic foot dredge which will be ready for operation about June 1, 1941. The dredge will weigh approximately 3,500,000 pounds and is designed to dig 80 feet below the water level.

The Emigrant company's holdings are in Emigrant Gulch near Emigrant, Montana, and are under the general management of Thomas W. Thompson, who is at Emigrant. A. E. Mosier, 710 Commerce Building, Kansas City, Missouri, is president of the company.

LEON W. DUPUY* describes

An Improved Drill Bit

The extraction of tools from holes drilled in heavy ground was one of the most perplexing problems encountered by the Picacho Mining Company in conducting development work at its property 18 miles north of Yuma, Arizona, in Imperial County, California. The author describes a bit, developed at the property, which greatly facilitates this work.

AT PICACHO, California, during the past several years a large body of low-grade gold ore has been developed. To accomplish this development the ground was drilled with Worthington wagon drills and sampled by use of a vacuum sample collector.

Naturally in doing this work a number of operating problems arose. One of the most perplexing of these was that when the ore was particularly good it was often heavy which made it difficult to raise the cuttings in the hole while drilling, especially when a little moisture was present.

The material tended to pack behind and above the bit, causing difficulty in extracting the tools from the hole. The tools were always recoverable, thanks to independent rotation on the drilling engine, but the process was too slow to suit our ideas of drilling economy.

The advantage of being able to reciprocate the drill and to rotate independently was put to further gain by designing a new bit to facilitate removing the tools from the hole. The improvement was the simple addition of two opposite cutting blades placed on the back of any standard bit in a position to cut upwards in a directly opposite direction to the usual advancing blades.

Bits were tried with different combinations from a single prong to one on back of each down cutting blade. The design shown in the sketch proved to be most successful.

It is always possible to either reciprocate or rotate with a Worthington-type drill when a hole caves or becomes overloaded with cuttings. The up or back cutting blades cut through the impeding material and permit easy extraction of the tools so that the hole can be cleaned out and saved.

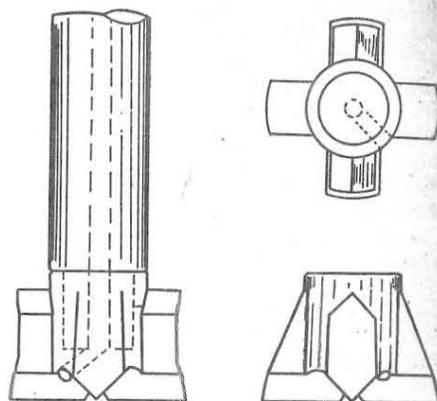
It was our experience that if the driller could get our back cutting bits he would use nothing else. The main reason for that was that he could crowd his bit and drill more hole; then if he got into trouble he knew he could get out quickly.

*Consulting Mining Engineer, Los Angeles, California.

IMPROVED DRILL BIT

DESIGNED BY

LEON W. DUPUY, FRANK STEFFEY, RALPH HAMILTON.
FIRST USED PICACHO MINING CO. PICACHO, CALIF.



Due to the high cost of adding the back cutting ears to standard bits by hand, (we had no forging equipment), we found it highly profitable to apply hard surfacing to the downward cutting edges and particularly to the reaming edges. At first we found that we softened the body of the bit, causing it to crush during use. Our master mechanic, Frank Steffey, soon found a method of application which obviated the difficulty. Some of the bits surfaced in this manner drilled as much as 500 feet of hole.

The back cutting bit was jointly designed and developed by the writer, Leon W. Dupuy, who was engineer in charge of operations at Picacho; Frank A. Steffey, master mechanic; and by Ralph E. Hamilton, assistant engineer. The inventors have applied for a patent covering their development.

STATISTICAL STUDIES OF THE MINING INDUSTRY IN ARIZONA

A COMPILATION of statistical studies on mining in Arizona and the importance of the industry to the state from an economic standpoint has just been published by the Arizona Department of Mineral Resources. The publication is titled: "The Dependence of Arizona on the Mining Industry." Many of the articles are reprinted from Pay Dirt, a publication distributed monthly to the members of the Arizona Small Mine Operators Association. In their compiled form they make an impressive booklet, 9 by 12 inches in size and 48 pages long.

The booklet discusses and analyzes in detail taxes, metal production, payrolls, population, the copper excise tax, the relation of other industries to mining, and many other subjects, and contains 39 illustrative charts as well as 41 tables of statistical information. It is available from the Department of Mineral Resources, Capitol Building, Phoenix, Arizona.

The Magma Copper Company, 14 Wall Street, New York City, has reported a net profit of \$754,808 or \$1.85 a common share for the nine-month period ended September 30, 1940. The amount compares with \$972,288, including \$122,731 profit on sale of securities, or \$2.38 a common share for the corresponding period of last year. During the nine months Magma produced 25,196,811 pounds of copper.



William B. Laveen, 903 Pine Street, San Francisco, California, operating under the name of the G. and L. Mining Company, a limited partnership, will begin active mining operations in November at its placer property near La Porte in Plumas County, California. The area is comprised of approximately 120 acres. The gravel will be handled with a scraper and Carryall and washed in a bucket-fed trommel.

The Imperial Smelting and Refining Company, Sam B. Mosher, president, Signal Oil Building, Los Angeles, California, has contracted with United States Smelting Refining and Mining Company to ship 100 tons of low-grade lead-silver crude ore daily to the latter company's plant at Midvale, Utah. The ore will be taken from the Darwin mine near Darwin, California, which Imperial Smelting recently optioned from the Wagner Assets Realization Corporation, 1 Wall Street, New York City. About 45 men are employed at the mine under the direction of James D. Williams.

A group headed by D. K. Ribble, Washington, California, has contracted to supply 1,000 tons of barite from the Spanish mine north of Washington, operated under lease. The property is said to be the only one in Nevada County where the ore is mined at present. The Spanish mine is owned by the Bradley interests, 1022 Crocker Building, San Francisco, California.

The furnace has been started at the Knoxville quicksilver mine near Monticello, California. Several shafts have been sunk and ore is being mined steadily. The furnace also is handling material from the

old dumps. Equipment from the Kenton gold mine near Allegheny has been transferred to the Knoxville and some new mining equipment has been purchased. Several new buildings have been erected, including homes for the workers. A crew of 43 men is employed. The property is owned and operated by George E. Gamble and W. V. Wilson, both of Palo Alto, California. T. S. Scribner of Monticello is superintendent.

Two pilot mills and cyanide tanks are being installed at the Big Four mine in the High Grade mining district of Modoc County, near Fort Bidwell, California. Thorough testing operations are to be completed before installing larger equipment. Development plans include sinking a 500-foot shaft and crosscutting at each 100-foot level. If results of the present work prove satisfactory a 100-ton mill will be constructed. C. C. Crow of Hanford, California, is owner of the property which is being leased by George Mathewson and

associates of Alturas, California. Mathewson is in charge of operations.

The new 40-ton mill, consisting of amalgamation, gravity concentration, and flotation equipment, is in operation at the McDow holdings in the Diamond Mountain mining district six miles from Susanville, California. R. S. Bartholf is in charge with a crew of 12 men employed. A. G. Lantz, 1115 Delmas Avenue, San Jose, California, is owner of the plant which will operate on a custom basis, handling ore from several properties in the district but the chief source of supply will be from lessees on the McDow property.

E. M. Dawes and associates are operating a dredge near Roseville, in Placer County, California, and handling about 1,200 yards of gravel daily.

The King Development Company, Arthur N. King, superintendent, Vancouver, Washington, is using a 1½-yard dragline with a dry washing plant at the Walker property in the Rand district, Kern County, California. The washing plant consists of three units with a capacity of 60 yards an hour.

The Gould interests, headed by H. W. Gould, president, Mills Building, San Francisco, California, have leased the Helen quicksilver mine in Lake County, California, to Alan Fleishhacker and Tom Robinson who are opening the mine. A crew of 20 men is employed. A 30-ton plant is on the ground and it is expected to be in operation early in 1941. Robinson, who is from Middletown, California, is in charge of operations. Fleishhacker is addressed at Room 1220, 200 Bush Street, San Francisco.

The flotation mill of Old Gold Mines, Inc., is handling 30 tons of gold-silver-lead ore daily from the company's mine near Trona, California. The plant is being used as a pilot mill and is being overhauled and modernized. A modern 50-60 ton plant is planned when the metallurgical and mechanical problems in the present unit are completely solved. Underground workings have reached a depth of 400 feet. A crew of 15 men is employed. A. D. Disney, 545 South Olive Street, Los Angeles, California, is president of Old Gold Mines. C. C. Randall, 3452 Westmount Avenue, Los Angeles, is secretary and general manager. F. M. Merilees is

AVERAGE PRICES OF METALS
(Figures by American Metal Market)

	Copper Per Lb. Conn. Valley	Lead Per Lb. New York	Zinc Per Lb. St. Louis	Silver Per Oz. New York
1924	13.024	8.097	6.344	66.781
1925	14.042	9.020	7.622	69.065
1926	13.795	8.417	7.337	62.107
1927	12.920	6.755	6.242	56.870
1928	14.570	6.305	6.027	58.176
1929	15.107	6.833	6.512	52.993
1930	12.982	5.517	4.556	38.154
1931	8.369	4.244	3.638	28.701
1932	5.792	3.181	2.881	27.892
1933	7.276	3.870	4.081	34.728
1934	8.658	3.8595	4.162	47.973
1935	8.880	4.0643	4.381	64.273
1936	9.710	4.7091	4.903	45.088
1937	13.391	6.0085	6.517	44.805
1938	10.225	4.7388	4.613	48.222
1939	11.197	5.0531	5.117	39.082
1939				
Jan.	11.25	4.826	4.676	42.75
Feb.	11.25	4.8045	4.60	42.75
Mar.	11.25	4.8241	4.60	42.75
Apr.	10.469	4.782	4.50	42.75
May	10.058	4.75	4.50	42.75
June	10.00	4.80	4.50	41.955
July	10.220	4.854	4.517	34.944
Aug.	10.491	5.0426	4.724	35.951
Sept.	11.930	5.454	6.150	36.956
Oct.	12.442	5.50	6.50	35.726
Nov.	12.50	5.50	6.50	34.75
Dec.	12.50	5.50	6.012	34.956
Ave. 1939	11.197	5.0531	5.117	39.082
1940				
Jan.	12.216	5.4712	5.644	34.75
Feb.	11.405	5.0761	5.543	34.75
Mar.	11.385	5.1923	5.75	34.75
Apr.	11.327	5.0712	5.75	34.75
May	11.324	5.0154	5.808	34.949
June	11.375	5.00	6.24	34.825
July	10.812	5.00	6.25	34.75
Aug.	10.954	4.8537	6.398	34.75
Sept.	11.536	4.9292	6.937	34.75
Oct.	12.00	5.3077	7.25	34.75

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consulting engineer and general superintendent; Ronald Heidrick, mill superintendent; and D. H. Miller, chief chemist; all of Box 726, Trona, California.

The old **Dreisam** gold mine north of Tuolumne, California, has been purchased by A. H. Keast of San Francisco, who will direct work at the property. Preliminary work is under way and mining operations are expected to start by early spring. The property is stated to have been a good producer in early days.

James Hackett and S. B. Moore, leasing on the **Minnehaha** claims, one mile west of the Yellow Aster mine, Randsburg, California, have reported a shipment of 26 tons of gold ore, assaying \$23 a ton, to Burton Brothers mill. The property is being leased from E. B. Maginnis of Randsburg.

Production has been stepped up at the **New Idria Quicksilver Mining Company**, Idria, San Benito County, California. The furnaces are treating 400 tons of ore each 24 hours and an average of 570 flasks of quicksilver a month is being produced. Underground operations are being carried forward in the Number 10 tunnel, which is being reopened for a distance of 2,900 feet to tap additional ore reserves. Material from the dumps left by earlier operators is also being handled in the recovery plant. A crew of 250 men is employed, under the direction of C. Hyde Lewis, general superintendent in charge.

The new cyanide plant at the property of the **Lava Cap Gold Mining Corporation** has been completed and placed in operation, making the company entirely independent in the handling of its concentrates. In addition to the plant, a huge vault has been constructed for storing gold pending its shipment to the mint in San Francisco. The cyanide unit consists of 28 steel tanks, ranging from 50 feet in diameter and 16 feet deep to 14 feet in diameter and 8 feet deep. It will handle 25 tons of mill concentrates daily and is thought to be capable of operating on a large tonnage basis. The plant was built under the supervision of Otto E. Schiffner, general manager, and Bert Hardin, chemist, both of Nevada City, California. Underground operations include general development at the Banner and Central shafts. A crew of 383 men is employed at the Lava Cap mine.

Dredging activities have been started on the E. A. Putnam ranch 2½ miles northeast of Clements, California, by the **Gold Hill Dredging Company**. The equipment, which operated at Loomis, California, for six years, has been reconstructed and modernized. It is estimated that the company will work at the present site for six or eight years. A crew of 30 men is employed on a three-shift basis. The company operates five dredges in California. Officials in the firm include E. B. De Golia, president, 904 Robert Dollar Building, San Francisco, California; J. J. Coney, secretary-treasurer, 311 California Street, San Francisco, California; M. L. Summers, general superintendent in charge of operations; and N. Stetler, dredgemaster.

Aalders and Prather, dragline dredge operators, have started dredging operations

near Lincoln, California. The outfit has been working near Red Bluff in Tehama County, California.

A tunnel and crosscut are being driven at the **Dickey Bird** property on Bellas Creek, 2½ miles north of the Cherokee mine, to reach territory thought to contain a large body of high-grade manganese ore. The mine, which also contains values in gold, is leased by Charles Tognetti, Route 1, Box 186, Watsonville, California, Beach Burdick, Route 5, Box 369, Watsonville, and Ned Burdick, also of Watsonville. The ground is owned by the Wolf Creek Timber Company. Burdick is in charge at the mine and Charles Tognetti is secretary of the partnership.

W. E. Grant and Charles Bryan are installing a 35-ton mill at their **Mildred Lloyd** mine near Columbia, California. The men, who formerly leased the property, have bought out the C. E. Harthorn and John Fischer interests. Previous production from the Mildred Lloyd has been sent to the Selby smelter.

John Kehl and Charles Burpits, Hollister, California, have a 20-year lease on mining property in the Panoche mining district from Henry Berg of Panoche and are engaged in exploratory work. According to the lessees the deposit is 50 feet wide and extends for three-quarters of a mile. It contains copper with some quicksilver, silver, and gold.

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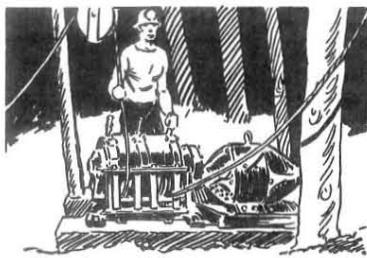
The **Lookout Mountain Mining Company**, H. L. Parkman, general manager, 163 Second Street, San Francisco, California, will erect a 500-ton mill at its property near San Andreas, California. A 50-ton Huntington mill has been on the ground. The company is working a large body of low-grade ore blocked out at its Lookout, Etna, and Golden Hill mines. The Golden Hill is developed by open cuts, a 100-foot vertical shaft, and an old 350-foot inclined shaft. The Lookout claim is developed by a 50-foot adit and 100-foot shaft with about 2,200 feet of drifts. H. P. Hoyt, construction engineer, 325 Fremont Street, San Francisco, is president of the company.

Newmont Mining Corporation, 14 Wall Street, New York City, has reported its net asset value per share on 1,063,292 common shares outstanding as \$41.32. This figure compares with \$84.81 a share on 531,646 shares outstanding May 15.

The **Coleman and Kingman Lease** is reported to be milling 15 to 20 tons of gold ore a day at a section of the old Jamison property adjacent to the Plumas Eureka, Johnsville, California. The ground is practically unexplored.

The shaft at the property of the **Altaville Mining Company, Inc.**, has been sunk to a depth of 300 feet with 50 or 60 feet yet to go before reaching the objective. Water was struck at 300 feet and two large electric pumps are pumping 500 gallons a minute. The company is buying 130 acres of ground two miles from Altaville in Calaveras County, California. Luke Capanich, Altaville, California, and George Engelke and J. Cadamortari of Columbia, California, comprise the company. Capanich is in charge.

The cyanide plant for treatment of concentrates has been completed recently and is in operation at the **Cherokee** mine near Greenville, California. The flotation plant, which has been in continuous operation on a two-shift basis 16 hours a day since October 1, is handling 125 tons with a recovery of 94 per cent. The main shaft has been sunk to the 350 level, a station and sump completed, and the four veins which are being stoped on the 200 level are being successfully developed on the 350 level. Alfred L. Merritt, 200 Bush Street, San Francisco, California, is owner



of the property; Frank Humphrey, Box 215, Greenville, is general manager; and J. K. Jackson is superintendent.

United States Chrome Mines, Inc., A. H. Wild, president, 558 Russ Building, San Francisco, California, plans to work a chrome deposit at Heifer Camp in Glenn County, California. The company produces about 18,000 tons of high-grade chrome annually at its plant in El Dorado County, California, and has extensive interests in chrome properties in eight other counties in California and two counties in Oregon. United States Chrome recently submitted the lowest bid for supplying domestic chrome ore to the United States Treasury Department in Washington, D. C.

Interests controlled by the **Natomas Company**, Thomas McCormack, president, Forum Building, Sacramento, California, are reported to be testing gold-bearing placers in the Scott's Flat and Quaker Hill districts of California. If the results are satisfactory, large-scale dredging operations are planned.

Alex Rossi, 1021 Twenty-Second Street, Sacramento, California, is developing the **Hong-Sing** mine at Iowa Hill in Placer County, California, and has reported an expenditure of \$6,000. He is considering application for an RFC loan.

Frank Smith, operator of the **Smith and Black** hydraulic mine, Happy Camp, California, will use a 4,000-yard floating plant to work the Allen ranch on the Klamath River about six miles north of Happy Camp. The unit also will work the Muck-a-Muck, Ralph Gordon, and Crumpton brothers properties. Three shifts of six men each will be employed.

Bert Austin, Balfour Building, San Francisco, California, is understood to be conducting testing operations on the **Pine**

Hill gold mine in Placer County, California, near Wolf, and about 10 miles northwest of Auburn. If the tests prove satisfactory, a mill is planned. C. H. Bathurst of Placerville, California, is in charge.

The **Red Hill** hydraulic mine, Junction City, California, which has been closed down for a time, will operate again this winter. It has been estimated that one more season of work is possible at the property. The mine is worked by the Gilzean brothers, J. A. and W. M., the latter directing operations.

