THE ORE.-BIN

Volume XVI

1954

January 1954 Portland, Oregon

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

State Governing Board

Mason L. Bingham, Chairman, Portland
Niel R. Allen Grants Pass
Austin Dunn Baker

F. W. Libbey, Director

Staff

R. E. Corcoran Geologist
Hollis M. Dole Geologist
L. L. Hoagland Assayer & Chemist
Ralph S. Mason Mining Engineer
T. C. Matthews Spectroscopist
Lenin Ramp Geologist
M. L. Steere Geologist
R. E. Stewart Geologist

Field Offices

2033 First Street, Baker
N. S. Wagner, Field Geologist

239 S.E. "H" Street, Grants Pass
David J. White, Field Geologist

****

THE ASTORIA LANDSLIDES

Erosion to most of us means the slow, almost imperceptible, wearing down of the higher parts of the earth's crust by running water, wind, or ice. Seemingly mountains remain the same height and stream valleys the same depth throughout the years. The only rapid changes in the landscape which are accepted as normal are the neat excavations made when new roads, dams, or other man-made structures are constructed. It is not surprising that special attention to the choice of a foundation for an ordinary building is seldom given, for our experience tells us that the durability of the structure is infinitely less than that of the ground on which it is built. It comes as a shock to us when exceptions to our everyday observations occur. Such is the case in the landsliding at Astoria, Oregon, at the mouth of the Columbia River.

This year, damage from landsliding in Astoria has centered in the western part of town at West Commercial and West First streets. Twenty-seven houses have been affected, five of which were already abandoned as the result of slippage last winter. The houses in this area will be destroyed unless moved and the streets, sidewalks, plumbing, landscaping, and other improvements are doomed. In 1950 twenty-three houses in the Coxcomb Hill area were removed or destroyed. A loss of fifty houses in one city due to geological processes in a matter of a few years is a serious situation, and a brief review of the geology of the area is given so that a better understanding of the underlying cause of the destruction may be had.

Structurally, the site of Astoria is on a syncline, the axis of which runs almost east-west through the center of town. The angle of dip of the limbs varies from about 10° to greater than 30°. Outcrops indicate that most of the sediment which makes up the bedrock in the city of Astoria is a clay shale containing limestone concretions. Underlying and overlying the shale is fine-grained sandstone. Petrographic examination of the shale shows that it is bentonitic and made up predominantly of the mineral beidellite (?). The sandstone contains some greensand that consists largely of a glauconitelike mineral and gypsum with minor amount of detrital grains of quartz and plagioclase feldspar. The sandstone is mainly quartz and feldspar. The fossils found in the sandstone and shale have been the subject of study by paleontologists for more than a hundred years. The shale has been designated as a part of the Astoria formation and assigned a Miocene age; however, recent re-examination of foraminifera from a roadcut along Commercial Street about 100 yards east of 37th Street by R. E. Stewart of the Department suggested an upper Oligocene age for the shale in that area. The name "Astoria formation" was first used by Thomas Condon, Oregon's pioneer geologist, sometime before 1880. Basalt is found near the center of town and most of Coxcomb Hill is thought to be a basalt plug. These rocks are assigned to the Miocene epoch also.

Landsliding in the West Commercial Street area as well as in other parts of Astoria is not new. From the top of the hill above West First Street the characteristic topography of landslides can be seen below extending on both sides and above the present zone of slippage. Evidence that the movement of some of this area is not recent is found in the fir and alder trees 8 to 10 inches in diameter growing in slump blocks. These trees show no tilting. Geologists have noted before that landsliding in the Astoria shale is to be expected when the shale occurs on slopes. Etherington, in his paper on the Astoria Miocene of southwest Washington which was published in 1931, states:

> ". . .They (the Astoria shales) are very soft and subject to slumping in steeply exposed slopes causing landslides where they form part of a hillside. This tendency seems to be characteristic of the Astoria. . . ."

An explanation of the inherent property of the shale to slide is found in its high content of the bentonitic clay minerals that can take water into their crystal lattice. This causes swelling of the mineral and reduces the friction between the grains. The result is internal stress which is reflected in heaving, and the lead-bearing characteristic is greatly reduced. Once landsliding has started, fractures are formed and water can penetrate deep into the shale mass thus affecting a greater volume.

