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OREGON'S MINERAL INDUSTRY IN 1957

By
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The value of minerals produced in Oregon in 1957 increased a whopping 11 percent over last year's record-breaking high. This increase is in contrast to the trend taken by nearly every other segment of the State's industry and points up the desirability of encouraging those fields which will broaden the economic base of the region.

The preliminary figures on the value of Oregon's mineral industry released by the U.S. Bureau of Mines give an estimated total of $37,582,000, or an increase of approximately $3,600,000 over 1956. The federal bureau's figures are largely based on the value of the raw material rather than on the finished product. On a finished-product basis the value of minerals produced in Oregon would be several times that reported. Furthermore, the value of electro-process products such as aluminum, calcium carbide, ferronickel, elemental silicon, zirconium, titanium, ferrosilicon, and ferromanganese is not included in the total.

More than 8,200 men were employed by the mineral and metallurgical industries in Oregon in 1956, most of them on a year-around basis. Mineral industry payrolls reported by the State Unemployment Compensation Commission for 1956 totaled $42,743,678. The increase in value of mineral production in 1957 would indicate that the mineral and metallurgical industries employment and payrolls should exceed the 1956 totals.

Major Developments

Uranium - Two and a half years after the uranium deposits northwest of Lakeview were discovered, Lakeview Mining Company received a permit from the Atomic Energy Commission to build a 210-ton per day capacity uranium concentrating plant. This AEC permit may be among the last to be granted for new mill construction for some time to come since the Commission announced that capacity of yellow cake concentrate from planned or existing mills

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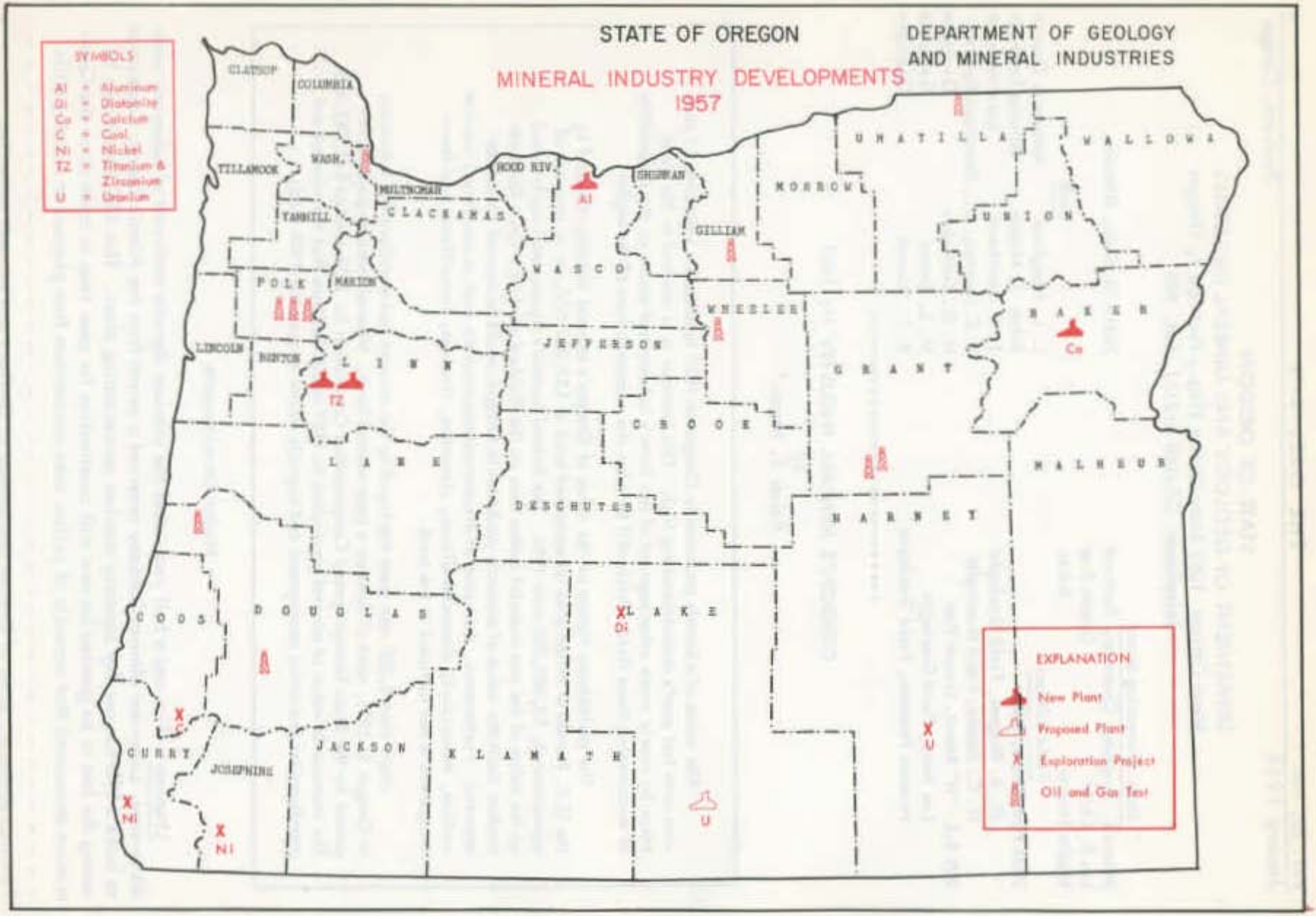
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
MINERAL INDUSTRY DEVELOPMENTS 1957
SYMBOLS
Al = Aluminum
Di = Diatomite
Co = Calcium
C = Coal
Ni = Nickel
TZ = Titanium & Zirconium
U = Uranium
CLATSOP
COLUMBIA
TILLAMOOK
WASH.
MULTNOMAH
HOOD RIV.
GRUBAN
YAMHILL
CLACKAMAS
MORROW
UMATILLA
WALLOWA
UNION
GILLIAM
WASCO
POLK
MARION
WHEELER
BAKER
LINCOLN
BENTON
LINN
JEFFERSON
GRANT
CROOK
LAKE
MALHEUR
DESCHUTES
HARNEY
COOS
DOUGLAS
LAKE
CURRY
JOSEPHINE
JACKSON
KLAMATH
EXPLANATION
New Plant
Proposed Plant
Exploration Project
Oil and Gas Test

is in excess of current demands. The Galigher Company of Salt Lake City, Utah, has been retained by Lakeview Mining Company to design and engineer the reduction plant. Construction is scheduled to start early this spring and operation will probably commence in about one year. The $2,600,000 plant will be located immediately north of Lakeview and when completed will employ around 60 men. The mill should make prospecting for uranium in southeastern Oregon attractive since 20 percent of the plant capacity has been reserved for custom milling ore. This will be the second uranium mill to be erected on the West Coast; the other, near Spokane, Washington, was nearly ready to process ore in late 1957.

Lakeview Mining Company has carried out an intensive exploration project on its two properties, the Lucky Lass and the White King, since they acquired the prospects in September 1955. In addition to drilling 86,000 feet of exploration holes, opening up several pits for bulk sampling,and making several large test shipments of ore to Salt Lake, Lakeview has sunk a vertical shaft and driven drifts on the 70-foot and 155-foot levels.

Little activity in uranium exploration was reported elsewhere in the State during the year. A minor amount of work was done in the Pike Creek area on the east flank of Steens Mountain in southeastern Harney County and late in the year Solar-X Corporation of Boise, Idaho, announced it had taken over many of the claims and expected to intensify exploration in 1958.

Lime - Chemical Lime Company, Baker, fired up the first of its two rotary kilns early in October to produce burnt lime from limestone. A second kiln is expected to be placed in operation early in 1958. The $2,000,000 plant employs about 50 men three shifts a day and when in full operation will have a capacity of 75,000 tons of lime a year. Stone for the kilns is obtained from a company-owned quarry on Marble Creek 10 miles west of the plant. It was announced that the deposit has a proven reserve of 3,000,000 tons of high calcium marble, with another 3,000,000 tons indicated. The plant will operate continuously, but the quarry, due to rigorous winter weather, will shut down for the three winter months. Main products of the plant include chemical-grade lime, pulverized quicklime, and regular and superfine hydrate. These basic materials will be used in the manufacture of acetylene gas, steel production, nickel smelting, paper industry, insecticides, and building material. A description of the operation was published in The Ore.-Bin in November 1957.

Metals

Nickel - Production of ferronickel by Hanna Nickel Smelting Company at its smelter near Riddle, Douglas County, was the highest since the plant went into operation in 1954. Continuous operation of all four of the smelter's ferronickel furnaces during the year was largely responsible for the record production of approximately 18 million pounds of recoverable nickel. Hanna's smelter was the only operation in the United States producing nickel from domestic ore during the year and its output was equivalent to 7 percent of the nation's total consumption of nickel. Hanna Coal & Ore Corporation mined slightly more than 1 million tons of nickel ore from a large open pit on the summit of Nickel Mountain to supply the raw material for the smelter.

Interest in Oregon's nickeliferous laterite deposits reached a new peak in 1957. Two large-scale exploration projects were carried out in southwestern Oregon. Just south of the Oregon border in northern California large areas of land were staked and some drilling and trenching were done by major mining companies. In Josephine County, Nickel Corporation of America investigated the nickel-bearing deposits on Woodcock and Eight Dollar mountains near Cave Junction. The areas were extensively churn-drilled and a series of deep bulldozer cuts were made to permit taking bulk samples for testing. A pilot screening plant was erected to determine beneficiation by simple sizing.

Pacific Nickel Company explored the Red Flat area east of Gold Beach, Curry County, with a series of bulldozer cuts and churn-drill holes. Field work was handled by Southwestern Engineering Company, Los Angeles, which holds a license for the Krupp-Renn process of direct smelting. The process was originally designed for the reduction of iron ores but a report[1] published late in the year indicated that nickeliferous ore identical in composition to that at Red Flat had been up-graded with an 83-percent recovery from a raw ore containing .93 percent nickel to metallic nodules containing 8.8 percent nickel. The Krupp-Renn process is carried out in a revolving kiln which can be heated by practically any solid fuel, even low-grade, high-ash coal. Cost of a reduction plant using this system is said to be a fraction of that for plants of standard design. If proved feasible, a process of this type would be attractive for intermediate sized, low-grade deposits located in areas where high-grade fuels are difficult to obtain and large plant amortization charges are not justified.

Oregon's Mineral Industry at a Glance

	1956	1957
Chromite	$ 2,001,083	$ 670,800-
Clays	278,205	260,000-
Copper	5,950	5,040-
Mercury	492,029	955,890+
Sand and gravel	11,646,367	12,000,000+
Stone	7,890,197	8,200,000+
Undistributed	12,929,235	16,889,829+
Total	$34,011,000	$37,582,000+

(Symbols indicate relation to 1956)

Chromite - With the termination of the General Services Administration stockpile program for chromite growing steadily closer, production of lump ore and concentrates in Oregon declined 12 percent from last year. Mine operators were understandably reluctant to do any exploration or development work beyond that required for immediate production when shipments to the stockpile at Grants Pass will probably be cut off this fall. Of the fourteen concentrating plants in southwestern Oregon, only two were in full-time operation, two were inactive, and ten were operated intermittently. Only three of the thirty mines were active on a year-around basis, with the balance either being worked seasonally or making small shipments at irregular intervals. In Grant County, activity was reported at eleven properties but substantial production was limited to only a few. Value of chromite produced in 1957 is estimated by the U.S. Bureau of Mines at $670,800 for a total of 7,800 long tons.

At the Oregon Chrome Mine, Josephine County, Bill Robertson discontinued exploration work with a diamond drill and reduced his crew to six men. Oregon Chrome has a history of production dating back to World War I and was considered to have been worked out several times. Through exploration under the incentive of two government stockpile programs, new ore bodies were discovered and the mine has been the State's top chromite producer.

In Coos County, Mineral Sands Company, which began construction of a black sands plant a few miles north of Bandon in 1954, was reported to have commenced operations in December.

Mercury - Mercury production in 1957 was more than double the 1956 figure, with an estimated total of 3,870 flasks valued at $955,890. Four properties contributed the bulk of the State's production. These were the Bretz in southern Malheur County, operated by Arentz-Comstock Mining Venture; the Bonanza in Douglas County, operated by Bonanza Oil and Mine Corporation; the Horse Heaven in Jefferson County, operated by Cordero Mining Company; and the Black Butte in Lane County, operated by Mercury and Chemicals Corporation. The Black Butte mine was forced to close in July and at year's end the Horse Heaven was understood to be nearing the end of its reserves. At Glass Buttes, northeastern Lake County, Oregon Uranium Corporation installed a 20-ton rotary furnace in May and fired it up in June. Con-

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[1] Engineering and Mining Journal, December 1957, pp. 84-93.

siderable exploration work has been done on the property and ten men are currently employed in the mine and mill.

Nearly 7,000 feet of diamond drilling was done at the Bretz during the first nine months on a continuing exploration program. A 10-ton Herreschoff furnace was added to the mill in May to treat concentrates. An article describing the operation appeared in the October 1957 Ore.-Bin. In Crook County, the following properties were explored: the old Blue Ridge and Number One mines held by Mia Mines; the Amity mine held by Orion Exploration and Development Corporation; and the Axehandle mine held by International Engineering & Mining Company. In Jackson County an 18-foot rotary furnace was installed at the Bonita mine and a considerable amount of stripping with a bulldozer was done. At the Steamboat mine, also in Jackson County, Kubli Bothers cleaned out an old tunnel and stripped with a bulldozer. Oregon Drilling and Mining Company did minor exploration work on their group of claims near Fields in Harney County.

At the end of December 1957, the government stockpile program calling for the purchase of 125,000 flasks of domestic metal was replaced by a program that would allow purchase of 30,000 flasks during 1958. Price to be paid under the new program remained at $225 per flask. A review of 30 years of mercury production in Oregon by Howard C. Brooks of the Department's field office at Baker appeared in the March 1957 issue of The Ore.-Bin.

Gold - Oregon's only year-around hard-rock gold operation, the Buffalo mine in the Granite district of Grant County, still continued to produce during the year. The mine, which dates back to early mining days in Oregon, operates a mill on an intermittent basis. The Standard Milling Company moved the 50-ton mill from the Pyx mine to a location just north of Prairie City on Dixie Creek, Grant County. Installation was completed late in the year and several cars of gold and copper concentrates were produced before the collapse of the copper market forced closure. Ore was obtained from the Standard mine 6 miles north of Prairie City.

In southwestern Oregon four small gold lode properties saw some activity during the year. Carl Stevens and Lloyd Gilbert opened the Eureka mine in the Illinois River district, Josephine County; Wes Pieren and Ray Richards built a small mill at the Greenback mine, Josephine County; Walt cannon enlarged the mill at the Dry Diggings east of Grants Pass to 24-ton per day capacity; and Frank Gelhaus shipped some ore from the Warner mine in Jackson County to the Selby, California, smelter.

Placer mining, mainly concentrated in Josephine County, was confined to seven small part-time operations. Placer mines in the area characteristically operate during the winter and early spring months when water is plentiful and the restrictions on muddying the streams are relaxed.

Bauxite - Harvey Aluminum Company was active during the year in obtaining leases on land in the Salem Hills, Marion County. It was reported in the press that lease holdings total around 5,000 acres. Exploration work by the company so far has been confined to drillings for the purpose of directing their leasing. Investigations of the occurrence of high-iron bauxite in the area were reported in the Department's Bulletin 46 published in 1956.

Industrial Minerals

Coal - Initial field explorations in the Eden Ridge coal deposits of southeastern Coos County were concluded in August 1957 by Pacific Power & Light Company's staff engineers and consultants. The project is directed toward the possible development of coal to fire a mine-mouth steam-electric power plant that may be located south of Powers and along the South Fork of the Coquille River. During the early months of 1957 the field investigations

included extensive core drilling of the ridge area, the digging of sufficient coal from the Anderson seam for pilot-plant boiler-firing tests, and the driving of three exploration tunnels into the Anderson and Carter seams. Thirty-two stratigraphic holes were drilled on the ridge and a total of 20,400 feet of core logged.

Pacific reported at year's end that the results of the preliminary investigations indicate a deposit of coal in the neighborhood of 50,000,000 tons and that the laboratory and burning tests have shown that the coal can be utilized in boiler equipment of advanced design. Progress of the studies has designated a tentative site for the power plant on the southeast side of Eden Ridge, where water for cooling purposes would be drawn from a reservoir located on the river. The reservoir may be constructed as a phase of a hydroelectric development for which the company has been conducting investigations under a preliminary permit issued by the Federal Power Commission in February.

New Plants in 1957

Chemical Lime Company (Lime)
Wah Chang Corporation (Zirconium)
Harvey Aluminum Company (Aluminum)

Prospects for 1958

Lakeview Mining Company (Uranium)
Pacific Power and Light Company (Coal)

Sand and gravel - The year 1957 saw a slight increase in the production of aggregates over the previous year, with more than half being used for road metal, approximately one-third for construction work, and the balance for a variety of purposes. Shortages of suitable natural aggregate in certain areas continued, and longer hauls from quarry to point were being made. Either crushed stone or sand and gravel are produced in every county but one (Wheeler) in the State. The 18,500,000 tons of crushed stone and sand and gravel reported by the U. S. Bureau of Mines does not represent all of the State's production since many private companies, such as logging companies, produce for their own use, and their figures are not included in the State total.

Cement and limestone - Production of cement from the State's three cement plants was about 5 percent greater than last year. Oregon Portland Cement Company completed a plant expansion program at its Lime operation, Baker County, and at its plant at Oswego, Clackamas County, early in the year. Ideal Portland Cement Company trucked cement rock from its quarry on Marble Mountain, Josephine County, to the kilns at Gold Hill, Jackson County. National Industrial Products Company continued shipping high-calcium limestone to sugar mills and metallurgical plants from its crushing and screening plant near Durkee, Baker County. Greely Lime Company furnished rock from a quarry near Enterprise, Wallowa County, to Pacific Carbide & Alloys in Portland for the manufacture of calcium carbide. Greely also distributed agricultural limestone in the Willamette Valley. Near Dallas, Dewitt's Polk County Lime Company and the Oregon Portland Cement Company quarry furnished agrock for farms in the area.

Silica - Bristol Silica Company contined production of metallurgical-grade silica at its plant at Rogue River in Jackson County. Bristol is the only producer of this commodity in the State and supplies metallurgical plants in Oregon, Washington, and California. Poultry grit, Bermuda roof aggregate, and other specialty products are also produced. Plans for relocation of the State highway through Rogue River will force the removal of the plant to another location in the near future.

Late in the year a large deposit of quartz was located by Roy Rannells, Riddle, and G. D. Rannells, Aurora. The deposit is located on Quartz Mountain about 15 miles northeast of Tiller in southern Douglas County. Analysis by a private laboratory of six samples of the quartz gave the following averages: SiO_2, 98.75 percent; Al_2O_3, 0.27 percent; Fe, 0.12 percent; TiO_2, 0.25 percent; CaO, 0.013 percent; MgO, 0.015 percent; P_2O_5, 0.008 per-

cent; and loss on ignition, 0.35 percent. Preliminary investigations by the Department indicated that the deposit is a replacement of a volcanic tuff by silica.

Lightweight aggregates - Production of pumice and volcanic cinders decreased slightly from 1956 levels. Expanded-shale producers, on the other hand, reported slight increases in production with many orders on the books at the end of the year. Lloyd Williamson, who has been continually producing pumice since 1946, reports that he sold his business at Bend to Boise Cascade Corporation. Williamson has been retained as general manager of the company. Central Oregon Pumice Company produced pumice aggregate from a series of pits just west of Bend and volcanic cinders from a quarry south of town. Pit-run material is trucked to a crushing and screening plant in Bend in a 40-cubic-yard dump truck. Harney Concrete Tile Company shipped pumice for blocks and road rock from a series of pits near Burns, Harney County.

Smithwick Concrete Products Company moved its entire expanded shale plant from Portland to the quarry near Vernonia and revamped and improved its flowsheet. Empire Building Materials Company operated its quarry and plant near Sunset Tunnel in Washington County and a block and precast pre-stressed plant in Portland. The Empire plant is the pioneer expanded-shale producer in the State, dating from 1948. Empire continued to increase the length of pre-stressed lightweight concrete structural members with some 95-foot long girders which were shipped to Washington for a bridge. Both Empire and Smithwick reported increasing acceptance of lightweight aggregate by architects for large commercial and industrial projects including complete prefabricated bridges, multi-storied buildings, and pontoons for floating causeways.

Bentonite - Central Oregon Bentonite Company located a deposit of bentonite east of Logan Butte in Jefferson County early in the year. The company did some exploratory core drilling and supplied the drilling mud for two oil test wells drilled in central Oregon.

Diatomite - Great Lakes Carbon Corporation processed diatomite from a deposit that has been in continuous production since 1935 at Lower Bridge in northern Deschutes County. The corporation conducted a large-scale diatomite exploration and stripping project near Fort Rock, northern Lake County, and test shipments were trucked from the new site to Lower Bridge to determine quality and milling characteristics. The company reports a 12-percent increase in production over last year for its plant located at Lower Bridge. The operating division is now called the Dicalite Department, Mining and Mineral Products Division, Great Lakes Carbon Corporation.

Water - The sand dunes along the southern Oregon Coast have been mined and sampled for more than 100 years and considerable quantities of gold, platinum, chromite, zircon, magnetite, ilmenite, and garnet have been recovered from them. Exploration for an entirely different mineral, water, was conducted during the year by Pacific Power & Light Company in the extensive dune area just north of the mouth of Coos Bay. Despite a heavy annual rainfall, the region is critically short of adequate supplies of industrial water. A series of test holes was drilled and at year's end a pilot pumping plant was in operation to determine the feasibility of the undertaking and the amount of flow that could be obtained on a sustained basis. Pacific is hoping to develop enough water to attract additional industry to the area. Initial studies of the potentialities of the dune area were made by the U.S. Geological Survey, Ground-Water Division, in cooperation with the State Engineer's office in 1954-56. The open-file report on their findings is available for inspection in the Department's library.

The quality of Oregon's waters was jointly studied during the year by the State Water Resources Board and the Engineering Experiment Station at Oregon State College. Results of their study have been published in two bulletins, "Water Quality Data Inventory" and "Water

Quality Data Inventory Supplement." Water from approximately 400 stations was analyzed during the study.

Electro-process Products

New metals - Sharp increases in the production of the reactive-use metals, zirconium, titanium, and hafnium, were chalked up in 1957. At Albany two commercial plants, Wah Chang Corporation and Oregon Metallurgical Corporation, together with the U.S. Bureau of Mines research laboratories now provide a 3-million dollar annual payroll. Wah Chang opened a zirconium sponge plant in April and simultaneously announced that a 1-million dollar addition would be started immediately. Wah Chang also operates a plant at the U.S. Bureau of Mines Electrodevelopment Laboratory at Albany. Wah Chang processes and purifies zirconium tetrachloride shipped in from the east into metallic zirconium sponge which is then shipped to other plants, including Oregon Metallurgical, for reduction into ingots. The company has announced the possibility that it might produce its own tetrachloride from raw material in the future. Oregon Metallurgical Corporation added new presses during the year and late in November announced a $4,000,000 contract to supply 350,000 pounds of zirconium ingots to Westinghouse Electric Company. The metal will go into atomic reactors which Westinghouse is building for the Atomic Energy Commission.

The U.S. Bureau of Mines Electrodevelopment Laboratory in Albany processes the metallic hafnium fraction derived from the zirconium tetrachloride during Wah Chang's purification process, and turns it over to the AEC.

Aluminum - At The Dalles, construction by Harvey Aluminum Company of a $40,000,000 production plant capable of producing 108 million pounds of aluminum per year neared completion at year's end. When this plant goes on stream in 1958 it will employ between 400 and 500 men on a three-shift, year-around basis and consume more than 1 billion kilowatt hours of electric power annually. The economic impact of this plant is even greater when subsidiary services required by the plant are taken into consideration. These include unloading of raw materials from ocean vessels into railroad cars, loading and shipment of aluminum ingots and pigs, and handling of secondary supplies. The 300,000 tons of alumina which will be required annually for reduction in the two potlines will come from Japan. For the present, ocean-going vessels will be unloaded at Portland and the cargo transferred into railroad cars. Eventually the company expects to use river barges to move the alumina from Portland to The Dalles.

Miscellaneous

New State dredge law - The 1957 regular session of the State Legislature passed a dredge bill which requires a license and a performance bond and imposes restrictions on any dredging activity which disturbs the topsoil or ground cover of more than 15 acres of land annually, if the land so disturbed constitutes the floor of a valley. Application for a license must be accompanied by a fee of $50 for each 50 acres of land. After investigation of the land to be dredged, a bond of $300 per acre may be required to insure faithful performance of the provisions of the law. Upon completion of the dredging operation, the operator is required to replace the topsoil and to restore the area to a reasonably useful condition. Furthermore, any streams disturbed must be restored with a pool structure conducive to good fish habitat and recreational use, and settling ponds must be constructed to avoid silting or muddying of the stream.

Multiple-use mining law - Investigations of mining claims under Public Law 167 in Oregon by the U.S. Forest Service and Bureau of Land Management were carried on vigorously during the year. A total of 4½ million acres either has been or is in the process of being investigated by the two agencies. Acreages involved were published in the December 1957 Ore.-Bin.

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OIL AND GAS EXPLORATION

By V. C. Newton, Jr.*

Oil drilling in Oregon did not increase significantly in 1957 over the previous years; seven new drilling permits were issued during the year as compared with six in 1956. Drilling activity reached its highest point in 1955 when twelve drilling permits were issued. This trend agrees with the national drilling picture and does not necessarily indicate a decrease of interest in Oregon's oil prospects. Six major oil companies made geologic investigations in the State during 1957 and two companies carried on geophysical exploration. There were four small companies drilling for oil in the State at the beginning of 1958. Six oil tests were abandoned as dry holes during 1957. Oil in commercial quantity has yet to be found in Oregon.

Commercial oil production was obtained for the first time in the State of Washington July 17, 1957. This discovery created a great deal of interest in prospects for northwestern Oregon. Several applications to the State Land Board for off-shore oil leases have been submitted.

At present Oregon is virtually unexplored as to petroleum possibilities. There have been about 150 tests drilled in the State up to this time. Of these, only thirteen have been drilled deeper than 5,000 feet. This is significant since the average depth for wildcats drilled in the United States during 1956 was 4,600 feet, and only one wildcat in forty-four hit oil in sizeable quantity.1/ 2/ Statistically, 31 more dry oil tests deeper than 4,600 feet could be drilled in Oregon before it would be considered a poor prospect area. It is interesting to note that Oregon and Idaho are the only nonproducers in the western half of the United States.3/

Oregon, west of the Cascades, is made up primarily of Cenozoic marine sediments with islands of volcanic rock in the northwestern section. Oil and gas shows have been reported in the area for the last 50 years and, in the past, this part of the State has been most popular for oil test drilling. Recently, however, oil test drilling has been divided about equally east and west of the Cascades. The increasing popularity of central and southeastern Oregon is due in part to the shift from exploration of anticlinal and domal structures to exploration for stratigraphic traps. It is also due to the discovery of oil in continental Tertiary sediments in Utah, Wyoming, and Nevada, as similar sedimentary basins occur in central and southeastern Oregon.4/ Prospects should be good for stratigraphic-type oil accumulations in the Paleozoic and Mesozoic marine sediments believed to underlie about 8,000 square miles of surface in central Oregon.5/

The outlook for continued oil and gas exploration in Oregon is good. Economic forecasts for the United States call for the finding and development of 45 billion barrels of new oil by 1965. This is nearly as much oil as has been produced since the discovery of oil by the Drake well in 1859.6/ No doubt some of this oil will come from oil shale production and secondary recovery projects but new field discoveries will be of first importance. An estimated 645,000 new wells should be drilled by 1965 to meet the increasing demand for oil.

In order to expedite oil development in Oregon, the Department hired a petroleum engineer in September 1957 to help with enforcement of the oil and gas conservation law and to assist companies or individuals seeking oil information. His duties will also include assembling Oregon oil-exploration records for public use.

The U.S. Geological Survey released a series of nine aeromagnetic profiles of western Oregon (see November 1957 Ore.-Bin) in the summer of 1957. These should be helpful in locating areas where basalt underlies the sediments. During the past 15 years the Survey has made oil and gas investigations and published geologic maps covering most of the western part of the State.

1/ Gonzales, R. J., Land of the big risk (reprint): Humble Oil and Refining Company The Humble Way, November-December 1955.
2/ Am. Assoc. Petrol. Geol. Bull., v. 41, no. 6, June 1957. p. 989-1001.
3/ Oil and Gas Journal, v. 55, no. 36, September 9, 1957, p. 161-63.
4/ Am. Assoc. Petrol. Geol. Bull., v. 38, no. 8, August 1954, p. 1663-64.
5/ Tenth Biennial Report: Oregon Dept. Geology and Min. Industries Bull. 47, p. 34-37, 1956.
6/ Oil and Gas Journal, v. 55, no. 42, October 21, 1957, p. 69-70.

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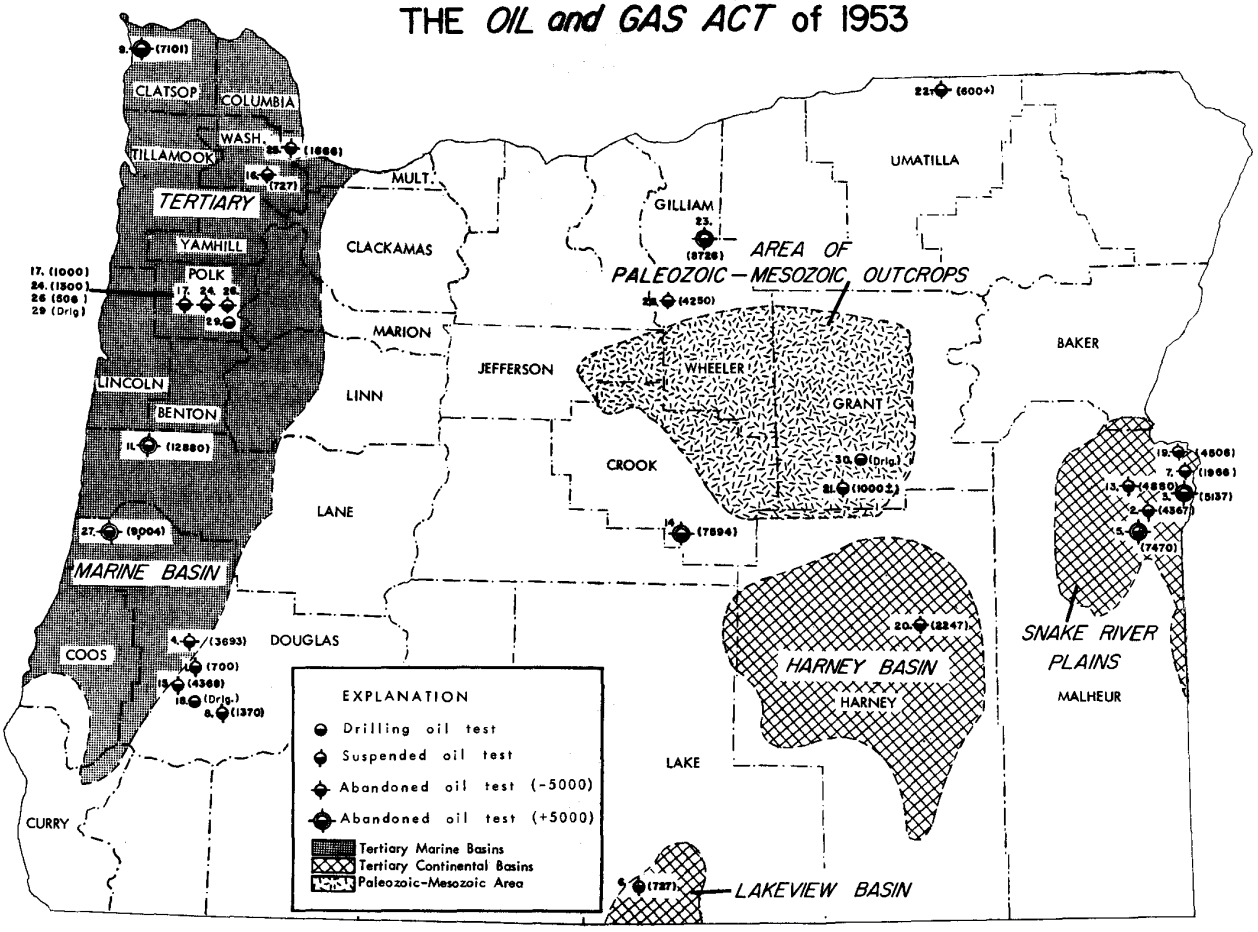
OIL TEST WELLS DRILLED UNDER THE *OIL and GAS ACT* of 1953



OIL AND GAS DRILLING PERMITS ISSUED SINCE ADOPTION OF THE OIL AND GAS ACT

Permit No.	Company	Well Name	Location	Status
1.	W. F. Kernin	D. Coon #1	SE¼ sec. 30, T. 28 S., R. 6 W.	Drilling
2.	R. A. Stamey	G. B. Russell #1	NW¼ sec. 14, T. 19 S., R. 44 E.	Suspended Oct. 1954
* 3.	H. K. Riddle	Kiesel Est. #1	SW¼ sec. 8, T. 19 S., R. 47 E.	Abandoned Oct. 1955
* 4.	Oil Developers, Inc.	Scott #1	SW¼ sec. 5, T. 27 S., R. 6 W.	Abandoned Dec. 1954
* 5.	El Paso Nat. Gas Co.	Federal #1	NE¼ sec. 5, T. 20 S., R. 44 E.	Abandoned Jan. 1955
6.	Chas. A. Stone	Shelley #3	SW¼ sec. 20, T. 39 S., R. 19 E.	Suspended Apr. 1955
* 7.	Oroco Oil & Gas Co.	Bolles #1	NW¼ sec. 15, T. 17 S., R. 47 E.	Abandoned Apr. 1955
8.	Riddle Oil & Gas Prod.	Dayton #1	SW¼ sec. 34, T. 30 S., R. 6 W.	Suspension Ext. Jan. 1957
* 9.	Standard Oil Co.	Hoagland Unit #1	SE¼ sec. 11, T. 7 N., R. 10 W.	Abandoned June 1955
10.	Sinclair Oil & Gas Co.	R. N. Ranger, et al		(Hole was not drilled - bond cancelled)
11.	Sinclair Oil & Gas Co.	Federal-Mapleton #1	SE¼ sec. 12, T. 16 S., R. 10 W.	Abandoned Feb. 1956
12.	Oroco Oil & Gas Co.	Lane #1		(Hole was not drilled - bond cancelled)
*13.	Sinclair Oil & Gas Co.	Eastern Oregon Land Co. #1	SW¼ sec. 15, T. 16 S., R. 44 E.	Abandoned Sept. 1955
*14	Standard Oil Co.	Pexco-State #1	NE¼ sec. 36, T. 20 S., R. 20 E.	Abandoned Dec. 1955
15.	Uranium Oil & Gas Co.	Ziedrich #1	NW¼ sec. 16, T. 29 S., R. 8 W.	Suspended Nov. 1955
*16.	Oregon Explorations	Wohler #1	NE¼ sec. 11, T. 1 S., R. 3 W.	Abandoned Oct. 1955
17.	Miriam Oil Co.	Elliott #1	SW¼ sec. 9, T. 8 S., R. 5 W.	Abandoned June 1956
18.	Riddle Oil & Gas Prod.	Wollenberg #1	NE¼ sec. 28, T. 30 S., R. 6 W.	Drilling
19.	Oroco Oil & Gas Co.	McBride #1	SE¼ sec. 19, T. 16 S., R. 46 E.	Abandoned Nov. 1956
20.	Oroco Oil & Gas Co.	Portland Co. #1	NW¼ sec. 18, T. 24 S., R. 33 E.	Abandoned Nov. 1956
21.	Seneca Oil & Gas Co.	Lemmons #1	NE¼ sec. 18, T. 17 S., R. 29 E.	Suspended Aug. 1957
22.	Big Red Uranium	Richartz #1	NW¼ sec. 24, T. 6 N., R. 34 E.	Suspended Apr. 1957
23.	Standard Oil Co.	Kirkpatrick #1	NW¼ sec. 6, T. 4 S., R. 21 E.	Abandoned June 1957
24.	Miriam Oil Co.	Bliven #1	SW¼ sec. 11, T. 8 S., R. 5 W.	Abandoned March 1957
25.	Sunray Mid-Continent Oil Co.,	Kappler #1	NW¼ sec. 12, T. 2 N., R. 2 W.	Abandoned July 1957
26.	Miriam Oil Co.	Bliven #2	SE¼ sec. 10, T. 8 S., R. 5 W.	Abandoned Oct. 1957
27.	General Petroleum Corp.	Long Bell #1	SW¼ sec. 27, T. 20 S., R. 10 W.	Abandoned Oct. 1957
28.	Oregon Petroleum Corp.	Clarno #1	SE¼ sec. 27, T. 7 S., R. 19 E.	Abandoned Sept. 1957
29.	Miriam Oil Co.	Bliven #3	SE¼ sec. 10, T. 8 S., R. 5 W.	Drilling
30.	Sunnyvale Oil Co.	Mitchell #1	SE¼ sec. 14, T. 16 S., R. 29 E.	Drilling

* Records on these wells are available for public use.

DMEA ACTIVITY IN OREGON

DMEA CONTRACTS

Name	Commodity	Government participation	Total
Bonanza Oil & Mine Corp. Bonanza Mine Douglas County, Oregon	Mercury	$ 70,575.00	$ 94,100.00
H. K. Riddle Jordan Mine Malheur County, Oregon	Mercury	22,875.00	30,500.00
Mercury & Chemical Corp. Black Butte Mine Lane County, Oregon	Mercury	46,755.00	62,340.00
John McManmon Joe Dandy, Red Idol, and Independence claims Crook County, Oregon	Mercury	7,074.75	9,433.00
Roba & Westfall Purple Ridge, et al, claims Grant County, Oregon	Mercury	15,105.00	20,140.00
M. L. & Charles Page d.b.a. Strickland Butte Mines Crook County, Oregon	Mercury	4,200.00	5,600.00
Paul W. Wise Coyote Antimony Group Malheur County, Oregon	Antimony	26,045.00	34,727.00
*Orion Exploration & Development Corp. Log Cabin, Ridge, & Camp claims Crook County, Oregon	Mercury	9,075.00	12,100.00
*Ford Converse Grand Cove claims Jackson County, Oregon	Copper	3,600.00	7,200.00
*International Engineering Co. Axehandle Mine Jefferson County, Oregon	Mercury	7,815.00	10,420.00
		$ 213,119.75	$ 286,560.00

*Active contracts. Last two will not begin work until Spring, 1958.

A. E. Weissenborn, Defense Minerals Exploration Administration area executive officer, informed the Department that since the inception of the DMEA program in 1950, the Government executed ten contracts with private mining operators in the State of Oregon. These contracts provided for exploration work estimated to cost a total of $286,560.00, with maximum Government participation of $213,119.75. Eight of the contracts were for exploration of mercury deposits, with Government participation at 75 percent and one contract each for antimony and copper with Government participation at 50 percent. Seven contracts have been completed and three contracts are in effect. Of the active contracts, work on one has just started and work on the other two will not begin until spring 1958. In addition, two more applications are being processed, one for uranium and the other for nickel. A summary of the DMEA contracts is given on this page.

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AMERICAN QUICKSILVER INSTITUTE ORGANIZED

A new organization called the American Quicksilver Institute has been set up to act as spokesman for the quicksilver industry, E&MJ Metal and Mineral Markets reports. The organization is headed by S. R. Smith, president of Sonoma Quicksilver Mines, Inc., Guerneville, California. Louis D. Gordon, secretary of the Nevada Mining Association, is secretary-treasurer. Among the nine directors are Arthur L. Albee, president of Bonanza Oil and Mines Corp., Sutherlin, Oregon, and S. H. Williston, vice-president of Cordero Mining Company (Horse Heaven mine), Palo Alto, California.

The Institute will represent the industry on such issues as tariffs and Government regulations. Its first action was to send a telegram to GSA administrator Franklin G. Floete protesting the recent unwarranted change in quicksilver flask specifications. Other aims of the Institute will be to keep the Government and the consuming industry familiarized with uses and properties of mercury and to sponsor research and development work on finding new uses for the metal.

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DOMESTIC METAL PRICES

According to January 16 quotations in E&MJ Metal and Mineral Markets, price of quicksilver has dropped to $220-25 per flask and copper to 25.37 cents per pound.

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ALASKAN CHROMITE ORES RESPOND TO UPGRADING

Chromite ore from the Red Mountain district of the Kenai Peninsula, Alaska, can be upgraded by simple methods to yield concentrates eligible for Government purchase, according to a U.S. Bureau of Mines technical report R.I. 5377. The report describes beneficiation tests at the Bureau's Juneau, Alaska, and Albany, Oregon, laboratories on ore samples from three of the more extensive chromite deposits in the district. Specimens responded to gravity concentration methods to yield products assaying 48 percent or more chromic oxide, and only one sample yielded a concentrate with a chrome-iron ratio below the minimum established for the minerals stockpile program. Chromium recovery ranged from 20 percent for low-grade ores (10 to 20 percent chromic oxide) to 95 percent for one high-grade sample.

A copy of the report, R.I. 5377, "Laboratory Concentration of Chromite Ores, Red Mountain District, Kenai Peninsula, Alaska," can be obtained by writing the Bureau of Mines, Publications-Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pennsylvania. It should be identified by number and title.

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RAW MATERIAL SURVEY ISSUES NEW PUBLICATIONS

Two new publications have just been issued by Raw Materials Survey, Portland, Oregon. One of these is Information Circular No. 3, "Principal chemical and metallurgical industries of the Pacific Northwest, which is a current (January 1958) revision of the original directory first issued in 1948. The other publication is Market Survey No. 5, "The 1956 raw material requirements of Pacific Northwest foundry and metallurgical industry," which shows the tonnages of ferroalloys, electrodes, pig iron, and iron and steel scrap consumed in 1956.

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FORT ROCK GIVEN TO LAKE COUNTY

The Lake County Examiner reports that a patent of 160 acres of land, including the Fort Rock, has been given to Lake County by the United States Government for use as an historical monument. The County had proposed that this property be given it for use as an historical monument and as a county park, but the patent specifies "for use as an historical monument only." It reserves mineral rights to the United States. Use of the land for a different purpose than that specified will require the consent of the Secretary of the Interior. After 25 years, however, all restrictions on the land will cease.

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NEW DIVISIONS AT GRAND JUNCTION AEC OFFICE

A reorganization of the Grand Junction Operations Office of the U. S. Atomic Energy Commission became effective January 1, according to an announcement from Allan E. Jones, Manager of the Office. The changes, Mr. Jones points out, involve a realignment of the organization to serve better the current needs of the program. The reorganization primarily affects those units responsible for programs for the evaluation of source material resources, uranium ore procurement, mining incentives, and the acquisition and production of uranium concentrates. Two new organizational units, a Production Evaluation Division and a Source Materials Procurement Division, have been established to replace the three former operating and technical divisions: the Mining, Exploration, and Concentrate Procurement divisions. Both the Production Evaluations Division and the Source Materials Procurement Division will report to Elton A. Youngberg, Assistant Manager for Operations.

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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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OCCURRENCES OF PERIDOTITE - SERPENTINE IN OREGON

By
N. S. Wagner* and Len Ramp**

Over the past few years increasing interest has been shown in Oregon's ultrabasic rocks as a source for mineral deposits. Instrumental in stimulating this interest has undoubtedly been the successful mining and smelting of nickel ore from Nickel Mountain near Riddle, Douglas County. This operation has given Oregon its largest mine and the United States its only domestic source of nickel. Department and U.S. Bureau of Mines studies on nickel-enriched laterites found on the basic rocks has resulted in recent exploration of two areas in southwestern Oregon. Metallurgical-grade chrome ore is another mineral deposit found in the ultrabasic rocks; in fact, these rocks have been a principal source of domestic chrome supply in two wars and in the present stockpile program. Gold and platinum placers and copper deposits have long been known to occur in the peridotite-serpentine areas and a few investigations have been made on the occurrence of asbestos.

The following articles and maps have been prepared to describe briefly and show the distribution of ultrabasic rocks in Oregon. An extended bibliography is presented for further reference. N. S. Wagner is responsible for preparation of the data on eastern Oregon and Len Ramp is responsible for the map and report on southwestern Oregon. It is hoped this compilation will be found useful pending publication of more extensive maps and reports such as the bulletin on the occurrence of chromite in southwestern Oregon which is now in preparation.

Ed.

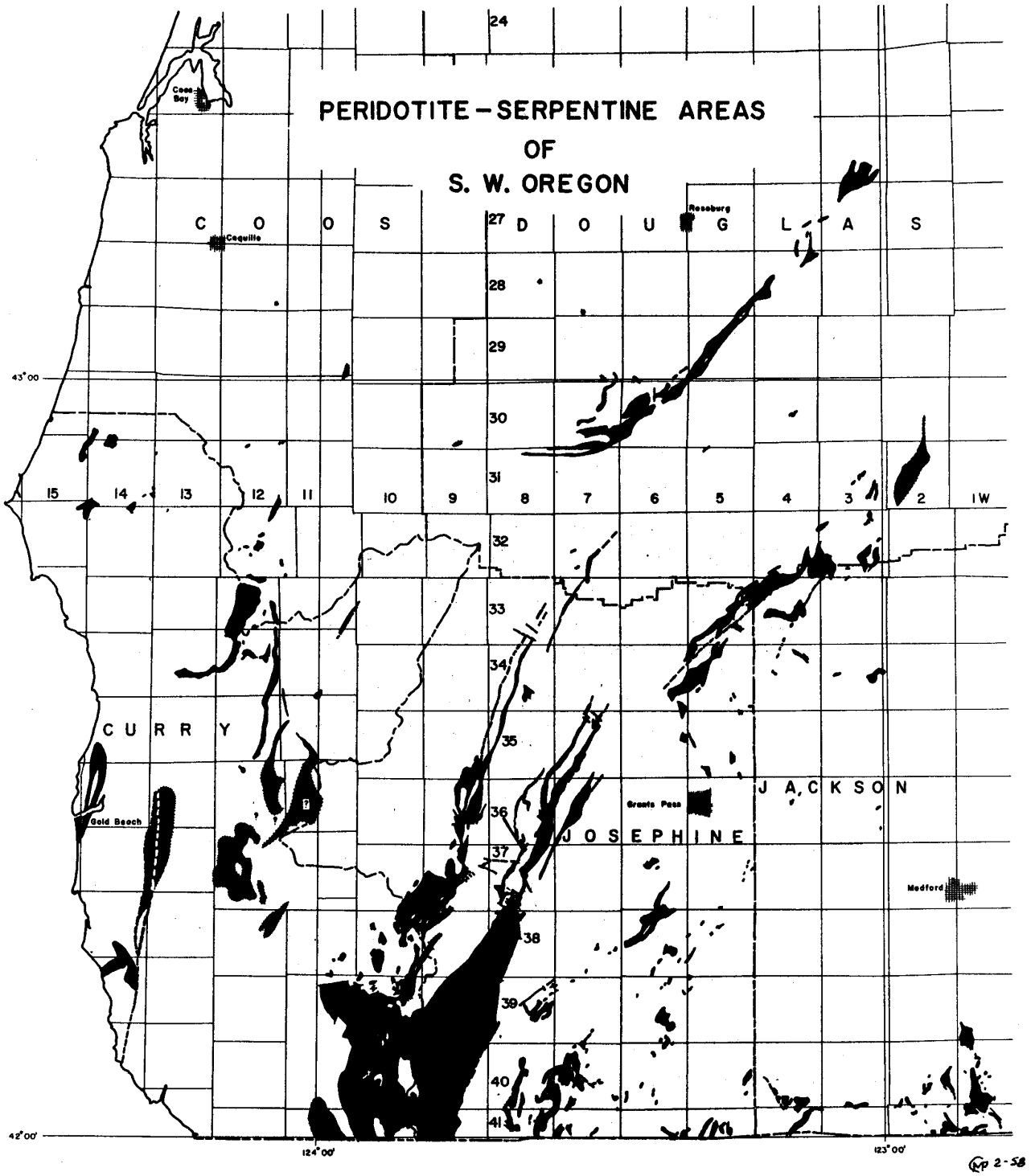
Southwestern Oregon

Peridotite, in large part altered to serpentine, has wide distribution in the Klamath Mountains area of southwestern Oregon as shown on the accompanying map. Exposures of serpentine range from 7,340 feet elevation at Observation Peak in southern Jackson County to sea level on the coast in Curry County.