A new headframe and surface unit are under construction at the **North Star** mine of **Empire Star Mines Company, Ltd.**, J. R. C. Mann, manager, Grass Valley, California. Three ore bins and a waste bin are to be erected. Ore will be trucked to the North Star mill for treatment. The new flotation mill at the company's **Pennsylvania** mine at Browns Valley, California, has been completed and is handling 125 tons of ore in 24 hours. In addition to ore from the Pennsylvania, the mill handles ore trucked from the adjoining **Dannebroge**. Robert J. Hendricks, Nevada City, California, is manager of the two properties.

All of the assets of the **Carlyle Mining Company**, totaling approximately \$65,000, were disposed of at a combination auction and liquidation sale by the Markall Machinery Company, 750 Folsom Street, San Francisco, California, held at the mine on October 10, 1940. The mining, milling, and assay equipment, together with the buildings, was sold. The mine is 27 miles east of Twentynine Palms, California, and was operated this summer on a short-term lease by Paul Nett and Pliny Murphy of Twentynine Palms.

The **Rubicon Placer Mining Company**, D. M. Austermell, local manager, Box 851, Auburn, California, is making gravel tests at its **Pigeon Roost** mine located along the Rubicon River in Placer County, California, about 18 miles east of Georgetown. The mine is developed by an adit 632 feet long, and, at a point 412 feet from the portal, the tunnel enters the gravel channel which has been exposed for a distance of 200 feet. Leslie Harris, Suite 301, 1036 South Menlo Avenue, Los Angeles, California, is general manager of the company.

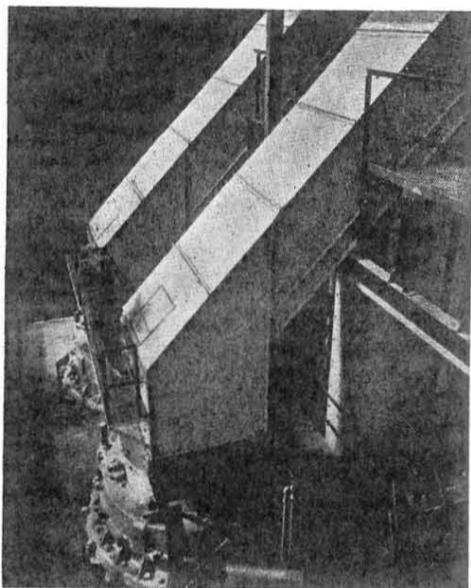
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JOHN ROBERT SUMAN TO HEAD AMERICAN INSTITUTE IN 1941

JOHN ROBERT SUMAN of Houston, Texas, has been elected president of the American Institute of Mining and Metallurgical Engineers. Suman is vice-president of the Humble Oil and Refining Company, principal producing subsidiary of the Standard Oil Company of New Jersey. Also elected were two vice-presidents: Paul D. Merica, vice-president, The International Nickel Company of Canada, Ltd., New York City; and LeRoy Salsich, president, Oliver Iron Mining Company of Duluth, Minnesota. Four new directors elected were: J. Terry Duce, vice-president, California Arabian Standard Oil Company, of San Francisco, California; Ira B. Joralemon, president, Desert Silver, Inc., San Francisco; J. R. Van Pelt, Jr., assistant director, Museum of Science and Industry, Chicago; and Clyde E. Williams, director, Battelle Memorial Institute, Columbus, Ohio. Re-elected as directors were: H. T. Hamilton, assistant to the president, New York Trust Company; and H. Y. Walker, vice-president, American Smelting and Refining Company, both of New York City.

Suman, who will formally assume his duties as president of the Institute at the annual meeting to be held in February 1941, was born in the small town of Daleville, Indiana, on April 9, 1890. However, he obtained his education in California—at the Los Angeles High School, the University of Southern California, and later at the University of California at Berkeley, where he was graduated as a mining engineer in 1912. His early professional experience was in gold mining, but he soon entered the oil industry, which was then beginning its rapid expansion. He worked successively as chief engineer and later as general manager for the Rio Bravo Oil Company, a subsidiary of the Southern Pacific Railroad Company, as technical superintendent for the Roxana Petroleum Corporation; and as general manager of operations in Texas for the Associated Oil Company of California. In 1927, he became connected with the Humble Oil and Refining Company and in 1933 he was made vice-president in charge of production.

ANNUAL MINING INSTITUTE WILL BE HELD IN SEATTLE

THE fourteenth annual mining institute will be held during the week of January 20 to 25, 1941, in Seattle, Washington, by the College of Mines, University of Washington. Meetings are scheduled on the university campus daily, and the program will include a field trip to some plant of mining or metallurgical interest. In 1940 the attendance was 325.

Sessions are open without charge to all interested persons. The carefully prepared schedule permits attendance at a single meeting or a series of meetings during the session.

Detailed programs and announcements will be completed at a later date. Requests for preliminary information should be addressed to Milnor Roberts, Dean, College of Mines, University of Washington.

OBITUARIES

KEY PITTMAN, GREAT SILVER CHAMPION, DIES IN RENO

THE SUDDEN death of Key Pittman, United States senator from Nevada, was a great loss to the mining industry. He was the strongest silver advocate since William Jennings Bryan and accomplished more for the metal than any man in recent history.

Pittman, who was president pro tempore of the Senate and chairman of the important committee on foreign relations, died in Reno on November 10 of a heart attack. He had just completed a successful campaign for reelection to the Senate to which he was first elected in 1912 and where he served without interruption until his death.

Pittman was born in Vicksburg, Mississippi, in 1872, and, after receiving his education at Southwestern Presbyterian University and George Washington University, went to Seattle, Washington, as a boy of 20 to start practicing law. Times were hard there and he found the going rough so when the gold rush to Klondyke started, he was one of the first to join the stampede to Alaska.

He worked there for two years as a miner and then pressed his law knowledge into service for the gold miners of the territory, becoming a member of the committee which was appointed as a consent form of government for Nome and later serving as its first prosecuting attorney. From Alaska, young Pittman went to the bonanza camp of Tonopah, Nevada, in 1902, which has been his home ever since. While in Tonopah he practiced law, keeping in close touch with the mining industry, and entered national politics upon his election to the Senate nearly 30 years ago.

The senator was untiring in his efforts to aid the mining industry and has long been the principal proponent of a more extensive use of silver in national currency and for the remonetization of the metal throughout the world. It was directly due to his efforts that the silver agreement was accepted by the London Economic Conference in 1933, and his work on behalf of the metal since then has been primarily responsible for the recovery in the price to the present 71-cent level.

Miners throughout the entire west lost a great friend in Key Pittman. He was a most gallant fighter for their cause.

Herbert E. Samms, 48, mining engineer of Wallace, Idaho, died at Wallace on September 5, 1940. He had been associated with the mining industry in the state for many years.

Mark H. Wanless, 66, assayer in the Nogales Assay Office, died October 28, 1940, at his home in Nogales. He had been a resident of that city and Old Mexico for 45 years, the last 20 having been spent in Nogales.

George R. Sheldon, 64, mining engineer, of Salt Lake City, Utah, died at Salt Lake on October 5, 1940. He was graduated from the Michigan College of Mines in

ELLIS BRINGS BACK FANTASTIC STORY OF OWN RESURRECTION

By Addison N. Clark

RECENTLY, Addison N. Clark of Oakland, California, received a telephone message to the effect that "Captain Ellis of the Steamship President Cleveland is in San Francisco and wants you to get in touch with him."



Addison N. Clark

Clark scratched his head—knowing no salty sea captain of that name. The Cleveland had arrived from—yes, that was it: The Philippines. And his old friend "Cap" Ellis (Ernest Wm. Ellis), had been over there among the go-goos, with Engineering Equipment and Supply Company, building mills, etc., for three years and a half. Immediately Clark phoned the purser of the President Cleveland. Yes, Mr. and Mrs. Ellis were aboard—that is, had been, but were ashore. (It developed that they'd taken in the Stanford football game that afternoon.)

Next day Cap and Mrs. Ellis found their way by dead reckoning to Bellevue Avenue, Oakland, locus of the Clark "cabin." They caught Clark in a blue flannel shirt and a pair of ragged and very dirty pantaloons, creating a flower bed where a thorn-hedge had stood—giving an expert imitation of his mucker days.

Whereupon the two mining engineers, who hadn't seen each other for five years (since Cap was metallurgical engineer and mill superintendent at the Empress mine in Grass Valley and Cap Clark did some consultation work for that property) gave Mrs. Ellis a first-rate imitation of two long separated sorority sisters getting together in a clinch.

"This," observed Ellis, "is a resurrection."

"Two resurrections," replied Clark.

"Let's make it three resurrections," suggested Mrs. Ellis. So they rang one Charles Wesley Strine, construction engineer, who was associated with Ellis on Philippine jobs, but returned to the homeland nearly a year ago. Soon Strine rolled up in his car.

But the whole resurrection story isn't out yet:

Last May in Manila *Cap Ellis died—literally*. Was pronounced dead twice by competent physicians—then miraculously came back to life.

Fond of swimming, and finding heat-relief in it, on Sunday, May 26, Ellis was taking a dip in the long pool of the Manila Polo Club. A strong swimmer, liking to swim under water, he dove off the curb and swam thus the length of the pool; climbed out, dove in again and started back. And that second dive was the last thing he knew until Tuesday. At some interval later two boys, seeing Ellis' form under water, motionless, and *perpendicular*, arms outstretched, hailed passing Henry Hesch, and showed him what they saw.



Ernest Wm. Ellis

Hesch said, "I had the feeling of rescuing a dead man!"

They got Ellis on the shore, and Mrs. Margaret Hanson, wife of a Manila businessman and who had had Red Cross first-aid training, gave him artificial respiration for full 30 minutes. Then the ambulance of St. Paul's hospital screamed up and Ellis was taken thither. Mrs. Ellis met the ambulance en route and trailed it to the hospital. There Dr. L. Z. Fletcher took one look at the prostrate form, listened for heart action, and, arm around Ruth Ellis' shoulders, started to comfort her in her bereavement.

"But Doctor—*he isn't dead!*" she cried. "He gasped when Margaret was working on him!" Dr. Fletcher turned Ellis over (he was face-down still) and barked an order for the oxygen tanks. Then he and the nurses went to work.

All day Monday a parade of friends came to see Ellis—and he talked with them, called them by name, "kidded" with them . . . *yet to this day he remembers not one thing of that Monday.* "My body had come back to life," he says, "but my brain had not—at least, my conscious mind had not; and what my subconscious was doing is all a blank to me. The first things I remember were on Tuesday morning—and I left the hospital for home that afternoon. If it was death—and remember, two doctors pronounced it that—then where was my soul rambling in that interval? I don't know, and the psychologists will have to guess."

All concerned with the startling episode are a unit in agreeing that it was the persistent artificial respiration administered by Mrs. Hanson that actually saved Ellis' life. His heart had ceased to beat on that return swim up the long pool. His body had partly turned black when they brought it out. There was no water in the lungs—so he did not drown.

"It all proves one thing," says Mrs. Ellis. "That is this: That in many so-called heart-attack 'deaths' lives may possibly be saved by persistent use of artificial respiration. Ellis supposedly was dead from heart-attack—all the water ejected was a cupful, from his mouth. He had been 'dead' for perhaps a quarter of an hour—possibly longer. Mrs. Hanson saved his life."

And—in the Orient, when a person saves another person's life, the one saved forever after acknowledges the rescuer as his patron saint and spiritual boss.

"That's all right," said Hesch, "that's Cap Ellis—he's a fine swimmer, and he's just stunting."

At least 10 minutes after that a woman passed. Hesch himself in trunks and having a drink at a table under the trees, heard her scream. He tore to the pool, saw Ellis yet motionless, dove in. Afterwards

The facts are worth serious consideration by every reader connected with mine safety organizations.

Temporarily the Ellises are in Los Angeles. Cap is looking for a job on the American continent—and has a professional record as long as the New Testament to back the search up.

"No more Philippines for me!" he says. "Japan's behaviour, backed up by the Rome-Berlin Axis, is ominous. It doesn't look good to me. We're back home to stay!"

His temporary address is: c/o P. K. Perkins, Suite 1111, Pacific Southwest Building, Los Angeles.

NEVADA SCHEELITE CONCERN IS INCREASING PRODUCTION

THE Nevada Scheelite, Inc., has just completed the erection of a new mill for its tailings, the mill to have a capacity of approximately 200 tons in 24 hours. At present this is being augmented by the installation of preliminary grinding and crushing equipment of approximately the same capacity.

The company's mine is in the Sunnyside district of Mineral County, Nevada, near Dead Horse Wells and about 8½ miles from the mill. A three-compartment shaft has been completed to the 100-foot level and is now being equipped with a 75-foot headframe which is being moved from the Mono Lake district of California. Additional equipment will be purchased to enable sinking to the 1,000-foot level. The mine is fully equipped with Caterpillar Diesels and generators, blacksmith shop, wood-working shop, housing facilities, etc. Ore is hauled to the mill in trucks. In the past, production has averaged around 1,000 units a month, but the company expects to increase this to between 2,000 and 3,000.

The Nevada Scheelite, Inc., is a Nevada corporation, headed by Oscar L. Mills of Los Angeles, California. R. R. Crum of Whittier, California, is vice-president. Harley Hammond is in charge as superintendent at Dead Horse Wells, which is between the postoffices of Rand and Rawhide in Mineral County, Nevada. The company frequently is confused with the Mills Alloys, Inc., with which it has no connection beyond the fact that both concerns rent office space from the Mercury Oil Tool Company in Los Angeles and occasionally the Nevada Scheelite company sells a certain amount of its scheelite production to the Mills Alloys, although practically all of its present production is under contract to the Molybdenum Corporation of America.

ARIZONA SECTION, A.I.M.E.

WILL MEET ON DECEMBER 14

THE ANNUAL meeting of the Arizona section of the American Institute of Mining and Metallurgical Engineers is set for December 14, 1940, at Ray, Arizona. Program arrangements are being made by Brent N. Rickard, director of the institute, 810 Valley National Bank Building, Tucson, Arizona, with other committeemen.

College of mines students at the University of Arizona will go on a field trip at that time and will attend the convention.

assertion by the RFC. The plant continues to operate steadily on tailings, ore from the dump, and on custom ore. W. A. Leddell is general manager in direct charge of operations.

The Mowry Exploration Company, Patagonia, Arizona, is operating the old Mowry mine under lease and option from Bert Logan of Patagonia and Karl Peterson of Nogales, Arizona. The property is equipped with a 30-foot steel headframe, steep skip bin, hoist, compressor, and a blacksmith and steel sharpening shop. The No. 4 shaft has been retimbered to the 325-foot level and two headings are being driven on two shifts on this level. A crew of 24 men is employed. M. B. Lovelace is superintendent.

S. T. Stevens, Box 871, Clifton, Arizona, and associates are engaged in mining and hauling ore from the South Sycamore group 10 miles north of Clifton to the International smelter at Miami, Arizona. Regular carload shipments are being made from a new strike on the property. In two small shipments values ran over \$40 in gold in one and over \$100 in the other. A small amount of silver is present also. The high-grade ore was discovered on a surface outcrop at a point approximately 300 feet farther south along the vein from where the operators had been working. Burros are used to pack the ore a distance of approximately two miles to the end of the truck road. The mine is owned by Harry G. White, Clifton. Three men are employed.

A road from Aravaipa into the Rutledge claims has been completed by Lon Rutledge, Klondyke, Arizona, and he is ready to start mining activities. Almost two miles were done by hand labor. Rutledge plans to stope ore exposed in old workings and ship to the El Paso smelter. Principal metals are in lead, silver, copper, and gold.

E. S. Chafey of Morristown, Arizona, and associates are shipping at the rate of 50 tons of ore a day from the Newsboy mine 3½ miles from Morristown, and expect to increase the amount to 100 tons a day, according to a contract stated to be pending with the International smelter at Miami. To date a total of 140 cars of ore have been shipped from the mine. Values are in silver and gold. Six men are employed. The operators are leasing the property from M. D. Pitt of Morristown, owner.



J. Alexander, with a small crew of men, has been working at the Slab Ranch gravel mine near Angels Camp, California, for the past three months. Construction work includes building a new gallows frame, hoist house, etc. A shaft has been sunk and a drift completed. The mine, located on the Mother Lode highway with electric power, water, and roads accessible, had been closed for several years.

The Three S Mining Company, W. F. Schweikert, general manager, 609 El Te-

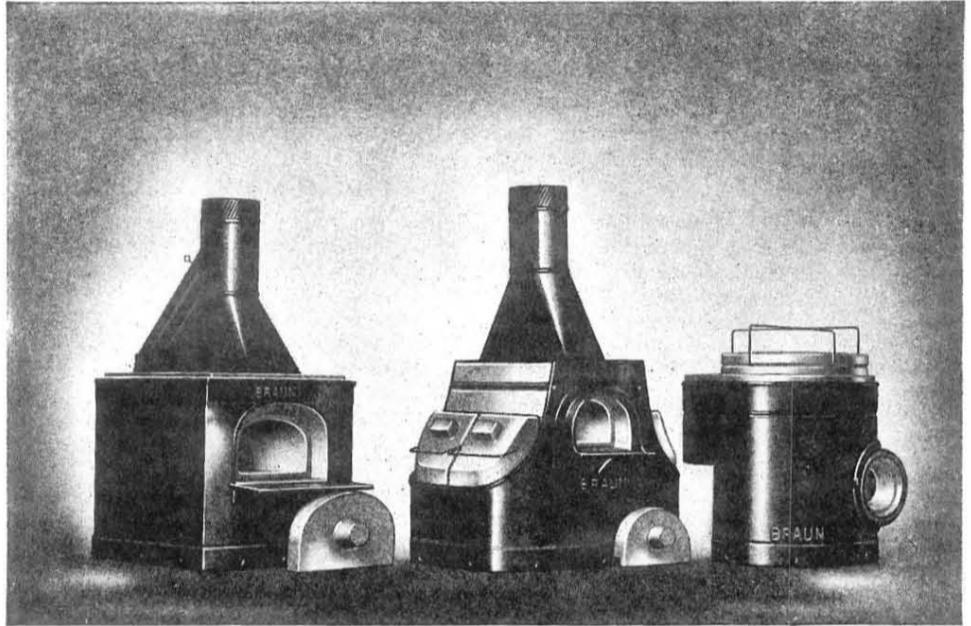
jon Street, Bakersfield, California, is handling 300 cubic yards of gravel in one shift at its property near Weaverville, California. Mining equipment includes a bulldozer and Carryall. A crew of nine men is employed. J. C. Price, San Pablo, California, is president of the company and Virgil Hughes, Box 40, Douglas City, California, is general superintendent.

Hydraulic mining is in progress at the French Bar placer near Belden, California, on the North Fork of the Feather River where the stream has been diverted temporarily from its channel by a 900-foot flume. The monitor is working on bedrock in a hole 40 feet deep. A six-inch pump raises the gravel to the sluice box. Rocks are moved from the channel by

means of a large boom pole. C. A. Cooley, Belden, and associates, are the operators. The project is backed by Rosene Brothers of Tacoma, Washington. Preliminary work was started last May.