Equilibrium of slope of bentonitic material in areas of heavy rainfall is established only when the angle of slope is essentially flat. If the rainfall is not great this same material may be able to stand on quite steep slopes without danger of failure. It is well known that landslides may be started and speeded up by natural causes such as earthquakes, and unnatural causes such as undercutting lower slopes of a hill in construction work.

Landsliding, a type of mass wastage, is a form of erosion every bit as potent as running water or ice. It is not as well known because the conditions necessary for it to occur are not as widespread and the results are more localized. Like flooding, the damage from landsliding may be disastrous to limited areas and at times difficult to predict; nevertheless its damage is real. If you don't believe it, ask the people of Astoria.

H.M.D.

****

OREGON OIL AND GAS RULES

The 1953 Legislature passed a new oil and gas conservation law and it became Chapter 520, Oregon Revised Statutes. This law directs the Governing Board of the State Department of Geology and Mineral Industries to compile reasonable rules for the guidance of operators both in the prospecting for and production of oil and natural gas in order to prevent waste. Therefore the Board has just issued Miscellaneous Paper No. 4 titled "Rules and Regulations for the Conservation of Oil and Natural Gas." The paper includes an appendix containing Chapter 520, Oregon Revised Statutes, for reference purposes.

Miscellaneous Paper No. 4 may be obtained at the Portland office of the Department, 1069 State Office Building, or the field offices in Baker and Grants Pass. Price is 50 cents postpaid.

****

WASHINGTON MINING LAW BULLETIN

The State of Washington Division of Mines and Geology, Sheldon L. Glover, Superviser, has just issued Bulletin 41, "An Outline of the Mining Laws of the State of Washington." The author is Mr. Morton H. Van Nuys, mining lawyer, Seattle. Bulletin 41 is a revised and expanded edition of the original mining law bulletin by Mr. Van Nuys issued by the Division of Mines and Geology in 1940.

This bulletin is a valuable reference to anyone who needs to look up mining law, not only of the State of Washington but also the federal law which is basic to all public land states. It may be obtained from the Division of Mines and Geology, Olympia, Washington for 50 cents.

****

OREGON'S MINERAL INDUSTRY IN 1953

By

The Staff

Introduction

Total value of 1953 mineral production for Oregon has not yet been released by the U.S. Bureau of Mines. The last official figures were for 1951 when total production was valued at a little less than 28½ million dollars. It seems likely that value in both 1952 and 1953 did not vary greatly from this figure.

Nonferrous metal production in the State in 1953 was very small, even though gold production increased to $288,750 as compared with $192,815 for 1952. Only insignificant amounts of copper and lead were produced as by-products of precious metals from ore shipped to the Tacoma Smelter. However, metal mining assumed a more hopeful status because of the start of construction of the Hanna nickel smelter at Riddle and also because of increased chromite production in southwest Oregon. Interest in deposits of some nonmetallics was shown by large out-of-state mining companies and several examinations were made. On the whole, construction continued at a consistent level compared to 1952 which meant a good demand for sand, gravel, stone, and portland cement.

Metallics

Gold, silver, copper, lead, and zinc

A major proportion of the gold produced in Oregon in 1953 came from the dredge of the Powder River Dredging Company which is working the gravel close to the town of Sumpter, Baker County. Small quantities of placer gold came also from some small hydraulic operations including about ten in Josephine and Jackson counties which were active when water was available. The principal lode gold producer was the Buffalo mine in eastern Grant County which, following its usual procedure, shipped some sorted high grade and ran the flotation mill when sufficient milling grade was accumulated in the stockpile.

Copper and lead output was very small and came principally from the smelting ore shipped from the Buffalo mine. In the late part of the year a new discovery of copper ore was made at the old Standard mine on Dixie Creek in Grant County, and a shipment of high-grade copper ore was sent from the discovery to the Tacoma Smelter. Some exploration was started at the Queen of Bronze copper mine, Josephine County, including diamond drilling by the U.S. Bureau of Mines, and it was reported that the Queen of Bronze Mining and Smelting Company, Grants Pass, had signed a contract with a Japanese company for shipment of copper concentrates from the Queen of Bronze to Japan. A diamond drilling campaign was conducted during the year at the Almeda gold-copper mine on the Rogue River near Galice. A small amount of development work was done at the Neonday (Thompson) mine on the West Fork of Cow Creek in eastern Coos County, and also at the Hamlin copper prospect on Onion Mountain in Josephine County.

