STATE OF OREGON
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

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A NEW GEOLOGIC MAP

A colored geologic map of the Butte Falls quadrangle has just been released by the State Department of Geology and Mineral Industries. The map area in general is in the western Cascades of southwest Oregon, about midway between Roseburg and Medford. More particularly, it covers the territory between the villages of Trail and Tiller. A rectangular section of the country twenty-five miles east and west and thirty-four miles north and south was mapped. The Butte Falls quadrangle is bounded on the west by the Riddle quadrangle and on the south by the Medford quadrangle. Colored geologic maps of the latter two areas were previously issued - the Riddle map many years ago by the United States Geological Survey.

On the new Butte Falls map just issued, the various geological formations are outlined areally in different colors and an explanation of the type formations with their letter designations is given on the margin. The scale is 1/96,000, or about 7/10 of a mile to the inch.

This map constitutes the work of the Oregon Geological Survey carried out during the summer of 1940 by the Department. The field work was supervised by Dr. W. D. Wilkinson of the Department of Geology, Oregon State College. A bulletin to which this map is supplementary and which will describe in detail the geology and petrography of the area is in preparation. It will be published this summer. A short report, GMI Short Paper no.3, published late in 1940, gives brief descriptions of some quicksilver prospects found in the western part of this quadrangle.

THE PRICE OF THE MAP IS 45¢. Copies may be obtained at the State Department of Geology and Mineral Industries, 702 Woodlark Building, Portland, Oregon, or will be sent postpaid to any address upon receipt of price. Copies of the map are available also at the State Assay Laboratories at Baker and Grants Pass.

TO ALL EXCHANGE LIBRARIES

Copies of this publication were mailed from this office April 30th, 1941. If not received within ten days from the above date, advise this office immediately; otherwise, replacement for copies lost in the mail or otherwise cannot be made.

REAL CONSERVATION

Announcement has been made that the Portland Gas & Coke Company will install additional equipment costing $1,500,000 at its Portland plant. The new facilities will enable the company to meet the large demands made on it for supplying its products to various new industries engaged in, or to be engaged in, national defense work. Incidentally, Curran-Knowles ovens are to be installed. These ovens represent the latest development in by-product manufacture. They have been installed in a St. Louis plant, and have been successful in coking Freeport (Illinois) coal -- something not heretofore accomplished in ordinary coking ovens.

We quote from COMMERCE, published by the Portland Chamber of Commerce, in the issue of April 19th:

"First chemical and gas plant of its kind, the new works will produce large quantities of petroleum coke of the type used for electrodes in aluminum plants and in foundries working on national defense orders; benzol for high-test motor fuel; toluol for munitions factories; solvent napthas and xylol for the rubber and paint industries; and tar for airport runways, highways, streets".

It is of great interest to know that these valuable products will be available to defense industries of the northwest; also that the construction of these facilities reflects industrial growth of the community, which means creation of new wealth and various allied beneficial results. But the thought behind these comments goes somewhat further.

This company has aimed at converting all waste products obtained from the manufacture of gas into various commercial forms. This is real conservation.

To any thinking person, especially to the engineer, the thought of industrial waste is repugnant. This country is notoriously wasteful of its natural resources. Although they seem inexhaustible, they are being consumed very rapidly indeed. Theoretically at least, one of the worst examples is the burning of natural hydro-carbons for fuel. By so doing many potentially useful things are dissipated -- gone up in smoke. Therefore, when a project is designed to process a raw material so that there will be no industrial waste from such hydro-carbons -- so that everything but the "squeal" is recovered in usable form -- it deserves commendation. By intelligent and skillful scientific methods the Portland Gas & Coke Company is producing from petroleum and will produce on a greatly enlarged scale, valuable by-products from the manufacture of gas distributed for household and industrial heating. These by-product processes have been developed to a commercial stage only after careful and expensive research work. Great credit for results is due Mr. E. L. Hall, Vice-president and Chief Engineer of the company, for planning and supervising this work. The company has reason to be proud of the technical results obtained, and Oregon should be proud of an industry that has constantly worked for the elimination of industrial waste.