Milling has been suspended at the Plumas Eureka mine operated by the Portola Corporation, Johnsville, California, while development work is carried on in an endeavor to reach ore bodies known to exist in old workings. A 4,200-foot tunnel has been reconditioned for a distance of over 1,000 feet.

The Kemmerer Exploration Company of Eureka, Utah, is continuing work at the Arctic mine near Washington, California. The company began operating the 60-ton Eimco mill on October 12 with Paul Jen-



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nings as superintendent. A new 160-horsepower D17000 Caterpillar Diesel furnishes power. The Kemmerer firm, of which Mahlon S. Kemmerer, Eureka, is an official, recently acquired the property from L. F. Utter, Washington, who had operated it for the last three years. A 600-foot tunnel had been driven and has been stoped for a distance of 310 feet. George H. Burr, II, Moana Lane, Reno, Nevada, is associated with Kemmerer.

Discovery of a vein four or five feet in width and containing commercial ore averaging about \$20 a ton, has been reported at the Jamison mine near Johnsville, California. The mill is operating steadily. R. W. Cunningham, Johnsville, is in charge of operations. The property is owned by Colonel C. A. Lundy of Blairsville, California.

The 250-ton mill at the Nutmeg mine in the Whitlock district near Mariposa, California, is operating on a three-shift daily basis. Allen F. Grant, Mariposa, is owner and in charge at the property. Sam LeBarry and C. O. Willey are working the mine.

The Oro Fino and Aero Trust gold mines in the Solo district south of Baker, California, have been purchased by Joseph C. Howard of Long Beach, California, at a reported price of \$85,000. The amount is to be paid in installments of \$200 a month in royalties. The mining properties were owned by a syndicate comprised of Jerry Korfist and Wilbur Lawson of Baker; James E. Marable of Barstow; A.



D. Weidman, Berkeley; and J. F. B. Carruthers of Washington, D. C.

The Skaggs Springs mercury mine owned by Leo Curtis, Skaggs Springs, California, has been leased by a Hollywood group of movie actors comprised of Reginald Owen, Randolph Scott, Frank Morgan, Cary Grant, and others. The company will operate as the Star Springs Mercury Company with A. H. Heller, 1800 North Hill Avenue, Pasadena, California, as engineer and geologist. Heller is making an extensive examination of the ground at the present time and has reported his findings as satisfactory. The same group, with Heller as vice-president, owns and operates a tungsten property near Bishop, California, under the name of the Tungstar Corporation.

The Fairfield Mining and Milling Company has begun operations of its newly constructed 75-ton mill near Weldon in Kern County, California. Ore from the King mine is being handled at present, which will be followed by a larger tonnage from the Prosperity. Ralph Ralston, Weldon, is superintendent. The company also works the Miranda group at Weldon and several other claims in the Kernville district.

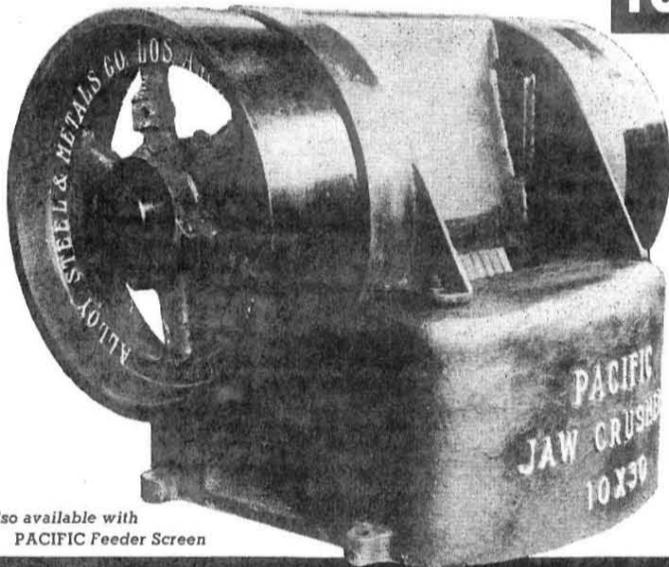
A cyanide regenerator has been installed at the mill of the Golden Queen Mining Company, Mojave, California, to recover for reuse the cyanide from solutions which would otherwise be wasted. The equipment is said to require but little attention and is handled by the regular mill crew. William C. Browning, Pacific Mutual Building, Los Angeles, California, is general manager of the company and Vernon T. Berner, Mojave, is mill superintendent.

The Western Mining Association, a cooperative group, has subleased the Diltz mine in the Sherlock district 10 miles northeast of Mariposa, California, from E. R. Baker, Mariposa. The transaction is stated to provide for \$60,000 to be paid in 10 per cent royalties over a 10-year period. Cleaning out and unwatering old workings, including the 600-foot main shaft, is expected to be completed in about 90 days, after which it is planned to begin operation of the 15-stamp mill. The mine is owned by the Diltz Mines Trust Estate, of which Baker is one of the principals. Western Mining Association also is leasing the Golden Key mine in the Whitlock district. Lyon C. Gray, Mariposa, is superintendent.

Wayne Huckaby, 201 Eighth Street, North Sacramento, California, will mine a low-grade gold property 1½ miles west of Kelsey, El Dorado County, California, and is making preparations to move equipment to that location.

A fire at the Contention mine in the Jupiter district of Tuolumne County near

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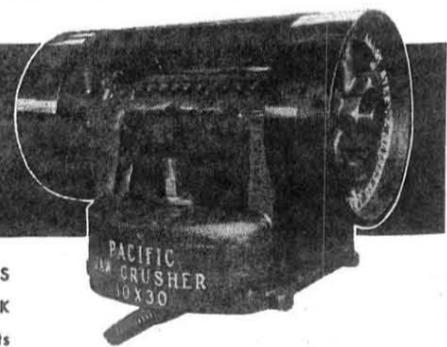
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Sonora, California, destroyed two buildings, resulting in an estimated loss of \$1,000.

Smith and Terrill Mining Company, L. A. Smith, manager, Nevada City, California, which has been testing on the Del Norte placer property along the Klamath River above Happy Camp, California, is reported to have discontinued operations. It is stated that other interests will take over the mine.

The General Dredging Corporation, O. Jack Boucher, general manager, 505 Bank of America Building, Sacramento, California, is reported to have given up its option on the China Point holdings in the Happy Camp district.

Dick Bernard has reopened the shaft at the California mine in Dead Man's Flat, two miles southwest of Grass Valley, California, to the 600-foot level. He plans to install milling equipment to treat ore from the dump as soon as sufficient capital is available.

W. J. Jordon, operating the Golden Bear mine in the Gold Stripe district near Greenville, California, plans to install flotation or cyanidation equipment to recover the gold. Jordon, his son, Harry Jordon, George Ingersoll, and Cecil L. Mills, all of Mariposa, California, have a lease and option on the Golden Bear.

The Darwin Consolidated Tungsten Corporation, Curley W. Fletcher, president and manager, Box 325, Bishop, California, has started operations at its property near Darwin, California. The first shipment of 25 tons of scheelite is stated to have carried a value of 5 per cent. Development work is being continued with 10 men employed. Plans are being completed for a concentration plant with an initial cost of approximately \$30,000, which will be constructed in the immediate future. The property is located in a district which has been a long-time producer of lead-silver ore.

Operations are in full sway at the property of the Midland Mining Company located on the North Fork of the Salmon River in Siskiyou County, California. The property was recently leased from the Elra Exploration and Mining Company, R. R. Stevenson, manager, 105 Montgomery Street, San Francisco, California. From 2,000 to 3,000 cubic yards are being handled every 24 hours with work on a three-shift basis.

Approximately 300 tons a week are being treated in the 10-stamp mill with work on a two-shift basis at the Ranch mine near Copperopolis, California. Ore is being taken from the 50-foot, 100-foot, and 200-foot levels. Particular attention has been given to the free-milling ore because of the long shutdown of the Selby smelter, which has hindered a more rapid development program. Recovery has been reported as approximately 90 per cent on \$4.50 ore. Construction of buildings has been underway the past month in preparation for wet weather. A crew of six men is employed. The property is operated by the J. D. McCarty Company, of miscellaneous businesses, Box 95, Copperopolis. Jackson T. McCarty is president and super-

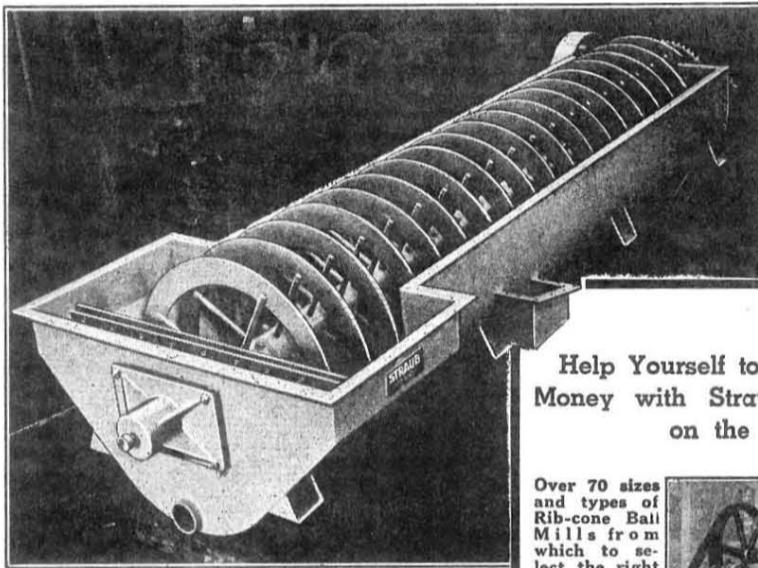
intends operations. Albert L. McCarty is vice-president.

The new shaft being sunk at the Crystal tunnel of Western States Gold Mines Consolidated, Clifford McClellan, president, Box 164, Angels Camp, California, has reached the 100-foot level. A station has been cut on this level and drifting is in progress. The company plans to extend the shaft to a depth of 500 feet and cut a station at each 100-foot level. The development program is intended to intersect a ledge from which high-grade crystal ore was taken in former operations. The capacity of the present five-stamp mill is expected to be increased when a sufficient quantity of ore has been blocked to supply

it for 24-hours steady operation. The property is owned by the German Ridge and Jupiter Gold Mines, a California corporation, and is under bond and lease to the Western States company.

Alaska Juneau Gold Mining Company, P. R. Bradley, president, 1022 Crocker Building, San Francisco, California, has reported a slightly higher recovery per ton of ore which was offset by increased costs for the month of October 1940. Estimated operating profit before depreciation, depletion, and income taxes totaled \$108,000 against \$113,500 in September of the current year. For the first 10 months of 1940 operating profit before depreciation, depletion, and income taxes, amounted to

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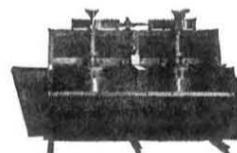
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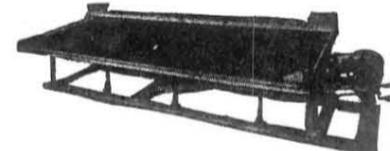
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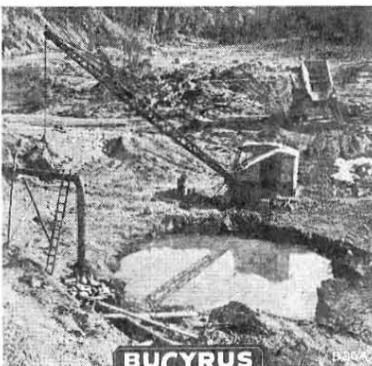
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\$1,019,600 which compared with \$1,103,300 in the corresponding period of 1939. Ore production for the 10-month period reached 3,956,300 tons as against 3,921,550 tons for the same period of the previous year. During October 1940, 403,580 tons of ore were mined and trammed to the mill.

Cosumnes Mines, Inc., Ralph Penn, president, Grizzly Flat, California, is continuing mining and milling of ore at its property near Grizzly Flat. Concentrates are shipped to the North Star mill of Empire Star Mines Company, Ltd., at Grass Valley, California. A crew of eight men is employed, working one shift under the direction of Charles Ranney.

The Universal Gold Mining Company has been organized to take over the Mound City gold placer mine, formerly known as the Calmo mine. The property is located in the Mother Lode district one mile northeast of Angels Camp, California, and includes about two miles of the old Central Hill Channel river bed. A headframe and hoist house have been completed and a new washing plant with new machinery and equipment has been installed. The operators are mining by the drift method and using trommel and sluices in recovering the gold. J. Howard Quinn, 4109 Magnolia Street, St. Louis, Missouri, is president; P. N. Alexander, 1567 Hiawatha Street, Stockton, California, and Angels Camp, is secretary and general manager; Sam Damalas, Box 596, Angels Camp, is assistant general manager; and Jack A. Bracco of Angels Camp is master mechanic.

The Red Pine Mining Company, Inc., W. J. Higdon, president, Balfour Building, San Francisco, California, has been organized with a capitalization of \$500,000 to develop the Pine Hill mine 10 miles southwest of Grass Valley, California. A small crew is engaged in sampling and initial development work under the supervision of W. J. Bathurst. Bert Austin, Balfour Building, San Francisco, is consulting engineer.

The Volo Mining Company, a Nevada corporation, has been organized to mine a large dike of low-grade ore at the old Shaw mine in the California Mother Lode district about six miles northwest of Placerville, California. A 200-ton mill is being erected and mining activities are expected to be underway in 90 days. The property contains a dike approximately 150 to 200 feet wide with veins at each side, which are estimated to have yielded at various times between \$350,000 and \$450,000 in gold. A nugget valued at \$7,000 is said to have been found at the location. Open-cut mining operations will be employed, using Caterpillars and bulldozers. Leo Kaufmann, 557 Market Street, San Francisco, California, is vice-president of the company.

The Argonaut Mining Company, Ltd., Jackson, California, has reported for the three months ended September 30, 1940, a net loss of \$14,219 after depreciation, interest, and federal income tax credit adjustments of \$6,497 but before deduction for depletion. An indicated net loss for the nine months ended September 30, 1940,

amounted to \$24,274 after the same deductions but before depletion. This report is not final as returns were estimated due to the strike at the Selby smelter where the company's ores are treated. The Argonaut company has settled its suit with the United States Government involving the price of bullion bars for which the mining company contended it should receive world prices. It has accepted the price of \$20.67, receiving a total of \$144,969 from the treasury.

The Red Top mine near Murphys, California, has been reopened after being shut down for one or two years. Actual mining and milling are expected to start by the end of the month. W. R. Green, Murphys, is in charge.

The Sills brothers of Auburn, California, are operating a stationary washing plant on the Molton Ranch near Rocklin in Placer County, and are recovering gold from an old creek channel. A year's work at this location is expected to be available. The plant has a capacity of 75 yards an hour.

Milling of ore at the Indian Girl mine in the Jupiter district near Columbia, California, is giving satisfactory returns. The plant is equipped with five stamps, two oil flotation cells, and a concentrating table. Mining operations continue with exploration of new territory. F. L. Macpherson is superintendent.

The Dodge Construction Company of Fallon, Nevada, H. K. Atkinson, manager, Round Mountain, Nevada, is reported to have discontinued mining operations at the placer holdings below the Plumas Eureka mine, near Johnsville, California. The ground was leased from the Portola Corporation, and is stated to have yielded a satisfactory amount of gold during the last few months. The company expects to resume operations in the spring and estimates that sufficient profitable gravel is available for several years' work.

Shaft sinking is in progress at the Silver Moon mine owned by Edward Herkelrath, Box 253, Randsburg, California. A depth of more than 20 feet has been reached and the operators plan to crosscut on the 50-foot level. The property, located between the Kelly mine and the Hatton lease, is operated by Glenn Hatton and L. E. Nethererton, both of Red Mountain, California, with Everett Petersen and Thurman Petersen.

The Placeritas Mining Company, W. D. Ingram, owner, Plymouth, California, operating near Plymouth, is using a Bodinson dredge with a Northwest dragline equipped with an Esco bucket of 1 1/4-cubic yard capacity. The dragline works 24 hours and dumps gravel into the washing plant at the rate of two times a minute. Other equipment includes a Caterpillar Diesel and LeTourneau bulldozer which strips ahead of the shovel and resurfaces the tailings. The company has operated in Amador County for the past two years and prior to that worked in Butte County. Ingram estimates that material for approximately three years' work is available in Amador and El Dorado counties.

According to E. E. Sisson, 456 Subway Terminal Building, Los Angeles, California, nearly \$40,000 has been expended in preparing the property of the Sisson Gold Mining Company for production. The company has been carrying on a development program on 230 acres of government mining claims on the middle fork of the Yuba River's north fork in Sierra County, about seven miles from Downieville, California. Approximately 10 miles of road have been built from the main highway to the mine; 4,500 feet of gravity pipe line have been laid; and a modern 20-ton mill erected. A tunnel in about 300 feet is being driven on the 150-foot level to contact the main vein and it is estimated that an additional 100 or 150 feet will reach the objective. Work is under the direction of Captain J. P. Hodgson, vice-president and general manager, 1224 Selby Avenue, West Los Angeles, California.

Ed Faris, lessee of a group of claims adjoining the old Golden Chariot mine 10 miles south of Julian, in San Diego County, California, is sinking a new two-compartment shaft on the Chariot vein. The first 40 feet were completed by hand. Compressor, hoisting equipment, and other mining machinery are being brought in preparatory to beginning more extensive mining activities.

The Martin brothers, Harold, Ralph, and William, of Hemet, California, are reported to be recovering an average of more than \$1,000 a week from ore run through the five-stamp mill at their Ranchito mine near Julian, California. A rich vein of ore was encountered recently in sinking a new shaft to a depth of 330 feet. William Martin is in charge of operations. The property is northeast of the old Golden Chariot mine in the same district.

Development work is in progress at the Hilltop antimony mine under lease to Dr. Robert H. Ellis, Medical Arts Building, Portland, Oregon. The property is eight miles west of Ballarat, California, in the Argus Range. If sufficient ore is exposed, erection of a mill is planned.

Kenneth Watkins of Portland is engineer in charge. The property was leased originally by Bill Lewis, prospector, from Archie Dean of Independence, California, but in October was subleased to Ellis.

COLORADO

The St. Louis Smelting and Refining Works, branch of the National Lead Company, is stated to be reopening its property in the Pioneer district of Dolores County near Rico, Colorado, where ore values are in lead, zinc, and silver. The electrical service has been restored and a crew of 20 men is engaged in preparing the workings for resumption of production. The company also holds silver-lead-zinc-copper-gold claims in Saguache County which are equipped with a flotation and gravity concentration plant. Jean McCallum, 722 Chestnut Street, St. Louis, Missouri, is gen-

eral manager. During the past 18 months work at Rico has been confined to lease operations and completing survey work to consummate patents on a considerable area.