Early geologic mapping of ultramafic rocks (peridotite and serpentine) in the Klamath Mountains was done by J. S. Diller of the U. S. Geological Survey about the turn of the century. In more recent years, F. G. Wells, also of the U. S. Geological Survey, has been responsible for most of the regional geologic mapping in southwestern Oregon and has delineated the mappable areas of peridotite and serpentine.

Rocks of the Klamath Mountains are pre-Tertiary and range in age from the pre-Mesozoic schists of undetermined age to Upper Cretaceous marine deposits. They are overlain to the north

* Field geologist, Baker Field Office, State of Oregon Dept. Geology and Mineral Industries.
** Field geologist, Grants Pass Field Office, State of Oregon Dept. Geology and Min. Ind.


PERIDOTITE – SERPENTINE AREAS
OF
S. W. OREGON
C O O S
D O U G L A S
CURRY
J A C K S O N
J O S E P H I N E
Coos Bay
Coquille
Roseburg
Gold Beach
Grants Pass
Medford
43°00
42°00
124°00
123°00
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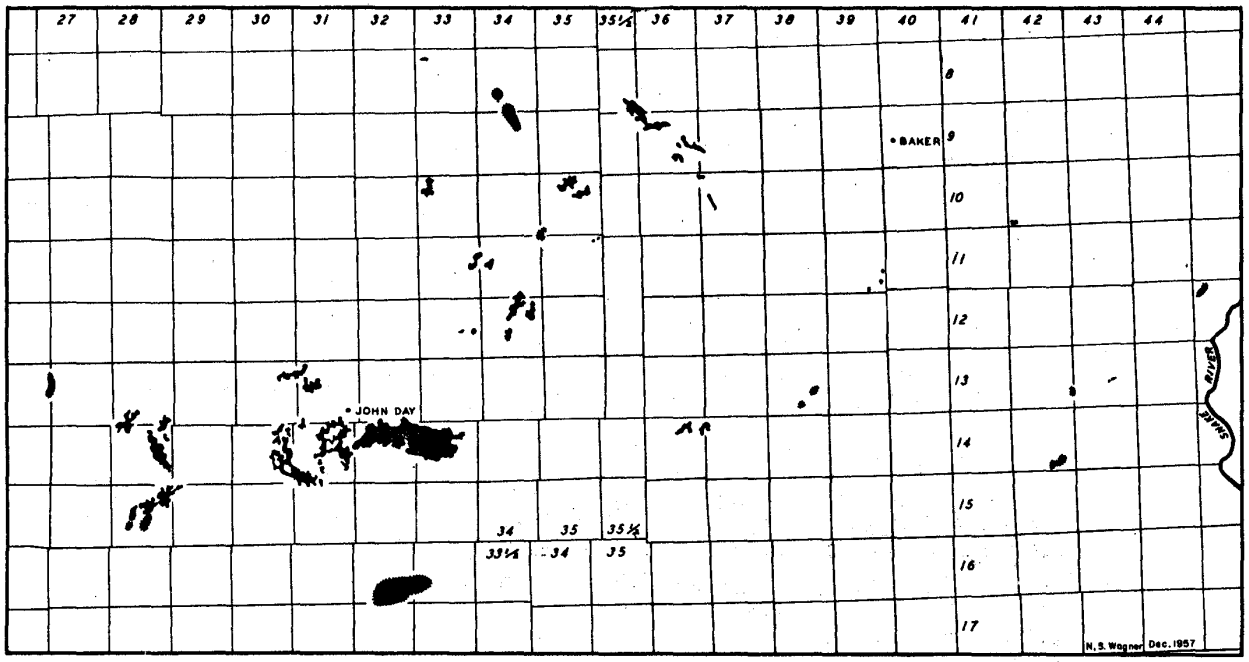
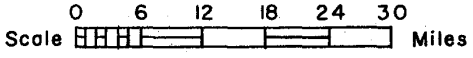
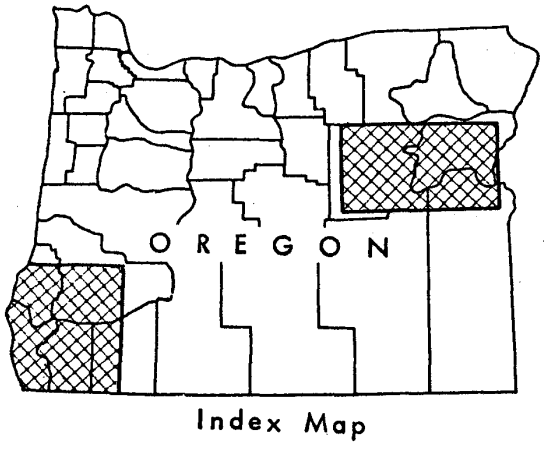
Scale
Miles

PERIDOTITE—SERPENTINE AREAS OF E. OREGON







Index Map

EXPLANATION

Peridotite and Serpentine

Peridotite and Serpentine
Approximate boundaries

Faults along which serpentine occurs in bodies too small to show

and west by Tertiary marine sediments of the Coast Range and to the east by Tertiary volcanics of the Western Cascades. Wells, Hotz, and Cater (1949) date the intrusion of ultramafic rocks in the Kerby quadrangle as late Knoxville (late Jurassic) in age since they found cobbles of peridotite in the overlying Cretaceous Horsetown formation. Diller and Kay (1924) map serpentine cutting the Knoxville formation in the Riddle quadrangle. Wells and Cater (1950) suggest the possibility that there may be two ages of serpentine and that some may have been intruded during Triassic time. Most of the acid igneous intrusions in the Klamath Mountains are late Jurassic or early Cretaceous age. The older ultramafic rocks are intruded by gabbros, diorites, and granitic rocks.

Composition of the ultramafic rocks in the area is fairly uniform. The peridotites generally contain a large percentage of olivine. Pyroxenes, usually enstatite, and occasionally diallage or diopside are also common mineral constituents. Accessory minerals are magnetite and chromite. No feldspar has been found in the peridotites and they are uniformly low in alumina content. A few small areas of dunite (nearly pure olivine rock) and streaks of pyroxenite are not uncommon varieties of the peridotite which is normally a saxonite (olivine plus orthorhombic pyroxene). Considerable amphibole in the form of radiate clusters of anthophyllite and scattered needles of tremolite occur in peridotite in the Red Mountain area south of Ashland.

Alteration of the peridotite to serpentine is common and shows a higher degree of development in smaller bodies, along contacts of the larger intrusive bodies, and in zones of intense shearing.

In zones of major crustal weakness along contacts and faults the occurrence of ultramafic rocks is somewhat localized. A few sill-like bodies of serpentine and peridotite show remarkable conformance to the bedding planes of the older intruded rocks. Highly sheared serpentine, sometimes referred to as "slickentite," has in places been squeezed upward into faults so that it appears to intrude rocks younger than the Horsetown formation.

Analyses of Samples of Ultrabasic Rocks and Laterite

	1.	2.	3.	4.	5.
SiO_2	41.43 %	42.81 %	---	---	7.58 %
Al_2O_3	.04	not deter.	---	---	10.76
Fe_2O_3	2.52	2.61	---	---	42.51 (Fe)
FeO	6.25	7.20	---	---	---
CaO	.55	none	---	---	---
MgO	43.74	45.12	---	---	---
Ni	.08	.20	1.74 %	1.22 %	0.845
Cr_2O_3	.76	.79	---	---	3.31
Loss on ignition	4.41	.57	---	---	---

1. Peridotite (saxonite) with more than two-thirds olivine from Nickel Mountain, Douglas County: U.S. Geol. Survey Bull. 931-I, p. 211.
2. Olivine, not entirely free from enstatite and chromite from Nickel Mountain, Douglas County: U.S. Geol. Survey Bull. 931-I, p. 211.
3. Laterite from 8-foot auger hole on top of Nickel Mountain, Douglas County: The Ore.-Bin, vol. 10, no. 5, p. 38.
4. Laterite from 3-foot, 8-inch auger hole near top of Woodcock Mountain, Josephine County: The Ore.-Bin, vol. 10, no. 5, p. 38.
5. Laterite from 11-foot auger hole at Red Flat, Curry County (composite sample): The Ore.-Bin, vol. 9, no. 3, p. 23.

Recent nickel exploration

Laterized areas in peridotite, i. e., areas of red soil development resulting in surface enrichment of nickel, are the principal locations for nickel investigations in southwestern Oregon. The accompanying table gives analyses of two samples of ultrabasic rocks and three samples of laterite from this region, showing the enrichment of nickel in laterite developed on ultrabasic rock.

Recent nickel exploration in southwestern Oregon has been stimulated by successful operations of the Hanna Coal and Ore Corporation on Nickel Mountain and by the Hanna Nickel Smelting Company at nearby Riddle, Douglas County. A program of exploration by churn drills and bulldozer trenching on Woodcock Mountain and Eight Dollar Mountain in the Illinois River district, Josephine County, was completed in the summer of 1957 by the Nickel Corporation of America. Exploration work is being done on Red Flat in Curry County by Southwestern Engineering Company. Earlier exploration at Red Flat was done by the U.S. Bureau of Mines and by this Department.

Some of the criteria believed significant in investigating areas of ultramafic rocks for nickel enrichment are:

1. A thick cover of red soil.
2. Fairly flat areas such as flat-top mountains, bench areas, or gentle slopes.
3. Float of white to pale-yellow or brown chalcedony boxwork.
4. Good cover of pine trees as compared to the usual lack of growth on serpentine and peridotite.
5. The presence of unserpentinized peridotite which weathers more readily than serpentine and is more likely to develop a thick soil cover. (The areas of nickel enrichment on Nickel Mountain are underlain by a fresh peridotite composed largely of fresh olivine.)
6. Lack of recent uplift and erosion. Much of the Klamath Mountains have undergone recent uplift and as a result most areas of laterite have suffered rapid erosion and only the roots remain of what may have been extensive deposits.

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Eastern Oregon

Areas of serpentine, peridotite, and dunite are represented in eastern Oregon by a series of widely scattered exposures all of which occur in the Blue Mountain ranges. The map on page 15 illustrates distribution excepting for two or three outlying exposures of very restricted extent. Occurrences shown in black represent exposures which have been defined by geologic mapping. Those indicated by the dotted boundary represent occurrences which are known to exist but which have not as yet been mapped in detail. The configuration of all mapped outcrops has been reproduced as accurately as practicable on a map of this scale but many of the smaller bodies are necessarily exaggerated in size.

The most intensive study of the eastern Oregon ultrabasics was made by Dr. T.P.Thayer of the U.S. Geological Survey during the course of several investigations of the chromite occurrences in the John Day area and the mapping of the John Day, Mount Vernon, and Aldrich Mountain quadrangles. Thayer's findings are that the peridotites are intimately associated with gabbro with which they are essentially contemporaneous. Olivine-rich peridotite predominates although pyroxene-rich (50 percent or more) peridotite is also present together with pyroxenite along the border zones of the gabbro. Dunite is widespread in its occurrence, but individual bodies are usually small. The serpentine is derived from the peridotite and is usually highly sheared. Abundant water-worked serpentine debris in the lower strata of a sedimentary series of well-established upper-Triassic age shows that the serpentine and its related rocks are of pre-Upper Triassic age and probably Lower (?) and Middle (?) Triassic.

The peridotite-serpentine exposures occurring outside of the area mapped by Thayer are in all instances associated with Mesozoic gabbros and other Paleozoic-Mesozoic formations geologically similar to those in the John Day area. Accordingly, the probabilities are that Thayer's observations for the John Day-Aldrich Mountain ultrabasics can be applied to all the eastern Oregon ultrabasics.

Geologic references covering the area represented on the map are listed on the following page. The references marked with an asterisk show mapped ultrabasic bodies. The others show an absence of peridotite-serpentine in their mapped areas. Data for the unmapped occurrences indicated by the dotted boundaries originate from this Department's files of mineral-resource investigation reports and general geologic reconnaissance studies.

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AIME REGIONAL CONFERENCE TO BE IN SPOKANE

The 1958 Pacific Northwest AIME Regional Conference will be sponsored by the Columbia Section and will be held at the Davenport Hotel in Spokane, Washington, April 17, 18, and 19. This will be the 11th annual meeting of the organization. Its three sponsoring sections are the Oregon, Columbia, and North Pacific sections, which take turn-about each year as hosts for the Conference.

R. N. Appling, Jr., publicity chairman for the Conference, reports that technical sessions will be held in geology, mining, milling, physical and extractive metallurgy, industrial minerals, and education for the minerals industry. The latter session will be conducted by Dean Cook of the University of Idaho, and is expected to be a highlight of the conference, in view of the rising concern over the shortage of engineers and scientists.

Field trips will be made Saturday to the Dawn Mining Company's uranium mill at Ford, Washington, and its Midnight Mine, and the new Gladding McBean brick and tile plant at Mica, Washington. Both should be very interesting trips. The mill is one of two in the nation using a counter current decantation column ion exchange process. The brick and tile plant is well engineered and contains the latest and best equipment available. The 400-foot, gas-fired tunnel kiln is one of the largest in existence.

Prominent speakers are expected for luncheons on Thursday and Friday, and an informal buffet supper will be held Friday night. The Women's Auxiliary has scheduled activities for the ladies.

Additional details about the Conference will be made public as they become available.

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CALIFORNIA DIVISION OF MINES CHIEF TO RETIRE

Olaf P. Jenkins, Chief of the California Division of Mines, retires March 1, 1958, after nearly 29 years with the organization. From 1929 to 1947, Dr. Jenkins served as Chief Geologist of the Division's Geologic Branch. In 1947, he was appointed State Mineralogist and Chief of the Division of Mines. Since 1947 the Division, under Dr. Jenkins, has doubled in size and has become internationally known for the quantity and excellence of its technical publications, which have been of great usefulness to industry and have contributed much to the general knowledge of the geology and mineral resources of California.

Dr. Jenkins is a graduate of Stanford University where he also received his master's and doctorate degrees. Before starting work for the California Division of Mines, he worked for state geological surveys in Tennessee, Washington, and Arizona. For several years he was Associate Professor of Economic Geology at the State College of Washington. From time to time he has carried on consulting work in economic geology in various parts of the world. Upon retirement from State service, Dr. Jenkins plans to continue with the new California geologic map, which he has under way, and do exploration work on a consulting basis. (Abstracted from Mineral Information Service, February 1958.)

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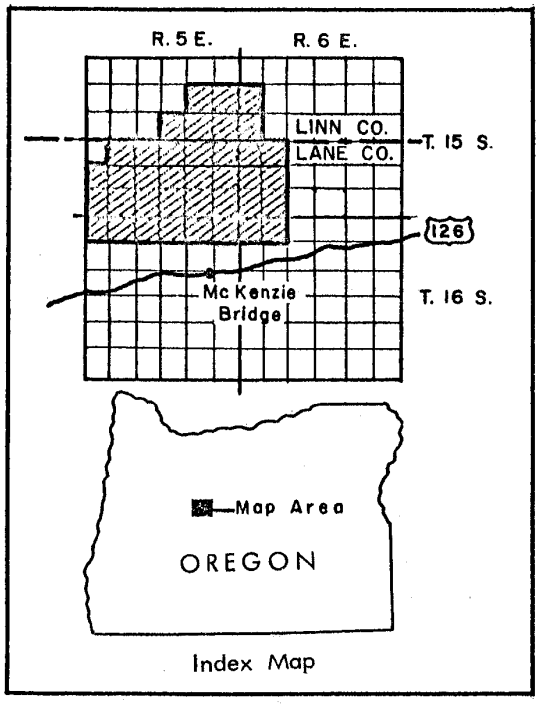
PROPOSED WITHDRAWAL



Index Map

The United States Forest Service has filed an application for the withdrawal of 15,000 acres of land in the Willamette National Forest (see index map) from all forms of appropriation under the public land laws, including the general mining laws but not including the mineral leasing laws. The withdrawal, if made, will be subject to valid existing rights. The Forest Service desires the land for the H. J. Andrews Experimental Forest. All persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the Bureau of Land Management, Department of the Interior, 1001 N. E. Lloyd Boulevard, P. O. Box 3861, Portland 8, Oregon. If circumstances warrant it, a public hearing will be held at a convenient time and place.

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OREGON MINING NEWS

Timber Beast Mining Company has concluded a $24,772 contract with DMEA for underground exploration of the company's uranium claims in Harney County. Under the terms of the contract, Timber Beast pays for 25 percent of the total cost of the work, which will consist of underground drifting, and the balance will be paid for by the government. The 75-percent government share of the cost must be repaid by the company out of any royalties resulting from production of ore developed by the exploration program. Timber Beast partners include W. C. Teegarden, Charles Skeeters, Glenn Young, and George Slade. Company headquarters are at Prospect, Oregon.

R. L. Adams, Jr., Carl W. Lange, and Dean Lange have leased the Manzanita and Bluetop groups of claims on Quartz Mountain in southeastern Lake County from Don Tracy, Ross Foster, and Dean Lange, Lakeview. Considerable prospecting for cinnabar has been conducted in the area during the past few years. Heavy earth-moving equipment was reported to have been moved onto the ground early this month. A total of 12 claims is contained in the leased ground.

A $2\frac{1}{2}$ million-dollar plant expansion program has been announced by Stephen S. Shelton, general manager of Oregon Metallurgical Corporation. The plant, located at Albany, is one of the few in the United States capable of handling the reactive metals titanium and zirconium. Oregon Metallurgical receives titanium and zirconium sponge from Wah Chang Company, also located in Albany, and reduces the sponge into ingots. Some forgings and castings of these jet- and atomic-age metals are also produced. The expansion program will include both new buildings and equipment. Recently Oregon Metallurgical received a 4 million-dollar contract from Westinghouse for zirconium ingots.

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CHROME MINING NEARING END

The following announcement on the status of chrome ore to be purchased by General Services Administration under the government stockpile program was received February 12:

"TO ALL SHIPPERS UNDER THE DOMESTIC CHROME PROGRAM:

"In order that shippers to the Domestic Chrome Program may be fully aware of the pending termination of both the Grants Pass, Oregon and the Carload Programs, it has been arranged that information as to the tonnage which remains to be purchased will be available on a weekly basis.

"Beginning immediately, a phone call to the Grants Pass Depot (GReenwood 6-5098) or to the San Francisco Office (YUkon 6-3500, Ext. 453 or 452) will be given latest information. The report will be available Tuesday afternoon and will include shipments received as of the close of business the previous Friday.

"Currently the balance remaining to be purchased at Grants Pass Depot is 10,562 L.D.T.* as of February 7, 1958.

"The balance remaining to be purchased under the Carload Program is 6,130 L.D.T. as of February 7, 1958.

"At a later date it may be decided to adjust tonnages between the Grants Pass Depot and the Carload Program so that both programs may be closed out at approximately the same time. If so, this change will be given the necessary publicity.

R. E. Reno, Jr., Regional Director
Defense Materials Service
General Services Administration"

As of February 21, GSA reported that the balance to be purchased at Grants Pass was 10,216 L.D.T. with 527 tons on hand but not payed for and the balance under the Carload Program 5,335 L.D.T. It was understood that between 800 to 900 L.D.T. remained to be purchased at Seattle which receives barge shipments from Alaska and carload shipments from central Oregon. Production of chromite from the West Coast has been close to 40,000 tons a year; therefore, it is obvious that the end of chrome buying through the present government stockpile program is very close at hand.

Last fall a questionnaire was sent to all shippers of chrome ore to the Grants Pass depot asking:

(1) Did the U.S. Department of Interior contact you to determine how much of a bonus would be necessary to keep you mining chrome?
(2) Can you mine chrome by doing your own selling to industry and receiving a $21 bonus (the Department of Interior's Long-Range Minerals Program)?
(3) At present prices how much does it cost you to produce a ton of ore?

Answers were received from approximately 50 of the 200 questionnaires sent out. Not one of these people had been contacted by the Department of Interior on the amount of a bonus necessary to keep them mining and not one stated the proposed government Long-Range Minerals Policy was adequate. Reported cost of producing ore varied but it was apparent from the returns that little, if any, production would result if a price was set up that would be less than that now paid.

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*Long dry tons.

Here is a painful example of the failure of government planning by not consulting the industry involved. The statement of the Secretary of Interior, when announcing the Long-Range Minerals Program, that "The basically short world supply coupled with the strategic nature of three of these minerals - namely, beryl, columbium-tantalum, and chromite - as well as the heavy dependence of the United States on distant overseas sources of supply, underscore the desirability of making every effort to develop and maintain some production of these commodities from domestic sources," makes the proposal on chrome even more absurd. Either the authors of the Program were very ignorant of the facts of domestic chrome production or they were influenced by advice of those who did not want domestic mining.

If something isn't done within the next few weeks, chrome mining in Oregon, California, and Alaska will become just a rapidly fading memory. The damage will go deeper than loss of chrome mining and its employment, however, for prospecting and exploration, now going on at a very reduced rate, will be curtailed even more. Without prospecting, mining is through.

H.M.D.

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PORT ORE SHIPMENTS INCREASE

The Commission of Public Docks, Portland, Oregon, announced that ores and ore concentrate tonnages have increased threefold since modernization of their facilities in 1954. The more than 112,000 tons of bulk concentrates imported through the terminal in 1957 helped make Portland the leading import-export harbor on the Pacific Coast in dry cargo tonnage. Among the large consumers of ores and concentrates are the Bunker Hill Company, the Anaconda Company, and American Smelting and Refining Company.

Ore arriving in Portland is unloaded from the ship's hold by two whirley cranes at the Dock Commission's Terminal No. 4 bulk cargo pier. The cranes, with their 3-cubic-yard buckets, are each capable of discharging vessels at the rate of 125 long tons per hour in free digging. These cranes can discharge bulk commodities from ships into barges, into open stockpiles, or through specially constructed hoppers into rail cars or trucks. Stockpile areas will hold 17,500 tons. Double rail tracks at this pier permit direct transfer of ore concentrates from ship to gondola cars for immediate haul.

The largest single cargo of lead concentrates yet received by the Commission of Public Docks was discharged from the "Hoyo Maru" under charter to C. Tennant Sons & Co., New York, in November 1957. Eight-thousand, eight-hundred tons of lead concentrates, valued at 1¼ million dollars, were brought to Portland from Port Pirie, Australia, for rail delivery to the Bunker Hill smelter at Kellogg, Idaho. (From Commission of Public Docks Harbor News, Portland, Oregon, February 1958.)

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ASHLEY HONORED IN NATIONAL SCIENCE TALENT SEARCH

Roger Ashley, a senior at Lincoln High School in Portland and a student worker with the Department since 1954, is one of the 260 senior students in the United States to receive honorable mention in the Seventeenth Annual Science Talent Search. All students receiving such an award are considered to have unusual potential scientific ability. Roger's scientific project was "Construction of a differential thermal analysis apparatus for qualitative determination of thermally active minerals."

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OREGON SENATOR ASKS STUDY ON MERCURY

Senator Alan Bible of Nevada has spearheaded a move directing the Tariff Commission to investigate the effects of foreign competition on the domestic mercury industry. Joining Senator Bible in signing a letter to Finance Secretary Chairman Harry Byrd requesting his committee to instruct the Tariff Commission to make a comparative study of the domestic and foreign mercury industries was Senator Neuberger of Oregon and six other senators from mercury producing states as follows: Nolan and Kuchel of California, Murray of Montana, Watkins of Utah, Barrett of Wyoming, Church of Idaho, and Malone of Nevada.

In a speech on the Senate floor, Bible pointed out that the domestic mercury industry's "very existence" depends on a continuance of a government purchase program which is due to end next December 31. "As I have pointed out before the members of the Senate" the Nevadan declared, "the domestic mining industry is in a perilous state. During the past year mines all over the country producing minerals and metals essential to our defense effort and national welfare have been forced to close or seriously curtail operations." Continuing he said, "These closings have not been brought about by a decrease in demand, nor have they been brought about because they have run out of paying ore bodies. These mines have been forced to close because of violent drops in world prices of minerals and metals. The prices they obtain for their products will no longer pay the cost of labor and materials used. In other words, these mines, necessary to our national well being, have been forced to close because they cannot compete with low cost foreign produced metals." Bible explained that mercury prices have declined from $295 per flask in 1955 to an average of $266 in 1956 and $225 in 1957. He added that the only factor preventing further decline had been the Government support price of $225, considered by domestic producers as the break-even point.

The Nevada Senator warned that unless the Government purchase program is continued the world market price will drop to such level that domestic producers will be forced out of business.

The following resolution directed to the Tariff Commission will be voted on by the Senate Finance Committee:

RESOLVED that the United States Tariff Commission is hereby directed, pursuant to the Tariff Act of 1930, to make an investigation of the conditions of competition in the United States between quicksilver produced in the United States and in foreign countries, and to report to the Senate Finance Committee the results of the investigation on or before December 1, 1958.

The report of the Commission shall set forth a summary of the facts obtained in the investigation including a description of the domestic industry, domestic production, foreign production, comparative costs of domestic and foreign production, including labor costs, imports, consumption, channels and methods of distribution; prices, including comparative London and New York prices quoted by foreign producers; U.S. exports, U.S. Customs' treatment since 1930; the impact of Government purchase programs authorized under Title III of the Defense Production Act of 1950 on domestic production, and the possible effect of the termination of that program on world prices and domestic production, and other factors affecting the competition between domestic and foreign mercury. In the course of the investigation the Commission shall hold hearings giving adequate opportunity to interested parties to appear and be heard.

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LONG-RANGE MINERALS PROGRAM

The Senate Interior Subcommittee on Minerals, Materials and Fuels has announced that it will begin public hearings March 24 on an all-inclusive, long-range minerals program.

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
Telephone: CApitol 6-2161, Ext. 488

Field Offices

2033 First Street
Baker

239 S.E. "H" Street
Grants Pass

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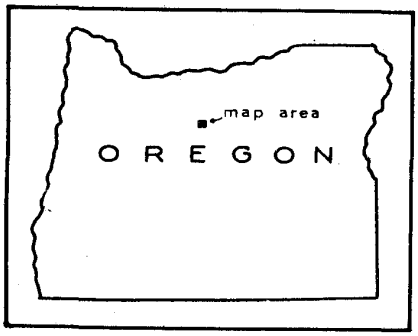
HORSE HEAVEN MINE
JEFFERSON COUNTY, OREGON

By
J. Eldon Gilbert*

The Horse Heaven Mine, located in sec. 12, T. 10 S., R. 18 E., Jefferson County, about 35 miles east of Madras, ranks as one of Oregon's principal mercury producers. During its two periods of activity, from 1934 through 1944 and from April 1955 to the present time, the mine has produced slightly more than 16,600 flasks of quicksilver.



Geology

The Horse Heaven ore bodies are associated with a biotite rhyolite plug, and its subsidiary dikes and protrusions, which has intruded volcanic rocks and derived sediments of Clarno (Eocene) and post-Clarno age. Three general types of ore bodies were formed: (1) Breccia zones formed during the emplacement of the intrusive were later filled with cinnabar to form relatively large and high-grade ore shoots. The size and grade of the shoots were in part dependent upon the intensity and amount of brecciation. (2) Locally cinnabar was dropped from solution beneath clay cappings developed along minor faults bordering the intrusive. Small but very high-grade ore bodies were formed. (3) Relatively low-grade ore bodies were formed in the rhyolite tuffs overlying the intrusive.

History

The initial evidence that a body of quicksilver ore lay along the northern base of Horse Heaven Mountain was found in the pan of Art Champion who was prospecting for cinnabar on Cherry Creek in April 1933. His interest in the "prospect" was sold to Ray R. Whiting, Ray R. Whiting, Jr., and Harry Hoy. The latter two discovered the first ore in place when one of them accidentally kicked loose a piece of rock with cinnabar attached to it. Subsequent underground work the same year revealed a high-grade ore shoot.

A small Herreshoff furnace was purchased and installed, and production began in September 1934. The mine ran under the supervision of Ray Whiting, Sr., for about 2 years during which time it produced approximately 2,200 flasks of mercury. In 1936 the property was sold to the Sun Oil Company which still owns and operates the property. Operation of the mine was continued with little interruption for the next 8 years, increasing the total production to 15,097 flasks of quicksilver. In November 1944, the Herreshoff furnace, the power plant, and other structures were destroyed by fire.

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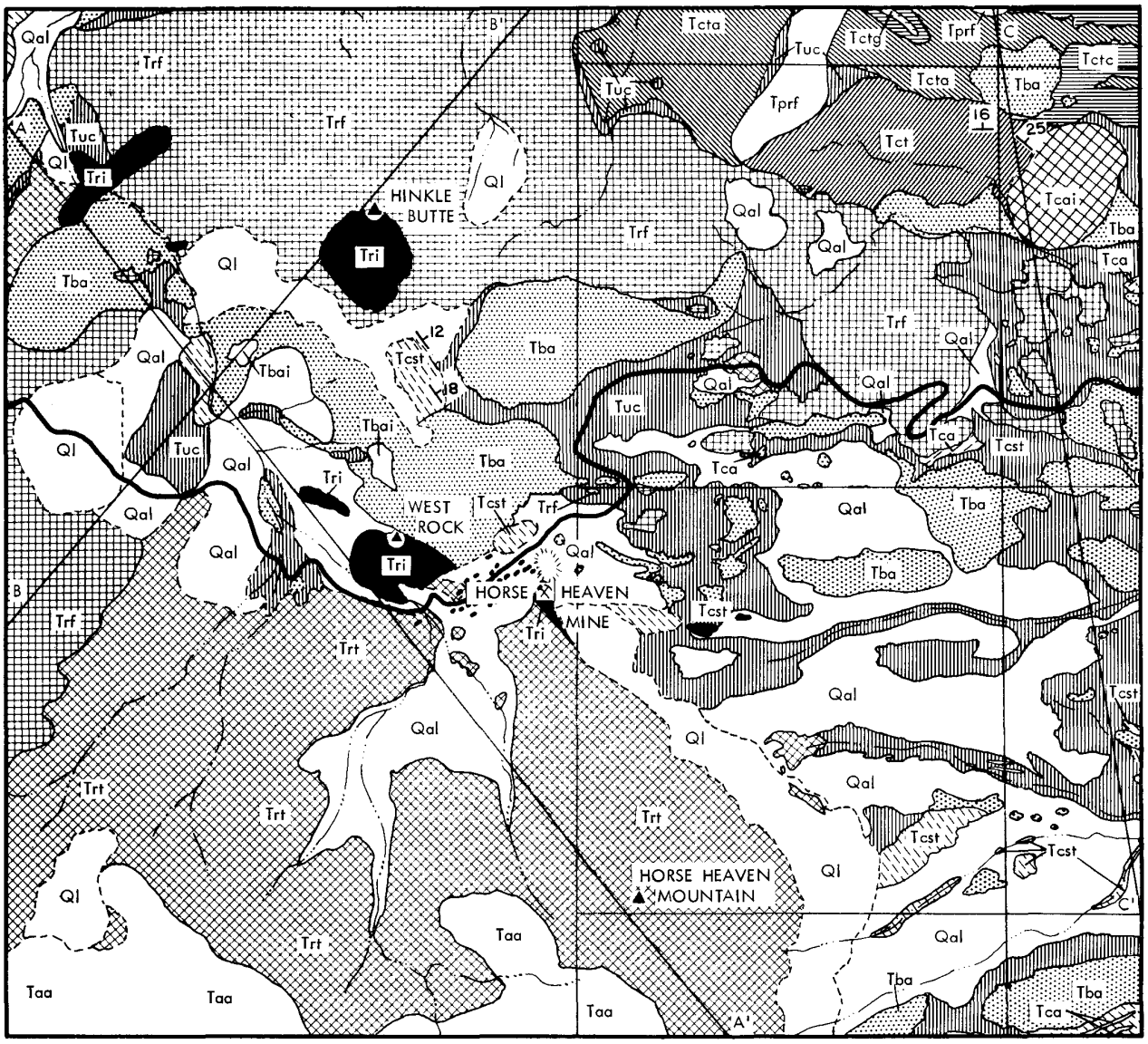
* Manager, Cordero Mining Company.

GEOLOGIC MAP AND SECTIONS OF THE HORSE HEAVEN DISTRICT, JEFFERSON COUNTY, OREGON



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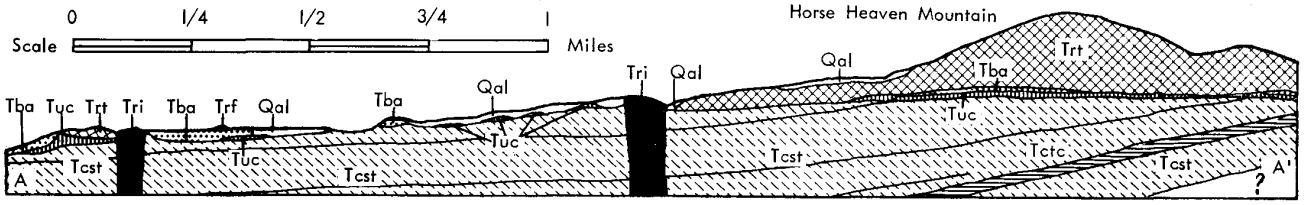
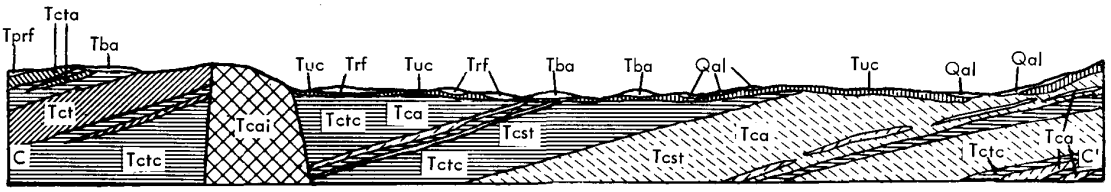
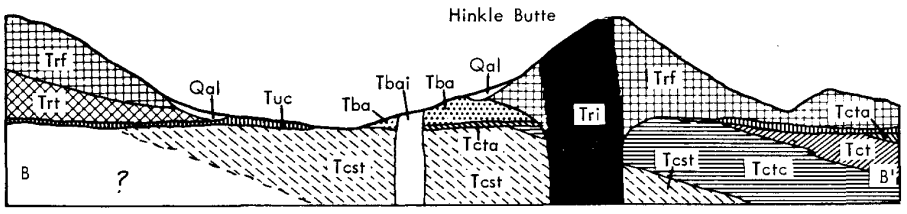


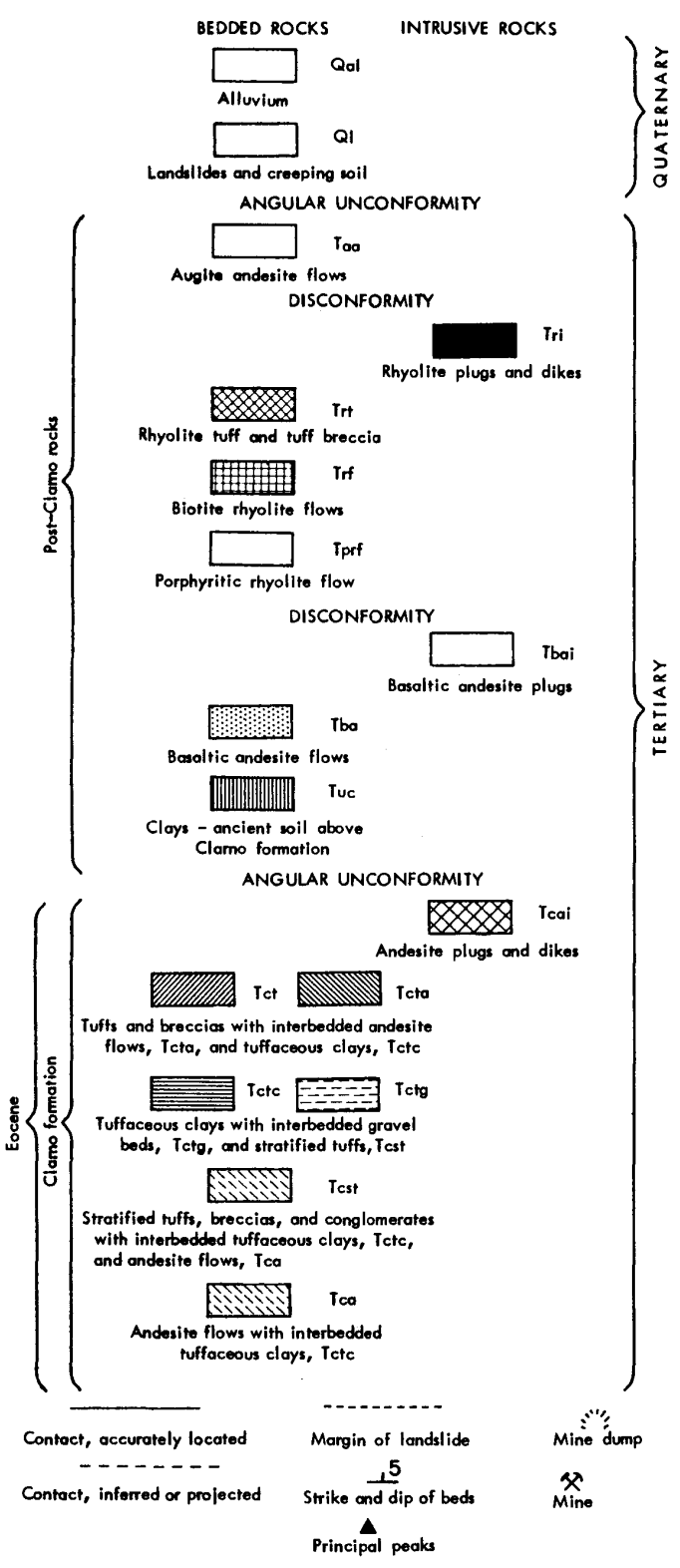




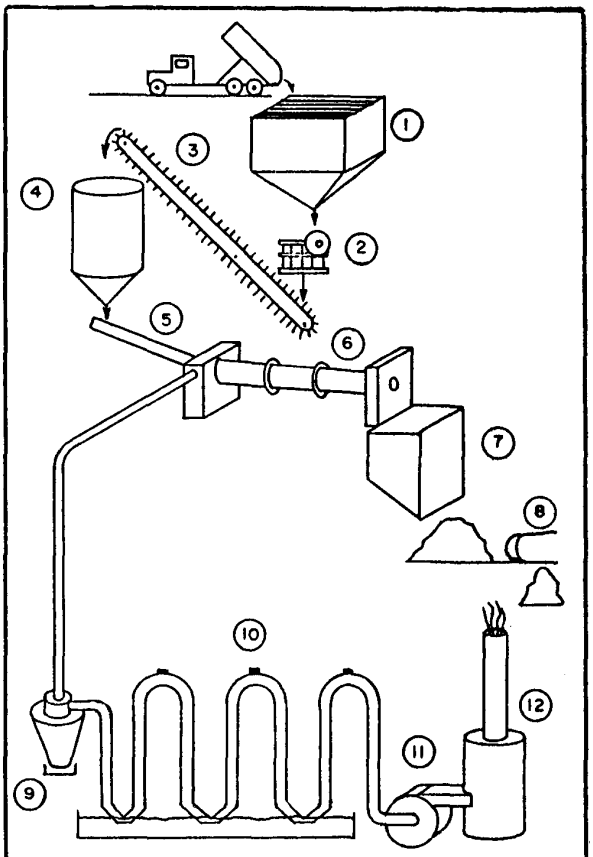
Geology by A. C. Waters, R. R. Compton, R. E. Brown, and Howel Williams, 1942

Source U. S. G. S. Bulletin 969 plate 21

Traced by M. P. Christianson March 1958



HORSE HEAVEN MINE FLOW SHEET



1. Coarse ore bin, 75-ton
2. Crusher 8" x 16"
3. Bucket elevator
4. Fine ore bin, 50-ton
5. Feeder
6. Rotary furnace 30" x 30'
7. Calcine soaking pit
8. Calcine scraper
9. Sirocco dust collector, 8"
10. Condensers - 44 pipes 8" x 16'
11. Stack fan
12. Redwood stack

At the time of the fire, known ore reserves were limited to pillars containing vital access ways and thin layers of ore left to help support the upper edges of some of the stopes. In view of rising costs and the decreasing value of quicksilver which followed the Government purchase of large stocks of foreign mercury in 1944, no immediate plans were made to rebuild the mill. However, mine development was continued on a very limited and intermittent scale for the next 10 years.

During 1954 the price of mercury climbed to more than $300 per flask. This price seemed to reflect a new market for the metal, and future needs looked promising. Consequently the company decided to install a small plant to recover the limited amount of ore left in the mine when it closed. A small rotary furnace was installed together with ore bins, crusher, and conveyors, and was put in operation in April 1955.

From 1955 through 1957 the mill operated more or less continuously. Some difficulties were experienced in reclaiming the smaller, less accessible ore pockets. A great deal of exploration work was attempted in 1955 but practically all of the results were negative; exploration and development work was stopped and the crew concentrated on mining and milling.

For about 18 months, during 1955 and 1956, a large portion of the ore came from an open pit but this eventually became too low grade to operate. The ratio of stripping to ore became excessive. The furnace, which was originally designed for 15 tons, was forced to mill 25 tons per day, and later 30 tons per day. Even with the ore coming from underground, each man-shift mined and milled 2.6 tons during 1957 and, as the price of mercury dropped and the grade of ore dropped, this was upped to a present rate of 3 tons per man-shift.

During the years 1956-1957 a total of 18,829 tons of ore containing slightly more than 6 pounds of mercury per ton was furnaced.

Present operations

Extraction of ore is done by various mining methods, from simple drifting to square set stoping.

The entire crew at the property, including mine, mill, surface, office and supervision, is 11 men. Many of the men, especially the mill crew, have been with the mine continuously from the beginning of the present operation. They work harmoniously together and, as employees of any small mine, they realize the necessity of augmenting each other's efforts and working for the good of the operation.

The success of this small mine is due essentially to three men. Frank E. Lewis, general superintendent, has been in charge of the operation for 20 years and it is his knowledge of the old work and the conditions of parts of the old mine which has made it possible to recover, economically, rock which was once left as waste. Mr. Lewis also keeps up the essential engineering and office work. Clarence McClain, general foreman, is in charge of all labor, both underground and in the plant. He has had considerable experience in many types of mines and in handling many classes of people. This experience has been valuable to Horse Heaven. Verne Haas, assistant manager of Cordero Mining Company, has been in the planning end from the beginning of the present operation. He put the various parts of second-hand equipment together to form an efficient, integrated mill. Many of the units are his own design and construction. He also assisted in planning work underground and organizing the entire operation. Many times he has had the role of trouble shooter and has helped solve problems of malfunctioning machinery and low-grade ore.

Communication is maintained with the other company-owned operations and with the company management in Palo Alto, California, by means of a radio which operates on a special frequency authorized by the Federal Communications Commission.

During the past 3 years the operating profit less amortization and depreciation costs has been about 10 percent of the gross sales. This leaves the property with a breakeven operation at best. Had the operation been forced to carry its fair share of the Company

overhead, or had it been necessary for it to pay a royalty to a land owner, the operation would not have been even near an overall breakeven point.

The future of the mine is not bright. During the past year the price of mercury has declined from $250 per flask to $220-225. Mercury can be sold to General Services Administration during the rest of 1958 at a price of $225 delivered San Francisco but difficulties in obtaining tags and flasks which are acceptable to GSA reduced this to an equivalent of $220 per flask. The future beyond 1958 is very uncertain.

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Quicksilver deposits of the Horse Heaven mining district, Oregon: U.S. Geol. Survey Bull. 969-E, 1951.

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GEOLOGY AND GEOGRAPHY SPLIT AT UNIVERSITY OF OREGON

The Department of Geography and Geology at the University of Oregon has been divided into two departments. Dr. Samuel Dicken, who has been head of the Department for the past ten years, will head the Department of Geography. Dr. Lloyd Staples, who has been a member of the teaching staff of the Department for many years will head the Department of Geology. The separation of the two departments was made to accommodate more efficiently the 800 students now enrolled in Geography and Geology. There are seven graduate students in Geography and twenty-five in geology.

In addition to Dr. Dicken, the Geography Department will be staffed by Dr. Forrest Pitts and Dr. Gene Martin, both of whom are assistant professors, and by an associate professor who will join the staff shortly. The Geology Department will be staffed by Dr. Ewart M. Baldwin, Dr. Ernest Lund, and Dr. Walter Youngquist, all associate professors, and James Stovall an assistant professor who will divide his time between the two departments.

Geology was first taught at the University in 1876 when Dr. Thomas Condon began lecturing there. A geology student's organization named in honor of Dr. Condon has been in existence for 40 years on the campus.

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NEW DRILLING PERMIT

Permit no. 31 was issued by the Department to Mr. V. V. Ernston of 745 West 30th St., Albany, Oregon, on March 4, 1958. The oil test hole will be drilled on the Schermacher property which is located in the $SE\frac{1}{4}SE\frac{1}{4}$ sec. 22, T. 9 S., R. 2 W., Marion County. Elevation is 355 feet above sea level.