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MINERAL PRODUCTS BROUGHT TO OREGON

In its study of markets for Oregon mineral products, the Department has obtained some figures from the National Research Council which show outgoing and incoming tonnages of mineral products. These figures are illuminating in showing the large tonnages of a great variety of mineral products brought in, many of which could be produced in Oregon. It is self-evident that, in the case of chemicals produced from mineral products, treatment plants would be necessary in this area in order to prepare Oregon raw materials for the market. The unique combination of low-cost power, deep water shipping facilities, and rapid increase in population offered by this area, will surely attract chemical industries. In addition, by-product manufacture from metallurgical industries to be established, as well as demand for ores and fluxes from local sources, will provide an increasing outlet for Oregon raw materials.

STATEMENT OF OCEAN GOING FREIGHT
Port of Portland
Calendar Year 1940
Ocean Going Only

COASTWISE RECEIPTS	SHORT TONS	COASTWISE RECEIPTS	SHORT TONS
Abrasives and Mfgs.	67	Lead arsenate	119
Aluminum and Mfgs.of	168	Lye	20
Asbestos and Mfgs.of	169	Titanium Dioxide	275
Shingles	241	Zinc Oxide	131
Roofing	25	Chinaware	22
Asphalt	23,964	Coal Bituminous	1,473
Brick	56	Coke	110
Cement	60,820	Cork (Insulation?)	310
Cement Pipe	42	Earthenware	87
Acid		Glassware	1,395
Unclassified	479	Glass Bottle	1,692
Aluminate	21	Granite	320
Calcium Compounds		Grits	100
Chloride	277	Infusorial Earth	21
Cyanamide	20	Insulating Material	350
Copper Sulphate	92	Kalsomine	599
Cadmate	25	Lime and Plaster	400
Potassium		Limestone	89
Potash	131	Lithophone	352
Muriate	418	Mineral Wool Cement (?)	100
Sodium Bicarbonate	918	Bauxite Ores	455
Bichromate	34	Pigments	69
Bisulphate	75	Pot Scourers, Pumice Stones	
Borate	311	and Mfgs.	108
Carbonate	541	Salt	20,016
Chlorate	83	Sand (no classif.)	266
Chloride	106	Slate	28
Hydrated	87	Slate (crushed)	3,337
Hydrosulphite	67	Soapstone	66
Nitrate	103	Stone and Mfgs.of	38
Phosphate	21	Tile	134
Silicate	131	Wallboard	258
Trisodium Phosphate	442	Zinc	218
Aluminum Sulphate	745	Misc.	127
		TOTAL	123,885

Under Miscellaneous are alkali, antimony, carbon, charcoal, sulphuric acid, barium sulphate, calcium arsenate, calcium molybdate, calcium sulphate, copper chloride, magnesium sulphate, argols, potassium bichromate, potassium nitrate, potassium permanganate, sodium cyanide, sodium sulphate, sodium sulphite, sodium thiesulphate, arsenic sulphide, cyanide salts, acetone, iron sulphate, zinc sulphide, red oxide, and graphite.

TOTAL FREIGHT TONNAGE CARRIED BY RAILROADS IN 1939.

