UNITED STATES
DEPARTMENT OF THE INTERIOR
Julius A. Krug, Secretary

BUREAU OF MINES
R. R. Sayers, Director

REPORT OF INVESTIGATIONS

SURVEY OF TIN IN CALIFORNIA

BY

R. H. Bedford and F. T. Johnson
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SUMMARY

In California the history of tin mining began in Riverside County in 1853, with the discovery of the Temescal deposit. This deposit remained the only one with a production record until recent small shipments were made from Kern and San Bernardino Counties.

According to the California State Division of Mines, Temescal's total output has been about 125 tons of tin, all of which was produced in 1891 and 1892. It was idle from 1892 to 1928. An extensive but unsuccessful development campaign carried on in 1928 and 1929 by the American Tin Corp. produced only half a ton of the metal, and the property again was idle until 1943, when an attempt to resume operations proved unsuccessful. After 1929 no production is recorded from California until 1944 and 1945, when small shipments of sorted ore from Kern County returned about 2 tons of tin and 1 1/3 tons was recovered from sorted ore and concentrates from San Bernardino County. The total output of tin from California has been less than 150 tons, and less than 4 percent of this was produced in the last 50 years, in spite of numerous attempts during that period to promote tin mines.

So marked a scarcity of a metal essential in war makes any occurrence interesting. When some prospects were reported to the Bureau of Mines in July 1942, in a new field 10 miles east of Gorman, they were at once examined and the preliminary exploration by the owners closely followed. Eventually one was explored by bulldozing and diamond drilling as a joint project by the Bureau of Mines and the Geological Survey.

To supplement this joint project, the authors undertook independently a general survey of tin in California - a survey designed to check reported occurrences and to bring their status up to date. In this work, the 37 places described in the text and spotted on the accompanying map, (fig. 1) were visited and sampled. Although traces of tin were found in many places, nothing that suggested a tin mine was found anywhere, and it is difficult to base much hope for appreciable future tin production upon anything found thus far in California.

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Report of Investigations 3876,"

2/ Mining engineer, Bureau of Mines.
In Kern County some tin has been found near Gorman and Isabella. There is a large area between these places that has not been mapped and probably never prospected. This area, comprising the eastern part of the Tehachapi and the southern part of the Sierra Nevada range, is made up of a granodiorite batholith in which are many roof pendants of metasediments. The type of orthoclase granite associated with the tin mines in Cornwall and the Malay Straits is rare and possibly nonexistent in California. It must be recognized that in spite of the possibilities of tin in any large unexplored area, the expectation is hardly bright enough to support a campaign of prospecting for that metal alone; however, it is possible that tin may be found fortuitously in the search for other minerals more likely to occur in the region. Figure 2 shows the geology (California State Division of Mines geologic map) of the area between Gorman and Isabella and also the area in the vicinity of Cima.

Southern California at this time seems to offer the best possibilities for tin prospecting. Thus far all of the interesting occurrences have been found in that region, and in spite of the great amount of placer and dredge mining in the northern part of the State, no tin occurrences of merit have been reported in any of the gravels. Some streams should show tin in the gravels in sufficient quantity to attract attention if lodes existed in the area.

A popular conviction exists that in California tin mining has languished because of the sinister influence of a "Tin Cartel." It is clear enough, in the cold light of factual data, that there has been no production because no tin mines have as yet been discovered.

INTRODUCTION

In contrast to its richness in other minerals, the United States is in the unfortunate position of being both one of the largest consumers and one of the smallest producers of tin. Even before the Nation was at war, tin was designated by the Secretaries of War, Navy, and Interior as one of the seven strategic minerals. Producing less than 1 percent of requirements, the country depended perforce upon imports that could be cut off, with disastrous results, by enemy attack on sea-borne trade.

Both before and since we entered the war the Bureau of Mines has given special attention to reported occurrences of tin in the United States and its possessions. This report, which is based on work done in 1944 and 1945, is a survey of tin in California.

SCOPE OF SURVEY

The purpose of the survey in California was to investigate all reported tin occurrences where exploration work by the Bureau might improve domestic production. The search was not confined to the few deposits claimed to be commercial but extended to any that might yield substantial tonnages under pressure of a necessity that made cost unimportant. One deposit, the Hogan-Hallery (25) in Kern County, was judged worthy of exploration.
FIG. 1 - TIN IN CALIFORNIA.
FIG. 2.—TIN IN Kern & San Bernardino Counties.
In 1944 the Bureau, in cooperation with the Geological Survey, explored that prospect by bulldozer cuts and diamond-drill holes, but only a minor amount of tin ore was developed.

