STATE OF OREGON
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
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THE ORE.-BIN

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Permission is granted to reprint information contained herein. Any credit given the Oregon State Department of Geology and Mineral Industries for compiling this information will be appreciated.

Because of increase in circulation of the Ore.-Bin with resulting increase in cost of preparation and mailing, the Department finds that free distribution has become too much of a burden. Therefore, beginning with the July issue, the price for a year's subscription will be 25 cents payable in advance. Please note that if you wish to receive the Ore.-Bin after July 1st, it will be necessary to send 25 cents before the July issue. However, this subscription charge does not apply to those receiving gratis copies of our Bulletins on our exchange list.

The Portland office of the Department has moved to a new location. The new address is 702 Woodlark Building, 813 SW. Alder Street - corner of SW. Alder Street and Ninth Avenue.

MINERAL LOCALITIES MAP

What minerals occur in Oregon? Where do they occur? These questions are answered on an Oregon Mineral Localities Map the Department has recently issued. It is an $8\frac{1}{2}$" x 11" paper reduction of the large map consulted frequently by visitors to the Portland office, and it shows the localities of the important minerals of Oregon.

These maps are available for 5¢ each at the Portland office or at the State Assay Laboratories at Baker and Grants Pass.

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NEW COAL BULLETIN ANNOUNCED

Many people now living in Oregon do not realize that back in 1904 and 1905 the homes and offices of the San Francisco Bay district of California were heated by coal shipped from the Coos Bay district. In those days, Oregon coal production totaled over 100,000 tons a year. However, the advent of petroleum and natural gas extinguished this market for Oregon coals, since natural gas and petroleum are so much easier to use.

In recent years, Oregon coal production has averaged around 8 or 10 thousand tons per year and supplies only a local market; moreover, Oregon coal has had to compete with hogged fuel, which is virtually a waste product, and California fuel oil.

The Oregon State Department of Geology & Mineral Industries, wishing to obtain essential facts in regard to Oregon coals, in order to be in a position to encourage more widespread utilization of this important natural resource, was fortunate in making a cooperative arrangement with the Federal Bureau of Mines for a factual study of the better known Oregon coal deposits that were accessible for sampling and study.

A report of this study has been issued in the form of a bulletin which gives analyses, results of burning tests, and other technical information, as well as conclusions that should tend to change what might be described as a defeatist attitude toward our coals on the part of many people in Oregon. In the opinion of this Department, these coals will be an increasingly valuable resource in this state.

This Bulletin no.20, "ANALYSES AND OTHER PROPERTIES OF OREGON COALS AS RELATED TO THEIR UTILIZATION", by H. F. Yancey and M. R. Geer, may be purchased from the Portland office or the State Assay Laboratories at Baker and Grants Pass for 35¢.

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LOW TEMPERATURE CARBONIZATION OF COAL*

Low-temperature carbonization of coal may be defined as the heat treatment of coal in the absence of air at temperatures of 450° C. and 700° C. as distinguished from the usual high-temperature carbonization at temperatures of 900° C. to 1200° C. 1/

The aims of the treatment are as follows:

1. To obtain a larger yield of liquid fuels than can be obtained from high-temperature processes.
2. To provide a smokeless, easily ignitible solid fuel for domestic purposes.
3. To obtain a dry, easily pulverized, highly combustible, low-volatile material for pulverized-fuel furnaces, and at the same time to recover by-products.
4. To obtain a substitute for low-volatile semi-bituminous coal for mixing with high-volatile swelling coals in order to make a suitable dense metallurgical coke.

The low temperature prevents decomposition of primary tar so that the treatment results in a larger yield of tar and light oils. Less gas is obtained than from high-temperature treatment, but the calorific value is higher.

The process will treat any coal. Although strong coking coal may be used, it is especially adapted to non-coking or weakly coking coals and fine coal that is rejected from coal preparation and cleaning plants. The process is designed to take the lowest priced product of a modern coal mine and make a smokeless household fuel.

One of the most successful of the low-temperature carbonization processes is the Disco process used by the Pittsburgh Coal Carbonization Company 2/. Present capacity of the plant is 7000 tons of coke per month and 140,000 gallons of tar. The coal is marketed through dealers for domestic consumption in furnaces or fireplaces.

Dense-grained and black, irregularly rounded balls, or fragments of balls, are the characteristic products of the process. Although the process produces coke, tar, light oil, and condensable gas, the coke and tar are the only products sold commercially since the gas and light oil vapor are burned in the plant.

The essence of the process is the continuous heating and carbonizing of coal in an inclined revolving retort to form low-temperature coke in rounded, homogeneous, ball-shaped pieces. The size of the coke balls is determined by the agglutinating property of the coal at the time it reaches its softening temperature in

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1/ A. C. Fieldner: Low Temperature Carbonization of Coal: U. S. Bureau of Mines, Tech. Paper 396 (1926).