Class No.	Commodity	NET SHIPMENTS OUT-GOING TONS (Oregon)	NET RECEIPTS IN-COMING TONS (Oregon)
	PRODUCTS OF MINES:		
290	Anthracite Coal		72
300	Bituminous coal		145,336
310	Coke		3,723
320	Iron ore		30
330	Copper ore and concentrates		-
331	Lead ore and concentrates		1,504
332	Zinc ore and concentrates	59	-
333	Ores and concentrates, n.o.s.	5,665	-
350	Gravel and sand		13,910
351	Stone, broken, ground or crshd.	27,371	-
352	Stone, rough, n.o.s.		2,757
353	Stone, finished, no.o.s.		23,406
360	Petroleum, crude		807
370	Asphalt, (nat.,byprod.,or petroleum)		37,372
380	Salt		29,295
390	Phosphate rock, crude (ground or not ground)		122
391	Sulphur (brimstone)		13,592
392	Products of mines, n.o.s.		109,020
820	Products of Mines, Total	33,095	359,986
	MANUFACTURES & MISCELLANEOUS (C.L.):		
490	Iron, pig		1,377
491	Iron & steel, rated 6th class, n.o.s.		14
520	Copper: Ingot, Matto and pig		2,747
521	Copper, brass, bronze: bar, sheet, pipe	249	
522	Lead & zinc: Ingot, pig, bar	5,293	
540	Cement, natural or Portland (building)		44,756
550	Brick, common		1,964
551	Brick, n.o.s., & bldg.tile		8,237
552	Artificial stone, no.s.		45
560	Lime, common (quick or slaked)		7,800
561	Plaster (stucco or wall) & dry kalsomine		11,035
570	Sewer pipe & drain tile (not metal)		1,422
661	Sulphuric acid		157
692	Furnace slag		30
693	Scrap iron and scrap steel	790	-
699	Glass, flat, other than plate		1,772
700	Glass: Bottles, jars & jelly glasses		5,922
	TOTAL	6,332	87,278

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TALE OF A ROCK-HOUND
"Pescado"

I opened my eyes a degree at a time to recognize a palm-thatched roof above me, wriggled a bare toe in the cords of my web hammock, recoiled from a nearby ear-splitting "Hanw-a-a-a-a" of a burro, and called, "Arturo?"

"Si, senor?"

"Donde estamos?" - (where are we?)

"In la iglesia, senor". (In the church).

"My God", and I rolled out on the flagstone pavement of the courtyard.

The previous afternoon, six native peons and I in a 30-foot dugout canoe had paddled or drifted lazily 40 or 50 miles down the Orinoco and tied up an hour after dark at the village of Los Castillos. It is (or was in 1931) a garrisoned town with perhaps 300 soldiers, 600 dogs, and probably 50 women that God forgot. To Los Castillos are banished from all over Venezuela prostitutes who are beyond redemption morally or medically. A ducky place for a self-respecting mining geologist to be caught in! We had pulled our big canoe well up on the sand among other similar craft and carried our duffel up through the crooked cobblestone streets looking for some place to sleep. The streets, even in the dim glow of a dying flashlight, seemed filthy, until we came to this thatched courtyard next to the pavement. Arturo, my native foreman, and I had merely hung up our hammocks and turned in. One can always explain one's presence if necessary. It developed that we had chosen the rear yard of the big Catholic church. The other peons had scuttled off to brighter parts of the town.

Early morning passers-by looked on as Arturo and I dressed, for who but an "Americano" would hang his "chinchora" up in a church? Breakfast consisted of a can of sardines and a handful of crackers, some bananas, and a bottle of warm beer. One doesn't drink local water.

Within an hour we were in the canoe and coasting along in the slow shore current. Somewhere below us, iron formation had been reported. An examination of it was the point of my trip.

For some time we cruised along the jungle-bordered shore of the 3-mile wide river, passing an occasional open, grassy bayou or lagoon. From some of the latter, beautiful white egrets creened their perky necks or circled warily. Then we began to pass rocky shores rising abruptly into the jungle, and to worry about the canoe hitting a submerged rock. This was the rainy season - July - and the river was 25 feet above low stage. Some of the rocks were plainly iron-stained, but I could not get the two hired paddlers to steer close enough to shore to permit a fair examination.

Seeing what looked like a partly-submerged log near the shelving bank a few rods below, I signalled the stern paddler to head in so we could land. He swung the long, slim boat a little to the right, and I got up on my knees ready to grab a root as we came abreast. But the big "log" silently vanished a dozen feet ahead of the boat, just as the bow paddler shouted "Caimon!" (alligator) and back-paddled with all his might. My stomach came into my throat! The boy in the stern swung the canoe out away from the shore, the paddlers amidships paddled in assorted directions as we, helped by the 7-mile current of the river, passed virtually over the spot where the 'gator had been.