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FERROCHROME PLANT STUDY TO BE MADE

A study on the feasibility of a western plant to make ferrochrome from domestic ores was authorized March 4 in a cooperative arrangement between two organizations within the Executive Department of the State of Oregon. The two organizations cooperating on the study are the Department of Geology and Mineral Industries and the Department of Planning and Development. Purpose of the study is to determine if local processing of domestic ores could sustain mining of chrome in Oregon.

Metallurgical-grade chromite in the United States is found only in Oregon, California, Washington, and Alaska. Domestic mining has been restricted to periods of international stress when chrome shipments from overseas were cut off and incentive prices paid by the Government. At the present time Oregon's chrome mining is for the Government stockpile of strategic materials. The chrome program was established during the Korean crisis. The amount of domestic chrome allocated for stockpile purchase is expected to be obtained within the next few months and as a result chrome mining will cease unless a market can be established.

Both the Department of Geology and Mineral Industries and the Department of Planning and Development recognize that loss of this basic industry would be detrimental to the State's economy and hope that some plan can be worked out that will prevent the loss. The ferrochrome plant feasibility study is only one of several plans under consideration by the State departments and West Coast chrome miners.

The U.S. Department of Interior proposed a plan for subsidization of domestic chrome mining when the National Long-Range Minerals Program was presented to Congress last summer. The Secretary of Interior in presenting the plan, which is considered unrealistic and not workable by the chrome miners, stated "The basically short world supply coupled with the strategic nature of (chrome) as well as the heavy dependence of the United States on distant overseas sources of supply, underscore the desirability of making every effort to develop and maintain some production from domestic sources." It has been announced that the Department of Interior is preparing another Long-Range Minerals Program for presentation to the Senate Committee on Interior and Insular Affairs.

If it appears that a ferrochrome plant would benefit Oregon chrome mining, the plan will be presented to the Senate Committee.

Ivan Bloch and Associates, Industrial and Economic Consultants, Portland, Oregon, have been retained to make the study.

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OREGON MANGANESE SURVEY PUBLISHED

"Manganese Deposits of Southwestern Oregon" has been published by the U.S. Bureau of Mines as Report of Investigations 5369. Author is Richard N. Appling. The report describes 39 manganese deposits in southwestern Oregon (Curry, Coos, Douglas, Josephine, and Jackson counties), and one in northern California. The deposits are irregular and small and the ores generally average less than 20 percent manganese and contain from 25 to 50 percent silica. Limited development of some of the ore has been attempted, but total output over the years probably has not exceeded a few hundred tons. Although this type of ore is not generally acceptable for ordinary processing, the Bureau of Mines has demonstrated at its Northwest Electrodevelopment Laboratory at Albany, Oregon, that high-silica, low-grade manganiferous materials from this part of the State can be smelted in an electric furnace to make silicomanganese or an acceptable pig iron for use in the Northwest.

The publication may be obtained free of charge from the Publications Distribution Section, Bureau of Mines, 4800 Forbes Street, Pittsburg 13, Pennsylvania. It should be identified by title and number.

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SPOKANE TO PLAY HOST TO AIME NORTHWEST REGIONAL CONFERENCE

More than 40 technical papers will be presented at the 1958 AIME Pacific Northwest Regional Conference in Spokane on April 17, 18, and 19. The conference which was first organized in 1948 by the Oregon Section of AIME has grown steadily during the 11 yearly meetings. The large number of papers to be presented at Spokane has necessitated holding sessions in the Davenport Hotel, the Chamber of Commerce Building, and the Spokane Club. Thursday and Friday will be devoted to the presentation of papers at the following sessions: a General Session at which "Cooperation of Industry, Government and Universities to Produce More and Better Engineers and Scientists" will be the theme; a Uranium Geology Session with papers describing deposits in Alaska, Washington, and Utah; a Mineral Beneficiation Session devoted to metallurgical problems of phosphate, chromite, manganese, and uranium; a Mining Session with subjects for papers ranging from road surfacing to shaft sinking and operations of a silver mine;a Geochemical Prospecting Session with two papers on copper prospecting and recent developments in geochemical prospecting; a session on Physical Metallurgy with five papers treating on testing various metals; a General Geology Session at which Washington's new geologic map will be discussed and the geological mapping program of the Southern Pacific described; an Extractive Metallurgy Session with three papers on uranium metallurgy; a Coeur D'Alene Geology Session with four papers on mines in the area; and an Industrial Minerals Session with papers on heavy clay, fluorspar, lime, and a discussion of industrial minerals in the Northwest.

Other events Thursday and Friday will be two luncheons and a banquet. On Saturday there will be two field trips, one to the Dawn Mining Company Mill and the Midnight Mine, and the other to the new Gladding McBean Company Brick Plant. Dr. A. E. Weissenborn is general chairman for the Conference.

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PUMICE STONE BILL INTRODUCED IN HOUSE

H.R. 11269 "Place Certain Pumice Stone on Free List." This bill has been introduced by Rep. Rogers (Florida), Committee on Ways and Means. It would place pumice stone on free list when imported to be used in the manufacture of concrete building blocks.

(From American Mining Congress Legislative Bulletin No. 13, March 13, 1958).

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MILITARY WITHDRAWAL BILL APPROVED

H.R. 5538 - "Military Withdrawal of Public Lands," introduced by Rep. Engle of California, was signed by the President February 28 and becomes Public Law 85-337. The legislation provides that (1) withdrawals of public lands exceeding 5,000 acres for one Defense Department facility may be made only by Act of Congress, and (2) minerals in public lands withdrawn or reserved for military purposes may be disposed of only under the applicable mining and mineral leasing laws, except where the Secretary of Defense determines that such disposal would be inconsistent with the military use of the lands.

Enactment of this meritorious law was strongly urged by the American Mining Congress to curb military withdrawals of large western areas and thus remove them from the purview of the mining laws.

(From American Mining Congress Bulletin Service, No. 5, March 4, 1958.)

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CHROME STOCKPILE SHIPMENTS

The Grants Pass chrome stockpile operated by General Services Administration reported that a balance of 11,978 long dry tons of chromite remained to be purchased on March 21. GSA has now combined all of the tonnages formerly earmarked for the Carload, Seattle, and Grants Pass programs into one figure. Information on the amount of tonnage remaining to be purchased is available at the Portland and Grants Pass offices of the Department each Tuesday afternoon, and at the Baker office on Wednesday mornings.

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DIRECTORY OF INDUSTRIAL MINERALS PRODUCERS

"A Directory of Pacific Northwest Industrial Minerals Producers" is the title of Information Circular no. 8 issued February 1958 by Raw Materials Survey of Portland, Oregon. The directory, arranged alphabetically by mineral commodity, lists mineral producers in Oregon, Washington, Idaho, Montana, and British Columbia. Price is $2.00.

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WASHINGTON GETS OIL AND GAS MAP

The first map in the Oil and Gas Investigations series to cover a portion of western Washington has been issued as OM 188 by the U.S. Geological Survey. Most of western Oregon is already covered by maps of this series. Map OM 188, with text, is entitled "Geology of the Doty-Minot Peak area, Washington," and authors are Maurice H. Pease, Jr., and Linn Hoover. The area covered by the map lies immediately west of the Centralia-Chehalis district, in parts of Grays Harbor, Lewis, and Pacific counties where Tertiary sedimentary and volcanic rocks range in age from middle Eocene to possibly Pliocene and have a total thickness of about 15,000 feet. The map may be purchased for 75 cents from the Distribution Section, Geological Survey, Denver Federal Center, Denver, Colorado.

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INDUSTRIAL SILICA SOURCES PUBLISHED

A January 1958 revision of "Industrial Silica for Pacific Northwest Industries," has been published by Raw Materials Survey. The publication is Resource Report No. 1, originally published in 1946 and revised in 1948. The new edition is intended to answer the increased demand for information on this important industrial mineral. It covers primarily the sources of silica available on a reasonably economic basis to industries in the lower Columbia River area. The report may be purchased for $3.00 from Raw Materials Survey, 324 S.W. Fifth Avenue, Portland 4, Oregon.

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MONTANA SCHOOL OF MINES TO HOLD SYMPOSIUM

Montana School of Mines announces that plans for its Stope-fill Symposium to be held on the campus May 9-10, 1958, are now practically complete. A considerable portion of the symposium will deal with the theoretical and practical aspects of handling slurries in pipe lines. Technical papers and field trips are scheduled. For further information write to Stope-fill Symposium, c/o Montana School of Mines, Butte, Montana.

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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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LIMESTONE OCCURRENCES IN WESTERN OREGON

The Department has received numerous requests in recent months for information on the limestone deposits of the State. Many of these requests are the outcome of the increased and anticipated industrial and building expansion of the Northwest plus the recent completion of pipelines from the Southwest and Canada which can supply ample quantities of natural gas for industrial usage.

On the following pages are two maps showing the location of all areas in which limestone has been found in western Oregon. Accompanying the maps are brief remarks on the limestone occurrences within the areas and references to the sources of the data. As will be readily seen, several comprehensive reports cover many of the occurrences, for example, "Limestone Resources of the Pacific Northwest," published in April 1957 by Raw Materials Survey. It is not the purpose of the present report to enlarge upon the published material, but rather to call attention to available data on known deposits and to note occurrences not generally considered economic because of size, composition, or distance from market. This information should serve as a ready reference and bibliography for anyone interested in this basic industrial commodity in Oregon.

A similar report on limestone in northeastern and central Oregon has been prepared and will appear in the Ore.-Bin next month (May 1958). The two articles will eventually be combined and issued as a Miscellaneous Paper of the Department.

Ed.

Southwestern Oregon

By N. V. Peterson
(Field Geologist, Grants Pass Office)

Coos County

*1. MORGAN LIMESTONE (4, 11)**
Location: NE¼ sec. 35, T. 25 S., R. 12 W., on the hillside west of South Fork Coos River, 250 feet above the county road.
Description: Small steeply dipping bedded deposit of dull-gray amorphous limestone. Quality is reported to be about 85 percent $CaCO_3$.

Douglas County

2. GREEN VALLEY DEPOSIT (2,4,9)
Location: NE¼ sec. 21, T. 24 S., R. 6 W., near the head of Green Valley.
Description: Small deposit of fossiliferous, calcareous shale.

Douglas County (cont.)

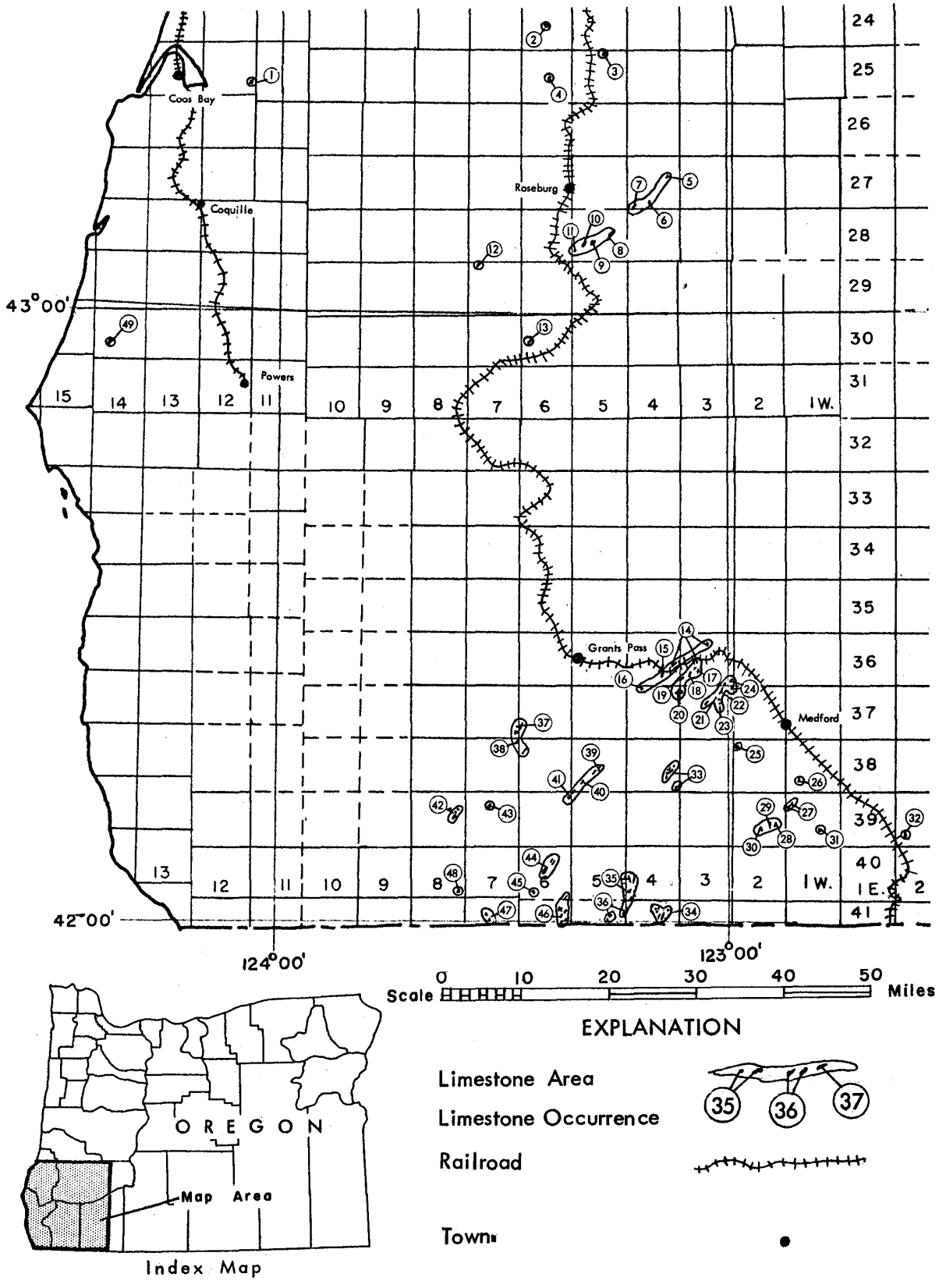
3. NO NAME (2, 4, 9)
Location: Sec. 3, T. 25 S., R. 5 W., about 1 mile northeast of Oakland.
Description: Small deposit of bluish, shaly limestone.

4. STARR RANCH (2, 4, 9)
Location: NW¼ sec. 22, T. 25 S., R. 6 W., about 4 miles northeast of Umpqua.
Description: Small thin beds of fossiliferous shale.

5. NO NAME (2)
Location: NW¼ sec. 14, T. 27 S., R. 4 W.
Description: A small lentil 15 feet thick containing an abundance of microscopic fossils.

* Number refers to map locality.
** Numbers in parentheses refer to bibliography on page 37.

Limestone Occurrences In Southwestern Oregon



Index Map

EXPLANATION

Limestone Area

Limestone Occurrence

Railroad

Town

Southwestern Oregon (cont.)

Douglas County (cont.)

6. ODEN-HATFIELD DEPOSIT (2, 4, 11, 13)
Location: NW¼ sec. 33, T. 27 S., R. 4 W., about 11 miles southeast of Roseburg.
Description: Lens 25 feet wide, vertical dip, can be followed for 225 feet along the strike. A small 30- by 30-foot quarry is developed from which dimension stone has been quarried and sawed. Abandoned.

7. HATFIELD DEPOSIT (2, 4, 11)
Location: NE¼ sec. 31, T. 27 S., R. 4 W., 1 mile west of the Oden-Hatfield occurrence.
Description: Small pod of light-colored limestone largely hidden by overburden; similar to Oden-Hatfield deposit.

8. DODSON DEPOSIT (Whitsett) (2, 4, 9, 13)
Location: SW¼ sec. 14, SE¼ sec. 15, T. 28 S., R.5W.
Description: Massive gray rock dipping steeply to the northwest with a maximum thickness of 60 feet. Can be traced for a third of a mile. Contains some imperfect fossils.

9. HARRINGTON LIMESTONE (4, 12, 13)
Location: SW¼ sec. 21, T. 28 S., R. 5 W., about half a mile east of the Oregon Portland Cement Co. quarry.
Description: Limestone outcrops over an area of 500 by 300 feet. This occurrence is similar to the Oregon Portland Cement Co. limestone. A Department assay shows it to be 97.6 percent $CaCO_3$.

10. OREGON PORTLAND CEMENT (2, 4, 5, 9, 11)
Location: SE¼ sec. 20, T. 28 S., R. 5 W., about 10 miles southeast of Roseburg.
Description: The quarry is in a large lens of steeply dipping limestone. Included bedded chert and faulting result in high quarrying costs. Abandoned in 1935. The limestone is of high purity 97+ to 98 percent $CaCO_3$.

11. FISHER PROPERTY (2, 4, 9, 13)
Location: SW¼ sec. 30, T. 28 S., R. 5 W.
Description: Outcrop reported to be 40 by 175 feet. A chip sample assay shows a 97.5 percent $CaCO_3$ content.

12. BYRON LIMESTONE (11, 13)
Location: SE¼ sec. 5, T. 29 S., R. 7 W.
Description: Very small pod of pink- to rose-colored limestone. Not developed. Contains about 85 percent $CaCO_3$.

13. HAMMERSLEY LIMESTONE (11)
Location: Sec. 20, T. 30 S., R. 6 W., about 5 miles west of Riddle.
Description: This is reported to be an irregular mass of vein calcite in metavolcanic rocks.

Jackson County

14. GOLD HILL DEPOSITS (3, 6, 9, 10)
Location: Secs. 3 and 16, T. 36 S., R. 3 W., and sec. 13, T. 36 S., R. 4 W., all near Gold Hill.
Description: Two small lenses in sec. 13, one in sec. 3, and one in sec. 16. The lens in sec. 16 is interbedded with argillaceous shales and is located near the present Ideal Cement Co. plant. Analysis of limestone from sec. 13 shows 89.4 percent $CaCO_3$.

15. ROGUE RIVER (9, 10)
Location: SW¼ sec. 23, T. 36 S., R. 4 W.
Description: Small elongate lens, 100 feet thick, 92 percent $CaCO_3$.

16. OWL HOLLOW MINE (6, 11)
Location: NE¼ sec. 26, T. 36 S., R. 4 W., near the head of Little Savage Creek.
Description: No information as to size or quality.

17. GALLS CREEK GROUP (6, 9, 10)
Location: Sec. 21, T. 36 S., R. 3 W., just south of Gold Hill.
Description: Two narrow lenses of light-gray to white crystalline limestone. Not developed, reported to be of good quality. Analysis shows 96.31 percent $CaCO_3$.

18. BEAVER PORTLAND CEMENT CO. (4, 12)
Location: Secs. 20 and 29, T. 36 S., R. 3 W.
Description: Quarry furnished limestone for Beaver Portland Cement Co.'s plant at Gold Hill for a few years after its erection.

19. EAGLE LIMESTONE (9, 10)
Location: Sec. 30, T. 36 S., R. 3 W.
Description: This deposit is near the Eagle Gold mine and not developed.

20. BRISTOL LIMESTONE (5, 6, 11, 13)
Location: Sec. 31, T. 36 S., R. 3 W., and sec. 6, T. 37 S., R. 3 W., north of the Left Fork of Foots Creek.
Description: The deposit is from 200 to 600 feet wide, and more than 1,000 feet long. A smaller lens occurs a few hundred feet southeast of the main body. $CaCO_3$ content is reported as 97 percent. Inactive since 1941.

21. LIVELY QUARRY (4, 6, 9, 10, 11, 13)
Location: Sec. 2, T. 37 S., R. 3 W., on Kane Creek.
Description: Two small lenses of limestone have been worked out and the quarries abandoned.

22. BAXTER LIMESTONE (6, 11)
Location: SE¼ sec. 2 and SW¼ sec. 1, T. 37 S., R. 3 W., southeast of Gold Hill.
Description: Two lenses of banded marble; the largest, 100 by 500 feet, was opened for quarrying. The quarry was abandoned by the Oregon Limestone Company in 1942. Reported to contain 97 percent $CaCO_3$.

Southwestern Oregon (cont.)

Jackson County (cont.)

23. BEEMAN LIMESTONE (6, 9, 10, 11)
Location: Sec. 11, T. 37 S., R. 3 W., southeast of Gold Hill.
Description: Banded, light and dark, medium-grained limestone in a steeply dipping lens. Inclusions of metasedimentary rocks are common. The better rock is reported to analyze 96+ percent $CaCO_3$.

24. MILLIONAIRE MINE LIMESTONE (11, 12, 13)
Location: Secs. 30 and 31, T. 36 S., R. 2 W., and sec. 36, T. 36 S., R. 3 W.
Description: Three elongate lenses trending N. 30° E. Reports indicate a high $CaCO_3$ content (88 to 92 percent).

25. ENSELE QUARRY (7, 10, 11)
Location: Sec. 6, T. 38 S., R. 2 W., 1 mile southwest of Jacksonville.
Description: Abandoned quarry in a small lens-shaped limestone mass.

26. BRINER LIMESTONE (4, 11, 13)
Location: NE¼ sec. 29, T. 38 S., R. 1 W., about 4 miles southwest of Phoenix.
Description: The limestone probably occurs as a series of lenses rather than a continuous bed. Where exposed, it is 20 feet wide and 50 feet long. An analysis from the deposit shows 92 to 95 percent $CaCO_3$.

27. SOUTH FORK ANDERSON CREEK (4)
Location: NW¼ sec. 7, T. 39 S., R. 1 W.
Description: Two small occurrences reported to be calcareous tufa.

28. MUDDY GULCH LIMESTONE (4)
Location: W½ sec. 23, T. 39 S., R. 2 W., near the Little Applegate River.
Description: Reported to be a body 65 by 500 feet and contains 93 percent $CaCO_3$.

29. BEAR GULCH LIMESTONE (4)
Location: W½ sec. 23, T. 39 S., R. 2 W., about half a mile west of the Muddy Gulch occurrence.
Description: 94 percent $CaCO_3$. Black limestone with white bands interbedded in schists and shales.

30. WOLF GULCH LIMESTONE (4)
Location: SW¼ sec. 22, T. 39 S., R. 2 W., about 10 miles southwest of Ruch along the Little Applegate River.
Description: Smaller occurrence similar to Bear Gulch Limestone.

31. BALD MOUNTAIN (12)
Location: SE¼ sec. 20, T. 39 S., R. 1 W., near the head of Wagner Creek about 6 miles south of Talent.
Description: Undeveloped.

32. SHEPARD SPRINGS (4)
Location: Sec. 28, T. 39 S., R. 2 E.
Description: Calcareous tufa.

Jackson County (cont.)

33. APPLEGATE RIVER GROUP (3, 4, 6)
Location: About 2 miles east of Applegate in secs. 23, 24, and 26, T. 38 S., R. 4 W.
Description: There are eight individual occurrences closely grouped. Generally these occurrences are steeply dipping lenses of no great extent with widths of 50 to 100 feet.

34. SEATTLE BAR GROUP (3, 4, 6, 9, 10, 11, 13)
Location: Just south of Watkins in secs. 2, 10, and 11, T. 41 S., R. 4 W.
Description: The largest of the six occurrences in this group is in sec. 11. This white crystalline limestone mass averages 75 feet thick and is exposed for three-fourths to one mile in length. There are narrow siliceous bands and included schistose material within the lens. A 1948 sample assayed 97 percent $CaCO_3$.

35. CARBERRY CREEK GROUP (3, 4, 6, 9, 10)
Location: Secs. 18, 19, 30, and 31, T. 40 S., R. 4 W., about 2 miles west of Steamboat.
Description: There are six occurrences in this group and the largest is 50 feet wide and 500 feet long. The dark, variegated, siliceous limestone grades into dark impure quartzite. An analysis shows 71.9 percent $CaCO_3$.

Josephine County

36. WHISKEY PEAK GROUP (6)
Location: Sec. 6, T. 41 S., R. 4 W., and secs. 11 and 12, T. 41 S., R. 5 W., in the vicinity of Whiskey Peak.
Description: Four occurrences, two in sec. 11 and one in sec. 12, T. 41 S., R. 5 W., and one in sec. 6, T. 41 S., R. 4 W.

37. MARBLE MOUNTAIN GROUP (4, 5, 6, 9, 10, 11, 13)
Location: Secs. 19, 30, and 31, T. 37 S., R. 6 W.; sec. 6, T. 38 S., R. 6 W.; and secs. 25 and 36, T. 37 S., R. 7 W., about 7 miles south of Wilderville.
Description: There are six irregularly spaced bodies in the Marble Mountain Group. Included is the Marble Mountain quarry operated by the Ideal Cement Company at Gold Hill. There are large reserves of high-quality limestone (95 to 97 percent $CaCO_3$) in this group.

38. MUCK LIMESTONE (5, 6, 9, 10)
Location: Sec. 30, T. 37 S., R. 7 W.
Description: This occurrence may be included in the Marble Mountain group. Light-gray limestone is exposed for about 1,000 feet in cliffs 150 to 200 feet high. The beds stand vertically and appear to be 150 to 250 feet wide. Several chip samples from different points in the quarry show the limestone to be about 95 to 98 percent $CaCO_3$. The property has been inactive since 1949.

39. HORSEHEAD LIME (5, 6, 11, 13)
Location: SW¼ sec. 15, T. 38 S., R. 5 W., 3 miles southwest of Provolt.
Description: Quarry at northeast end of narrow limestone belt that is interbedded with schist and cut by basic igneous dikes. The limestone is reported to be very pure, running more than 99 percent $CaCO_3$. Inactive since 1950.

Southwestern Oregon (cont.)

Josephine County (cont.)

40. TURVEY LIMESTONE (11, 12)
Location: Sec. 29, T. 38 S., R. 5 W., about 4 miles west of Williams.
Description: A steeply dipping limestone lens 25 feet wide and 400 feet long. One sample assayed 95.26 percent $CaCO_3$.

41. JONES MARBLE QUARRY (3, 4, 5, 6, 9, 10, 11, 13)
Location: Sec. 31, T. 38 S., R. 5 W., about 4 miles west of Williams.
Description: This occurrence is a variegated black-and-white to pure-white marble in a mass 600 feet wide and 2,000 feet long. There are small inclusions of siliceous shale and schist. The pure marble shows 99+ percent $CaCO_3$.

42. LIME ROCK (Holton Creek) (3, 4, 8, 11)
Location: Secs. 11, 12, and 14, T. 39 S., R. 8 W., about 2 miles southeast of Kerby.
Description: Gray or white limestone now recrystallized to marble. The bodies of marble rarely exceed 100 feet in thickness and a few hundred feet in length. The limestone is fine-grained and said to run more than 98 percent $CaCO_3$.

43. NO NAME (8)
Location: SW¼ sec. 4, T. 39 S., R. 7 W., about 8 miles southwest of Selma.
Description: A small body similar to the occurrence at Lime Rock.

44. OREGON CAVES MONUMENT (3, 4, 6, 9, 10)
Location: Secs. 10, 15, and 16, T. 40 S., R. 6 W., 18 miles east of Cave Junction on State Highway 46.
Description: This large mass of limestone in which the Oregon Caves were formed is not available for commercial purposes.

Josephine County (cont.)

45. GRIZZLY GULCH (6, 9, 10)
Location: SW¼ sec. 29, T. 40 S., R. 6 W., near the mouth of Grizzly Creek 2 miles south of the Oregon Caves.
Description: A small exposure of limestone similar to the Oregon Caves rock.

46. SUCKER CREEK GROUP (6)
Location: Sec. 35, T. 40 S., R. 6 W., and secs. 1, 2, 13, and 14, T. 41 S., R. 5 W.
Description: Seven lenslike occurrences grouped around Swan Mountain.

47. WEST FORK ALTHOUSE CREEK (8)
Location: Sec. 9, T. 41 S., R. 7 W., along the West Fork Althouse Creek about 1 mile north of the California state line.
Description: Two small undeveloped occurrences.

48. ELDER CREEK (Takilma) (4, 8, 9. 10)
Location: NW¼ sec. 25, T. 40 S., R. 8 W., near Takilma.
Description: This limestone was used as a source of lime flux for the old Takilma smelter.

Curry County

49. NO NAME (1)
Location: Sec. 29, T. 30 S., R. 14 W., about 5 miles northeast of Langlois.
Description:"..inely crystalline, light-gray siliceous limestone.

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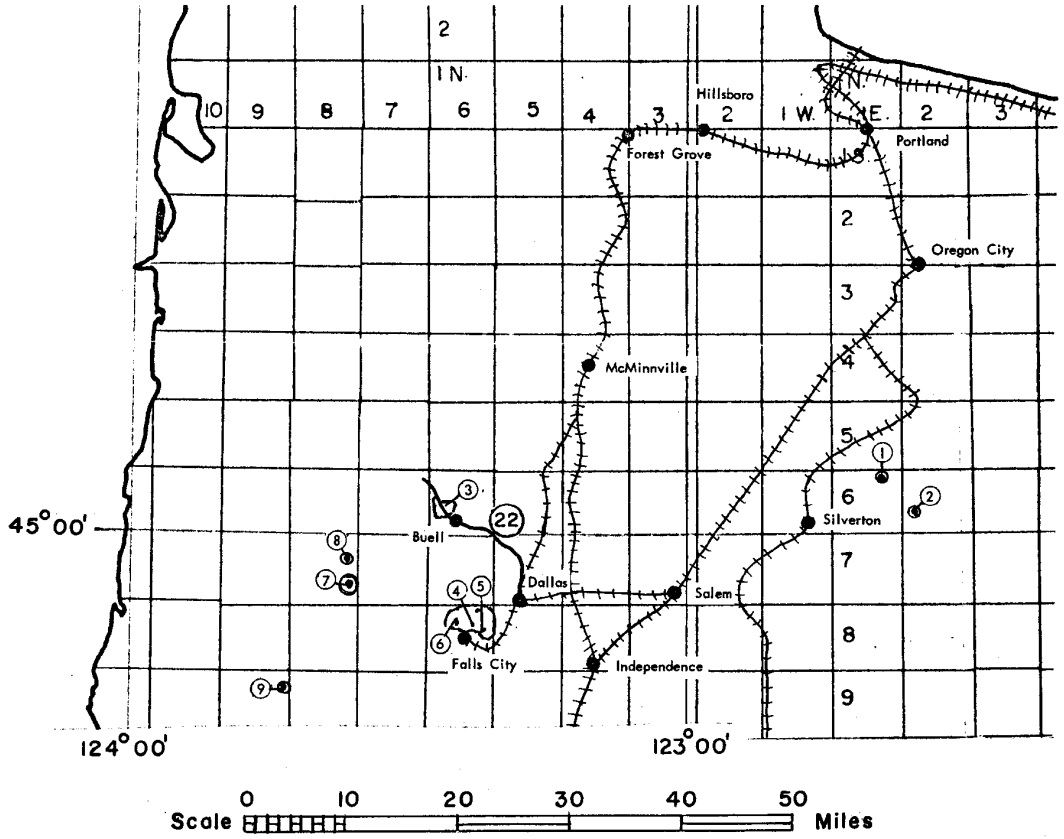
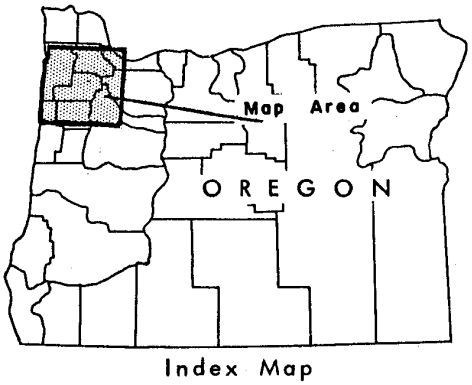
Limestone Occurrences In Northwestern Oregon





Index Map

EXPLANATION

Limestone Area

Towns

Limestone Occurrence

State Highway

Railroad

Northwestern Oregon

By R. S. Mason
(Mining Engineer, Portland Office)

Clackamas County

*1. MARQUAM DEPOSIT (1, 2)**
Location: Secs. 2 and 3, T. 6 S., R. 1 E., about 1 mile northeast of Marquam.
Description: Two deposits covering 10.38 and 3.96 acres. Lenses of broken oyster shells in sandy tuffs, grits, and conglomerates. Analyses range from 25 to 65 percent $CaCO_3$.

2. BEAVER CREEK (4)
Location: Sec. 19, T. 6 S., R. 2 E., about 3 miles east of Scotts Mills on Beaver Creek road.
Description: Limy tuff outcrops along road and stream bank. Undeveloped. Grab sample analyzed 50 percent $CaCO_3$.

Polk County

3. BUELL LIMESTONE (1, 2)
Location: Secs. 19, 20, 29, and 30, T. 6 S., R. 6 W., about 2 miles west of Buell and just south of State Highway 22.
Description: Massive, dense gray rock with carbonaceous and clastic fragments. Average thickness about 20 feet. Analyses range from 52 to 78 percent $CaCO_3$.

4. LIME PRODUCTS COMPANY QUARRY (1, 2)
Location: SE¼ sec. 11, T. 8 S., R. 6 W., about 6½ miles by road southwest of Dallas.
Description: Similar in grade and appearance to the rock quarried in the Oregon Portland Cement Co. quarry half a mile to the north.

5. OREGON PORTLAND CEMENT QUARRY (1, 2)
Location: NW¼ sec. 12, T. 8 S., R. 6 W., and parts of secs. 1, 2, and 11, T. 8 S., R. 6 W., about 3 miles southwest of Dallas.
Description: Dark-gray, tuffaceous, sandy limestone about 50 feet thick. Wide range of analyses but shipments average about 50 percent $CaCO_3$.

Polk County (cont.)

6. WAYMIRE CREEK (3)
Location: Sec. 10, T. 8 S., R. 6 W., about 2 miles northeast of Falls City.
Description: Exposures along banks of Waymire Creek for about 1 mile. Beds may be 100 feet thick. No development. Limestone probably similar to that found in Lime Products Company quarry to the east.

7. BOULDER CREEK CAMP (3)
Location: SE¼ sec. 24, T. 7 S., R. 8 W., between the pass in which Willamette Valley Lumber Company's Boulder Creek Camp is located and the head of Mill Creek.
Description: Impure beds about 50 feet thick. Undeveloped. Analyses range from 59 to 86 percent $CaCO_3$.

8. ROWELL CREEK (3)
Location: Sec. 12 (?), T. 7 S., R. 8 W., exposed in Polk Operating Company's railroad cut on the Rowell Creek-Rock Creek divide.
Description: Thickness apparently less than 50 feet but otherwise similar to the Boulder Creek Camp limestone. Undeveloped. Grab sample analyzed 63 percent $CaCO_3$.

9. SUNSHINE CREEK (3)
Location: Sec. 12 (?), T. 9 S., R. 9 W., exposed along logging road leading to north fork of Sunshine Creek from Valsetz.
Description: Calcareous sandstone more than 30 feet thick. Undeveloped. Sample analyzed 44 percent $CaCO_3$.

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* Number refers to map locality.
** Numbers in parentheses refer to bibliography on page 39.

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OREGON CHROME MINE CLOSES

The Oregon Chrome Mine, Oregon's largest producer of chromite, has closed once again. The last equipment was removed from the underground workings and mine area early in March as no further exploration or development work was warranted. Closing is the result of the near end of the stockpile purchase program and the inability of domestic mines to compete with foreign chrome mined with cheap labor and shipped by ocean vessels to the east coast.

The Oregon Chrome Mine, situated in the rugged Illinois River area of Josephine County about 35 miles southwest of Grants Pass, has a history of production through three periods of international stress. During World War I the mine produced about 6,000 tons of metallurgical-grade chromite. In 1942 the mine was acquired by Bill Robertson and associates of Grants Pass, Oregon, and from that period until 1948 produced another 14,000 tons. Between 1948 and 1952, extensive development work was done but there was no appreciable production. Since 1952, 12,000 tons of metallurgical-grade chromite has been produced.

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NEW DRILLING PERMIT

Drilling Permit No. 32 was issued to Sunray Mid-Continent Oil Company on April 4, 1958, for the drilling of "Bear Creek Unit No. 1." The approximate location is given as 1525 feet north and 1039 feet west from the southeast corner sec. 30, T. 17 S., R. 19 E., Crook County. Estimated elevation is 4239 feet. This is proposed to be a 10,000-foot test.

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BAY HORSE SILVER MINE LEASED

A partnership of Bill Traver, Davenport, Washington, and Henry and Harold Franz, Ritzville, Washington, has leased the old Bay Horse silver mine located on the Snake River below Huntington, Baker County. The old workings are being reconditioned and some new surface cuts are being made for preliminary appraisal purposes. Diamond drilling is contemplated in the near future.

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HORSEHEAVEN MINE CLOSES

The Horseheaven Mine, a major Oregon producer of quicksilver since 1934, was shut down in mid-April. The mine employed eleven men and was owned and operated by Cordero Mining Company. Total production from the mine, located in eastern Jefferson County, amounted to approximately 17,000 flasks. A detailed description of the mine and plant appeared in the March 1958 issue of The Ore.-Bin.

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PACIFIC CARBIDE NAMES QUARRY CONTRACTOR

Pacific Carbide and Alloys Company, which operates a calcium carbide plant in North Portland, has awarded a contract to National Industrial Products Company to quarry and crush limestone at its quarry near Enterprise in Wallowa County. Hauling and loading will continue to be done by Misander Brothers. NIPCO will conduct the quarry work on a batch basis during the summer months when the quarry is accessible, using heavy-duty portable equipment, and will do their own crushing at their quarry south of Durkee in the winter. Coyote holes will be used for blasting rather than the bench and down-hole method formerly used.

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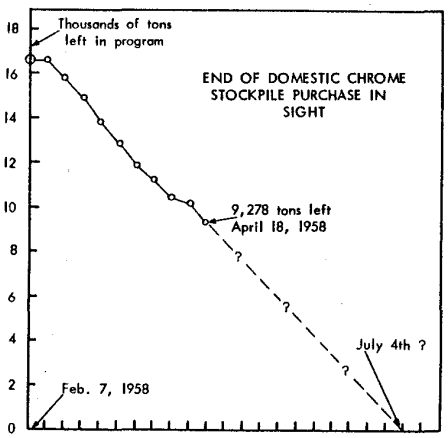
CONGRESS URGED TO BOLSTER WESTERN MINING

At hearings held March 25-28 before the Subcommittee on Minerals, Materials, and Fuels of the Senate Committee on Interior and Insular Affairs, governors and industry leaders of the eleven western states requested that action be taken by Congress and the Administration to halt the present area-wide closing of nonferrous mines. Governor Charles H. Russell, Nevada, presented a resolution adopted by the western governors at their conference in Colorado Springs, February 23-26, 1958. The governors' resolution called for specific action on many metals and minerals to assure the domestic mining industry of at least one-half of the domestic market or its present proportion, whichever is higher, through tariffs, excise taxes, or quotas, or combinations of them.

Governor Robert D. Holmes of Oregon was represented at the hearings by Hollis M. Dole, Director of the Department of Geology and Mineral Industries. Mr. Dole, who was presented to the Committee by Senator Neuberger, endorsed the western governors' proposals on mercury and gold and then devoted his testimony to the desirability of maintaining domestic chrome production. He called the Committee's attention to the near-completion of the Government purchase program (see chart) and the fact that mines are closing (see announcement on page 40). He stated, "Within three months an active, live segment of the Nation's mineral industry will cease and the displaced men will take their position in the ever-lengthening line at the unemployment office." Besides the desirability of maintaining chrome mining to broaden the State's economic base, placing chrome in the stockpile for emergency use, and lessening the dependence of the Nation on an overseas supply of a strategic mineral, chrome mining also encourages prospecting, which is a prime means for determining the mineral possibilities of the State.



Several plans to maintain domestic chrome mining were reviewed for the Committee. These plans included tariffs, excise taxes, quotas, the "wool plan," and continuation of the present program. After acknowledging that these were considered either unworkable or undesirable by Congress or the Administration, Mr. Dole presented a plan which was thought would allow for the continuation of chrome mining and, in addition, be the start for a new industry. This plan was to establish an electroprocess plant to treat newly mined ore. The background on the feasibility of economically processing West Coast chrome ore into ferrochrome had been developed through a study prepared by Ivan Bloch and Associates at the request of the Department of Planning and Development and the Department of Geology and Mineral Industries. It was pointed out that this plan, to be successful, would require a long-range (5 to 10 years) guarantee from General Services Administration to purchase the electroprocess plant's product for the national stockpile at a price not less than the current market price for these materials, and that Government assistance would be necessary in the financing of the electroprocess plant. Assistance from the Government could be in the form of either building, operating, and owning the plant through some agency of the Government or through a Government-guaranteed loan to a cooperative organization. The desirability of this plan is that it would establish chrome mining on a firm long-range basis, create new industry, and turn ore into a product that would be immediately available if needed. Mineral resources of the State would not be depleted as stockpiling of a finished product would save all ore mined. Continuation of mining would develop new ore, for it takes a going mine to find and increase reserves. Proof of this was established during the current stockpile program by the fact that reserves are greater now than ever known, even though more than 200,000 long dry tons of chrome ore has been mined from the ground in the past seven years.

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PROGRESS AT URANIUM MILL SITE

Grading and leveling on the site of Lakeview Mining Company's uranium mill, just north of Lakeview, was under way this week on a contract held by Lakeview Logging Company, it was announced by James F. Poulos, manager of the mining firm. This work is in preparation for the start of construction on Lakeview Mining's $2,600,000 uranium mill to be built this year. Burr Johnson has been employed by Lakeview Mining Company as its mill construction superintendent.

Actual start of construction will depend on bids now being sought by Lakeview Mining. Meanwhile, Lakeview Building Material Company is going ahead with construction of the mining firm's office quarters and the changing room at the mill site. The California Oregon Power Company has started construction of a 10 3/4-mile power line to deliver 66,000 volts to the White King mine. At present Lakeview Mining Company generates its own power at the mine site.

At the White King uranium mine on Augur Creek, miners reached the 312-foot depth last Saturday, said Poulos. Work was started this week on beginning the excavation for drifts and tunnels at the 250-foot level. This will be the third level in the 312-foot shaft, others being established at 70 and 160 feet. (From Lake County Examiner-Tribune, April 24, 1958)

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STRATIGRAPHIC CHART OF SOUTHWEST WASHINGTON PUBLISHED

"Stratigraphy and foraminiferal zonation in some of the Tertiary rocks of southwestern Washington," by Weldon W. Rau, is the title of a new publication issued in chart form by the U.S. Geological Survey. The chart provides detailed stratigraphic control for Eocene, Oligocene, and Miocene rocks in southwestern Washington based on seven foraminiferal zones. It is designated as OC 57 of the Oil and Gas Investigations chart series and may be purchased for 75 cents from the Geological Survey, Denver Federal Center, Denver, Colorado.

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HARVEY RECEIVES FIRST ALUMINA SHIPMENT

Two hundred tons of sacked alumina from Japan were received at Terminal No. 1 by Harvey Aluminum on April 10th. The shipment will be used to test pneumatic unloading equipment at the company's facilities now nearing completion on the east side of the Willamette River near the Northwestern grain dock. Movement to the reduction plant at The Dalles will be by rail. Nippon Light Metal Company, Ltd., of Shimizu, on the island of Honshu, Japan, was the shipper. The cargo arrived on the American Mail liner, "Oregon Mail."

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FOREIGN REPRESENTATIVES VISIT WHITE KING MINE

Visitors at White King uranium mine in Lake County, April 19, were Shahid Noor Khan, of Karachi, Pakistan; Aran Buranasiri, of the mines department, Bangkok, Thailand; and Jack D. Stavropodis, University of Athens, representing the new Atomic Energy Commission of Greece. They were accompanied by Robert G. Young, of the Atomic Energy Commission's staff at Grand Junction, Colorado, and Ross L. Kinnaman, AEC geophysicist from Denver, Colo. (From Lake County Examiner-Tribune, April 24, 1958.)

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LIMESTONE OCCURRENCES IN EASTERN OREGON

By
Norman S. Wagner
(Field Geologist, Baker Office)

The following report is the companion to "Limestone Occurrences in Western Oregon" which appeared in the April 1958 Ore.-Bin. These two reports combine to give a ready reference and bibliography on all known limestone occurrences in Oregon. It will be noted that certain "limestone areas" are shown on the eastern Oregon map without specific designation of "limestone occurrences." The text, however, briefly describes the nature of the "occurrences" within the "areas." Of particular significance to the investigator is the fact that no limestone occurrences are known outside the areas shown on the map.

Interest in limestone deposits in eastern Oregon has been high since completion of the natural gas line in 1956 between the Southwest and Portland as the pipeline traverses the region of the deposits. Since completion of the line the Chemical Lime Company has gone into operation. Its plant, located 5 miles north of Baker, has a yearly capacity of 75,000 tons and produces burnt and hydrated lime. The quarry, located 10 miles west of the plant, is in exceptionally high-grade limestone. (See The Ore.-Bin, November 1957, for complete details on the operation.)

Ed.

Wallowa County

*1. BIG BAR DEPOSIT (16)**

Location: Parts of secs. 8, 17, 18, and 19, T. 5 S., R. 49 E., and parts of secs. 24, 25, and 26, T. 5 S., R. 48 E., in the Snake River Canyon approximately 10 miles north of Homestead.

Description: Thick beds of massive limestone. Highly contorted and recrystallized to a variable degree in different places. Analyses of chips taken on 6- to 8-foot intervals over a horizontal distance of 115 feet beginning at the southern contact showed 53.69 percent CaO, 0.64 percent MgO, 1.04 percent R_2O_3, 1.22 percent SiO_2, and 42.62 percent ignition loss. A chip sample taken over a horizontal distance of 400 feet beginning at the northern contact showed 52.28 percent CaO, 0.68 percent MgO, 1.70 percent R_2O_3, 3.10 percent SiO_2, and 42.10 percent ignition loss.

Wallowa County (cont.)