Chromite

Chromite mining and prospecting activity continued active throughout the year, when weather conditions permitted, owing to the government's incentive price program. In southwestern Oregon ten chromite concentrating mills shipped concentrates to the purchasing depot. These mills are listed on the following page:

Ashland Mining Company, Ashland, Jackson County

Bristol-Baker mill, Curry County

Bowers mill, Josephine County

Waldo Milling Company (was Chrome Milling Company), French Flat, Josephine County

Foster mill, Josephine County

Freeman and Twombly mill, Curry County

Grants Pass chrome mill, Grants Pass, Josephine County

Six-mile chrome mill, Josephine County

Thompson Milling and Manufacturing Company, Ashland, Jackson County

Radcliffe mill, Galice, Josephine County

Several new chrome deposits were discovered, the most important of which appear to be the Lucky L & R mine, the Sad Sack mine, and some deposits at "Chrome Flats," all on Chrome Ridge, Josephine County. Some new prospects were opened in the Illinois River area but very little is known about their possibilities at present.

According to the U.S. Bureau of Mines chromite reports, production of domestic chrome during the first ten months of 1953 totalled 35,028 short tons, which included production from California and Montana as well as Oregon. Mining activity was curtailed in Oregon and northern California beginning late in October because of snow in the mountains.

Chromite concentrates were shipped to Grants Pass from the town of John Day in central Oregon by Zanetti Brothers of Wallace, Idaho, who had leased the Dry Camp mine, and the mill of the Tri-County Mining Company. Other shipments of concentrates were made by Burt Hayes from the Haggard and New property near Canyon City. U.S. Bureau of Mines metallurgists from Albany, Oregon, took a 30-ton sample of chromite ore from the Chambers and Iron King mines. Metallurgical testing work designed to study possibilities of producing commercial ferrochrome from this ore was started.

Mercury

The Bonanza quicksilver mine near Sutherlin, Douglas County, owned by the Bonanza Oil and Mine Corporation produced continuously throughout the year. A Defense Minerals Exploration Administration loan of $50,056 became available in the middle of the year to be used in exploratory drifting on the 830 and 1050 levels. Some new ore was developed.

Small-scale quicksilver prospecting with some production was conducted at the Maury Mountain mine in Crook County, at the Roba and Westfall property in Grant County, and at the War Eagle mine and Ruby claim group in Jackson County.

Nickel

Construction of the nickel smelting plant under contract by the Bechtel Corporation for the Hanna Nickel Smelting Company started early in 1953 and progressed satisfactorily throughout the year. It is now estimated that furnaces may be started in June 1954. Logging and clearing over the ore body on Nickel Mountain were nearly completed as the year ended. Construction of the aerial tramway has progressed rapidly and is nearing completion. About 400 men are employed.

The U.S. Bureau of Mines has been making smelting tests on low-grade nickel laterite from the Red Flat deposit in Curry County. This experimental work has been done along the lines of the process expected to be used by the Hanna Company at Riddle.

Manganese

Seven car lots of manganese oxide ore were shipped to the Geneva Steel Company, Utah, from prospects in Pleasant Valley south of Baker. Mining and shipping were done by the Ketell Investment Corporation, Portland.

The U.S. Bureau of Mines conducted a study of manganese deposits in southern Oregon and did some bulldozer trenching on the Neathamer deposit in the Lake Creek district east of Medford, Jackson County. The Bureau also did some exploratory diamond drilling on a rhodonite prospect on Upper Evans Creek in Jackson County. Some exploration work is reported to have been done at the Long Ridge manganese deposit in southern Curry County by Oliver and Earl Boyd and M. E. Porter. Reportedly about 30 tons of manganese oxide was mined but not shipped.

Iron

A small amount of limonite from the Scappoose district, Columbia County, was mined by the Orr Engineering and Chemical Company and processed in a plant at Scappoose for use in desulphurizing manufactured gas at the Portland Gas and Coke Company plant in Portland.

Nonmetallics

Sand, gravel, and stone

Construction remained at a fairly high level throughout 1952 and 1953, although probably there was a leveling off from the high rate in 1951 when value of sand, gravel, and stone was $19,948,000. By far the largest proportion of cement aggregate was produced in the Willamette Valley where about forty sand and gravel companies continued to dig river gravels.