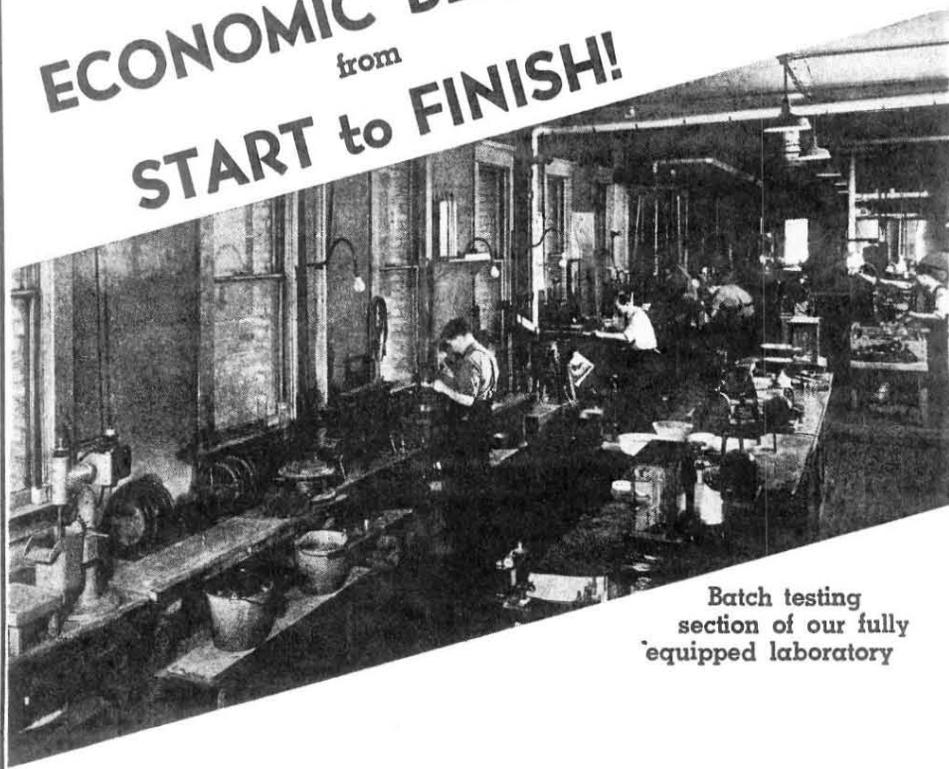
The Natomas Company, Thomas McCormack, Forum Building, Sacramento, California, president and general manager, is said to have purchased a half interest in the South Platte Dredging Company in Park County southeast of Buena Vista, Colorado, for \$750,000. The South Platte company, which did not accept the RFC loan of \$750,000 which had been given official approval, is completing installation of a bucket-type dredge on the South Platte River. Jefferson J. Doolittle, Mills Tower, San Francisco, is president and R. W. Derby of La Grange, California, is man-

ager. Charles Anderson is in charge at Buena Vista. The purchase price which Natomas paid for the half interest is reported to have been \$750,000.

The first carload shipment of ore recently went out from the Crusaders Gold property in the Animas district of San Juan County, Colorado. Ben T. Poxson, 695 Locust Street, Denver; George H. Garrey, 1555 Sherman Street, Denver; and George K. Townsend of Creede are the operators of the property, which is controlled by Maude W. Russell of Creede. Holdings include the Sylvanite, Gold Bug, Kankakee, Repeal, Bonita, King Pin, and I. S. L. claims.

Mine production has been started from the Smuggler mine nine miles west of

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MONTANA SURVEY PROJECT EXTENDED FOR SECOND YEAR

WORD has been received of the extension for another year of the state-wide Mineral Resources Survey of Montana which has been functioning with the financial aid of the Works Projects Administration and under the sponsorship of the Montana School of Mines, the Montana Bureau of Mines and Geology, and the Mining Association of Montana. Project headquarters are at the school of mines.

During the past year the survey has published a new "Directory of Montana Mining Properties" and has been researching all the known literature on the mining industry of Montana. This literature is being abstracted and segregated by counties and districts. Besides having the information available by counties and districts, there will be published a "Bibliography of the Geology and Mineral Resources of the State of Montana" with indexes.

Field work is being carried on at some of the manganese and tungsten properties and will be extended to cover chrome and antimony properties. The field work and the geological portion of the research and publications is being supervised by members of the faculty of the Montana School of Mines.

The project also is indexing news items concerning Montana mines in the periodicals and in the "Minerals Year Book" and its predecessors, so that these items will be available by mines and districts. This index will cover news items as far back as 1865.

Records of all the patented mining claims in Montana and their owners were made from the county records last year. However, it was found that there were some errors, especially in location. The patented claim record is now being checked with the records in the office of the United States Cadastral Engineer at Helena, so that the proper survey number, mineral entry number, and location may be obtained from the original government record and thus help to straighten out some of the county records.

It is planned to compile and publish a 1941 supplement to the "Directory of Montana Mining Properties" hereinbefore mentioned.

When all the work now planned has been completed, it will be available to the public, either through publications or in the files of the Montana School of Mines. The work being done on the strategic and critical minerals is available to the government as it is being carried on.

SETTLEMENT HAS BEEN REACHED IN SELBY SMELTER STRIKE

AFTER more than four months' duration, the strike at the Selby, California, smelter of the American Smelting and Refining Company was settled November 9, and operations are again going full blast.

The agreement, reached after numerous conferences between a conciliator from the United States labor department, a committee from the C.I.O. International Mine, Mill and Smelter Workers Union, and the Selby management, is based upon 5 cents an hour increase in wages for the workers. The company originally offered three cents and the union demanded 12½ cents.

The smelter is just now beginning to receive new shipments of concentrates. For some time after the strike went into effect the company accepted and stored concentrates, and, since the recent resumption of activity, has been handling this accumulation. The reopening of the plant will enable many small properties to resume production.

MINE AND FINANCIAL REPORT GIVEN BY SUNSHINE COMPANY

THE Sunshine Mining Company, headed by R. M. Hardy, Box 33, Yakima, Washington, reports an estimated net profit for the first three quarters of 1940 of \$1,864,386, which corresponds to a net profit of \$2,276,996 for the like period of 1939 and \$2,881,524 in 1938. Net smelter returns for the period were \$3,985,951.

During the third quarter the company recovered 1,976,141 ounces of silver, compared to 2,549,030 ounces in the third quarter of 1939. Figures show an appreciable increase over the second quarter in both tons mined and ounces recovered.

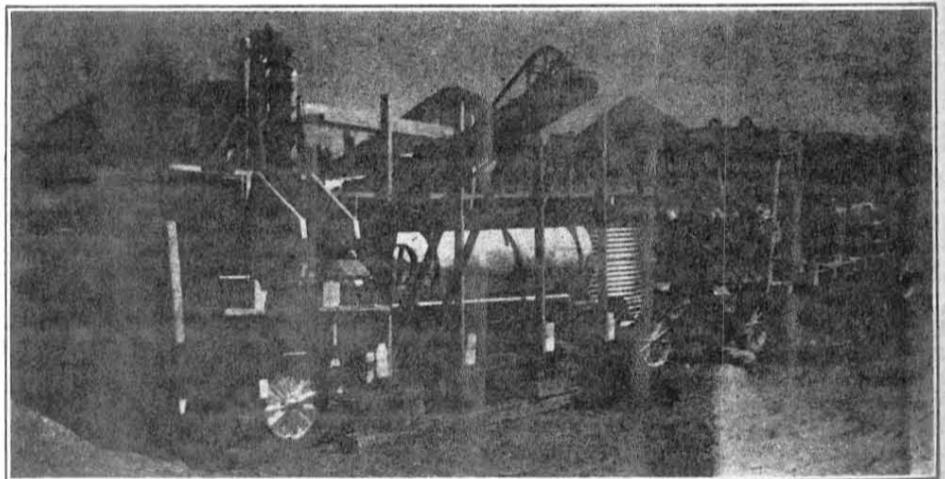
The Sunshine Company has temporarily discontinued crosscutting on the 3,700-foot level until the drift to the No. 4 winze is completed and a raise put up to the winze. A station then will be cut up to the 3,700 level and after that crosscutting will be resumed. The company is operating now on a five-day week, a shift being seven hours and 20 minutes, and employs about 550 men. Production stands at a little over 1,000 tons of ore daily, showing an increase of 200 tons since July. Most of the ore comes from between the 2,700 and 3,100 levels, with the rest coming from various parts of the mine, including a small amount on the old 900 level. Operations are under the management of R. D. Leisk, Box 1080, Kellogg, Idaho.

WET WASHER AT CAROLINE MINE SHOWS LOW WATER CONSUMPTION

A WET washer with an estimated capacity of five yards an hour has been constructed by N. G. Simpson at his Caroline mine. He has been experimenting with other equipment for six years and found the wet method to be more efficient for his purpose than the dry.

The high cost of water makes necessary the consumption of a minimum amount and he estimates this process to require 60 gallons a yard. Draglines have been built to feed gravel to the washer and for tailings disposal. The two buckets operate off the same drum but travel in opposite directions. The equipment is designed for operation by one man.

Simpson has 400 acres expected to average in its entirety about 50 cents a yard. The material which he has run through his machine has averaged \$1 from the surface to a depth of 8 or 10 feet.



Washing plant in use at the Caroline mine, near Randsburg, California

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New ore bins and a new headframe at the main hoisting shaft have been completed recently at the property of the **Sunset Mining Company** 20 miles northeast of Florence, Arizona. The shaft has been sunk to the 200-foot level and drifting is in progress along the vein in both directions. Miners are stopping on this level and on upper levels. Regular shipments of gold-copper ore are being made to the smelter of the American Smelting and Refining Company at Hayden, Arizona. Stanley A. Wardle, of Salt Lake City, Utah, president of the company, is living at the property, and Harry Currie of Oakland, California, is in direct charge of operations. A crew of eight men is employed.

California interests have optioned the **Gorham and Hall** group seven miles southwest of Superior, Arizona, and the **Woodpecker** mine adjoining. It is expected that a development program will be started in the near future. Some of the old workings were opened up and a considerable tonnage of silver ore shipped by former operators, E. N. Perkins of Superior, and C. W. Thompson of Phoenix. Part of the ore was newly mined and part was taken from old dumps and from loose waste in the stopes. The property was a former producer of high-grade silver and lead ore, but was handicapped until recent years by lack of a transportation outlet.

Several ore shipments are being made to the smelter of the American Smelting and Refining Company, El Paso, Texas, from the **White Eagle** group of mines in

the Cerbat Mountains near Kingman, Arizona. Satisfactory returns are reported, some amounting to as much as \$4,000 for a 50-ton carload. A crew of four men is employed under the direction of Dan Sheahan, mine superintendent. Murray F. Crossette, 333 East Summit Avenue, San Antonio, Texas, is operating the property under lease and option. Greely Clack of Kingman is owner. Values are in gold and silver.

Several shipments of ore have been made from the **Rico** mine in the Cerbat Mountains 15 miles north of Kingman, Arizona, to the mill of Producers' Mines, Inc., at Chloride, Arizona. The mine is held under lease and option to purchase by Ben Williams, Kingman, who is in charge of the work. Greely Clack, also of Kingman, owns the property. The Rico is on the C. O. D. vein which is mainly a silver producer. However, values at the Rico are chiefly gold. The mine, which is 300 feet deep, has not been unwatered below 160 feet. Williams plans to unwater to the 300 level which has not been opened up for 22 years. The mine is said to have a production record of \$50,000.



The **Panoche Quicksilver Mining Company**, P. D. Burt, president and general manager, Mills Building, San Francisco, California, has gone into production and is handling about 70 tons of ore daily in its 100-ton Gould rotary furnace, which is expected soon to be running at capacity. Ore so far mined has been of a low grade and has averaged about five pounds of quicksilver to the ton. The property is in San Benito County about 42 miles south of Hollister, California, and comprises 322 acres. If ore tests reach expectations, the operators plan to conduct extensive development work and are considering installation of another 100-ton furnace. A crew of 15 men is employed.

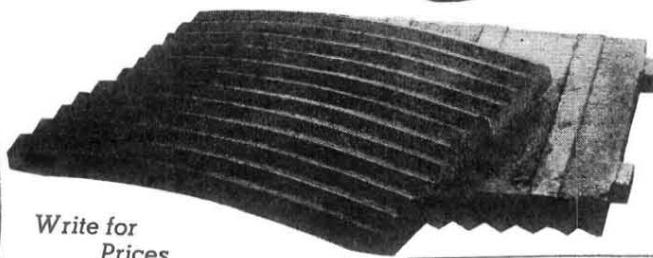
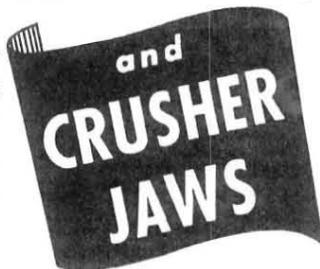
The **Martin-Walling** mine near Coulterville in Mariposa County, California, has been taken over by a group of men backed financially by B. N. Rosenbaum, 565 Fifth Avenue, New York City. Present work includes extension of an old 1,800-foot tunnel for approximately 246 feet in order to contact the vein. At a later date, construction of a 50-ton mill is planned. The property is stated to be a former producer of high-grade gold ore.

Following several months of sampling at the **Stone** property near Placerville, Cali-

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ifornia, the **Eclipse Placer Engineering Company** has completed construction of a dredge which is designed to handle 60 cubic yards of gravel an hour. Operations are expected to be carried on with a crew of 9 to 12 men working on a three-shift, 24-hour basis. The ground consists of 104 acres on Dry Creek and has been held under lease for a number of months by the present company. The project is backed by Detroit capital.

Production continues steadily at the **Oro Grande** mine near Callahan, California, operated by the El Oroso Corporation, 405 Montgomery Street, San Francisco, California, with mill-grade ore extracted from newly opened workings. Reconstruction of the mill was started last spring under the direction of J. Paul Jones, mine superintendent, Callahan. L. B. Jacobson, Callahan, is mill operator. A crew of 22 men is employed.

St. Joseph Lead Company, 250 Park Avenue, New York City, has declared a dividend of \$1 a common share payable December 20, 1940, to stockholders of record December 6. This amount brings the 1940 dividend payments to \$2.25 a share as compared with \$2 in 1939. The company operates the Sheepranch mine near Sheepranch, California.

A vein of gold ore, 30 feet in width with four feet of high-grade samples assaying \$124 a ton, has been reported at the property of **Red Cross Mines** by Cy Sterns, president, 105 Montgomery Street, San Francisco, California. The discovery was made after a year's development work during which a double-compartment shaft was sunk 220 feet and a 300-foot crosscut driven at this level. Future plans include deepening of the main shaft to 500 feet and continuing extensive development from that point. A 50-ton mill is on the ground and operating at capacity. A cyanide solution is used in recovery of the gold. I. N. Herman, 704 Shasta Street, Yuba City, California, is purchasing agent for the company. E. S. Van Dyck is superintendent at the mine and James R. Elmendorf is mine foreman. The property is located near Dobbins in Yuba County, California.

A depth of 70 feet has been reached in the shaft-sinking program at the **Blue Moon** mine five miles north of Hornitos in Mariposa County, California, and a headframe and ore bin have been constructed.

The property is operated by **Red Cloud Mines, Inc.**, Ely, Nevada, with J. H. A. Williams, manager, Hornitos, in charge. H. H. Buchanan and R. C. Ellithorpe of San Jose, California, and Lloyd A. Mason, Hornitos, are interested in the mine and recently have entered into an operating agreement with Red Cloud Mines.

The **General Dredging Corporation**, O. Jack Boucher, general manager, has moved its main offices from 505 Bank of America Building, Sacramento, California, to Natoma, California.

Anglo American Mining Corporation, Ltd., Walter Lyman Brown, president, 206 Sansome Street, San Francisco, California, has reported a net profit of \$29,174 for the third quarter of 1940. This amount does not include deduction for depletion, depreciation, etc. Revenue from the sale of gold and silver bullion totaled \$100,123. At the Carson Hill mine, which is 59 per cent owned by Anglo American, 90,791

tons were milled during the quarter, but result of the operations is not yet available.

The **Parks Bar Dredging Company** has ceased operations on the Big Ravine, a tributary of the Yuba River in Yuba County, California, all available ground having been worked. Edward C. Jacobs of Nevada City, California, is one of the owners of the dragline outfit which has employed six men since May 1, 1940.

The **Sovereign Development Company**, Ogilby, California, is reported to have reorganized under the name of **Tumco Mines, Inc.**, and will increase mining activities in the Tumco district of California. Plans include replacement of the present 30-ton mill with a 100-ton plant. The Sovereign company has operated a mine and mill in this district for several years, and a group of stockholders of this concern has combined with eastern interests to form the new company. W. M. Ballinger of Ogilby has been superintendent at the Sovereign mine.

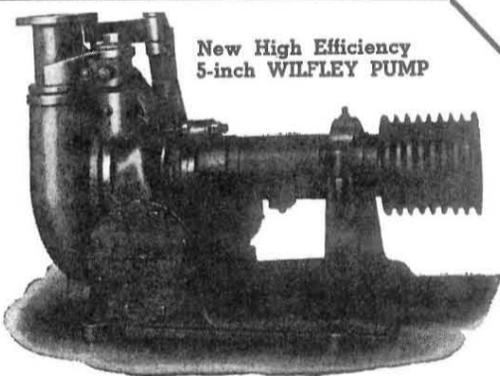
The dragline dredge of **Placer Properties, Inc.**, operating on Dry Creek in California, is handling an average of 200 cubic yards of gravel an hour. Approximately 2,000,000 cubic yards of material are estimated to be available at the site. Other equipment used in the operation includes a bulldozer and a portable electric generating plant. Work is carried on 24 hours a day. H. G. Kumble, Box 532, Oakdale, California, is president of the company and his son, Donald, is in charge of the Dry Creek project.

The tunnel at the **Palace** mine three miles above Strawberry Valley in Yuba County, California, has been driven 720 feet, at which point the ledge has been contacted and a drift run for a little more than 300 feet. The ledge is from three to nine feet wide and the values so far have been low grade. The operators plan to continue drifting for 1,500 feet. Approximately 500 feet more remain to be run in order to undercut previous workings. The present drift is 240 feet below the old workings. Jim Bollinger, Strawberry Valley, is operating the property and work is carried on the year around.