2. IMNAHA RIVER DEPOSITS (7, 17)

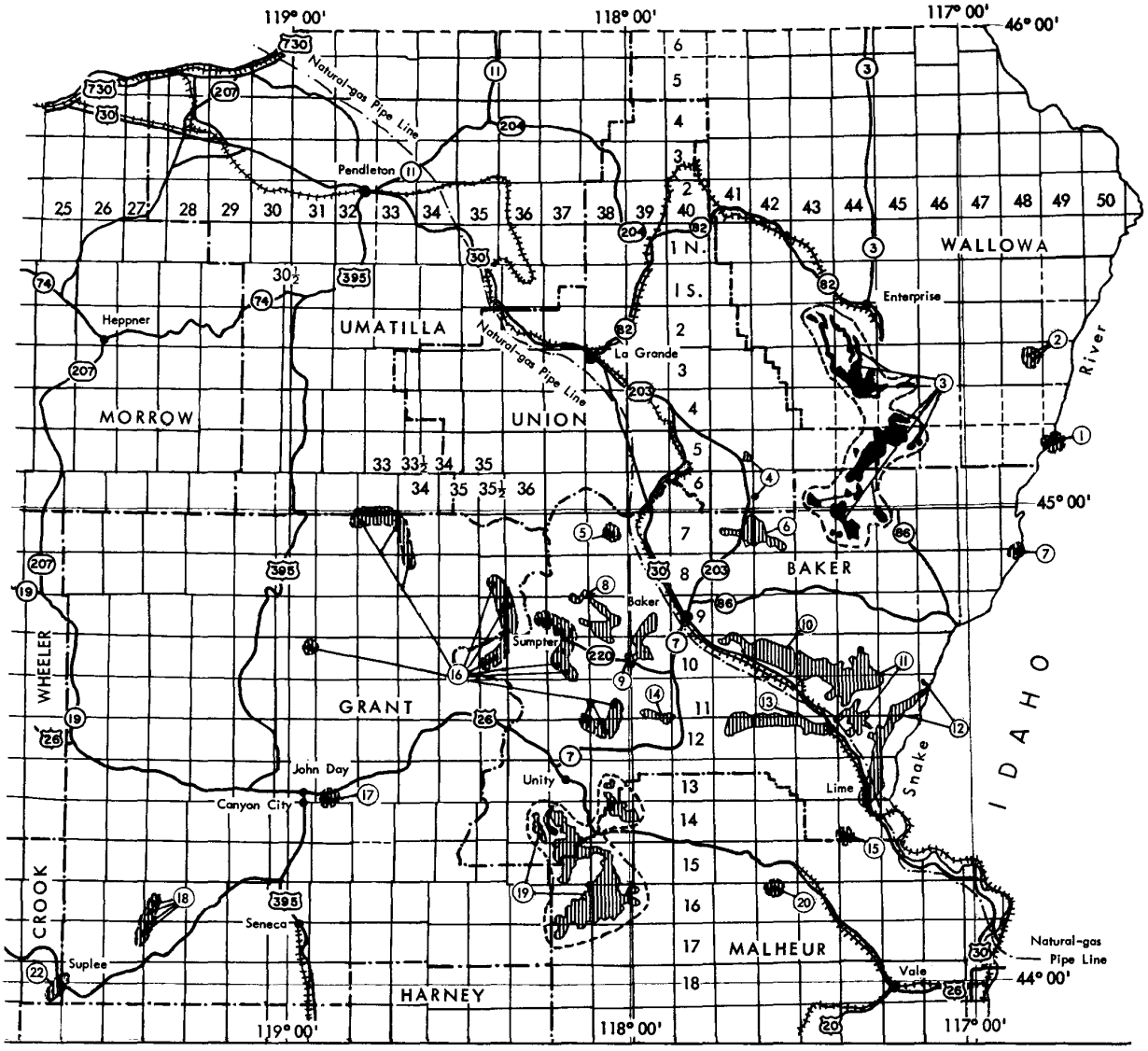
Location: Sec. 15, T. 3 S., R.48 E., in Imnaha River Canyon, and NW¼ sec. 23, T. 3 S., R. 48 E., on Summit Creek, approximately 23 miles south of Imnaha.

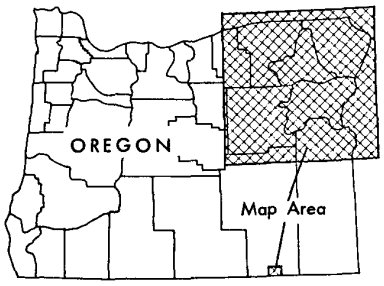
Description: The Imnaha Canyon deposit crops out in one place as a bluff 170 feet high of thick-bedded, slightly recrystallized and locally silicified limestone. Nearby, and along the banks of the river, the rock is described as thick bedded, noncrystalline, and soft. Analysis of the soft limestone shows 54.44 percent CaO, 1.12 percent SiO_2, and other impurities low.

The Summit Creek occurrence is small. No analysis available.

*Number refers to map locality.
**Numbers in parentheses refer to bibliography on page 47.

Limestone Occurrences In Eastern Oregon





Index Map

EXPLANATION

Limestone Areas

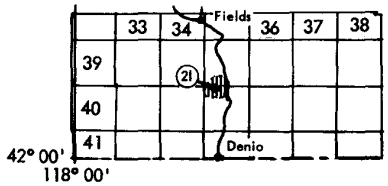
Limestone Occurrences

Natural-gas Pipe Line

Highways — State — United States

Towns

Railroads



Scale 0 5 10 15 20 25 Miles

State of Oregon
DEPARTMENT OF GEOLOGY
and
MINERAL INDUSTRIES
MAY 1958

Wallowa and Baker Counties

3. WALLOWA MOUNTAIN LIMESTONE (7, 11, 12, 22)

Quantities of limestone and marble occur in the Wallowa Mountains, and the areal distribution of these occurrences is indicated on the map. However, since most are too remote to be of commercial value, specific locations are given only for those occurrences situated within a reasonable proximity to rail transportation. These occurrences are all in the northern foothills and are as follows:

Location: (Lostine River) Parts of secs. 3, 4, and 9, T. 2 S., R. 43 E., in the Lostine River Canyon approximately 6 miles south of Lostine.

Description: Thick massive limestone, light gray in color and substantially recrystallized into a finely granulated texture. Quarried and burned into quicklime for local consumption years ago. Analysis indicated a 54.50 percent CaO content, with 0.92 percent SiO_2, 0.52 percent MgO and lesser amounts of other impurities. A bed of similar marble occurs high on the east bank of the Lostine Valley at a point opposite the old quarry. This bed of marble forms cliffs 300 to 500 feet high and is exposed for nearly 6 miles up the Lostine River at elevations of about 5000 feet.

Location: (Black Marble Quarry) Secs. 19 and 20, T. 2 S., R. 44 E., at an elevation of about 6000 feet and approximately $5\frac{1}{2}$ miles from a plant rail siding on the Wallowa River.

Description: A well-bedded, dense, black limestone quarried for burned lime purposes in the 1920's and intermittently thereafter, but purchased in 1949 by the Pacific Carbide and Alloys Co. of Portland and now used for carbide manufacture. Average analysis of 250 feet of drill core from the present quarry indicates the following purity: CaO, 53.37 percent; MgO, 1.06 percent; SiO_2, 1.10 percent; Al_2O_3 plus Fe_2O_3, 0.23 percent; P, 0.004 percent; free carbon, 1.25 percent.

Location: (Hurricane Creek) Parts of secs. 9, 10, 15, and 16, T. 3 S., R. 44 E., where first encountered in Hurricane Creek approximately 9 miles south of Enterprise. The occurrence extends south from the above location to the Matterhorn Peak in secs. 10 and 11, T. 4 S., R. 44 E.

Description: This immense body of limestone is a marble in some places. Composition varies from high purity to low grade.

Union County

4. CATHARINE CREEK OCCURRENCES (18)

Location: About sec. 24, T. 5 S., R. 41 E., on the south fork of Catharine Creek plus two small occurrences on the hill to the south in about secs. 25 and 26; also one small occurrence northeast of Medical Springs in sec. 24, T. 6 S., R. 41 E.

Description: These are all very small occurrences. No analytical data available.

Baker County

5. BULGER HILL LIMESTONE (10)

Location: Sec. 9, T. 7 S., R. 38 E., on the south flank of Bulger Hill approximately 5 miles from the railroad at Hutchinson.

Description: Two rather narrow parallel beds of limestone strike about N. 60° W. and extend nearly two-thirds of a mile across the southern section. The southernmost of the two beds is in contact with diorite but the other one is walled on both sides by argillite. Abundant development of garnet in places, especially along the diorite contact, but clean limestone is also present.

6. MEDICAL SPRINGS OCCURRENCES (3)

Location: T. 7 S., Rs. 41 and 42 E., 3 to 6 miles south of Medical Springs.

Description: A total of twenty individual lenses has been mapped in this area. Some are single, isolated occurrences. Others are grouped in clusters. All are associated with Permian greenstones. The grade is probably quite good in many of the occurrences, but most are too small to be of commercial significance.

7. OXBOW LIMESTONE (16)

Location: Parts of secs. 4, 8, and 9, T. 8 S., R. 48 E., in Snake River Canyon approximately 6 miles south of Copperfield.

Description: Limestone associated with Permo-Triassic volcanics and in contact with Mesozoic diorite. No analysis available.

8. ELKHORN MOUNTAIN OCCURRENCES (5, 9, 10)

Location: Principally in T. 9 S., R. 38 E., but with minor overlap into adjoining townships on the north, south, and west.

Description: A total of 145 separate limestone bodies occurs in this area, most of which embraces the higher elevations of the Elkhorn Range. These occurrences represent a series of disconnected lenses in pre-Tertiary argillites. The limestone is dense and for the most part moderately recrystallized. The two largest occurrences, both of which are far larger than any of the others, are owned by the Chemical Lime Co., of Baker. Rock from the occurrence at the head of Marble Creek is being burned for industrial uses. Total potential reserves have not been fully established but a calculated 2,000,000 tons has been demonstrated by diamond drilling to average 55 percent CaO, 0.17 percent MgO, 0.384 percent SiO_2, 0.106 percent R_2O_3, and 0.0072 percent P. No analytical data available for any of the other occurrences.

9. WASHINGTON GULCH OCCURRENCES (3, 14)

Location: Portions of Tps. 9 and 10 S., R. 39 E., with minor overlap into T. 10 S., R. 38 E.

Description: Forty-five separate occurrences are mapped within this area. Most are in association with argillites but several are in contact with, or in a close proximity to, gabbro. The largest single occurrence, secs. 22 and 27, T. 9 S., R. 39 E., runs 80.24 percent $CaCO_3$, 44.96 percent CaO, 16.54 percent SiO_2, 1.84 percent Al_2O_3, 0.88 percent MgO.

Baker County
(cont.)

10. PLEASANT VALLEY OCCURRENCES (3)
Location: Portions of T. 10 S., Rs. 41 and 42 E., with minor overlap into T. 9 S., R. 41 E.
Description: A swarm of approximately 160 separate occurrences is shown on the geologic map of the Baker quadrangle within this area (Gilluly, 1937). The occurrences are in argillite. The three largest cover an area estimated to range between 15 and 30 acres. The rest are much smaller. Two of these occurrences were utilized for burned lime for local building purposes about the year 1900. No analysis available.

11. PLEASANT VALLEY EXTENSION OCCURRENCES (2)
Location: Parts of Tps. 10 and 11 S., R. 43 E., and Tps. 10, 11, and 12 S., R. 44 E..
Description: Small pods and lenses of limestone occur here in a frequency probably comparable to that described under location 10, but they are not designated separately on any available map. The same host argillite occurring in location 10 extends into this area and delimits the possible bounds of these occurrences.

12. LIME-SODA CREEK OCCURRENCE (4, 5, 7)
Location: Parts of Tps. 12 and 13 S., R. 44 E., and Tps. 11 and 12 S., R. 45 E., with minor overlap into T. 11 S., R. 46 E.
Description: A series of massive, but separate, limestone bodies extends through this belt. The largest bodies occur at the heads of Fox, Conner, and Hibbard creeks and involve an estimated minimum of 300,000,000 tons according to Moore (1937). Cement is manufactured by the Oregon Portland Cement Co. from occurrences located near Lime, Oregon, on the southernmost extension of this belt. This company also controls large reserves at the head of Fox Creek. The Conner Creek occurrence was sampled a few years ago by other interests. Available analyses for these properties are: CaO, 55.65 percent for a grab sample from the Fox Creek property, reported by Moore (1937); CaO, 53.60 percent for a composite of two 25-foot channel samples on the Conner Creek occurrence reported by Hodge (1944).

13. DURKEE-BURNT RIVER OCCURRENCES (2, 3, 8)
Location: Parts of Tps. 11 and 12 S., Rs. 41, 42, and 43 E.
Description: A series of parallel exposures of massive crystalline limestone beds extends west a distance of approximately 18 miles from the site of the National Industrial Products Corporation quarry on Burnt River at Nelson Siding. Rock from this quarry is regularly delivered to sugar and paper plants and to Oregon Portland Cement Company.
Composite analysis of 1,040 carloads of the "sugar rock" is: 98.20 percent $CaCO_3$, 0.70 percent $MgCO_3$, 0.25 percent iron and aluminum oxides, and 0.85 percent insolubles. Quarry waste, composed of all minus 3/4-inch rock from the quarry plus dirt that overlies the deposit, averages 89.53 percent $CaCO_3$, 0.92 percent $MgCO_3$, 1.20 percent iron and aluminum oxides, and 6.19 percent insolubles. No analysis available for the westward extension of this belt but quarriable limestone in grades comparable to that at Nelson doubtless occur.

Baker County
(cont.)

14. DOOLEY MOUNTAIN OCCURRENCES (3)
Location: Part of T. 11 S., R. 39 E., with minor overlap into T. 12 S.
Description: Twenty-six small lenses occur in a pre-Tertiary schist within the bounds of the area indicated. All are situated high on Dooley Mountain. No analyses available.

15. LIMESTONE BUTTE (1)
Location: Sec. 30, T. 14 S., R. 44 E., approximately 10 miles from Huntington via Birch Creek Road.
Description: A butte of dense, crystalline pre-Tertiary limestone in close proximity to an exposure of granite. Much recrystallization and many local inclusions of shaly material. No analysis available but grade manifestly poor.

Baker and Grant Counties

16. MISC. BLUE MOUNTAIN OCCURRENCES (10, 15, 19, 20)
Location: Widely diverse as indicated on the map.
Description: Small pods and lenses of crystalline limestone in metamorphosed pre-Tertiary formations. No analysis available.

Grant County

17. DOG CREEK OCCURRENCES (13)
Location: Secs. 32 and 33, T. 13 S., R. 32 E.
Description: Five small lenses of crystalline limestone in metamorphosed Permian sediments. No analysis available.

18. IZEE AREA OCCURRENCES (21)
Location: Parts of secs. 20, 30, and 31, T. 16 S., R. 28 E.; sec. 6, T. 17 S., R. 28 E., with some overlap into the adjoining section to the west; and sec. 12, T. 17 S., R. 28 E.
Description: Four massive limestone beds of Triassic age occurring along the axis of a syncline. Other small occurrences of "reef" limestone are reported in the area but these are presumably small and few in number. No analysis available.

Baker and Malheur Counties

19. IRONSIDE MOUNTAIN AREA OCCURRENCES (6, 24)
Location: Portions of several townships in the area generally surrounding Ironside Mountain.
Description: Fossil-bearing limestone interbeds are mentioned in description of the Rastus formation of highly metamorphosed pre-Tertiary sediments. These interbeds are presumably small in size, few in number, and widely scattered in occurrence. Area shown on the map is that occupied by the host sediments in which the limestone interbeds occur thus delimiting possible range of location. This series of pre-Tertiary sediments extends northeastward toward the Willow Creek (Malheur) Reservoir, but contained limestones have as yet been reported only in the areas indicated. No analyses available.

Malheur County

20. BROGAN LIMESTONE (9)
Location: About secs. 9 and 10, T. 16 S., R. 42 E.
Description: Gray, crystalline limestone exposed in association with red and green Triassic shales. No analysis available, but appears to be clean.

Harney County

21. PUEBLO MT. OCCURRENCE (23)
Location: Approximately sec. 5, T. 40 S., R. 35 E.
Description: Thin beds of marble in the vicinity of Arizona Creek along the upper reaches of the eastern flank of Pueblo Mountains. Associated with highly metamorphosed sediments, greenstones, and granites. No analysis available.

Crook County

22. SUPLEE LIMESTONE (6a)
Location: Principally in Tps. 17, 18, and 19 S., Rs. 24, 25, and 26 E., partly in Grant County.
Description: Occurs in massive deposits, lenses of all sizes, reefs, and small irregular masses. No analysis available but material grades from nearly pure to calcareous sandstone. Numerous Paleozoic age fossils in some areas.

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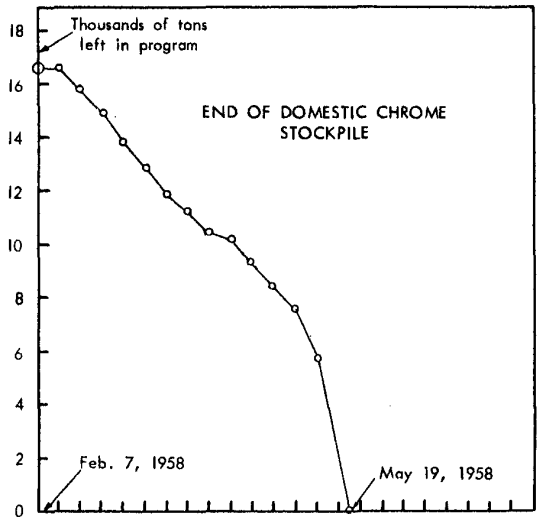
CHROME STOCKPILE CLOSES SUDDENLY

Purchases of lump chrome and concentrates at the Grants Pass Depot were stopped May 19 by the Defense Materials Service of the General Services Administration. Although the program was known to be nearing the end of the 200,000 long-ton quota, the termination came as a surprise to many shippers in the State who expected to have at least two weeks notice in which to clean up their shipments. California shippers who swamped the Depot with last minute deliveries caused the precipitous curtailment on purchasing (see chart).



Letters addressed to all stockpile shippers were mailed out on May 14 by GSA advising them that the purchasing program was nearing its end and to get clearance from the Depot before making shipments. In the John Day area shippers received the notice on the same day the stockpile shut down. Al Dunn had 25 tons of concentrate and 10 tons of ore ready to ship when the quota was completed. Al Curzon was also left with 15 tons of ore on hand.

Dan Beyer, manager of the Grants Pass Depot, reported that as nearly as could be determined no shipper would be left with undeliverable concentrates or ore that was ready to ship when the closing announcement was received. Producers with chrome ready to ship were being allotted certain tonnages to avoid confusion during the wind-up phase which was expected to extend to the end of May. A shortage of trucks developed as mines rushed to get their ore delivered.

First shipments to the Grants Pass Depot under the program just completed were made August 3, 1951. Originally the program was to be for five years only but subsequent revisions extended it until June 30, 1959, or until 200,000 long tons were received. A total of 41,697 tons was delivered to the stockpile by Oregon mines up to December 31, 1957. Value of Oregon chrome amounted to $3,435,154.

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UTAH URANIUM FIRM CLAIMS AEC BONUS

The Lisbon Uranium Company of Salt Lake City, Utah, was the first uranium ore producer to claim the $10,000 bonus offered by the Atomic Energy Commission's Circular 2. This Circular went into effect ten years ago (April 11, 1948) and expired at midnight on April 11, 1958. It required the discovery, production, and delivery to the Commission of not less than 20 tons of ore containing 20 percent or more U_3O_8. Carnotite-roscoelite type ores of the Plateau were not eligible. The Lisbon ore was of the uraninite-pitchblende type and weighed in at 22.25 tons. Assays revealed it contained 22.92 percent uranium oxide or 10,200 pounds of U_3O_8. It was delivered in a single truck load to the Grand Junction headquarters of the AEC on April 10, 1958, one day before the expiration of the Circular. (From AEC Grand Junction Operations Office Press Release.)

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MINERALS STABILIZATION PLAN

A five-year minerals stabilization plan, backed by the Administration, was submitted to a Senate Interior subcommittee on April 28 by Secretary of the Interior Fred A. Seaton. Under the plan, "stabilization payments" would be made to producers of copper, lead, zinc, acid-grade fluorspar, and tungsten. The government would pay the producers the difference between the prevailing domestic price at the time of the sale and the "stabilization price." Proposed prices, annual tonnage limitations, and current market quotations for the five mineral commodities under consideration are shown in the accompanying box.

	Stabilization Price	Annual Tonnage Limitation	Current Market Quotation
Copper	27.5 ¢ lb.	1,000,000 tons	24.65 ¢ lb.
Lead	14.75 ¢ lb.	350,000 tons	11.5 ¢ lb.
Zinc	12.75 ¢ lb.	550,000 tons	10.0 ¢ lb.
Fluorspar (acid-grade)	$48 short ton	180,000 tons	$50 short ton
Tungsten	$36 short-ton unit	375,000 units	$18-20 short-ton unit

Implementation of the stabilization plan would cost approximately $161,000,000 the first year, with costs slowly diminishing as production responds to demand, according to testimony presented by Seaton. Equitable distribution of "stabilization payments" within each industry would be provided for by the establishment of specific production limits for each producer. If the plan is adopted, no new government agency to administer it would be required as it could be handled by the Assistant Secretary for Mineral Resources of the Department of the Interior. In Seaton's opinion the plan would not require the imposition of import quotas on foreign ores. Seaton agreed, in response to a subcommittee suggestion, to study the conversion of "stabilization payments" into percentages of 1957 domestic consumption of the five minerals involved, with the object of protecting domestic production as consumption increases.

The plan also calls for:

1. Enactment of legislation extending the minerals exploration loan program now being conducted by DMEA, which otherwise would terminate June 30, 1958.

2. Possible later recommendation that Congress relax the present four-year $100,000-per-year limitation on the expensing of exploration costs.

3. A supplemental appropriation of $5.5 million for the fiscal year beginning July 1, 1958, to enable the U.S. Geological Survey and the U.S. Bureau of Mines to undertake high-priority minerals research projects.

Activities of the Defense Minerals Exploration Administration programs which terminate on June 30, 1958, would be continued on a permanent basis under the new program, using existing DMEA offices and personnel. Seaton feels that the $100,000 limitation now imposed

on exploration programs should also be relaxed to encourage increased exploration activity "absolutely essential to the future well being of the mining industry and the Nation as well." Particular research projects envisioned in connection with the recommended supplemental appropriation of $5.5 million "are urgent in the sense that new demands on our mineral resources are being created by missile, rocket, and other related defense developments," Seaton testified.

Seaton also reviewed the current status of several other metals and minerals, including the considerable sums being expended on research in each case by the Bureau of Mines. He noted that the asbestos purchase program will not expire until the end of this year; that the beryl purchase program still has three years to run; that the chromite purchase program will expire soon and that a pending proposal to provide chromite production bonuses should be enacted, as well as a similar proposal covering columbium-tantalum; that General Services Administration is still making contracts, under DPA authority, with domestic producers for delivery of metallurgical-grade fluorspar; that a low-grade manganese ore purchase program cannot be justified on the basis of defense needs, but there is a need for sustained research in this commodity; that the mercury situation after the current DPA purchase program expires at the end of this year is very uncertain; and that the Government stockpile program for domestic strategic mica has another four years to run.

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ASSESSMENT WORK DEADLINE NEARS

Assessment work on all unpatented quartz and placer mining claims should be completed on or before noon July 1, 1958. Federal law requires that $100 worth of work must be expended annually on each claim. The work must be of benefit to the claim. Supplies such as timbers and powder used in connection with the work may be included in the total cost. Immediately the assessment work is completed, a proof-of-labor blank should be filled out and recorded in the office of the clerk or recorder of the county in which the claim is located. A fee of $1 is charged for each document recorded by the county.

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DOMESTIC METAL PRICES

(From E&MJ Metal and Mineral Markets, May 15, 1958)

Copper - 24.655 cents per pound, domestic delivered.
Lead - 11.5 cents per pound New York.
Zinc - 10 cents per pound East St. Louis.
Quicksilver - $229 - $232 per 76-pound flask New York.
Aluminum - per pound f.o.b., primary pig, 24 cents; ingot, 26.1 cents per pound.
Antimony - domestic bulk 29 cents per pound.
Nickel - per pound duty included, 74 cents.
Platinum - per troy ounce $64 - 70.
Silver - per troy ounce 88.625 cents.
Cobalt - $2.00 per pound in 500-pound lots.
Cobalt ore - per pound of cobalt contained, free market, 10 percent, 60 cents; 11 percent, 70 cents; 12 percent, 80 cents.
Columbium - per pound 99½ percent, depending on lot, roundels, $55 - 70.
Osmium - per ounce troy, nominal $70-90.

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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
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FOSSIL LOCALITIES OF THE EUGENE AREA, OREGON

By
Margaret L. Steere*

Introduction

The Eugene area became known for its fossils through Dr. Thomas Condon, first Professor of Geology at the University of Oregon, who began collecting there about 80 years ago. Since that time many species of fossils have been discovered and identified, and both the University of Oregon and Oregon State College have important collections in their museums.

Typical fossils of the Eugene area are sea shells and leaf imprints. They occur in interfingering marine and terrestrial strata that were deposited from late Eocene to late Oligocene time (30 to 50 million years ago). These fossiliferous beds now crop out in the hills of the Eugene area and all dip gently eastward as the result of regional folding. In the valleys of the Willamette River and its tributaries these rocks are almost entirely buried under a horizontal blanket of Pleistocene and Recent alluvium.

Eleven localities where fossils can be found in the Eugene area are shown on the accompanying map. Localities 1 through 7 have marine fossils and localities 8 through 11 have leaf fossils. Following a review of the geologic history, these localities are described and some of the fossils listed and illustrated. A bibliography is added for persons who wish to know more about the geology and paleontology of the region.

Geologic History

During the time that the Eocene and Oligocene fossil beds were being deposited, most of northwestern Oregon lay beneath a warm shallow sea whose southeastern shoreline ran approximately through the Eugene area (Lowry, 1947). Marine invertebrate animals lived in great numbers on the sea floor, while semitropical forests grew along the coast. Because the sea level fluctuated considerably, the Eugene area was at times under water and receiving marine sediments, and at times above sea level and receiving terrestrial sediments. For this reason both fossil shells and fossil plants are found in close proximity in the rock strata.

The oldest fossil-bearing rocks in the Eugene area are brown tuffaceous marine sandstones and shales of late Eocene age, named the "Spencer formation" after typical outcrops near the mouth of Spencer Creek. The Spencer formation was laid down on the sea floor as layers of sand and mud which incorporated the shells of marine animals living there. It attained a thickness of several thousand feet. Today these fossiliferous beds are exposed in Richardson Butte and other hills along the western edge of the Eugene area (Locality 1). The formation can be traced northward along a narrow belt into the Corvallis area and southward toward Comstock; east of this outcrop belt it dips beneath younger strata.

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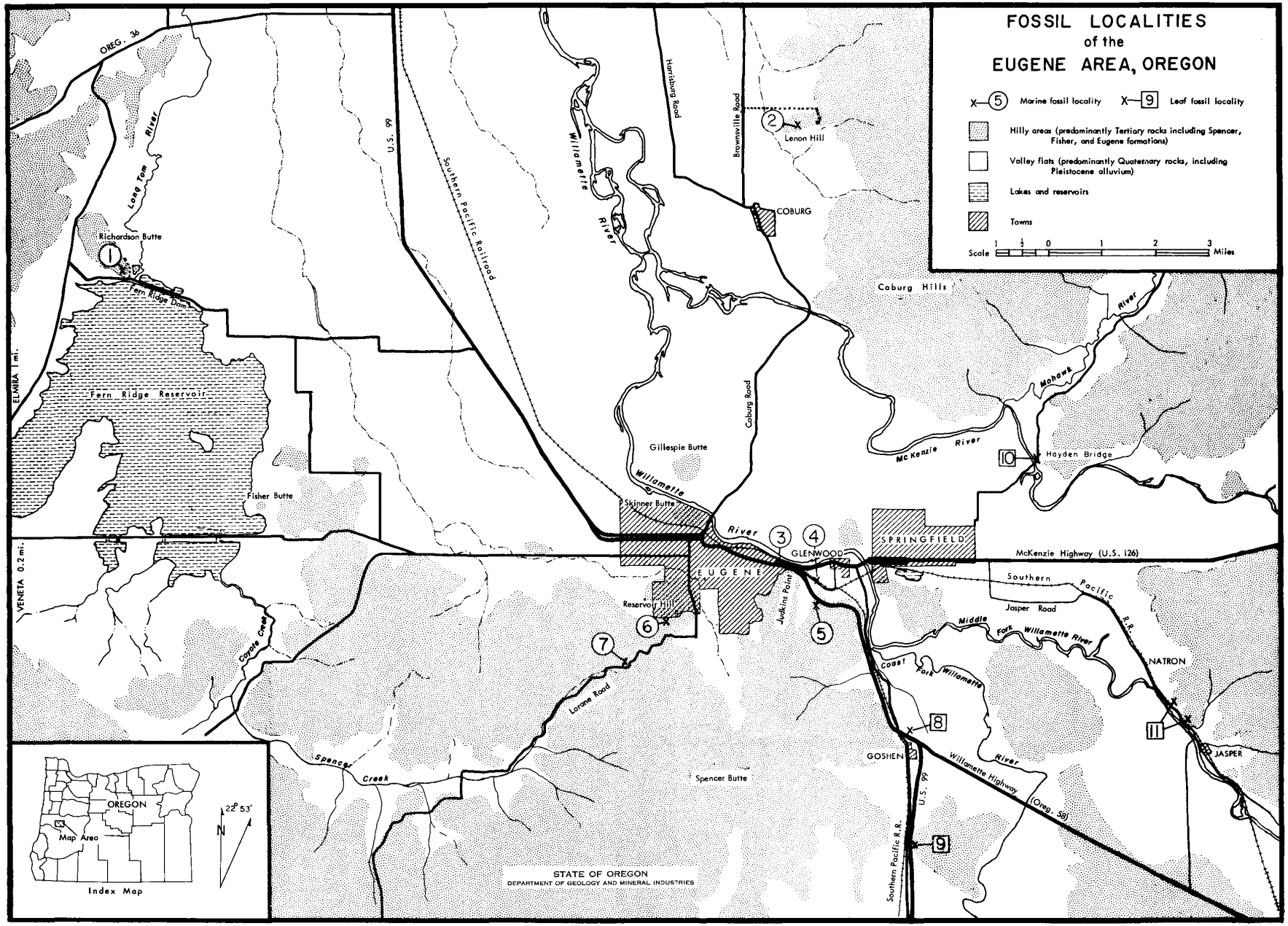
*Geologist, State of Oregon Department of Geology and Mineral Industries.


FOSSIL LOCALITIES
of the
EUGENE AREA, OREGON
Marine fossil locality
Leaf fossil locality
Hilly areas (predominantly Tertiary rocks including Spencer, Fisher, and Eugene formations)
Valley flats (predominantly Quaternary rocks, including Pleistocene alluvium)
Lakes and reservoirs
Towns
Scale
Miles
OREG. 36
Long Tom River
U.S. 99
Southern Pacific Railroad
Willamette River
Harrisburg Road
Brownsville Road
Lenon Hill
COBURG
Coburg Hills
Coburg Road
Richardson Butte
Fern Ridge Dam
Fern Ridge Reservoir
ELMIRA 1 mi.
Fisher Butte
Gillespie Butte
Skinner Butte
Willamette River
Mohawk River
McKenzie River
Hayden Bridge
SPRINGFIELD
GLENWOOD
EUGENE
McKenzie Highway (U.S. 126)
Southern Pacific R.R.
Jasper Road
Middle Fork Willamette River
NATRON
Coast Fork Willamette
VENETA 0.2 mi.
Coyote Creek
Reservoir Hill
Jenkins Point
Lorane Road
Spencer Creek
Spencer Butte
GOSHEN
JASPER
Willamette Highway (Oreg. 58)
OREGON
Map Area
Index Map
22° 53'
N
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Near the close of Eocene time, regional uplift caused the sea to retreat temporarily from the Eugene area. The new land surface, as the result of explosive volcanic eruptions, began to receive a thick terrestrial deposit known as the "Fisher formation" (named after Fisher Butte). This formation was composed of ash, tuff, breccia, and other volcanic material, some of which was reworked and deposited by streams. While the Fisher formation slowly accumulated, luxuriant forests, at first subtropical, grew on the slopes of the volcanoes and in the valleys between them. Fossil wood, leaves, seeds, and flowers that made up these forests are found today in rocks of the Fisher formation. They occur in lenses of fine-grained sediments that mark the sites of ancient ponds where plant remains from surrounding forests became buried in mud or ash (Localities 8, 9, 10, and 11). Several ages of forests are represented in the Eugene and adjacent areas, and two have been described in detail by paleobotanists Ralph Chaney and Ethel Sanborn (see bibliography). These are the late Eocene Comstock flora southwest of Cottage Grove (south of map area) and the Oligocene Goshen flora (Locality 9).

In middle Oligocene time, the sea again invaded the Eugene area. It filled what is now the Willamette Valley trough, and a tongue of it reached about as far south as Cottage Grove. An abundant invertebrate fauna, composed chiefly of mollusks and crabs, lived on the floor of this sea. Here the sands and muds eroded from the adjacent Fisher formation were brought in by streams and deposited to form the gray, tuffaceous and highly fossiliferous sandstones of the Eugene formation. As the sea floor subsided, the formation became extremely thick. According to Vokes, Snavely, and Meyers (1951), who mapped the Eugene area in considerable detail, the formation may be as much as 15,000 feet thick.

The fossiliferous Eugene formation is exposed today at many places in and about Eugene (Localities 2 to 7). It can be traced southward toward Cottage Grove where it interfingers with the Fisher formation. It can also be traced northward along the Coburg Hills and into the Salem area.

Withdrawal of the Oligocene sea from the Willamette Valley some 30 million years ago marked the end of marine deposition in the Eugene area. In Miocene time, the Spencer, Fisher, and Eugene formations were intruded by lavas which in places spread out over the strata as extensive flows. The prominent topographic features such as Skinner Butte, Spencer Butte, and Judkins Point are erosional remnants of these resistant volcanic rocks. During more recent geologic epochs, the Willamette River and its tributaries have carved wide valleys in the older rocks and have developed extensive flood plains underlain by thick deposits of alluvium. Occasionally an excavation in this alluvial material reveals bones and teeth of now extinct mammals that lived in this region at the close of the Ice Age.

Where to Find Fossils

* 1. Fern Ridge dam

Marine fossils are abundant and well preserved in buff-colored sandstone of the Spencer formation which crops out on Richardson Butte at the west end of Fern Ridge dam. The locality is on the barren hillside at the extreme southeast end of the Butte and above a dirt road leading north from the west end of the dam. The fossils occur at various elevations on the side of the hill. As many as 25 different species of mollusks of Eocene age have been reported from this locality.

2. Lenon Hill

Many marine fossils have been collected from outcrops of the Eugene formation on Lenon Hill northeast of Coburg. To reach the locality from Coburg, go west on the Harrisburg road a short distance to the junction of the Brownsville road. Follow the Brownsville road north 1.9 miles

* Numbers refer to localities on index map.

to a dirt road running east toward the Coburg Hills. Go east on this road 1½ miles to the farmhouse at the end of the road. Here, permission may be obtained to use the lane leading west from the farmyard toward Lenon Hill. The hill is composed of sandstone of the Eugene formation. Beds rich in Crepidulas, Spisulas, and other Oligocene mollusks crop out about halfway up the hill on the steep south slope and also on the west slope.

3. Smith quarry

Oligocene marine fossils are numerous in the old abandoned Smith quarry at the eastern edge of Eugene. The quarry is situated on the north side of U.S. 99, between the Highway and the mill race, at the junction of the west-bound lane of the McKenzie River Highway (US 126). Tuffaceous sandstone of the Eugene formation crops out in the quarry walls and contains layers packed with large white pelecypods.

4. Railroad cut near Sears Warehouse

Marine fossils occur in the steep bluff along the Southern Pacific railroad near the Sears warehouse between Eugene and Glenwood. To reach the locality from Glenwood, follow Henderson Road south from the McKenzie River Highway ½ mile. Cross Southern Pacific tracks and turn west on Judkins Road. Go about ½ mile to the Sears warehouse. The railroad tracks lie immediately to the north. Walk back along railroad grade for about ¼ mile to the steep bluff where sandstone of the Eugene formation crops out above the tracks. Although somewhat weathered now, this locality has yielded a large fauna in the past.

5. U.S. Highway 99

Oligocene marine fossils are varied and abundant in a prominent road cut east of Eugene on U.S. Highway 99. The locality is 0.7 mile southeast of the junction of U.S. Highway 99 and the McKenzie River Highway. The hill into which the cut was made is composed of soft, gray sandstone of the Eugene formation. Although the material in the cut is disintegrating rapidly and grass is gradually covering it, sandstone beds containing layers of fossils are still partially exposed. Numerous small ball-like concretions containing beautifully preserved crab claws are characteristic of this locality and are scattered along the roadside at the base of the cut.

6. Reservoir Hill

Marine fossils are reported from recent road cuts and basement excavations along Jefferson and Washington streets in the vicinity of 26th and 28th avenues high up on the west slope of Reservoir Hill. The fossils are in the form of casts and molds in weathered Eugene sandstone.

7. Lorane Road

Fossiliferous sandstone of the Eugene formation crops out at the top of the high hill on the Lorane Road near the south edge of Eugene. The locality is 2.3 miles southwest of the corner of Willamette Street and 29th Avenue. Marine fossils can be found in weathered sandstone in the shallow road cut and in outcrops above the road on the crest of the hill. Fresh rock containing fossils is temporarily exposed in some of the nearby basement excavations.

8. North Goshen leaf locality

Many fossil leaves of late Oligocene age occur in dark gray shale in the upper part of the Fisher formation at the north edge of Goshen. The locality is a road cut in a small hill on the north side of the junction of U.S. Highway 99 and State Highway 58. The fossils are in the form of black carbonaceous films and impressions beautifully preserved on thin layers of shale. This flora has been described by R. E. Brown (see Vokes and others, 1951, in bibliography). It is younger than the true "Goshen flora." Several fossil salamanders have been discovered on slabs of shale along with the leaves at this locality.

9. South Goshen leaf locality

This leaf locality is one of the sites of the "Goshen flora," a large suite of fossil plant remains of lower to middle Oligocene age occurring in lenses of whitish tuff within the Fisher formation. The Goshen flora is described by Chaney and Sanborn (see bibliography). This locality is at a road cut through a small hill on old Highway 99 beneath an overpass 1.75 miles south of Goshen. The outcrop has been partly destroyed by recent highway construction, but fossil leaves can still be found in the bed of whitish tuff at road level.

10. Hayden Bridge leaf locality

Fossil leaves reported by R. W. Brown to be of late Oligocene age are found in a road cut near Hayden Bridge. To reach the locality from Springfield, go about 3 miles northeast on Marcola Road, cross McKenzie River on Hayden Bridge, and continue 0.2 mile to road cut through small hill. The cut exposes beds of black carbonaceous shale of the Fisher formation or equivalent dipping gently eastward. Fossil leaves occur in thin layers at several levels. The shale is poorly cemented and breaks easily so that specimens must be handled with extreme care.

11. Jasper leaf locality

Fossil leaves and wood reported by R. W. Brown to be of late Eocene to early Oligocene age occur at three outcrops along the Southern Pacific railroad near Jasper. The outcrops are between 5 and 7 miles southeast of Springfield via the Jasper road. Measured from the bridge across the Middle Fork of the Willamette River at Jasper, the first outcrop 3/4 mile north, the second 1/4 mile north and the third about 1 mile south. All outcrops are prominent exposures of massively bedded sandstone in vertical cuts along the railroad tracks immediately east of the Jasper road. Carbonized wood, including some large logs, is scattered through the sandstone, while leaf impressions occur in streaks of cream-colored ashy shale.

Fossils to Look For

Plant fossils: Fossil leaves, wood, and occasionally flowers, fruits, and seeds, occur locally in the Fisher formation in the Eugene area. The fossil plants so far recognized in the map area include two ages of Oligocene floras. The older flora (Goshen flora) contains meliosma, magnolia, fig, and other semitropical plants. The younger flora contains plants characteristic of a more temperate climate such as pine, oak, maple, and sassafras. Some of these fossil plants are listed below. Fossils marked with an asterisk are illustrated.

Plant Fossils

Fisher formation (Oligocene)

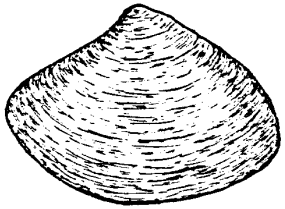
South Goshen flora (Early Oligocene)	North Goshen flora (Late Oligocene)
Ocotea eocernua Chaney and Sanborn	* Pinus latahensis Berry
* Meliosma goshenensis Chaney and Sanborn	* Quercus consimilis Newberry
Ilex oregona Chaney and Sanborn	* Hydrangea bendirei (Ward) Knowlton
Magnolia reticulata Chaney and Sanborn	Acer glabroides Brown
Cupania packardi Chaney and Sanborn	Platanus dissecta Lesqueureux
* Ficus goshenensis Chaney and Sanborn	* Cinnamomum dilleri Knowlton
Tetracera oregona Chaney and Sanborn	Sassafras sp.

* Illustrated on page 57.

EOCENE FOSSILS FROM THE SPENCER FORMATION

Venericardia hornii

Pitar eocenica

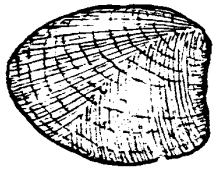


Spisula packardi

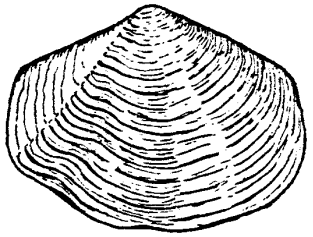
Turritella uvasana

Dentalium

OLIGOCENE FOSSILS FROM THE EUGENE FORMATION

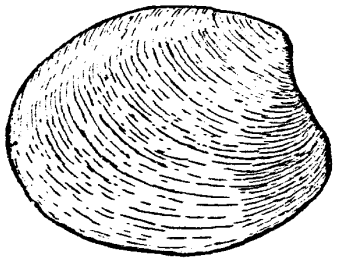


Acila shumardi



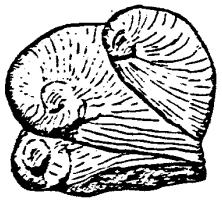
Thracia condoni

Epitonium condoni

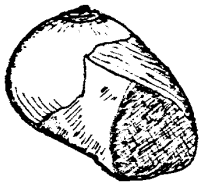


Pitar dalli

Solen eugenensis

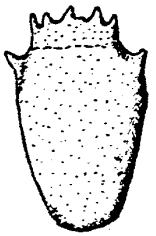


Crepidula ungana



Polinices secta

Raninoides eugenensis (crab claw)

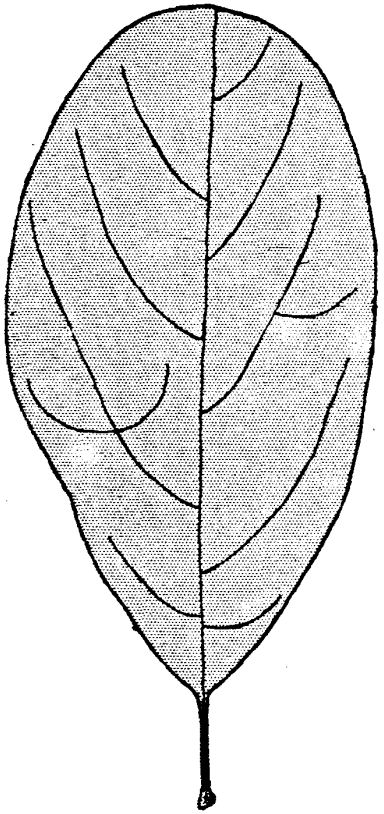


Callianasa oregonensis (crab shell)

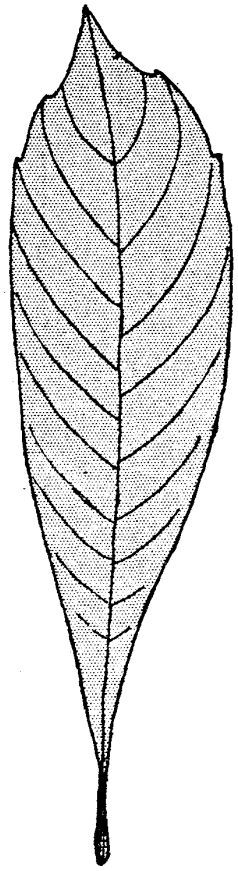
(approximately natural size)

MARINE FOSSILS OF THE EUGENE AREA, OREGON

FOSSIL PLANTS

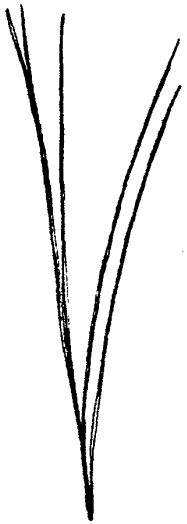


Ficus goshenensis (fig)

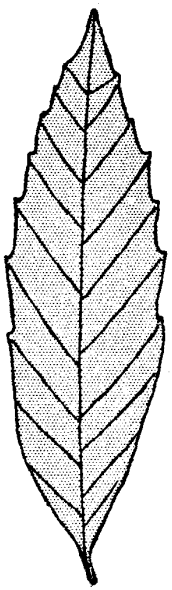


Meliosma goshenensis

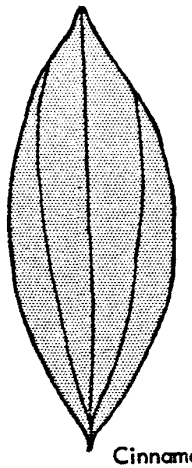
(approximately natural size)



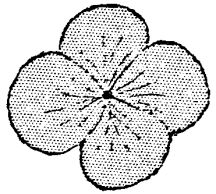
Pinus latahensis (pine)



Quercus consimilis (oak)

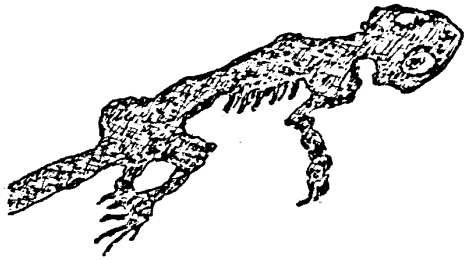


Cinnamomum dilleri (cinnamon)

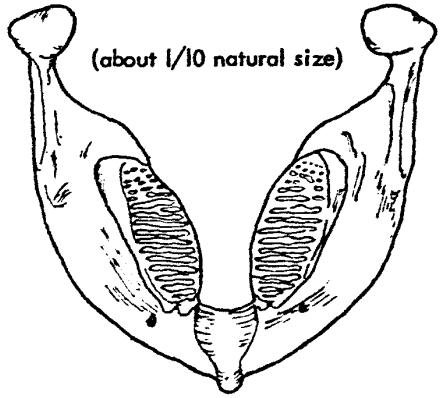


Hydrangea flower

FOSSIL VERTEBRATES



Oligocene salamander



(about 1/10 natural size)

Pleistocene elephant (jaw and grinding teeth)

LAND FOSSILS OF THE EUGENE AREA, OREGON

Marine fossils: Mollusks are by far the most abundant of the invertebrate marine fossils of the Eugene area. They include pelecypods (clam-like shells), gastropods (snail-like shells), and scaphopods (tooth shells). The Spencer and Eugene formations each carry a distinctive assemblage of mollusks, with more than 20 species of pelecypods and nearly as many species of gastropods. Fossil barnacles, sea worms, echinoids, and crabs, although not as numerous as the mollusks, are not uncommon in the Eugene formation. Some of the characteristic marine fossils of the Eugene area are listed below, and those marked with an asterisk are illustrated.

