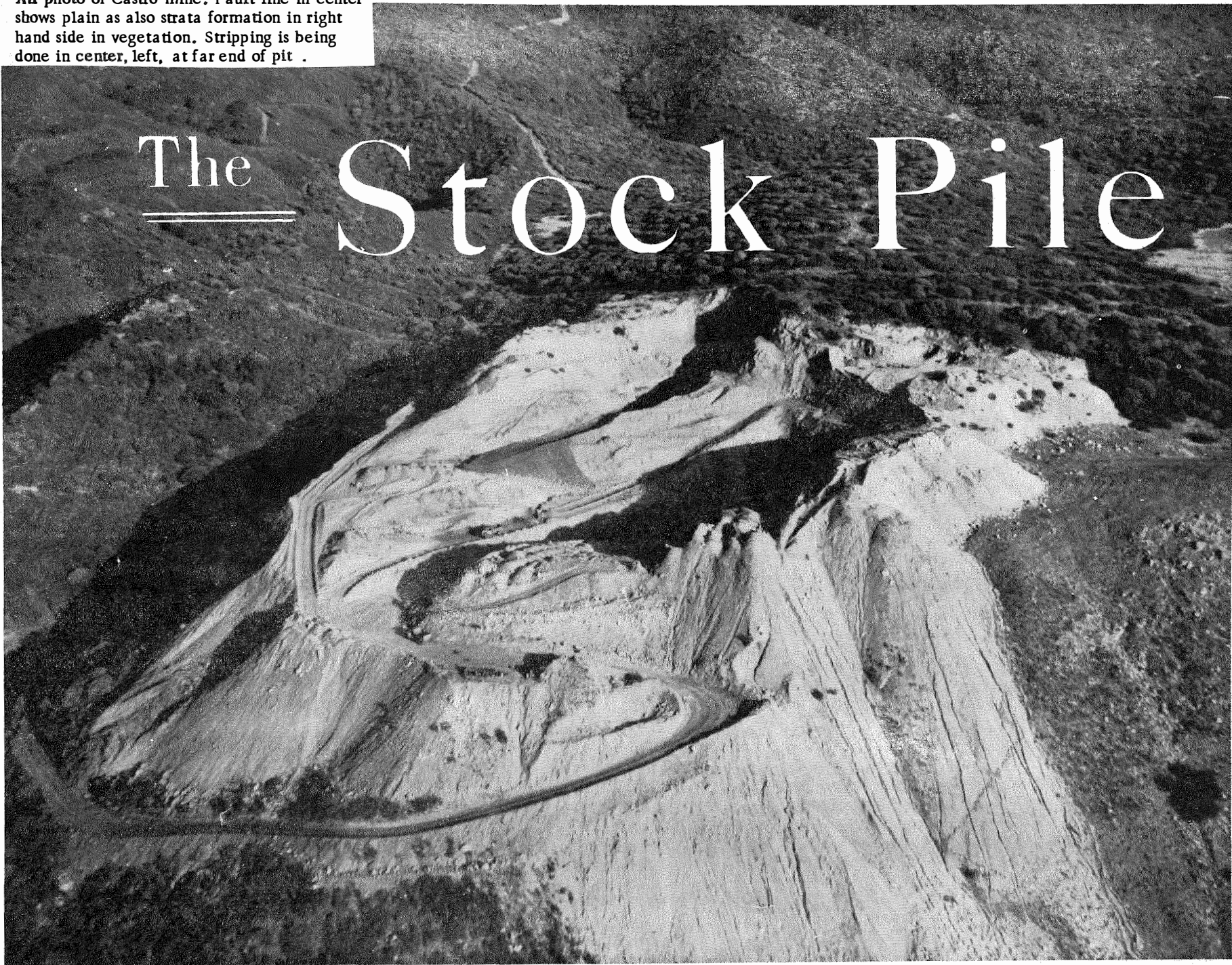


Air photo of Castro mine. Fault line in center shows plain as also strata formation in right hand side in vegetation. Stripping is being done in center, left, at far end of pit .

# The Stock Pile



I. M. C. C. mill, San Luis Obispo, Calif. This mill grinds for Pierce Bros. and Castro.



VOLUME I

MAY, 1954

30 CENTS A COPY

# THE STOCK FILE

PUBLISHED by a committee of the Oregon Mining Association

EDITOR: Fay I. Bristol

P. O. Box 505, Rogue River, Oregon

SUBSCRIPTION RATE: \$3.00 yearly. Single copy: 30¢

ESTABLISHED: May, 1, 1953

Published monthly through the facilities of The Times Newspaper, Rogue River, Oregon.

## EDITORIAL

### FUTURE DOMESTIC CHROME PRODUCTION

Chromite, one of the most essential of all war materials, can be reproduced in the United States of America, in very substantial quantities, if some way can be found to protect the American chrome producers from the low wage scale paid in Turkey and South Africa.

Turkey is paying an over-all wage cost of approximately \$1.00 per day. South Africa less than 40¢ a day. They have had more assistance from the U. S. government in cash and long term contracts than have the domestic producers. President Eisenhower indicates that this trend will be reversed.

Domestic producers will cooperate in every way to work out a long term program.

\*\*\*\*\*

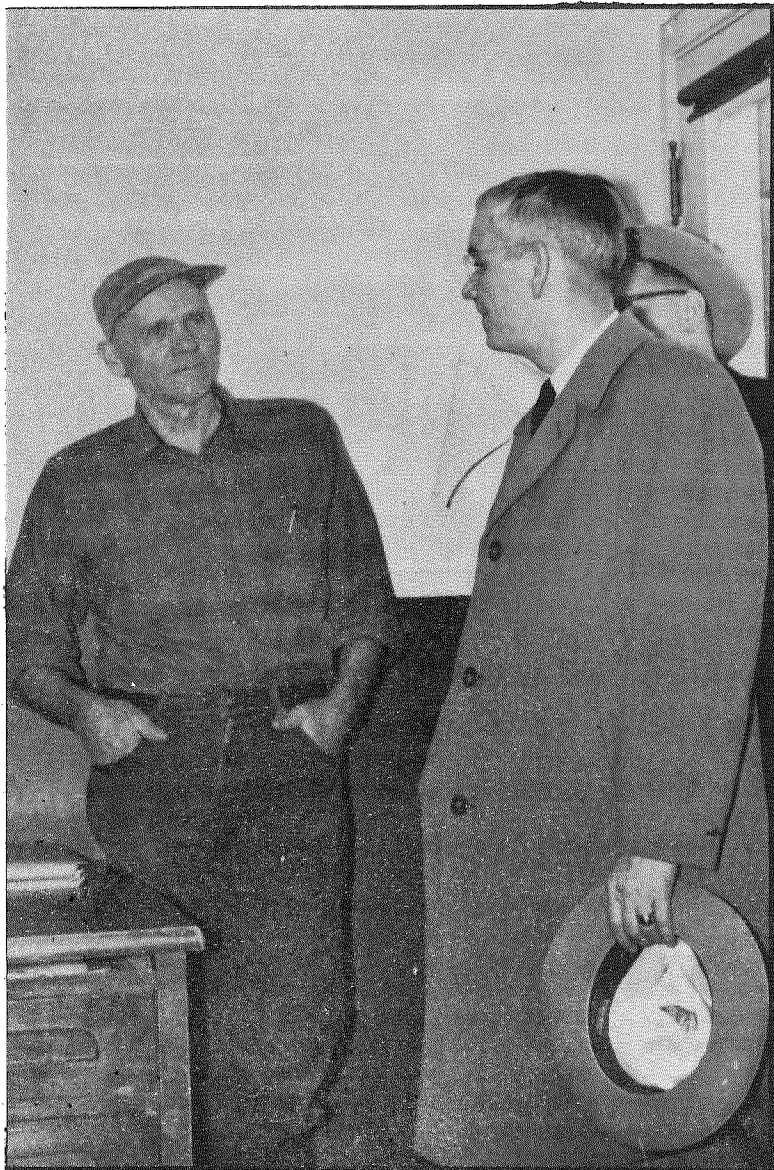
**TURKISH CHROME:** We are very appreciative that the Engineering and Mining Journal is allowing us to reprint a very complete story on the production of metallurgical grade chromite in Turkey.

After careful study of this article we are very pleased to find that in two short years the chrome mines of Oregon and California are operating and producing in a manner that proves that they would be very competitive if there was any relationship between the wage scale paid in the two countries

In two short years, we have developed mines with an annual production record of 2,000 to 10,000 tons per year. This year of 1954 will see the development of quite a few more. A long term program would develop many of them. This was done through American ingenuity, paying 20 times the wages, and receiving, after taxes, approximately 25% more than the Turkish producers.

We are very, very proud of our accomplishment.

\*\*\*\*\*



GOVERNOR PAUL PATTERSON talking with William S. Robertson in the Chrome Depot office at Grants Pass, Oregon.



DANIEL C. BEYER, PURCHASING AGENT G.S.A. CHROME DEPOT, GRANTS PASS, ORE.

### WHAT ONE GOOD MINE CAN DO by J. R. HOLMAN

What one good mine can do for a district points a moral to all scoffers who decry our ability to develop a sound strategic minerals production.

When the Mistake Mine at Coalinga, California, was opened in January of 1953, as an open cut operation, the procedure was an untried experiment. The mill it supported was new in design, simple and cheap to construct. Regardless of the numerous problems that arose and were solved over a period of twelve months, the continuous tonnage of high grade concentrates rolling North to the Nation's stock pile began to assume rather impressive totals at year end.

The most satisfactory result of this initial operation in the district however, was not in the total tons of chromite produced, but in the local interest developed in the prospects of additional mineral reserves yet to be mined. It is indeed gratifying to point out what one single operation has brought forth by April 1954.

A very satisfactory deposit on Railroad lands in Fresno County, just two miles East of the Mistake Mine, has made its first ten ton shipment of \$157.00 per ton high grade lump ore. This operation is a partnership composed of Charles Akers, a local cattle rancher, Harry Bean of Long Beach, and Bob Ruberts, one of Coalinga's leading contractors.

The second operation of note is the James-Corbett claims on Rucker Ridge, one mile West of the Mistake Mine. This claim was leased in early March by Chambers & Russell of Los Angeles. These two young engineers were primarily interested in oil production when they first came to Coalinga. Their diversion to Chrome mining in addition to their oil interests, has resulted in opening the initial dozer cut to a sizable shovel operation. The first month of digging has accumulated over 2000 tons of very high grade mill feed in the form of disseminated ore. The present indications are that this deposit will rival the Mistake Mine and support a mill equal to or bigger than the Holman unit. Plans are under way to construct a mill immediately on White Creek some two miles down the Canyon from the first mill. There is no doubt this mine will increase the Coalinga total to double the 1953 production.

The third operation is the result of the right parties showing up at the right time looking for a high grade deposit. In late 1952 Holman & Powell Paving Co. opened an excellent lead in the bottom

### CHROME MEETING SET FOR STOCKTON, CALIF. MAY 24

On May 24th at 10 a. m. in the North Hall of the Civic Auditorium of Stockton, California, there will be a meeting of the chrome producers of California and Oregon.

On March 26th, President Eisenhower authorized the office of Defense Mobilization to establish immediately new long term objectives for the mineral stock pile. The purpose of the meeting in Stockton is to discuss ways and means of implementing Eisenhower's program. The domestic production of high grade metallurgical chromite has now reached substantial enough proportions to materially effect the plan.

The long term program for domestic chrome at the present time would immediately result in large scale development work, and definitely safe-guard our country in time of war, against interruption of over-seas supplies. It is hoped that a program acceptable to the office of Defense Mobilization will come out of this meeting.

### EARNs COMMENDATION

Day Mines Inc. has earned the commendation of the U. S. Forest Service for the progress it has made on a timber management and tree-farming program started about two years ago. Some of the tree-farm acreage is at the company's Aurum gold property in Ferry County, Washington, some in the Metaling District of Pend Oreille County, Wash., some at its Jupiter Mining Co. holdings in Western Mineral County, Mont., and some in the Nine Mile Canyon and St. Joe River drainage of Shoshone County, Idaho.

(From: The Engineering and Mining Journal, published by McGraw Hill Publishing Co. Inc. New York)

of a canyon on State lands at the border of Fresno and San Benito Counties. Since this prospect could only be operated as underground diggings, it awaited a hard rock miner interested in chrome to activate it. During the past month the slide has been cleared away, collar-set and portal installed, and active production begun on high grade lump ore. This operation is a partnership of Earl Redding and Don Brooks with financial support from J. R. Holman. Needless to say all are very enthused with the face exposed at the portal.

Four active mines within the radius of 4 miles in 12 months time, and more interesting leads being reported every day.

### DWORSHAK BILL

Senators Dworshak of Idaho and Anderson of New Mexico have introduced S-3347, which was referred to the Committee on Interior and Insular Affairs on April 26th.

This bill, as far as we have been able to find out, amends the mining laws in a way that is satisfactory to the Federal Agencies that have been crying for a change in the mining laws. It effectively answers all their testimony as to the abuses of the mining laws.

This particular bill is the result of several years of work by the Western Governors Advisory Board, by the mining organizations of the West, and very particularly by members of the Oregon Mining Association.

The Oregon Mining Association recommends its passage. The following is the bill:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act of July 31, 1947 (61 Stat. 681), as amended by the Act of August 31, 1950 (64 Stat. 571; 43 U.S.C., 1946 edition, Supp. IV, secs. 1185-1188), is amended by adding at the end thereof the following new section:

"Sec. 5. Deposits of common varieties of sand, stone, gravel, pumice, pumicite, or cinders on lands belonging to the United States, including lands in national forests, shall be subject to disposal under and in accordance with the provisions of this Act, except that no such mineral deposit on lands in a national forest shall be disposed of under such provisions without the consent of the Secretary of Agriculture. For the purposes of this Act, common varieties of pumice or pumicite shall not include so-called block pumice which occurs in nature in pieces two inches or more in one dimension."

Sec. 2. A disclosure of a deposit of common varieties of sand, stone, gravel, pumice, pumicite, or cinders shall not be deemed a mineral discovery sufficient to give effective validity to any mining claim hereafter located under the mining laws of the United States unless the so disclosed deposit shall be valuable because of some other mineral occurring therein or in association therewith or because the deposit has some property giving it distinct and special value. For the purpose of this Act, common varieties of pumice or pumicite shall not include so-called block pumice which occurs in nature in pieces two inches or more in one dimension.

Sec. 3. Any mining claim hereafter located under the min-

(Continued on Page 12)

# BEN BAKER VIEWS CHROME MINING DISTRICTS

by  
BEN BAKER

(Ed.'s note: Central and Southern California have a terrific advantage over Northern California and Oregon, in that year round work is possible. We have been in contact with quite a number of producers, but as trips like Baker's cost considerable money and time, we have not made near as many as we would like. This is by no means as complete as they would like to have it, but it is a result of two weeks of travelling and one week of re-write work on the notes taken.)

On March 31st Clarence Peshman and I started out on a trip from Grants Pass, Oregon, to make a survey of the chrome mining districts in California, to take pictures, interview the operators and find out what the present and potential production of each operation was going to be.

This trip was a direct result of the announcement by President Eisenhower that the strategic stock pile was being re-surveyed and that wherever possible minerals from domestic sources would be used, with particular emphasis on the availability in time of emergency. The trip took longer than anticipated. We originally planned a three or four day trip and were gone nearly two weeks. We were only able to see a few of the mines and mills personally in that length of time. Wherever possible we saw the properties, and supplemented our information with phone calls and personal interviews. We took a lot of pictures and are publishing the ones that turned out good.

## DEWEY VAN CURLER MILL

We left Grants Pass very early in the morning on March 31st. Our first stop was at the Dewey Van Curler Miller at Ashland, Oregon. The mill was operating and Ed Loff was in charge. Dewey had left a few minutes before we arrived, and we did not get to see him. Mr. Loff supplied us with the following information.

The ore they were milling was from the Lady Gray mine on McGuffey creek, near Hamburg, California. This is an 80 mile haul, but most of it is on pavement. There are three men employed at the mine. The mill is equipped as follows: A hammer mill is used as a primary crusher, then to the ball mill equipped with a screen classifier, then over a Denver jig, and on to two Wilfley tables. The middlings are returned through the ball mill by the use of a sand pump. The mill has a capacity of approximately four tons per hour.



ED LOFF, MILL OPERATOR, at door of Van Curler Mill, Ashland, Ore.