2/ C. E. Lesher: Production of Low-Temperature Coke by the Disco Process: A.I.M.E. Tech.Pub.1176 (1940), copyrighted by the American Institute of Mining & Metallurgical Engineers.

the retort. A coal of moderate coking property will make coke balls of desired size with little or no preliminary treatment, but a weakly coking coal must be heated rapidly thru the preplastic stage if coke balls are to be produced. Bituminous material such as coal-tar, pitch or strongly coking coal may be mixed with weakly coking coal to produce coke balls.

Estimates of capital costs and operating expenses of plants using weakly coking coal are given in the following table 2/:

ESTIMATE OF CAPITAL COSTS AND OPERATING EXPENSES

	One Unit	Two Units	Three Units	Four Units
Capital Costs				
Carbonizer, roaster, storage	$100,000	$187,000	$270,000	$352,000
Outside plant (coal, coke, gas, and tar handling equipment)	110,000	143,000	160,000	176,000
Total Plant Cost	$210,000	$330,000	$430,000	$528,000
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Capacity, tons of coal per day	160	320	480	640
Capacity, tons per 300-day year	48,000	96,000	144,000	192,000
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Plant cost per ton capacity	$ 1,312	$ 1,030	$ 895	$ 825
Expenses				
Depreciation (15-year life) cents per ton of coal	29.2	22.9	19.9	18.3
Labor (day and salaried)	62.5	41.0	33.6	30.0
Supplies and Steam	10.0	11.0	12.0	13.0
Power Cost ($1\frac{1}{2}$¢ per Kw.hr.)	22.5	27.0	33.0	37.5
Cost per ton of coal	$ 1.242	$ 1.019	$ .985	$ .988

Oregon has sub-bituminous, non-coking coals, high in moisture, of moderate ash content, and low in sulfur. According to Yancey and Geer 3/, these coals make satisfactory low-carbonization products. It is probable that cost of plant and cost of operation may be balanced so as to permit conversion of these low-value coals into a desirable form of smokeless fuel whose value will allow competition with other forms of fuel.

2/ C. E. Lesher: Production of Low-temperature Coke by the Disco Process. A.I.M.E. Tech.Pub.1176 (1940). Copyrighted by the American Institute of Mining and Metallurgical Engineers.

3/ H. F. Yancey and M. R. Geer: Analyses and other properties of Oregon coals: Oregon State Department of Geology & Mineral Industries, Bulletin 20, (1940).

MANGANESE PURCHASES

According to the Arizona Mining Journal (April 15, 1940) the Procurement Division of the Treasury Department has announced the awarding of two contracts for 10,000 long tons of manganese ore, with a total value of $304,000. One order to L. W. Lambert of Upper Lake, California, for 5,000 long tons of Grade B (Philippine) (manganese minimum 48%, silica maximum 10%, phosphorus maximum 0.18%) brought 65¢ per long ton unit (22.4 pounds) f.o.b. Baltimore. The second order to L. L. Patrick of Los Angeles called for 5,000 tons of Grade A (domestic) (manganese minimum 48%, silica maximum 9%, phosphorus maximum 0.12%) at 62¢ per long ton unit, f.o.b. Ogden, Utah.

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(The following notes on industrial minerals and processes are taken from the U.S. Bureau of Mines Information Circular 7106).

ELECTRIC "EYE AND EAR" CONTROL

The "electric eye" and thermostatic devices now control processes that involve high temperatures. An "electric ear" regulates the load of grinding mills to the optimum point, reducing its feed when the sound is muffled and increasing it when the mill gets too noisy. Chemical control and physical tests have been extended. Better standardization and clearer understanding of consumers' requirements have reduced the variety of products and eliminated unnecessary lines. As certain specifications have grown more rigid they have actually been simplified and made less liable to misinterpretation.

CEMENT CLINKER GRINDING AIDS

Many industrial minerals are used in pulverized condition. The biggest dry-grinding job in industry is the grinding of cement clinker, and a number of Portland cement companies are now obtaining 20- to 50-percent increases in grinding efficiency by the employment of "grinding aids". It has long been known that additions of certain substances such as coal or resin, prevent packing of fine material and remove the coatings from balls and liners of grinding mills, probably by charging particles of the material with static electricity. During the last few years it has been found that an even better grain in grinding efficiency (though actually less dispersion) can be obtained by adding minute amounts of complex organic compounds. After trying a great many products, the Dewey & Almy Chemical Co., Cambridge, Mass., perfected a mixture of triethanolamine salts and certain calcium salts of modified lignin sulfonic acid which was named TDA. In addition to speeding up grinding, it materially improved the quality of cement because it also disperses the cement particles in mixing concrete and catalyses the hardening reaction. This triple-effect material is sold as dry-powder, but it is fed into the mill as a water solution very much as flotation reagents are fed into concentrating-mill circuits. For full effect on strength and workability 1 part is used to 1,520 parts of cement, but for grinding aid only, a 1:3000 ratio suffices. TDA is the only material other than gypsum whose addition to ground cement has been approved by the American Society for Testing Materials (A.S.T.M.Committee C-1). The cost is about 1½¢ per barrel for ordinary cement and 3¢ for high early-strength cement.

