



DEPARTMENT OF THE INTERIOR

Division of Information Northwest Regional Office
PORTLAND, OREGON

BUREAU OF MINES

December 15, 1958

For Release to PM's, December 16, 1958

NEW REPORT BY MINES BUREAU DESCRIBES FAMED HOLDEN METAL MINE

The Howe Sound Company's Holden Mine, which operated successfully for 20 years in a remote and picturesque section of Washington's Cascade Mountains, is the subject of a new Bureau of Mines publication released today by the Department of the Interior.

One of a series describing mining practices, the report is considered of particular interest because the Holden Mine was a low-cost, large-scale-production operation carefully planned to develop a low-grade ore deposit from which copper, zinc, silver, and gold were obtained. The mine was active from 1937 until 1957, when it closed due to unfavorable economic conditions. The Bureau's report presents detailed information on mining methods and costs throughout this period.

The Holden Mine is on Railroad Creek near the crest of the Cascade Mountains, about 12 miles west of Lake Chelan, Chelan County, Wash. Its remoteness and the severity of the winters in this region caused serious recruitment problems. To attract employees, the company built a town near the mine, complete with stores, living quarters, and recreational facilities. It also serviced, at nominal cost, a campsite of privately owned homes.

During its economic lifetime, the Holden Mine produced approximately 10 million tons of ore, which yielded over 212 million pounds of copper, 40 million pounds of zinc, 2 million ounces of silver, and 600 thousand ounces of gold. The mine was developed by more than 56 miles of underground workings on 14 levels.

John R. McWilliams, mining engineer at the Bureau's Spokane, Wash., office, wrote the report, which reviews the history of the Holden Mine, describes the geology of the area, and discusses prospecting, exploration, sampling, estimating tonnages, development and mining. Information is included on ventilation, drainage, safety practices, labor, and wage and bonus systems employed by the company.

A copy of Information Circular 7870, "Mining Methods and Costs at the Holden Mine, Chelan Division, Howe Sound Co., Chelan County, Wash.," can be obtained from the Bureau of Mines, 4800 Forbes Avenue, Pittsburgh 13, Pa. Requests for this report should include its number and title.



DEPARTMENT OF THE INTERIOR

Division of Information Northwest Regional Office
PORTLAND, OREGON

U. S. BUREAU OF MINES

July 1, 1960

For Immediate Release

BUREAU OF MINES OBSERVES GOLDEN ANNIVERSARY

The Federal Bureau of Mines, a leader in scientific development and conservation of the nation's mineral resources, was 50 years old Friday.

Secretary of the Interior Fred A. Seaton, under whose department the Bureau of Mines is operated, noted that the Bureau was created at a time when coal mining disasters were claiming the lives of many workers. He pointed out the agency's safety research and training and its cooperative efforts with management, labor and other Federal and State agencies have been major factors leading to improved working conditions in all segments of mineral industries.

The Bureau of Mines has and is continuing to play a leading part in development in the Pacific Northwest, the agency's region one, with its activities, led by research in high purity metals at the Albany, Ore., headquarters, its approximately 20 mining engineers in the Spokane area serving the rich mines of Idaho and elsewhere, its research program at Seattle along with the University of Washington, and the operations in Alaska.

Particular attention has been focused on the metallurgy laboratory work at Albany where the process now employed by industry to make zirconium metal, used in the atomic engine that powered the nuclear submarine Nautilus, on its record breaking run beneath the North Pole, was engineered. Its work with zirconium, hafnium, highly important in atomic reactors, and 30 other metals has been directly credited with the establishment of metal industries near Albany that employ 700 men and would not be there were it not for the bureau's laboratory. The process found at this laboratory opened the way for production that was an important factor in reducing the price of zirconium from \$500 to a few dollars per pound.

The Albany laboratory has been a mecca for scientific and production people around the world and as many as 5000 persons a year have visited the laboratory.