Marine Fossils

Spencer formation (Eocene)

Pelecypods:
- Acila decisa Conrad
- Ostrea idriaensis Gabb
- Brachidontes cowlitzensis (Weaver and Palmer)
- Macrocallista conradiana (Gabb)
- Tellina cowlitzensis Weaver
- *Spisula packardi Dickerson
- *Venericardia hornii Weaver and Palmer
- *Pitar eocenica (Weaver and Palmer)

Gastropods:
- Polinices nuciformis (Gabb)
- Siphonalia sopenahensis (Weaver)
- Perse sinuata (Gabb)
- *Turritella uvasana Conrad

Scaphopod:
- *Dentalium stramineum Gabb

Eugene formation (Oligocene)

Pelecypods:
- *Acila shumardi (Dall)
- *Thracia condoni Dall
- Loxocardium eugenense (Clark)
- *Pitar dalli (Weaver)
- Tellina eugenia Dall
- Spisula eugenense (Clark)
- *Solen eugenensis Clark

Gastropods:
- *Epitonium condoni Dall
- *Polinices secta (Gabb)
- *Crepidula ungana Dall
- Bruclarkia fulleri Durham
- Molopophorus dalli Anderson and Martin

Scaphopod:
- *Dentalium

Echinoid

Barnacle:
- Balanus

Sea worm:
- Teredo

Crabs:
- *Raninoides eugenensis Rathbun
- Zanthopsis (several species)
- *Callianasa oregonensis Dana

*Illustrated on page 56.

Vertebrates

Pleistocene elephant:
- *Elephas columbi (jaw and grinding teeth)

Oligocene salamander:
- *Palaeotaricha oligocenica

Oligocene shark tooth:
- Odontaspis sp.

*Illustrated on page 57.

Vertebrates: Occasionally teeth and fragments of elephant tusks are found in the Pleistocene silts in outcrops along Spencer Creek and in the Willamette Valley. Such finds are rare and new locations are unpredictable, consequently no localities are described in this report. Several fossil salamanders have been discovered at the north Goshen leaf locality (Locality 8) in black shales of the upper Fisher formation of late Oligocene age. A few shark teeth have been collected from Oligocene marine sandstones of the Eugene formation. Fossils marked with an asterisk are illustrated.

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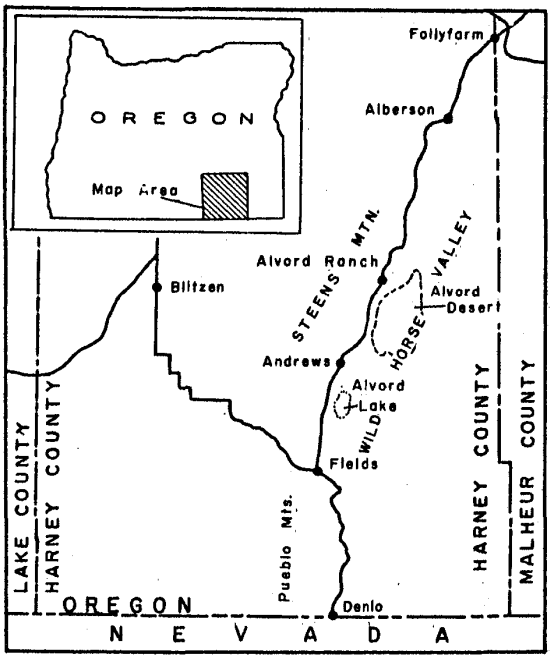
ALVORD LAKE AREA LEASED FOR BORAX

After more than half a century the sodium borate deposits of southern Harney County are again receiving attention. Approximately 50,000 acres are involved in prospecting applications covering the Alvord Lake area (see map). The wave of interest in the area apparently stems from the recent publicity over the use of boron in high-energy fuels. Borax was first produced at the turn of the century from the playa immediately south of Alvord Lake by the Rose Valley Borax Company. The Company scooped up borax-rich crusts from the playa surface, dissolved them in boiling water, and collected the pure crystals upon cooling. Approximately 400 tons were shipped annually for several years to Winnemucca, Nevada. The discovery of the borate mineral colemanite in 1882 resulted in the decline of the use of playa crusts as a source of borax, and by 1907 had completely replaced them.



Much of the land in the vicinity of Alvord Lake and Alvord Desert is federally owned. In the past six months the Land Office of the U.S. Bureau of Land Management has received 30 applications for prospecting permits from individuals. Eight of these applications, totaling 15,000 acres, have been processed by the Bureau, but due to a conflict of overlapping claims in the southern portion of the area, it will be some time before the remainder can be acted upon. There is a small amount of State land in the area but no applications have been received by the State Land Board. Federal prospecting permits are granted for a 2-year period for areas where deposits of mineral are not known to occur. Other than the $10 filing fee which must accompany the application, and which is not returnable, there is no charge for the prospecting permit. A letter in duplicate, addressed to the Land Office of the U.S. Bureau of Land Management, 809 N.E. 6th Avenue, Portland, together with the filing fee, giving the legal description of the land and indicating whether the applicant is a native born or naturalized citizen, is all that is required. Naturalized citizens must give their citizenship certificate number and the date and place it was granted. A limit of 2,560 acres is placed on each application, with a total maximum of 5,120 acres per applicant. Under the terms of the permit a holder can examine the ground, make such explorations as are necessary to determine the extent and quality of the deposit, but may not develop or remove any mineral prior to obtaining a lease and royalty agreement. An application for a Preferential Right Lease must be accompanied by a $10 filing fee. The application is examined by the mining branch of the U.S. Geological Survey.

In recent years California has produced all of the borax used in the United States and supplied nine-tenths of the world's requirements. A comprehensive article on borax minerals has been published by the California Division of Mines in their Bulletin 176, Mineral Commodities of California, 1957.

R.S.M.

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NO NEW DMEA CONTRACTS AFTER JUNE 30, 1958

The Defense Minerals Exploration Administration has announced that funds will not be available to finance new mineral and metal exploration contracts after June 30. Exploration project contracts in effect on June 30 will be continued until terminated, but no new contracts will be approved after that date.

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OUR IN-AND-OUT POLICY ON MINERALS COULD HAMPER AMERICA'S DEFENSES*

By
Edmund Christopherson

Today the minerals segment of our economy is in trouble. World prices of copper, zinc, lead, tungsten and other metals essential to our industries have toppled to the point where U.S. producers, who pay miners from five to twenty times what foreign miners receive, just can't compete.

In Butte, long famed as the "richest hill on earth," 5300 men were working in the mines in January of 1957. Today fewer than 2000 are employed, with more lay-offs expected. It's a sort of chain reaction. With a smaller ore output, the smelter in Anaconda needs fewer men and the refinery in Great Falls lays off workers too.

This current crisis in the feast-and-famine minerals industry is a result of the patch, mend, and improvise Government policy on U.S. mining. During World War II, when enemy submarines were sinking a shockingly high percentage of the ships bringing strategic minerals from Africa and South America, we depended on our ability to produce these minerals at home. The industry's response was a decisive contribution to winning the war.

After the war, in 1946, Congress passed a Strategic and Critical Materials Stockpiling Act, but failed to implement it with necessary appropriations. Since then, Government agencies have spent some billion dollars to aid and develop minerals production abroad while doing little for domestic producers.

The Korean crisis again put metals mining on a crash basis, and U.S. producers came to the rescue. After Korea, in 1953, Congress passed measures and appropriations to continue buying strategic minerals, and the General Services Administration operated this program. Congress voted in 1956 to continue the program, but was slow about putting up the money. In the absence of immediate appropriations, minerals producers were encouraged to continue production on the assumption that deficiency appropriations would be forthcoming. They ended up holding the sack.

Tungsten is the key component of heat-resistant alloys vital in jets and missiles. With unlimited use of tungsten for aircraft engines, Russian designers turned out a hotter-burning jet, which gave their MIG-15 better climbing and altitude capabilities than our F-86's showed over Korea. It was only because of other design faults in the MIG that we came out ahead. Our designers were handicapped by limitations on the use of tungsten because the Defense Department rated it short. At the same time another Government agency was trying to shut down domestic tungsten production because there was too much! It wasn't until December 1956 that our aircraft engineers were told to use all the tungsten they wanted in engine design. This delay may have played a part in putting us behind the U.S.S.R. in the missile race.

When the Korean crisis caught us unprepared, tungsten prices soared from $25 a unit to $100. The current price on the world market is $13. While this low price has shut down even our most efficient domestic producers and put miners and processors out of work, the Government continues with contracts to buy another $60,000,000 worth of this product abroad at $55.

We need a long-range minerals program which will enable the industry to operate with reasonable continuity and stability.

This does not mean that we should shut off all minerals imports, nor should we bail out obviously inefficient producers. We should determine realistic price and volume levels which will keep efficient U.S. mines in operation and encourage needed exploration. We should then set import bases that will permit the importation of needed mineral products without forcing our producers to shut down.

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URANIUM MILL CONSTRUCTION STARTS

Lakeview Mining Company, acting as its own general contractor, is well under way with the construction of the uranium reduction plant located at the north edge of Lakeview. The $2,600,000 mill will process ore from the White King and Lucky Lass properties a few miles northwest of Lakeview. At the White King Mine, work has been started on a new three-compartment shaft which will cost more than $500,000 and reach a depth of 700 feet below the surface. The shaft is located 600 feet east of the original two-compartment shaft which was sunk 312 feet deep to explore the deposit. A total of 116 men are presently employed, with 70 at the mill site and 46 at the White King Mine. Announced completion date of the mill, which will supply "yellow cake" to the Atomic Energy Commission, is early in 1959. (From Lake County Examiner.)

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SECRETARY OF INTERIOR SEATON MODIFIES PROPOSAL FOR CHROME

Secretary of Interior Fred A. Seaton appeared before the Senate Interior and Insular Affairs Committee June 19, 1958, to modify his Stabilization Plan of 1958 and his Long-Range Minerals Program submitted to the Senate last year as Senate Bill 2375. Of particular interest to Oregon miners are his remarks on production bonuses, especially as they apply to chromite. It will be noted from the Secretary's statement, which appears below, that the experts within the Department of Interior still believe it unnecessary to consult with industry regarding the needs to keep the mines open and that they prefer to operate under a stopgap proposal. Industry representatives testifying before the Senate Committee have repeatedly stated that bonuses for production are not the answer to the problem of continued mining, and they have shown that the domestic chrome miner must compete with United States costs at the finished product level rather than with cheap labor of foreign mines at the raw-ore level. Industry representatives have suggested that, in lieu of giving a production bonus for domestic raw ore, the government underwrite a domestic chrome-miners cooperative ferrochrome plant by purchase of a guaranteed portion of the production over a 6-year period and thereby establish mining on a permanent basis. The text of the Secretary's statement as it applies to chrome follows:

The Administration's proposal of last year for production bonuses for beryl, chromite, and columbium-tantalum, apparently has not been completely understood. . . . The production bonus program is not a support program. It is, rather, a program undertaken as an adjunct to the on-going programs of research in the Government and it is justified by the present and potential importance to the Nation of the commodities included in the proposal and by the foreseeable technological advances that will affect their production and use.

The Administration originally proposed specific production bonuses for limited quantities of domestically produced beryl, chromite, and columbium-tantalum. Following hearings before this Committee, the chairman and several members suggested that the Department take another look at the over-all situation with respect to these commodities. This has been done. Accordingly, we are modifying our original proposals. . . .

Chromite: Our initial proposal for chromite called for a production bonus of $21 per long dry ton for not to exceed 50,000 long dry tons annually. It is now recommended that this production bonus be fixed at $35 per long dry ton, but that there be no change in the annual or company limitations (10,000 l.d.t.) as contained in the Administration's original bill. In view of the fact that there has been a great deal of discussion of the chromite proposal, I should like to provide the Committee some of the background as to the method through which our original price was arrived at and outline to you the reasons for increasing the bonus from $21 to $35 per long dry ton.

The prevailing quotation from imported metallurgical grade chromite, f.o.b. United States ports, is approximately $55 per long dry ton. Freight and other charges involved in moving this material into the primary marketing area, the Ohio Valley, would add another $10 to this price, bringing the total price to consumers in the major marketing area to approximately $65 per long dry ton. This is the price that would prevail for material of comparable grade produced from our own Western States if sold under existing conditions. Chromite from Oregon and California moving into the Ohio Valley would have to bear freight and handling and other charges approximating $25. Deducting this figure from the market price of $65 leaves a gross return of approximately $40 to the mine to cover all mining and, where applicable, milling costs. On the basis of our original proposal this $40 figure would be increased to approximately $60 upon payment of the production bonus of $21. Information contained in the Department indicates that this level of income would be sufficient for the bulk of the mining operations conducted in the western chromite-producing area. We acknowledge, however, that much of the affected production would be sold at a somewhat lower price than that commanded by the imported material, particularly when account is taken of the penalities which would apply to producers on sales of material that cannot meet the highest commercial specifications, therefore we are proposing that this bonus be increased to $35 per ton.

One further point with respect to the chromite proposal needs clarification. The production bonus will be paid on the basis of 46% material. Premiums over this amount will apply to higher-grade chromite and penalties to chromite of lower-grade. A schedule of premiums and penalties will be contained in the regulations which will also apply to the chrome-iron ratio of the concentrates and fix the basic specifications on which the bonus will be computed.

The success of the chromite production bonus program is largely up to the domestic industry. As indicated, I am advised that the quantities and magnitude of the bonus are such as to maintain a substantial production of chrome in the United States. Until now the domestic producers have enjoyed a guaranteed market and guaranteed price for their product. They have not established commercial relationships with consumers in the United States. Under the terms of the proposed bonus program, such relationships must be established inasmuch as there must be evidence of a sale before the bonus can be paid. In this way a commercial domestic industry can be established and maintained.

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IMPORTANT ROCK UNITS OF NORTHEASTERN OREGON

By
N. S. Wagner*

Introduction

The rock units described in this report, and shown on the accompanying map, represent the dominant types of material comprising the bedrock in northeastern Oregon. Since the map units are based largely on lithology, their age relationships are treated very broadly. Three time units are recognized. These are pre-Tertiary, Tertiary, and Pleistocene to Recent. The distinction between Tertiary and pre-Tertiary rocks is considered to be of special importance; hence all known outcrops of pre-Tertiary rocks are shown on the map (p. 65).

Pre-Tertiary Rocks

Metamorphosed sedimentary and igneous rocks

The rocks of this group include a thick and varied series of marine sediments, minor amounts of other sediments which may have been deposited in fresh or brackish waters, lavas, volcanic tuffs, and igneous intrusives, principally gabbro. The intrusive occurrences, although fairly numerous, are too small to be shown on a map of this scale.

All of these rocks have been subjected to the tremendous pressures and distortions that characterize some types of mountain building, and most of them display varying amounts of both regional and contact metamorphism. As a consequence the sedimentary formations are so profoundly folded and faulted that the fossil evidence needed for determining their age has been largely obliterated. Such fossil evidence as has been found, however, shows that the bulk of the sediments and their associated volcanics were formed during the Permian and Triassic periods. There is meager evidence that some Jurassic and pre-Permian Paleozoic sediments may also be present. All of the associated intrusives have been dated as pre-Cretaceous and most of them early Mesozoic. Considering their small size and wide distribution, it is probable that intrusion of individual occurrences took place at many different times.

Diorite and related intrusives

Rocks of this group are commonly called "granites" but from a technical standpoint they are not true granites. They comprise several closely related crystalline types known as tonalites, diorites, granodiorites, and quartz diorites. For the most part these rocks formed at depth by cooling of magma which intruded the country rock. Some of them, however, are believed to be the result of granitization (recrystallization of existing rocks). Contact pegmatites and tactites are frequently found around the margins of the intrusions.

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*Field Geologist, State of Oregon Department of Geology and Mineral Industries.

Most of the crystalline rocks of the area originated some time during the Cretaceous period. Those in the Elkhorn range, west of Baker, are known to be of early Cretaceous age. All of the pre-Tertiary rocks of the region underwent folding, faulting, and erosion late in the Cretaceous period, so that by the beginning of Tertiary time mountain ranges composed of these rocks existed in parts of the map region.

Tertiary Rocks

Rhyolite and related volcanics

Rocks of this group are chiefly lavas, tuffs, tuff breccias, and agglomerates with compositions that are predominantly acidic. The lavas include rhyolites, dacites, andesites, and their related porphyries. Some of the clastic volcanic rocks are waterlaid. Some interbeds of basalt and lake-bed sediments also occur with the rocks of this group. Where these basalts and sediments are extensive enough to be separately mapped, they are included in other lithologic units on the accompanying map and described later in this report.

Many of the individual rock members of this group appear fresh and glassy. Others, particularly the tuffs, show the effects of weathering and devitrification, and some are locally altered by hot spring activity. Tilting and brecciation and greater-than-normal fracturing are characteristic of the rocks of this group. As a whole, they show a greater amount of structural shattering than do the later basalts and lake beds.

The rhyolites and related volcanic rocks range in age from Eocene to Miocene. The celebrated Clarno and John Day formations make up the bulk of the mapped occurrences shown in the western portion of the area.

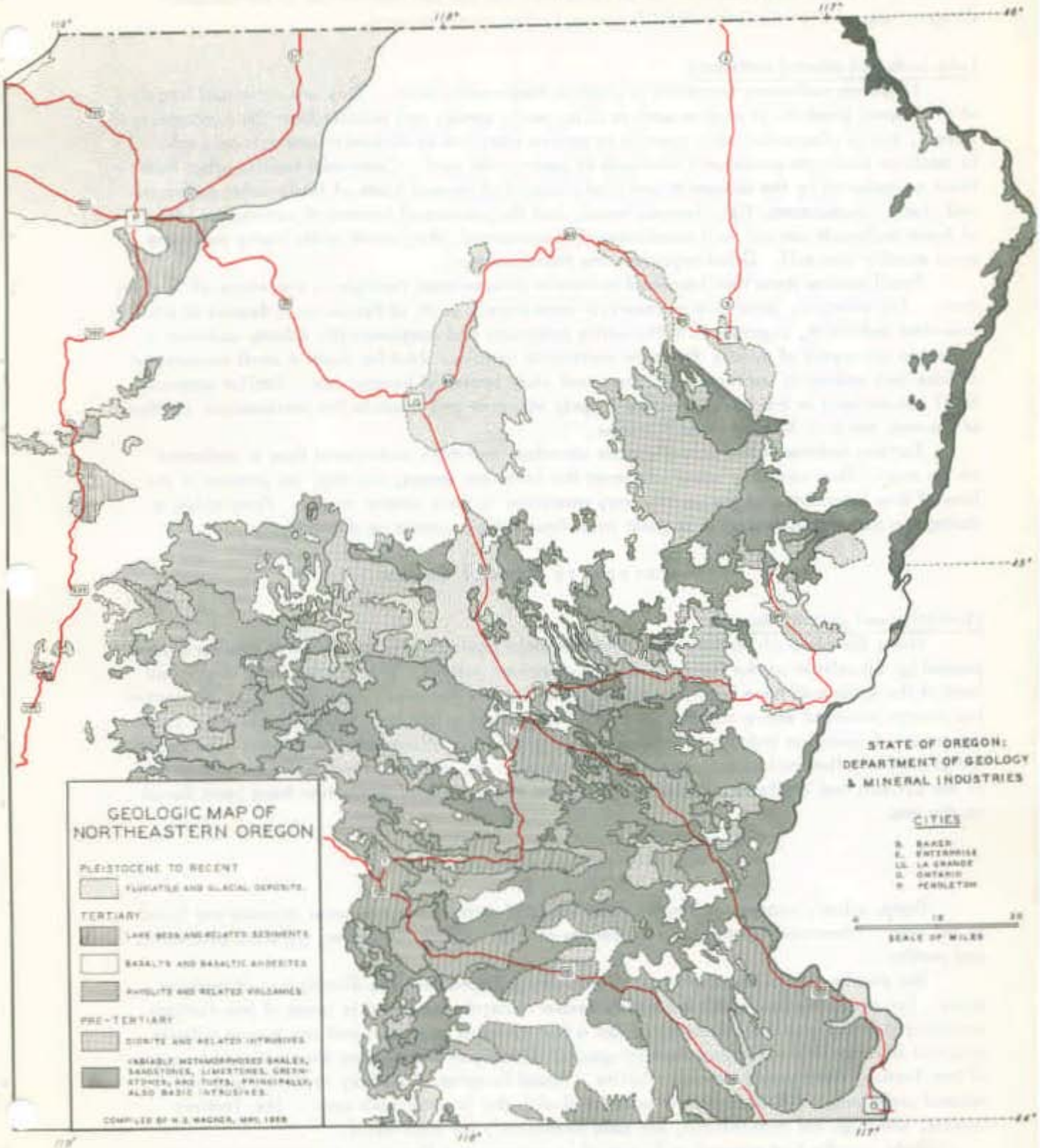
Basalts and basaltic andesites

Basaltic lavas are perhaps the most impressive and distinctive type of rock in the area and certainly the most widespread. These rocks occur in three ways: first, as a tremendously thick series of lava flows; second, as isolated occurrences involving only two or three flows and sometimes only a single flow; and third, as dikes representing channels from which the surface flows originated. Of these modes of occurrence the thick series of flows is by far the most prevalent and the dikes the least.

The thick series of flows is part of the great northwestern shield known as the Columbia River lavas. The formation blankets large portions of Washington, Oregon, and Idaho and is one of the major examples of lava flooding in the world. This shield is represented in northeastern Oregon by the basalts shown in the northern and western portions of the map. Generally speaking, the shield feathers out against the Blue Mountains, some of the higher portions of which were probably never completely buried under lava. The aggregate thickness of the shield amounts to several thousands of feet. The lowest flows exposed in the map area are in the extreme northwest corner along the bank of the Columbia River, while the upper flows of the series occur on some of the highest portions of the mountain ranges situated to the south and east of Pendleton. In addition, the base of the series is not known to have been penetrated by any well yet drilled in the portion of the Columbia Basin occurring within the mapped area. Other striking examples of the enormous thickness of the series are to be seen in the canyons of the Snake and Imnaha rivers east of Enterprise.

In the southeastern section of the map area the flows are much less numerous and give rise to "table tops" capping softer rock.

The basalts range in age from Eocene to Pleistocene. Some of those northwest of Ontario are dated as Plio-Pleistocene in age, whereas others in the same area are recognized as Pliocene and Mio-Pliocene. The great plateau basalt series (Columbia River basalt) is generally accepted as predominantly Miocene.. Some basalts are known to have been extruded in central Oregon during the Eocene in association with the other members of the Clarno formation. It is


GEOLOGIC MAP OF
NORTHEASTERN OREGON
PLEISTOCENE TO RECENT
FLUVIATILE AND GLACIAL DEPOSITS
TERTIARY
LAKE BEDS AND RELATED SEDIMENTS
BASALTS AND BASALTIC ANDESITES
RHYOLITE AND RELATED VOLCANICS
PRE-TERTIARY
DIORITE AND RELATED INTRUSIVES
VARIABLY METAMORPHOSED SHALES, SANDSTONES, LIMESTONES, GREENSTONES, AND TUFFS, PRINCIPALLY; ALSO BASIC INTRUSIVES.
COMPILED BY N.S. MAGNUS, MAY, 1958
STATE OF OREGON:
DEPARTMENT OF GEOLOGY
& MINERAL INDUSTRIES
CITIES
B. BAKER
E. ENTERPRISE
LG. LA GRANDE
O. ONTARIO
P. PENDLETON
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SCALE OF MILES

possible that a few small occurrences of basalts of this age are represented in northeastern Oregon, especially where the rhyolite group is abundantly present.

Lake beds and related sediments

These are sediments deposited in shallow fresh-water lakes. They are composed largely of the normal products of erosion such as silts, muds, sands, and pebbles from the surrounding terrain, but in places they also contain extensive interbeds of diatomite and volcanic ash. In addition there are occasional interbeds of poor-grade coal. Contained fossils, other than those represented by the diatomite and coal, consist of several kinds of fresh-water gastropods and clams, crustaceans, fish, leaves, wood, and the remains of terrestrial vertebrates. Most of these sediments are not well consolidated; consequently they erode quite easily and some slack readily into soil. Good exposures are therefore rare.

Fossil studies show that lake-bed sediments accumulated throughout the whole of Tertiary time. For example, near McKay reservoir immediately south of Pendleton a deposit of shallow lake-bed sediments, together with fluviatile sediments and fanglomeratic rubble, contains a veritable graveyard of middle Pliocene vertebrate remains. Not far south a small occurrence of lake-bed sediments contains fossil ferns and other leaves of Eocene age. Similar scattered fossil occurrences in the Baker area are largely Miocene and those in the southeastern portion of the map are both Miocene and Pliocene.

Tertiary sediments are actually more abundant and more widespread than is indicated on the map. They probably occur wherever the lavas are shown, but they are present in the form of thin interbeds and are usually very restricted in their lateral extent. Their value in dating the associated volcanics is great even though they cannot be shown here.

Pleistocene to Recent Rocks

Fluviatile and glacial deposits

Since the close of Tertiary time, the dominant geologic process has been erosion accompanied by deposition on the floors of the larger stream valleys. It is perhaps safe to say that most of the sediments have been carried to points outside the area. However, local deposition has always occurred where streams have been confronted with a temporary base-level. Such deposition is going on today to a limited extent and will continue into the future. The deposits are principally fluviatile sands, gravels, and clays in the major valleys, and glacial moraines in the Elkhorn and Wallowa mountains. Only the major areas of deposition have been shown on the map.

Mineral Deposits

Gold, silver, copper, and many other kinds of metalliferous mineral deposits are found in the area. Nonmetallic mineral occurrences of note include limestone, gypsum, diatomite, and perlite.

The distribution of these minerals is definitely linked with the distribution of bedrock types. For example, nearly all the metalliferous minerals are found in areas of pre-Tertiary metamorphics and granites. Exceptions are a few cinnabar prospects and one known stibnite prospect in rocks of the Tertiary rhyolite group. Limestone and gypsum are restricted to areas of pre-Tertiary metamorphic rocks. Perlite is found in areas of Tertiary rhyolites and their related sediments. All diatomite is associated with the Tertiary lake beds. The Tertiary basalts, although not mineralized, are used extensively for road metal.

Gold was the first mineral to be mined in northeastern Oregon. Its production began in Griffith Gulch, a few miles west of Baker, in 1861. From then until the mines were closed by a so-called "defense" order issued at the commencement of United States participation in

World War II, gold mining constituted the most important mining activity in the area. The area has produced an estimated two-thirds of the State's total gold production, which according to the U.S. Bureau of Mines (Minerals Year Book for 1943) amounted to 5,668,118 ounces for the period 1848 through 1943. Practically all the gold mines are inactive today. This is due to the fact that gold is still priced at its pre-Pearl-Harbor level. Under these circumstances, there are very few gold mines that can be operated successfully even though their productive capacities are still essentially as good as they were during the pre-war period. The condition of enforced idleness will doubtless continue until such time as the economic dilemma is resolved.

Limestone is being quarried at four places. Three of these are in Baker County; the other is in Wallowa County. The rock produced from these operations is being used for sugar refining, paper processing, and the manufacture of cement and carbide. Production for cement manufacture has been going on since the 1920's but production for all the other uses comes from operations which have been established since 1950.

Sand and gravel deposits, although not mineral resources in the same sense of the word as gold and limestone, show a yearly production that is high in both amount and value. Furthermore, the availability of sand and gravel suitable for aggregate use is of great importance to the communities in which they occur. The Pleistocene to Recent deposits in the Columbia River basin area northwest of Pendleton and along the Snake River in the vicinity of Ontario support some important aggregate-producing operations.

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MINERAL BILLS IN CONGRESS

As Congress is looking forward to adjournment sometime in August, action on several bills that may furnish assistance to domestic mineral producers is being speeded up. Prospects for passage of the bills into law are unknown. Of interest to mineral producers in Oregon are the following:

S. 4036 - the Domestic Minerals Stabilization Plan introduced by Senator James E. Murray of Montana. This bill provides price supports for lead, zinc, tungsten, and acid grade fluorspar, and a purchase program for 150,000 tons of refined copper. The bill, which has passed the Senate, has been reported out of the House Interior Subcommittee for consideration on the House floor. The House Subcommittee cut out that portion of the Senate-passed bill allowing the Secretary of the Interior to borrow from the Treasury to finance the five-year price support program in favor of financing through annual appropriations from Congress. Added to the Senate bill by the House Subcommittee was a section to provide incentive payments for chromite, beryl, and columbium-tantalum. For chrome, the bill calls for Federal purchase of $46 per ton with a yearly maximum of 50,000 long dry tons over a period of 5 years.

S. 4146 - the Incentive Payment Plan introduced by Senator James E. Murray of Montana. Title 1 of the bill provides for production incentive payments for beryl, metallurgical chromite, columbium-tantalum concentrates, metallurgical manganese, mercury, antimony, cobalt, and metallurgical-grade fluorspar. Title 2 of the bill directs the Office of Defense and Civilian Mobilization to initiate and execute a program for upgrading chromite and manganese ores now in the stockpile. Upgrading is defined as the conversion of these materials "to a state of immediate usefulness to defense essential industry." Contracts for the upgrading of the ores are to be negotiated through normal commercial channels. The proposed incentive payments for chromite and mercury production are given as follows:

> "For commercial grade, metallurgical chromite, $1 per long dry ton unit, for not to exceed an aggregate of four million six hundred thousand long dry ton units annually. No incentive payment shall be made in any calendar year on a quantity in excess of six hundred and ninety thousand long dry ton units produced by any one producer and originating in any one mining district from properties controlled by such producer.
>
> "For mercury, $50 per flask (a 'flask' meaning a steel container holding 76 pounds of prime virgin mercury 99.95 per centum pure or better), for not to exceed an aggregate of thirty-three thousand flasks annually. No incentive payments shall be made in any calendar year on a quantity in excess of two thousand flasks produced by any one producer and originating in any one mining district from properties controlled by such producer."

Senator Richard L. Neuberger (Oregon) informed the Department July 22 that this bill was favorably reported from the Senate Interior Committee for action by the Senate. Senator Neuberger's office reported that they were hopeful of early Senate action.

H.R. 13280 - the Domestic Minerals Exploration Stabilization Plan introduced by Congressman Clair Engle of California. This bill, referred to by Engle as a "one package" bill, would combine Secretary Seaton's stabilization and copper stockpiling plan as approved by the Senate, give extension to a DMEA type exploration program, provide for production bonus payments on beryl and columbium-tantalum, and establish government purchase of ferrochrome produced from a domestic chrome ore producers cooperative association. This bill has been considered by the House Subcommittee on Mines and Minerals and reported to the House Interior and Insular Affairs Committee. The provisions for chrome and the ferrochrome plant were struck from the bill.

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ANNUAL ASSESSMENT DATE MAY CHANGE

Senator Church (Idaho) has prepared a bill that would change the traditional deadline for annual assessment work on unpatented mining claims. The bill, S. 3199, originally contained a moratorium on assessment work for the assessment year 1958-59. Congressman Al Ullman (2nd District, Oregon) has written the Department on this bill as follows:

> "I know you will be pleased to learn that the House Interior Committee Mines and Mining Subcommittee, of which I am a member, yesterday (June 26) approved similar legislation (to Senator Church's bill, S. 3199). Under the terms of the amended legislation the assessment date will be moved to September 1, although this change will not go into effect until next year (1959). The moratorium provision was not approved and it is highly doubtful that any legislation which is enacted into law will contain a moratorium provision."

****

PERMANENT EXPLORATION LOAN PROGRAM TO BE ESTABLISHED

A bill to establish a domestic minerals exploration loan program similar to the Defense Minerals Exploration Administration program, which expired June 30, is showing good indications of becoming law before this session of Congress adjourns. This bill would authorize the Secretary of Interior to establish an exploration program for such minerals, excluding organic fuels, as he may designate and provide for Federal financial assistance as is deemed in the national interest on a participating basis to private industry. Other provisions would (1) limit Government participation in any single contract to not more than $250,000; (2) require inclusion in each contract of terms and conditions for the repayment of Federal funds with interest thereon as a royalty on the value of the production from the area described in the contract; (3) require that interest at average Treasury rates, plus 2 percent to cover administrative costs, be calculated from the date the funds are made available to the private contractor; and (4) require applicants to furnish evidence that funds from commercial sources are unavailable on reasonable terms. "Exploration" would be defined as "the search for new or unexplored deposits of minerals, including related development work . . . whether conducted from the surface or underground, using recognized and sound procedures including standard geophysical and geochemical methods for obtaining mineralogical and geological information."

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DMEA LOAN GRANTED TO OREGON MINE

The Spokane field office of the Defense Minerals Exploration Administration announced earlier this month that three new mine exploration contracts had been granted, one each to properties in Oregon, Idaho, and Montana. Cost of the three projects will total an estimated $101,114 and government financial participation will amount to $58,707, the announcement showed. The Oregon contract is in the amount of $15,624 to the Moneta-Porcupine Mines, Ltd., for mercury exploration at the Elkhead mine in Douglas County. Cost sharing is on a fifty-fifty basis. The Idaho project was for cobalt at the Long Dike property in Lemhi County. The Montana project was for monazite-columbium-tantalum in the Sand Basin placer area of Granite County.

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LATE NEWS ON STATUS OF LEGISLATION

The Department received the following telegram from Congressman Al Ullman on the status of the mineral legislation in Congress as of July 24.

JULY 24

HOLLIS M. DOLE, DIRECTOR
DEPT. OF GEOLOGY AND MINERAL INDUSTRIES STATE OF OREGON
1069 STATE OFFICE BLDG.

S. 3199 - (Change of Assessment Date) AWAITING FULL HOUSE CONSIDERATION.

S. 3817 - (Exploration Loan Program) PASSED BY HOUSE INTERIOR COMMITTEE TODAY. FLOOR CONSIDERATION NEXT WEEK.

S. 4036 - (Domestic Minerals Stabilization Plan) PASSED BY HOUSE MINING SUBCOMMITTEE, FULL COMMITTEE ACTION EXPECTED NEXT WEEK. BILL CONTAINS $46 PER LDT INCENTIVE PAYMENT, 50,000 LDT ANNUALLY FOR FIVE YEARS. STRONG OPPOSITION ON FLOOR EXPECTED.

H.R. 13280 - (House "One Package" Plan) TABLED, AS CHROME PROVISION INCORPORATED IN S. 4036.

AL ULLMAN, MEMBER OF CONGRESS

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TURKISH CHROME COOPERATIVE TO FORM

Some chrome ore producers in Turkey are getting together in a cooperative of which Eti Bank, the government mining bank, holds 25%. The object is to develop and finance chrome ore mines. So far 8-million Turkish lira, about $2.7-million at the official exchange rate, has been subscribed. Some feel this is a significant amount for Turkey and that more systematic development may result and that transport to railroads, a great difficulty in Turkey, may be aided. (From E&MJ Metal & Mineral Markets, June 19, 1958.)

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WITHDRAWAL OF PUBLIC LANDS PROPOSED

The U.S. Bureau of Land Management, Portland, Oregon, has notified the Department of a proposed withdrawal of 6,020 acres in an area common to the Gilliam-Morrow-Umatilla county border. The proposed withdrawal is for the Corps of Engineers, U.S. Army, and is related to the John Day dam project on the Columbia River. The Bureau notes that the withdrawal of the land is subject to valid existing rights and, if consummated, would prevent all forms of appropriation including grazing leases or permits, mineral leases, and location of mining claims. Persons wishing to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the Bureau of Land Management, Department of the Interior, 809 N.E. 6th Avenue, Portland 12, Oregon. All comments should be in by the middle of August.

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GOLD MINERS LOSE L-208 CASE

Gold mine owners required by the Government to shut down operations during World War II lost their last chance to be compensated for the losses they suffered when the U. S. Supreme Court recently reversed, 7 to 2, a 1956 Court of Claims decision that six companies were entitled to compensation.

The case stemmed from War Production Board Order L-208, issued in 1942, which required closing of gold mines deemed nonessential to the war effort, with the object of conserving scarce equipment and materials and encouraging the voluntary relocation of skilled miners to the more vital copper mining industry.

In appealing for reversal of the Court of Claims decision, the Justice Department said that similar claims could boost the Government's total liability to more than $40 million. The Supreme Court majority opinion said that the "damage to the mine owners was incidental to the Government's lawful regulation of matters reasonably deemed essential to the war effort."

(From Mining Congress Journal, July 1958.)

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BAKER COUNTY MINING NEWS

The Evening Star Consolidated group of lode gold claims is now owned by Mr. Francis Murphy, Oak Run, California. The property consists of three patented and two unpatented claims and is located near the head of Gimlet Creek in the Greenhorn area of Baker County. Mr. Murphy, in association with Richard E. Bixley, Carmel, California, plans to reopen some of the old workings and do some new exploratory development this year. Some equipment has already been moved to the property.

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PHILIPPINES SUBSIDIZE GOLD PRODUCTION

The July 14 issue of Barron's, a national financial weekly, contains an article describing the operation of Benguet Consolidated, Inc., a Philippine mining organization. The article notes that Benguet would not be able to operate profitably without benefit of the substantial subsidy granted Philippine gold producers by that country's government. Under the program, according to Barron's, gold producers are permitted to offer their bullion to sale on the open market for the equivalent in pesos of $60 to $65 per ounce. The purchasers can then sell the bullion for dollars to the Central Bank at the statutory price of $35 per ounce. The situation reflects the depreciation of the Philippine peso. Costs of production of Benguet's operation are given as $49.50 per ounce, with overall costs (including depreciation and depletion) as $56.50 an ounce.

United States gold miners not only face higher labor and material costs than foreign producers but they are deprived of the opportunity to sell on the open market as foreign miners are able to do. Add to this currency manipulations by foreign countries and it is little wonder that domestic mining is in the doldrums.

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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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Field Offices

2033 First Street
Baker

239 S. E. "H" Street
Grants Pass

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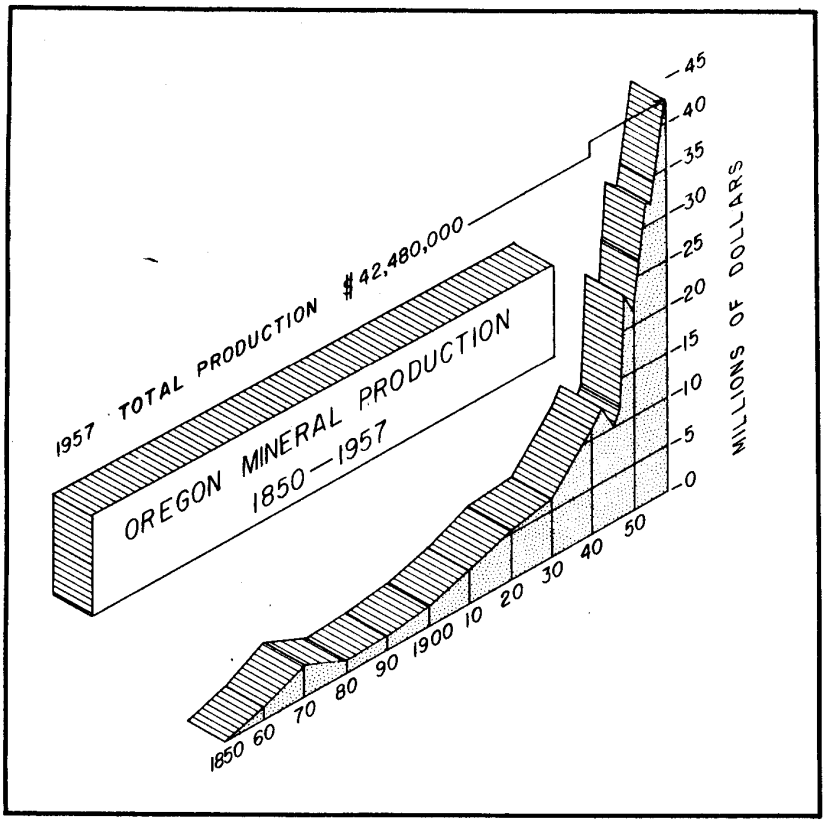
OREGON MINERAL PRODUCTION REACHES NEW HIGH IN 1957

By Ralph S. Mason *

Oregon's mineral industries took a sharp upward surge during 1957 with a 25-percent increase in value over 1956 (see Table 1, p. 74). Value of Oregon's mineral production for 1957, according to U. S. Bureau of Mines advanced summary figures, was $42,480,000 which is almost double the 1950 figure. Hand in hand with this growth was a 10-percent increase in mineral and metallurgical industry payrolls which last year totaled $47,000,000 (see Table 2, p. 74). Discrepancy between payroll and mineral production figures lies in the fact that the payroll figures cover both mineral and metallurgical production, while the mineral production figure is restricted to minerals mined in the State and does not include the smelting, refining, or processing of minerals originating elsewhere.



The broad base of Oregon's mineral industry is shown in the accompanying map which lists the dollar value of minerals produced in each county and the percent of the total contributed by each county Not all segments of the mining industry in the State showed a growth in volume over the previous year. Chromite producers expecting a termination of the government stockpile program in the near future began curtailing development and mining, and clay and pumice were in less demand due to fewer starts in the building trades. On the plus side were cement, sand and gravel, and stone which were needed by the expanded highway program, and production of ferronickel increased 66 percent over 1956 due to modified ore-drying equipment at the Riddle nickel smelting plant. Other increases were mercury, 111 percent; diatomite, 12 percent; dimension stone, 30 percent; gold, 23 percent; and mineral pigments, 20 percent.

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* Mining Engineer, State of Oregon Department of Geology and Mineral Industries.

Table 1.

Mineral Production in Oregon, 1956-1957 [1]

Mineral	1956 Short tons (unless otherwise stated)	1956 Value	1957 Short tons (unless otherwise stated)	1957 Value
Chromium ore and concentrate - gross weight	[2] 54,577	$ 2,001,083	7,900	$ 674,631
Clays	256,942	278,205	239,595	265,556
Copper (recoverable content of ores, etc.)	7	5,950	23	13,846
Gold (recoverable content of ores, etc.) - troy ounces	2,738	95,830	3,381	118,335
Iron ore (limonite) - long tons	893	[3]	[3]	[3]
Lead (recoverable content of ores, etc.)	5	1,570	5	1,430
Mercury - 76-pound flasks	1,893	492,029	3,993	986,191
Nickel ore - nickel content	6,866	[3]	12,276	[3]
Pumice and volcanic cinders	[3]	[3]	123,644	294,374
Sand and gravel	11,637,183	11,646,367	12,842,941	13,481,263
Silver (recoverable content of ores, etc.) - troy ounces	13,542	12,256	15,924	14,412
Stone	6,097,965	7,890,197	10,311,229	11,404,962
Value of items that cannot be disclosed: Carbon dioxide, cement, diatomite, gem stones, lime (1957), mineral pigments, natural sodium carbonates (1956), tungsten, uranium, and values indicated by footnote 3		12,939,583		16,153,541
Total [4]		$34,021,000		$42,480,000

1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/ Includes 45,710 short tons of concentrate produced in 1955 and 1956 from low-grade ore and concentrate stockpiled near Coquille, Oregon, during World War II.
3/ Figure withheld to avoid disclosing individual company confidential data.
4/ Total adjusted to eliminate duplicating value of clays and stone; 1956 figure revised.

Table 2

Oregon Mineral Industry Employment and Payrolls*

	1956 Employment	1956 Payrolls	1957 Employment	1957 Payrolls
Mining	1,259	$ 6,228,349	1,216	$ 6,150,380
Mineral manufacturing	1,469	7,088,105	1,663	8,482,287
Primary metals	4,660	25,487,215	4,985	28,728,266
Miscellaneous	813	3,940,009	701	3,641,569
TOTALS	8,201	$42,743,678	8,565	$47,002,502

*Oregon State Unemployment Compensation figures. Only firms hiring two or more employees are included.

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MINERALS SUBSIDY BILL KILLED

THE MINERALS SUBSIDY BILL WAS KILLED BY THE HOUSE ON AUGUST 21.

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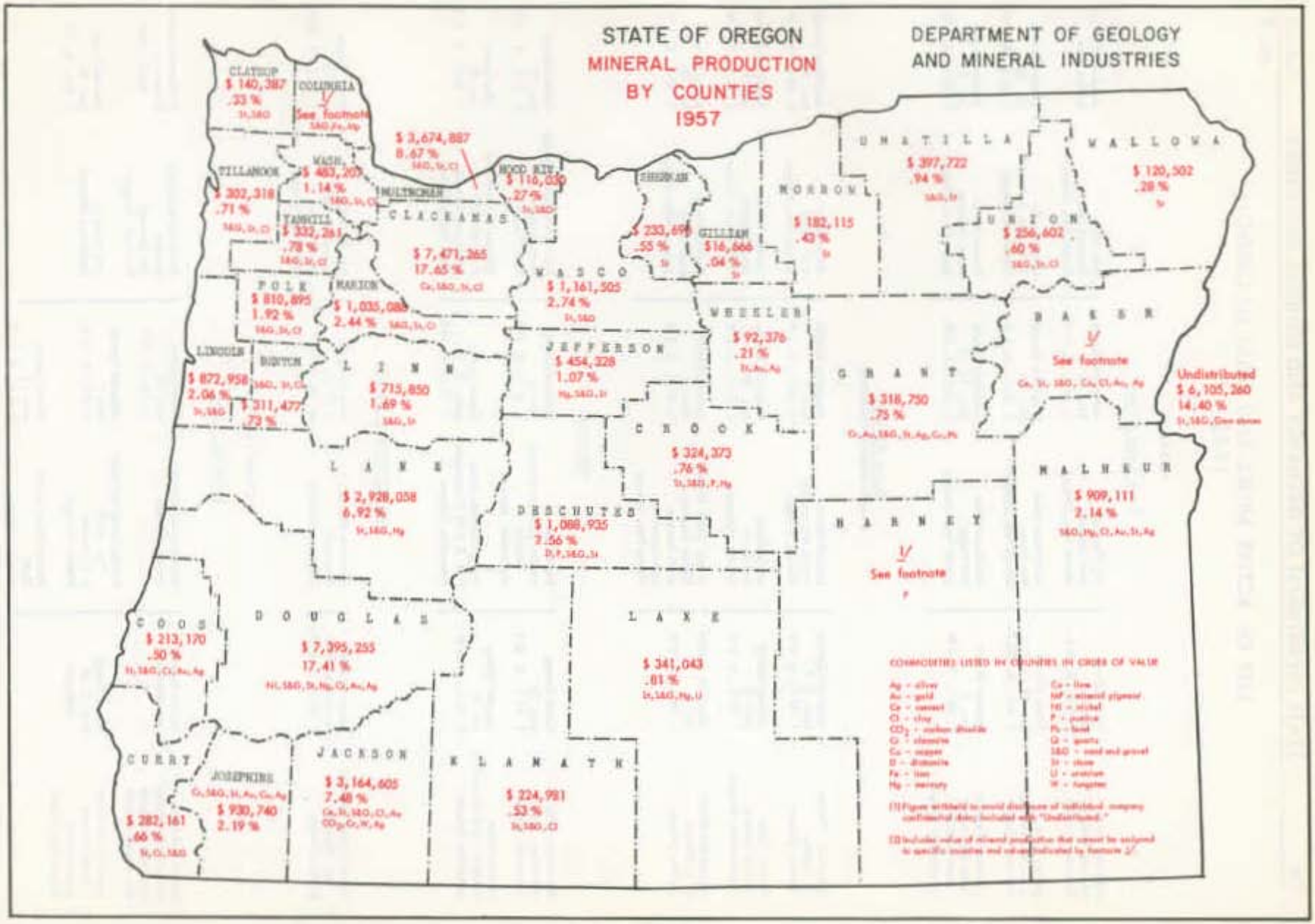
STATE OF OREGON
MINERAL PRODUCTION
BY COUNTIES
1957

DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES



COMMODITIES USED IN COUNTIES IN ORDER OF VALUE

Ag - silver
Au - gold
Ca - cement
Cl - clay
CO_2 - carbon dioxide
D - diatomite
Fe - iron
Hg - mercury
Gy - gypsum
Mi - nickel
P - pumice
Pb - lead
Q - quartz
S&G - sand and gravel
St - stone
U - uranium
W - tungsten

(1) Figure withheld to avoid disclosure of individual company confidential data; included with "Undistributed."