At times, one can do a tremendous amount of thinking in a few seconds. I probably recalled every Stanley-in-Africa story I had ever read about alligators crushing a boat with a mere flick of their tails, and "drawing the terror-struck native slowly and inexorably under the surface", or something. Then, it seemed, Hell did break loose! A God-awful splash and threashing of the water not four feet from me, but on the side of the canoe away from the shore. I did a sitting broad jump toward the prow of the boat that probably will remain as a record for all time. I landed in the canoe, fortunately, but in such a position as practically to capsize the boat. That would have been easy, because the sub-surface topography of an Indian dugout canoe is exactly that of a steel oil barrel - cylindrical.

The bow paddler turned and actually laughed at me. How the 'gator had missed us was what I couldn't understand. The peon pointed toward the water with a grin and uttered a word in Spanish that I couldn't get. He repeated, and it began to dawn on me that the animal might not have been an alligator. The native then said "Pescado", and I realized it was a fish that had all but frightened me to death. The fish, a torñilla, then came up ten feet away and showed a big dorsal fin and four or five feet of scaly back as he played about. It was a fresh water variety of porpoise, I understood. For half an hour, while my heart gradually eased back to normal, the big fellow cruised around the dugout, usually keeping a dozen yards away, and then finally wandered off.

From the river men I learned that these torñillas are their friends. The legend is that if a canoe capsizes in 'gator-infested water, the big torñillas gather in, thresh about, and frighten the 'gators away until the swimming natives can get to shore. I hope never to have to demonstrate the veracity of the legend.

And that is my best fish story -- and it happens to be true!

- Earl K. Nixon

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QUICKSILVER PRODUCTION

According to the monthly mercury report of the United States Bureau of Mines released April 30th, domestic output of mercury amounted to 3,500 flasks in March, an increase of 600 flasks over the 2,900 flasks reported for February. Reported consumption in March was 4,000 flasks, a decrease of 700 flasks reported for February. It is stated that the high rate of use in March was due principally to the manufacture of mercuric oxide ordered by the Navy. The high consumption of 4,700 flasks in February was due principally to the same cause. As in previous months there were no imports for consumption. Data on March exports are not yet available. In February exports were given as 347 flasks. Consumers and dealers stocks at the end of March amounted to 11,600 flasks, a decrease of 500 flasks from stocks reported at the end of February. Producers stocks amounted to 350 flasks at the end of March as compared to 503 flasks at the end of February. Companies that were responsible for 98% of Oregon's total in 1939 reported that the March total was 105% higher than the monthly average for 1939 and 16% higher than that reported for February 1941. Quoted market prices advanced in March from $174-$176 a flask for spot metal to $180-$182 at the close of the month. During April the price remained fairly steady at around $180-$182 per flask. There has been little variation so far during the present month.

BORAX

An interesting article on borax by Vincent Morgan was published in the December 1940 issue of the Pacific Mineralogist. Following is an abstract:

The twilight period between historic and prehistoric man hides the origin of the use of borax. Before the time of Marco Polo it was obtained from the high semi-dry lakes of Tibet and used in China and India. Transportation by coolie-back from the high lakes of Tibet to the great ancient cities of the Orient made the cost so great in European markets that new sources closer to markets were sought. Borax was then considered a precious substance used only by the silversmith and the maker of fine porcelain and china.

The first production of borates in Europe was from the boric acid found in the steam jets of Tuscany in Italy. Expanding industries made a demand so great that a new source was developed in Panderma, Asia Minor. The mineral pandermite (priceite) produced here was the principal source of borates in Europe for a great many years.

Industrialization of the New World created a demand for various raw materials, many of which were first imported, but gradually domestic sources for most of these were discovered. For many years borax was imported, and then in 1856 came the epochal discovery of borax at Little Borax Lake in Lake County, California. A small refinery was operated here from 1864 to 1868.

About this time a teamster at a Nevada silver mine took a vacation from his job in order to satisfy his curiosity as to a white patch on the desert which showed up in the distance as he drove his team between the mine and the railroad. The white material proved to be borax made up mainly of ulexite, and the teamster who acquired the title of "Borax" Smith quite his job and took up as much of the land as he could. This region is known as Teale's Marsh. Smith and associates organized the Pacific Coast Borax Company and Smith became its president. Operations begun at Teale's Marsh were later expanded to Columbus Marsh.