VAN CURLER MILL AND RAMP

Dewey Van Curler's mill has the bugs pretty well out of it, and has been a consistent shipper. It might not be a bad place for new operators to look over.

From Ashland we headed South. We did not go down the Klamath River or to Scott's Valley or Gazell, but here are a few of the operations that we know of in these districts:

Mr. C. B. Sappington of Grants Pass is digging in the Gazell District.

Mr. J. A. Richter of Callahan, California, is producing some nice ore tonnage from the Gazell Mt.,

about 25 tons per week.

Mr. Charles Miller of Grants Pass, is getting out some lump ore on the Seiad.

The Scott River Mining Company (Carver Gelford of Etna) is starting mill construction in the next couple of weeks.

Harry Bowyer and Harry Hollaway are starting to open up the Peg Leg and other properties on Moffet Creek Fort Jones area.

## MAGALIA MINE & CASTELLA MILL

Our next stop was at Castella which is a few miles south of Duns-

muir, California. The mill is about one-half mile off the highway west of Castella. The mill is in charge of Don Schuler. So far most of the ore they have milled is from the Lambert mine at Magalia, Calif. This is actually 132 miles from the mill, which seems like a terrific distance. The mill was already built and available so was put in operation by the partnership of Ray Helmke and Bob Janssen. They are also developing several mines in the immediate vicinity of the mill.

The mill is equipped as follows: Jaw crusher, two large fine ore bins, feeder and a Hardinge mill, Southwest Engineering jig, Dorr classifier and six tables, sand pump for returning middlings. This mill is arranged so that the operator can observe all the equipment, except the jaw crusher, from practically any place in the building.

Their particular ore requires a rather fine grind for chrome. The mill has a capacity of 125 tons per day. They are doing a rather remarkable job on their tables as their gauge is only .4 specific gravity lower than their chrome grains.

Twelve men are employed at the Magalia mine producing ore for this mill. Don Schuler said that they are also developing ore in the Brown mine on Little Castle Creek, and that as soon as the snow was off they would be getting ore from the Johnson-Owens mine, which is just up the hill in back of them, but is about a 30 mile haul to get it down.

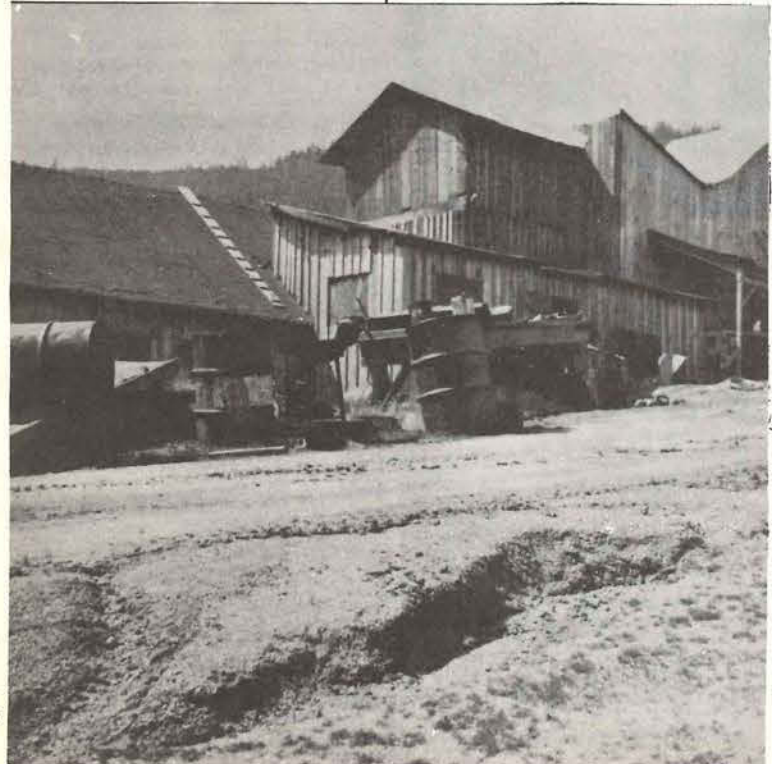
(More pictures of Castella Mill on Page 4)

ELDER CREEK MINING COMPANY

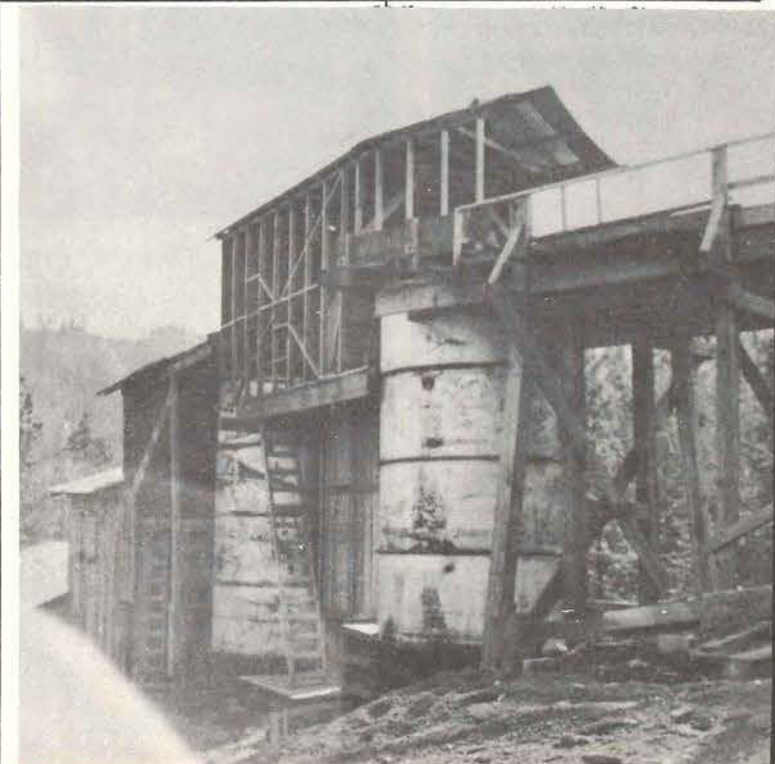
Our next stop was at Red Bluff, California. We had left our four wheel drive jeep at home, and were informed that the road out to the Kleimsord mining district was not passable in our Chevrolet. We were able to find Mr. Otto Brink, who is one of the operators of the Elder Creek Mining Company, partnership of Nusser Bros. and Brink, located 32 miles northwest of Red Bluff. At the present time they are using a 42 inch Ellis mill and two tables. There is a 10 stamp mill on the property, which is being reconditioned to use as a fine crusher and the Ellis mill will be used for regrinding the middlings. When the remodeling is complete they will be using the 10 stamps, two Brainard jig classifiers, and four tables, and the Ellis mill for regrinding middlings.

They will have a capacity of approximately 100 tons per day. At present only three men are em-

(Continued on Page 4)



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# BEN BAKER VIEWS VARIOUS CHROME MINING DISTRICTS

## BAKER'S TRIP (Continued from Page 3)

ployed at the mine and mill, but as soon as the rain and snow lets up they will be employing 10 to 12 men. The chrome crystal is liberated at about 16 mesh, and they seem to have had no serious slime problem.

Considerable ore has been developed, a good deal of it shipping grade lump. They anticipate using an open pit operation, gradually changing over to underground mining.

Mr. Otto Brink told me that he had been an under-ground gold miner all of his life, and would eventually plan for all underground operation.

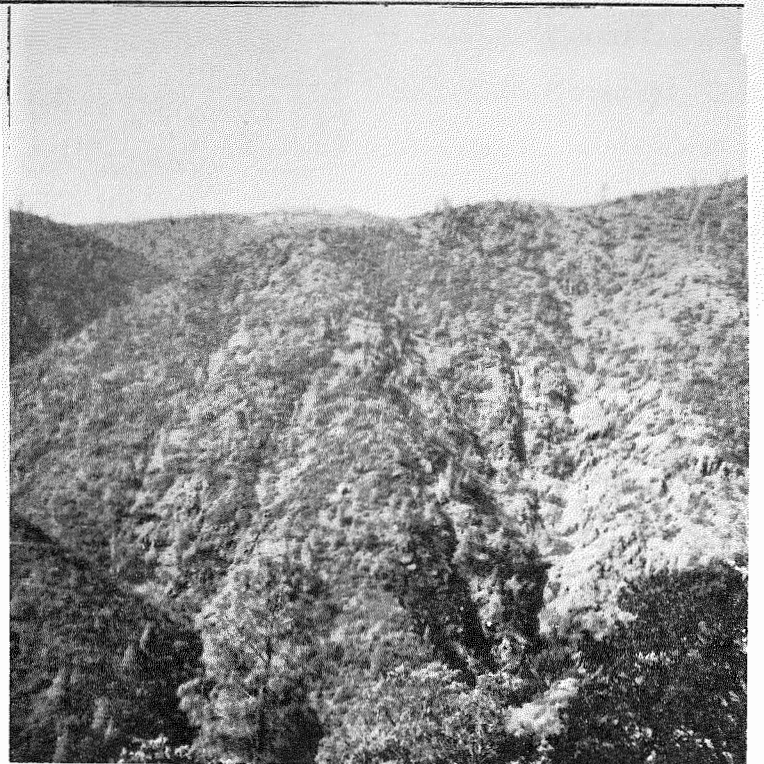
## METRO METALS

Metro Metals are operating in the same district. Harold Heathman of Seattle is the manager, and Floyd Jolly is the superintendent. They are operating a mill of 50 tons capacity per day. The mill consists of jaw crusher, two sets of rolls, a Huntington mill, Dorr classifier and two jigs. The mine is being operated as an open pit. They employ 10 men at present. This property was formerly known as the Conconully mine. **TEDOC MINING COMPANY**

The Tedoc Mining Company is located about 42 miles west of Red Bluff. This is strictly a high grade lump ore property, and is being operated by Roy, Albert, and Herbert Sanders, and Dave Brundage. They have been troubled by



ORE DEPOSIT, CRO-TUNG MINE.



LOOKING UP at Rustless dumps, Cro-Tung Mine.

rain and snow all winter and they anticipate considerable increase in production as soon as the weather permits.

## WALTER HOPPE

The next lap of our trip took us to see Walter Hoppe, who is operating the old Rustless mine 32 miles west of Willows, Calif. This mine was supposedly completely worked out by Rustless Iron and Steel during World War II. Hoppe's operation is known as the Cro-Tung Company. Walter Hoppe is general manager; Howard Wil-

moth, Superintendent; and Bob Mathews, Mine Foreman.

They were not able to secure the old Rustless mill setting, as they had hoped, but found a good location on Elder Creek 12 miles away. Actually this is probably better, as they have power lines and housing at the mill site, and most of the haul is over black top.

The construction of the mill has been in charge of Howard Wilmoth, and uses the following equipment: Jaw crusher, feeder, rod mill, classifier, dewatering cones and five tables. Two jigs will be installed later after determining where in the circuit they will be best suited. They anticipate the capacity of the mill as 150 tons

per day. Ten men are now employed.

They were just completing the mill during our visit. Their mining operation is nearly a mile north of the old Rustless diggings. They have developed ten exposures of ore, that they have faced up and are ready to start open pit operations on. Four of these show possibility of large tonnage. Prospecting this last year has developed numerous other chrome bodies. New roads have been built to the mine from the valley approximately two miles, and the mine is ready to go.

Before starting construction of their own mill 100 tons was hauled to Jack Hoppe's mill near Auburn,

California, for a test run. The results showed a good high grade concentrate.

(More pictures of Cro-Tung on Pages 5 and 6)

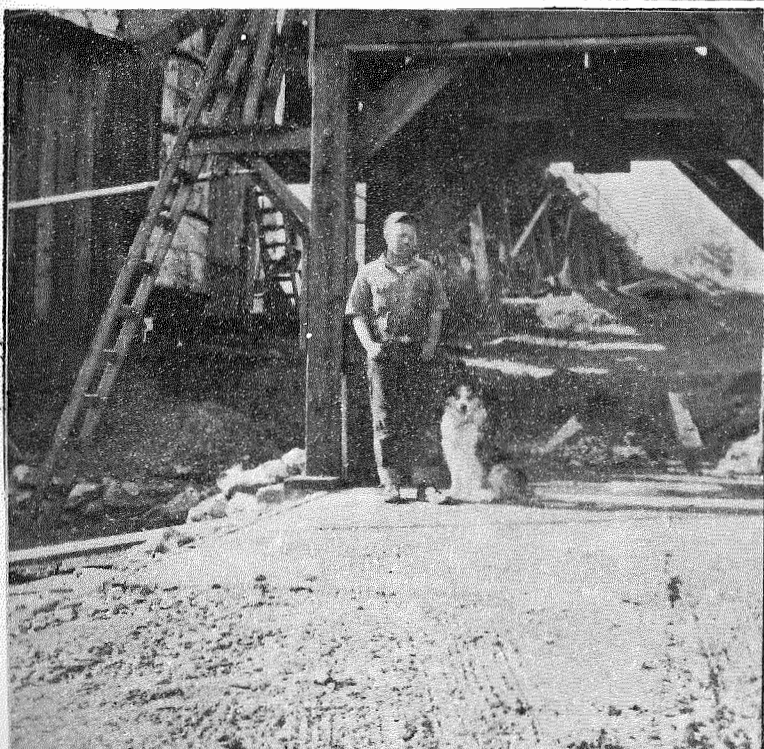
## JACK HOPPE'S MILL

Jack Hoppe has been moving his mill from Auburn over into Lake County. His mine is located about 15 miles southeast of Lower Lake. He is using open pit method. The ore is disseminated type, and is in a dunite. He has found that it requires very careful clean mining to help him overcome a bad slime problem.

He is building his mill about (Continued on Page 5)



LOWER PART OF BUILDING, CASTELLA MILL.



DON SCHULER AND NIGHT WATCHMAN UNDER CONCENTRATE BIN, CASTELLA MILL.

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# BEN BAKER VIEWS CHROME VARIOUS MINING DISTRICTS

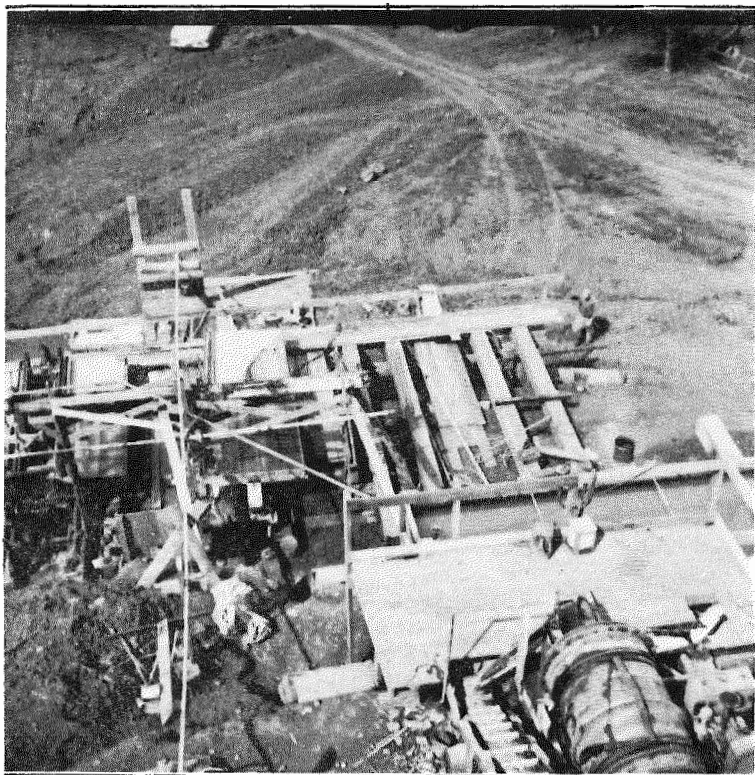
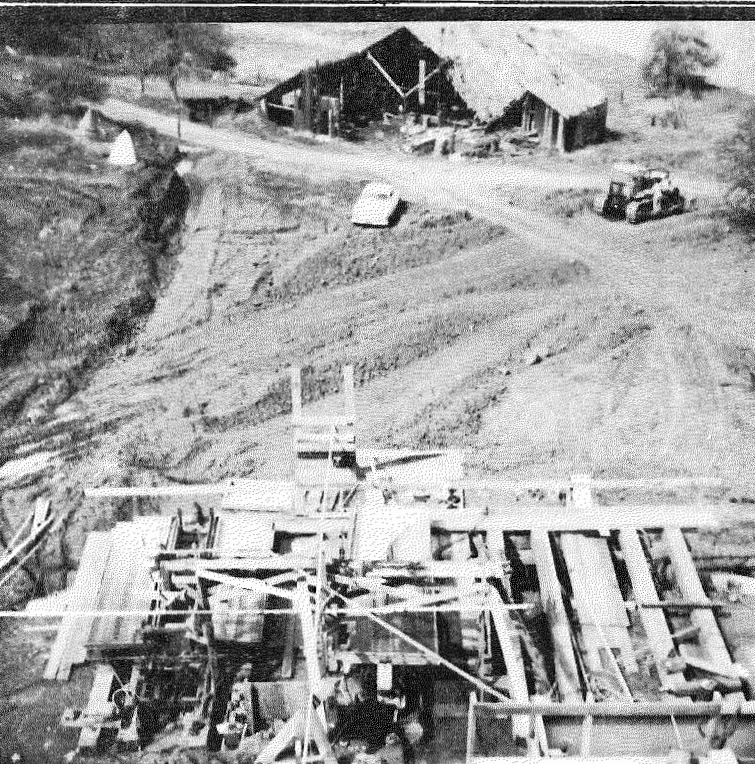


TABLE PLATFORM, CRO-TUNG MILL.