(2) Includes value of mineral production that cannot be assigned to specific counties and values indicated by footnote 1/.

LIST OF ACTIVE MINES AND MILLS IN OREGON
1958

METALS

Gold Lode Mines

Bald Mt. Mine Kenneth Grabner Sumpter, Oregon	Baker County Sec. 3 T. 3 S., R. 36 E.	Dry Diggings Walt Cannon Grants Pass, Oregon	Josephine County Sec. 14 T. 36 S., R. 5 W.	Reno Mine Quentin Stone Grants Pass, Oregon	Josephine County Galice area
Buffalo Mine J. P. Jackson, Jr. Granite, Oregon	Grant County Sec. 14 T. 8 S., R. 35½ E.	Greenback Mine Wes Pieren Grants Pass, Oregon	Josephine County Sec. 32 T. 33 S., R. 5 W.	Union Leader S. Vaughn and Sons Glendale, Oregon	Douglas County Sec. 36 T. 32 S., R. 5 W.
Charlotte Prospect Lloyd Warner and Dave Williams Grants Pass, Oregon	Jackson County Sec. 5 T. 40 S., R. 4 W.	Humdinger Mine Earl Young Grants Pass, Oregon	Josephine County Secs. 21, 16 T. 38 S., R. 5 W.	Warner Mine Frank Gelhaus Rogue River, Oregon	Jackson County Sec. 4 T. 33 S., R. 4 W.

Gold Placers
(Mostly seasonal operations)

Cal.-Ore. Placers Ed Carlson Galice, Oregon	Josephine County Secs. 2, 3 T. 35 S., R. 8 W.	Leipold Placer Pieren and Connoly Galice, Oregon	Josephine County Sec. 3 T. 35 S., R. 8 W.	Smith Placer A.C. Smith Grants Pass, Oregon	Josephine County Sec. 10? T. 33 S., R. 5 W.
Federal Placer Orville Snavely Jacksonville, Oregon	Jackson County Sec. 13 T. 39 S., R. 3 W.	Lewis Placer Bud Lewis Galice, Oregon	Josephine County Sec. 36 T. 34 S., R. 8 W.	Speaker Placer Henry Speaker Wolf Creek, Oregon	Josephine County Sec. 9 T. 33 S., R. 5 W.
Golden Bar Placer R. L. Pancost Merlin, Oregon	Josephine County Sec. 2 T. 35 S., R. 8 W.	Palmer Creek Placer (China Diggings) Lewis Brothers Sierra Land Co. Grants Pass, Oregon	Jackson County Sec. 7 T. 40 S., R. 3 W.	Sterling Placer Paul Pearce Jacksonville, Oregon	Jackson County Sec. 33 T. 38 S., R. 2 W.

Mercury

Blue Ridge Mine Mia Mine, Inc. Prineville, Oregon	Crook County Sec. 15 T. 14 S., R. 20 E.	Bretz Mine Arentz-Comstock Mining Venture McDermitt, Nevada	Malheur County Sec. 3 T. 41 S., R. 41 E.	Towner Quicksilver Mine Frank Towner Post, Oregon	Crook County Sec. 10 T. 17 S., R. 19 E.
Bonanza Mine Bonanza Oil & Mine Corp. Sutherlin, Oregon	Douglas County Sec. 16 T. 25 S., R. 4 W.	Maury Mountain Mine F.D. & H.W.Eickemeyer Prineville, Oregon	Crook County Secs. 10, 15 T. 17 S., R. 19 E.	Western Minerals, Inc. P.O. Box 697 Lakeview, Oregon (Four Square Group)	Lake County Sec. 32 T. 37 S., R. 17 E.

Miscellaneous Metals

Hanna Nickel Smelting Co. (Nickel) Riddle, Oregon	Douglas County Nickel Mountain T. 30 S., R. 6 W.	Lakeview Mining Co. (Uranium) Lakeview, Oregon	Lake County T. 37 S., Rs. 18, 19 E.	Standard Mine (Copper, cobalt) Ray Summers John Day, Oregon	Grant County Sec. 12 T. 12 S., R. 33 E.

NONMETALLICS

Building Stone

Idanha Tuff Stone Harold Hills, Detroit Larry and Ted Geck Mt. Angel, Oregon	Marion County Near Idanha	Northwest Granite Co. Haines, Oregon	Baker County Sec. 27 T. 7 S., R. 39 E.	Rocky Butte Quarry (Basalt) Joe Marston Portland, Oregon	Multnomah County Quarry at Rocky Butte
Indian Candy Stone (Rock Quarry) Melvin Parker Grants Pass, Oregon	Wasco County 4 mi. E. of Simnasho	Pacific States Cut Stone Co. (Tuff) E. L. Keeter Madras, Oregon	Jefferson County Sec. 9 T. 9 S., R. 15 E.	Tuff Stone Co. Sublimity, Oregon	Marion County Sec. 29 T. 8 S., R. 1 E.
		Rainbow Rock Quarry (Tuff) Maupin, Oregon	Wasco County Sec. 11 T. 6 S., R. 11 E.		

Lightweight Aggregate Producers

Cascade Pumice Co. Bend, Oregon	Deschutes County Sec. 5 T. 18 S., R. 12 E. and Sec. 36 T. 16 S., R. 11 E.
Central Oregon Pumice Co. W. E. Miller Bend, Oregon	Deschutes County Sec. 7 T. 17 S., R. 12 E. and Sec. 7 T. 18 S., R. 12 E.
Cinder Hill Quarry (Cinders) Leroy E. Grote Redmond, Oregon	Deschutes County Sec. 33 T. 14 S., R. 13 E.
Deschutes Concrete Products Co. (Pumice) Chester T. Lackey Redmond, Oregon	Deschutes County Sec. 30 T. 16 S., R. 12 E. and Sec. 33 T. 14 S., R. 13 E.
Great Lakes Carbon Corp. (Diatomite) Dicalite Dept. Lower Bridge, Oregon	Deschutes County Sec. 16 T. 14 S., R. 12 E.
Harney Concrete Tile Co. (Pumice) Don Robbins Burns, Oregon	Harney County Sec. 3 T. 24 S., R. 30 E.
Northwest Aggregates, Inc. (Expanded shale) Portland, Oregon	Washington County Sec. 24 T. 3 N., R. 5 W.
Smithwick Concrete Products Co. (Expanded shale) Portland, Oregon	Washington County Sec. 8 T. 3 N., R. 4 W.

Limestone

Chemical Lime Co. (Burnt lime) Baker, Oregon	Baker County Plant at Wingville
Dewitt's Polk County Lime Co. Dallas, Oregon	Polk County SW of Dallas
Greely Lime Co. (Quarry near Enterprise) Portland, Oregon	Wallowa County Sec. 19 T. 2 S., R. 44 E.
Ideal Cement Co. (Quarry at Marble Mt.) Gold Hill, Oregon	Josephine County Sec. 30 T. 37 S., R. 6 W.
National Industrial Products Co. Durkee, Oregon	Baker County Sec. 10 T. 12 S., R. 43 E.
Oregon Portland Cement Co. (Quarries at Lime and Dallas; plant at Oswego) Portland, Oregon	Baker and Polk counties Secs. 26, 27, 34, 35 T. 13 S., R. 44 E. and Sec. 12 T. 8 S., R. 6 W.

Miscellaneous Nonmetals

Alkali Lake Sodium (Salines) A. M. Matlock Eugene, Oregon	Lake County Alkali Lake
Bristol Silica Co. (Crushed granite and quartz) F. I. Bristol Rogue River, Oregon	Jackson County Sec. 30 T. 36 S., R. 3 W.
Gas-Ice Corporation (Dry ice) Portland, Oregon	Jackson County Sec. 7 T. 39 S., R. 2 E.
Wilhoit Coal Mine T. G. Mandrones Portland, Oregon	Clackamas County Sec. 15 T. 6 S., R. 2 E.

Miscellaneous Processing Plants

Electro Metallurgical Co. (Carbide, ferroalloys) Div. Union Carbide Co. Portland, Oregon	Multnomah County Plant in St. Johns
Harvey Aluminum Company The Dalles, Oregon	Wasco County
Industrial Processing Co. (Calcium hydrate) 5005 N.W. Front Avenue Portland, Oregon	Multnomah County
Nat'l. Metallurgical Corp. (Aluminum silicon; silicon) Springfield, Oregon	Lane County Springfield
Oregon Metallurgical Corp. (Zirconium, titanium) Albany, Oregon	Linn County Albany
Oregon Steel Mills (steel) 5200 N.W. Front Avenue Portland, Oregon	Multnomah County
Owens-Illinois Glass Co. (Glass containers) 5535 N.E. 101 Avenue Portland, Oregon	Multnomah County
Pacific Carbide & Alloys Co. (Carbide) N. Columbia Blvd. & Hurst Portland, Oregon	Multnomah County Plant in N. Portland
Reynolds Metals Co. (Aluminum) Troutdale, Oregon	Multnomah County
Supreme Perlite N. Suttle Road Portland, Oregon	Multnomah County Plant in N. Portland
Vermiculite-Northwest Inc. (Vermiculite) 2303 N. Harding Portland, Oregon	Multnomah County
Wah Chang Corp. (Zirconium) Albany, Oregon	Linn County Albany

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MINING NEWS

Gold

At the Buffalo Mine, Grant County, work is underway to open a new and deeper operating level. When completed the new adit will intersect all known veins at a depth of approximately 230 feet below the present working level. The new adit will be approximately 1400 feet in length. Development of this level will necessitate eventual relocation of the mill. The Buffalo, operated by James P. Jackson, Jr., is the only lode gold mine in Oregon in steady, year-around operation. Mr. Jackson has been in charge of operations during the past five years.

* * * *

Four gold mines are active at the present time in Josephine and Jackson counties. The Daisy mine in sec. 14, T. 34 S., R. 5 W., Josephine County, is being leased to R.C.Hanford who is doing underground exploration. The Humdinger mine located about 25 miles south of Grants Pass in secs. 21 and 16, T. 38 S., R. 5 W., Josephine County, is being worked intermittently by Earl Young of Grants Pass. The Reno mine in the Galice area, Josephine County, is being worked by Quentin Stone of Grants Pass. Frank Gelhaus of Rogue River is mining and milling high-grade ore from the Warner mine in sec. 4, T. 33 S., R. 4 W., Gold Hill District, Jackson County.

Copper, lead, and zinc

The old Zinc mine on the South Umpqua River, sec. 23, T. 29 S., R. 1 W., Douglas County, is under lease to Mr. Moe Platt and associates who are conducting exploration work.

Quicksilver

Western Minerals, Inc., Lakeview, Oregon, has erected a 30-ton Lacey furnace and is operating a new cinnabar occurrence on Angel Peak about 5 miles east of Quartz Mountain in western Lake County. The Four Square group of claims is being leased from Johnson, Tomlin, and Morrison of Lakeview. The operators are Phil Parks, Jr., Roy Matchett, and G.I. Bryant, who are producing and shipping quicksilver.

Uranium

The Lakeview Mining Company announces completion of the head-frame for the new uranium production shaft at the White King mine, Lake County. The new structure is all-steel, 96 feet high, and contains two ore compartments of 100 tons capacity each. The hoist for this shaft, a 150-horsepower double-drum unit, has also been installed and tested. The Company hopes shortly to resume sinking operations in the shaft, which will go down to 700 feet at an estimated initial cost of $500,000.

* * * *

Kenneth Arnold, president and general manager of Solar-X Corporation, which is exploring the Steens Mountains uranium properties on Pike Creek in Harney County, brought several hundred pounds of the ore to Lakeview on August 1 for testing by the Lakeview Mining Company. If the ore proves to be of commercial grade and quantity, it will probably be hauled to Lakeview Mining Company's mill, now under construction, for processing.

* * * *

Leonard Lundgren and associates of Bend are leasing the Bear Creek uranium property in Crook County and have obtained a geologist, James Barlow, who will supervise further exploration.

Building stone

Tuff stone from a large deposit near Idanha, Marion County, is being mined by Harold Hills, Detroit, and Larry and Ted Geck of Mt. Angel. The tuff is a lightweight volcanic rock capable of being cut into any desirable size. It is suitable for either exterior building or for interior rock for fireplaces and flower planters, and comes in a variety of colors reported to include red, rose, green, purple, orange, and tan.

* * * *

Melvin Parker of Grants Pass is operating a building stone quarry 4 miles east of Simnasho on the Warm Springs Indian Reservation in Wasco County. The rock is a banded tuff called "Indian Candy Stone" and is similar to the "Rainbow Rock" that also comes from this area. First production from the quarry was made on July 1, 1958. Mr. Parker also opened a flagstone quarry near Riddle but is awaiting a hydraulic clipping machine before beginning production.

Limestone

The National Industrial Products Company has recently completed a drilling program to determine the available tonnage of hot spring travertine located on their property near Durkee, Baker County, Oregon. The company is now engaged in the production of limestone used in sugar refining, paper processing, and cement manufacture. The easily ground travertine represents a new product for the agricultural market.

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NEW DRILLING PERMITS

Permit No. 33 was issued by the Department to Riddle Gas and Oil Producers, Oreg., Ltd., on July 25, 1958. This oil test hole will be drilled on the J. L. Aikins property located in the NE¼ SE¼ sec. 27, T. 30 S., R. 6 W., Douglas County. Elevation at ground level is 725 feet.

Permission to deepen Miriam Oil Company's "Elliott No. 1" (permit No. 17) was given by the Department on June 12, 1958. The hole was originally drilled to a depth of 1080 feet in 1956. The drilling is located in the SW¼ sec. 9, T. 8 S., R. 5 W., Polk County.

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EASTERN OREGON CHROME PRODUCTION

During the life of the GSA chrome-purchasing program, shipments of chromite from eastern Oregon amounted to 7,361 dry long tons of concentrates and lump ore. Shipments were made between August 4, 1952, and June 12, 1958, with the total value of $789,332.00.

Leading producers in order of production were the Haggard and New, the Dry Camp, and the Carlsen properties. Both the Haggard and New and the Dry Camp are old properties with production records during World Wars I and II, but the Carlsen is a newly discovered prospect with no previous history of production. No appreciable amount of ore was exposed on any of these properties at the beginning of the GSA program, but all had minable ore exposed at the time the program terminated.

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U.S.G.S. CONDUCTS SUMMER FIELD WORK IN OREGON

A program of geologic mapping and special field studies is being furthered in Oregon this summer by the U.S. Geological Survey. Geologists and projects worked on are as follows:

Thomas P. Thayer, assisted by Erving Brown, is working on Triassic rocks in the Blue Mountains. Aaron Waters is mapping in the Snake River area in northeastern Wallowa County. Dick Lewis, assisted by Omer B. Raup, is compiling the reconnaissance geology of northeastern Oregon north of lat 44° and east of long 121°. George Walker began field work on the Klamath 1° sheet, and will spend several months working in that area. Ralph Imlay is making further stratigraphic and paleontologic studies in central Oregon. Donald A.Lindsley is mapping the Spray quadrangle for a Doctor's Thesis, under a while-actually-employed status with the Survey. Francis G. Wells, accompanied by Dallas Peck, will spend a few weeks in the Grants Pass quadrangle making preparations for a geologic quadrangle report. Later Dr. Wells and Mr. Peck will make some studies in the Antelope quadrangle in central Oregon.

The Survey's Menlo Park office has geologists working in the Coast Range. Parke D. Snavely, Jr., Fuels Branch, is continuing geologic mapping and stratigraphic studies begun for maps OM 88 and 97. He will be accompanied part of the time by Weldon Rau with whom he will complete the systematic sampling for Foraminifera along the Siletz and Yaquina rivers. Bill Bromery and Dave Stuart of the Geophysics Branch are working on a project of correlating the aeromagnetics and geology across the central part of the Coast Range (between Corvallis and Newport). Ewart Baldwin and Weldon Rau will sample Eocene sections along the North Umpqua River and in the Dallas and Valsetz quadrangles. Linn Hoover is completing the bulletin report on the Anlauf and Drain quadrangles.

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U. OF O. GRADUATE STUDENTS MAPPING IN OREGON

Six University of Oregon graduate students working for Master's degrees in geology are mapping sections of the Roseburg 30-minute quadrangle. The students are Charles Pyle, Ronald Larsen, John Lawrence, Charles Payton, Don Warner, and Keith Westhusing. Two other University of Oregon students are working in Malheur County; they are Ernest Wolff in an area just south of the Mormon Basin and Larry Kittleman (Ph. D. Thesis) in an area just south of the Mitchell Butte quadrangle.

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SAND DUNE TREATISE PUBLISHED

"Coastal sand dunes of Oregon and Washington," by William S. Cooper, has been published as Memoir 72 by the Geological Society of America. It is a systematic study of coastal dunes from the standpoint of their origin and development. It also discusses rate of movement of the dunes and programs for controlling them. The book is cloth bound, has 169 pages, and is abundantly illustrated with photographs and maps. It may be obtained from the Geological Society of America, 419 West 117th Street, New York 27, N.Y. The price is $3.50.

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DEPARTMENT FIELD ACTIVITIES

N. S. Wagner (field geologist, Baker) is doing field mapping in the Imnaha River area and in the Elkhorn Mountain region, northeastern Oregon, for the State Geologic Map.

Howard C. Brooks (field geologist, Baker) has been visiting the quicksilver deposits of the State in order to revise and bring up to date Department Bulletin 4, "Quicksilver in Oregon."

Norman V. Peterson (field geologist, Grants Pass) has been spending most of the summer in Lake County doing geological reconnaissance. Peterson is attempting to establish stratigraphic position of the uranium deposits of Lake County. In the course of his work, Peterson has found several plant fossil sites and one fossil tooth. The tooth has been tentatively identified by Dr. J. A. Shotwell, University of Oregon, as an upper premolar of Diceratherium, a rhino of John Day age (lower Miocene).

Len Ramp (field geologist, Grants Pass) is completing his studies on the occurrence of chrome in southwestern Oregon. Ramp reports that the manuscript is nearly complete and that field investigations are limited to small prospects recently uncovered.

H. G. Schlicker (geologist, Portland) is doing reconnaissance work on the intrusives in the Coast Range. Schlicker's work will be coordinated with that of Mr. Parke Snavely of the U.S. Geological Survey and published as a Department bulletin.

Margaret L. Steere (geologist, Portland) is completing investigations for her bulletin on western Oregon fossil localities, and with the assistance of Mrs. Lillian F. Owen is compiling the third supplement (1951-1955) to Bibliography of Geology and Mineral Resources of Oregon.

R. E. Stewart (micropaleontologist, Portland) is continuing his studies on Oregon micropaleontology. Drawings of foraminifera are being made and will appear in Part IX of Department Bulletin 36.

Dr. George S. Koch, Jr., (professor of economic geology, Oregon State College) is working for the Department on a study of the copper deposits of the State. A reconnaissance of the deposits in northeastern Oregon has been completed and work is progressing in southwestern Oregon. Dr. Koch is assisted by William L. Rice, graduate student at Oregon State College.

Vernon Newton (petroleum engineer, Portland) is visiting oil tests throughout the State to check drilling and abandonment procedures in connection with enforcement of oil and gas regulations.

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U.S. BUREAU OF MINES RESEARCH PROGRAMS ANNOUNCED

The Bureau of Mines has announced several research programs for the fiscal year 1959. Four experiment stations will participate in research on bauxite and aluminum to develop processes for producing aluminum from low-grade domestic materials. The program will be carried on at four Bureau laboratories including Albany, Oregon.

A columbium-tantalum research program to be carried on at the Albany laboratory will emphasize methods of producing cheaper and better columbium and tantalum metal, alloys, and compounds for nuclear reactors, guided missiles, jet engines, and other important uses.

The Bureau's research on mercury will continue at an accelerated rate to provide industry with pertinent information on the occurrence, mining, and recovery of mercury. Information will be compiled on mercury mines and prospects in Arizona, Arkansas, Alaska, California, Idaho, Nevada, Oregon, Texas, Utah, and Washington. Metallurgical studies to devise new or improved methods of extracting mercury from its ores are being conducted at Bureau laboratories in Albany, Oregon, and Juneau, Alaska.

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LLOYD A. WILLIAMSON

The pumice industry lost one of its foremost champions with the death on July 29 of Lloyd A. Williamson, President of the Cascade Pumice Corporation. Williamson, a resident of Bend for the past 16 years, was responsible for many of the technological improvements in the production, beneficiation, and use of pumice as a lightweight aggregate for the construction industry. National recognition for his efforts came in 1955 when he was elected the first president of the National Pumice Institute. About a year ago Williamson sold his business to the Boise Cascade Corporation but continued his association as President of the new operation. His death followed an earlier injury suffered from a fall at the plant. He was 61.

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UPPER CRETACEOUS OF PACIFIC COAST DESCRIBED

"Upper Cretaceous of the Pacific Coast," by F. M. Anderson, has been published as Memoir 71 by the Geological Society of America. Dr. Anderson was born and brought up in the Rogue River Valley of southern Oregon and was early attracted to the ammonites and other fossils in the Upper Cretaceous rocks. As early as 1895 he published a paper on the Cretaceous beds of the Rogue River Valley. In the later years of his life he returned from other fields of geology to the study of Upper Cretaceous rocks of the Pacific Coast, and the Memoir is the result of these studies. Final preparation of the manuscript for publication was done by J. Wyatt Durham after the death of Dr. Anderson.

The Memoir describes the subdivisions of the Upper Cretaceous rocks occurring along the Pacific Coast from Baja California to Queen Charlotte Islands, British Columbia. The term Upper Cretaceous series is adopted for these rocks rather than the term Chico, which is now restricted to the sequence in the Sacramento and San Joaquin valleys of California. The work is devoted primarily to the description and illustration of more than 500 species of invertebrates of which 223 are ammonites, 118 of them new species.

The book is cloth bound, has 378 pages, 75 plates, and is priced at $6.75. It may be obtained from the Geological Society of America 419 West 117th Street, New York 27, N.Y.

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ALUMINUM PRODUCTION BEGINS AT THE DALLES

Harvey Aluminum Company's multi-million dollar aluminum reduction plant west of The Dalles has started production, and the firm will begin delivery of its first commercial output of the primary metal within approximately 60 to 90 days, Lawrence A. Harvey, Executive Vice President, announced. Capacity of the new smelter is more than 100,000,000 pounds on an annual basis. The reduction facilities consist of two potlines comprising a total of 240 pots. Operating techniques include automatic control systems throughout. (From The Oregonian, August 5, 1958.)

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WORLD'S DEEPEST WELLS

The deepest hole in the world is the Phillips Petroleum Company's 1-EE University wildcat well in Pecos County, Texas. The present depth is 24,357 feet with expectations to drill deeper after a precautionary shutdown. Just 30 miles away is Phillips 1-A Montgomery which runs second deepest at 23,400 feet. The third deepest well is Shell Oil Company's 5 Rumberger at 22,000 feet in the Elk City field, Oklahoma. (From Oil and Gas Journal, August 11, 1958.)

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
Telephone: CApitol 6-2161, Ext. 488

Field Offices

2033 First Street
Baker

239 S. E. "H" Street
Grants Pass

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PUBLIC AGENCIES CONNECTED WITH MINERAL RESOURCES

How do I go about patenting a mining claim? Who has supervision of State water rights? From whom can I lease State land? Where can I find out if I have good soil? Where can I obtain maps and geological reports? These are typical of the inquiries continually received by the Department. To answer these and other questions of this kind the accompanying list has been compiled. This is a revision of the original list which appeared in the July 1949 issue of The Ore.-Bin.

FEDERAL

Agency	Address	Service and Information
Atomic Energy Commission	Raw Materials Division Grand Junction, Colorado	Information on and analysis of radioactive ores. Grants licences to sell and lets contracts to buy uranium-bearing ores. Commission has charge of all activities related to radioactive materials.
Bonneville Power Administration (Interior Department)	1001 N.E. Lloyd Blvd. Portland 12, Oregon BE 4-3361	Power transmission to mining areas and metallurgical plants.
Bureau of Federal Supply (General Services Admin.)	U.S. Courthouse Portland 5, Oregon CA 6-3361	Purchasing agent for strategic and critical materials to be stockpiled.
Bureau of Land Management (Interior Department)	Land Office 809 N.E. 6th Avenue Portland 12, Oregon BE 4-3361, Ext. 293	Administers public-land laws. Maintains maps showing status of all Federal lands in State. Maintains file of mineral locations on O&C and Coos Bay Wagon Road Grant Lands. Handles applications for mineral patents and mineral surveys. Maintains records of land patents.

FEDERAL (cont.)

Agency	Address	Service and Information
Bureau of Mines (Interior Department)	Metallurgical Division Northwest Electro-Development Laboratory Albany, Oregon	Provides factual data, statistical and technical information on metallurgical problems.
"	Publications Distribution Sec. 4800 Forbes Street Pittsburg 13, Pennsylvania	Distributes Bureau reports of investigations, information circs., periodical reports on mineral resources.
Coast and Geodetic Survey (Commerce Dept.)	U.S. Courthouse Portland 5, Oregon CA 6-3361	Sells planimetric maps of Portland area and hydrographic charts of navigable streams and coastline.
Commerce Department	520 S.W. Morrison Street Pioneer Post Office Bldg. Portland 4, Oregon CA 6-3361	Have data on imports and exports; trade lists of offshore buyers and sellers.
"	Bureau of Public Roads Morgan Building Portland 5, Oregon CA 6-3361 or	Constructs and supervises roads in public lands and national forests.
"	408 Highway Building Salem, Oregon EM 4-2171, Ext. 559	
Corps of Engineers, U.S. Army	Portland District Room 537 628 Pittock Block Portland 5, Oregon CA 7-7681	Information on power resources. Information relating to navigable streams, dam sites, and harbor improvements.
"	North Pacific Division 210 U.S. Custom House Portland 10, Oregon CA 7-7681	
Forest Service (Agriculture Department)	729 N.E. Oregon Street Portland 12, Oregon BE 4-8211, Ext. 516	U.S. Forest Service maps. Aerial photographs.
Geological Survey (Interior Department)	Denver Federal Center Denver, Colorado	Sells U.S. Geol. Survey topographic and geologic maps of areas west of Mississippi River.
"	Director, U.S. Geol.Survey Washington 25, D.C.	Sells the Survey's circulars, geologic folios, topographic quadrangle maps, aerial photographic control surveys.

FEDERAL (cont.)

Agency	Address	Services and Information
Geological Survey (cont.) (Interior Department)	Fuels Branch Menlo Park, California	Conducts surveys and publishes information on mineral fuels.
"	Ground-Water Branch 1001 N.E. Lloyd Blvd. Portland 12, Oregon BE 4-3361	Water-well records and other information on ground water.
"	Map Information Service Washington 25, D.C.	Information on maps, aerial photos, and control surveys.
"	Mining Branch Salt Lake City, Utah	Handles royalties and leases of certain mineral deposits on public lands.
"	Oil and Gas Leasing Branch Regional Oil and Gas Office 1012 Bartlett Bldg. 215 West 7th Street Los Angeles, California	Administers regulations concerned with oil and gas drilling on Federal land.
"	Quality of Water Branch P.O. Box 3418 1001 N.E. Lloyd Blvd. Portland 12, Oregon BE 4-3361	Information on quality of surface and subsurface waters.
"	Surface Water Branch 1001 N.E. Lloyd Blvd. Portland 12, Oregon BE 4-3361	Data on stream flow and runoff.
"	Topographic Division Box 4197 Sacramento 21, California	Information on status of topographic mapping in State.
"	Water and Power Branch P.O. Box 3418 1001 N.E. Lloyd Blvd. Portland 12, Oregon BE 4-3361	Classification and mapping of public lands for power sites and reservoirs. Maintains file of topographic maps of western United States.
Office of Minerals Exploration (Formerly Defense Minerals Exploration Administration)	S. 157 Howard Street Spokane, Washington	Government exploration loans on a participating basis for all minerals except mineral fuels.
Small Business Administration.	Mittleman Bldg. 811 S.W. Washington St. Portland 5, Oregon CA 6-3361	Loans for mining equipment and mine buildings.

FEDERAL (cont.)

Agency	Address	Services and Information
Soil Conservation Service (Agriculture Department)	209 S.W. 5th Avenue Portland 4, Oregon CA 6-3361	Information on soils and water, dam sites, and materials for constructing dams.
Superintendent of Documents	Government Printing Office Washington 25, D. C.	Sells U.S. Bureau of Mines bulletins and technical papers; U.S.Geol. Survey annual reports, monographs, professional papers, bulletins, water-supply papers.

STATE OF OREGON

Board of Health	Sanitation & Engineering Div. State Office Building 1400 S.W. 5th Avenue Portland 1, Oregon CA 6-2161	Bacteriological tests on drinking water. Analysis of gases and fumes; chemical analysis of water.
Corporation Commissioner	520 State Office Building Portland 1, Oregon CA 6-2161, Ext. 256 or 1158 Chemeketa Street N.E. Salem, Oregon EM 4-2171, Ext. 1283	Status of Oregon mining corporations.
Engineering Examiners Board	717 Board of Trade Bldg. Portland 4, Oregon CA 8-0053	Conducts examinations for registration of engineers and land surveyors. Maintains lists of registered engineers and land surveyors.
Forestry Board	2600 State Street East Salem, Oregon EM 4-6851, Ext. 231	Administers laws and grants leases on mineral deposits in State forests.
Geology and Mineral Industries	1069 State Office Bldg. 1400 S.W. 5th Avenue Portland 1, Oregon CA 6-2161, Ext. 488	Analysis and identification of rocks and minerals, clay testing, spectrographic analysis, information on mining and geology, examination of mineral deposits, makes field studies, publishes and sells reports and maps. Administers oil and gas conservation act.
"	Field Offices 2033 First Street Baker, Oregon	Information on geology and mineral deposits; field inspections of mining properties; preparation of reports. Department reports for sale.
"	239 S.E. "H" Street Grants Pass, Oregon	

STATE OF OREGON (cont.)

Agency	Address	Services and Information
Highway Department	State Highway Building Salem, Oregon EM 4-2171, Ext. 771	Investigations of road construction materials.
"	Soils Section 2940 State Street East Salem, Oregon EM 4-6851	Investigate engineering properties of soils.
Industrial Accident Commission	Accident Prevention Div. Public Service Bldg. Salem, Oregon (mail only) 1176 Chemeketa Street Salem, Oregon	Enforce safety regulations in surface and underground mining and milling operations.
Land Board	106 State Capitol Salem, Oregon EM 4-2171, Ext. 255	Administers laws and grants leases on mineral deposits on State lands.
Oregon State College	Department of Geology and Department of Engineering Corvallis, Oregon	Engineering and geologic investigations. Soil studies.
Planning and Development Department	720 State Office Bldg. 1400 S.W. 5th Avenue Portland 1, Oregon CA 6-2161, Ext. 364	Compiles data on area resources. Contacts with industrial firms.
State Engineer	170 12th Street, S.E. Room 251 Salem, Oregon EM 4-2171, Ext. 281	Administers water rights; issues water-well permits; insures beneficial use of water.
University of Oregon	Department of Geology Eugene, Oregon	Geological investigations.
Water Resources Board	170 12th Street, S.E. Room 270 Salem, Oregon EM 4-2171, Ext.1198	Prescribes preferences for future use of water. Inventories quality of surface and subsurface water.

COUNTY

Agricultural Agents (One in each County)	Usually located at county seat	Analysis of soils for acidity, potash, and deficiencies.
Assessor or Surveyor	Offices in all county seats	Information on ownership of county land.
Clerk or Recorder	Offices in all county seats	Records location notices, miner's liens, proofs of labor, etc.

MISCELLANEOUS

Agency	Address	Services and Information
Raw Materials Survey	Chamber of Commerce 824 S.W. Fifth Avenue Portland 4, Oregon CA 9-9411	Publishes information on natural resources and markets.

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BUYERS OF INDUSTRIAL MINERALS IN OREGON

The following list of buyers of industrial minerals in Oregon is intended only as a guide to producers seeking a market for their product. Industrial minerals are normally used in large quantities and buyers must have a guaranteed source of supply that is consistent in quality over a long period of time. Although prices can be found in some trade journals regarding certain industrial minerals, generally a price for a product is determined only after negotiation between the buyer and the seller.

LaGrand Industrial Supply Co. 15 S.W. Arthur Street Portland 1, Oregon CA 7-3683	Lump iron ore, limestone, lime, silica sand, quartz
Miller Products Co. Foot of S.W.Caruthers Street Portland 1, Oregon CA 8-7608	Talc, gypsum, dolomite, limestone, sulfur, bentonite, diatomite
Pacific Supply Cooperative 1928 N.W. Vaughn Street Portland 10, Oregon CA 7-6621	Ground talc and limestone, lime, gypsum
Stauffer Chemical Co. North Suttle Road Portland, Oregon AV 6-3675	Talc
Van Waters & Rogers, Inc. 3950 N.W. Yeon Avenue Portland 10, Oregon CA 2-1721	General industrial minerals
Western Industrial Supply Co. 208 S.E. Hawthorne Blvd. Portland 14, Oregon BE 2-1511	Limestone, fireclay, bentonite, ganister

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SMELTERS IN THE WEST

American Smelting and Refining Co. Tacoma Smelter P.O. Box 1605 Tacoma 1, Washington	Gold, silver, and copper ores and concentrates
East Helena Plant East Helena, Montana	Lead ores and concentrates
Selby Smelter 405 Montgomery Street San Francisco 4, California	Lead ores and concentrates
Garfield Copper Smelter 700 Crandall Bldg. 10 West 1st South Street Salt Lake City, Utah	Copper ores and concentrates
Combined Metals Reduction Co. Felt Bldg. Salt Lake City, Utah	Lead and zinc ores and concentrates
International Smelting and Refining Co. Ore Purchasing Department P.O. Box 1265 Miami, Arizona	Copper, silver, and gold ores and concentrates
Ore Purchasing Department 818 Kearns Bldg. Salt Lake City, Utah	Lead and zinc ores and concentrates
Kennecott Copper Company McGill, Nevada	Copper ore
Magma Copper Co. Superior Arizona	Copper, gold, and silver ores
The Anaconda Co. Anaconda, Montana	Copper ores and concentrates
The Bunker Hill Co. Ore Purchasing Department P.O.Box 29, Kellogg, Idaho	Lead and zinc concentrates

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PRIVATE RESEARCH FACILITIES OFFERING SERVICES TO THE MINERAL INDUSTRY

Northwest Testing Laboratories 4115 N. Mississippi Portland 17, Oregon	Materials testing chemical analysis ore assays	Abbot A. Hanks, Inc. 624 Sacramento Street San Francisco, California	Assayers and chemists shippers representatives
Pittsburgh Testing Laboratories 2419 S.E. Powell Blvd. Portland 2, Oregon	Materials testing chemical analysis	Black and Deason P.O. Box 1888 Salt Lake City, Utah	Assayers and chemists
Smith-Emery Company 781 East Washington Blvd. Los Angeles 21, California	Assayers and chemists spectrographic analyses	Charlton Laboratories 2340 S.W. Jefferson Street Portland 1, Oregon	Materials testing chemical analysis metallurgical
W. H. Stowell and Co. West 421 Sprague Avenue Spokane, Washington	Assayers and chemists	Laucks Testing Laboratories, Inc. 1008 Western Avenue Seattle, Washington	Chemical and fire analyses

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SELECTED LIST OF GUIDEBOOKS AND DIRECTORIES

Engineering and Mining Journal - 1958 Mining Guidebook and buying directory, Mid-June 1958.

Mining World - Catalog, Survey and Directory Number, April 15, 1958.

Raw Materials Survey reports:

Smith, Barnard E., 1957, The 1956 raw material requirements of Pacific Northwest foundry and metallurgical industry: Market Survey 5.

Sterrett, Chester K., 1950, Consumption of refractories in Oregon and southern Washington, 1949: Market Survey 1.

" , 1955, Research facilities of the Pacific Northwest: Inf. Circ. 4, rev.

" , 1958, Principal chemical and metallurgical industries of the Pacific Northwest: Inf. Circ. 3, rev.

" , 1958, A directory of Pacific Northwest industrial minerals producers: Inf. Circ.8.

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NEW MARKET FOR QUICKSILVER

Van Waters and Rogers, Inc., have announced that they are buying and selling small lots of quicksilver, including fractional flasks. Small mercury producers wishing to dispose of their metal should either write to the company's Industrial Chemical Division, 3950 N.W. Yeon Avenue, Portland 10, or call CA 2-1721.

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GEORGE NISBET

George Nisbet, one of the region's last old-time hand miners and prospectors, died in his cabin on the Clackamas River August 13. He was 80 years old. Nisbet discovered the quicksilver deposits which have been named for him in the headwaters of the Clackamas.

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GOLD

The following statement was issued by the U.S. Treasury Department for general information. It does not have the effect of law, regulation, or ruling. The Gold Regulations were printed in the Federal Register, July 14, 1954. Copies of the regulations may be obtained from the U.S. Treasury Department, Washington, D. C.

"Gold in its natural state" is defined in the Gold Regulations as being gold recovered from natural sources, which has not been melted, smelted or refined, or otherwise treated by heating or by a chemical or electrical process. This gold may be purchased, held, sold, transported within the continental United States or imported without a Treasury Department license under the provisions of Section 54.19 of the regulations, regardless of the amount involved. This type of gold may also be held in custody for a resident of the United States without a license.

Gold in its natural state may be exported only under a special export license. The Bureau of the Mint grants such licenses solely for the purpose of enabling the owner to ship the gold abroad for refining or processing, subject to the condition that an equivalent amount of gold in refined or processed form is returned to the United States.

Gold in its natural state and gold amalgam may be melted, smelted or refined or otherwise treated by heating or by a chemical or electrical process only pursuant to a Treasury license (generally a TGL-13 license) or without a license within the limitations contained in Section 54.19 of the gold regulations.

Gold amalgam results from the addition of mercury to gold in its natural state. Gold amalgam produced from domestic sources may be dealt with in the same manner as gold in its natural state. The Mints and Assay Offices do not purchase gold in the form of amalgam.

In addition, gold amalgam may be heated to a temperature sufficient to separate the mercury from the gold (but not to the melting temperature of gold), without a license by the person, or his duly authorized agent or employee, who recovered the gold from natural deposits in the United States or a place subject to the jurisdiction thereof. The retort sponge resulting from the heating of the amalgam may be held and transported by the person who mined or panned the gold, without a license, except that he may not hold at any one time an amount of retort sponge produced by him which exceeds in fine gold content 200 troy ounces.

Retort sponge produced by a miner or panner may be sold to a United States Mint or Assay Office, to a person holding a Treasury Department gold license authorizing the purchase of such gold, or to unlicensed persons provided that such unlicensed persons do not hold, at any one time, more than 200 fine troy ounces of gold. Persons other than the miner or panner, who acquire retort sponge, may sell the gold only to the United States or to the holder of a Treasury license.

An unlicensed person may not retort gold purchased by him from miners or other persons, nor may he sell the retort sponge resulting therefrom.

Gold in melted or treated form may be sold or disposed of only by a person or concern operating under a Treasury gold license authorizing the disposition of gold in such form.

The Secretary of the Treasury, subject to the approval of the President, has authority to revoke or modify the Gold Regulations.

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TURKISH CHROME SUBSIDIZED

Turkish chrome ore exports are being "subsidized" by the Turkish Government. A payment to exporters of chrome ore of 2.1 lira per dollar of export value began Aug. 4. Actually, according to some metal firms, the new system is an indirect devaluation. It means exports can be made for lower prices than otherwise and should have some effect in encouraging exports. The same system is applied to other exports but the rate of "subsidy" varies. Accompanying it is an import tax which will doubtless help Turkey in getting her payments into balance. Before recent exchange rate changes exporters were getting 2.8 lira per dollar. Now they receive 4.9 lira - the 2.8 lira basic price, which has not been reduced, plus a premium of 2.1 lira.

(From E&MJ Metal & Mineral Markets, August 21, 1958.)

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MASON L. BINGHAM

Mason L. Bingham, Chairman of the Governing Board of the Department, died at his office in Portland September 4, 1958. Mr. Bingham, who had served as Chairman since April 1952, was first appointed to the Board by Governor Douglas McKay in April 1949 and continued his service through reappointments by governors Patterson, Smith, and Holmes. Under his guidance, the Department of Geology and Mineral Industries has made steady progress in developing Oregon's mineral industry. Mr. Bingham was instrumental in the adoption of the Oil and Gas Act by the State Legislature in 1953 and worked closely with the Department in its administration.

Although best known in the Portland area as Chairman of the Multnomah County Tax Supervising and Conservation Commission and as a member of the Multnomah County Board of Equalization, Mr. Bingham was also well known in southwestern Oregon as General Manager of the Benton mine, which had been acquired by his grandfather, J. C. Lewis, in 1894 and was Josephine County's largest mine just prior to World War II.

Mr. Bingham was an active champion of domestic mining and his influence was felt in many ways. At the time the government chrome program was set up in 1952, it was upon his suggestion that the local banks worked out a procedure for rapid payment of ore accepted by the stockpile, thus insuring working capital for the small miners. He wrote many "letters to the editor" on the need for developing a workable national minerals policy, the latest of which appeared in the local papers a few days before his death.

The press of the State has eulogized Mason Bingham on his service to his community, especially in the field of finance. The mining industry of Oregon adds its acknowledgment of his outstanding service, and the members of the Department of Geology and Mineral Industries are especially appreciative for his astute counsel in many policy decisions and grateful for the privilege of close association with him.

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NEW LAWS

The 85th Congress will be remembered by the mining industry mainly for what it did not do. It did, however, pass some important pieces of legislation that will affect mining. A brief resumé of these laws, as abstracted by the American Mining Congress and published in their Legislative Bulletin No. 18, is given below:

H.R. 5538 - Military Withdrawals of Public Lands. Approved by the President February 28, 1958. Public Law 85-337.

Provides that (1) withdrawals of public lands exceeding 5,000 acres for one Defense Department facility may be made only by Act of Congress, and (2) minerals in public lands withdrawn or reserved for military purposes may be disposed of only under the applicable mining and mineral leasing laws. No such disposal of minerals is to be made where the Secretary of Defense determines that such disposal would not be consistent with the military use of the lands.

S. 2039 - Assessment Work -- Geophysical Surveys. Approved by the President September 2, 1958. Public Law 85-876.

Permits geological, geophysical and geochemical work to be considered "labor" as pertaining to the annual $100-per-claim assessment labor requirement on unpatented mining claims. Such surveys must be conducted by qualified experts and "verified by a detailed report filed in the county office in which the claim is located which sets forth fully (a) the location of the work performed in relation to the point of discovery and the boundaries of the claim, (b) the nature, extent and cost thereof, (c) the basic findings therefrom, and (d) the name, address, and professional background of the person or persons conducting the work." Such surveys may not be credited for more than two consecutive years or for more than a total of five years on any one claim, and no survey may be repetitive of any previous survey on the same claim. Surveys are also limited to those made on the ground.

S. 2069 - Increase Maximum Acreage of Coal Leases. Approved by the President August 21, 1958. Public Law 85-698.

Increases from 5,120 acres to 10,240 acres the amount of public coal lands in any one State which can be held by an individual or company. An additional 5,120 acres may be leased if the Secretary of the Interior finds that the additional land is needed by the lessee "in order to carry on business economically and is in the public interest."

S. 3199 - Change Annual Assessment-Work Deadline. Approved by the President August 23, 1958. Public Law 85-736.

Changes the deadline for annual assessment work on unpatented mining claims from July 1 to September 1 of each year, beginning with the work-year ending in 1959. Deleted from the bill was a provision which would have granted a moratorium on assessment work for the year ending July 1, 1958.

S. 3817 - Establish Exploration Loan Program. Approved by the President August 21, 1958. Public Law 85-701.

Establishes a domestic minerals exploration loan program. The Secretary of the Interior may designate minerals (excluding organic fuels) which he deems necessary for the national interest and provide loans on a participating basis to private companies for exploration for such minerals. Government participation is limited to $250,000 for any one contract and the applicant is required to prove that funds for the exploration are not available from commercial sources on reasonable terms. Loans would be at the current Treasury interest rate plus two percent for administration, and repayment of any loan, with interest, is required through payment of royalties on minerals produced from the project. Congress appropriated $4 million for the agency's use in the current fiscal year, with the proviso that loans may not exceed 50 percent of the cost of a project.

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NEW BOARD MEMBER APPOINTED

Appointment of William Kennedy, Portland real estate appraiser and former manager of the Reconstruction Finance Corporation for Oregon for many years, to the board of the State Department of Geology and Mineral Industries was announced Sept. 17, by Governor Holmes.

Kennedy succeeds the late Mason L. Bingham, a longtime member of the board who had recently been reappointed to a new four-year term by Governor Holmes. With the naming of a successor, Governor Holmes voiced high praise for the long years of devoted service contributed by Bingham, "He held great responsibility for the efficient operation and service to the public by the Department, " the Governor said.

The new board member, an active Multnomah County Democrat, has been in private business as an appraiser and bankruptcy cases trustee for the past six years. Prior to that he had served since 1937 as manager of the Reconstruction Finance Corporation activities in Oregon and was assistant manager for four years before that.

A former resident of Hermiston, he was active in the promotion and development of the West Umatilla irrigation system, and served as a member of the Hermiston city council and as president of the Commercial Club there. Kennedy was born at Cove in 1882 and was educated in the public schools and at Whitman College. He entered the real estate business at Hermiston in 1915, served three years as United States Revenue Agent in Portland, and was engaged in liquidation and property management activity from 1919 to 1933. He became assistant manager of RFC in 1933.

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NOTE

Press dispatches that annual assessment work has been changed to $500 worth of work on each claim are incorrect. The amount necessary to hold unpatented mining claims still remains $100 per claim per assessment year. Only the time for completion of work has been changed. See Public Law 85-736.