The board of directors of the **Central Eureka Mining Company**, 111 Sutter Street, San Francisco, California, has declared the regular bi-monthly dividend of 8 cents a share on its capital stock payable

AVERAGE PRICES OF METALS (Figures by American Metal Market)

	Copper Per Lb. Conn. Valley	Lead Per Lb. New York	Zinc Per Lb. St. Louis	Silver Per Oz. New York
1924	13.024	8.097	6.344	66.781
1925	14.042	9.020	7.622	69.065
1926	13.795	8.417	7.337	62.107
1927	12.920	6.755	6.242	56.370
1928	14.570	6.305	6.027	58.176
1929	18.107	6.833	6.512	52.993
1930	12.982	5.517	4.566	38.154
1931	8.869	4.244	3.638	28.701
1932	5.792	3.181	2.881	27.892
1933	7.276	3.870	4.031	34.728
1934	8.658	3.8595	4.162	47.973
1935	8.880	4.0648	4.331	64.273
1936	9.710	4.7091	4.903	45.088
1937	13.391	6.0085	6.517	44.805
1938	10.225	4.7388	4.613	48.222
1939	11.197	5.0531	5.117	39.082
1939				
Jan.	11.25	4.826	4.676	42.75
Feb.	11.25	4.8045	4.50	42.75
Mar.	11.25	4.8241	4.50	42.75
Apr.	10.469	4.782	4.50	42.75
May	10.058	4.75	4.50	42.75
June	10.00	4.80	4.50	41.955
July	10.220	4.854	4.517	34.944
Aug.	10.491	5.0426	4.724	35.951
Sept.	11.930	5.454	6.150	36.956
Oct.	12.442	5.50	6.50	35.726
Nov.	12.50	5.50	6.50	34.75
Dec.	12.50	5.50	6.012	34.956
Ave. 1939	11.197	5.0531	5.117	39.082
1940				
Jan.	12.216	5.4712	5.644	34.75
Feb.	11.405	5.0761	5.543	34.75
Mar.	11.385	5.1923	5.75	34.75
Apr.	11.327	5.0712	5.75	34.75
May	11.324	5.0154	5.808	34.949
June	11.375	5.00	6.24	34.825
July	10.812	5.00	6.25	34.75
Aug.	10.954	4.8537	6.398	34.75
Sept.	11.536	4.9292	6.937	34.75
Oct.	12.00	5.3077	7.25	34.75
Nov.	12.00	5.7283	7.25	34.75



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December 14 to stock of record November 30. This payment will bring the total amount disbursed in 1940 to 46 cents a share as compared with 45 cents in 1939. Announcement was made also by C. C. Prior, president, that a distribution of \$60 had been approved to all employees of the company employed for one year or longer. Amounts in proportion to length of employment will be paid to those who have served less than one year.

The Newmont Mining Corporation, 14 Wall Street, New York City, has declared a dividend of \$1 a share payable December 14, 1940, to stockholders of record November 29.

The Altaville Mining Company, Inc., is reported to have made a rich strike at a depth of 310 feet while sinking a shaft to bedrock at its property about 1½ miles from Altaville, California. About 40 or 50 feet remain before reaching the objective. The property is being purchased by Luke Capanich, George Engelke, and J. Cadamortari of Columbia, California, who are making arrangements to erect a new mill. Operations will be on a three-shift basis with 15 men employed. Capanich is in charge.

Development work on the two ore bodies encountered during the driving of the 6,000-foot crosscut from the Murchie mine to the North Banner property of Empire Star Mines Company, Ltd., Grass Valley, California, is reported to be disclosing satisfactory showings of commercial ore, of which a substantial tonnage is stated to be in sight. Drifts have been extended for a distance of 175 feet in each direction along the ledges which are approximately 4,500 feet from the Murchie shaft. Robert J. Hendricks, Nevada City, California, is manager of the properties.

The Lava Cap Gold Mining Corporation will continue to ship concentrates to the Selby smelter under the terms of a contract which runs until September 1941, according to Otto E. Schiffner, general manager of Lava Cap, Nevada City, California. Until the Selby smelter, recently reopened after a four months' strike, can catch up on the concentrates now on hand, Lava Cap will handle its own product in its new cyanide unit. The plant will then operate on mill tailings until the expiration of the contract, after which the company will take care of its own recovery processes. Present production is reported to be about 600 tons of concentrates monthly. Development work at the Lava Cap property includes drilling at the west Banner shaft, and a distance of 400 feet has been completed. Drilling to the east of the Banner was abandoned after 2,640 feet when no productive ground was encountered. A crew of 120 men is employed at the Banner.

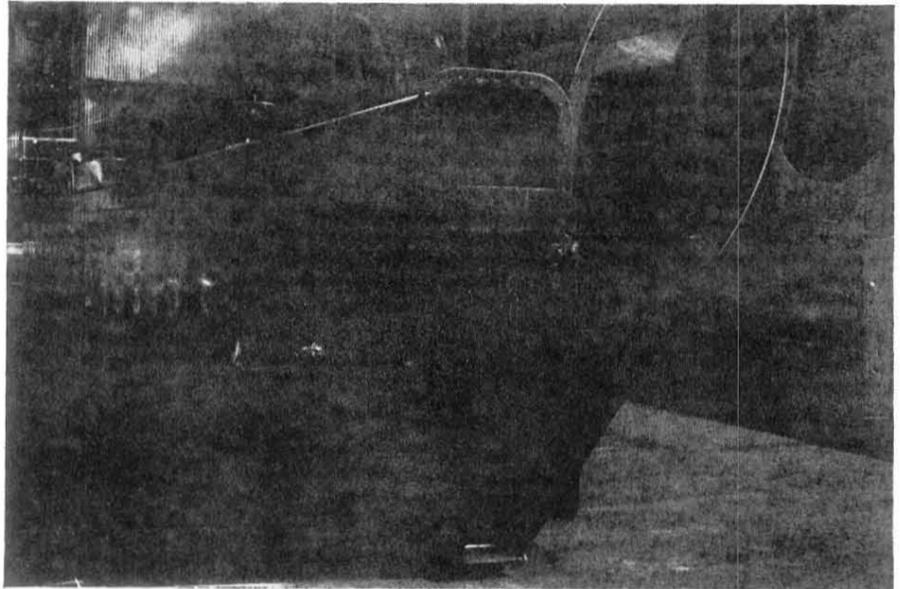
A 25-ton Herman ball mill is being installed at the Flyer mine near Randsburg, California, according to C. D. Overton, 336 West Fortieth Place, Los Angeles, California, principal owner of the property. The equipment was installed and ready for operation early in December, and will be used primarily to handle ore from the Gold Bell mine and other properties in the Rade-

macher district. In addition it will treat lower grade ores from the Flyer. Plans also include installation of a cyanide unit for the recovery process and an assay laboratory. A crew of 10 men is employed in the work under the direction of Overton.

Marvin Harris, Box 221, Randsburg, California, has purchased the interests of G. E. Bogart, his former associate, in the Jerry mine near Randsburg. Phil Adams of Gold Beach, Oregon, will be associated with Harris in operation of the mine. The property has been developed on the 65-foot level with a crosscut and stope, and it is understood that the operators will continue development work during the winter. According to Harris, production from the mine to date has totaled \$1,800.

Development work is being continued at the Wear mine in the Remington Hill district of Nevada County, California, and plans are underway for the construction of a mill in the near future. The property is under lease and option to the Steep-hollow Mining Company, Al Zeiwright, general manager and engineer, Nevada City, California. The mine is said to have a production record of \$25,000.

Natomas Company, Thomas McCormack, president, Forum Building, Sacramento, California, has declared a quarterly dividend of 25 cents a share, which is an increase of 5 cents over its usual payment. In addition the company will distribute an extra dividend of 20 cents. Both amounts are payable December 27, 1940.



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Harold S. Chase, 1012 State Street, and Walter F. Lineberger, 303 Valley Road, both of Santa Barbara, California, owners of the **Colosseum** mine in the Clark mining district of San Bernardino County, have spent approximately \$20,000 in development and are now starting a diamond drill campaign. About 1,500 feet of work have been completed. Operations are directed by John C. Anderson, consulting engineer, Room 453, 610 South Main Street, Los Angeles, California.

Operations have been suspended at the **Silver Tip** mine 25 miles southwest of Quincy, California. A ledge containing a satisfactory grade of ore has been contacted, and work is expected to be resumed on a larger scale in the spring. J. Buren Evans, 2536 Verbena Drive, Hollywood, California, has been directing the development.

Clean-up milling on ore in the bin has been started by the **Operator Consolidated Mines Company**, Johannesburg, California, after which the plant will be rented by A. Z. Landis who will use it for custom milling. Since October 23, 100 tons a day from the slime dump at the Operator have been taken to the Kelly cyanide plant near Randsburg, California. Harold G. Hunt, Randsburg, is general manager for Operator Consolidated Mines and will continue in charge at the mill after the change in operators.

According to C. E. Reagan, secretary of the Klamath River Mines Association, Happy Camp, California, Oregon mining interests will develop electric power in the Klamath River Basin, which will be available to several placer operations in the district. The project would include the driving of a 1,100-foot tunnel through the hills at China Point and diversion of the river for the purpose of generating power. Two miles of the river bed would be drained, making it possible to mine the ancient channels. The **China Point** holdings, owned by Reagan, comprise a large part of the territory which will be affected by the operation.

The construction program, which has been in progress for several months at the property of the **Stockton Hill Corporation**, was scheduled for completion on December 1, 1940. Primary and secondary



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crushers with conveyor belts, ball and flotation mills, and four Diesel motors have been installed. One of the motors is linked to the Ingersoll-Rand compressor and three are belted to the generator to supply power. The cyanide reduction plant, which will handle mill tailings, is reaching completion. Heavier 45-pound rails are replacing the lighter rails of the shaft from the collar to the 450-foot level. Upon completion of the building program, Stockton Hill will be entirely independent in the handling of its ore, including the generating of its own electric power. Walter R. Woock, Box 449, Auburn, California, is president and general manager of the company.

A patented claim owned by **Howell Manning**, Tucson, Arizona, has been added to the group of six claims worked by **Jim McDonald**, Box 31, Daggett, California, for the past three years. The property is known as the **Hafford** quartz mines and is located 29 miles east of Trona, via Layton Pass, on the east slope of the Slate Range. McDonald has built four miles of road, developed ample water, and now has the shaft down 110 feet with levels at 56 feet and the bottom. The vein averages 40 inches in width and runs about \$20 in gold, varying from 54 inches wide with an \$86 average to 30 inches wide, averaging \$7.50. There is a small mill, a 60-cubic foot compressor, and other essential equipment at the property.

H. R. Johnson, Barstow, California, has been carrying on gold production on a small scale at his **Sunset** mine in the Panamint district of California for the past six years. His equipment includes a five-ton Straub ball mill, Economy concentrator and amalgamation plates.

A 68-foot shaft has been completed by **Bill Wright** on his **Blue Bird** group located at Todds Springs, 70 miles north of Barstow, California. Wright is working a 10-ton Wheeler mill as the ore supply from development work gives him a mill run. The values are in gold.

Longfellow Mines, Inc., will reopen the Longfellow mine near Groveland 18 miles southeast of Sonora, California. Offices will be in Monterey, California. C. E. Stanley of Stockton, California, is one of the directors. The company has filed articles of incorporation in Sonora, listing 250,000 shares of stock at \$1 per share par value.

The **Bonanza Mining Company** of Salt Lake City, Utah, has optioned the Eureka mine of the **Eureka Sky High Mines, Inc.**, at Incline, California. A 140-foot shaft is said to have exposed commercial ore. Future operations include sinking the shaft to greater depth and stoping. A mill will be erected near the South Fork of the Merced River and a tramway built from it to the mine. **John C. McGarry**, 3706 Fourth Avenue, Los Angeles, California, is vice-president and general manager of the Bonanza company. **J. W. Warford**, Mariposa, California, is consulting engineer. **Dr. H. G. Dewey**, Lewis Memorial Hospital, Yosemite National

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Park, California, owns the California mine and is president of Bonanza Mining Company.

W. A. Huelsdonk is operating two Huelsdonk concentrators on the tailings at the Engles mine, Crescent Mills, California, in the extraction and recovery of fine gold and platinum. The tailings are hydraulicked and fed to the concentrator through a pipe by gravity at the rate of 30 tons an hour. The Huelsdonk Concentrator Company, George Reimche, manager, Lodi, California, is leasing the Engles tailings.

The Pacific Placers Engineering Company is handling about 150 cubic yards of gravel an hour with its dry-land gold dredge which it has in operation 12 miles west of Plymouth, California. The dredging equipment was moved from Valley Springs, California. It is estimated that material sufficient for two more years' work is available at this site. W. W. Allen is in charge. E. H. Seaver, 1736 Standard, Glendale, California, is manager of the company.

The Walker Mining Company is handling approximately 1,500 tons of ore daily in its 2,300-ton mill and producing about 85 tons of concentrates at its Walkermine property in Plumas County, California. Approximate values per ton of 0.735 ounce of gold, 11.9 ounces of silver, and 25.98 per cent copper are reported. A large electric hoist is to be installed at the Piute shaft of the mine. H. M. Hartmann, Walkermine, is manager. A crew of 540 men is employed in the mine and mill.



Equipment installation has been completed by the Ward United Mines Company at its property near Ward, Colorado. A Diesel generator plant, large compressor, pumps, and electric hoist have been set up. Equipment is by Ingersoll-Rand and was furnished and installed by the Western Machinery Corporation. J. E. Emmons, 305 Denham Building, Denver, is president.

A ball mill is being installed in the Crisman mill in Boulder County, Colorado, by J. W. Pherson of Boulder and associates who have acquired the plant from Mack and Bailey to handle ore from the Yellow Pine group near Crisman. The Pherson group took a lease on the property and equipped it with a two-drill compressor, new pipeline, and new track. Production will be started soon.

It is reported that the Golden Cycle Corporation, which is driving the Carlton tunnel at Cripple Creek, Colorado, has encountered the first heavy flow of water in the tunnel in what is believed to be the El Paso water course. Such flows in increasing volume are expected from now on. John R. Austin of Cripple Creek is tunnel superintendent. The company expects to cut the Portland shaft in April 1941, and immediate connection will be made before continuing the tunnel. Then tunneling will be resumed in two headings,

one to the Vindicator shaft and one to the Cresson.

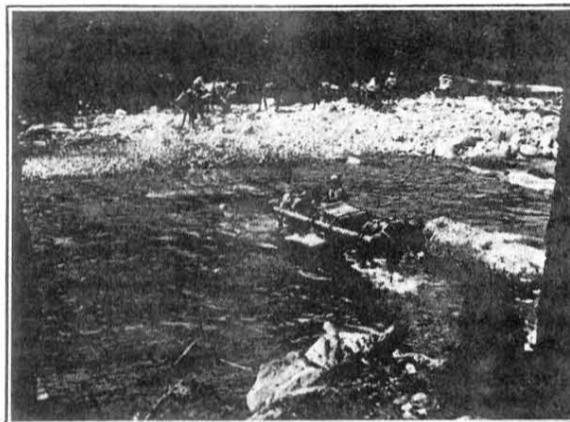
The Wolf Tongue Mining Company has changed from water to electrical power at its mill in Boulder County, Colorado, because of freezing weather. However, the plant will continue to operate two shifts daily, treating 30 tons of tungsten ore. New rolls were recently installed. W. G. Roseborough of Nederland is mill superintendent. William Loach, Box 25, Boulder, is vice-president and general manager of the company, which operates its Illinois, Illinois Extension, and Western Star mines and leases the rest of its property. Charles Meyring was leasing the company's Lone Jack mine until he was forced to suspend

because his equipment was not suitable for winter weather. Jonas Johnson and son, Ralph, of Louisville, Colorado, are working the company's Hammer mine. They recently installed a new compressor.

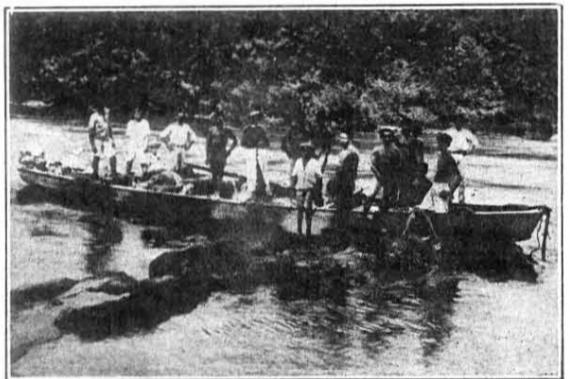
S. F. Wright of Boulder, Colorado, is reported to have relinquished his lease on the Emancipation mine and dumps in the Salina district near Boulder. Wright has held the lease for the past year and has been subleasing on a split-check basis. He plans to confine his attention to the Amy Paul mine near Eldora which he and others leased several months ago from J. B. Rooney of Eldora. The Amy Paul ground includes the Amy Paul No. 1, Compromise,

(Continued on Page 22)

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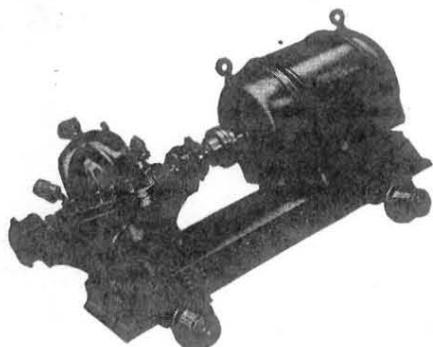
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MANGANESE PLANT IS PLANNED NEAR MODESTO, CALIFORNIA

ACCORDING to reports, a manganese plant will be erected in the Modesto, California, district, by the Western Electrolytic Products Company of Sacramento, California. The equipment will provide for treatment of manganese under a process developed by the United States Bureau of Mines. The Modesto site was selected because of its location in the center of California's manganese district. Electrolytic manganese, which is obtainable from ore as low grade as 20 per cent, will be produced. This process has an advantage over the old one, which required ore of at least 48 per cent. The new metal is claimed to have all the qualities of ordinary manganese in addition to many new uses. Knoxville, Tennessee, is said to have the only other plant licensed to use the process.

The company, of which L. G. Nisbet, Room 401, Nicolaus Building, Sacramento, California, is one of the principals, has been granted a permit by California Corporation Division to sell \$350,000 worth of stock at \$1 par value. J. M. Crowell, formerly of Nevada, will be in charge of the plant.

WAGE-HOUR DIVISION CONFERS ON METAL MINING PROBLEMS

AN informal fact-finding conference on metal mining problems under the Wages-and-Hours Act was held in Salt Lake City on December 11 and 12. Similar conferences are planned later in the month in Birmingham, Alabama.

Wesley O. Ash, western regional administrator of the Wage-Hour Division, announced that Colonel Philip B. Fleming, national administrator, would attend the Birmingham meeting where he would issue an advisory opinion governing hours practices in the metal mining industry.

The purpose of the conference is to determine what time should be paid for as "hours worked" under the Wages-and-Hours Act. The controversy relates to whether miners should be paid from the time they enter the mine until they leave or for the time they actually work at the face.

The Salt Lake City sessions were attended by representatives of industry, labor, and other interested parties and testimony was presented on the longest, shortest, and average time required to reach the face from the portal of the mine; means of transportation within the mine; amount of time consumed in getting tools and changing clothes; customary practice on payment for time spent traveling from the portal to the working face and return; union agreements or state laws governing the computation of working time; amount of time spent at the working face and estimates of the minimum time required for completing a round of work; and other pertinent factors.