CONCENTRATE TABLE AND ROD MILL, CRO-TUNG MILL.



BOB MATHEWS standing on ore, Cro-Tung Mine.



CRO-TUNG MINE ORE EXPOSURE.

## BAKER'S TRIP

(Continued from Page 4)

five miles from the mine. He has the ore bin up, a Huntington mill in place and foundations set for other equipment. The flow sheet will be a jaw crusher, Huntington mill, Brainard jig, hydraulic classifier, hydraulic cone de-slimmer, three tables and a sand pump. He is using diesel-electric power, and the mill will have a capacity of 60 to 70 tons per day.

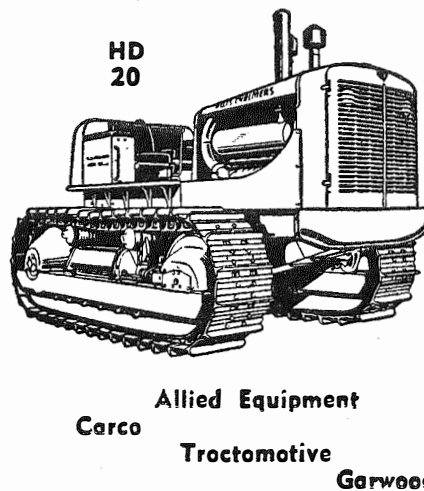
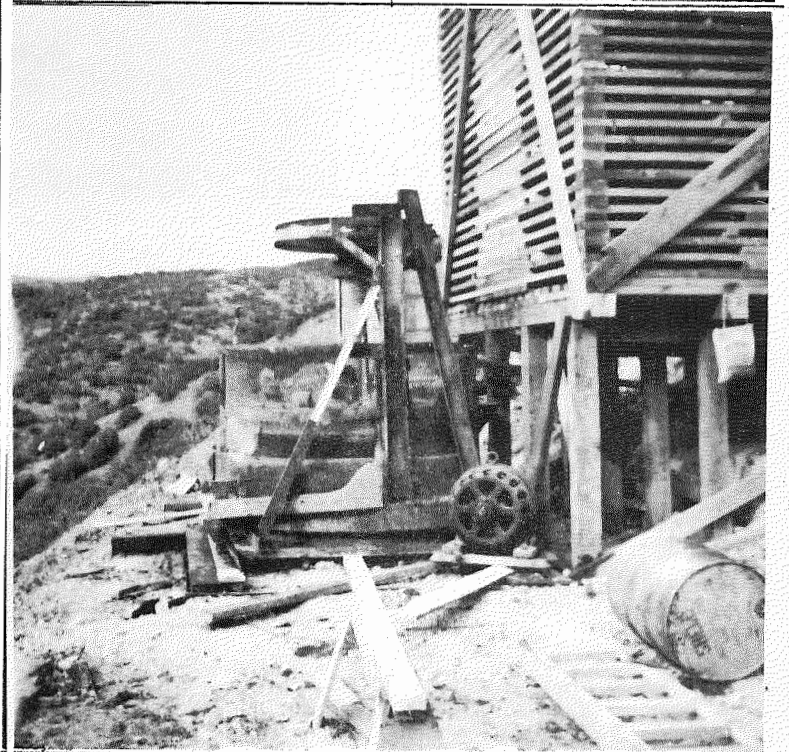
## JIM SCOTT'S MILL

Our next stop was to see Jim Scott at his mill 3 1/2 miles south of Middletown. Jim is one of the few remaining World War II strategic metals miners. We are sure lucky to have a few of them left. He mined and shipped manganese near Eureka, California, during the War. He returned to mining when the chrome program started.

He spent several months prospecting and testing, looking for a good grade of milling ore. He located and opened up a body of chrome ore that hundreds of people have been walking over for years. Times have not changed, it still takes good prospectors in the field. It has taken him over a year to assemble machinery for his mill, and has come up with a very neat and well planned operation. His flow sheet is as follows: Jaw crusher, conveyor belt to storage bin to Brainard Ellis mills, two Wilfley tables, sand pump for returning middlings, and concentrate elevator to storage platform. His ore is the disseminated type, with an occasional piece of lump chrome. He is grinding to 20 mesh.

(Continued on Page 6)

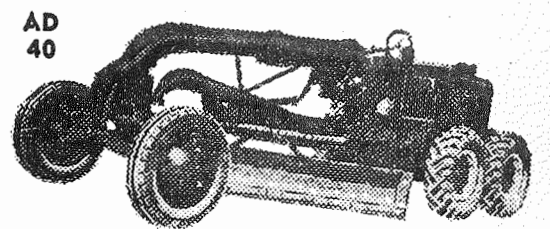
UPPER RIGHT: Jack Hoppe Mill ore bin. Lower right: Jack Hoppe Huntington Mill.



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# BEN BAKER VIEWS VARIOUS CHROME MINING DISTRICTS

## BAKER'S TRIP (Continued from Page 5)

He was able to build his mill close to a power line, and actually has a push button plant. It is about a one-half mile haul from the mine to the mill. The mine being operated as an open pit. The chrome lays as a blanket, dipping slightly into the hill. It is from 6 to 20 feet thick and the chrome float indicates over 1,000 feet of length. The ore assays between 18 and 22%. It looks like he has about 15,000 or 20,000 tons in sight. It is sure good to see a prospector able to put his prospect into production.

(More Jim Scott Mill pictures on Page 7)

## PALO ALTO MINING COMPANY

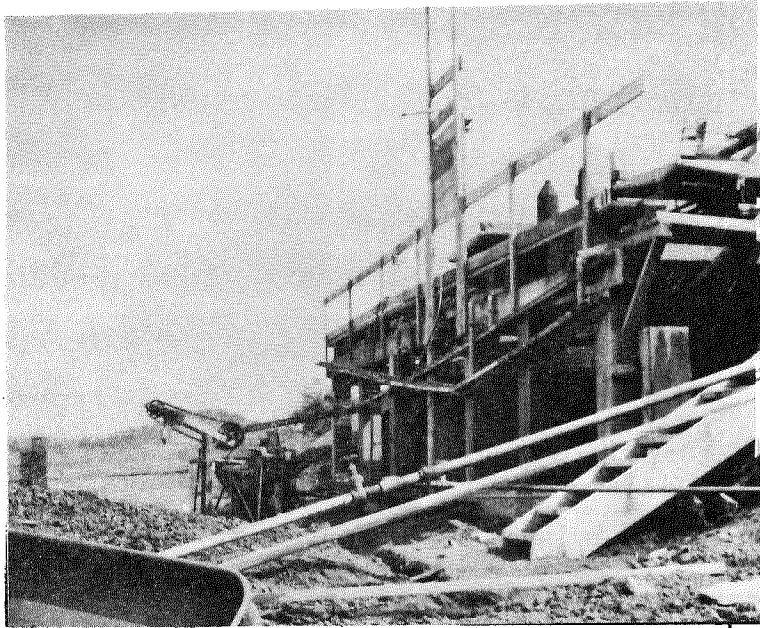
At Coyote, near San Jose, we found Steve Ridgely and George Carlson at their mill on Coyote Creek. Their mill is on a surfaced road close to Highway 101, about four miles north of the town of Coyote. Their flow sheet is as follows: Jaw crusher, storage bin, Syntron vibrating screen feeder, a ball mill, a Denver Ruffer jig, a Denver fine jig, a Wemico drag classifier, one Wilfley fine table and two Diester Diagonal deck coarse tables, sand pump, a spiral elevator to elevate concentrates to the storage bin. Mill has a capacity of about 75 tons per day.

The ore is mined at the Santa Theresa mine, one-half mile from the mill, and from the O'Connell mine located 10 miles away. They are also getting ore from the Mendenhall, and Saco mine 51 miles away. They have had a bad time with the weather this winter, but will soon be running at capacity. Ore from each mine is entirely different, requiring a different setting for each ore, such as the grind, table setting, and what part of the middlings to return. They are doing a real job.

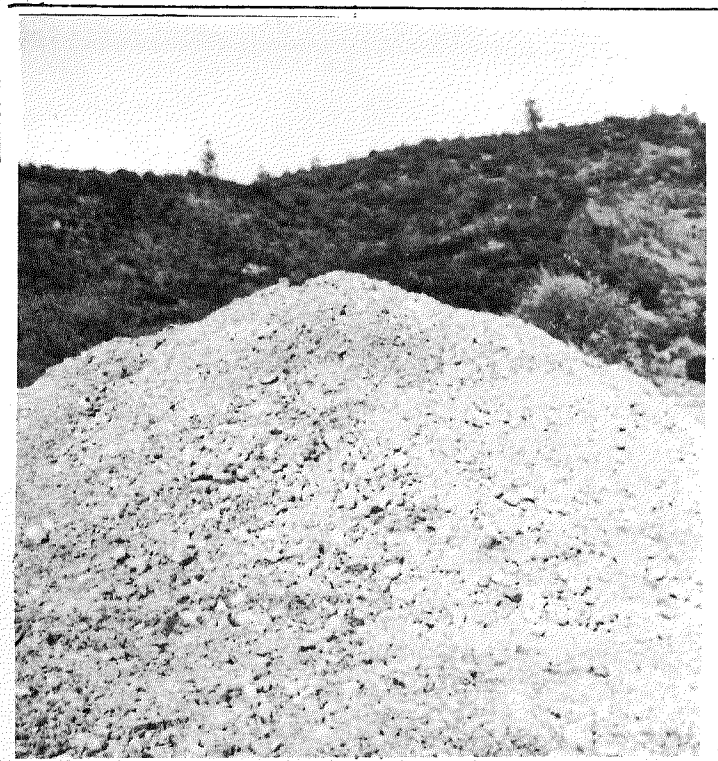
(Pictures on Pages 7 and 8)

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PICTURE AT RIGHT: ORE BIN AND UPPER DECKS OF CRO-TUNG MILL. PICTURE BELOW: TABLE PLATFORM AND LOWER DECK OF CRO-TUNG MILL.



LOOKING INTO SCOTT MILL from end of concentrators.



ORE STOCKPILE AT SCOTT MILL.

## JOE HOLMAN MILL

Next we found the Holman mill some distance out of Coalinga, California. When I say found, I mean just that. There were no road

signs, and we covered most of the area before we found the mill which is located about three miles from the mine, as most of the time it is the nearest water. Much to our amazement we found the crew installing a dryer. We found out that Oregon is not the only place that it rains in the winter time.

The reason for installing a dryer is to enable them to separate the asbestos fibre from the chrome. This will be done through air separation. The fibre has been giving them a bad time clogging their screens and with the dryer they hope to be able to sell the asbestos.

The flow sheet consists of: Jaw crusher, rotary dryer, air separation for asbestos (over vibrating screen), Syntron feeder, Brainard-Ellis mill, two economy tables, sand pump for middlings, spiral elevator for concentrates into a steel storage and de-watering bin. The mill is powered by a LeRoi 37 1/2 K.V.A. power unit, using Butane for fuel. Joe's mill may be small in size, but his shipping record of approximately a carload a week of concentrates proves that consistent operation gives real production.

On the road up to the mine we passed a quicksilver property that was shut down some time ago, because of low quicksilver prices. Joe's mine is being operated as an open pit. The ore out-crop was near the crest of the hill and the ore is paralleled by a steep ravine running approximately north and south. Originally the mine was operated with a D-6 bulldozer, later a half yard P&H Shovel, and as the ore hardened a 210 LeRoi compressor and drilling equipment

(Continued on Page 7)

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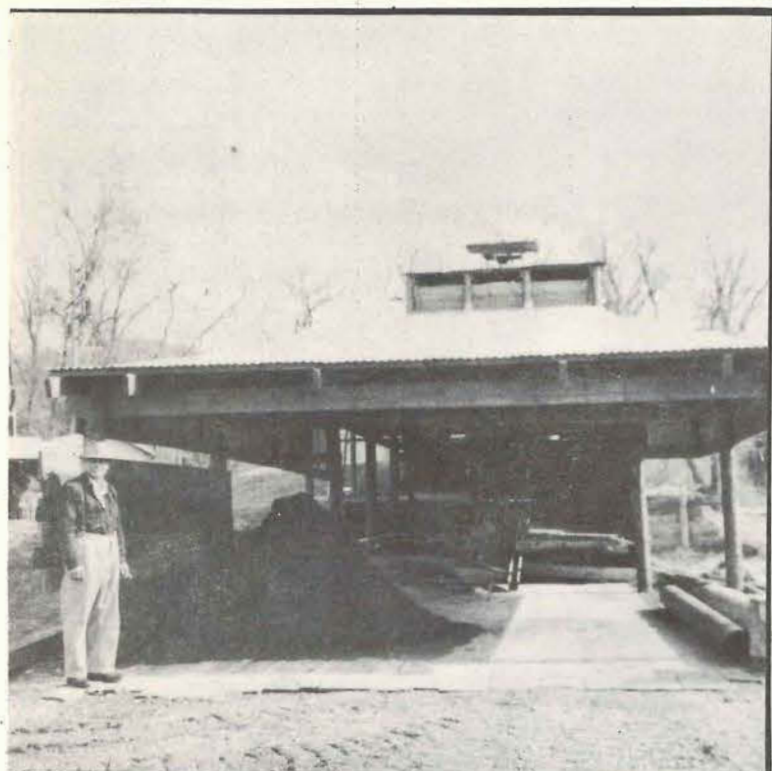
**Ted Paulus**

**VALLEY HARDWARE**

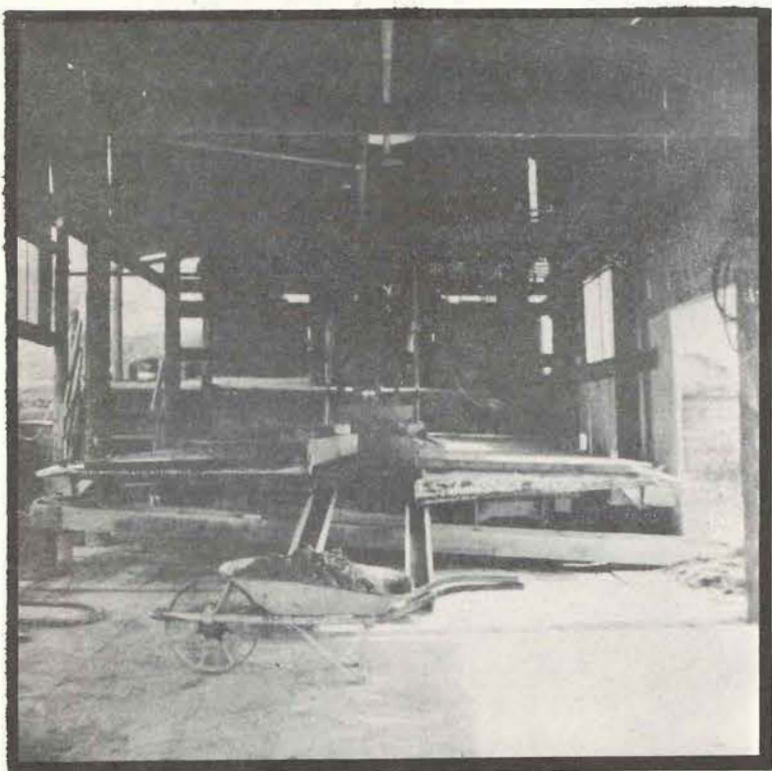
**24 S.W. Sixth St.-Dial 3211**

**Grants Pass, Ore.**

# BEN BAKER VIEWS VARIOUS CHROME MINING DISTRICTS



JIM SCOTT standing on concentrating platform with mill in back.