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STATE OF OREGON
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KEEP STEPPING

On September 22 the United States established import quotas on lead and zinc amounting to 80 percent of the average annual imports for the period 1953-1957. The announcement was met with varying responses: a spokesman for the lead-zinc industry stated that the action was much less than had been hoped for; countries which import the metals into the United States (annual average 1953-1957, 443,400 short tons of lead and 651,200 short tons of zinc) issued statements ranging from consideration of severing diplomatic relations to scathing criticism; lead-zinc mining states, whose unemployment rolls had risen to an alarming high, were relieved to find something was done that recognized their plight; nonmining states and port areas expressed opinions which generally deplored the decision as damaging to free trade. The domestic producers of the nonferrous metals, still smarting from House defeat of the minerals stabilization bill, were surprised at the direction federal assistance had taken. Of all the ways domestic mining could be strengthened - i.e., tariffs and their variations, support prices, stockpiling, direct subsidies, and barter - quotas seemed the least likely to be adopted due to diplomatic difficulties in assigning allotments.

Just prior to the United States announcement of quotas, a United Nations sponsored meeting was held in London to consider views and suggestions on a plan to help world producers of lead and zinc achieve a better balance between supply and demand. It was reported that the United States, Peru, Mexico, and other nations were ready to proceed with a voluntary restriction of 20 percent on exports, based on 1957 figures, but Canada is said to have blocked acceptance of the scheme. Early this month (October) a statement was drafted by State Department officials setting forth the views of the United States on the problem of the two metals. The statement was to the effect that the 80 percent import quota merely represents a sharing of this nation's burden with other countries, the United States having cut its own production as the result of imports of considerable quantities from other countries.

Up to now there has been little worldwide "sharing of the burden" of overproduction in nonferrous metals. The domestic producers have had to take up almost all of the world slack, and because most mines are located in the West the effect has been concentrated in a relatively restricted area with serious economic results.* The value of metallic mineral production in the 11 western states dropped 25 percent from $1,300,000,000 in 1956 to $977,000,000 in 1957. Production of some commodities - for instance, tungsten, chrome (on the West Coast), and antimony - has stopped completely and other commodities, such as mercury and manganese, are in a very shaky condition. None of the western mines competing on the world market have escaped drastic cutbacks.

The nation, for its survival, must keep domestic mining in as many fields as possible in order to maintain a raw material base, a trained working force, and continued exploration for new deposits. This necessity has been demonstrated several times in the last two decades. Examples that stand out are: the frantic search for a wide variety of minerals during wartime when foreign sources of supply were cut off; the big uranium program following realization of the tremendous importance of fissionable material; and the discovery of deposits to fulfill bulk demands by the jet and rocket manufacturers for elements hitherto regarded as laboratory curiosities. Recently the world supply of minerals and metals has been used as a weapon of economic warfare, as witness the market disturbances in aluminum and tin caused by dumping of metal by the U.S.S.R. This threat continues.

Unfortunately many people consider the recurring crisis to the domestic metal mines as temporary difficulties to be met by temporary measures. Many others are out of sympathy with the domestic producer because they subscribe to the fallacious theory that minerals should be left in the ground for future use. These people never give thought to the fact that mineral deposits are to be found only through exploration and that exploration depends on steady, profit-making mining operations capable of supporting the expense.

A step has been taken to strengthen our domestic mining industry. Many more steps must be taken to prevent mining from becoming an Achille's heel of national security.

Hollis M. Dole, Director.

* Annual value of all farm products in 11 western states is nearly 5 billion dollars, minerals produced 3.3 billion dollars, forest products 3¼ billion dollars.

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THE FOREIGN MINERAL TRADE OF THE U.S.S.R. IN 1956*

By
Alexander Gakner**

The following article has been extracted from the U.S. Bureau of Mines Mineral Trade Notes, a monthly inventory of information obtained from U. S. Government Foreign Service offices and other sources. The report, according to the foreword, is based on a 150-page "Statistical Review of the U. S. S. R. Foreign Trade in 1956" which was issued by the Soviet government in 1958, the April and May 1958 issues of "Vneshnyaya Torgovlya," and numerous other sources. Parts of the report are reproduced below in order that people living in Oregon may better understand the mineral activities of Russia and how they use minerals and metals as an instrument of foreign policy. Those wishing the complete report should write to the U.S. Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pennsylvania, giving the title and references in the footnote.

Ed.

Foreign-Mineral Trade - Reasons and Motivations

Soviet mineral trade. - The number and quantities of mineral and metal commodities that the Sino-Soviet bloc of nations, headed by the U.S.S.R., is offering for sale on the world markets are constantly growing. Augmenting the traditional exports of manganese ore, chromite, gold-platinum group metals, asbestos and anthracite, the Soviet Union trades in about 35 additional mineral and metal commodities with the Free World and in an even greater number within the Sino-Soviet bloc. By 1956 the value of the Soviet foreign-mineral trade (exports plus imports) exceeded US$2 billion (at the artificial commercial exchange rate of 4 Soviet rubles to US$1.

Effect on Free-World markets. - Many of the Soviet mineral commodity exports constitute a small proportion of the Free-World mineral needs; nonetheless, even relatively small Soviet shipments of such items as aluminum, tin, and zinc, particularly when injected at a lower price, dislocate established Free-World trade patterns.

Economic planning.- Mineral and metal trading companies must have facts to look into the future and plan. Since, however, the Soviet Union does not (nor do the other communist nations of the world) publish complete production and consumption statistics, reserves of commercial mineral resources, plant capacities, or production costs, the already difficult task of mineral-market analysts is further complicated by the addition of a potentially large, unknown quantity -- Soviet mineral exports and imports.

Large mineral resources. - Soon after World War II the Soviet Union realized the strategic significance and the economic importance of a broad and well founded domestic mineral raw-material base for industrial development. Organized geological prospecting and exploration were greatly intensified. According to various reports, in a single year as many as 6,000 field parties (some with as many as 1,000 members) employing modern tools and methods, including geochemical prospecting, were engaged in exploring for minerals and in large-scale geological mapping of the country. The total annual exploration budget is equivalent to approximately 1 percent of the Soviet Gross National Product.

As a result of this work, the U.S.S.R. claims possession of commercial reserves of all mineral commodities, including diamonds. It further claims the world's largest explored reserves of iron ore (41 percent of world total), manganese ore (88 percent of world total), copper, lead, zinc, nickel, bauxite, tungsten, mercury, mica, potash salts (54 percent of world total), peat (60 percent of world total), coal (53 percent of world total geological reserves), and significant resources of crude petroleum, natural gas, phosphate raw material (nearly one third of world total explored reserves), titanium, molybdenum, uranium, sulfur, and numerous other minerals. There are insufficient quantitative data on the individual commodities to support these Soviet claims to such vast mineral resources. In fact, some statements are inconsistent with widely accepted views, for example, that Communist China has the world's greatest tungsten resources. Similar uncertainties arise in respect to other minerals (mercury,

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* From U.S. Bureau of Mines, Mineral Trade Notes, Special Supplement No. 55 to vol. 47, no. 3, Sept. 1958.
** East European Specialist, Division of Foreign Activities, U.S. Bureau of Mines.

sulfur). However, the U.S.S.R. if for no other reason than its immense size, undoubtedly possesses great mineral wealth, and, according to Soviet sources, the proved reserves of most mineral raw materials are increasing faster than their exhaustion by expanding industry. Furthermore, where Soviet resources are inadequate, the country can draw on the resources of its satellites in Europe and Asia.

Mineral industry. - The U.S.S.R. has built an impressive mineral and metal industry and has become the world's second largest producer and consumer of most mineral and metal commodities after the United States. The minerals and metals industry is providing one of the more stable pillars for the support of the communist way of life. From a nation that less than 3 decades ago required foreign brainpower and financial aid to develop its basic mineral industries, it has, despite the devastating war, become a country capable of competing successfully in a Free-World market. Mineral and metal products play an increasingly important role in the Soviet Union's foreign trade and as an instrument of foreign policy. Along with ferrous and ferroalloy ores and metals, precious metals, nonferrous metals, nonmetallics, solid and liquid fuels, and construction materials, the country now exports technical competence as well: Construction of steel facilities in India; plans for construction of oil refineries, coal washing, cement, fertilizer, and aluminum plants; offers to perform countrywide geological exploration; programming technical assistance; and training foreign students and technicians are manifestations of present-day Soviet capabilities and efforts to penetrate into traditionally Western endeavors.

Inferior raw materials and poor economics. - There is ample evidence that many of the Soviet mineral raw materials are inferior to those produced and/or consumed in the United States. In some instances unfavorable geographical distribution of superior deposits precludes their use.

Although Soviet mining men, metallurgists, and economists claim great progress, the mining and metallurgical industries of the U.S.S.R. are plagued with low labor productivity, raw-material supply and distribution, and transportation problems. Many Soviet ventures in the minerals and metals field are economic failures if measured by Western standards. The Soviets admit, for example, that although the entire Ministry of Coal Industry operated at a profit in 1955, more than half the coal mines finished the year with a net loss. Now that all mineral and metal industries have been combined into one Ministry of Geology and Conservation of Natural Resources the policy of subsidizing nonprofitable operations may very well carry over from one mineral industry to another.

Post-World War II mineral and metal developments. - A large part of the Soviet industrial capacity, including the Krivoi Rog iron ore and the Donets and Moscow coal basins, was in areas occupied by the Germans soon after they attacked the U.S.S.R. This necessitated increased industrial development and activity in the eastern U.S.S.R. After World War II the transplanted industries in the new eastern locations continued to operate, and the Soviet Union set out to reconstruct its devastated industries in the western parts of the country with equipment dismantled in Eastern Europe, reparation payments from most of the same nations, and forced labor.

Prewar levels reached. - In 1948, three years after V-E Day, the Soviet had almost reached prewar production rates of most mineral and metal commodities. By 1949, the U.S.S.R. reports, the country had exceeded its 1940 production rates of iron ore, pig iron, steel, coal, coke, petroleum, natural gas, and many other mineral commodities.

During that period (circa 1948) the U.S.S.R. put into effect a Master-Plan, tying the economies of the East-European communist nations with that of the Soviet Union and initiating a stockpiling program. Meanwhile, the United States and its western allies placed an embargo on shipments of strategic materials (including most mineral and metal commodities) to Soviet-bloc nations.

The Master-Plan. - By 1948 Communist regimes were firmly established in the Eastern European countries. Mining and metallurgical industries were nationalized along with all others. Two, three, five, and six-year plans for the economic development of these countries were initiated; and all these lesser plans became part of a comprehensive Soviet master-plan.

Joint mining companies were organized between the Soviet Union and its satellites, ostensibly to help the satellite nations to develop their mineral resources properly. "Gorubso" (Soviet-Bulgarian Mining Administration), "Sovrompetrol" (Soviet-Rumanian Petroleum Co.), and "Wismut A.G." (Soviet-East German Uranium Mining Co.) are examples of such companies. To these joint companies the Soviets contributed mostly administrative skill, sometimes technical assistance and equipment as well, and in return for this contribution the Soviet Union received a large share of the mineral output from these nations. The U.S.S.R. also made large purchases of mineral commodities from these nations at most favorable prices. Before the Polish uprising (Poznan 1956), for example, the U.S.S.R. purchased from that country about 8 million tons of coal annually at prices that just about covered transportation costs. Some of the mineral commodities acquired by the U.S.S.R. in this fashion were frequently resold on world markets at several times the purchase price. Although nearly all the joint companies (except for those mining uranium) have been dissolved, the U.S.S.R. may act as agent for its satellites in the international trade of many a mineral commodity.

Stock-piling program. - As minerals and mineral products flowed into the Soviet economy, the country started a stock-piling program. It is reasonable to assume that the program is similar basically to that of the United States, and similarly the Soviet stockpiling objectives have already been achieved for the majority of mineral commodities considered strategic in the U.S.S.R. It is further possible that the Soviet Union started with a program to cover a long emergency period and has now decided to plan for a shorter one. If so, some stockpiled minerals may be considered surplus supplies available for foreign trade.

Western embargo. - As East-West tensions increased after World War II, the Western Allies decided to discontinue shipments of strategic commodities (including strategic minerals and metals) to the U.S.S.R. and its satellites in 1948. This was obviously intended to deprive the Soviet economy of vitally needed raw materials and finished products and to weaken that country's offensive potential. While this policy may have caused temporary set-backs, just as obviously its effects were dissipated in the long range as the Soviet Union proceeded towards higher and higher production and greater self-sufficiency. The Soviet Union was forced into development of certain industries to make up for no longer available imports, even if it required the use of more costly raw materials. What it could not produce indigenously, it acquired from its satellites in Europe and Asia. What the country could not find within the Communist bloc (industrial diamonds) it was able to purchase outside despite the embargo. When other measures failed to satisfy its needs, the Soviet government intensified scientific research to find suitable substitutes.

Soviet motivations and reasons. - Among other mineral commodities, three highly competitive metals from the U.S.S.R. - aluminum, tin, and zinc - have recently made a debut into Free World markets. These three metals as far as the Soviet Union is concerned, have one thing in common: in each case the U.S.S.R. imports either some of the raw material or some finished metal from other bloc countries:

1. Bauxite from Hungary and fluorspar from China and Mongolia.

2. Zinc concentrate from Bulgaria, North Korea, and China, and zinc metal from Poland.

3. Tin metal from China.

This circumstance makes it difficult to form a clear picture of the Soviet trade plans and motivations. In addition to the economic motivations given below, there is evidence that the Soviet may now be able to use its mineral-production potential as a formidable economic-political weapon through foreign trade. Such activities are facilitated by the integration of the Soviet trade organizations in the government of the U.S.S.R. Some of the motives behind the Soviet foreign-mineral trade might be:

1. The Soviet Union initiated a crash program to meet its stockpiling objectives. Now that some of these objectives have been met, the country finds itself with a surplus production capacity of some minerals and metals.

2. As a result of the large exploration program, the Soviet Union found new mineral resources, which it developed beyond its own normal domestic needs.

3. The country needs foreign exchange to purchase industrial equipment and is prepared to sacrifice some of its own domestic needs in mineral raw materials.

4. The recent economic reorganization of the country resulted in a slowdown in the development rate of some mineral and metal industries, while other mineral industries did not experience a commensurate slowdown of development pace and are out of step with the rest of the country's industrial development program.

5. Because the Soviet Union exports many commodities for which she herself depends on substantial imports from other Communist nations, it is possible that it is in the interest of the U.S.S.R. to keep world prices for these commodities down, as Free-World market prices also affect the price that the Soviet Union must pay to its satellites for the same commodities.

Desire United States trade. - As evidenced by the appointment of an experienced trader to the Soviet ambassador's post in Washington, D.C., and by their recent attempts to purchase taconite and chemical plants in the United States, the Soviet Union would like to remove the barriers to normal trade development between the two Nations. Soviet earning power in the United States, however, is limited because of the absence of a formal trade agreement, which would entitle the U.S.S.R. to the lower tariff rates of a "most preferred nation." At the higher tariff rates, the Soviet Union finds it difficult to compete for United States markets. Given the opportunity, the U.S.S.R. would like to sell iron ore, manganese, chromite, and anything else for which it can find a market in the United States.

Exports vs. Imports - Mineral Commodities

Several features are outstanding in the Soviet foreign-mineral trade developments:

Table 1.

Soviet Foreign Trade in Mineral Commodities in 1956
in percent of total trade
(Value in 1,000 Soviet rubles 1/)

	Exports 2/		Imports	
	Value	Percent of total trade	Value	Percent of total trade
Total value of all trade . .	14,676,800	100.0	14,452,500	100.0
Fuels:				
Solid	571,137	3.9	475,354	3.3
Liquid	1,132,540	7.7	548,725	3.8
Total fuels . . .	1,703,677	11.6	1,024,079	7.1
Metals:				
Ores and concentrates .	520,113	3.5	1,498,503	10.4
Ferrous metals	1,534,690	10.5	582,765	4.0
Nonferrous metals . . .	629,322	4.3	572,374	4.0
Total metals . . .	2,164,012	14.8.	1,155,139	8.0
Nonmetals	165,528	1.1	49,482	0.3
Total mineral trade	4,553,430	31.0	3,727,203	25.8

1/ 4 Soviet rubles equals US$1.
2/ All exports include re-exports.

1. From 1938 to 1956 the proportion of mineral imports to the total value of foreign trade dropped from 29 to 26 percent, and exports of mineral commodities increased from 13 to 31 percent.

2. Almost all the increase in the proportion of exports is due to the growth in ferrous and nonferrous metal exports.

3. While nearly all the prewar mineral imports consisted of metals and metal products, these commodities constituted less than one-third (by value) of the Soviet mineral imports in 1956.

4. The U.S.S.R. is establishing itself (particularly within the Sino-Soviet bloc) as a manufacturing nation. In 1956 the Soviet Union imported about three times as much ore and concentrate by value as it exported. On the other hand, in metals it exported twice as much by value as it imported (see table 1).

East vs. West Trade in Mineral Commodities

Table 2.

Value of Soviet Foreign Mineral Trade
by Continent and Bloc, 1956
(1,000 Soviet rubles 1/)

	Exports 2/		Imports	
	Total value all trade	Total value mineral trade	Total value all trade	Total value mineral trade
Free world nations:				
Europe	2,326,000	973,180	2,196,900	579,123
Asia	404,500	177,926	683,800	11,047
Africa	155,826	78,528	285,700	---
South America . . .	88,200	60,792	172,000	---
North America . . .	117,300	318	117,500	1,829
Oceania	34	---	34,100	---
Total . . .	3,091,860	1,290,744	3,490,000	591,999
Communist nations . . .	10,917,900	3,048,880	10,943,100	2,567,457
Unaccounted	667,040	213,806	19,400	567,747
Grand total	14,676,800	4,553,430	14,452,500	3,727,203

1/ 4 Soviet rubles equals US$1.
2/ All exports include re-exports.

Although there are still large gaps in the Soviet trade statistics, it is possible to estimate that approximately 70 percent of the export trade in mineral commodities and probably more than 80 percent of the import trade is with the Communist nations (including Yugoslavia). There are not enough historic mineral-trade statistics available to establish any definite overall trends. In individual commodities, however, such trends are quite apparent. This is particularly true of tin, zinc, and aluminum.

Within the Free World, about three-quarters of the Soviet mineral trade is with European nations -- the United Kingdom, Finland, France, the Federal Republic of Germany, Italy, and Sweden (in that order) heading the list.

Within the Sino-Soviet bloc the principal mineral-trading nations are China, the German Democratic Republic (East Germany), Poland, and Czechoslovakic (see table 2).

Mineral-Trade Patterns

Metals:

Ores and concentrates.- Soviet exports of ores and concentrates consist almost entirely of iron ore, manganese ore (including some battery grade), and chromite. While significant exports of manganese and chromite are traditional with the U.S.S.R., the large shipments of iron ore, all to Communist nations in Europe, are an outgrowth of post-World War II developments. Before the war, the Soviet Union shipped a maximum 1.1 million tons of iron ore in 1931 to Poland, Czechoslovakia, and the United States. After the war, the European Communist nations insisted, and the U.S.S.R. encouraged them, upon the development

of basic iron and steel industries at home, of a size unwarranted by indigenous iron-ore resources. In 1956 the Soviet Union supplied about 50 percent of the iron contained in the total pig-iron output of the satellite nations in Europe for that year by exporting 11.6 percent of its own marketable iron-ore output. Following are the Soviet Union's exports of manganese, chrome, and iron ore for selected years, in 1,000 metric tons:

	1946	1950	1955	1956
Iron ore	792	3,227	8,818	9,124
Manganese ore . . .	281	277	851	918
Chrome ore	122	96	158	219

At the same time Soviet imports consist primarily of bauxite, zinc, and lead ores and concentrates, and some ferroalloy-metal concentrates. In these Soviet-import statistics are considerable gaps. For example, there are no details on Soviet ore and concentrate imports from Bulgaria, Czechoslovakia, or any of the other European satellites. The Soviets admit imports of tungsten and molybdenum concentrates from China but will publish no details. There is, of course, a complete blackout in the field of fissionable raw materials.

Nonferrous metals. - The Soviet Union's nonferrous metal trade is principally with the Communist nations. Much of its exports are re-exports (zinc, tin, antimony, cadmium) or domestic products that have been made available as a result of the sizable imports. Most interesting are the Soviet Union imports of tin from China in 1,000 metric tons:

	1950	1955	1956	1957
Tin	3.8	16.9	15.7	22.0

Of equal interest are the imports of zinc from Poland - about 47,000 metric tons for each of the years 1955 and 1956. Polish export statistics show the following zinc and zinc-alloy shipments to the U.S.S.R. in 1,000 metric tons:

1953	1954	1955	1956
54.4	50.5	51.1	49.0

Here the Soviet statistics are deficient in that they do not show the probably sizable mercury imports from China nor do they give enough detail about imports of copper. The bulk of the country's copper imports, however, almost all in the form of copper wire, can be traced to shipments from the United Kingdom (40,600 tons in 1956), the Federal Republic of Germany (5,100 tons), Belgium-Luxembourg (3,300 tons) and Yugoslavia (1,500 tons).

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SOUTHERN OREGON-NORTHERN CALIFORNIA CHROME MINERS FORM CO-OP

At a meeting of the California-Oregon Chrome Producers Association in Cave Junction, Oregon, September 27, articles of incorporation were signed forming the group into a co-operative. Incorporation directors were given as Jack Eggers, Cave Junction, Oregon; Eugene R. Brown, O'Brien, Oregon; and Harry E. Hawk, Ashland, Oregon. Bruce J.Manley, attorney, was named agent for the co-op and the principal place of business was given as 212 Leverette Building, Medford, Oregon.

Purpose of formation of the Association was given in the Articles of Incorporation as: Mining, milling, beneficiation, blending, storing, purchasing equipment and supplies for resale or rental to members, conversion of chrome and other ores and concentrates to higher end-use and more salable products, marketing, research, and such other activities as may be conducted by cooperative associations for the benefit of its members.

Since completion of the GSA stockpile in May of this year, all chrome mines in Oregon and California have shut down as price of foreign ore was below western mining costs. It is the plan of the newly formed Association to investigate the possibility of marketing their chrome ore as ferrochrome manufactured in a cooperative-owned electric furnace. By competing on the open market at the finished product level, it is believed the mines can be kept open and western chrome mining can be placed on a firm base.

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NEW DRILLING PERMIT

Permit No. 34 was issued to the Linn County Oil Development Company to drill an oil test on October 6, 1958. The hole is to be drilled on the Elmer Barr property located in sec. 31, T. 11 S., R. 1 W., Linn County. Approximate elevation is 365 feet. Principals in the company are P. L. Turnidge of Albany, president; C. M. Lowen of Salem, vice president; and Adolph Hildebrand of Dallas, secretary. Address of the company is given as 80 East Maple Street, Lebanon, Oregon.

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MINING NEWS

Webster Decker and Wilford Sirrine of Salt Lake City have completed several weeks of exploration trench work on a molybdenum prospect located on the east side of the Elkhorn Mountains in Baker County. The claims, held by Robert Hulin and associates, are situated on the north side of the North Powder River. Work has been suspended for this season but it is understood the lessees plan to resume exploration next spring and that they are considering drifting the prospect.

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KENNEDY APPOINTED CHAIRMAN OF DEPARTMENT BOARD

At a meeting of the Governing Board of the Department held in Portland, October 14, Mr. William Kennedy was selected to act as Chairman of the group. Mr. Kennedy, who received his appointment to the Board from Governor Robert D. Holmes September 17, is from Portland. Other members of the Board are Nadie Strayer, Baker, and Les Child, Grants Pass.

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HEARINGS TO BE HELD IN BEND ON WILDERNESS BILL

A subcommittee of the Senate Interior and Insular Affairs Committee will hold public hearings November 7 in Bend, Oregon, on a bill to establish a vast wilderness preservation system in National Forest and other public domain lands.

According to the measure, "The Wilderness System shall be devoted to the public purposes of recreational, educational, scenic, scientific, conservation and historical use." The bill provides that "Within such areas . . . there shall be no permanent road; nor shall there be any use of motor vehicles, motorized equipment, or motorboats, or landing of aircraft, nor any other mechanical transport or delivery of persons or supplies, nor any temporary road, nor any structure of installation, in excess of the minimum required for administration of the area for the purposes of this Act."

Included in the system would be (1) wilderness, wild, primitive, or roadless areas within the national forests (the Secretary of Agriculture can designate additional areas for inclusion); (2) each park, monument, and recreational area in the National Park System embracing a continuous area of 5,000 acres or more without roads (additional units could be designated for inclusion by the Secretary of Interior); (3) wildlife refuges and game ranges designated by the Secretary of Interior; (4) areas of tribal land on Indian reservations designated by the Secretary of Interior after consultation with authorities of the tribes; and (5) such other units as may be designated within any federally owned or controlled area of land or water by the Government officials having jurisdiction.

Persons wishing to testify at Bend should contact Senator James Murray, Chairman of the Senate Committee. Other hearings will be held at San Francisco on November 10; Salt Lake City on November 12; and Albuquerque, New Mexico, on November 14.

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NEW LAWS
(Continued)

The following new laws were passed by the last session of Congress. These items are a continuation of the list appearing in the September Ore.-Bin but were not included for lack of space. The resumé is from the American Mining Congress Legislative Bulletin No. 18.

H.R. 10969 - Extend Defense Production Act. Approved by the President June 28, 1958. Public Law 85-471.

Provides for a 2-year extension of the Defense Production Act, including priorities and allocations and distribution of materials to the civilian market. Also provides for the expansion of productive capacity and supply through loans to private business enterprises, including the exploration, development and mining of strategic and critical metals and minerals, the purchase of raw materials, the development of substitutes for strategic and critical materials and regulations dealing with the national stockpile. Also extends the executive reserve program and programs for the encouragement of small business, the distribution of defense contracts and exemptions from the antitrust laws in certain instances.

H.R. 12591 - Extend Trade Agreements Program. Passed Senate, amended, July 22. Differences between the House version (which included a 5-year extension) and the Senate version (which included a 3-year extension) were compromised by a joint conference committee. Signed by the President August 20, 1958. Public Law 85-686.

Extends the President's authority to enter into trade agreements for four years to June 30, 1962, and permits him to further reduce tariffs by as much as 20 percent. The law also provides that (1) not more than a 10 percent reduction could become effective in any one year; (2) no reduction could become initially effective after June 30, 1962; (3) under escape-clause procedure, the President may (a) raise duties as much as 50 percent above the rates in effect July 1, 1934, rather than January 1, by 1945, (b) base an increase on the ad valorem equivalent of a 1934 specific duty, and (c) impose a duty not in excess of 50 percent ad valorem on any article not otherwise subject to duty; (4) Congress may override a Presidential decision in an escape-clause case by a two-thirds vote of both Houses; and (5) under the National Security provision, which empowers the President to take such action as he deems necessary to adjust imports which are threatening a defense-essential industry, consideration must be given during any investigation to unemployment and to the "investment, exploration, and development necessary to assure (the industry's) growth."

S. 3651 - Small Business Aid. Approved by the President August 21, 1958. Public Law 85-699.

Provides for a system of small business investment companies, Federally chartered, to provide equity capital and loans of long duration to small business enterprises. Such investment companies would be privately operated with the Federal Government supplying a portion of the initial funds.

Legislation of particular interest to the mining industry which fell by the wayside during the 85th Congress is given below by title only.

(1) Tax-Free Period for Certain New Mines.

(2) All Minerals Stabilization Bills.

(3) Authorize Production Incentive Payments on beryl concentrates, metallurgical chromite, columbium-tantalum concentrates, metallurgical manganese, mercury, cobalt, antimony, metallurgical-grade fluorspar.

(4) Free Market for Gold.

(5) Give tariff Commission Control over Duties on Critical Minerals.

(6) Federal Inspection of Metallic and Nonmetallic Mines.

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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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Telephone: CApital 6-2161, Ext. 488

Field Offices

2033 First Street
Baker

239 S.E."H" Street
Grants Pass

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MINING LANDS ARE MULTIPLE-USE LANDS

"Our expanding economy is creating added demands for the use and development of the public lands and their resources. Not so long ago public land could be dedicated to a single purpose or use - it could be used exclusively for mining, grazing, logging, or for recreation. Now, however, the demand for public lands and resources is so great by individuals and corporations that single-purpose use is no longer generally satisfactory." So said Director Edward Woozley, whose Bureau of Land Management exclusively administers approximately 468 million acres of federal land and has the responsibility for the administration of mineral resources on some 800 million acres. The occasion for the statement was a speech before the 1958 meeting of the American Mining Congress in San Francisco, September 24, 1958.

Mr. Woozley's statement caused very little comment at the meeting, for mining people are accepting as a fact that mining lands are multiple-use lands. In 1954 Public Law 585 cleared the way for developing locatable minerals in some 60 million acres of public land then under oil and gas leases and, conversely, permitted oil and gas development on land under mining location. In 1955 Public Laws 167 and 359 were passed. Public Law 359 restored to mining location about 7.2 million acres of land that had been previously set aside as water- and power-site withdrawals. Public Law 167 limited the use of a mining claim to prospecting, mining, and processing operations only. Under this law the government manages the timber resources just as if there were no mining claim location. Access can be had on and across the claim for timber, grazing, hunting, fishing, and recreation as long as it does not interfere with the actual mining operation. Public Law 167 also set forth a procedure whereby claims located prior to passage of the law could be examined and if certain requirements were not met by the claim holder the surface rights would be managed by the government.

Since enactment of Public Law 167 the U.S. Bureau of Land Management and Forest Service have examined and requested publication on approximately 33 million acres of land. Within this 33 million acres, mining claimants filed answers (verified statements to the effect that mining was the highest use of the land) covering approximately 9,300 claims, but subsequently, either by waiver or stipulation, about 650 claims were withdrawn by the claimants. In 1958, eleven hearings involving 35 claims were held to determine if the government was to manage the surface of claims. As of June 30, 1958, eighteen hearings involving 55 claims were pending. This number is much less than had been anticipated by the federal agencies.

In Oregon in the past 2½ years, the Forest Service has examined more than a million acres and made preparations for examining another 1 3/4 million acres. The Bureau of Land Management has examined parts or all of 102 townships, or an amount nearly the same as the Forest Service. (See following pages for progress report.)
In addition to the examinations under Public Law 167, it should be noted that all mining locations in Oregon's Mount Hood National Forest (1,115,505 acres) have been on a multiple-use basis since 1934. The law establishing this even reserved the title to the surface of the lands and its products to the United States after patent.

Mining is not the only land user that has been forced to recognize the principle of multiple use. Public Law 337, passed in 1958, put a limitation (5,000 acres) on the amount of land that can be withdrawn by a Defense Department facility without an act of Congress and opened public land withdrawn or reserved for military purposes to mining. Owners of large blocks of private timber and grazing land open their lands to hunters and fishermen. Power and timber companies are doing an excellent job in developing recreational sites for public use. Mining companies have embarked upon reforestation programs, land-reclamation projects, and recreational-site development.

Increasing pressure from all sides has caused industry to recognize and accept the principle of multiple use of land. The cooperation shown in furthering the principle indicates that a major problem of an expanding population and industry can be successfully met. But this encouraging trend is not without inharmonious elements. Proposed contradictory legislation does crop up. The most publicized in recent weeks has been the Wilderness System bill. Hearings on this bill have brought out that a minimum of 50 million acres of public land would be set aside for single-purpose use. Advocates of this type legislation should take a long hard look to determine if this legislation will not jeopardize the multiple-use principle.

Hollis M. Dole, Director

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PROGRESS REPORT OF AREAS IN U. S. NATIONAL FORESTS APPROVED FOR DETERMINATION OF SURFACE RIGHTS

Forest	Name of Area	Acres Nat'l Forest Land	Acres Examined	Approved for Examination	Date of First Publication	End of 150-day Period
Fremont	Chemult	8,500	8,500	5-17-1956	2-27-1957	7-29-1957*
Deschutes	Chemult	45,500	45,500	5- 4-1956	2-27-1957	7-29-1957*
	Bend	29,760		5- 1-1957		
	Tolo	9,750		5- 1-1957		
	Ground	1,120		5- 1-1957		
Malheur	Twin	55,200		7- 5-1956		
	Dixie	36,070	36,070	1-29-1958	9-25-1958	2-22-1959
	Baldy	47,830		7- 5-1956		
	Canyon	22,680		4-25-1957		
Ochoco	Round "A"	24,450	10,440	7- 5-1956	11-20-1957	4-21-1958*
	Round "B"		14,015	7- 5-1956	9- 4-1958	2- 1-1959
	Marks	30,170		7-31-1957		
	Green Mountain	22,920		7-31-1957		
Rogue River	Applegate "A"	113,250	17,785	7- 5-1956	9- 4-1958	2- 1-1959
	Elliott "A"	49,260	5,812	7- 5-1956	6-19-1957	11-18-1957*
	Union "A"	230,400	39,295	4-17-1957	9-17-1958	2-14-1959
Siskiyou	Wildhorse	53,000	53,000	2- 2-1956	2-21-1957	7-22-1957*
	Elk "A"	138,220	14,570	7-11-1956	9-12-1957	2- 9-1958*
	Elk "B"		110,706		9-11-1958	2- 8-1959
	Elk "C"		4,487			
	Fuller	8,800	8,800	7-11-1956	2-21-1957	7-22-1957*
	Taylor	34,230	34,230	7-11-1956	9-11-1957	2- 8-1958*
	Illinois	45,350		7-11-1956		
	Pistol	39,950	39,950	7-11-1956		
Umatilla	John Day "A"	29,165	8,942	7-11-1956	9-25-1957	2-23-1958*
Umpqua	Bohemia	157,460	157,460	7- 5-1956	9-17-1958	2-14-1959
	Steamboat	24,000		7-31-1957		
	Cow Creek	58,000		7-31-1957		
Whitman	Dooley Mountain-Buffalo	44,000	44,000	6- 1-1956	2-27-1957	7-29-1957*
	Pine	82,230	82,230	7- 5-1956	2-21-1957	7-29-1957*
	Woodley	35,250	35,250	7- 5-1956	2-27-1957	7-29-1957*
	Unity	37,500	37,500	7- 5-1956	2-21-1957	7-29-1957*
	Baker "A"	261,770	79,120	3-22-1957	5-28-1958	10-27-1958*
	Bull Run	22,200		3-22-1957		
	Whitney	37,700		3-22-1957		
	Eagle	89,600		3-22-1957		
	Limber Jim-Sheep Creek	39,780	39,780	3-22-1957	5-21-1958	10-20-1958*
	Snake River	31,750	31,750	3-22-1957	5-22-1958	10-20-1958*
	Summit	35,720		3-22-1957		
Willamette	Little N.Fork Santiam	22,600	22,600	2-21-1956	2-27-1957	7-29-1957*
	Quartzville	28,000	28,000	2- 2-1956	11- 1-1956	4- 1-1957*
	Blue	17,600	17,600	7- 5-1956	9-25-1957	2-22-1958*
	Blue River	170,200		7- 8-1957		
	Cascadia	218,000		7- 8-1957		
	Detroit	281,950		7- 8-1957		
	TOTAL	2,770,885	1,027,392			

* Determination completed (time expired for submitting verified statements).

RESUMÉ OF U.S. BUREAU OF LAND MANAGEMENT PUBLIC LAW 167 WORK *

DETERMINATION COMPLETED

Baker and Wallowa Counties

T. 11 S., R. 37 E.
T. 12 S., R. 37 E.
T. 8 S., R. 38 E.
T. 11 S., R. 38 E.
T. 12 S., R. 38 E.
T. 11 S., R. 40 E.
T. 12 S., R. 40 E.
T. 9 S., R. 41 E.
T. 11 S., R. 41 E.
T. 12 S., R. 41 E.
T. 7 S., R. 42 E.
T. 7 S., R. 43 E.
T. 11 S., R. 44 E.
T. 11 S., R. 45 E.
T. 5 S., R. 48 E.
T. 6 S., R. 48 E.
T. 7 S., R. 48 E.

Douglas County

T. 30 S., R. 2 W.
T. 19 S., R. 9 W.
T. 19 S., R. 8 W.

Grant County

T. 13 S., R. 30 E.
T. 14 S., R. 30 E.
T. 13 S., R. 31 E.
T. 14 S., R. 31 E.
T. 12 S., R. 32 E.
T. 13 S., R. 32 E.
T. 14 S., R. 32 E.
T. 12 S., R. 33 E.
T. 13 S., R. 33 E.
T. 14 S., R. 33 E.
T. 12 S., R. 34 E.
T. 13 S., R. 34 E.
T. 13 S., R. 35 E.

Josephine County

T. 34 S., R. 5 W.
T. 34 S., R. 6 W.
T. 37 S., R. 5 W.
T. 38 S., R. 5 W.
T. 39 S., R. 5 W.
T. 39 S., R. 6 W.
T. 36 S., R. 5 W.
T. 36 S., R. 6 W.
T. 36 S., R. 7 W.
T. 37 S., R. 6 W.
T. 37 S., R. 7 W.
T. 37 S., R. 8 W.
T. 38 S., R. 6 W.
T. 38 S., R. 7 W.
T. 38 S., R. 8 W.
T. 39 S., R. 8 W.
T. 40 S., R. 8 W.

AREAS EXAMINED AND ADVERTISED

Jackson County
May 14, 1958

T. 31 S., R. 4 W.
T. 32 S., R. 3 W.
T. 32 S., R. 4 W.
T. 33 S., R. 1 W.
T. 33 S., R. 3 W.
T. 33 S., R. 4 W.
T. 36 S., R. 3 W.
T. 38 S., R. 2 W.
T. 38 S., R. 3 W.
T. 39 S., R. 1 W.
T. 39 S., R. 2 W.

Josephine County
June 11, 1958

T. 33 S., R. 5 W.
T. 33 S., R. 8 W.
T. 34 S., R. 7 W.
T. 34 S., R. 8 W.
T. 35 S., R. 7 W.
T. 35 S., R. 8 W.
T. 39 S., R. 6 W.
T. 39 S., R. 7 W.
T. 40 S., R. 7 W.
T. 41 S., R. 8 W.
T. 41 S., R. 9 W.

AREAS EXAMINED AND NOT ADVERTISED

Curry County

T. 31 S., R. 14 W.

Douglas County

T. 29 S., R. 2 W.
T. 31 S., R. 4 W.
T. 32 S., R. 4 W.
T. 32 S., R. 5 W.
T. 32 S., R. 7 W.

Jackson County

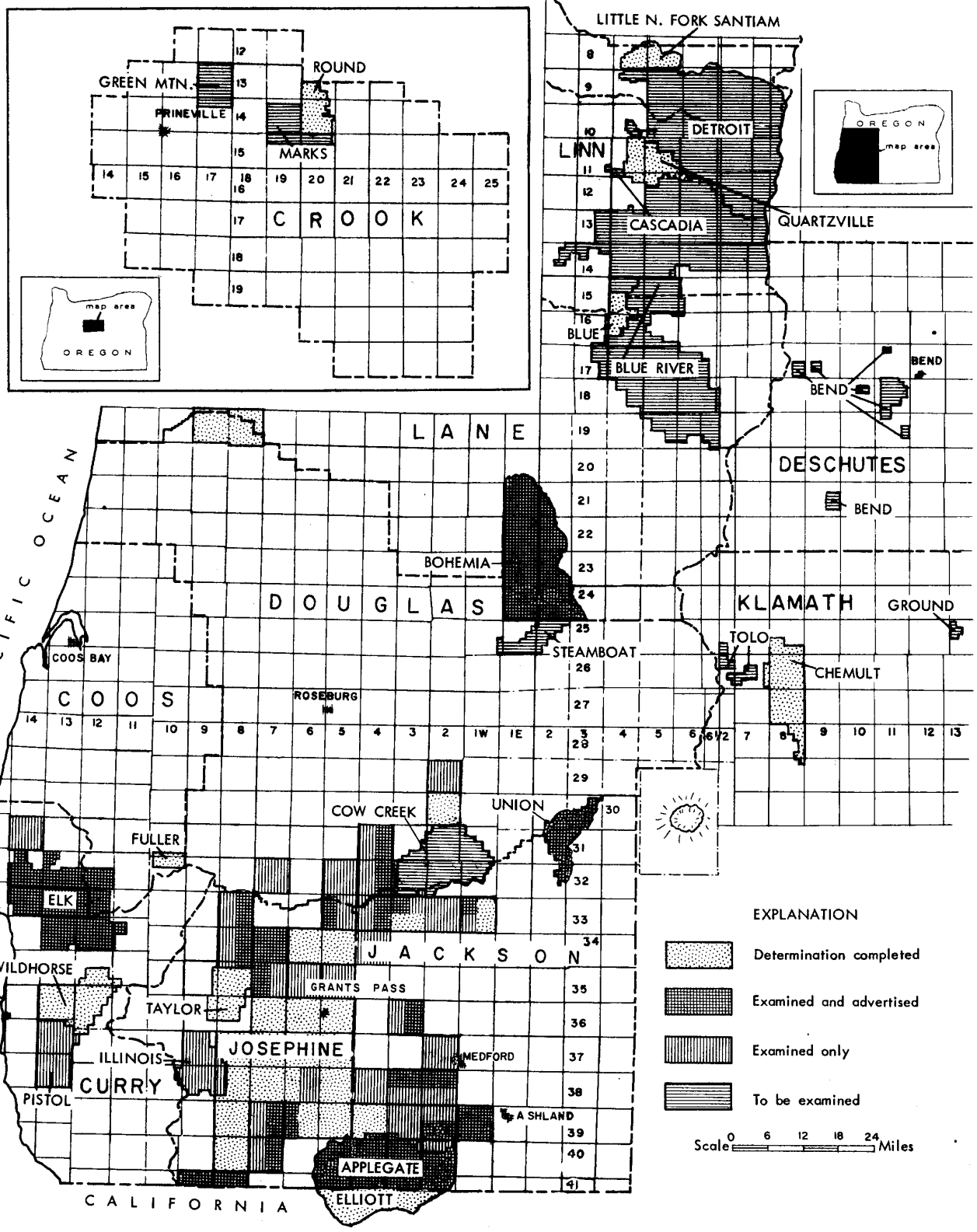
T. 33 S., R. 2 W.
T. 37 S., R. 2 W.
T. 38 S., R. 2 W.
T. 39 S., R. 2 W.
T. 40 S., R. 2 W.
T. 32 S., R. 3 W.
T. 33 S., R. 3 W.
T. 36 S., R. 3 W.
T. 38 S., R. 3 W.
T. 39 S., R. 3 W.
T. 33 S., R. 4 W.
T. 34 S., R. 4 W.
T. 38 S., R. 4 W.

Josephine County

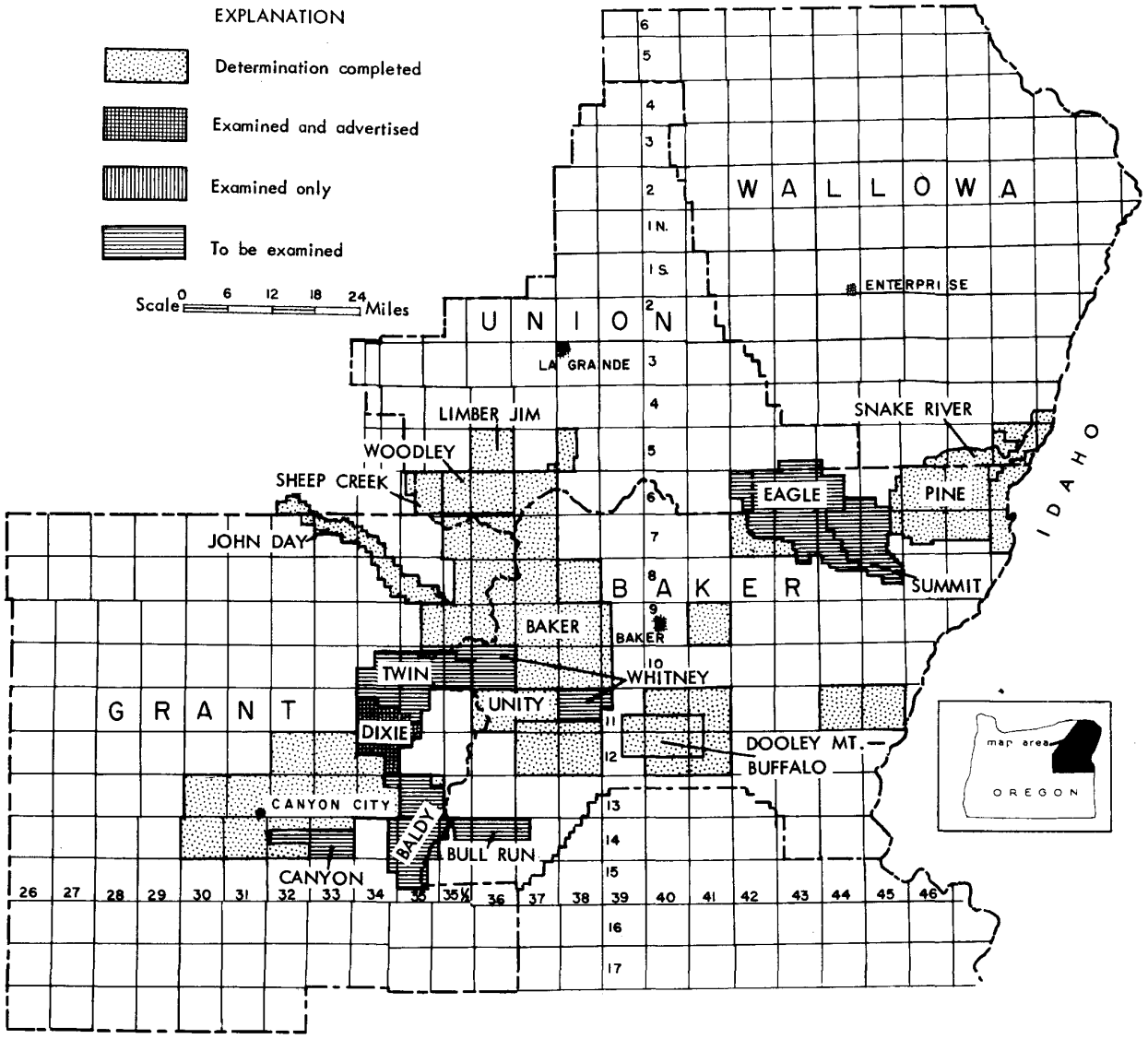
T. 33 S., R. 5 W.
T. 35 S., R. 5 W.
T. 35 S., R. 6 W.
T. 38 S., R. 6 W.
T. 35 S., R. 7 W.
T. 39 S., R. 7 W.
T. 40 S., R. 7 W.
T. 33 S., R. 8 W.
T. 34 S., R. 8 W.
T. 35 S., R. 8 W.

* In most instances only part of township has been examined. Exact areas examined can be obtained from U.S. Bureau of Land Management.