Administrator Fleming pointed out that any interpretation announced as a result of the conferences would be merely an informal opinion to be used as a guide in the enforcement of the act. However,

his interpretations are considered to be of considerable importance inasmuch as the Supreme Court has held that interpretations by the administrator are entitled to great weight in determining decisions.

NEW COMPANY TO OPERATE GREENHALGH'S BANNER MINE

THE Banner Consolidated Mines, Inc., has been organized by the Greenhalgh Enterprises to take over the Banner silver property in the Banner district of Boise County, Idaho, eight miles from Idaho City. For the past year the Greenhalgh Enterprises have been opening the Banner mine, preparing for extensive development and production. Several truckloads of high-grade silver ore were mined and shipped to the American Smelting and Refining plant at Garfield, Utah.

The work to date indicates that the mine justifies the expenditure necessary to develop the ore to a depth of 100 feet. In order to do this a 120-foot winze will be sunk and 600 feet of drifting done on the veins. A larger air compressor plant will be installed and a 25-ton mill will be erected.

The new operating concern will have offices in Idaho City, Idaho, where M. C. Greenhalgh and Cy W. Greenhalgh are located, and in Salt Lake City, where Dave Greenhalgh of 1347 Gilmer Drive is in charge.

SOWBELLY DINNER ANNOUNCED BY COLORADO ASSOCIATION

THE Colorado Mining Association has announced that on January 24 and 25, 1941, it will hold its annual convention at the Shirley-Savoy Hotel in Denver. This year the convention is to be in the nature of a general round-up of all mining men who at some time in their lives have mined in the state of Colorado. The association also extends invitations to all those who, while not active in mining, are still endowed with the same mining spirit which prevailed in the west during the early days.

On the first evening the Silver Banquet will be held and the ladies are invited to attend. The famous Sowbelly Dinner will be staged the second evening and is traditionally a stag affair. Jesse F. McDonald of Denver and Leadville is president of the association and Bob Palmer of Denver is secretary.

NEW LABORATORY FACILITIES BEING BUILT AT SALT LAKE

THE contract has been let for the construction of additional laboratory space in the Bureau of Mines building at Salt Lake City, Utah, which is expected to cost about \$70,000. In addition, about \$100,000 worth of laboratory equipment will be installed. The work is being done as a part of the national defense program and will provide facilities for experiments on treatment of domestic manganese.

The present building is a new structure, three stories high in front, with only one floor of laboratory space. The staff of the bureau will be augmented to about 80 persons, including technicians, clerks, laboratory assistants, and others, all of whom will be taken from civil service lists.

PHIL BURCH* discusses

Single-Arch Dams For Debris Control

JANUARY 1941 will see the completion of the Upper Narrows Dam, key unit in the series of hydraulic debris dams being constructed by the California Debris Commission on behalf of the hydraulic mining industry.¹ The work is in charge of the Corps of U. S. Army Engineers.

These dams are all of the type known as the "single-arch" dams, and were so designed because such a structure was particularly suitable to the dam sites selected. They also are cheaper to construct than the gravity-type concrete dam, or rock-fill dams.

Most of the single-arch dams in the United States have been built in the west. Fundamentally, they consist of arches, circular in horizontal section at all elevations. Unlike gravity dams, the stability of single-arch structures is dependent upon the strength of the concrete used rather than upon the mass of weight involved.

The arch dam is not an engineering innovation, the first one having been constructed in Italy in 1611. This dam was named the Ponto Alto, and was built in a narrow canyon near Trentino. It was constructed of cut-stone masonry. Originally 16 feet high, it later was raised to a total height of 124 feet. Some idea of the margin of safety obtainable in this type of dam can be gained from the fact that in spite of the greatly increased hydrostatic head thus developed upon the lower part of the dam, that portion of it never has been reinforced.

The real development of the single-arch dam began about the middle of the nineteenth century, several being built in Italy during that period and some in the United States and Australia. The highest up to 1900 was the original Ponto Alto. After the turn of the century construction and design moved forward rapidly, resulting in the Pathfinder Dam (210 feet) and the Shoshone Dam (328 feet) between 1905 and 1910.

Since 1910 numerous dams of the single-arch type have been built throughout the west. They include: Lake Spaulding, California, 275 feet; Bullard's Bar, California, 183 feet; Cushman Dam, Washington, 280 feet; Pacoima Dam, California, 370 feet; and Diablo Dam, Washington, 389 feet.

THE earlier arch dams were generally built with a vertical upstream face having a constant upstream radius from crest to base of dam. In those earlier designs, the stresses due to water load were assumed to be the same as those for a thin cylinder, that is that the stress in any horizontal arch ring one foot in height was equal to the pressure on the extrados multiplied

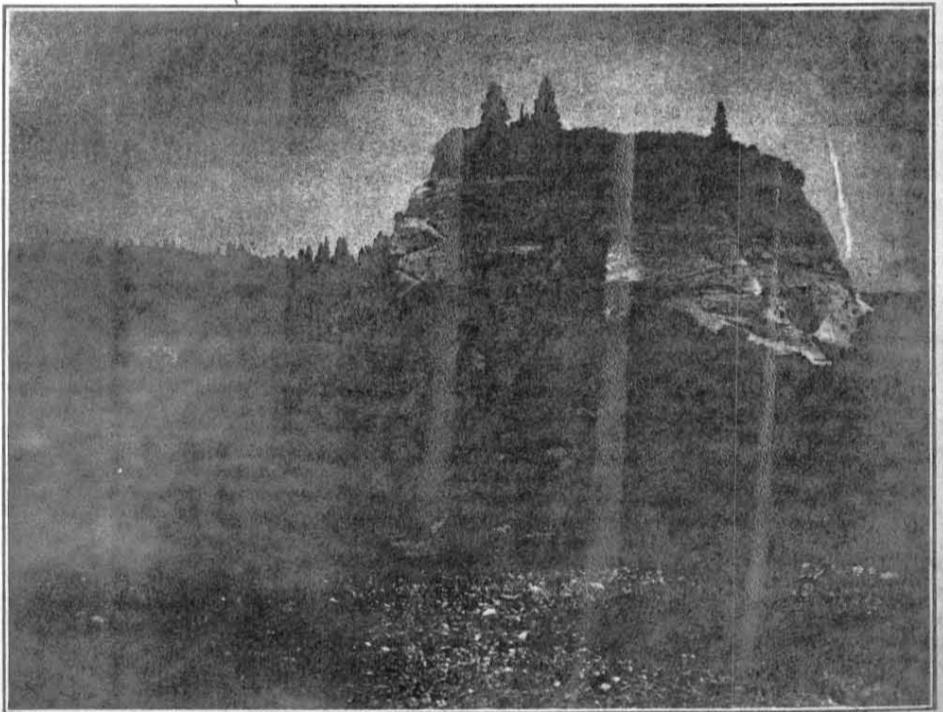
Concrete, single-arch dams of the overflow type are being built on the Yuba and American rivers to permit resumption of hydraulic mining in California. Many factors entered into the selection of this type of structure as the one best suited to the sites chosen for storage of mining debris. The Upper Narrows, the second of these dams, is scheduled for completion in January of 1941.

by the radius of the upstream face and divided by the thickness. No account was taken of the stresses due to rib-shortening of the arch under load, nor of the stresses due to changes in temperature.

About 1912, another type of the single-arch dam made its appearance and was destined to play a large part in the development of arch dams. Using the so-called cylinder formula as a means of determining stresses in the arch, L. R. Jorgensen, member, American Society of Civil Engineers, found that for an arch of given span, unit water load and stress, the minimum volume of concrete in the arch was obtained when the subtended angle of the arch was $133\frac{1}{2}$ degrees. He also showed that for a change

in central angle of 15 degrees either way, the relative volume was changed but a small amount. With this as a basis for design, he proposed to make the central angle of the horizontal arches at all elevations as nearly as possible constant by decreasing the radii of the arches progressively from crest of dam to base. He gave to this type of dam the name constant-angle arch dam.

Jorgensen's idea was prompted entirely by motives of economy in dam construction, but this principle was to have even more importance on the design of arch dams, when more rational formulae were used in stress determination. The cylinder formulae was still used extensively in arch-dam analysis, but about 1920 it began to fall into ill repute. Various means of analyzing arch dams had found their way into technical literature, particularly the publications of the American Society of Civil Engineers. In the various methods of analyses proposed about 1921, the authors of those papers gave consideration to the deformation of arches under load and the stresses induced by temperature changes. One of the more forward looking and widely accepted methods of arch-dam analysis was published in the 1922 transactions of the American Society of Civil Engineers. This paper, entitled the "Circular Arch Under Normal Loads," was the work of



A portion of an old hydraulic pit near North San Juan, in Yuba County, California. The island in the foreground was unmined because of litigation. It represents one claim and is nearly 200 feet high. Note the tunnels into the island where drifting has been carried on. —Photo by Phil Burch.

*Seneca, California.

¹See *The Mining Journal*, April 30, 1939.



The Upper Narrows Dam, on the Yuba River, near Marysville, California, as it appears from the air.

—Photo by Steve Hust.

the late Professor William Cain. All formulae were derived by the principle of least work. They give the arch thrust, bending movement, and radial shear at any point due to water load, as well as the crown deflection for arches either fixed or hinged at the abutments. That their mathematical accuracy is indisputable is shown by the fact that his formulae for bending moments and deflection become identical for those of straight beams when the radius of the arch approaches infinity as a limit and the subtended angle correspondingly approaches zero.

Cain's analytical work served as a foundation for similar studies of other factors influencing stress distribution in the arches of dams. Notable among these studies are those of B. F. Jakobsen on stresses in thick arches of dams, the effect of lateral strains, and the effect of water soaking of the concrete. Dr. Vogt's greatest contribution was the development of formulae for stresses due to water load where consideration was given to the deformation of the rock abutments.

ALL the foregoing studies were used in designing the debris dams. In addition, formulae for stresses due to the overhanging crown section of the type of arch dam finally erected were developed by the Sacramento, California, office of the Corps of United States Army Engineers.

Before the final plans were drawn investigations were made to determine the pressure developed on the upstream face of the dams due to the debris to be impounded in the reservoir. Samples of similar debris were taken from existing debris reservoirs and shipped to the U. S. Water-

ways Experiment Station at Vicksburg, for the purpose of determining experimentally the unit pressure to be used. As a result of the Vicksburg experiments and analysis of the data collected, it was concluded that the pressure exerted by the debris was equivalent to that exerted by a perfect fluid having a weight of slightly less than 70 pounds per cubic foot. Consequently, the California Debris Commission adopted 70 pounds as the equivalent loading to be used in the design of the dams.

Arch-dam design is accomplished largely by trial, numerous designs being made and analyzed by proved methods. The final design is one best suited to the bedrock as shown by exploratory work and which has the minimum volume of concrete without exceeding permissible maximum stresses.

The debris dams are all overflow structures with no separate spillway structure provided. The arch dam was especially suitable in this respect as the bedrock upon which the dams were constructed is sufficiently massive and durable not to be injured by the impact of the overflow. Also an adequate supply of air is admitted under the nappe so that alternate forming and breaking of a vacuum will not set up undesirable vibration—this was accomplished by constructing adequate aeration piers on the crest of the dams.

Concrete shrinkage, due to dissipation of chemical heat, was off-set by constructing the dams with radial contraction joints. Before final closure of the diversion works and after the chemical heat of setting was entirely dissipated, the contraction joints were pressure grouted to off-set shrinkage. As an aid in determining the proper time for grouting, electric resistance thermometers were imbedded in the concrete.

The Upper Narrows Dam, due to the comparatively high head developed, will be used to generate electric power. Outlet works and pressure tunnel were provided in the initial construction.

The Upper Narrows dam, largest of the group, was constructed by L. E. Dixon Company of Los Angeles and the Arundel Corporation of Baltimore, Maryland.



WILLIAM CARNIE, JR.,* reports

Expansion in Domestic Chrome Production

IN CASE of a war emergency, domestic chrome producers could supply up to 150,000 tons of high-grade chromite suitable for civilian industries and military uses, according to Alwyn H. Wild, president of United States Chrome Mines, Inc. This production, which represents almost half the average United States consumption during the five-year period 1935 to 1939, inclusive, has been made possible through two important developments in the processing of chromite concentrates recently perfected by his company, Wild states.

Production of chromite for domestic use from extensive deposits in the western states has been retarded by two factors, he explains. The steel industry, which uses 75 per cent of the chrome consumed in the United States, requires the delivery of chromite in lumps which have a chrome-to-iron ratio of not less than three-to-one. Similar specifications have been adopted by the federal government to cover stock-pile purchases under the strategic materials act.

Because the larger western chromite deposits carry a low percentage of chromite crystals, although fortunately of a high-grade tenor, it is necessary to mill the ore and extract a concentrate to turn out a product with the acceptable chromic oxide content of 48 per cent. This concentrate, however, is still of a lower chrome-to-iron ratio than the required three-to-one, actually averaging around two-to-one.

In order to meet physical specifications set by the government and the major portion of the steel industry, U. S. Chrome Mines, Inc., developed a chrome briquette or synthetic lump which can readily be produced from chromite concentrate. In May of 1940, the company submitted an offer of 17,500 tons of these briquettes to the government, but was turned down because of the unsatisfactory chrome-iron ratio. The difficult problem of reducing the iron content of the ore remained unsolved until late in October.

It was then that company research workers, after extensive experimentation in collaboration with Wild, are said to have perfected a method of bringing up the chrome-to-iron ratio of their product and at the same time producing certain by-products which will pay a substantial part of the processing costs.

It has been established that under an intense electric furnace three-phase arc, the briquettes melt just as does solid chromite; no segregation of particles takes place. The briquettes also can be transported readily and stored with less loss than natural ore and during any period

Marked advances in methods of producing chromite concentrates are reported by the U. S. Chrome Mines, Inc., principal domestic producer of this important strategic metal. Holdings of U. S. Chrome, including the famous Pilliken mine in El Dorado County, California, accounted for virtually the entire domestic production of chromite during 1938 and 1939.

of time will produce less fines than the lump product, Wild states.

WILD and the U. S. Chrome Mines, Inc., now hold some two-thirds of the chrome properties in California, Oregon, and Washington having proved production records. These deposits, Wild predicts, can be brought to produce 100,000 tons of chromite concentrates annually, while other domestic properties can be expected to yield another 40,000 to 50,000 tons.

Through application of the new process, the original concentrates, produced by gravity concentrate, can be treated and converted into a like tonnage of briquettes. These briquettes can contain 48 to 58 per cent chromic oxide, have a chrome-to-iron ratio of three-to-one or higher, and will be suitable for the steel industry and for government stockpiles, Wild asserts.

At present, the only important domestic chrome producing property is that of U. S. Chrome Mines, Inc., in El Dorado County, California. This group of mines extends over 2,400 acres and the entire output, which amounts to 20,000 tons annually, is purchased under contract by the Rustless Iron & Steel Corporation of Baltimore, Maryland, rated as the world's largest producer of stainless steels, and the only plant in the world engaged in the manufacture of stainless steels exclusively.



Milling plant at the El Dorado County, California, holdings of United States Chrome Mines, Inc.

Because of a special process used by Rustless Iron & Steel Corporation, the delivery of lump ore with a specified chrome-iron ratio is not required. Consequently, concentrates are shipped east from the El Dorado County property exactly as they leave the mill.

This property, which includes the well-known Pilliken mine, produced more than 20,000 tons of lump ore and concentrates in 1918, and yielded virtually the entire domestic chromite output during 1938 and 1939. The revival of operations by U. S. Chrome Mines, Inc., started in 1936 when a 50-ton pilot mill was installed. In 1939, a 200-ton mill was placed in operation; and soon after Hitler's invasion of Poland made it plain that a world war was inevitable, Rustless Iron & Steel Corporation cooperated in the installation of a 300-ton plant to assure a domestic source of chromite for its Baltimore operations.

Should government stock-pile orders make a market available, Wild states, plants similar to the one in El Dorado County could be installed immediately at mines throughout the Pacific Coast states to make the 100,000-ton annual production possible.

Importance of this potential domestic chromite output can be judged from the fact that chrome is listed by both the war and navy departments as one of the four most essential strategic minerals. In the five-year period ending with 1939, total apparent consumption of chromite in the United States was set at 1,809,938 tons by the U. S. Bureau of Mines, while only 7,531 tons were produced in domestic mines. The entire yield came from California with the exception of small tonnages produced in Oregon in 1937 and 1939.

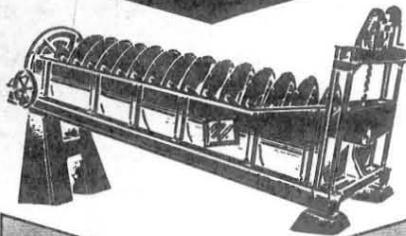
Although primary efforts of the U. S. Chrome Mines, Inc., to date have been slanted toward making available a domestic chrome supply in case of a war emergency, Wild has visualized a more substantial basis for a permanent west coast chrome industry.

With a plentiful supply of chromite assured, Wild believes manufacturing plants can be set up in the west to produce chrome products such as ferrochrome, chrome chemicals, and chrome bricks, that will be entirely competitive at normal peace-time prices with similar products manufactured in eastern states with the foreign chromite at present delivered to the Atlantic seaboard.

Economic manufacture of chrome-iron alloys such as stainless steel could be effected through the use of local chromite, scrap iron formerly sold to Japan at low prices, and low-cost electric power available at Bonneville and Boulder dams.

*San Francisco, California.

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pointed California representative for the Davenport Mining and Milling Company, which operates near Auburn, California, and for the Martin-Walling Mining Company, operating near Coulterville, California.

Wilbur H. Smith, who has been employed at the Leonard mine of the Anaconda Copper Mining Company at Butte, Montana, has been transferred to the Anaconda affiliate, International Smelting and Refining Company at Battle Mountain, Nevada, where the latter is doing diamond drilling.

Lewis R. Robins, mining engineer of Reno, Nevada, has been retained by the Smith Valley Gold Mines, Inc., Frank C. Olive, Chamber of Commerce Building, Indianapolis, Indiana, president. The Smith Valley concern is developing and exploring the old Ambassador Gold placer property.

Hugh W. Coke has been appointed superintendent of the Atolia Mining Company, Atolia, California, succeeding L. E. Putnam, resigned. Coke has been associated with the Bradley interests for 10 or 12 years and has recently been in Juneau, Alaska, with the Alaska-Juneau Gold Mining Company.

John L. Bischer, 1212 Spring Arcade Building, Los Angeles, California, is a member of the Los Angeles group who are backing the opening of the Silver Prince mine in the Irish Mountain district of Lincoln County, Nevada. Accommodations have been provided for 12 men and machinery is being installed.