LOOKING INTO SCOTT MILL AT BRAINARD ELLIS MILL.

**BAKER'S TRIP**  
(Continued from Page 6)  
were placed on the job.

This is one of those mines you have heard so much about, but is actually true. The deeper they go the wider the ore gets. The ore body is now nearly 40 feet wide, at 80 feet of depth. The ore has been mined with a benching method taking about a 10 foot bench at a time. The pit is now 200 feet long, and about 100 feet wide at its widest place, and they are down to about 80 feet. It has taken very little shooting as most of the ore can be dug directly with the shovel, as can the overburden. They occasionally get some lump ore on the hanging wall.

(Pictures on Page 8 and 9)

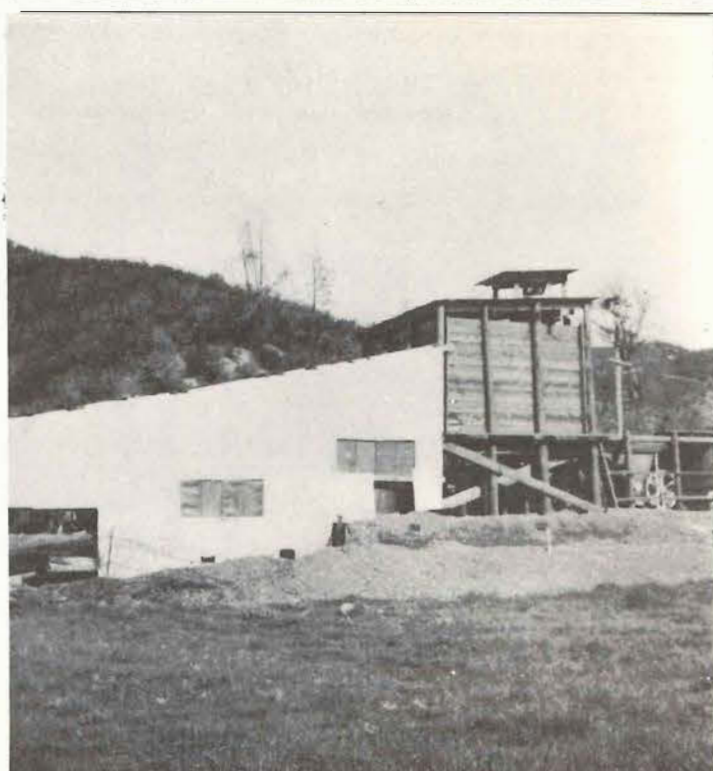
SAN LUIS OBISPO DISTRICT  
CASTRO MINE

From Joe's we headed for San Luis Obispo. Our first contact was with Mr. Barnett, who was able to contact many of the operators in the area, so that we could meet them. It was impossible to visit all of the properties, but they promised to take pictures and outline the story of their operations.

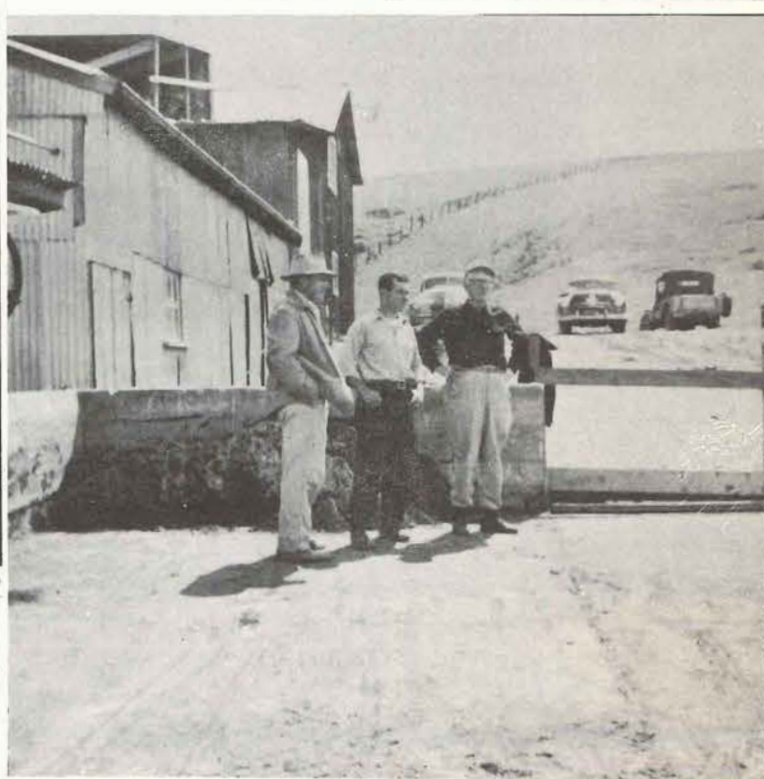
Durand Hall and Mr. Barnett operate the Castro mine. They had a couple of nice aerial photographs. We went up to the Castro mine with them. The Castro mine shipped chrome during World War I and World War II, but it is now really being developed. It is being operated as an open pit where formerly it was an underground mine. Hall and Barnett initiated a drilling program, and after locating the position of the ore bodies a real stripping job is done. They are stripping as much as 80 feet of overburden. They seem to be doing a very efficient job of stripping using a D-8 and D-7 cat. They completely strip the ore, absolutely cleaning it up, having it already to mine separately. Through the use of a loader three men are able to supply 150 tons of mill ore per day from the ore bodies. They have a long range drilling program mapped out.

According to Durand Hall this

(Continued on Page 8)



MILL BUILDING, SCOTT MILL.



GEORGE E. CARLSON, LEONARD S. SCIORTINO AND STEVE RIDGELY ON CONCENTRATING PLATFORM, MILL BUILDING IN BACK

Chrome producers meeting at Stockton, Calif. May 24th

**Alec says:**

"I can neglect lights and brakes...



but **YOU** have only **ONE** life"

Sure, Spring's the time for love and fun. But moonlight's much more effective outside a hospital. Brakes or wiper, lights or horn out of kilter can fail at the wrong time. So keep your car in shape and...

**DRIVE CAREFULLY**—the life you save may be your own!



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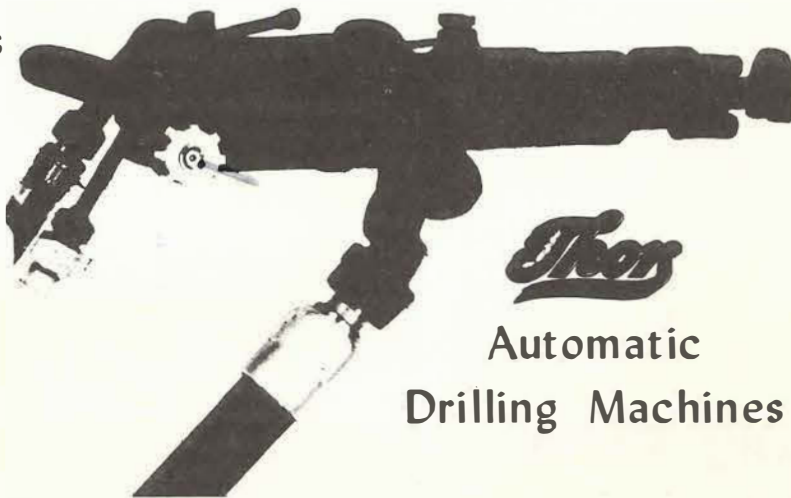
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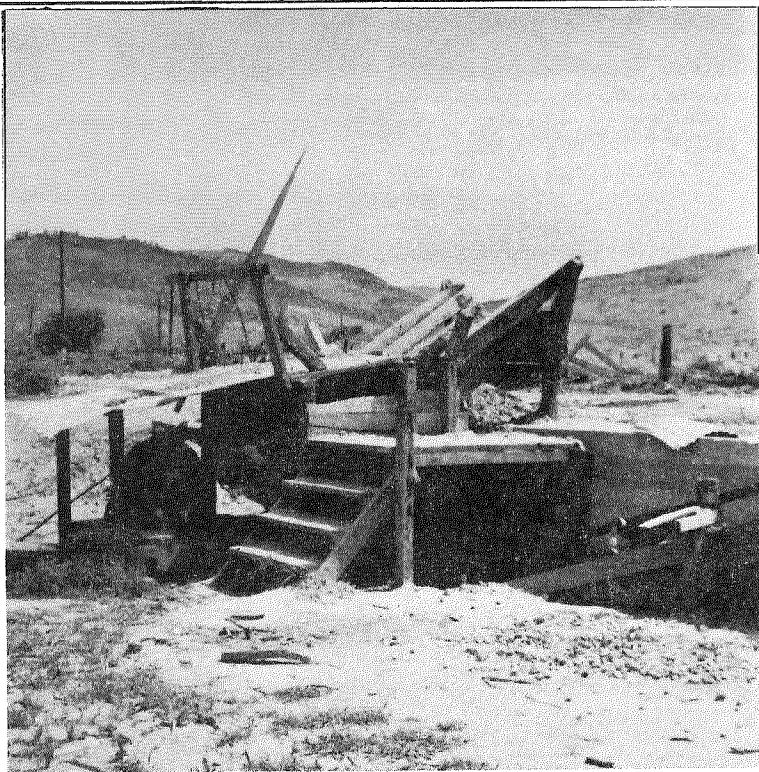
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**Cal-Ore Machinery Co.**

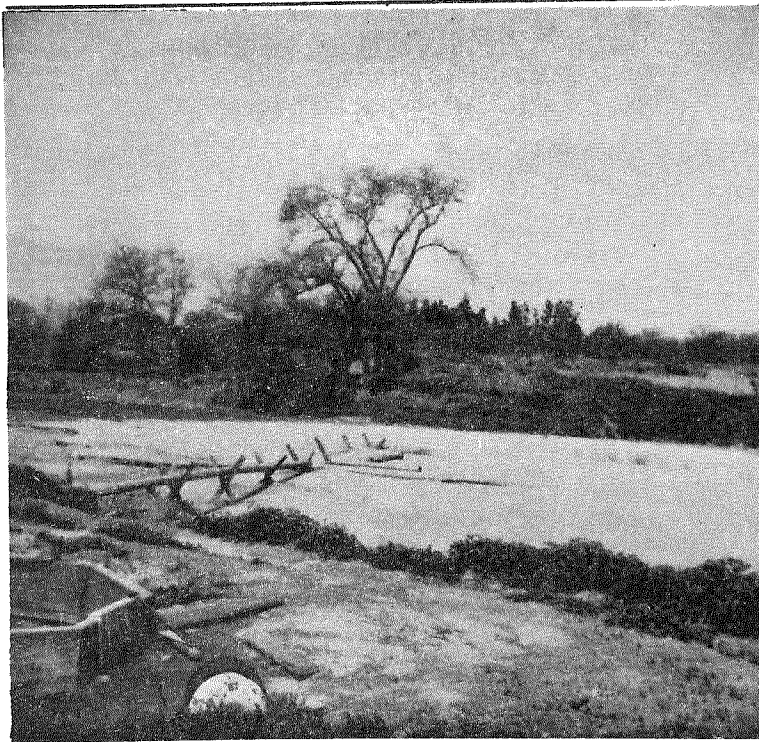
944 So. Central Ave.

Medford

Phone 2-6155



CRUSHER AND ELEVATOR BELT, RIDGELY MILL.



TAILING POND, RIDGELY MILL.

**BAKER'S TRIP**  
(Continued from Page 7)

property would never have been re-opened unless a mill had already been built, and available to the property. They actually sell their ore to the I. M. C. C. mill where it is up graded and then shipped to Grants Pass, Oregon. This mine has been the largest producer shipping to the Grants Pass Stockpile.

(Pictures on Pages 9 and 10)

**PIERCE BROTHERS MINE**

On the way back from the Castro mine we stopped by the Pierce Brothers mine. It is a blanket ore body similar to Castro. They plan on a large open pit operation, stripping from 60 to 80 feet. At the present time the Pierce Brothers are selling their ore to the I. M. C. C. Mill. Their equipment consists of an International loader and truck.

**INTERNATIONAL METALLURGICAL CHROME CORPORATION**

Next we stopped by the International Metallurgical Chrome Corporation Mill. Mr. Arness is General Manager, and Mr. McDonald is mill superintendent. Their flow sheet is as follows: Jaw crusher, storage bins, vibrating screen, ball mill, five cell hydraulic classifier, centracone, nine tables for classified feed, and two Diester diagonal slime tables. This mill has normally delivered five carloads a week of concentrates to Grants Pass, turning out 50 tons of concentrates per day.

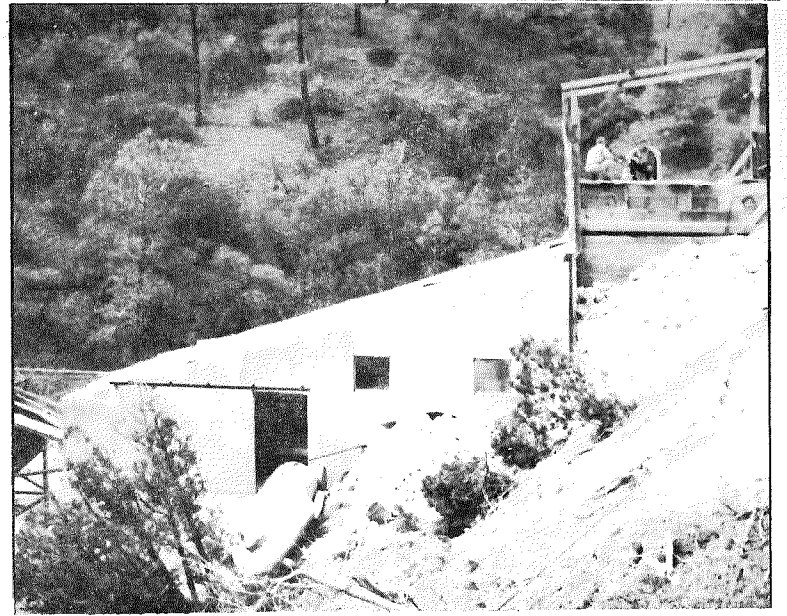
**SAN LUIS OBISPO DISTRICT**  
(Continued)

We met with Vern James, Harry Stevens and Al Tiemann, and discussed their operations with them. Each of these operators have mills and will be really producing this summer. The following mines are now being operated in the San Luis Obispo area;

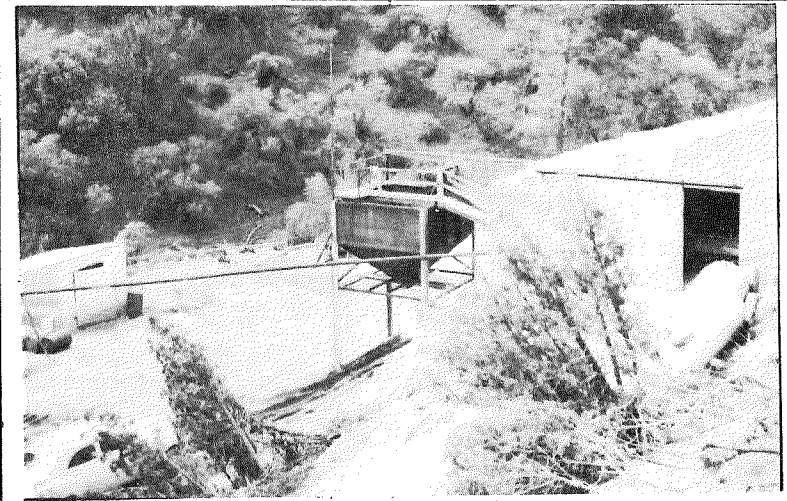
Sweetwater (San Juan); Tip Top; Chromic Acid Nos. 1 and 2; Eureka; Norcross (Biaggini); Sunrise No. 2; Victory No. 3 (Bernardo Sunrise No. 3, Manzanita); West Norcross (Brooklyn); Crown Point; Castro; Leitner; Niggerhead; El Divisadero; El Salto; Santa Clara; Trinidad (La Trinidad); Outpost (Old Glory); Ore Bag (Mutual?); Single Jack; Pick and Shovel (Safety); New London; El Primero (La Primera); From Ranch.

In talking with the various people we heard a great deal about the Brainard Ellis mills that were being installed throughout the chrome country. On the way back we stopped in to see Mr. Brainard at Sacramento. We thought maybe he could give us some idea of how many chrome mills were being constructed. We were greatly surprised in the number.

