STATE OF OREGON
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
329 S.W. OAK ST.
PORTLAND, OREGON

# THE ORE.-BIN

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That you may have

A HAPPY AND PROSPEROUS NEW YEAR

is the wish of the staff of the Oregon Department of Geology and Mineral Industries.

It is our hope that during 1940 you may be as busy and as happy in being busy as you have been and as we have been during 1939.

This Department is now 2½ years old. It is getting much of the wobbliness out of its legs, has had a reasonably lusty voice for some time, and shows occasional signs of intelligence.

At the moment this child of ours is thrilled with the prospect of new types of diversion and new worlds to conquer. In our earliest babyhood we heard strange stories about kilowatts, jigs, anodes, electrolytes, and other mysterious toys. These bedtime stories are beginning to take more tangible form. We hear about a new plant that is assured for the manufacture of aluminum metal, about plans afoot for employing these kilowatt and anode toys in doing all sorts of interesting things. We hear about Uncle Sammie diamond-drilling for chromite - and finding some - to make more bright shiny toys and tools. In fact, we hear so many things, and in the meantime note that some of them are coming to pass, that we are more enthusiastic than ever before on the kind of story we will have to tell you a year or two years from now.

On the whole, we are extremely pleased that our babyhood and youth are to coincide with the most interesting development of the country in which we live. We hope you share our pleasure in the prospect of growing with, and contributing to, this country and its future.

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TO ALL EXCHANGE LIBRARIES:

Announcement is made of the release of Bulletin No.15, entitled "Geology of the Salem Hills and the North Santiam River Basin, Oregon", by Thomas P. Thayer. Copies of this publication will be mailed from this office about January 6th, 1940. If not received within ten days from the above date, advise this office immediately; otherwise, replacement for copies lost in the mail or elsewhere cannot be made.

## NEW BULLETIN ANNOUNCED

Announcement is made of the publication of the following bulletin by the State Department of Geology and Mineral Industries:

> "Geology of the Salem Hills and the North Santiam River Basin, Oregon", by Thomas P. Thayer: State Department of Geology and Mineral Industries, Bulletin no.15; 40 pp., 3 tables, geologic map in colors of the Salem Hills and North Santiam River Basin, Oregon, 8 figures.

Owing to the nature of the Act which created it, this Department functions in Oregon as a State Geological Survey, a Bureau of Mines, and a Department of Mineral Industries, all combined. In view of this rather broad scope of activities the departmental publications are divided among several categories, including geology, mining, metallurgy, state-wide mineral inventories, industrial analyses, etc.

This bulletin is confined strictly to a geologic subject and embodies an academic discussion of the structure, age relations, glaciation, physiography, and general geology of the area covered. Although a reasonable amount of areal geologic work has been done in the Cascade area from Eugene north to the Columbia river, the results of most of such work have not been made accessible to the public. The work done by Dr. Thayer and published herewith is an addition to the geology of this country and fits in with Eugene Callahan's Cascade work. We believe that the author, Dr. Thayer, now one of the geologists of the U. S. Geological Survey, has made a worthwhile contribution to Oregon's geological literature, especially by his outlining the relations between the older "Western Cascades" and the younger "High Cascades" volcanic series. The bulletin should be of interest and value to geologists and students making investigations anywhere along the Cascade belt of the Pacific Northwest.

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## NEW ALUMINUM PLANT TO USE BONNEVILLE POWER.

The lower Columbia River area received, almost as a Christmas present, assurances of the installation in 1940 of a plant for the manufacture of aluminum metal. The Aluminum Corporation of America, according to our understanding, has purchased some 200 acres of land on the north side of the Columbia River just below Vancouver, Washington, for a plant location, and has signed a contract with the Bonneville Administration for some 32,500 kilowatts of electrical energy. It is stated that the plant will be completed within the next twelve months, will cost a matter of $3,000,000, will employ between 300 and 400 men, and will use raw material shipped mainly all rail from the lower Mississippi Valley and perhaps from the Guianas.

This is the first large block of electrical energy which has been contracted for by the Bonneville Administration, we are told, and should start the ball rolling toward the larger use of Bonneville power for industrial purposes. The people of the Portland-Vancouver district should feel kindly toward Dr. Raver, Bonneville administrator, for his successful work in negotiating this contract, and should themselves feel fortunate in being the recipients of such an industrial punch as the building of this plant should give to the community. Dr. Raver has openly advocated that industries that are large consumers of electrical power are the ones which should best fit into the Bonneville picture, and he has also maintained that certain industries might be encouraged to locate here, rather than elsewhere, for no other reason that the inducement offered by low-cost power.

The accuracy of his position has been fully borne out by the recently completed negotiations with the Aluminum Corporation, because so far as we now know there are no substantial deposits of raw materials in the Pacific Northwest to support an aluminum industry. All of the raw materials will be brought in from outside and a major portion of the product of this plant must be shipped away to the outside until such time as there is sufficient consumptive capacity in the Northwest to absorb it. (That's some kind of a challenge to us).