In addition, engineers of the Bureau visited the 37 prospects shown on the accompanying maps (figs. 1 and 2), which show the three that have a record of production, as well as some others reported by the State Division of Mines but not examined by the Bureau of Mines.

In the following texts, prospects are grouped under county headings and described in a sequence based upon geographical position rather than alphabetical order. Many of the prospects were examined solely because tin had been reported in the area from time to time.

**KERN COUNTY**

**Isabella District**

**Lucky Three(1) and Jennette Grant(2)**

**Location.** — Sec. 1, T. 28 S., R. 33 E., M.D.M. These are adjoining properties in which the northern claims of Lucky Three overlap those on the southern end of Jennette Grant. They are reached by turning east from highway 178 at Scovern Hot Springs, a point 2.6 miles south of Isabella. Thence a rough country road leads 11 ½ miles up Erskine Creek to the properties. On the Lucky Three group, the latest location notice is signed by Whaley, 718 South Maryland Street, Glendale, Calif. Chris Anderson of Kernville owns the Jennette Grant.

**Description.** — Both prospects are on a contact between the granitic rock of the Sierra Nevada batholith on the west and a roof pendant of metamorphic sediments on the east. The contact, which is marked by tachite and other signs of metamorphism, has an average strike of N. 25 W., and varies from vertical to steep east and west dips.

The Lucky Three claims were located originally as tungsten prospects and the Jennette Grant for copper. On Lucky Three the most southerly development is a short adit that originally seems to have been started as an open-cut. From the face a 4-foot horizontal-cut sample assayed 4.2 lb. of tin per ton. About 1/8 mile north is another adit driven 50 feet along the contact and then 20 feet east as a crosscut in contact fault breccia. From this adit a sample of the altered granite on its west wall assayed 0.6 and a cut across the fault breccia assayed 0.4 pound of tin per ton.

A sample taken from iron-rich material at the adit portal gave a return of 1.8 pounds and from an open-cut above 500 feet still farther north a sample ran 1.4 pounds tin. From this open-cut to the Jennette Grant adit about 1,000 feet north, no workings or any sign of tin was found.

On the overlapping southerly claims of Jennette Grant and northerly claims of Lucky Three is the Grant adit, which meanders 160 feet northwest in the altered zone of the contact without much sign of mineralization. About 1/8 mile north of this adit on Jennette Grant's Copper King claim, a
caved open-cut offers the best showing on either property. Nothing can
be seen in place, but on the dump are to be found copper carbonates and
some cassiterite. Samples taken from sorted ore and from the dump as a
whole assayed respectively 12 pounds and 0.8 pound tin per ton.

Conclusions. — Although all samples showed some tin, at no place
along the contact was there any evidence of such mineralization as is
always found associated with ore shoots. Moreover, the igneous rocks
are closer in type to granodiorite than to orthoclase granites that
characterize tin deposits. Along the half mile of contact that was examined
there was seen nothing to give much hope for a tin mine.

Iconoclast(7)

Location. — Sec. 28, T. 25 S., R. 33 E., M.D.M. This prospect is
also accessible by way of the Erskine Creek road and is about 1½ miles
north of the Lucky Three and Jennnette Grant claims.

Description. — A narrow quartz vein along the schist and granite
contact was in the past explored for gold and silver values. Examination
showed no indications of cassiterite or associated minerals.

Laurel(3)

Location. — Sec. 26, T. 27 S., R. 33 E., M.D.M. It is situated in
the same area as the Iconoclast and reached by the Erskine Creek road.

Description. — The principal rocks on this group of claims are
granites and metamorphosed sediments. Extensive prospecting had been
done in search of gold and silver ores. It was examined for tin occurrences
owing to the fact that it was in an area where tin occurrences had been
reported. Samples were not taken, as no evidence of tin mineralization
was disclosed.

Unnamed Prospect

Location. — Sec. 5, T. 27 S., R. 33 E., M.D.M. Situated on Erskine
Creek road 2 miles from highway 178.