He told us that he sold the first mill for chrome milling to the Pierce Brothers for their mill at Morro Bay, shortly after the chrome program started. He has now shipped over 100 Brainard-Ellis mills, and stated that his factory couldn't keep up with the orders. Most all of these mills have been sold by word of mouth. It seems rather amazing that one manufacturer would be supplying 100 mills for grinding chrome ore in this short period of time. In fact we would like to know where all these chrome mills are. We will no doubt find out when they start shipping.



HOLMAN MILL BUILDING.



LOWER PART OF MILL BUILDING AND CONCENTRATING BIN AT HOLMAN MILL.



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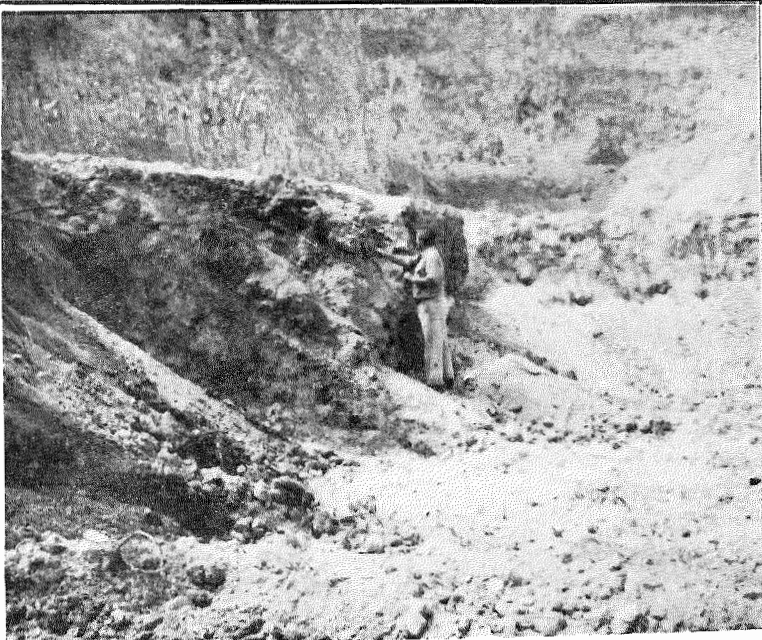
P.O. Box 828

Medford, Oregon





HOLMAN MINE. Ore body across face. At bottom 40 feet; 80 foot wall. Black spot solid ore.



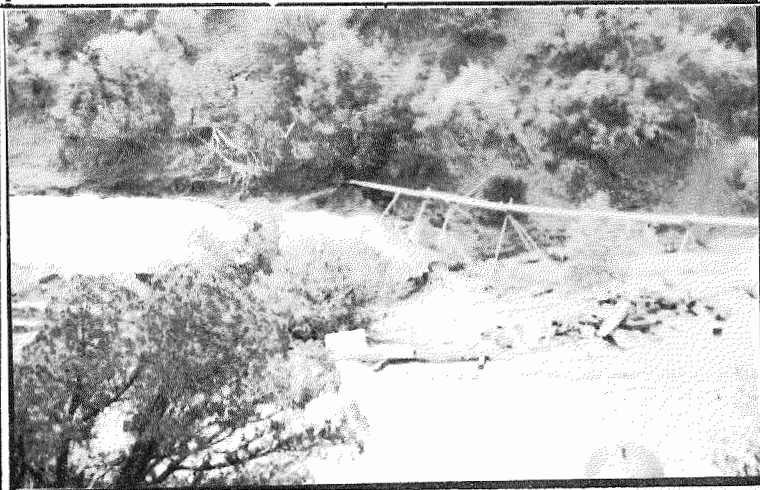
CLEMLAKER pointing to hanging wall of ore at entrance Holman Mine.



VON ROGUS, CLEM BAKER, ALBERT ROGUS, HAL PIMLOTT, FRED WILDER AND LEONARD COOPER standing on ore bin, Holman Mill.



MR. JEFFERIES, MRS. JEFFRIES, JOE'S DAUGHTER, MRS. WILDER AND SON, NETTIE BAKER, CLEM BAKER AND BOOTS. CAMP BUILDINGS IN BACKGROUND.



TAILING POND, HOLMAN MILL.



CASTRO MINE. D8 stripping new ore body. East pit.

OREGON CHROME

Bill Robertson is now sinking a 150 foot winze in the Oregon Chrome mine, to tap the ore body that he drilled out this winter. The winze is located 900 feet from the tunnel mouth, the tunnel being on a 750 foot level of the mine.

Bill is very optimistic as to the tonnage he has drilled, and feels that production for the next two years would be good, even in Turkey. This operation has proved that nothing teaches like experience.

Here is an operator who attempted to ship, and did ship, metallurgical grade chrome after the end of World War II. Finally rising costs caused him to shut down the mine in 1949.

Bill has also developed other prospects into mines. A long term chrome program will give us the know-how and the experience to have many steadily producing mines, such as Oregon Chrome.

REMEMBER CHROME MEETING STOCKTON, CALIF, MAY 24th



HALF YARD P & H SHOVEL. D6 IN BACKGROUND, HOLMAN MINE

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Mercury	3.00
Copper	3.00
Zinc	3.00
Lead	3.00
Gold or Silver, ea.	2.00
Gold and Silver	2.50
Nickel	4.00
Tin	4.00
Calcium (Lime)	4.00
Magnesium	5.00
Limestone, complete	15.00
Magnesite, compl.	15.00
Molybdenum	5.00
Vanadium	5.00
Titanium	7.50
Tungsten	\$5.00
Aluminum	6.00
Phosphorus	4.00
Sulphur	4.00
Iron	4.00
Copper, Lead, Zinc	7.00
Lead and Zinc	5.00
Spectrographic Analysis	7.50

Samples may also be left in Grants Pass, Oregon, at

Dean S. Axtell

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## Seldovia Chrome Starts Shipping to Grants Pass

Shipping of high grade lump chromite is starting from deposits of Seldovia Chrome Co., located 12½ miles south-east of Seldovia, Alaska, with initial production about 10 tons per day but goal of 30 tons daily expected by next July. A 1954 production goal of 5,000 tons is the firm's aim this year, according to Wm. Lyons, company president.

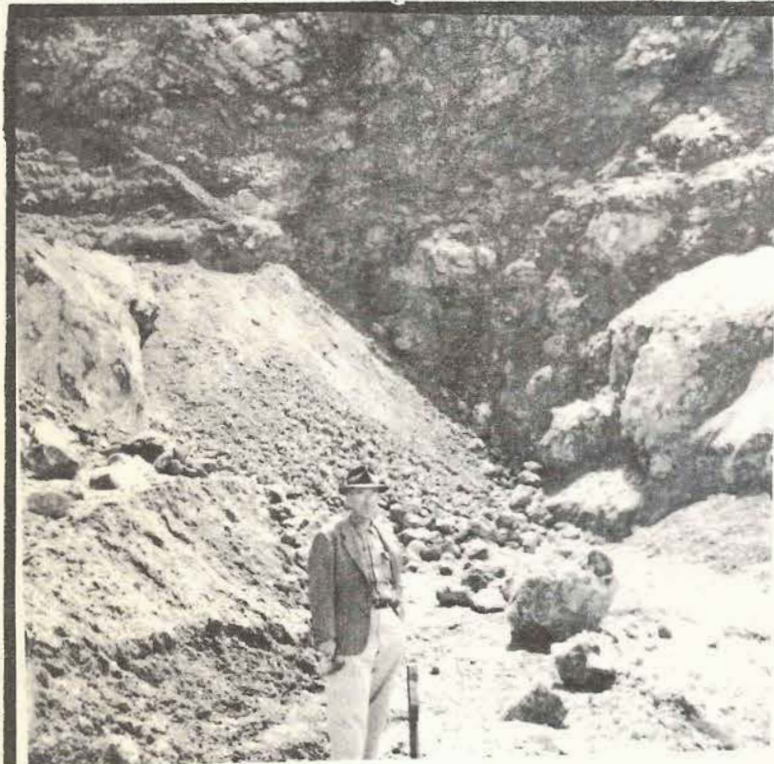
From the Red Mountain mines, the ore is taken to the Seldovia dock via caterpillar and wagon, loaded aboard an Alaska Steamship Co. boat and taken to Seattle. From there it is shipped either by truck or rail to government stockpile at Grant Pass, Ore.

The Seldovia Chrome Co. was incorporated recently with capitalization of \$175,000. The reactivated operations were formerly the Lyons Mining Account, which consisted of five claims of 20 acres each. Seldovia Chrome recently purchased the four mining claims of Kearns and Cooper, bringing the total up to 180 acres. An airstrip about 600 ft. long by 60 ft. wide has been bulldozed and living quarters for the workers have been completed.

In addition to President Lyons, officers include John P. Little, vice president, and Frank Raby, secretary-treasurer. Mr. Lyons is in charge of the plant.

.....Mining & Ind. News

Seldovia to ship in 5000 ton boat loads.



MR. BARNETT. Ore body uncovering in face in background.

## CURRENT SHIPPERS TO GRANTS PASS STOCKPILE

APRIL 1954

The following is a list of the active high grade producers, that we know of, in California and Oregon. An average of a little over one new producer per week ships to the Grants Pass Stockpile.

If you are a high grade chrome producer, or soon will be, and your name is not on this list, please give us complete information on your operation.

Legend:

- # 1 - Large, 1953 over 1000 tons
- # 2 - Medium, 1953, 500 to 1000
- # 3 - 1953, 100 to 500 tons
- # 4 - 1953, under 100 tons but OK

- L. L. ANDERSON # 4  
Foresthill, Calif.
- GEO. A. ANDERSON # 4  
1522 Blue St.,  
Maryville, Calif.
- ASHLAND MINING CO., #1  
835 N. Main St., 50 ton mill  
Ashland, Ore.
- W. B. BARTON CHROME CO.,  
P. O. Box 70,  
Grants Pass, Ore.
- JOHN BAKSHAS  
728 N. W. 6th,  
Grants Pass, Ore.
- W. E. BEER,  
Box 123,  
Middleton, Calif
- D. W. BOWERS  
48 Rose Ave., Very small mine  
Medford, Ore. 20 ton mill
- E. S. BOWSERS, Prospector  
539 S. W. "G" St.,  
Grants Pass, Ore.
- W. D. BOWSER, Prospector  
P. O. Box 162,  
Grants Pass, Ore.
- HARRY BOWER & H. HOLLOWAY  
P. O. Box 206, # 3  
Yreka, Calif.
- BRADLEY & EKSTROM,  
320 Market St., # 1 100 ton  
San Francisco, Calif. mill
- E. R. BREWER & W. R. CHERRY  
Big Barr, Calif. # 4
- FAYETTE I. BRISTOL,  
1040 N. W. Washington Blvd.  
Grants Pass, Ore. # 3

- E. R. BROWN,  
O'Brien, Ore. # 2
- AUSTIN BROWNELL,  
1948 Highway 99 S, # 4  
Grants Pass, Ore.
- JOHN R. BROWNELL,  
1403 N. W. LawnrIDGE Ave., # 4  
Grants Pass, Ore.
- M. CALOIA,  
Star Route # 4  
Etna, Calif.
- CONCONULLY MNG. & MLG. CO.,  
Red Bluff, Calif. # 2, 75 ton mill
- CASTRO MINING CO.,  
1819 San Luis Drive, Largest pro-  
ducer.  
San Luis Obispo, Calif. 200 ton mill
- CHETCO MINING CO.,  
P. O. Box 87 # 4  
Grants Pass, Ore.
- CHURCH MILLING CO.,  
So. Main St., Box 151 # 4  
El Dorado, Calif
- CLARKE & EVANS # 4  
Elk Creek, Calif.
- L. J. CONLEY & H. B. GRAHAM  
Gasquet, Calif. # 1
- O. K. COSTER  
Box 90 - B # 4  
Bridgeport Myrtle Point,  
Ore.
- TOM CRONIN,  
% Leo Dressler, # 4  
Crescent City, Calif.
- CRO-TUNG, INC. # 1  
Elk Creek, Calif. 75 ton mill
- E. A. CUMMINGS, # 4  
Auburn, Calif.
- M. C. DEFARIA & B. FACEY  
Callahan, Calif. # 4
- J. DELMUE & E. A. STONE  
P. O. Box 77 # 4  
Foresthill, Calif
- J. T. EASTLICK  
P. O. Box 583 # 4  
Fort Jones, Calif.
- ELDER CREEK MINING CO.,  
2700 - 19th St., # 4  
San Francisco, Calif.
- J. E. FITZPATRICK # 4  
Myrtle Creek, Ore.
- DONALD A. FOSTER,  
Box 152, # 4  
Kerby, Ore.
- ERNEST A. FOSTER, # 4  
Selma, Ore. 25 ton mill
- BLANCH & WALTER FREEMAN  
Grants Pass, # 3  
Oregon 40 ton mill
- HAROLD T. FUNK,  
Box 87 # 3  
Fort Dick, Calif
- J. G. GALLAHER # 3  
716 N. E. "A" St., 5 ton mill  
Grants Pass, Ore.
- FRED GARDNER # 4  
Harbor Ore.
- FRANCIS GEORGE # 4  
Cecilville, Calif.
- W. R. GEORGE, # 4  
Sawyer's Bar, Calif.
- CARVER GEPFORD, # 4  
Box 18,  
Etna, Calif.
- E. R. GILMORE & L. J. CONLEY  
Gasquet, Calif. # 3
- J. N. GRISSON & HELEN INMAN  
Selma, Ore. # 3
- JIM GRAHAM,  
1918 Nebraska Ave., # 4  
Grants Pass, Ore.
- R. L. HARDISTRY,  
Box 172 # 4  
Smith River, Calif.
- MARK HAUSMAN,  
P. O. Box 1391 # 3 or # 4  
Redding, Calif.
- BURT S. HAYES # 3  
Box 422, 50 ton mill  
John Day, Ore.
- H. H. HANSEN # 4  
Etna, Calif.
- RAY HELMKE, BOB JANNSON &  
JIM MCDONALD, # 1  
320 Market St., 100 ton mill  
San Francisco, Calif.
- HARRY HILL, # 4  
Harbor, Ore.

- ROY HILLIS  
210 S. W. Pine # 4  
Grants Pass, Ore.
- HOLLIDAY MINES  
433 "J" St., # 1  
Crescent City, Calif.
- TULARE & HOLLIDAY # 3  
Grants Pass, Ore.
- JOSEPH R. HOLMAN # 1  
1564 E. Orange Grove Ave., 50  
Pasadena 7, Calif. ton mill
- ROMIE HOLZHAUSER # 4  
Cave Junction, Ore.
- JACK A. HOPPE # 2  
Route 1, Box 1074 75 ton mill  
Auburn, Calif.
- C. E. HUFFMAN # 4  
Box 187,  
Selma, Ore.
- MAX HUGHES  
Rte. 4, Box 575 # 4  
Murphy, Ore.
- J. R. HUTCHISON  
Rte. 1, Box 472A # 4  
Ashland, Ore.
- J. E. INMAN & J. L. LEONARD,  
1506 Fruitdale Drive,  
Grants Pass, Ore.
- INTERNATIONAL METALLURGI-  
CAL CHROME CORP. # 1  
1026 Chorro St., 200 ton mill  
San Luis Obispo, Calif.
- ROY JACKSON # 4  
Box 12, 100 ton mill  
Selma, Ore.
- PETE JANTZEN # 4  
Gasquet, Calif.
- JAMES VERNON # 3 1954  
Box 1095, 50 ton mill  
Atascadero, Calif.
- JOHN DAY MINING CO. # 3 1954  
John Day, Ore. 100 ton mill
- J & W MINING CO., # 1  
Gasquet, Ore.
- D. KARTES & R. WALLACE # 3  
Box 284, 50 ton mill  
Canyonville, Ore.
- A. E. KAST # 4  
Meadow Valley, Calif.
- FRANKLIN KING # 4  
1302 N. E. Madrone 20 ton mill  
Grants Pass, Ore.
- E. W. & J. W. KRAMER # 4  
Callahan, Calif.
- FRANK A. KRAUS,  
P. O. Box 467 # 4  
Seal Beach, Calif.
- FRED LANGLEY  
234 S. W. 6th St. # 3  
Grants Pass, Ore.
- JESS LATTIN  
General Delivery # 3  
Redding, Calif.
- LAUGHLIN ENGINEERING CO.,  
P. O. Box 446 # 3  
Medford, Ore. 200 ton mill
- J. L. LEAK, # 4  
Clear Creek, Calif.
- R. S. LONG  
Rte. 3, Box 682 # 3  
Grants Pass, Ore.
- MASTELOTTO, A. M. # 4  
136 Canyon Highway Drive  
Oroville, Calif.
- F. M. MAESTRETTI,  
Rte. k, Box 271 # 4  
Loomis, Calif
- C. L. MATHEWS  
2890 Garden Ave., # 4  
Concord, Calif.
- R. E. MCCAULEY # 4  
Box 26, 40 ton mill  
Selma, Ore.
- PHIL MCCANNA # 4  
Fort Jones, Calif
- C. H. MCCLENDON # 4  
Crescent City, Calif. 20 ton mill
- WILLIAM T. MCNABB, # 2  
400 Sansome St.,  
San Francisco, Calif.
- V. K. MCNICHOLS  
Rte. 5, Box 2041X, # 4  
Oroville, Calif.
- E. K. MCTIMMONDS \$ # 4  
706 S. E. "M" St., 10 ton mill  
Grants Pass, Ore.
- M. J. MCSHANE  
590 East Park, # 4  
Grants Pass, Ore.