It is our feeling and prophecy that other corporations in the business of utilizing or treating mineral and other raw materials, and who require large quantities of cheap electricity, and who can operate with high load factors, may be encouraged by the example set by the Aluminum Corporation. Next in order should come such industries as ferro-alloys and electro-chemicals, with cellulose and waste wood product plants following.

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## HOUSE INSULATION.

Recent experiments have been carried by the Tennessee Valley Authority in connection with the problem of saving domestic fuel bills by proper house insulation. According to information recently published, the reduction in total heat loss in a properly insulated house was 45%. Two identical four-room houses were built at the Hiawassee Dam construction community, one of the houses built in the usual way and the other insulated throughout with a type of wool batting in the walls and over the ceilings. It is stated that the total cost of construction

of the house with proper insulation amounted only to an additional $200 for both labor and materials. The heating of the two houses was done by electricity so that the cost could be accurately calculated.

This question of proper insulation is one which should be given careful thought in the Pacific Northwest, because we are large manufacturers of insulating materials from waste wood products, and because almost all of the coal and oil (and the oil to manufacture gas) with which Portland homes are heated must be purchased out of the state and shipped in.

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## MINERAL WOOL.

Mineral wool is a substance composed of very fine, interlaced mineral fibers having the appearance of loose wool or cotton. It is composed principally of silicates of calcium and aluminum. This term covers a number of similar products as follows:

Rock wool, made from natural rock or combinations of natural minerals.
Slag wool, made from iron, copper, or lead smelter slags.
Glass wool, made from silica sand, soda ash, and limestone.

These products are marketed in various forms: loose wool, granulated wool, fabricated forms, and insulating cement.

Individual plants follow various practices, so only the essential steps of the manufacturing process will be outlined here. The process consists essentially of melting the raw materials, blowing the molten material into a woolly fibrous material, and preparing the product for the market. Electric cupola furnaces are the principal melting units. Slag is drawn off the furnace and is blown through nozzles or orifice plates by means of steam or compressed air. The wool fibers are screened to rid the wool or slag shot and are then prepared for market. Loose wool and granulated wool require little handling. Wool for fabricated forms and insulating cement is mixed with various binders, and pressed or molded into shapes.

It would appear from the foregoing brief outline that the process for the manufacture of mineral wool is a comparatively simple process. It is true that for an investment of from $30,000 to $50,000 a plant capable of producing about 1,000 pounds of wool per hour (12 tons per day) may be built. However, the manufacture of mineral wool to meet specifications within rapidly narrowing limits is not a simple process and cannot be accomplished without detailed and elaborate technical control. Those items which require study and control within the plant are: chemical and physical composition of raw materials, type of melting furnace, melting and blowing temperatures, blowing technique, and shot prevention and removal. Consumer specifications control the limits on the following properties: chemical composition, shot content, fiber size (diameter and length), ductility or softness, waterproofing, and thermal conductivity. These specification requirements vary considerably according to the use of the particular product.

Mineral wool is used as an insulating material in buildings of all sorts. Modern homes with mineral wool insulation not only are easier to heat, as well

as heated more cheaply, but the wool is an excellent fire-retardent. The wool may be tamped loose between walls or may be put directly in place in the form of sheets, blocks, or bats.

Mineral wool manufacture tends to be a decentralized industry because the wool may be made from a number of different kinds of raw materials and because mineral wool is a bulky material, expensive to ship great distances. In spite of the fact that small, widely scattered plants are possible, their operation must be highly technical so that the product may meet the market specification.

Mineral wool manufacturing plants in the western states are located at Torrance, Los Angeles, Watson, and Huntington Park, in California; and Salt Lake City and Sandy, Utah.

Prices of rock wool range from about $20 to $50 per ton for the finished product.

In the Pacific Northwest any manufacturer of mineral wool would have to compete with makers of wall board and several types of insulation made from waste wood products. This would be rather stiff competition. Nevertheless, the fact that mineral wool is fire-proof or fire resistant and reportedly is less affected by climatic changes and less apt to absorb moisture, may give the product a slight advantage over a product made from organic materials.

References: "Rock Wool", Furcron, Munyan and Smith: Dept. of Natural Resources, Div. of Mines and Geology, Atlanta, Georgia, November 1939.
"Mineral Wool": J. R. Thoenen; U.S.Sur.Mines, IC 6984 R, June 1939.

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## HIGH EFFICIENCY ELECTRIC LIGHT BULBS.

According to SCIENCE NEWS, the research engineers of the Westinghouse Company predict, on the basis of tests, that in the future we shall have electric light bulbs which are at least three times as efficient as the ones in common use today. These new bulbs will employ the two rare metals caesium and tellurium. Caesium is now used in small quantities in photo-electric cells and it works with great efficiency. Tellurium, the engineers state, promises to make possible a lamp yielding almost the exact duplicate of sunlight, a bluish light or a yellow light as desired.