A little after Smith's discovery became known (borax was then worth about $400 a ton) a prospector named Aaron Winters discovered borax in Death Valley. Still later W. T. Coleman, a commission merchant of San Francisco, hunted for and found borax on the salt flats of Death Valley. Both Winters and Coleman built small refineries, and both later sold out to Smith. It was from these Death Valley properties that the famous Twenty-Mule Teams hauled the borax to the railroad.

More profitable sources of mineral shifted production to Borate in the Calico Mountains, then to Death Valley Junction where a concentrating plant was built. The Tonapah and Tidewater Railroad was built by the Borax Company to haul ores from Ryan, overlooking Death Valley, to Death Valley Junction for treatment.

During the last World War potash was extracted from the brines of Searles Lake, California, and borax was produced as a by-product. It is still being extracted from this source.

About 1927 sodium borate was discovered near Kramer on the Mojave Desert by a well driller at horizons from 400 feet to 1000 feet below the surface. No surface indications were found. The Pacific Coast Borax Company purchased the ground which upon development proved to contain probably the largest dry deposit of sodium borate in the world. Production was discontinued at Death Valley and concentrated at Kramer. The minerals mined are mainly tincal and rasorite (kernite).

Southern California produces 98% of the entire world production of borax. In ancient times when the mineral was transported from Tibet on coolie-back, a ton or two was consumed. Now several hundred tons a day are produced.

Naturally, the vast increase in production reflects the multiplicity of uses for borax. Originally used only by skilled workers in some of the arts, borax is now used in some form each day by everyone in the civilized world. The facility of molten borax to dissolve metallic oxides leads to its use as a flux in welding and brazing; the same properties promote its use in making glazes for pottery, tile, porcelain and china, and in making special heat resisting glassware. Other important uses of borates are in soaps; medicinal use as boric acid; photographic uses in development of films; as a fireproofing material; as a dryer in paints; and as boron carbide (norbide), an abrasive harder than silicon carbide.

The important borax minerals are listed as follows:

Priceite ($5CaO.6B_2O_3.9H_2O$)
Ulexite ($Na_2O.2CaO.5B_2O_3.16H_2O$)
Colemanite ($Ca_2B_6O_{11}.5H_2O$)
Tincal ($Na_2B_4O_7.10H_2O$)
Rasorite ($Na_2B_4O_7.4H_2O$)

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LONGEST POWER CABLE

According to Western Mining News, San Francisco, the longest power cable span in the world will soon cross the Snake River between Idaho and Washington, about nineteen miles south of Lewiston. The horizontal distance between towers is 6,804 feet, making a free swinging span 7,000 feet long.

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BONNEVILLE DAM DRILL RECORDS

Through the cooperation of the War Department and Dr. Walter H. Bucher, Chairman of the Division of Geology and Geography of the National Defense Council, the State Department of Geology and Mineral Industries has secured copies of the Bonneville Dam drill records together with supplementary geologic reports resulting from foundation studies. These records are on file at the Portland office of the Department.

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MINING NOTES

North Fork Placers, operated by Ralph Davis, Boise, Idaho, has started operations on the North Fork of the John Day River. Ground covering about 17 miles of the river up to the mouth of Big Creek has been acquired. Equipment consists of a 4½ yard Monighan dragline and proper recovery equipment.

Ray Whiting has been developing ore on the 130 foot level of the Whiting quicksilver mine located about 25 miles east of Prineville. A new electric centrifugal pump has been installed. Ore is being treated in a small Champion furnace.

At the Strickland Butte Mine on Mill Creek, northeast of Prineville, Page Brothers are driving a new tunnel to intersect at depth a vein outcrop showing cinnabar.

Eichemeyer Brothers are mining a new orebody at the Maury Mountain cinnabar mine southeast of Prineville.