Description. — Prospected originally for gold by numerous cuts and
shallow pits in iron-stained schists near contact with granitic rocks.
No tin minerals were noted.

Black Jack(5)

Location. — Section 26, T. 26 S., R. 23 E., M.D.M. Is reached by
following highway 178 to a point 3 miles east of Isabella, thence 1½ miles
south and west by rough country road. Owned by I. Prudy, Lancaster,
Calif.
Description. — From this property, which comprises four unpatented claims, 30 tons of lead-zinc ore was shipped to the Garfield smelter, but no record is available as to returns. The mineralized zone, in limestone, outcrops irregularly as gossan over a distance of 2,000 feet in a direction generally east and west. A shaft 36 feet deep, now nearly filled with water, is the principal development. A selected sample taken from the dump assayed 2.2 pounds tin per ton.

Rocky Point(6)

Location. — Sec. 22, T. 27 S., R. 35 S., M.D.M. Accessible by following the Kelso Creek road 8 1/2 miles southeast from Weldon.

Description. — Development work consists on an inclined shaft 20 feet deep, apparently sunk to explore a basic dike in granitic rock. The location notice, signed by W. A. Lewis and I. W. Nicoll, is dated November 1942 and names the claim as the "Worthless." Concerning this prospect, locally known as the Rocky Point, there had been some rumors of good tin ore, but there is not enough mineralization to support much hope of finding commercial tin ore. A selected sample from the dump assayed 1.4 pounds tin per ton.

Big Blue(8)

Location. — Sec. 28, T. 25 S., R. 33 S., M.D.M. One half mile north of Kernville.

Description. — This property is the most important precious-metal producer in the Kernville area and has been thoroughly explored. Although its geological association of alaskite with a swarm of acid dikes adjacent to a contact with meta-sediments is favorable for tin, there is no record of any having been found. Two samples, one of jig concentrates and the other of the flotation product, assayed, respectively, only 2 pounds and 0.6 pound of tin per ton. In the original ore the tin content, therefore, could hardly have amounted to more than a trace.

Mammoth Mine(9)

Location. — Sec. 35, T. 26 S., R. 33 E., M.D.M. Five miles south of Isabella.

Description. — The Mammoth mine has a production record of about half a million dollars in gold from a free-milling ore found in a strong quartz vein in granitic rocks. No traces could be found of tin or of the minerals characteristically associated with it, and no samples were taken.

Pennsylvania Mine(11)

Location. — Sec. 35, T. 26 S., R. 32 E., M.D.M. Five miles south of Isabella.
Description. - This property adjoins the Mammoth mine and has a similar geological history. It was not judged a likely place for tin, but because concentrates were available a sample was taken. The return was 1.8 pounds of tin per ton, an amount too small to have been more than a trace in the original ore.

Keyesville Mine(10)

Location. - Sec. 26, T. 26 S., R. 32 E., M.D.M. This property is 3 miles southeast of Isabella. The Keyesville mine is of the same geological type as Mammoth and Pennsylvania and holds no promise of tin. A sample of concentrates assayed only 0.6 pound tin per ton.

Mary Ann Prospect(12)

Location. - Sec. 8, T. 27 S., R. 33 E., M.D.M. This property is about 2 miles south on Erskine Creek road from its junction with highway 178.

Description. - This prospect is an iron-rich area adjacent to a contact between metamorphic rock on the west and granites on the east. Tactite is plentiful on the contact proper but most of the exploration work (five cuts and three short adits) has been in the iron-bearing area about 100 feet to the west. Except for magnetite and ilmenite, mineralization is meager, and a grab sample of the most highly mineralized material assayed only 0.8 pound of tin per ton.

Unnamed Prospect

Location. - Sec. 31, T. 25 S., R. 33 E., M.D.M. Accessible by following the Kernville - Greenhorn Summit road 2½ miles, where a loading ramp marks the property.

Description. - This unnamed prospect showed some exploration work on an aplite dike in granite. Examination showed no tin minerals and little mineralization.

Gorman District

Hogan-Mallery, Crow Bar Gulch, Butler and Dunton Properties(25,27,28)

Location. - T. 9 N., R. 18 W., S.B.M. These properties are in the southern part of Kern County on an unsubdivided old Spanish grant that is now a part of the Tejon Land Co. They are reached by following State Highway 138 from its junction with U. S. Highway 99 to the Barnes ranch house, a distance of 11 miles. From the Barnes ranch a good country road leads 8½ miles to the prospects.