Present difficulties of manufacturing these new lamps include the fact that quartz, which must be used to confine these rare metal vapors at extremely high temperatures, is brittle and difficult to use in automatic machines. Tellurium vapor yields light efficiently on direct current but not, apparently, on alternating current, - a handicap to such a lamp's use now.

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## TIN.

According to a recent announcement by a member of the American Tin Trade Association, two tin smelting plants will be in operation on the Atlantic Coast. Phelps Dodge Refining Corporation and American Metals Company have completed, on modest bases, installing equipment for furnace-smelting and fire- and electrolytic-refining of tin ores and concentrates. With this industry established in the United States, American consumers of tin will not depend entirely on Dutch smelting interests. Concentrates from Bolivia, the Far East, and China could be treated directly in the United States without shipping to England and Holland and then shipping the metal back to the United States. The United States consumption for 1938 was 50,000 long tons, or 30% of the world production.

Establishment of the industry on continental United States may stimulate domestic production from Alaska, South Dakota and Wyoming, and South Carolina.

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So many requests have come in for a little pamphlet on Sampling that we produced in 1937, that we have made a re-issue. Now, we will be pleased to send it to anyone who asks for it, and who encloses a 3¢ stamp to cover postage.

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The Industrial Minerals Chemical Company, address 6th and Gilman Streets, Berkeley, California, mine, buy, process, and deal in many types of non-metallic industrial minerals. They also act as distributors for products of other concerns. Persons looking for a possible market for non-metallic minerals may address inquiries direct to the company in Berkeley.

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WE UNDERSTAND -

That this week, "Pop" Wilmot is starting his enlarged quicksilver reduction plant at the Oregon Bonanza mine near Sutherlin. This operation will now be the largest producer of quicksilver in the United States, and the Bonanza mine represents the largest known deposit of quicksilver ore in the United States. (Wanna fight?)

That Art Champion is getting along nicely at the Mother Lode mine east of Prineville and is producing a number of flasks per week with a Gould furnace.

That the Blue Ridge property also east of Prineville is retorting about a flask a day from their workings, which are shallow.

That Ray Whiting is installing a small rotary retort at his interesting new quicksilver property across from the Ochoco Ranger Station.

That a real placer gold operation is really getting going in the Mormon Basin.

That Atlas Dredge Corporation is well along with its installation of a big 3-yard doodle-bug on Althouse creek in southern Josephine county.

That Murphy and Murray, within the last two weeks, shipped in the makings of a new bucket line dredge to operate on the left fork of Foots creek in Jackson county.

That the Al Sarena, better known as the Buzzard mine, north of Medford, recently started up their 100-ton flotation mill and should be among the interesting producers in 1940.

That the Esterly mine in southern Josephine county, one of the more consistent hydraulic placer operations of the state, started piping December 9th and is set for a good season.

That the Benton mine, 40-50 ton cyanide operation on Whiskey creek down Rogue River below Grants Pass, is running at capacity - as usual.

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Hey! You!! Try this. Make one column of all the mine operations in the state that are running along profitably. (Yes, you'll have quite a column - and an ever-increasing one). Make another column of all the mine operations in the state that have real, honest-to-God technical supervision - that is, sound scientific engineering and geological advice (and we mean SOUND, not merely "an old-head miner from the Couer-d'Alene", or a "miner from the Mother Lode").

Then see if you can tell one column from the other. You'll find they're "bloody twins".

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Assayers at the State Assay Laboratories, established to provide free assay service to citizens of Oregon, have analyzed samples of all descriptions for a great variety of elements, although mainly for gold, silver, copper, chromium, manganese, platinum, and quicksilver. The Grants Pass office opened in August 1937; while the Baker office opened in September 1937. Detailed records of the first few months were not kept, but a resume' of the records for the past two years is given in the accompanying table.

The first year, the laboratories were on trial and had to prove themselves to the mining public. As a consequence, many "test samples" were submitted by curious prospectors. However, the laboratories have proved themselves and now have settled down to stabilized operation. It is our hope that the records for 1940 will be as good as those of 1939, for they will show we are satisfactorily serving the people of Oregon.

REPORT OF STATE ASSAY LABORATORIES FOR 1938 and 1939.

| | Baker | | Grants Pass | |
|---|---|---|---|---|
| | 1938 | 1939 | 1938 | 1939 |
| Visitors: | | | | |
| Total | 6166 | 5347 | 3200 | 3321 |
| Average per month | 514 | 445 | 267 | 277 |
| Average per working day | 23 | 20 | 12 | 11 |
| Assay Determinations: | | | | |
| Total | 4010 | 3062 | 3390 | 3228 |
| Average per month | 334 | 255 | 284 | 269 |
| Average per working day | 15 | 12 | 13 | 10 |
| Correspondence: | | | | |
| Total | 2211 | 2033 | 1505 | 1293 |
| Average per month | 184 | 170 | 125 | 110 |
| Average per working day | 9 | 7 | 6 | 4 |

The Portland office during 1939 received 2881 visitors, received 8984 pieces of mail, and sent out 18,323 pieces of mail. The mail sent out included letters, Ore.-Bins, reports, and bulletins.

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