(Continued on Page 11)



CASTRO MINE, D8 stripping East pit. Mr. Moore.



MR. BARNETT AND MR. MOORE in charge of stripping, with Ben Baker. D8 Cat in background. East pit.



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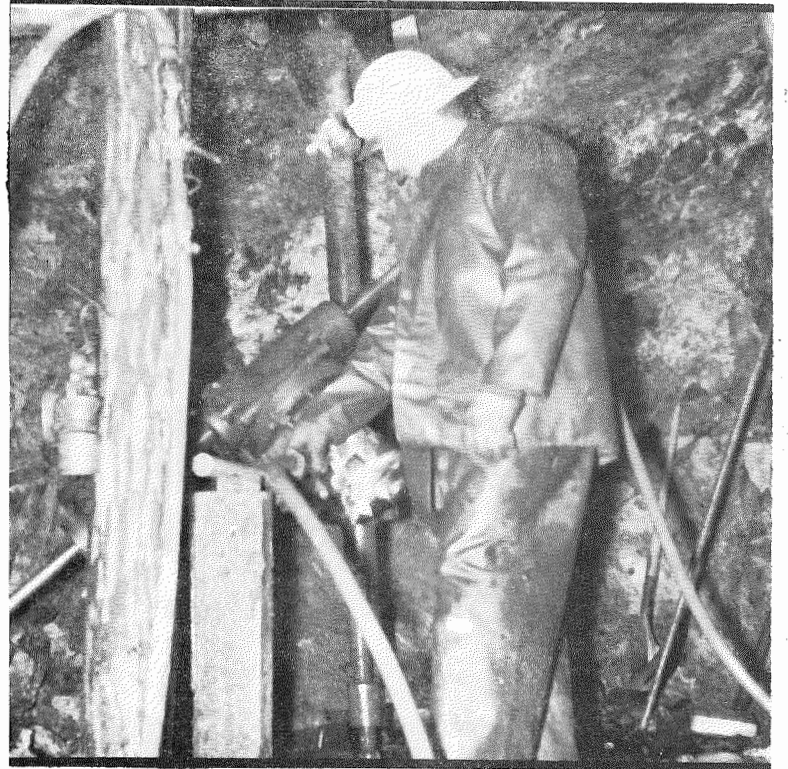
Standard Chevron Products  
Towing Day or Night



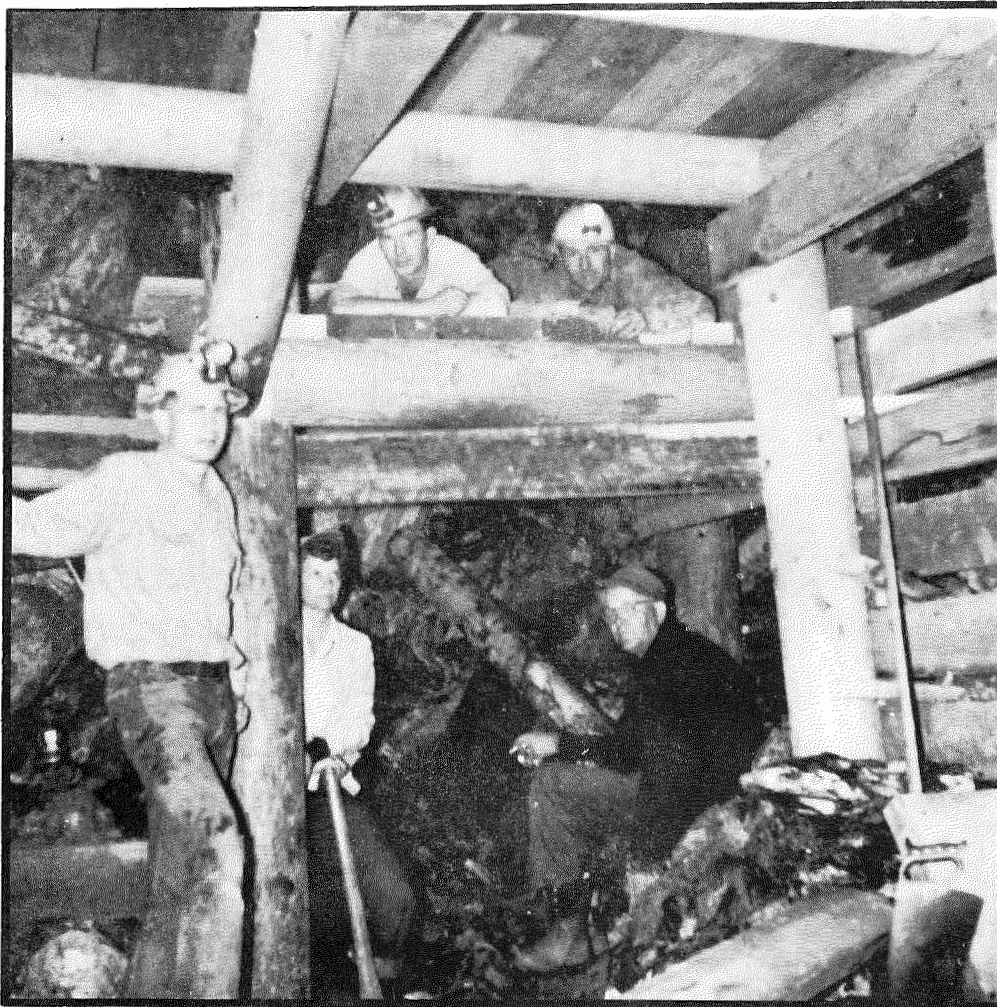
**Tommy's Service**  
324 Redwood Hwy  
Grants Pass, Ore



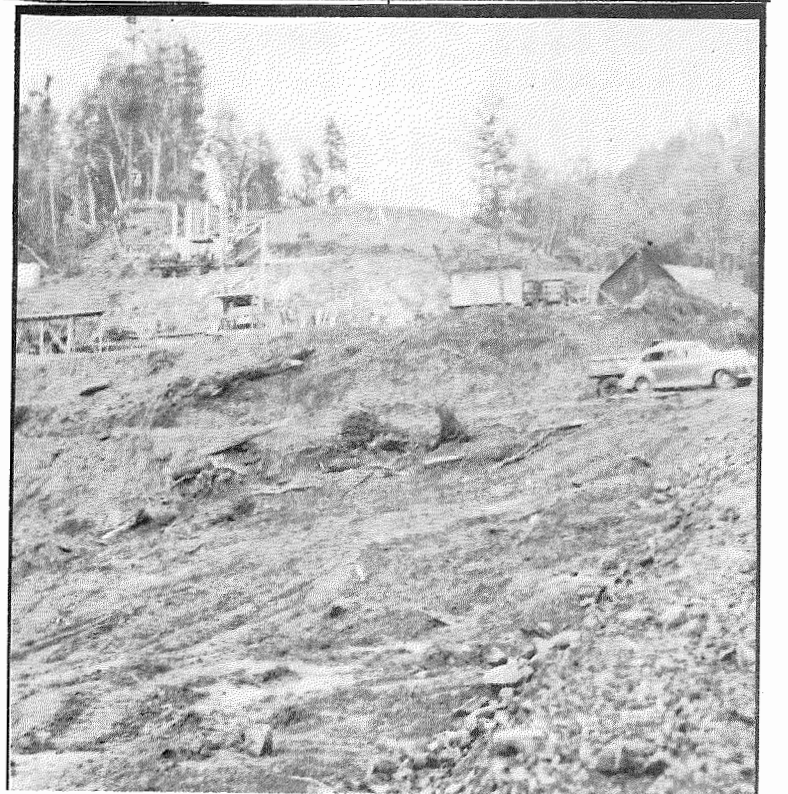
SHIP MOUNTAIN, Del Norte County, California. Of all the places that the old time prospectors (all now dead) reported seeing large out crops of chrome, Ship Mountain is the number one spot. One should plan on a two week pack trip to even get on the mountain.



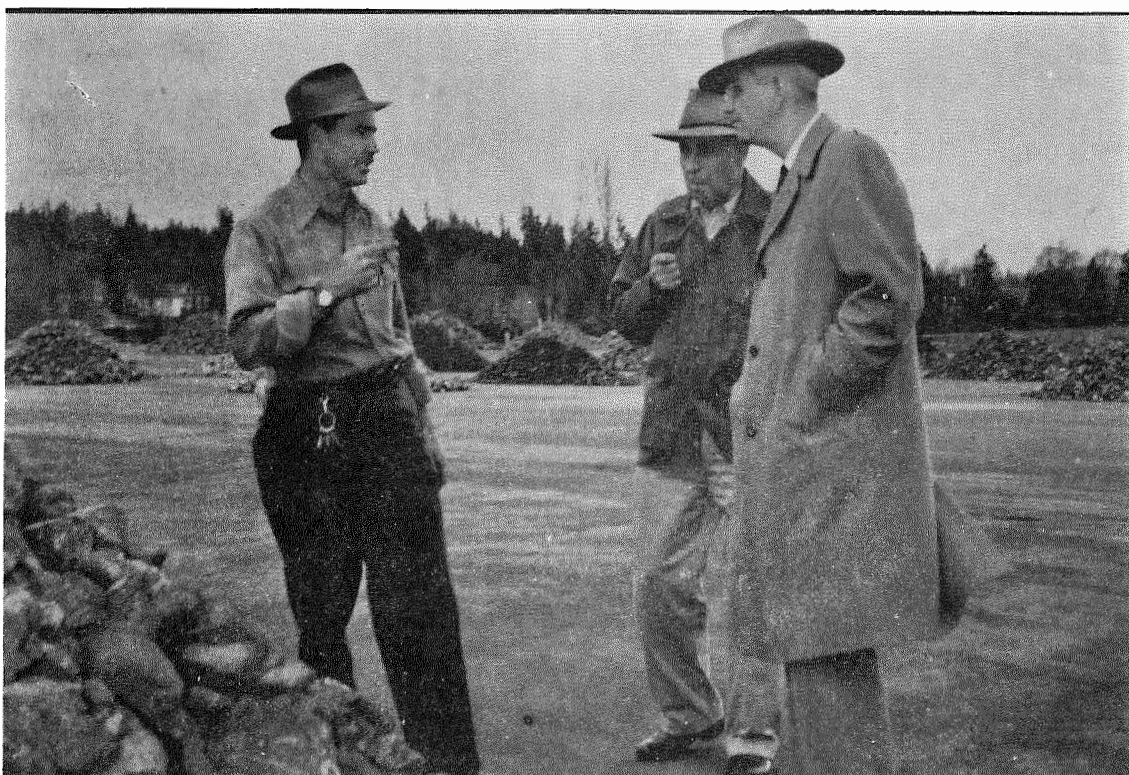
EDWARD EKSTRAND, Diamond drilling at Oregon Chrome Mine.



SETTING HEADING for 150 foot winze at Oregon Chrome Mine.



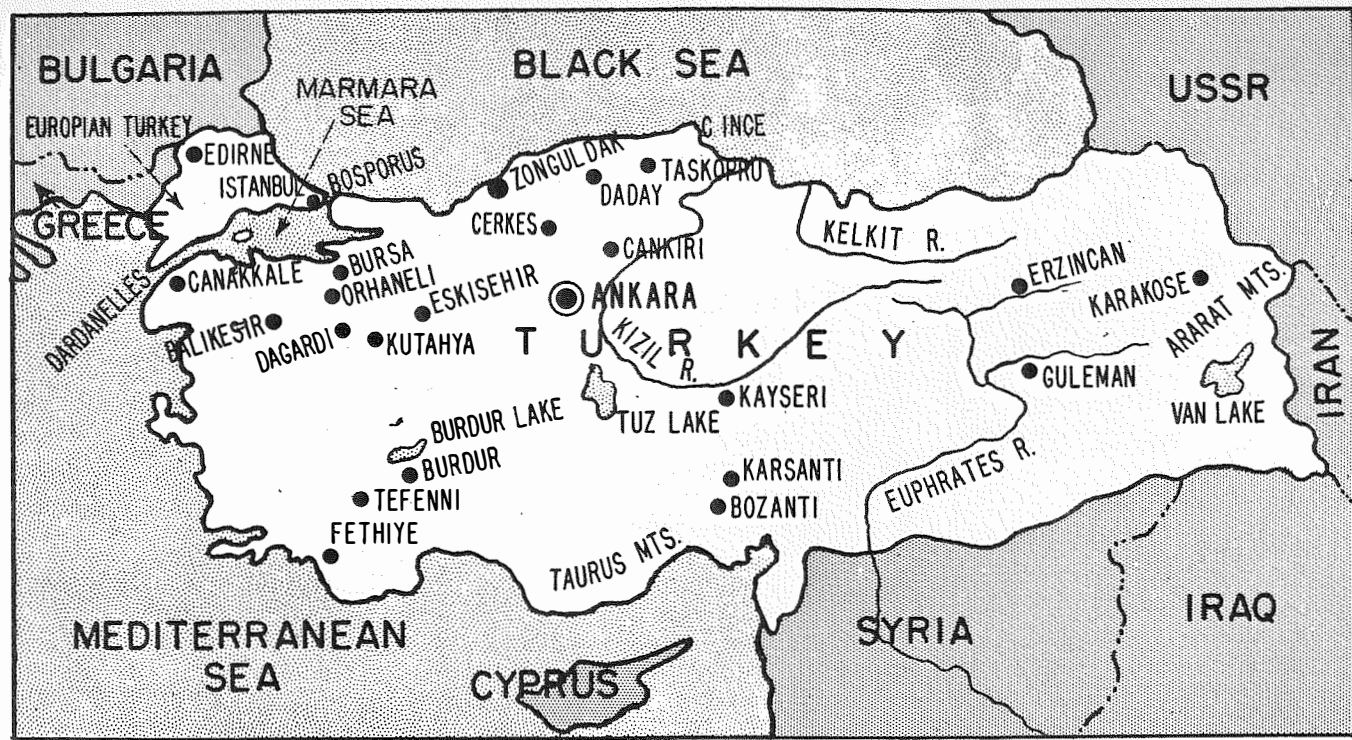
LUCKY NINE MILL



DEAN AXTELL talking over hauling problems with Governor Paul Patterson and Daniel C. Beyer. Chrome ore in background.



WILLIAM S. (BILL) ROBERTSON SHOWING THE SAME ELATION OVER CATCHING A FINE FISH AS HE DOES WHEN DISCOVERING A LARGE BODY OF CHROME.