Description. - All of these prospects are close to the contact between the limestone roof pendant and underlying granitic rock that outcrops to the south, and all are associated with iron-rich gossan.
The Hogan-Mallory(25) was explored by a bulldozer and diamond-drill project that indicated a reserve of 36 tons of tin in 2700 tons of limonitic material.

Crow Bar Gulch(26) shows small gossan outcrops sparsely distributed in an east-west direction along the contact between limestone and granite. From the western end of mineralization a chip sample assayed 17 pounds tin per ton and a grab sample from an open-cut about 400 feet east of that place, 2 pounds tin per ton.

The Butler(27) showed tin in surface concentration in an area close to the contact between granite and limestone, but bulldozing demonstrated that the mineralized area was much smaller than at the Hogan-Mallory, which therefore was selected for the exploration project.

The Dunton, with a similar geological background, is undeveloped and is the least impressive of the three.

**Mojave District**

**Golden Queen(23)**

**Location.** — Secs. 6 and 7, T. 12 N., R. 12 W., S.B.M. About 4 miles south of Mojave.

**Description.** — The Golden Queen property comprises 460 acres on the northwest slope of Soledad Mountain and has been one of the most important recent gold producers in the State. Vein matter consists of brecciated quartz and dacite. A selected sample taken from the deepest portion of the mine, where sulfides were more abundant, assayed 0.4 pound of tin to the ton.

**Treasure Island(24)**

**Location.** — Sec. 7, T. 12 N., R. 12 W., S.B.M., About 5 miles south of Mojave.

**Description:** Formation consists of meta-sediments that have been mineralized along fractures. Some sulfides were noted, but there was no indication of tin or tin minerals.

**Rademacher District**

**Gold Bug(21)**

**Location.** — Sec. 35, T. 27 S., R. 40 E., M.D.M. This property is 5 miles north of Searles in the El Paso Mountains.

**Description.** — A granitic country rock is cut by numerous diorite dikes. Vein matter consists of broken and altered dike material, more rhyolitic than dioritic, that has been recemented by quartz. Some copper stains were noted, but none of the tin minerals were present.
El Dorado (22)

Location. — Sec. 34, T. 27 S., R. 40 E., M.D.M. The El Dorado is in the vicinity of the Gold Bug (21) and is reached by following U. S. Highway 395 to about 4 miles north of Searles, where a country road leads a mile to the mine.

Description. — Vein consists of rhyolitic dikes that have been broken and recemented with quartz. Values are principally in gold. No tin minerals were noted.

Woody District

Greenback Copper (14)

Location. — Secs. 1, 2, and 3, T. 26 S., R. 29 E., M.D.M. About one-half mile south of Woody.

Description. — The granodiorite country rock is cut by aplite dikes, a condition not unfavorable for tin, but a grab sample selected from the most highly mineralized material on the dump assayed only 2.6 pounds tin per ton.

Iron Mountain (15)

Location. — Secs. 9 and 10, T. 26 S., R. 29 E., M.D.M. This property is situated 1½ miles south of Woody and is reached by the Iron Mountain road.

Description. — Iron Mountain is listed by the State Division of Mines as an iron deposit. It was visited in this reconnaissance because the recent discovery of tin in iron gossan of the Gorman district drew attention to that type of occurrence and suggested that tin might have been overlooked in the numerous roof pendants that are scattered over large igneous areas of the Tehachapi and Sierra Nevada. Iron Mountain, however, consists essentially of granodiorite and shows ferruginous material only in shear zones. These shear zones which show no indication of more than minor movement generally have northeast to northwest strikes and steep dips. They are marked by iron-stained outcrops and sometimes are stained by a little copper carbonate. Magnetite, limonite, and ilmenite are the only conspicuous minerals. Two samples from the most mineralized outcrops in the central portion of the ridge assayed 0.4 pound and 1.3 pounds tin per ton, and another sample from a mineralized outcrop at the east gave a return of 1.6 pounds tin per ton.