J. Owen Ambler, who has been in Turkey for the past two years as resident engineer for the Eti Bank of Ankara, Turkey, has returned to the United States and is addressed at 518 West Craig, San Antonio, Texas. He was employed in construction of a concentrator, smelter, and hydroelectric plant at Murgul.

Frederick P. Gaethke, who was manager of mines for the Anaconda Copper Mining Company's interests with headquarters at Katowice, Poland, is now at Battle Mountain, Nevada, with the International Smelting and Refining Company, controlled by Anaconda, which is diamond drilling the Copper Canyon properties.

Robert S. Moehlman, 600 Gordon Avenue, Reno, Nevada, of the geological department of the Anaconda Copper Mining Company, is now engaged at Battle Mountain, Nevada, where the International Smelting and Refining Company is diamond drilling the Copper Canyon property under a six-month option.

Norris Charles Stone has been appointed resident engineer at Antamok Goldfields Mining Company, Baguio, Mountain Province, Philippine Islands. Stone resigned as mill shift boss at Antamok Goldfields in 1939 to join the staff of North Camarines Gold Mining Company, Paracale, with which company he remained until his recent transfer.

Robert F. Brown has been appointed mill superintendent at Batong-Buhay Gold Mines, Inc., Lubuagan, Kalinga, Mountain Province, Philippine Islands. Brown went

to the Islands in July 1937 to take over the duties of mill superintendent for Royal Paracale Mines, Inc., Balete, Masbate. In March 1939 he resigned his position with Royal Paracale to become associated with North Camarines Gold Mining Company as general mill foreman.

G. A. Joslin, 311 Financial Center, 704 South Spring Street, Los Angeles, California, was elected president of the Mining Association of the Southwest at its annual meeting. Howard Kegley, mining editor of the Los Angeles Times, First and Spring Streets, Los Angeles, was elected first vice-president; Robert Linton, consulting engineer, Los Angeles, second vice-president; and Victor J. Hayek, also of Los Angeles, was reelected secretary of the association.

Eugene A. White, manager of the American Smelting and Refining Company's plant at Tacoma, Washington, has been elected director of the Northwest Mining Association. Other directors for the coming year are Rowland King, consulting engineer of 424 Symons Building, Spokane; R. K. Neill, 1706 Ninth Avenue West, Spokane; and Jens Jensen, secretary of the Pend Oreille Mines and Metals Company, Old National Bank Building, Spokane.

A. C. Oberg, mining and valuation engineer of Duluth, Minnesota, with offices at 503 Court House, has been in Hawthorne, Nevada, making a report on the Lucky Boy property of the Champion City Mines, Inc., for Minnesota and Michigan investors. The new interests are considering joining the Urpo Kyto interests of Duluth in the financing of large-scale work. Oberg served as consulting engineer of the State Securities Commission of Minnesota from 1917 to 1933 and as such reported on many properties in this country, Canada, and Mexico.

John A. Burgess, manager of the Carson Hill Gold Mining Company, Melones, California, has been reelected president of the Mother Lode Mining Association. P. R. Bradley, Jr., manager of the Pacific Mining Company, Bear Valley, California, and W. D. Manning, of the Argonaut Mining Company, Ltd., Jackson, California, also were reelected as vice-president and secretary-treasurer, respectively. The association, recently incorporated, does not operate for profit, but was organized for the purpose of encouraging the development of mining properties in the Mother Lode district of California.

LAVA CAP GOLD EMPLOYEES RECEIVE CHRISTMAS BONUSES

ACCORDING to an announcement by Otto E. Schiffrer, general manager of Lava Cap Gold Mining Corporation, Nevada City, California, more than \$7,000 in Christmas bonuses was distributed to employes of the company.

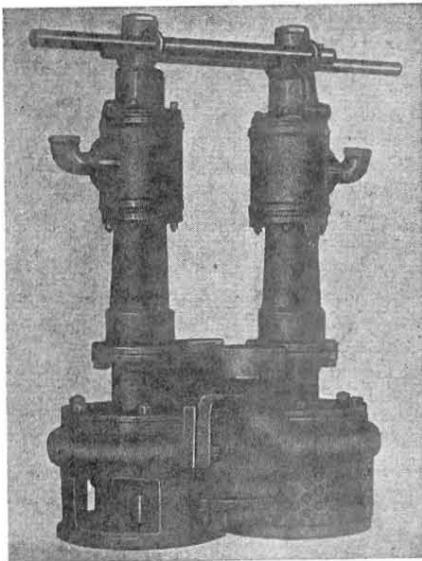
Twenty-five dollars was given to those in the service of the company for over one year; \$10 was received by employes of less than a year but more than a month; and \$5 was given to those working less than a month.

The company employs approximately 350 workers.

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which time it produced in excess of \$20,000,000, attained a vertical depth of 5,850 feet, and is classed as the deepest gold mine on the North American continent.

His love for, and his devotion to the cause of mining needs no elaboration. Suffice it to say, he has carried its banner, "full high advanced," and has passed it on untarnished and unblemished, to be borne by us to generations yet unborn; may its effulgence ever continue as a beacon light to all.

I can offer no higher tribute to his memory than to charge him with doing unto others as he would have them do unto him. His many humanitarian activities, known only to those who enjoyed his association and confidence, will ever remain as pleasant memories. Humbly and gratefully we give thanks for the privilege of having known him.

(Signed)

G. CHESTER BROWN.

135 ATTEND ENGINEERS' MEETING AT RAY, ARIZONA

THE annual meeting of the Arizona section of the American Institute of Mining and Metallurgical Engineers, held at Ray, December 14, 1940, drew an attendance of approximately 135 Arizona engineers and students and faculty members from the University of Arizona.

The day was spent in an inspection of the mines at Ray and the mill and smelter at Hayden, while technical discussions pertaining to their operation comprised part of the evening's program.

Robert W. Thomas, general manager of the Arizona division of Nevada Consolidated Copper Company at Ray, was unanimously elected chairman of the group for the coming year, succeeding Brent N. Rickard of Tucson. Robert W. Hughes, assistant general manager of Miami Copper Company, Miami, was elected vice-chairman; Hubert O. Woods, assistant superintendent of American Smelting and Refining Company, Hayden, secretary-treasurer; and Frank A. Wardlaw, Jr., assistant general manager of Inspiration Consolidated Copper Company, Inspiration, national director. Wardlaw will represent the section at all national meetings.

PAPER ON GOLD QUARTZ VEINS OF GRASS VALLEY IS AVAILABLE

THE Geological Survey Professional Paper Number 194, "The Gold Quartz Veins of Grass Valley, California," has been completed and may be secured from the Superintendent of Documents, Washington, D. C., at a price of \$2.50. The work was compiled by William D. Johnston, Jr., field geologist for the United States Geological Survey, who spent several months in the Grass Valley district in underground research.

The 98-page booklet is paper bound, well illustrated, and contains several maps of the principal workings of the Grass Valley vein structure by isometric blocks. It is said to be the most complete work on this area since the Waldemar Lindgren reports and maps and to contain more factual information than the former writing.

DOLBEAR COMMENTS ON THE STRATEGIC MINERAL PROBLEM

SAMUEL H. DOLBEAR, mining engineer of New York City, declares there is a conflicting school of thought on the desirability of a prewar production from domestic deposits of the so-called "war minerals." One group, he says, contends that stockpiles of foreign ores should be accumulated, leaving domestic ores in the ground until needed, while a second group points out that domestic deposits are not to be regarded as readily available reserves, since much time and preparation is necessary to bring them into production.

Emphasizing the latter point, Dolbear calls attention to the fact that domestic operation also brings into play the search for and discovery of new deposits. Of this fact, he states:

"Recognizing this, the National Defense Commission may be said to be committed to a policy of encouraging the development of, and production from, domestic sources at this time. The principle has also been recognized by Congress in its acts appropriating funds for the Bureau of Mines and Geological Survey to enable them not only to study regions in which deposits are known to exist, but actually to explore promising occurrences and to conduct research work on the beneficiation or other utilization of low-grade and off-grade ores.

"Discretion as to the location, character, and extent of this work is entirely in the hands of these two bureaus and this work is being prosecuted with all the equipment and men permitted by current available appropriations. The Geological Survey conducts geological studies aided in some cases by geophysical surveys, while the Bureau of Mines conducts actual exploration of the deposits by diamond drilling or other exploratory work necessary to determine the probable character and extent of these occurrences. At Salt Lake City, Utah, Boulder City, Nevada, and at Rolla, Missouri, the bureau has stations engaged in the study of beneficiation, metallurgical treatment, and utilization of ores. Research is conducted on ores of such types as are known to exist in sufficient quantities to play an important part in the defense plans. Obviously, it is impossible to attempt such work on the ores of small individual mines, the number of which is legion. Where deposits are privately held, the work is done under contract with owners. The terms give the government access to the property and the right to do such work as it deems advisable. The owner is provided with a map showing the work done and results obtained, and incurs no financial liability for expenditures made. Strategic minerals are given precedence over those in the critical list."

The so-called "strategic" materials include nine minerals which are essential to national defense, but for the supply of which dependence must be placed mainly on sources outside the United States. They include antimony, chromium, manganese of ferro-grade, mercury, mica, nickel, quartz crystals, tin, and tungsten. Dolbear points out that the government has adopted va-



The Solid Silver Mining Company began operation on October 15, 1940, of the 50-ton flotation plant at its property one-half mile west of Crescent Mills, in Plumas County, California. Work is on a three-shift daily basis and is under the direction of L. G. Cox, Greenville, California. Milling equipment consists of a 50-ton coarse ore bin feeding into a Wheeling jaw crusher, after which the material goes by belt conveyor to a 75-ton fine-ore bin. The fine ore is fed into a four by five Eimco ball mill which discharges into a 14-foot Dorr-type duplex classifier. The product from the classifier is discharged into three-unit Fagergren flotation equipment. The concentrates are shipped. Tunnel, shaft, and open stope methods are used in mining ore from a 10-foot vein which is stated to carry values up to \$15 a ton. F. J. Keller is in charge of underground work. The operation is financed by Fletcher Walker and associates, including Guy Porter, Susanville, and W. B. Laughead of Westwood, California.

The Plumas Development Company, E. R. Zeigerst, superintendent, Crescent Mills, California, is handling 10 to 25 tons of ore a day in its pilot mill from the property of the Mount Huff Mining Company near Crescent Mills.

Ned Story, Portola, California, has re-timbered 300 feet of haulage tunnel in his Mae West mine two miles east of Seneca, Plumas County, California. The property was known formerly as the Hazard.

Applications are being received by the California Debris Commission to mine behind the Upper Narrows hydraulic debris dam on the Yuba River near Marysville, California, which is scheduled for completion by the first of the year. Storage will be available after January 15, 1941. According to Colonel Warren T. Hannum, president of the commission, Post Office Building, Sacramento, California, costs are expected not to exceed 3½ cents a cubic yard of gravel mined. The power development program, which will reduce considerably storage costs to miners, is yet to be completed. Members of the engineering staff of the California Debris Commission and engineers of the Pacific Gas and Electric company are conferring in an endeavor to reach a solution whereby the Bear River dam may be constructed advantageously. Exploration is nearly completed at the lower Ruck-a-Chucky dam site where between 20 and 30 men are employed in the initial drilling and tunneling. Clarence E. Church is in charge of construction at the Ruck-a-Chucky site and Vernon L. Glaze is in charge of construction on both debris dams, both men of Auburn, California. Business offices for the Upper Narrows dam are located at the dam site and E. M. Whipple is superintendent.

A 12-inch vein of high-grade ribbon quartz is reported to have been contacted at a depth of 45 feet at the Arrastarar quartz mine two miles east of Paloma in Calaveras County, California, adjoining the old Guinn mine. At the present time ore is being sacked for transportation to a custom mill. A new hoist has been purchased and a headframe is being erected preparatory to further development of the property. The mine is owned by William Hunter of Paloma, California, with a group of Los Angeles associates. Tracy R. Bouseman is consulting engineer; Charles A. Isham, 230 Redwood Avenue, North Sacramento, California, is geophysical engineer; and Hunter is mine superintendent. A crew of four men is employed.

The Jackson quartz mine three miles west of San Andreas, Calaveras County, California, has been leased by H. M. and L. O. Kearns of Stockton, California. Equipment is being moved to the ground preparatory to exploration work. Several rich pockets are said to have been found on the property in the early days, and while the highway department was putting a cut through the area, a pocket was uncovered reportedly yielding over \$1,000. W. T. Watson, Valley Springs, California, is consulting engineer and Charles A. Isham, 230 Redwood Avenue, North Sacramento, is geophysical engineer.

William Richter and Sons, Oroville, California, is preparing to dredge on the Middle Fork of the Yuba River below the Freeman's Crossing bridge. The company has recently been operating about six

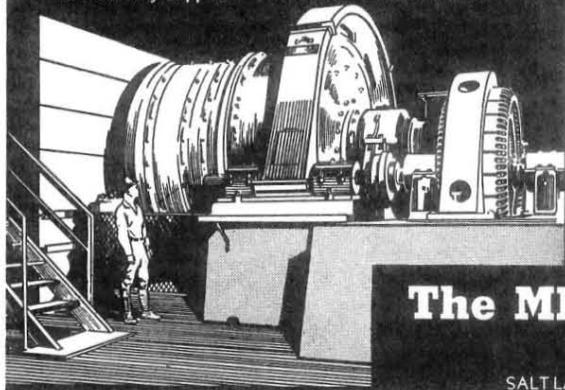
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262 or 33 cents a share in the preceding quarter and a net profit of \$293,752 or 29 cents a share on 995,820 shares outstanding in the June quarter of last year.

Drifting operations are under way both north and south of the shaft on the 112-foot level of the **Two Orphans** mine near Auburn, California, which is being operated by a group composed of Steve Kutcher, Frank Stein, Joe Slak and Joe Cukjati of Grass Valley. Some stoping is also being done in the south drift. The mine is equipped with a five-stamp mill.

It is reported that plans are being made to step up mill capacity at the **Brush Fence** mine, Auburn, California, in the near future. At present the property is equipped with a three-stamp mill, which is being re-conditioned. Underground crews are sinking on a promising three-foot ledge and ore is being stacked in anticipation of an early start of mill operations. A crew of eight men is working two shifts daily with C. C. Simpson as engineer in charge. The mine is owned by Charles Hopper Brown of Auburn.

Fred DeBerry, Garden Valley, California, who recently leased the **Rich Gulch** mine near Georgetown, California, is preparing to install equipment at the property, following a successful test run of 15 tons of ore at the Flint mill. Power is being installed at the mine by the Pacific Gas and Electric Company.

Fire of undetermined origin destroyed all surface buildings at the **Pioneer Lucky Strike** mine, located in the Pioneer district near Pine Grove, California, causing damage estimated at between \$50,000 and \$75,000. The fire is believed to have originated in the ball mill. In operation only a short time, the mine had been idle for more than two years due to litigation. The property is operated by the **Anozira Mining Company**, Pioneer Station, Pine Grove, California, David Horowitz, general manager.

A compressor and other machinery are being installed at the **Billy Owl** mine on the Mokelumne River, five miles south of Jackson, Amador county, California. A crew of 10 men is engaged in the installation work. The mine is owned by Preston Nuner, who is superintending operations. The shaft is 120 feet in depth and a 10-foot vein is said to carry commercial ore.

A construction program is planned for the **Lost Camp Gold Mining Company's** hydraulic mine near Blue Canyon, Placer county, California, early in August, preparatory to early resumption of activities next season. The program will include the provision of an additional water supply and about \$40,000 will be spent on improvements at the property. Plans have been made for the use of two pits during the coming season. George F. Buell, Emigrant Gap, California, is superintendent.

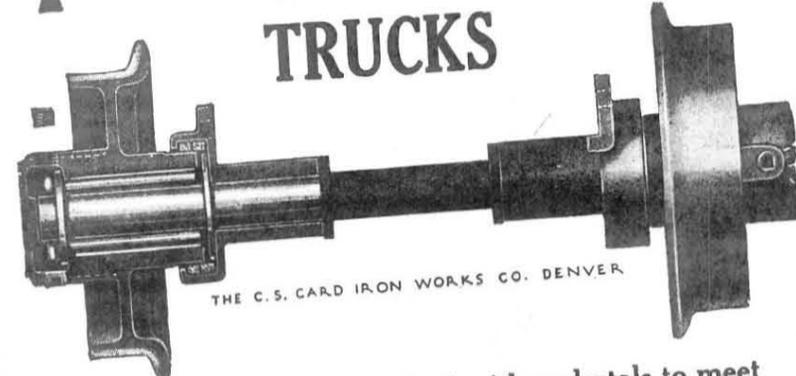
A milling plant is to be in operation soon at the **Two Brothers** mine, Big Oak Flat, California, operated by **Two Brothers Consolidated Gold Mines, Inc.** F. R. Stanley, 731 North Edison Street, Stockton, California, is the principal owner of the company.

The **Titanium Ferro Alloys Corporation** of Niagara Falls has taken under option the large deposit of molybdenum and tungsten ore located on Bloody Mountain near Mammoth Lakes, Mono county, California, and a crew of men is engaged in activities at the property under the direction of Eugene Thomas of Colorado. The ground has been under examination by the organization's engineers since last year. The

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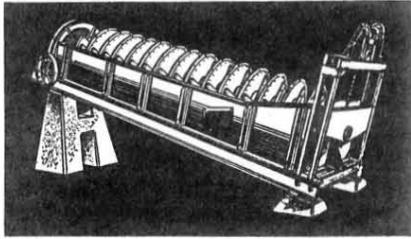


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miles east of Nevada City above Scotts Flat Dam on ground leased from the Nevada Irrigation District, Grass Valley, California.

The mill of the Del Norte Mining Company, J. W. Stivers, resident agent, Mojave, California, has been closed down during the winter months and will be reopened some time in March 1941. During the past eight months, approximately 7,000 tons of ore have been handled by the plant from the Del Norte, Gold King, and other mines in the district. The Gold King has supplied 1,300 tons during the period. C. O. Mittendorf, Box 321, Randsburg, California, is operator of the Gold King.

Milling operations are continuing steadily at the property of Highway 40 Mines, Inc., one-half mile west of Newcastle, California, with additional development work planned. The milling plant includes a 25-ton ball mill and a concentration and flotation unit. Heavy concentrates and free gold are saved in a Miners Foundry jig, while other concentrates, amounting to about five tons a month, are shipped to the Selby smelter. Two shifts are employed in the mill. A. N. Kangas, Auburn, California, is superintendent.

Satisfactory returns are reported from the Poverty Hill placer mine near La Porte in Sierra County, California, and arrangements have been made to continue steady operations throughout the winter months. The property includes at least a half mile of virgin channel which is being worked extensively. A crew of 25 men is employed under the direction of Army Adams, general superintendent, 714 West Main Street, Grass Valley, California. The mine is owned by A. J. Oyster, 650 Russ Building, San Francisco, California, and associates.