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Of the energy available from the fuel, the modern airplane gasoline engine delivers about a third to the propeller. Somewhat more than a third escapes through the cooling surfaces, and the remainder is discarded in the exhaust. The engine designers find that they must pay just to lose energy: cooling systems add materially to weight and cause a very substantial drag; exhaust manifolds add weight, create a hazard, and cause some drag. As engines get bigger, speeds higher, and planes cleaner, the radiator surfaces become an increasingly important source of air friction. Perhaps 5 to 10 percent of the power of a fast plane may be spent in dragging the radiator through the air.

- Technology Review, May 1941
Cambridge, Mass.

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CLEARING HOUSE

FOR SALE OR LEASE: Lode mining claim in Boulder County, Colorado, patented and recorded. Claim has nearly a mile of transportation tunnel under the rich Magnolia Mining District. Cuts many unexplored veins besides rich known veins. Write F. R. Carroll, c/o C. C. Buck, Jacksonville, Oregon.

FOR SALE OR LEASE: 120 A. patented land covered with a blanket of rich bentonite, running from 85% to 96% pure bentonite, most of it with no overburden, easily accessible, close to a railroad. Write H. L. Marsh, c/o C. C. Buck, Jacksonville, Oregon.

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ELECTROLYTIC ZINC

(Extracts of an interesting article by C. R. Ince on electrolytic zinc operations during 1940, and published by the American Zinc Institute, are given below).

During 1940, electrolytic zinc operations reflected the heavy demand for high grade metal which developed particularly during the last half of the year. The three electrolytic zinc plants in this country operated practically at capacity all year, and the production during the first five months was sufficient to not only take care of domestic demand, but permit the export of metal to some of the countries cut off from their usual sources of high grade zinc by the war. However, during the second half of the year following the fall of France, the situation rapidly changed. The regular domestic uses picked up strongly and the defense program with its requirements for the higher purity metal, created a demand that soon exhausted smelter stocks and practically precluded the possibility of further exports. By the end of the year it was no doubt true that electrolytic smelters had minimum stocks and were shipping metal out as fast as cast. . .

The electrolytic zinc production in 1940 was 187,538 tons, or 29% of the total primary metal production of the country, as compared to 127,056 tons, or 24% of the total of the previous year. These were both the highest production and highest percentage of the total ever reached by the electrolytic smelters. Of this tonnage, the Sullivan Mining Company's plant in Idaho produced 37,477 tons or a monthly average of 3,123 tons. This was 208% of the original contemplated capacity of the plant as the first two cell units built in 1928 had a production of only 1,500 tons a month. In 1937 the plant was enlarged 50% but was not operated at full capacity, because of unfavorable demand and zinc price, until December 1939. 1940 was the first full year of capacity operation for the enlarged plant. Shipments during the year also reached an all time peak of 38,150 tons as compared to 21,842 in 1939.

In Montana the Anaconda and Great Falls plants of the Anaconda Copper Mining Company produced 150,061 tons, of which 35,077 was toll zinc returnable. Of this production 26,292 tons were made by use of the insoluble lead-silver anode. Deliveries of zinc, including metal sent to the manufacturing and zinc oxide plants of the Company amounted to 126,194 tons compared to 100,514 tons in 1939. . . .

The die casting industry continued to be the largest consumer of special high grade zinc, in which category most of the electrolytic metal falls. It is estimated that between 105,000 and 110,000 tons were used by die casters, a substantial increase over the 84,000 tons reported for 1939. The brass industry, with its requirement for low-leaded metal necessary in the hot rolling of cartridge brass, took more than its proportionate share of high grade metal, but no exact figures are available. About 20,000 tons of the metal went into the manufacture of French Process oxide.

It might seem incongruous to talk of new uses for high purity metal when it is difficult to supply the current demand, but one application is worthy of note at this time. Special high grade zinc containing aluminum, copper and magnesium as alloying ingredients, is being used as a die material in the stamping of wing and fuselage assemblies for aeroplanes. The advantages of this alloy appear to be greater strength and toughness and an increased hardness, which makes possible the production of about ten times as many stampings as could be produced with the previous die material. There is little doubt that when metal becomes more available, the success aeroplane makers are having in producing stampings with dies and punches of this alloy, will extend the usefulness of the material in other industries confronted with similar problems.

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