RIVERSIDE COUNTY

Temescal District or Cajalco District

The area in the Temescal district where tin occurs is 5 miles south of Arlington on the western portion of the Rancho el Sobrante de San Jacinto, a Spanish grant. All the prospects are within an area of less than 15 square miles.
Innumerable northwest-striking fractures in the granite country rock have served as channels for the tourmaline dikes in and adjacent to which tin has been found. Fairbanks, Mining and Scientific Press, October 16, 1887 concludes that the vein-dike contents represent entire replacement of the granite bordering narrow fissures by heated water carrying various minerals in solution and that tin was deposited only under exceptional circumstances.

In general, the Temescal district has been thoroughly prospected and explored for tin by competent capital and management, and it is difficult to find any foundation for hope of appreciable deposits.

Temescal Tin Mine(29)

Location. — Secs. 2, 3, 10, and 11, T. 4 S., R. 6 W., S.B.M. This property, consisting of 870 acres, is in the western part of the Rancho el Sobrante de San Jacinto, about 5 miles southeast of Corona.

Description. — The Temescal tin mine is the only tin property in the district that is credited with any production. Records show that from 1889 to 1929, 252,489 pounds of tin was produced, which is more than 95 percent of California's tin production.

Discovered in 1853, the Temescal deposit was worked in desultory fashion without recorded production until in 1889 the operating San Jacinto company, after refinancing in London, worked vigorously until 1892. Practically all of the recorded production of about 125 tons was won in 1891 and 1892.

After a shut-down in 1892 the property was idle, until in 1928 and 1929 the Tin Corp. of America carried out an expensive but entirely unsuccessful development campaign that produced only half a ton of tin.

Another idle period followed 1929, until in 1943 a small mill was erected and an attempt made to treat material locally believed to be ore. This operated only a few weeks, and operations were apparently suspended owing to the disappointingly low tin content of the rock.

Tin occurs as cassiterite in black tourmaline veins that cut through a coarse-grained hornblende-biotite granite. Two samples taken by a Bureau of mines mining engineer, I. W. Butner, from the places mined, assayed less than 0.4 pound of tin per ton.

Holmes Ranch Tin Deposits(30)

Location. — Sec. 12, T. 5 S., R. 6 W. S.B.M. The Holmes Ranch deposit is 5 miles south of Arlington or 1/2 miles southeast of Temescal.

Description. — On this property are several typical tourmaline dikes in granite. No work has been done, but the dikes can be traced across country by their prominent outcrops. From the strongest of these outcrops, said by the owner to carry 2 to 3 percent tin, one sample returned 1 pound, another 3.6 pounds, and another less than 0.4 pound tin per ton.

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Moore Tin Deposit(33)

**Location.** - Secs. 13, 14, 23, and 24, T. 4 S., R. 6 W., S.B.M. This deposit is 7 miles south of Arlington.

**Description.** - Six hundred acres are held by the Robert L. Moon Estate, Riverside, Calif. The geological conditions are identical to the Holmes Ranch deposit. Shallow shafts have been sunk at points on the various dikes of tourmaline that cut the granite country rock. There was no evidence of tin minerals, and no material found was worthy of sampling.

Black Rock Tin Deposit(31)

**Location.** - Secs. 18 and 19, T. 4 S., R. 5 W., S.B.M. This property adjoins the Moore deposit and is about 7 miles south of Arlington.

**Description.** - There are at least 10 parallel black tourmaline dikes in granite on this property. Although a shaft reported to be over 100 feet in depth was filled with water, material on the dump and on the outcrops was examined for tin minerals, and none were found. Some copper carbonate stains were observed.

South Black Rock Tin Deposit(32)

**Location.** - Sec. 19, T. 4 S., R. 5 W., S.B.M. This property, consisting of 80 acres, is south of the Black Rock deposit or 7 1/2 miles south of Arlington.

**Description.** - The South Black Rock deposit is similar to the Black Rock deposit. Several tourmaline dikes cut the granite country rock. A sample from the most persistent and prominent dike assayed less than 0.4 pound of tin per ton.

Elsinore District

American Flag(35) and Monarch Mines

**Location.** - Secs. 4 and 9, T. 6 S., R. 4 W., S.B.M. These claims are 2 miles east of Elsinore and comprise 12 mining claims in 3 groups.