LAND DETERMINATION AREAS CURRENTLY BEING EXAMINED BY
U.S. FOREST SERVICE AND U.S. BUREAU OF LAND MANAGEMENT



LAND DETERMINATION AREAS CURRENTLY BEING EXAMINED BY
U.S. FOREST SERVICE AND U.S. BUREAU OF LAND MANAGEMENT



Information about Public Law 167 and its management is given in the following Ore.-Bin articles, which, may be obtained free-of-charge by writing to the Department of Geology and Mineral Industries, 1069 State Office Building, Portland 1, Oregon:

1. "Basic Mining Law Amended" (explains Public Law 167) - August 1955.
2. "Mining Claim Holders Take Note" (gives procedures under which the U. S. Forest Service is conducting land determinations and discusses rights of claim holders) - April 1956.
3. "The Multiple-Use Mining Law - Success or Failure" (shows purpose of PL 167 and includes maps of land determination areas) - October 1956.
4. "Multiple Use of Public Land" (gives progress report and maps of land determination areas) - December 1957.

In addition, the Department, upon request, will send free forms for notice that land determinations have been made and for filing a "Verified Statement" of the claims' validity.

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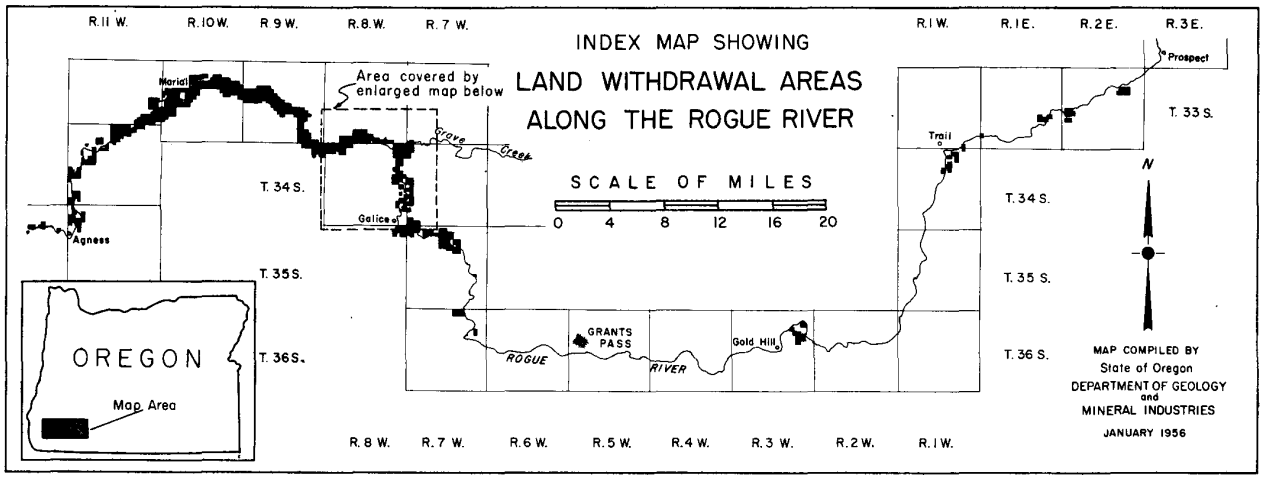
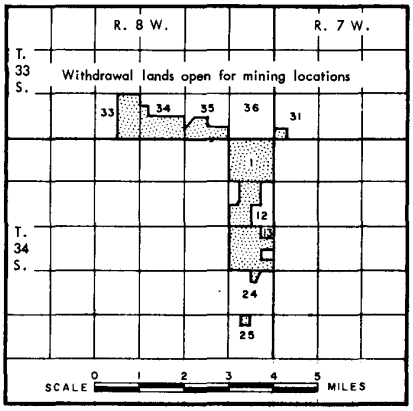
ROGUE RIVER WITHDRAWALS FINAL

On September 10, 1958, the Secretary of Interior published in the Federal Register Legal descriptions of the areas bordering the Rogue River that are to be reserved and set aside for protection and preservation as scenic and recreation sites (see index map). The Secretary's determination came almost two years after the public hearing held at Grants Pass.



At the hearing, local sportsmen, businessmen, miners, and mining organizations protested against the withdrawals while State and National wildlife, recreation, and sportsmen groups along with local individuals and others urged the withdrawals. More testimony was presented, both for and against, than had ever been given before to the Bureau of Land Management hearings officer on a proposed withdrawal of land in the State of Oregon. Nevertheless, only 2,323 acres (see map of Tps. 33 and 34 S., Rs. 7 and 8 W.) out of 23,096 acres of the withdrawn area were left open for mineral location. This was done in spite of the fact that the government had the right to manage the surface of any mining claim made in the proposed withdrawal area (Public Law 167) and that, in addition, the Secretary of Interior could control all placer locations (Public Law 359, see article on page 101). By contrast, leasing of land for summer homes and lodges under the Small Tract Act will now be permitted on 16,200 acres, and leases or sales under the Recreation and Public Purposes Act will be permitted on 13,879 acres. Lease or sale of resources under the Materials Act will be allowed on all 23,096 acres.



Although the original publicity stated that the withdrawals were to be within one mile on either side of the Rogue River, it develops that other land was included. Four parcels of land were withdrawn on the upper Applegate River. These are: (1) near Ruch, (2) on the Little Applegate River approximately 1 mile east of Buncom, (3) between the Little Applegate River and the Sterling mine ditch on Bear Gulch south of Tunnel Ridge, and (4) at the confluence of First Water Gulch and the Little Applegate River. As the names imply, this is mining country. It was near these areas that gold was first discovered in Oregon in 1852. It would be interesting to know what the old-timers who settled southwestern Oregon in their search for gold would say if they knew the land of their struggles was now being set aside just for recreation purposes.

H.M.D.

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BLM EXPLAINS MINING CLAIM PROCEDURE

Of vital importance to mining men who have claims on O&C or Coos Bay Wagon Road grant lands is the press release issued by the Bureau of Land Management of November 19, 1958, which is reproduced below.

Virgil Heath, Bureau of Land Management Supervisor for Oregon, reports there is some misunderstanding about the necessity of recording mining claims on Oregon and California revested lands and Coos Bay Wagon Road grant lands. Heath said that many mining claim locators are forfeiting their unpatented claims because they are not complying with the O&C Mining Act of April 8, 1948. This act opened the O&C and Coos Bay Wagon Road grant lands to mining claim locations, but it required that a copy of the notice of location must be filed in the U.S. District Land Office within 60 days after the location is made. Heath points out that if this requirement is not observed, the mining claims are voided.

Heath also said that since completion of an exchange of national forest lands for O&C lands on June 22, 1956, approximately 242,000 acres of former national forest lands became O&C lands. These lands are now subject to the laws pertaining to the O&C lands, including the O&C Mining Act of April 8, 1948, which requires that a copy of the notice of location must be filed in the U.S. District Land Office within 60 days after the location is made. Any locator of a mining claim believed to be on O&C or Coos Bay Wagon Road grant lands should learn the exact legal description of the land on which the claim is located, then inquire at the nearest BLM district office, or the Land Office at Portland, as to whether the claim is located on O&C or Coos Bay Wagon Road grant lands. If so, the O&C Mining Law must be complied with or the claim will be voided, Heath said.

Claim holders in western Oregon who have claims located on or near O&C or Coos Bay Wagon Road grant lands are advised to make periodic checks with the Bureau of Land Management to determine the status of their claims. New regulations, transfers of land between federal agencies, and the changing status of certain parcels of land may impair or imperil a claimholder's rights and may even render them null and void.

The Bureau of Land Management suggests, and the Department concurs, that claim holders having claims located on or near O&C lands make duplicate filings with the Bureau. Copies of location notices are acceptable but certified copies of "Proofs of Labor" are specified. Inquiries concerning claims on O&C lands should be directed to the Bureau of Land Management, 809 N.E. 6th Avenue, Portland 12, or to the Bureau's field office in the Medford City Hall.

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NORTHWEST MINING ASSOCIATION TO HOLD ANNUAL CONVENTION

The 64th annual convention of the Northwest Mining Association will be held December 5th and 6th in Spokane at the Davenport Hotel. Principal speakers will be Dr. John Convey, Director of the Mines Branch, Department of Mines and Technical Surveys, Ottawa, Canada, whose topic is "Recent Canadian Developments in Mining and Metallurgy," and Hon.Royce Hardy, Assistant Secretary for Minerals, United States Department of the Interior, Washington, D. C., who will speak on "Mineral Resource Development in America."

The two-day program will be divided into sections including Canadian Industrial Developments, Geology, Management, and Mining. Papers on uranium, iron ore, roof bolting, industrial development, production cost control, potential and outlook of Northwest Canada emphasize the scope of the conference which draws mining men from the Northwest, Western Canada, and Alaska.

Social functions during the convention include two luncheons, the Miner's Soiree, a Moose Milk Breakfast, an evening of dancing, and the annual banquet. Women attending the convention will be entertained at several coffee hours and a luncheon.

W. D. Nesbeitt is general chairman, with E. C. Stephens in charge of the program. Registration is being handled by Hamilton Owen. Reservations for hotel accommodations and registration for the convention may be obtained by writing to the Northwest Mining Association, West 522 First Avenue, Spokane 4, Washington.

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JOINT SCIENCE MEETING AT CORVALLIS

The Oregon Academy of Science and Northwest Scientific Association are combining their annual meetings this year at Corvallis on December 29 and 30. This is the first time since the 1952 meeting at Reed College that the two organizations have joined forces. The sessions of the Geology-Geography section are scheduled to start at 9:00 a.m. Monday, December 29, and continue both days. Chairmen are George S. Koch, Jr., Department of Geology, Oregon State College, for the Oregon Academy of Science, and R. C. Newcomb, U.S. Geological Survey, for the Northwest Scientific Association. Meetings will be held in room 208 Memorial Union Building on the Oregon State College campus. Tentative program for the Geology-Geography section is as follows:

Monday, December 29 - 9:00 a.m.
George S. Koch, Jr., and R. C. Newcomb, presiding

1. The Oregon "Klima" - R. D. Rudd, Natural Resources Department, Oregon State College.
2. A reconnaissance of structural geology of the Alturas area - Q. A. Aune and T. E. Gay, Jr., California Division of Mines.
3. Geologic report on the Cougar Peak volcanic area, Lake County, Oregon - Gerald H. Haddock, The State College of Washington.
4. Preliminary geology of the Lakeview, Oregon, uranium deposits - Norman V. Peterson, State of Oregon Department of Geology and Mineral Industries.
5. Volcanic conglomerate and breccia of the Clarno Basin, Oregon - W. D. Wilkinson and E. M. Taylor, Oregon State College.
6. Late Tertiary historical biogeography of horses in the northern Great Basin - J. Arnold Shotwell, University of Oregon.

Monday, December 29 - 2:00 p.m.
Ira S. Allison and Charles D. Campbell, presiding

1. Geologic structure of the upper part of the Grande Ronde River Basin, Oregon - E. R. Hampton, U. S. Geological Survey.
2. Geology of the Dutchman Butte quadrangle, Oregon - Hollis M. Dole, State of Oregon Department of Geology and Mineral Industries.
3. Permian microfossils of Oregon - D. A. Bostwick, Oregon State College.
4. Cupriferous analcime from Oregon - Lloyd W. Staples, University of Oregon.
5. The 1950 eruption of Mauna Loa, Hawaii - commentated motion picture in color - Frank Hjort, U. S. National Park Service.

Tuesday, December 30 - 9:00 a.m.
Marshall Huntting and Lloyd Staples, presiding

1. Patterned ground in central Washington, a preliminary report - Martin A. Kaatz, Central Washington College.
2. Permafrost problems in mining - Ernest Wolff, University of Oregon.
3. Frasch sulfur in Mexico - J. Granville Jensen, Natural Resources Department, Oregon State College.
4. Geology of part of the Santa Cruz Mountains, California - Jon Cummings, Oregon State College.
5. Upper Paleozoic corals from Stevens County, Washington - Joseph W. Mills, The State College of Washington.
6. Deformation of the Ringold formation - M. W. McGonigo and R. E. Brown, General Electric Company.

Tuesday, December 30 - 1:30 p.m.
Joseph W. Mills and John E. Allen, presiding

1. Glacial studies in the northern Cascade Mountains during 1958 - W. A. Long, Eatonville, Washington.
2. A geologic reconnaissance of the southern Cascade Mountains in Washington - Vaughn E. Livingston, Jr., Washington Division of Mines and Geology.

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RUSSIAN CHROME ORE TO UNITED STATES

The E&MJ Metal and Mineral Markets, issue of October 30, 1958, states:

> Russian chrome ore, 80,000 tons of it, is being acquired by a major U.S. producer of ferroalloys. The same firm bought perhaps a third as much last year. On both occasions a Canadian broker arranged the business.
>
> The transaction is probably better described as a barter arrangement. An amount of steel equal in value to the chrome ore is being taken by the Canadian broker for shipment to the USSR. A major U.S. steel manufacturer may have had more interest in arranging the transaction than the ore consumer. The steel company has probably assured the ferrochrome manufacturer it will take any of the ferro the latter cannot sell.
>
> Though the ore is scheduled to go to Canada, shipping arrangements for some of it may provide for alternative U.S. destinations. The ore is standard Russian ore - good grade but with considerable amount of fines.
>
> Doubtless chrome ore suppliers and their governments will express displeasure at acceptance by U.S. firms of Russian ore. Some Americans take the position that since the U.S. has no significant amount of chrome ore - it is clearly a have-not country in this respect, and chrome ore is an important product to the steel industry here, it is to the advantage of the U.S. to take all it can get from the USSR. It might appear that it conserves the limited Western supply. Turkish chrome ore representatives have been saying Turkish good grade ore is becoming scarcer and that what was a few years ago considered only passable ore is now considered high grade; they suggest this will continue. They have claimed prices must rise because of this growing scarcity of good ore. In the past year Turkish asking prices have dropped very little in spite of the drastic drop in sales.
>
> The claim probably will be made the Russian sales are really calculated to destroy the Western chrome ore industry. Some chrome ore suppliers point out that the USSR was once a major supplier of chrome and manganese ore to the U.S. and some years ago stopped selling here - a part of the USSR's economic warfare. No one doubts the USSR will engage in economic or any other form of warfare that suits its purpose. But there is no doubt it also has the more usual motive - to export in order to import.
>
> Since the USSR is taking an equal value of steel, and since the steel maker here appears to be as interested in the steel market as the ferro maker is in getting the ore, any claim of economic warfare may be hard to prove. Doubtless when negotiations were going on the sale of perhaps $3.5-million of steel looked to be most beneficial to the U.S. economy and steel industry. Certainly U.S. firms can be expected to compete with the rest of the Western world in getting foreign business including with Russia. They have been put to considerable disadvantage by the slowness with which the U.S. Government has implemented the COCOM agreements, announced August 15, to drop the Western embargo on the export of hundreds of products to the USSR.
>
> It is most impractical to export products to the Iron Curtain areas without importing from them; if U.S. firms are going to get a significant amount of that business they will have to import from them also.

Shades of Harry Dexter White! How familiar these arguments sound to the West's mining industry. Following World War II we were characterized as a "have not" nation in various materials including tungsten, petroleum, cobalt, columbium-tantalum, uranium, and quicksilver - to name a few. Now we have many of these commodities "running out of our ears." That "have not" is a matter of price has been demonstrated time and again.

Another slant on the subject is furnished by the Wall Street Journal in its Commodity letter of November 18, 1958. Here pitfalls of trading with Russia are touched upon. Sales of aluminum and platinum have been carefully timed by Russia to disrupt the markets, according to U.S. producers. Russia trades arms for cotton and then dumps the cotton on world markets. Now it is rumored that Russia plans to dump Chinese tea.

Perhaps the barter of American steel for Russian chrome, as described above, benefits the steel producer in this instance, but such a deal puts another nail in the coffin of the domestic chrome industry and therefore is difficult to reconcile with the common good.

H.M.D.

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OREGON URANIUM PLANT TO START PROCESSING

Lakeview Mining Company announces that it expects to begin processing uranium ore at its new 3-million-dollar plant at Lakeview on November 29. The plant will process ores from the Company's White King mine and also independently produced ores that are economically and metallurgically amenable to the plant's processing methods. The Atomic Energy Commission will purchase the entire output of uranium oxide on a five-year contract. The plant has a capacity of 210 tons of ore per day. The mine and mill will employ about 140 men on a three-shift basis.

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NATIONAL METALLURGICAL ENLARGING SPRINGFIELD PLANT

National Metallurgical Corporation, Springfield, Oregon, is adding a new stationary hearth electric furnace to their plant which produces elemental silicon. The new furnace will go "on stream" next July and approximately 15 men will be employed in addition to the 30 now on the payroll. The furnace and other related installations will cost in the neighborhood of $500,000. Raw materials for the plant include silica, obtained from near Reno, Nevada, and Rogue River, Oregon; coke from the San Francisco Bay area; and wood chips obtained locally. National has recently obtained a contract for firm power from the Springfield Municipal Power Company for both its present furnace and the new unit which is rated at 4000 Kva.

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IAN CAMPBELL TO HEAD CALIFORNIA DIVISION OF MINES

Prof. Ian Campbell of the California Institute of Technology was named Chief of the California Division of Mines on October 30 by DeWitt Nelson, Director of the California Department of Natural Resources. Dr. Campbell placed first in a competitive examination for the post and was recommended by the State Mining Board. He succeeds Dr. Olaf P. Jenkins who retired in March of this year. Dr. Campbell received his bachelor's and master's degrees from the University of Oregon and his doctor's degree from Harvard. In 1931 he joined the teaching staff at California Institute of Technology, and in 1952 was made Executive Officer of the Division of Geological Sciences at that school. He takes over his new position as Chief of the California Division of Mines on January 1, 1959.

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SALIENT STATISTICS OF CHROMITE*
(In short tons)

Year	Domestic production (shipments)	Imports	Total New Supply	Consumption
1954	163,365	1,471,037	1,634,402	913,973
1955	153,253	1,833,999	1,987,252	1,583,983
1956	1/ 207,662	2,175,056	1/ 2,382,718	1,846,600
1957	166,157	2,281,591	2,447,748	1,760,469
1958: First 3 Months	42,617	322,945	365,562	279,979
April	13,582	104,671	118,253	85,677
May	16,872	175,675	192,547	87,047
June	4/ 8,877	133,670	142,547	3/ 72,663
July	2/ 9,785	76,397	86,182	3/ 71,122
August	2/ 9,559	154,775	164,334	3/ 90,631
Total 8 Months	101,292	968,133	1,069,425	3/ 687,119

* U.S. Bureau of Mines Chromite Report 103, prepared November 13, 1958.
1/ Includes 45,710 short tons of concentrate produced in 1955 and 1956 from low-grade ore and concentrate stockpiled near Coquille, Oregon, during World War II.
2/ Dry weight. 3/ Preliminary. 4/ End of GSA stockpile purchasing.

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
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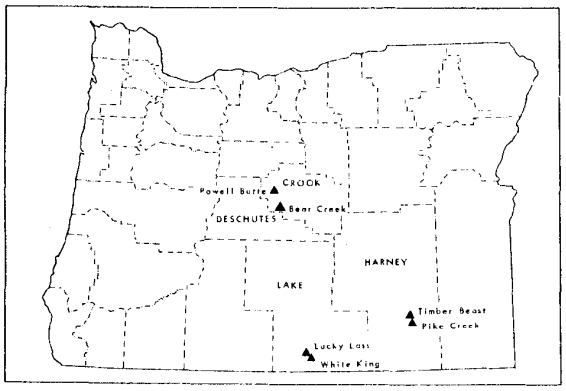
OREGON'S URANIUM PICTURE

By
Norman V. Peterson*

The White King Mine

Location: The White King mine is located about 15 miles northwest of Lakeview, Oregon, near the center of sec. 30, T. 37 S., R. 19 E., Lake County. The mine is in the southern Fremont Mountains at about 6,300 feet elevation and receives 6 to 8 feet of snow in the winter. It is near the west edge of an upland meadow through which Augur Creek meanders. Heavy soil cover and abundant timber are typical of the area.



The discovery of secondary uranium minerals in a surface outcrop of opalized tuff was made by Don Tracy of Lakeview in June 1955. Limited exploration by trenching and drill holes indicated the possibility of a commercial ore body extending out into the Augur Creek meadow. In the fall of 1955, Tracy and his partners, John Roush and Walter Lehman, leased the White King claims to the Lakeview Mining Company, an Oregon corporation. Lakeview Mining Company is headed by Dr. Garth Thornburg, Lakeview, Oregon, and is jointly owned by Dr. Thornburg, his brother Vance Thornburg of Paonia, Colorado; the Murchison interests; and the Richardson-Bass partnership of Fort Worth, Texas.

General geology: All rocks exposed in the general area are Tertiary age and consist of a great variety of volcanics. The oldest rocks in the mine area consist of a series of acid to intermediate tuffs, tuff breccias, crystal tuffs, and welded tuffs which are prominently exposed in northwest-trending ridges with steep northeast-facing fault scarps along Cottonwood Creek and Thomas Creek. A fossil rhinoceros tooth found in this sequence in the summer of 1958 has been identified as being of early Miocene age. These tuffs are overlain, apparently conformably, by less indurated agglomerates, clayey tuffs, and a thick section of tuffaceous lake beds. Fossil leaves have been found in both tuff sequences but have not yet been identified. The younger, less indurated tuffs are in turn usually covered by thin to thick olivine basalt flows which range from a few feet to 750 feet in thickness. The tuffs and basalt have been intruded by glassy flow-banded rhyolite. At some outcrops the rhyolite

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*Geologist, State of Oregon Department of Geology and Mineral Industries.

is massive while at other places it has formed conical rubble cones. Cougar Peak, the highest peak in the area (7925 feet), is one of these cones built on a northwest-trending ridge of the older tuffs.

The topography and drainage are controlled by prominent sets of faults in three directions, N. 45° W., N. 45° E., and N. 15° E. Field work indicates the presence of a rather broad anticline trending N. 45° W., with the axis just east of the mine. The area near the axis of the anticline has been highly faulted. Vertical displacement along the faults does not appear to be great -- a few tens to a few hundreds of feet -- but the faults are so numerous that the stratigraphy and structure is complex.

Except for a small amount of commercial-grade material containing secondary minerals in the oxidized zone near the surface, all of the ore is found in a roughly rectangular area about 400 feet wide and 1200 feet long. Ore bodies are roughly tabular and extend downward and eastward from the original discovery point.

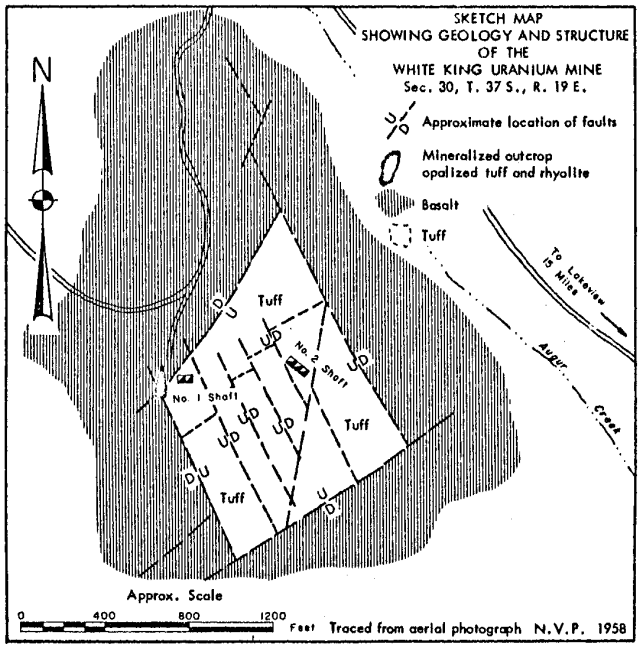
The mineralization appears to be directly related to the intrusive rhyolite, and localization of the mineralization is the result of faulting. The mineralization is found in a horst of younger tuffs and agglomerate surrounded on all sides by down-faulted basalt flows. Intrusive flow-banded rhyolite occurs both at the surface and underground in the mine. A variety of minerals indicates the possibility of at least two periods of mineralization. The earlier mineralization period contains low-temperature minerals such as cinnabar, realgar, stibnite, and opal. A suite of medium-temperature minerals including sooty pitchblende, coffinite, galena, pyrite, and jordisite is believed to have originated at some later time. A new mineral, lakeviewite, a uranyl arsenate, has been described by mineralogists from the Atomic Energy Commission from the oxidized part of the deposit. It is a yellow-green fluorescent, autunite-type mineral. A vivid blue mineral, ilsemmanite, a hydrous molybdenum oxide, is also found as an oxidation product of the jordisite.

The clayey tuffs and agglomerates, in which most of the ore occurs, have been highly altered. Underground the rocks are mottled gray and black and are colored by the orange and yellow arsenic minerals. Fault zones are sometimes difficult to see but are usually marked by a gouge zone of several inches of clay. Later faulting has broken the ore body into roughly tabular blocks. More than 30 faults have been recognized in the mine and they offset blocks of ore and complicate the geology underground.

Exploration and development: Early exploration by the Lakeview Mining Company was supervised by James H. Polous, General Manager, and Howard Dutro, Chief Geologist, (now Assistant General Manager). Surface exploration and a drilling program were followed by underground development.

Drilling in the mine area totals about 125,000 feet. More than 250 vertical drill holes averaging about 500 feet deep have explored the area mainly to the east of the original discovery. Company-owned truck-mounted "Sullivan" rotary drills are used for shallow holes (less than 500 feet) and a large "Mayhew 2000" rig sinks the deeper holes (to 1700 feet). Mineralization is determined both by probing the holes and interval checking of the drill cuttings with a geiger counter.

Underground exploration and development work now totals well over 4,000 feet. Development and mining through the No. 1 shaft are being carried out on three main levels at 70, 160, and 260 feet below the surface. The latest step in the development of the mine is the sinking of a Number 2 shaft about 600 feet east of the Number 1 shaft. This 3-compartment shaft will be about 700 feet deep and will tap haulage levels to permit mining of the deepest ore bodies. The Number 2 shaft required extensive new installations at the mine site. These included a hoist house, compressor building, change room, and an all-steel headframe 96 feet high. A station being cut at the 6130-foot level will be the main connection to the older mine workings to the west.



Mining methods: Normal mining methods are being used and there are no unusual safety hazards. Mining is conducted on a 3-shift basis, 6 days a week. Miners live in Lakeview and are transported by company buses. Ore is presently being mined by square-set stoping but plans call for extensive use of a modified top-slicing method. Since ore ane waste cannot be determined visually the face drill holes and exploratory long holes are probed before blasting. Each face is then scanned with geiger counters and channel samples are taken after each round. After grinding and drying, samples are analyzed with a binary scaler, a device for determining equivalent uranium content. Since the ore has not reached equilibrium, a positive correction factor is applied to indicate the U_3O_8 content. Chemical analyses are made at frequent intervals to check radiometric determination. Working faces are marked with paint from a spray can, "O" for ore and "W" for waste. In some areas soft ground enables the use of spade bits for mining ore or muck. Mucking machines load mine cars and the ore or waste rock is dumped into slusher pockets at the shaft station for loading into ore buckets and hoisting to surface ore bins. Each mine car is probed before dumping as a further check. Small dump trucks then haul the ore to appropriate stockpiles.

Haulage of ore from the mine to the mill in Lakeview has been contracted to the Lakeview Logging Company. Specially designed "belly dump" trucks with a 50-ton capacity will be used for the 15-mile haul over private roads.

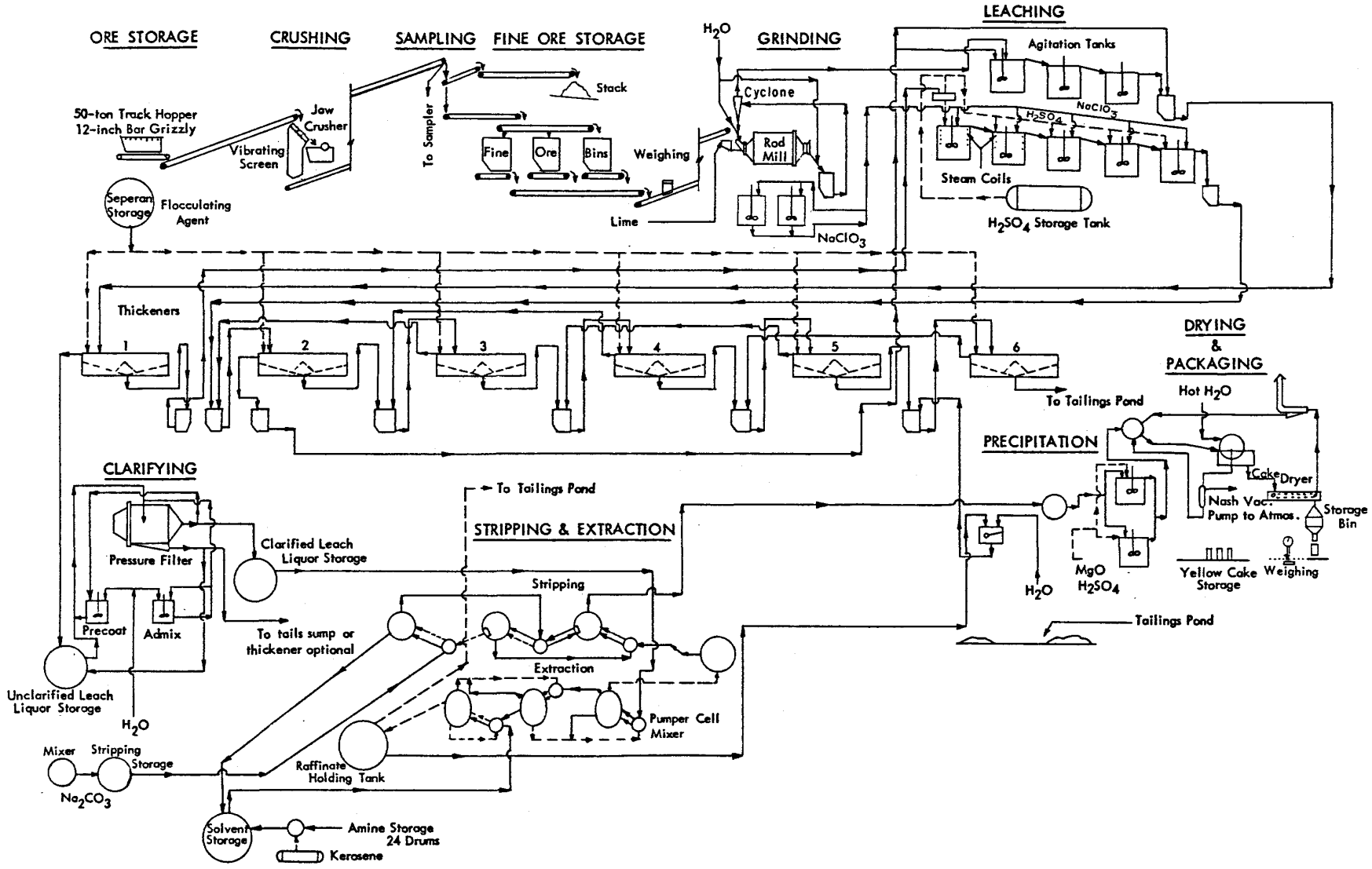
Lakeview Mining Company Uranium Mill

Early in 1957 the Lakeview Mining Company entered into negotiations with the Atomic Energy Commission for a contract that would enable it to build a uranium mill. In November 1957 a contract was signed that authorized the construction of a 210-ton per-day capacity mill. A site just north of Lakeview was obtained and by June 1, 1958, construction was well underway. Lakeview Mining Company acted as its own general contractor with Burr Johnson as mill construction superintendent. The mill, designed by Galigher Company, Salt Lake City, is complete. Ore grinding was started on November 28, 1958. The first "yellow cake" will be recovered before Christmas, 1958.

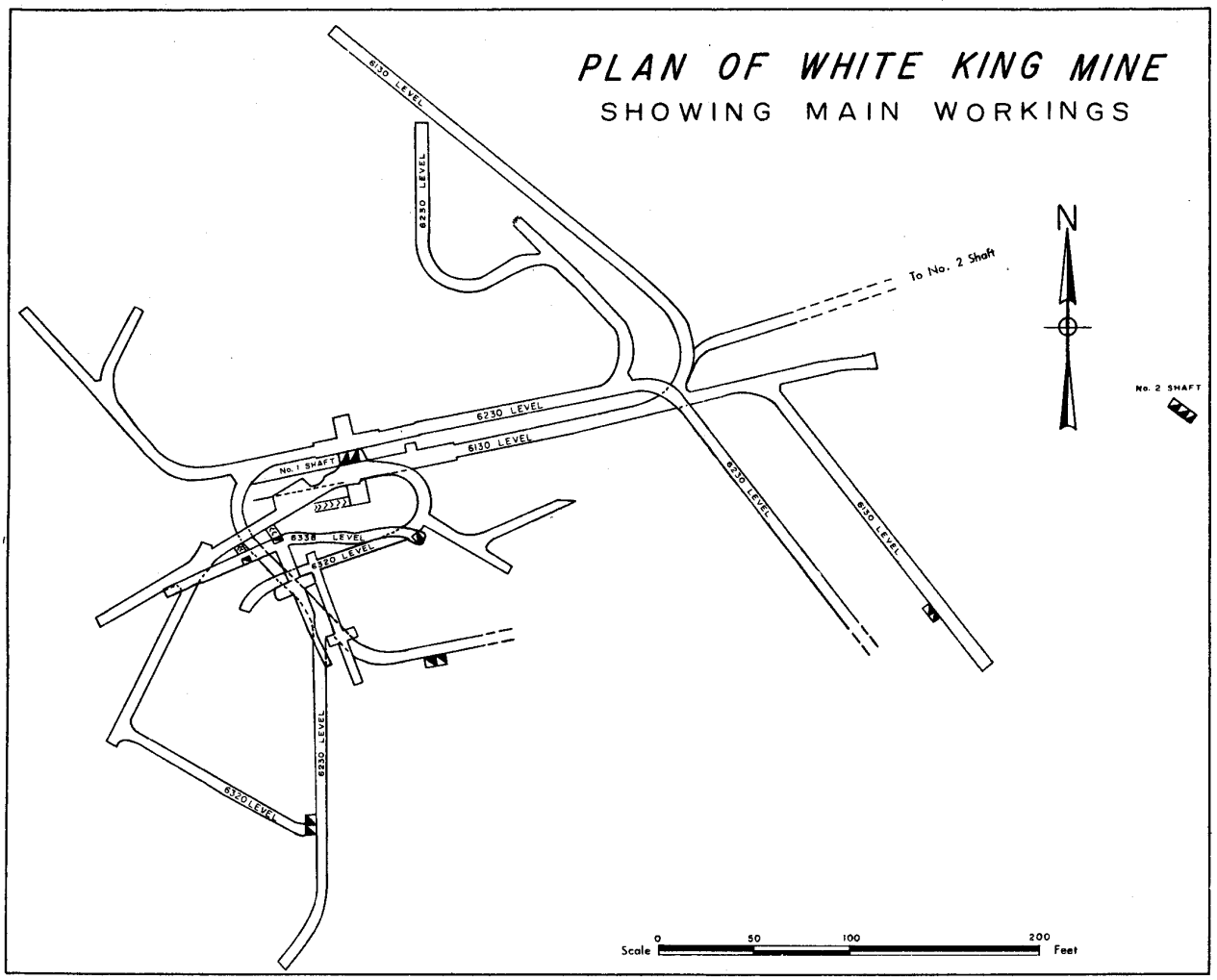
A straightforward "solvent extraction" process will be used to extract the uranium oxide from the clayey ore. Recovery is expected to be 90 percent. After grinding to minus-35 mesh in a 6 by 12-foot rod mill, the ore, containing an average of about 0.3 percent U_3O_8, is automatically weighed and sampled and fed to sulfuric acid leaching tanks. The leach liquor after dissolving the uranium from the ore is fed to thickeners and clarifiers and then is mixed with an organic solvent (a 5-percent lauryl amine solution in kerosene). Then the organic solvent and aqueous phases are allowed to separate. During the time the two are in contact the solvent selectively extracts the uranium from the acid liquor leaving a raffinate (a barren leach liquor) which is discarded or recycled. The pregnant solvent is then stripped of its uranium by a sodium carbonate solution which has a greater affinity for the uranium than the

LAKEVIEW MINING COMPANY URANIUM MILL

SIMPLIFIED FLOW SHEET



solvent. The barren solvent from this step is recycled for further leach liquor extraction. To the now pregnant stripping solution that contains from 30 to 60 grams of U_3O_8 per liter, magnesium oxide is added which precipitates the uranium concentrate as "yellow cake." The "yellow cake" has a chemical composition of MgU_2O_7 and contains about 80 percent uranium oxide. After drying, the "yellow cake" is packed in metal containers for sale to the Atomic Energy Commission.



For typical operating conditions the consumption of chemicals is estimated to be:

Sulfuric acid - 80 lbs/ton
Sodium chlorate - 5 lbs/ton
Sodium carbonate - 10 lbs/ton
Lauryl amine solvent loss - small amount from entrainment
MgO for precipitation - 0.1 lb/ton
Flocculating agent - .75 lb/ton

Water supply for the mill comes from two deep wells which deliver water to the mill at 90° F.

The mill schedule has been set up to process 231 dry tons per day for continuous operation. The capacity of the mill will allow for processing of about 300 tons per day on a 10-day-on and a 4-day-off operating schedule. Mill superintendent C. Oliver Hower will

operate the mill on a 3-shift basis with a total of 35 employees. Other staff members are John Vecchies, assistant superintendent; Dale Cutting, chief chemist; and Al Legard, maintenance superintendent.

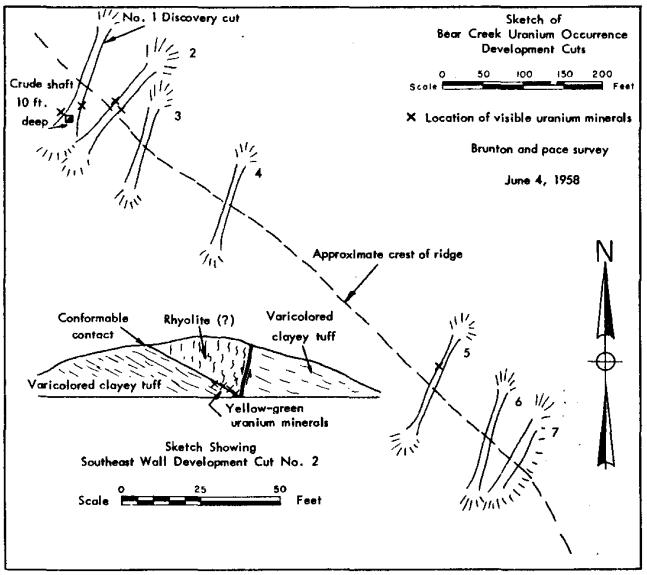
Under the contract with the Atomic Energy Commission, 30 percent of the mill capacity must be reserved for processing of custom ore. Custom ore must be amenable to the "solvent extraction" process.

Other Uranium Occurrences In Oregon

Other uranium and radioactive occurrences of small size have been discovered at several places in the State. Those that have been actively explored during 1958 are briefly described below.

Lucky Lass

The Lucky Lass deposit is in sec. 25, T. 39 S., R. 19 E., Lake County, about a mile northwest of the White King mine. A group of Lakeview people discovered it in June 1955 soon after the White King discovery was made public. A few thousand tons of ore have been mined from this deposit. The ore body is roughly triangular and bounded on all sides by faults. Secondary minerals similar to those found at the White King coat fractures and fill voids in the tuffs and vesicular basalt fragments which have been pulled into fault zones. The mineralization has lessened with depth and no more minable ore is known at the present time. A continuing drilling program is being carried on by the Lakeview Mining Company.



Bear Creek

This radioactive occurrence is in sec. 13, T. 18 S., R. 16 E., Crook County, near Bear Creek southeast of Bend. It showed some promise on its discovery in 1955 but intermittent exploration to November 1958 has not uncovered a minable amount of commercial-grade ore.

During 1958, Leonard Lundgren of Bend leased and explored the claims and, on deepening and cleaning out the older bulldozer excavations, found minor occurrences of uranium minerals (see sketch map). Individual samples in the 1-percent U_3O_8 range have been reported. The minerals found in small lenses of breccia in slickensided zones were identified by the Atomic Energy Commission as primary uraninite (?) and secondary autunite. The zones containing the cemented breccia are very narrow, discontinuous, and show small horizontal displacements. Additional exploration included a detailed radiometric survey and a shallow drilling program. This work was supervised by James Barlow, a former AEC geologist. No new radioactive zones were encountered.

Powell Butte

The occurrence is on Powell Butte in sec. 13, T. 16 S., R. 14 E., Crook County, about 8 miles south of Prineville. The discovery of small amounts of mercury mineralization along with the moderate radioactivity has been the only encouraging development during 1958.

The radioactivity occurs with iron-oxide coatings of fractures and joints in small isolated occurrences in the rhyolite flows that make up Powell Butte. The claimants, Harley Dosser and Eldon McCoin of Redmond, plan further exploration as time permits.

Pike Creek - Kiska Mine

The mine is in sec. 20, T. 34 S., R. 34 E., Harney County, and is being explored by the Solar-X Corporation of Boise, Idaho. The radioactive occurrence is in the steep-walled gorge of Pike Creek, along the east scarp of the Steens Mountains. Exploration has been concentrated on the original discovery claim where uranium mineralization occurs in a banded rhyolite breccia along a high-angle, northeast-trending normal fault. Surface trenching has exposed the narrow brecciated zone for a distance of about 150 feet. Five samples of the rhyolite breccia from the fault zone recently analyzed by the Lakeview Mining Company varied from 0.14 to 0.95 percent U_3O_8. A selected sample of the breccia from near the creek level assayed by the Department contained 0.37 percent U_3O_8. Future exploration will be an attempt to discover minable widths of the mineralized breccia and associated tuffaceous sediments.

Timber Beast Claims

The prospect is located in secs. 8 and 9, T. 34 S., R. 34 E., Harney County, on Little Alvord Creek just north of the Pike Creek claims. During 1957-1958 the Timber Beast Mining Company, with the aid of a DMEA loan, drove about 270 feet of underground tunnels. A drift was driven along the west side of a fine-grained basic dike for 180 feet to intersect an east-west trending fault along which minor uranium mineralization had been found at the surface. A drift was then driven eastward along the fault for about 90 feet. No ore-grade material has been developed. The underground workings show zones of weakly radioactive material along fractures in the volcanics adjacent to the dike and also in the gouge zones along the intersecting fault. The radioactivity is generally associated with thin, but in places numerous and closely spaced, seams of ilsemannite (a hydrous molybdenum oxide). However, much of the ilsemannite-bearing material is not radioactive. The U. S. Bureau of Mines reports that the Company's DMEA contract was terminated by mutual agreement effective June 6, 1958.

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DOMESTIC URANIUM RESERVES ESTIMATED

Measured, indicated, and inferred ore reserves of uranium in the United States were estimated by the Atomic Energy Commission to total 78,500,000 tons on June 30, 1958. These are determined in accordance with the definitions for measured, indicated, and inferred ore reserves as adopted by the U. S. Geological Survey and the U. S. Bureau of Mines and include only material metallurgically amenable to treatment. Distribution of ore reserves by states is approximately as follows:

	Thousand Tons	Percent U_3O_8
New Mexico	52,800	0.26
Wyoming	11,100	0.30
Utah	5,100	0.36
Colorado	3,700	0.29
Arizona	1,400	0.32
Washington, Oregon, Nevada	2,000	0.23
North and South Dakota	600	0.26
Others:		
Texas, California, Montana, Idaho, Alaska	1,800	0.23
Total Reserves	78,500	0.27

(From: U.S. Atomic Energy Commission Press Release No. 219, September 23, 1958.)

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PROPOSED RECREATION WITHDRAWAL

The U.S. Forest Service has filed an application for the withdrawal of 152 acres along the Illinois River, Curry County, approximately 2 miles south of Agness adjacent to Oak Flat. The Forest Service desires this land for a public recreation area. If the withdrawal is consummated, the land will be subject to valid existing rights but withdrawn from all forms of appropriation under the general mining laws. All persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal should write to the State Supervisor, U.S. Bureau of Land Management, 809 N.E. Sixth Avenue, Portland, Oregon, before January 15, 1959. The lands involved in the application are located as follows: Sec. 19: Lot 7, $NE\frac{1}{4}NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$; Sec. 29: Lots 5, 9, and 11, T. 35 S., R. 11 W., (approximately 151.88 acres).

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CHEMICAL LIME CHANGES MANAGERS

Robert Vervaeke, General Manager of the Chemical Lime Company since 1956, resigned as of November 1. Appointed in his place is Hans Leuenberger, a native of Switzerland and, since 1950, Assistant Administrative Manager of Technology with a branch of Union Carbide Corporation of Niagara Falls.

The Chemical Lime Company is located 5 miles north of Baker. Owners are Tony Brandenthaler and Thomas Dant, Sr. According to the new General Manager, Leuenberger, both kilns are in operation at the lime plant and lime rock is still being transported from the quarry. The plant will continue to operate during the winter from the stockpile accumulated since spring.

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AEC LIMITS URANIUM PURCHASE GUARANTEE

The Atomic Energy Commission has announced a change in its policy governing purchases or uranium concentrate. Effective November 21, the AEC said, its guarantee to buy concentrates produced and delivered between April 1, 1962, and December 1, 1966, will apply only to "appropriate quantities" from reserves already developed. Developed reserves, according to an AEC spokesman, include indicated and inferred reserves in known districts.

Purchases from already developed reserves in 1962-1966 will be at the previously established price of $8 per pound of uranium oxide in an acceptable concentrate, the agency said. Production from reserves developed hereafter, the AEC added, will be bought in 1962-1966 only as needed and "on such terms and conditions and at such prices" as the AEC may determine.

The action was taken to "guard against overproduction" of uranium and "is not due to any forecast of a reduction in the Commission's uranium requirements or in the potential requirements for commercial atomic power," the AEC said. "However, it is in the best interest of both the industry and the Government to hold uranium production in reasonable balance with requirements."

Buying policies from now until 1962 are not affected by the new policy. Under existing contracts, annual concentrate production is expected to run about 20,000 tons by 1962, with privately owned uranium mills processing about 23,400 tons of ore daily.

(From: American Mining Congress Bulletin Service No. 23, November 28, 1958.)

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FRED BARTELS

Fred J. Bartels of Springfield died November 12. He was 76 years old and had been a resident of the State since 1900. Long associated with the mining industry in the Bohemia District of Lane County, Bartels installed and operated a cyanide mill on the Evening Star claim in 1922-1932 and was associated with the H & H operation of the Champion mine 1939-1942. With a partner he again produced shipping-grade ore from the Evening Star, now part of the Champion group, 1945-1947. With a brother and nephew, co-owners, he mined both milling and shipping ores at the Champion 1948-1949 and retained an interest in the property to time of death.

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