Chrome ore mining areas and potential areas in Turkey

Table 1. Turkish Chrome Ore Exports

Years	(Metric Tons)		Years	(Metric Tons)		
	Tons	Tons		Tons	Tons	
1939	192,840		1943	80,832	1947	183,672
1940	110,040		1944	149,184	1948	294,396
1941	86,208		1945	62,688	1949	353,244
1942	116,796		1946	37,336	1950	352,596

Table 2. Turkish Chrome Ore Exports by Private Producers

Name of Producers	Exports (Tons)	
	1949	1950
Turkish Mining Co. Inc.	24,730	25,190
Turkish Chrome Co. Inc.	33,122	6,500
Fethiye Mining Co. (T.A.S.)	13,144	14,634
Orhan Brand and Partner Chrome Co., Inc.	22,323	26,630
Bastas Turkish Mining Co. Inc.	4,500	7,800
Sakir Yorulmaz Mining Co.	5,736	713
Mine Search and Exploitation Co. Ltd.	3,750	3,500
Stanley Paterson	3,890	3,025
Bilgin Mining Co., Ltd.	13,500	9,600
Chromite Co., Ltd.	19,100	76,067
Tekirora Co.		4,098
Others		48,014

Table 3. Average Value in Dollars of One Ton of Exported Chromite

(1 Turkish Lira = 36 U.S. Cents)

Years	Average Value	Years	Average Value	Years	Average Value
1932	11.36	1939	10.41	1945	29.59
1933	10.41	1940	12.66	1946	27.73
1934	9.16	1941	12.66	1947	33.05
1935	8.51	1942	13.39	1948	35.94
1936	8.47	1943	15.72	1949	36.72
1937	9.68	1944	28.64	1950	36.92
1938	10.67				

Table 4. Minimum f.o.b. Dollar Prices of Turkish Chrome Ore Exports, by Grades of Cr<sub>2</sub>O<sub>3</sub>, in Percents

Years	48%	46%	44%	42%
1950	30	28	26	22
1951	35	33	30	26
1952	42	39	35	32
1953	45	42	38	35

# Chrome Ore Mining in Turkey

## Geology, methods, costs, law

BY H. FERID KROMER,\* E.M.  
Istanbul, Turkey

TURKEY IS RICH in underground mineral resources. Its bituminous coal basin at Zonguldak north of Ankara near the Black Sea is considered the richest in the near East. It has deposits of most important metals and uranium, oil, and some nonmetallic minerals. Turkey has mined and exported chrome ore for over 90 years. Following the development of the Government controlled Guleman chrome mines, exports increased until 1939 when World War II reduced output and exports. Favorable world market conditions plus the Turkish currency devaluation of 1947 led to exploration for new orebodies and intensive working of existing properties, and an increase in exports (Table 1).

Major firms contributing to the increase of chrome ore production, and the amount of their exports are shown in Table 2.

The rapid increase in the value of chrome ore is indicated in Table 3.

The minimum f.o.b. prices for the past four years as set by the Com-

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mittee of Chromite Producers of Turkey are summarized in Table 4, by grades of chrome ore exported. The Committee has the authority to withhold export licenses if the price is below the minimum.

Chrome ore exports have become important in acquiring scarce dollar exchange for Turkey. In 1950, chrome ore exported by private producers provided \$5,300,000; in 1951, \$9,850,000; 1952, \$11,530,000 and in 1953 about \$25,000,000 in dollar exchange. In 1950, chrome ore provided about 60% of the total Turkish mineral export tax of 3,440,000 lira. About 180,000 workers were employed in 1952 for an average of 285 days by private chromite producers in Turkey.

### Geological Description

Though the geology of chrome ore occurrences in Turkey has been investigated to some extent by the M.T.A. of Ankara (the government's Mining Institute of Research and Exploration), no complete study has been made.

**1. Northern Alpine Chrome Region:** Chromite occurrences in this region are characterized by small lenses of massive ore in sharp contact

with the enclosing rocks. The lenticular bodies are oriented with their planes of greatest dimensions roughly in a northwesterly direction. Most of the occurrences are grouped around Cankiri with about 44% Cr<sub>2</sub>O<sub>3</sub> content and small reserves are reported in Cerkes, Daday and Taskopru.

**2. Southern Alpine Chrome Region:** Extends from Fethiye to Guleman. The ore occurs mostly in forms of elongated bodies or seams of varying thickness. The longest dimension in the direction of mineralization may reach 300m. The thickness of the seams may attain 6m. Indications are that the deposits persist in depth and reach 120m as in Sandalbasi and Yuruk (Cenger). Most of these consist of spherical and spotted ore. The spherical bodies are the segregates of chromite crystals and serpentinized cementing material. Some of these spherical ores consist of well rounded individual chromite crystals, and the others consist of alternating layers of chromite and olivine. The spherical shape of these grains are probably due to the corrosion of original angular crystals while sinking in the liquid magma. The spherical and spotted ore of this region is accompanied, however, by sprinkled and banded ore,

and the average grade of chromic oxide is lower than 44%. Still other portions in small amount belong to a massive ore type with about 50% Cr<sub>2</sub>O<sub>3</sub> content.

Fethiye deposits extend mainly in North-South and East-West directions, between which lie the less important portions which are located in NE-SW direction. The E-W formations are younger, and they seem to have caused several slips in N-S occurrences along the fault planes. The sharp contact between ore and enclosing rock is characteristic of the deposits; this suggests that the formations are seated by penetration of fluid magma carrying the ore along the solidified cracks.

Besides the Fethiye and Guleman deposits, the regions of Yesilova and Tefenni (Burdur), Bozanti and Karsanti in the Taurus Mountains which may be included in the southern ophiolitic region, are important for chrome ore. In the Eseler Mountains of the Burdur District is a series composed mainly of basic, ultrabasic and intermediate intrusive rocks spotted by dikes of andesite-diorite series, containing 56% silica, 16% alumina, 5% iron oxides and 5% lime. The serpentine of the Eseler Mountains extends about 90m in N-S direction, and it makes large contacts with younger limestone at the SE of Tinnax Tape, the East of Yesilova and the South of Tefenni.

The distribution of chrome ore in Burdur is somewhat erratic. However, it generally follows a N-S line which starts from Yesilkoy in the south and

comprising Gokarik, Domuzcamı and Topdusen mines, and ends at the Manatir and Doganbaba occurrences in the northern part of the Eseler Mountains.

Most of the occurrences are vein-like and make generally sharp contacts with the surrounding wall. The chrome ores are confined to rocks of highly mafic character, making it usually easy to delimit the field of search.

The physical character of vein ores are similar in this region; they are friable and of dull dark color. The thickness of veins vary between 0.6 meters and 4.0 meters. As an interesting occurrence the Gokarik Mine of Tefenni (not typical) shows about 400 sq meters of working face. The average result of analysis made on 20 different samples of the Yesilova district gave 40% Cr<sub>2</sub>O<sub>3</sub> and 4.6% SiO<sub>2</sub>. Gokarik mine grades around 47-48% in Cr<sub>2</sub>O<sub>3</sub> content.

**3. Central Chrome Ore Region:** The major localities are Canakkale, Balikesir, Orhaneli, Dagardi and Tavsansli, Northern Eskisehir, Denizli and Cardak, and the Northern part of Burdur Lake.

The most important was Dagardi, which now is considered depleted. About 380,000 tons of chrome ore with an average of 50% Cr<sub>2</sub>O<sub>3</sub> has been mined in Dagardi. The deposits, in pipelike form, may be regarded as explosion vents in which differentiation by crystallization has taken place. This is accompanied by early separation of chromite crystals by sinking

and accumulation in the lower part of the magmatic body. The uplift and erosion must have brought such masses to the surface. Other pipelike formations of less value are encountered on surfaces of tectonic movements near the main deposits of Dagardi.

Other important deposits of the Central Chrome Region are the Kavak, Basoren, Tastepe, all in Eskisehir, and those in Orhaneli and Bursa.

The Kavak mine consists mainly of three independent massive lodges of conical shape with their apex upward. One of these conical masses is partly eroded. The reserves are estimated to be high with 38-42% Cr<sub>2</sub>O<sub>3</sub>. It is assumed that the ore is a result of differentiation by crystallization. The ore fades out gradually in the enclosing rock. It is concentrated by using Humphreys Spirals. An analysis of the concentrated product showed: 47.1% Cr<sub>2</sub>O<sub>3</sub>, 5.4% SiO<sub>2</sub>, 13.2% FeO. The property is being operated by Turk Maadin Anonim (The Turkish Mining Co.) which has invested more than 2.5-million lira (\$900,000 at 1 lira=36c) for the mine plant and development during the past 10 years.

The Bahtiyar mine of the Kavak mining district deserves attention as the continuity of the ore in depth is very likely to lead to high tonnage in reserve. About 80% of the run-of-mine needs to be concentrated.

The Basoron mine consisted mainly of one huge lens of about 80,000 tons reserve which now is largely depleted. The Tastepe mine is a typical lens

## Ton of Ore Sorted at Tastepe Chromite Mines, Eskisehir

(1 Turkish lira = 36 U. S. Cents)

Period covered—April 5 to Dec. 5, 1950  
Sorted chromite ore..... 7,800 Tons  
Sorted waste..... 4,200 Tons

Output hoisted..... 12,000 Tons

	Labor	Super- vision	Power	Explo- sives	Sup- plies	Tota
Prospecting, exploration and devel- opment.....	0.35	....	0.10	0.15	0.11	0.71
Mining.....	0.90	....	0.47	0.44	0.25	2.06
Underground tramming.....	0.80	....	....	....	....	0.80
Hoisting.....	0.15	....	....	....	0.05	0.20
General underground Expenses.....	0.02	0.22	....	....	....	0.24
Surface exploration applicable to underground operations.....	0.20	....	....	....	....	0.20
TOTAL Underground Expenses.....	2.42	0.22	0.57	0.59	0.41	4.21
Surface sorting.....	0.43	....	....	....	....	0.43
TOTAL Direct Mining.....	2.85	0.22	0.57	0.59	0.41	4.64

formation. The mineralization has probably taken place by segregation. The lenses are aligned in a NW-SE direction. The major findings are located at the end of the mineralization line which is about 600 meters in length. Some of the lenses are nothing but masses separated from one originally formed elongated body by the planes of faults in an E-W direction. It is indicative that in a westward direction the strike slips remain under 15m. This was the major guide in determining new lodes by diamond core drilling in this property during 1953.

The Hermancik Mines (Bursa) are artinitic and show distinctly the characteristics of a vein deposit. The mineralization zone is well formed along the fissure in rock. The mineralization has probably taken place during the late stage of magmatic segregation during which the ore again melted and was injected into the cracks produced in the country rock. The thickness of the vein varies 0-2m, reaching the length of about 1 km. The present underground workings are 60m below the surface. The ore is said to contain 46-50% of chromic oxide with a high Cr:Fe ratio.

### Underground Mining Methods and Costs

In the Tastepe mines, owing to the small size of individual lenses and the firm hanging wall, no supports, filling or pillars are necessary. In instances where the hanging wall is unreliable, as the case is in the Karaçorn Chromite Mine of Eskisehir, waste filling is made while the ore is worked upward. We give in Table 5 some cost data on our own property, the Tastepe Chromite Mines, Eskisehir

The low cost of direct mining on

this property is a result of the minimum sorting required owing to the character of the ore, the reliable rock walls making timbering unnecessary, the lens shape of the orebody, and the extent of mechanization. Where the hanging wall is inadequate and timbering is necessary the timber cost may be 4 lira per ton of ore. In some cases with unfavorable physical and geological conditions and inadequate management, direct mine costs reach 24 lira per ton of ore.

The importance of the ore character is indicated by the sorting expense of 3.5 lira per ton of ore at a nearby mine of similar capacity. The ore at this mine has 40% fines and the banded structure of the ore with serpentine of the same dark color make sorting difficult.

Table 5a shows wage rates per day in Turkish lira and the number of persons in the various occupations.

Mechanization has been important in reducing direct mine costs, as indicated in Table 6.

**Taxes:** There are three major taxes:

1) Sales taxes are applied to all mineral or metal production. For chrome ore it is 5% of the ore's f.o.b. value, if the mining is done under concession rights. Under research permits this tax is 20%. If the ore is concentrated by mechanical means the tax is 1% of the f.o.b. value.

2) The income tax is universal, and the following scale applies (in Turkish lira):

For the first 2,500 portion of income, the rate of income tax is 15%  
For the following 5,000 portion of income, the rate of income tax is 20%  
For the following 10,000 portion of income, the rate of income tax is 25%  
For the following 20,000 portion of income, the rate of income tax is 30%  
For the following 20,000 portion of income, the rate of income tax is 35%  
For the following 20,000 portion of income, the rate of income tax is 40%  
For the following 22,500 portion of income, the rate of income tax is 45%  
For incomes above 100,000 T.L. the rate is fixed at 35%.

by the corporation tax is universal and is fixed at 10% of income.

**Transportation Costs:** Truck transportation on dirt roads varies between 0.11 and 0.16 lira per ton-km. When the road is stabilized or of asphalt, the cost varies from .06 to .10 lira per ton km. The railroad freight rate is 0.066 lira per ton-km. Loading railroad cars at stations varies between 0.9 and 1.2 lira per ton; at ships in ports between 4.5 and 6.5 lira per ton.

### Potential Mining Areas

Almost all chrome mines in Turkey were discovered from visible outcrops rather than rational prospecting. Often mines were prematurely abandoned owing to a belief that all ore was depleted. The Bozanti chrome ore area was redeveloped during 1952 and produced about 160,000 tons of ore; reports are that 300,000 tons of ore remain. The Karsanti district in the Eastern Taurus Mts. may contain chrome ore in sizeable quantities.

The Tastepe chrome mine was abandoned in 1947 for lack of reserves; our new workings there have produced 26,000 tons of metallurgical grade chrome ore. In 1953 significant amounts of chrome ore were proven at the Karaagac mine (Sazak) and the Karatarla mine both of which were abandoned about 20 years ago.

Some remote areas have been neglected which may contain large chrome ore reserves. The Kelkit river valley in northern Turkey, Kayseri and Erzincan regions, Karakose in eastern Turkey and the Ararat Mts. are potential chrome ore areas. The Governments' Uckopru (Mugla) areas contain huge chrome ore deposits.

The pegmatite and pyrometasomatic zones in Asiatic Turkey, mined for centuries, deserve more attention, especially in connection with the rare minerals. The granite and granodiorite intrusions should receive engineering attention at Edirne in European Turkey, Ezine and Kazdagi in the Dardanelles district, Kapudag (the mountain peninsula in the Marmara Sea), Egrigoz Dagi in the Kutahya district and Uludag in Bursa. The Government is now surveying the Kapadaz and Uludag areas. Uludag has scheelite with .14-.85% WO<sub>3</sub> (recent investigation suggest 2.0% WO<sub>3</sub>).

Some epithermal regions of east

## Table 5a. Direct Mine Labor Cost in Turkish Lira at Tastepe Chromite Mines, Eskisehir, Turkey

(1 Turkish lira = 36 U. S. Cents)

Number of workers	Occupation	Av. wage rate, T. L.	Cost per day, T. L.
12	Drillers and field prospectors.....	3.30	39.60
9	Trammers.....	2.82	25.40
2	Hoistmen.....	2.35	4.75
10	Ore sorters.....	1.36	13.60
2	Motorman, guards.....	4.92	9.85
1	Supervisor.....	4.00	4.00
36			97.20

and northeast Turkey have lead, zinc and silver ores. There are crystalline schists intruded by thick syenite-porphry (tertiary) dikes. Four occurrences have been noted, some of them pyrometasomatic. Paragenesis: pyrite, lollingite, sphalerite, chalcopryrite, galena, and marcasite.

The government does not have sufficient funds for mineral exploration of Turkey. Private capital, local and foreign, is necessary in order to find and develop fully the mineral wealth of Turkey.

### Establishing a Mine in Turkey

In the past few years private enterprise has become more important in mining, relative to the State. All mining areas in Turkey, including petroleum areas, are open to local and foreign private capital, except the bituminous coal fields in the Black Sea coast. The number of applications for mineral exploration permits, exploitation permits and concessions for exploitation have increased greatly in recent years. And 210 abandoned mines, which had reverted to the government, have been reopened.

The 1950 Turkish law on foreign capital (not to be confused with the mining law), intended to encourage entry of foreign capital, was found unsuccessful and a new and apparently more workable one has been passed by the National Assembly. The new law reduces the restrictions on sending profits and other income, and capital, out of the country. Aliens may send income from the country in U.S. dollars. Foreign capital will get the same rights and privileges as local capital.

The basic principle of the present mining law is the concession system—mines are national properties and the State is the owner. Even after the

Government parts with the title it may reserve to itself certain rights and royalties. Present economic and social conditions in Turkey probably justify this.

The acquisition of mineral exploration permits is open to real or juridical persons. Each is good for 2 years, covers 2,500 acres and only one mineral, but any number may be obtained. The exploration permits may be transferred with the permission of the Bureau of Mines in the Ministry of Economics and Commerce.

Exploitation permits may be acquired from the Ministry, good for a period of 5-10 years. There are few formalities or financial obligations. A concession of exploitation may be obtained from the Council of Ministers good for a period of 40-60 years.

Abandoned mines which have reverted to the Government are turned over to private interests at the discretion of the Bureau of Mines.