Limestone

Because of the high level of construction activity, portland cement and hence limestone were produced up to capacity of the plants. In southern Oregon the Ideal Portland Cement Company was active throughout the year. This company quarries limestone at the Marble Mountain quarry and produces cement from this stone at the plant at Gold Hill. A newspaper article reported a statement by a company official that "Although the smallest of Ideal's cement operations, the Gold Hill plant has had $200,000 worth of modernization and its Marble Mountain quarry is one of the best sources of lime rock in the United States. . . .The Gold Hill plant has an annual payroll of more than half a million dollars . . . and another half million goes for plant materials."

In Baker County the Oregon Portland Cement Company initiated a modernization and expansion program at its quarry and plant at Lime, and the Morrison-Knudsen Company started large-scale exploration of limestone near Durkee. The objective of Morrison-Knudsen is to prove sufficient reserves so that a large-scale program for supplying stone to sugar mills, paper mills, and for agricultural purposes may be set up. Mr. Anthony Brandenthaler announced plans for a new burned lime plant at Baker to be supplied from the property of the Chemical Lime Company owned by Messrs. Brandenthaler and Lilley on Marble Creek west of Baker.

Pacific Carbide and Alloys Company continued quarrying high-grade limestone at their deposit near Enterprise in Wallowa County. A change in furnace design at the Portland plant was made late in the year which will result in increased production of calcium carbide. Undersize material was sold for agricultural use.

Agricultural limestone spread on Oregon farms in 1953 under the Production and Marketing Administration program was somewhat less than the 46,744 tons spread in 1952. More than half of the lime originated in the State of Washington. Bad weather, which prevented spreading during the liming season, was largely responsible for the decline. Oregon agstone quarries are located neat Lime, Grants Pass, Roseburg, and Dallas.

Perlite

The perlite quarry and plant of Dant and Russell, Dantore Division, at Dant on the Deschutes River in Wasco County, optioned by Kaiser Gypsum in 1952, was closed down in 1953. Late reports were that the equipment would be liquidated.

Diatomite

The operation at Lower Bridge near Terrebonne on the Deschutes River by Great Lakes Carbon Corporation was continued at capacity throughout the year. Reportedly the company is seeking new reserves in central Oregon. Strong interest in Oregon diatomite deposits has been shown by other large mining companies who have been investigating occurrences in central and eastern Oregon.

Silica

The only producer of silica in Oregon, the Bristol Silica Company, Rogue River, continued to ship crushed quartz for metallurgical use, chicken grit, etc. A specialty, catalytic silica for the petrochemical industry, was marketed during the year. An overall increased demand was reported by Mr. F. I. Bristol, owner of the company. It is also reported that when operations of the nickel smelter at Riddle begin, demand for high-grade quartz will be greatly stepped up.

Lightweight aggregates

Two producers at Bend, L. A. Williamson, Cascade Pumice Company, and William Miller, Central Oregon Pumice Company, were active throughout the year. Harney Concrete Tile Company, operated by Don Robbins near Burns, produced cinders and pumice. A considerable quantity of pumice was sold for road metal to logging companies.

Volcanic cinders found increased use in 1953, particularly for aggregate used with asphaltic paving. Leroy Grote produced cinders from Tetherow Butte near Redmond and L. A. Williamson operated a quarry near Tumalo.

Expanded shale continued to be produced by Northwest Aggregates and Smithwick Concrete Products Company in the Portland area.

Clay

Brick plants were busy throughout the year as demand for building brick continued good. Most of the brick clay was produced in northern Willamette Valley, although the plant at Klamath Falls continued active as in previous years.

Asbestos

The Canadian Johns-Manville Company finished prospecting for chrysotile asbestos in Grant County and shifted activities to Josephine County where several prospects were examined. Three diamond drill holes were put down on a prospect on Josephine Creek owned by George C. Foster. Representatives of other asbestos companies made examinations in southern Oregon.

****

UMATILLA COUNTY MAP TO BE PUBLISHED

N. S. Wagner, field geologist of the Department, has completed a preliminary geologic map of the southern half of Umatilla County. Field work on this project by Mr. Wagner was done during 1952 and 1953. For two weeks during 1953 he was assisted by R. E. Corcoran from the Portland office. A reproduction of the map together with an abstract of the report on the geology will be included in the March issue of the Ore.-Bin.

****