**Description.** - The north area is composed of slates and quartzites, while the south area contains intrusive granites and basic dikes. There are no distinct veins and the dikes prominent in places more often appear to be mere color and hardness changes in the country rock. There are at least 20 open-cuts, pits, and shallow shafts, and the exposures in all appear to be variations in the igneous rocks rather than distinct dikes or veins. Six samples were taken from places selected by the owners as carrying 22 to 80 pounds of tin per ton. This sampling showed that there was less than 0.4 pound of tin per ton and less than 0.2 pound nickel and 0.4 pound cobalt in any of the samples.
Old Dominion Mine (34)

Location. — Sec. 7, T. 6 S., R. 5 W. The Old Dominion mine is in Long Canyon 6 miles west of Elsinore.

Description. — This property is noted as a lead-zinc deposit and also carried traces of tin. The vein in meta-sediments is irregular, and no persistent structure was found. Examination of vein material showed no tin minerals, although sulfides of lead and zinc were noted. A sample taken of concentrates assayed 0.4 pound of tin per ton.

San Bernardino County

Atolia Mining District (20)

Location. — Secs. 19, 20, and 21, T. 30 S., R. 41 E., M.D.M. The Atolia mines, comprising 1,200 acres, are in the central part of the tungsten belt. It is 43 miles northeast of Mojave and 23 miles north of Kramer Junction, a station of the Atchison, Topeka & Santa Fe Railway. The district is accessible by U. S. Highway 395.

Description. — The Atolia mines have been among the largest producers of tungsten in the United States. Mineralization occurs irregularly along a zone of shearing and fissures in a gangue of quartz, calcite, and crushed quartz monzonite. The country rock is a quartz monzonite containing intrusives of aplites, diorite, and red granite and occasional diabase. With the exception of the Union mine, the deposits have been shallow. The Union mine was mined to a depth of more than 850 feet while most of the other ore bodies terminated at less than 200 feet.

From a geologic point of view, the setting is favorable for the deposition of tin. Samples of concentrates were not available, but a grab sample of the mill tailings at the Union mine assayed 1.2 pounds of tin per ton. Further investigation of mill feed, final concentrates and middlings is anticipated but not with a great deal of optimism.

Mesal District

Evening Star or Maynard Tin Mine of Bernice Group (16)

Location. — Sec. 25, T. 15 N., R. 13 E., S.B.M. The Evening Star is in northeastern San Bernardino County, 8 miles north of Cima in the New York Mountains.

Description. — This property is credited with a production of about 1 1/3 tons of tin, extracted principally from a hematite-filled irregular pipe or roughly cylindrical shoot that averaged about 10 feet in diameter and extended from the surface to 85 feet. The pipe, striking N. 80° W., and at a dip varying from 20° to 70°, was apparently formed in a shattered zone of intersecting fractures in the marbleized dolomitic limestone that is the country rock. Granitic outcrops 500 feet to the east is presumed to be the source of mineralization.
Development work consists of two 1\(\frac{1}{2}\) compartment shafts situated some 100 feet apart. The east or No. 1 shaft was sunk on the pipe at its intersection with the northwest-striking fissure and follows the sinuous course of the pipe for 65 feet. This cavity has been filled from 35 feet to the bottom.

The west or No. 2 shaft is a 100-foot vertical shaft that was sunk on the nearly vertical northwest-striking fissure. The bottom of this shaft, where all of the drifting and cross-cutting was done, is 125 feet below the collar of the No. 1 shaft. The 250 feet of prospecting failed to find any ore, although it did show the continuation of the fracture and encountered a strong dike, but no mineralization or tin minerals were found.

An open-cut from No. 2 shaft connects with No. 1 shaft, 25 feet below its collar. This open cut was on the northwest fracture zone, where erratic and irregular mineralization occurred along cross fractures and joint planes. No appreciable amount of ore was taken from this cut.

Suzanna R(17)

**Location.** - Sec. 25, T. 15 N., R. 13 E., S.B.M. The Suzanna R is 8 miles north of Cima and adjoins the Evening Star(16).

**Description.** - Chrysocolla and chalcopyrite occur in an irregular fracture zone in the dolomitic limestone. This fracture with a north-south strike and 70° west dip is being developed by a shaft which was down about 30 feet and 550 feet northwest of the No. 2 shaft of the Evening Star mine.