The Pacific Sulphur Company, operator of several large sulphur processing plants on the Pacific Coast, is conducting a gold dredging operation on 1,000 acres of placer ground in the Del Loma district of Trinity County near Weaverville, California. Equipment includes a 2½-yard bucketline dredge formerly used on West Weaver Creek by H. Helwig. The ground is in an unworked area adjacent to a number of old hydraulic mining properties, and portions of the land are said to have been enriched by gold washed down from nearby ledges and placers. Work is on a three-shift basis with Malcolm L. Benoist, Weaverville, foreman in charge.

Amador Coalition Mines, Ltd., M. D. Couch, president, 381 Bush Street, San Francisco, California, plans construction of a 25-ton test plant to determine the value of mill tailings at the Lotz mine near Nevada City, California. The company also maintains offices in McGill, Nevada, where the address is Box 956.

The Monty Mining Company is operating the Blue Bar placers in the Indian Creek district 10 miles above Happy Camp, California, under the direction of Bert Moore, general manager, and R. H. Wilson, assistant general manager, both of Happy Camp. A crew of six men is employed. The company is controlled by Seattle, Washington, interests.

Sixty tons of gravel a day are being washed at the property of the Glacier Mining Company, Seneca, California. Values are said to run from \$5 to \$25 a car. The mine was reopened last fall following a year's shutdown. William J. McMillan is general manager at the property.

A rich strike has been reported at the Droege mine near Greenville in Plumas County, California. The property has been reopened recently by North Canyon Mines, Inc., owner. Walter H. Parsons, Greenville, is general manager.

New equipment, purchased from the Co-chise Rock Drill Manufacturing Company, a division of Independent Pneumatic Tool Company, has been installed at the Jamison mine near Johnsville, California. Discovery of a vein, four or five feet in width and containing commercial ore reported to average about \$20 a ton, was made recently at the Jamison. The mill is operating steadily. R. W. Cunningham, Johnsville, is in general charge.

A crew of men, under the direction of R. L. Wetherbee, is engaged in drilling several test holes, ranging in depth from 50 to 250 feet, in the Morris Ravine area near Oroville, California. The section comprises such old mines as the Butterfly, Wagner, and Old Glory. If the testing operations prove gold-bearing gravel exists, the entire area, including the unworked portion, is expected to be mined.

Alaska Juneau Gold Mining Company, P. R. Bradley, president, 1022 Crocker Building, San Francisco, California, has reported a lower estimated profit of \$89,500 for November 1940, which is attributed to smaller production and poorer grade ore combined with slightly increased operating expenses per ton. The amount does not provide for depreciation, depletion, and federal income taxes, and compares with an estimated operating profit taken on the same basis, of \$108,000 for October and \$128,100 in November 1939. The 1940 November figures bring the total estimated operating profit for the first 11 months of the current year to \$1,109,100 as against \$1,231,400 in the corresponding period last year. During November 1940, 396,080 tons of ore were mined and trammed to the mill.

The Sierra Kings Mining Company, headed by Ted LeMaire, president and general manager, 132 Main Street, Nevada City, California, has suspended operations at the Three Kings mine near Al-leghany, California.

Work has been discontinued indefinitely at the property of King Solomon Mines Company, Forks of Salmon, California. The mine is equipped with a 300-ton amalgamation plant, but milling operations have been suspended for the past several months while underground development was in progress. Wilbur H. Grant, 582 Market Street, San Francisco, California, has been directing the work. The property is controlled by A. O. Smith Corporation of Milwaukee, Wisconsin.

A rich strike has been reported at the Fort Ann mine near Volcano, in Amador County, California. The discovery was made in a tunnel that had been driven a

distance of 350 feet. F. W. Kent and J. C. Nimmo, Volcano, are owners of the ground.

E. A. Montgomery, Virginia City, Nevada, is reported to have acquired interests in two tungsten properties near Bishop, California, and plans extensive production in 1941.

The Pacific Minerals Company, Ltd., is dismantling its crushing unit and shipping the machinery from its plant near Angels Camp in Calaveras County, California, to Placerville, California, where the company has another plant. The equipment includes two crushers, one of 6-ton capacity. The mine, which produces greenstone, is located just outside the city limits of Angels Camp. Charles Renwick, Jr., Box 1546, Richmond, California, is manager of the company.

Roseklip Mines Company, Henry S. Sweet, general manager, Bodie, California, has nearly completed the reconstruction and enlargement of its mill, the crushing and scrubbing units of which were destroyed by fire in September. New machinery is being installed, and the daily capacity of the plant will be increased to 600 tons. J. C. Haun is superintendent at Bodie. The company is a co-partnership composed of J. N. Rosekrans and H. W. Klipstein, both of 206 Sansome Street, San Francisco, California.

A five-stamp mill, operating on a two-shift basis, is handling an average of 50 tons of ore a day at the Old Slave mine in the Grass Valley district of California. Development, including drifting, is in progress on two levels. Al Adams of Grass Valley is working the property and expects to conduct work on a larger scale in the near future.

Hydraulic mining will begin at the Relief Hill mine as soon as there is sufficient rain or snow to provide water for the operations. Work at the property for the past two or three years has consisted mainly in preparing and keeping the mine in condition for operation when the new Upper Narrows debris dam at Smartville, California, is completed. The dam will be ready for storage purposes after January 15, 1941. C. E. Clark of North Bloomfield, California, is managing the property, which is owned by Western Gold, Inc.

Ed McBroom, Cecilville, California, has purchased the Farnsworth hydraulic mine near Cecilville, and plans to begin operations in the near future.

Sonoma Quicksilver Mines, Inc., is unwatering the lower levels of the Mount Jackson quicksilver mine near Guerneville, California. Approximately two years' supply of ore is estimated to be available above the water level. The mine is 600 feet deep, but present mining is being carried on at a depth of about 60 feet. The first ore supplied to the 75-ton Gould rotary furnace came from a dump left from previous operations. Production has been underway since September, the output for that month amounting to 85 flasks of mercury, and in October, 100 flasks. About 25 men are employed under the direction

of S. F. Wickham, mine superintendent, Guerneville. H. D. Tudor is president of the company, with headquarters at 58 Sutter Street, San Francisco.

Operations have been suspended at the Marble Cone and Willow Creek placers in the Bucks Lake district of California by the Roberts Island Dredging Company, Antioch, California. Because of the increased wartime demand for steel and other materials, the company has been unable to secure machinery and mine supplies. It is expected that work will be resumed in the spring at both properties. Jack Lowe is superintendent.

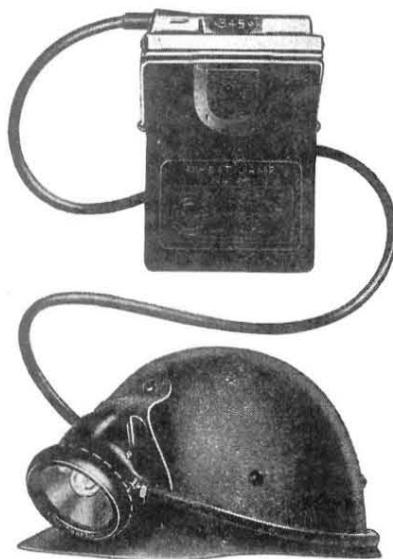
A crew of 18 men, under the direction of M. E. Volin, mining engineer with the strategic minerals division of the United

States Bureau of Mines, Southwest Experiment Station, Tucson, Arizona, is testing on the old Ladd manganese property in California. Tunnels have been driven on two levels and diamond drilling is in progress on another.

The Horse Shoe Dredging Company of Placerville, California, is working on the Gertzen ranch near Altaville, California. The plant was moved to the present location from Ione, California. Several months' work is estimated to be available at this site. It is understood that the company may secure additional ground in this section. George Butler is manager.

New crushing equipment, operated by a newly installed Diesel power plant, has replaced the two 20-ton crushers in the

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Lantz custom mill on the property of the **Diamond Mountain Mining Company**. Flotation cells, just installed, are said to recover 94 per cent of the ore values. The equipment change was made to accommodate an increased supply of ore following a recent strike on the holdings. The plant is located on the McDow property six miles south of Susanville, California, and R. S. Bartholf is in charge with a crew of 12 men employed. Bob DeFossett is in charge of the mine, operated by the company. Five claims of the holdings are being worked by lessees. A. G. Lantz, 1115 Delmas Avenue, San Jose, California; Ralph Fitzpatrick of Petaluma, California; and George Greenwood of Susanville are the principal stockholders and directors in the **Diamond Mountain Mining Company**.

COLORADO

Clark H. Clark of Boulder, Colorado, is reported to be operating under the name, **Clark Associates** and producing fluorspar from property at Jamestown. The group is operating the Lehman fluorspar mill at Jamestown under lease from E. W. Lehman of Jamestown.

The **Elsie tungsten** mine near Boulder, Colorado, is reported to have been leased by Wallace L. Tanner of Boulder and his son, Guy J. Tanner of Nederland. The mine has been idle since it was closed down in 1918. The Tanners, who hold the Mammoth and other tungsten claims in the same district, plan to install hoisting equipment and clean out and straighten the shaft.

Water for power is now assured the **Wano** mine and mill near Jamestown, Colorado, with completion of the rehabilitation work on the line which brings the water in by gravity flow. Not only will the mine operators have more power, but they will have a steady supply. H. M. Williamson, 327 U. S. National Bank Building, Denver, is the general manager. The mine is producing 25 carloads of ore a month under the general superintendency of H. B. Williamson, Box 2, Jamestown.

Frank V. Thompson, Box 32, Idaho Springs, Colorado, is reported to have leased the **Lalla** mine in the Alice district near Idaho Springs and to have started production. Ore is trucked across Willis Gulch to the 50-ton Anchor stamp mill for treatment.

A new 100-ton ore bin has been built at the **Gold King** mine in the Sweet Home district on Fall River near Idaho Springs, Colorado, and preparations have been made to continue development and mine production after snow blocks the road, forcing a suspension of shipments. Since May 30 carloads of ore have been trucked to the railroad for shipment to the Golden Cycle plant. Glen C. Shaw, Box 673, Idaho Springs, is the operator and Tom Dempster, Box 572, Idaho Springs, is mine foreman.

Fire completely destroyed the 250-ton milling plant of the **Butterfly Consolidated**

Mining Company at Ophir, Colorado. This will result in a slowing up of mine production, but it is understood that the plant will be replaced soon. Besides mill equipment, the loss includes transformers, sheds, and mine railroad motors. During the last year the company had concentrated on development work and was ready for production on a substantial scale. Walter E. Binner of Telluride is general manager and C. L. Brown of Ophir is mine superintendent.

An extra dividend of 37½ cents and a regular quarterly dividend of 12½ cents a share have been declared by the **National Lead Company**, payable December 23 to common stock of record December 6, 1940. The company's interests in the western United States are represented in the **Combined Metals Reduction Company** in Nevada and Utah and the **St. Louis Smelting and Refining Company** in Colorado. Fletcher W. Rockwell is president with offices at 111 Broadway, New York.

The **Hardrock Mining Company** has been organized by H. Guy Pyle and Tom Holden, both of Ward, Colorado, and L. C. Pensinger of Kansas City, Missouri, to operate a lease on the **Nancy** group of claims in Four Mile Canyon west of Boulder and near Salina, Colorado. A. H. Scruggs, 621 Pine Street, Boulder, who has been working the property under lease and sold his lease and option on the whole group, will continue work under sublease on a portion of the mine. Associated with him are his son, Donald Scruggs, and his son-in-law, Herman Robinson. The property is owned by the Frank E. Wallace estate of New York and Donald F. Wallace is executor.

The **Mytus Gold Corporation** is reported to have uncovered important gold values in a crosscut to the west on the third level in its property at Cripple Creek, Colorado. The territory has not been extensively developed and the formation opened by the crosscut is said to be the **Hawkeye Vertical** of the Portland. The company recently completed the connection with the fourth level of the Portland No. 3 shaft, working from the Colorado City shaft. Development of the Commonwealth mine is being started. K. M. Ohlander, 315 Colorado Building, Denver, is president of the company and A. S. Konselman, 1619 Woods Avenue, Colorado Springs, is supervising engineer. Other holdings are located in San Juan and La Plata counties.

The **Highland Mary Mines, Inc.**, is having the No. 2 tunnel extended about 800 feet, making its total length 900 feet, in order to operate in the area of the new strike the year around. Development of the newly found segment of the **Highland Mary** vein, stated to carry high-grade gold and silver values, will be carried on from the No. 2 level. This is 150 feet below where the No. 5 tunnel cut the faulted segment. Holdings consist of gold, silver, lead, and copper claims in the Animas district of San Juan County nine miles east of Silverton, Colorado. Joseph M. Bradley of Silverton is president and general manager, employing from 30 to 50 men.

The **Mountain View** and **Blue Bell** groups of claims in the **Switzerland Park**

TWO MANGANESE PLANTS UNDER CONSTRUCTION IN NEVADA

THE United States Bureau of Mines is rushing erection of a 40-ton daily capacity semi-commercial testing plant near Boulder Dam in Clark County, Nevada. The first tests to be made in the new mill will be on ore from the Three Kids manganese mine of the Western Minerals Exploration Company. The bureau has contracted 3,600 tons of Three Kids ore for this purpose and tests will be run over a 90-day period.

Laboratory tests have shown that ore running 30 per cent manganese can be reduced to a 58 per cent manganese concentrate with a 66 per cent recovery. The inverted flotation method is used, that is floating the gangue and deleterious matter. Tailings then are treated by a modified Bradley process to recover the lost manganese by electrolysis.

After the Three Kids ore tests are completed, the bureau has made similar plans to treat 3,600 tons of ore from the Artillery Peak district in Arizona, using the straight Bradley electrolytic process. Professor Sweet of Michigan will be in charge. J. Koster of Reno is the engineer in general charge of the bureau's electro-analysis division.

While these tests are being made by the government, a 400-ton daily capacity plant will be constructed by the Western Minerals Exploration Company, operator of the Three Kids mine, work having already been started. G. R. Boggs, 1027 North Crescent Boulevard, Hollywood, California, is manager of the Western Minerals concern and Ray Golenor is president. The company, in which Harlan H. Bradt of New York and 234 East Colorado Street, Pasadena, California, is also interested, has a government contract to supply 100,000 tons of sintered concentrates of ferrograde. The property is in Clark County, nine miles west of Boulder Dam and six miles from the highway and railroad. Mine equipment is Diesel powered.

The Bureau of Mines has been testing various manganese properties in the Boulder Dam district, including the Three Kids, during the past year. Other electrolytic tests are being made on chromium, antimony, and vanadium ores.

CALIFORNIA DIVISION OF MINES ISSUES APRIL 1940 EDITION

THE California Journal of Mines and Geology for April 1940 has been released by the California Division of Mines, Ferry Building, San Francisco, under the direction of Walter W. Bradley, state mineralogist.

This latest report deals particularly with the mines of Mono County and includes a discussion of the general geology and ores of the Blind Spring Hill mining district. A map of Mono County, showing the location of the principal mining properties, accompanies the work. A number of maps and illustrations, including photographs, are contained in the section devoted to the geology of the area. Several pages are given to a report on methods and costs of mining and concentrating chromite.

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MINING INDUSTRY IN MEXICO SEEKS AID FROM GOVERNMENT

THE confederation of chambers of commerce and industry in Mexico is negotiating with the national government in an endeavor to obtain a reduction in federal taxes for the mining industry. The government is stated to have assured the confederation that it will do all possible toward that objective, and it was indicated that the action would be taken early in 1941.

The mining council for cooperative and other small-scale miners has asked financial assistance of the Mexican government during a period of progressively decreasing markets for Mexican silver. The situation is termed desperate by the council.

NEW MAP IS AVAILABLE TO CALIFORNIA HYDRAULIC MINERS

A MAP of the South Fork of the Yuba River from Jones Bar to Ladies Canyon and of Deer Creek to a point 12 miles upstream is available from the United States Geological Survey.

A survey was made to show the development of water resources in the basin and to obtain basic data for studies of several storage sites which may be used for development of additional water power and to supplement the supply of water for irrigation. Published in 12 sheets, eight plans, six of which show large-scale surveys of dam sites and four profiles, the maps are expected to be an asset in connection with resumption of hydraulic gold mining upon completion of the Upper-Narrows debris dam.

The map may be purchased from the geological survey at Washington, D. C., for 10 cents a sheet or \$1.20 for the set.

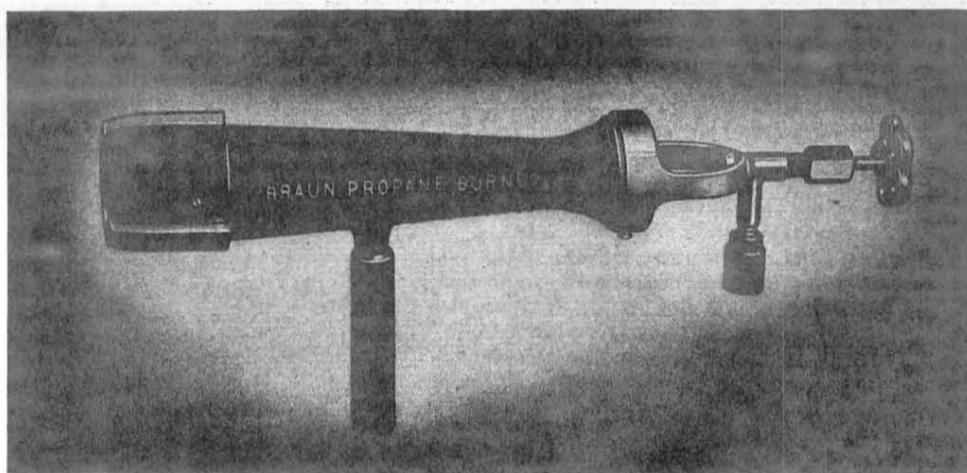
BOOK EXPLAINS CYANIDATION IN NON-TECHNICAL LANGUAGE

THE small mine operator or the layman who wants a clear, concise description of the cyanide process written in non-technical language will find a book of great value recently published in Australia, entitled "Cyaniding for Gold." The book is designed primarily for the small producer and above all else it is practical.

No attempt has been made to deal with the large-scale modern cyaniding process but, nevertheless, there are many valuable bits of advice for the experienced man. For the man who is interested in investing from \$100 to \$15,000 in equipment, the process is explained from A to Z and the book is invaluable.

The author of the volume, Ion L. Idriess, an old-time miner himself, gathered his material from his experience in the Australian cyaniding world. The first chapter is on sampling methods and thereafter the process is carried through to its conclusion. Chapters on the difficulties and problems presented by the presence of certain elements, such as arsenic, copper, graphite, iron sulphides, etc., are presented.

The book is available from the publisher, Angus and Robertson, Ltd., 89 Castlereagh Street, Sydney, Australia. The price is 20 shillings.



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