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COPPER IN BONNEVILLE CABLE

According to "The Mining and Contracting Review" (March 31, 1940) the Phelps-Dodge Copper Products Corporation has been awarded a contract for 114 additional miles of 110,000-volt hollow copper cable for the Bonneville Power Project. This brings P-D's total to 800 miles of copper cable for the project.

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BUILDING MATERIALS

(Mineral Trade Notes: U.S. Bureau of Mines, April 20, 1940)

Tests are being made in Germany on the use of a new type of mineral fiber developed recently from polyvinyl chloride (an acetylene derivative, with the addition of hydrochloric acid) as a substitute for iron for reinforcing concrete. If experiments now being conducted prove that mineral fiber additions are practicable, it will mean a substantial saving in iron, thereby benefiting Germany's foreign exchange situation and relieving somewhat the existing shortage of iron.

One of the chief advantages claimed for the new mineral fiber as a reinforcing agent is its great strength, which is said to equal that of ferro-concrete. Other advantages are the fiber's light weight, resistance to water, acids, alkalies, and other chemicals, resistance to rust, rotting and ignition, elasticity, and great insulating properties against heat and electricity.

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ASBESTOS-SUBSTITUTE BRAKE LINING DEVELOPED*

Following 5 years of laboratory research work, a new type of brake lining for automotive vehicles has been developed in Germany to obviate the use of asbestos for the purpose.

The new lining consists of aluminum or steel wool as a substitute for asbestos, incorporated with synthetic "Buna" rubber as a binding material. The new lining is said to be not only equal but superior in some ways to ordinary brake-linings made from asbestos, rubber, resin, drying-oils, etc. Former brake linings required imported raw materials, and Germany feels that it is now in position to manufacture its brake linings entirely of domestic raw materials.

To make the new-type linings, fine metal fibers of about 0.03 mm. diameter are embedded in resin or synthetic rubber. In contrast to pure-metal lining, the new fiber lining does not injure, by an abrasive effect, the metal surface to which it is applied. The metal fiber lining is mechanically resistant and is no more sensitive to oils and fats in reducing its braking power than are asbestos linings. Water exerts only an inconsequential reduction of braking action, and the new lining is very resistant to wear. Another important feature is the ability of the new lining, because of its high conductivity, to dissipate excessive heat.

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* Mineral Trade Notes: U.S. Bureau of Mines, April 20, 1940.

WILLAMETTE VALLEY SURVEY

A magnetometer survey will be made this month by a geologist from the Geophysical Division of the U. S. Geological Survey, assisted by a geologist from the State Department of Geology & Mineral Industries. Work will start about May 6. Structures will be studied along two sections about 25 miles in length from east to west in the general vicinity of Salem. Field work will be completed in about two weeks.

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OREGON EXHIBIT AT THE SAN FRANCISCO FAIR.

A mineral exhibit, representative of Oregon's minerals and mining industry, is being assembled by the Department and will be ready for the Fair's opening on May 25.

The mineral exhibit will include four transparencies 30 inches by 40 inches showing views of the state's mining and quarrying operations.

A third feature of the display will be a glass apparatus in continuous operation illustrating the retorting and condensing of quicksilver.

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BEACH SAND SURVEY

Preliminary field work has been started by the Department on a back-beach sand area north of Bandon to determine the most feasible method of mapping the black sand accumulations along the coast. This work will be continued and supplemented by a U. S. Geological Survey party probably in June. Some drilling will probably be done, and arrangements have been made for research on the best method of concentrating chromite from these sands by U. S. Bureau of Mines metallurgists at College Park, Maryland.

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24-6 Edward H. Lough, 3214 Odd Fellows Home, Portland, Ore., wishes assistance in financing on a partnership basis gold property on North Umpqua river in Douglas county, about 37 miles east of Roseburg. Reported high gold assays in quartz. Crosscut tunnel 184 feet; shaft 84 feet deep with crosscut 25 feet. 1¼ miles by trail from automobile road. Claims held by location in the Umpqua National Forest.

24-7 R. P. Thompson, Hotel Wabash, Portland, Ore., has chrome prospect about 3 miles west of O'Brien. Reported 200 tons high-grade chromite shipped during World War. Financial assistance desired in order to open up new lenses.

24-8 L. G. & Gertrude McKenny, 514 Isham, Grants Pass, Ore., desire to sell gold lode property comprising 6 claims, containing orebody reported to be 16 feet in width and averaging $15. Fifty assays said to have ranged from $3.85 to $26.00. Development work consists of tunnels and cuts. Price $5000 with 1/3 down.

24-9 J. T. Logan, Cave Junction, Oregon, has for sale one Brunton compass reported in good condition, price $17.50; one box compass with alidade sights, price $7.50.