When an exploration permit has been granted the Bureau of Mines requires that within 1½ years an ore survey be made and an engineering report be submitted. The Bureau of Mines then determines an annual amount of ore which must be mined in order for the operator to maintain his rights. If the required level of output is not reached the royalty and sales tax must still be paid on the amount assigned by the Bureau of Mines. The operator must produce within 1½ years a topographic map at a 1/5000 scale. If the above conditions are not fulfilled a fine of 2,500 Turkish lira must be paid. If the property is leased to someone else, rights to the property are withdrawn. The Government's conditions are intended to obtain conscientious working of the properties, or their acquisition by the Government.

The Turkish government has been preparing a new mining law intended to encourage and protect the interest of private mine investors, and reduce the formalities of acquiring mining rights. The basic difference of the proposed new law is that the mine operator may lease his property and also mortgage his concession right in order to obtain capital.

The proposed new law may also include the requirement that research, exploration, and exploitation be supervised by mining engineers, that exploitation rights be given only to "limited" companies, and that export taxes be reduced from the present 10-20% of the f.o.b. value of the ore to 1-5%.

Some decentralization of the Bureau of Mines is needed. Courts or advisory committees are needed to deal solely with mining disputes.

## Table 6. "Productivity" and Direct Mine Costs before and after Mechanization of the Basoren Chromite Mine, Eskisehir

Productivity and Costs	Before (av. of 3 mo.)	After (av. of 3 mo.)	Changes in pct.
Productivity (Tons/man-day).....	0.35	0.65	+83
Salaries, TL/Ton.....	11.59	6.67	-42
Explosives, TL/Ton.....	0.91	0.77	-15
Other Supplies, TL/Ton.....	2.21	0.37	-83
TOTAL Direct Mine Cost, TL/Ton.....	14.71	7.81	-47

### Turkish Mining Problems

Capital is difficult to come by for the Turkish mine operator. Banks do not grant credit and ore reserves are not accepted as a guarantee for capital. Scarcity of capital has restricted ore exploration considerably, even though the cost is not great. (Indicative of these low costs is our own experience: we have conducted some chrome ore exploration in connection with outcroppings in South Turkey and the cost was about \$3 per ton of ore established.)

Technical help and advice is only available from the Government's Mining Institute of Research and Exploration—its scope is very limited.

Qualified mine labor is extremely scarce except in a few districts. Local peasants should be hired first and trained intensively before outsiders are brought in. The latter may be obtained from East Turkey where some at least partly trained workers may be found. They emigrate under their shift bosses in groups of 30-50. The attitudes of Turkish workers is determined largely by their present origin.

It is better that prospective mine operators in Turkey purchase mining rights than become a partner with existing holders of such rights. Also, rather than arranging ordinary contracts of transfer with such holders it is less risky to make the transfers through the Ministry of Economics and Commerce. The holders of mining rights should be approached delicately since they often have highly exaggerated notions of the value of the property. The property should not be investigated until arrangements are made with the holders. This should include a contract on an optional basis permitting acquisition of the property if it appears worthwhile, or its rejection.

**SHIP LOSSES IN WORLD WAR II**  
 (This material from Hearings before the Special Subcommittee on Minerals, Materials and Fuel Economics of the Committee on Interior and Insular Affairs, United States Senate, 83rd Congress.)  
**SENATOR MALONE:** At that point, Congressman Martin, do you have the figures on the destruction of our merchant vessels by submarine

in 1942?  
**REPRES. MARTIN:** I do not have them here.  
**SENATOR MALONE:** I would like to make a part of the record at this point merchant vessels lost, worldwide, in 1942, from all the causes including submarine, aircraft, surface craft, enemy mines, and other enemy action, and marine casualty. The total for the year 1942, from January to Dec-

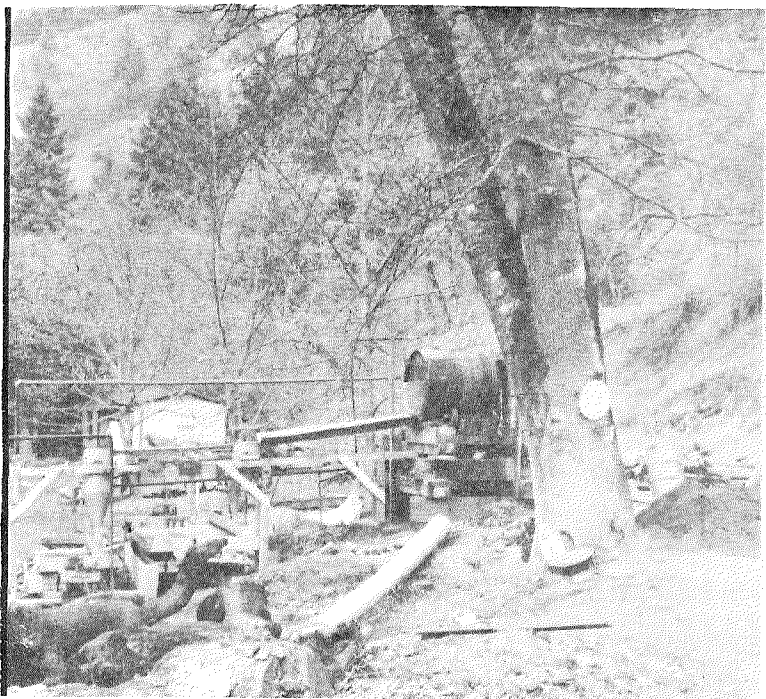
ember, was 1,150 vessels lost.  
**REPRES. MARTIN:** What year was that?  
**SENATOR MALONE:** 1942.  
**REPRES. MARTIN:** Yes.  
**SENATOR MALONE:** I will make that table a part of the record at this point, and I would like to call your attention to this document, entitled "United States Fleet Anti-submarine Summary" by R. S. Edwards, Deputy Commander in

Chief, United States Fleet, and Deputy Chief of Naval Operations. This summary portrays graphically the various phases of the antisubmarine campaign in the Western Atlantic. While the entire summary will be retained in the committee's files, I would like to submit as exhibit No. 2, the following chart which appears on page 43 of this summary.  
 I might say just as an example,

that in order to obtain the cargo that we were able to get through with all of these sinkings, we had to utilize 248 surface craft and 721 aircraft. So it is obvious on the face of it that the cost of materials in the stockpile, or the cost of a going mining industry would be minute in comparison to the lives of the men lost by enemy action, vessels sunk, and the terrific expense of the naval and air protection.

Merchant vessels lost worldwide, 1942, all causes

Period	Submarine		Aircraft		Surface craft		Enemy mine		Other enemy action		Marine casualty		Total	
	Number	Gross tons	Number	Gross tons	Number	Gross tons	Number	Gross tons	Number	Gross tons	Number	Gross tons	Number	Gross tons
January	62	327,357	15	57,086	1	3,275	11	10,079	9	19,920	48	103,363	146	521,380
February	82	470,136	29	138,498	1	983	2	7,242	17	36,640	18	53,006	149	706,505
March	94	531,998	12	48,501	9	21,521	5	16,862	103	168,832	32	53,778	255	841,492
April	75	437,656	16	82,723	25	131,188	8	14,934	3	6,237	18	28,219	145	700,957
May	125	607,247	13	58,995	3	19,363	5	18,786	1	254	15	26,075	162	730,720
June	141	707,270	11	54,769	6	41,298	6	19,930	1	242	14	32,535	179	856,044
July	95	476,049	18	74,313	11	54,358	2	8,905			26	81,937	152	695,562
August	108	544,410	6	60,532	8	59,432			1	229	15	21,744	138	686,347
September	97	485,374	12	57,526	4	24,388					30	38,747	143	606,035
October	93	614,304	1	5,683	3	7,576	2	5,114			22	58,190	121	690,867
November	116	711,880	7	61,793	5	10,484	1	992	5	21,836	28	56,715	162	863,700
December	62	343,872	2	4,156	8	19,352	3	344			36	65,657	111	433,381
Total	1,150	6,257,553	142	704,575	84	393,218	45	103,188	140	254,190	302	620,266	1,863	8,332,990



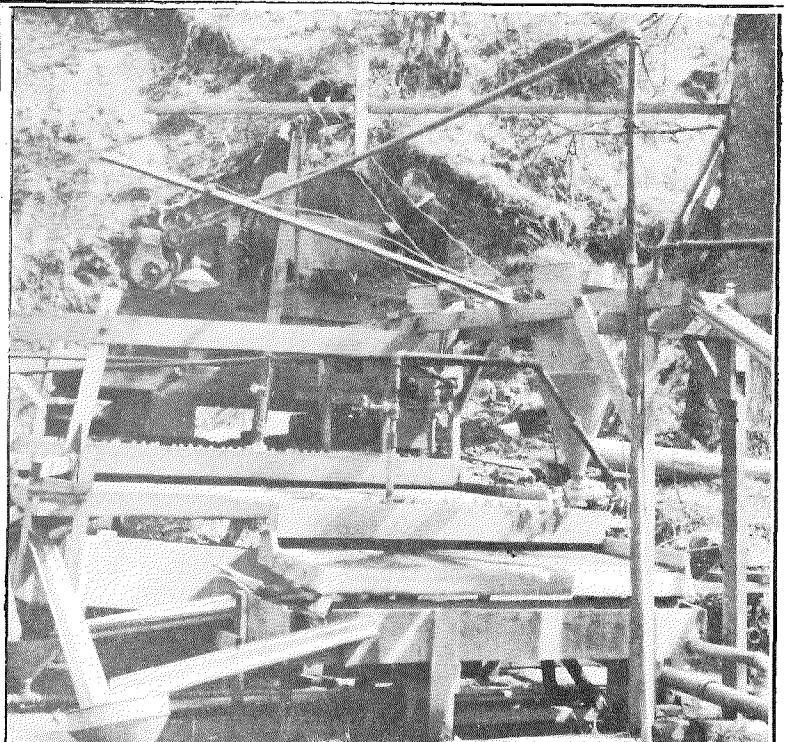
Pictures 1 and 2

**FITZPATRICK MILL**

A small concentrating mill located at the Umpqua Cottages, on U. S. Highway 99 north of Canyonville, Douglas County, has been operating for several months. The mill is owned by G. W. and J. E. Fitzpatrick. Ore from several properties in the area has been treated.

Equipment at the mill consists of a jaw crusher, a ball mill, two cone classifiers, and two small homemade concentrating tables (4 x 10 and 3 x 5 feet). A larger table is being installed. The ball mill is operated by a Briggs and Stratton gasoline engine and the tables are driven by electric motors. This mill is estimated to have a maximum capacity of about 2 tons of concentrates a day.

(Pictures 1, 2, 3, and 4)



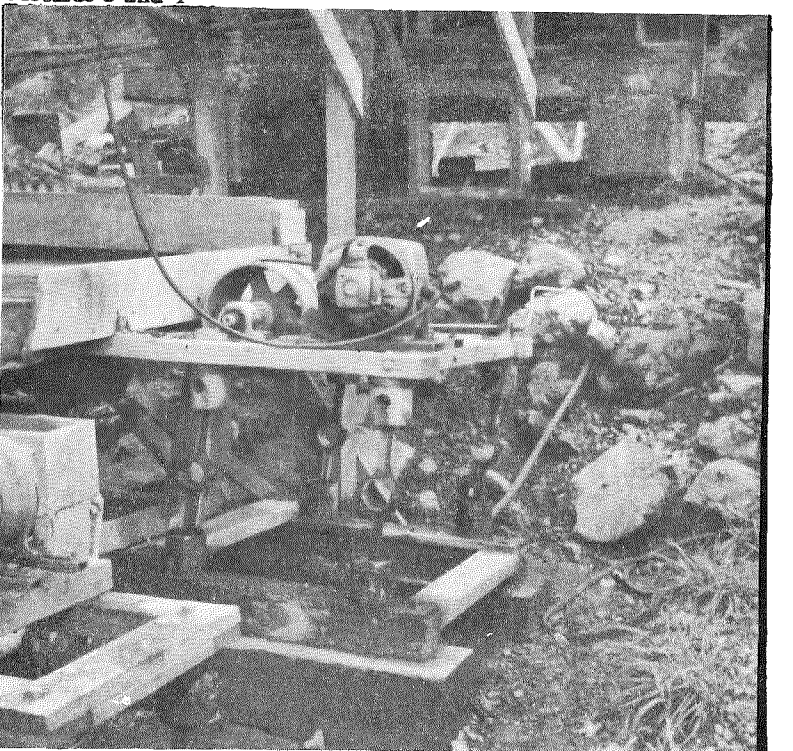
Pictures 3 and 4



**NEW STOCKPILE PLAN**

President Eisenhower, on Mar 26th, authorized the Office of Defense Mobilization to establish immediately new "long-term" objectives for the mineral stockpile.

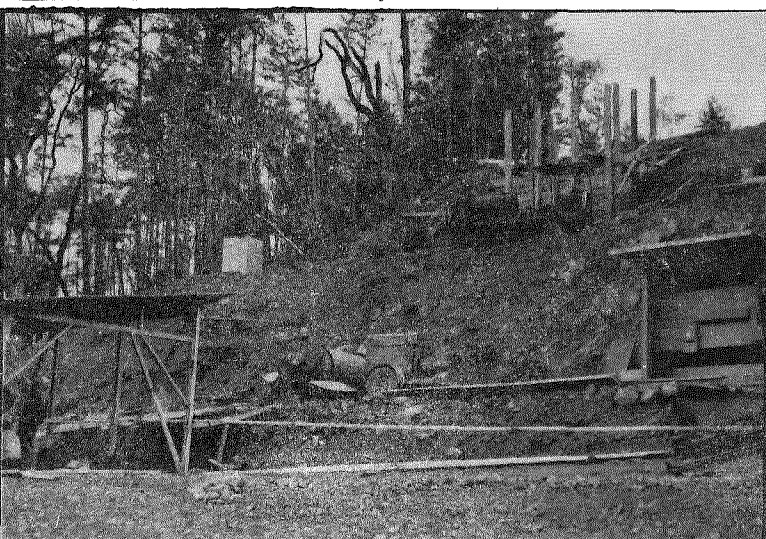
The White House announcement stated that a careful review of stockpile objectives in the light of the new concept will be made by the ODM before specific purchase directives are given to the General Service Administration. Current estimates indicate that the new program will result in additional government acquisitions of from 35 to 40 metals and minerals. These, it is said, will be purchased wherever possible from domestic producers over a considerable period of time. Preference will be given to newly mined metals and minerals of domestic origin.



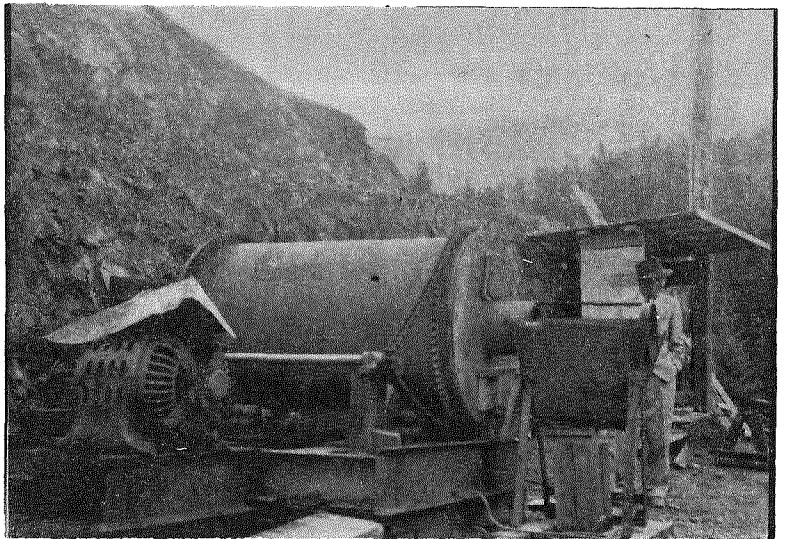
**LUCKY NINE CHROME CO. MILL**

H. R. Winston, Wayne Young, Daryl Cohl, Raymond Carson, Ed Collins, Sealy Carson, Bernard Carson, Dorothy Kartes and Hurley Wilson are the incorporators of the Lucky Nine Chrome Company. This company has begun the construction of a concentrating mill about 2 miles west of Canyonville north of the road to Riddle. Ore from deposits in sec. 36, T. 30 S., R. 7W., and sec. 20, T. 30 S., R. 6 W., will be treated.

(Pictures 5 and 6)



Picture 5



Picture 6