Two samples were taken. One, a chip sample, was taken across the 6-foot vein at the bottom of the shaft and assayed 0.8 pound of tin per ton, and the other was a grab sample of sorted ore on the dump which assayed 1.0 pound of tin per ton.

Unnamed

**Location.** - Sec. 31, T. 16 N., R. 14 E., S.B.M. This unnamed prospect is about 12 miles north of Cima in the New York Mountains, about a township north of the Evening Star(16) and Suzanna R(17) mines.

**Description.** - An inclined shaft was sunk in meta-sediments on a 4-foot vein that strikes north 20° west and dips southwest.

Although now deserted and in poor repair, the dump indicates considerable development. Mineralization consists chiefly of hematite with few sulfides, but no tin was in evidence. A sample taken from a small pile of assorted ore assayed 2 pounds of tin per ton.
Solo Mining District

Telegraph Mine(19)

Location. - Secs. 16 and 17, T. 15 N., R. 11 E., S.B.M. The Telegraph mine is reached by taking highway 466 from Baker, east 17 miles, then a dirt road for 3/4 of a mile south direct to the mine.

Description. - The country rock is granite, with numerous dikes of aplite and the siliceous end products of segregation. Present operation consists in a vigorous development, as a gold prospect, of a highly siliceous 5-foot vein with N. 540 E. strike and 650 W. dip.

This shows very little mineralization, but 1/4 mile east is a small, well-mineralized vein with N. 350 W. strike and 400 W. dip. This shows chalcopyrite, hematite, and pyrite and is said to carry gold. A grab sample from the most highly mineralized material returned only 0.4 pound of tin per ton.

Bagdad District

Eureka Tin Claims(36)

Location. - T. 4 N., R. 10 E., S.B.M. These claims are 10 miles south from Bagdad and are reached by rough country road.

Description. - These claims were reported to contain 50,000,000 tons of ore with a tin content of 3 to 10 percent.

The area is made up of andesite flows and agglomerates striking N. 200 W. and dipping 450 E. No mineralization was noted, and three samples taken from places selected by the owner as the richest all assayed less than 0.4 pound tin per ton.

SONOMA COUNTY

Healdsburg District

Derrick Tin Prospect(37)

Location. - T. 10 N., R. 8 W., M.D.M. This prospect is on the Derrick Ranch about 5 miles northeast of Healdsburg.

Description. - Tin has been reported along and adjacent to a well-defined fault in an area of Franciscan formation with N. 720 W. strike and 550 N. dip. A 20-foot adit has been driven along the footwall of the fault in thin-bedded chert that dips 450 to the south.

The chert contains considerable pyrite and a black scotty material. Seven samples, taken from places designated by the owner as the richest, assayed less than 0.6 pound per ton.

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OTHER COUNTIES

The prospects shown on figure 1 in Amador, Humboldt, Inyo, Orange, Plumas, San Diego, Siskiyou, and Trinity Counties are described in California State Division of Mines quarterly of October 1941. Of the occurrences mentioned, only five were verified, and none of these was found to be important.

Conclusions. - Although traces of tin can be found in California in many places at or near contacts of the igneous rocks with meta-sediments, nothing that can be called a tin mine has yet been discovered.

The reason is probably to be found in the composition of the igneous rocks that constitute the batholiths. As a rule, these are closer in composition to granodiorite than to the particular type of granite that is generally associated with tin deposits. According to Ferguson and Bateman (Economic Geology, vol. 7, 1912, p. 209), the most striking feature is the association of tin with a granite in which orthoclase is always predominant, in which biotite is more common than hornblende, in which muscovite, tourmaline, and topaz are frequent associates, and which is often porphyritic in structure.

Future prospecting in Sierra Nevada, Tehacapi, and the desert ranges may find such granites close to contacts with meta-sediments, and in such places tin deposits may be discovered, particularly in areas characterized by dikes of quartz porphyry, pegmatite, aplite, and rhyolite. At Hogan-Mallery (25) the igneous rock, though not exactly of the type described above, is a granite and not a granodiorite and a small amount of prospecting found tin in several places along and adjacent to its contact with a limestone roof pendant. Granites of the orthoclase-dominant type described above are rare in California, and the chances for tin would hardly support a campaign of prospecting for that metal alone. The hope must be that prospectors in their constant search for other metals, particularly gold, may be on the alert for tin as a secondary possibility.