In the ten years before the Bureau began its work in a single research laboratory on the old Arsenal grounds in Pittsburgh, Pa., coal miners died at the rate of 364 a year in major disasters. Since, the fight carried on by the bureau, and others has reduced that yearly average disaster toll to 32, and impressive safety gains have been made throughout the nation in all activities concerned with the mining and processing of minerals.

More

Bureau of Mines Director Marling J. Ankeny said his agency's accomplishments are not limited to the mining field, but touch, directly or indirectly, the lives of all Americans. For example:

The electric bill paid by most American homeowners is relatively low, partly because bureau research helped improve the efficiency of coal-burning equipment at power plants so that a pound of coal today will generate as much electricity as five pounds did half a century ago;

Air conditioners and refrigerators are leak-tested with bureau produced helium--a lightweight gas that also helps insure the purity of many products from candy mints to medicines and has essential uses in missiles, electronics and space exploration;

Bureau studies paved the way for safe ventilating systems in structures like New York's Holland Tunnel, and they still are providing information that will help reduce air pollution from automotive exhaust gases and incinerators;

Some hospitals in this country are still using radium extracted by the bureau years ago from domestic carnotite ores. This achievement, which came early in the bureau's history, made the element available for medical use at \$40,000-a-gram less than the price then paid for imported radium;

By controlling fires that sometimes break out in inactive coal deposits, the bureau has saved for future generations millions of tons of valuable fuel reserves at a cost of less than a penny a ton. Valuable reserves of anthracite also have been saved through the bureau's participation in mine-drainage projects in the hard-coal regions of Pennsylvania;

American businessmen are aided by bureau factfinding programs that supply statistical information and economic analyses on domestic and foreign minerals. Friendly foreign nations also benefit from technical advice and assistance provided by bureau experts through the Economic Cooperation Administration.

Ankeny, the agency's tenth director, noted that in half a century the bureau has published nearly 8000 reports describing its findings in research and development work on minerals, mineral fuels, and industrial health and safety. An equal number of articles by bureau researchers has appeared in the scientific, trade, and technical press of the United States and many foreign countries, he said. Comprehensive 50-year lists of these reports and journal articles will be issued soon to mark the bureau's golden anniversary.

Ankeny said the bureau has also added substantially to domestic supplies of mineral raw materials. Increased production of copper resulted from bureau investigations at San Manuel, Ariz., and White Pine, Mich., and many additional barrels of crude petroleum have been produced through the bureau's promotion of secondary oil-recovery techniques. Bureau studies of blasting, roof bolting, rock dusting and other mining methods and practices have not only improved safety but also have increased efficiency in mines throughout the nation. As an example, Ankeny cited the American coal miner, who now produces an average of 12½ tons of coal a day. In 1910, he said the average output per man was 3½ tons a day.

"Although the bureau is proud of its achievements," Ankeny concluded, "it values the past primarily because it provides the knowledge needed in solving problems of the present and future. With 50 years of experience as a guide, the bureau hopes in the half century ahead to strengthen further the mineral-resource base upon which the industrial progress and economic security of the United States depend."

Northwest Regional Information Office, Portland, Oregon

DEPARTMENT OF THE INTERIOR

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BUREAU OF MINES

For Release Thursday, December 26, 1968

MINES BUREAU REPORTS MINERAL PRODUCTION VALUES IN FOUR NORTHWEST STATES RISES IN 1968

Mineral production values during 1968 in each of the four Pacific Northwest states of Washington, Idaho, Montana, and Oregon rose from the previous year's levels, according to preliminary annual reports issued today by the Bureau of Mines, Department of the Interior.

Montana's estimated \$234.0 million mineral production in 1968 increased 25 percent over the previous year. This figure, however, was still below the total 1966 value of production--\$245.3 million. The nationwide copper strike, which began in July 1967 and continued for the first three months of 1968, affected production totals for two years. Most of the metal industries affected by the strike were able to recover to normal production by year-end.

Oregon's mineral production value rose to \$77.5 million, a 16 percent increase from the 1967 value of \$66.6 million, but still far below the record-setting value of \$107.5 million reached in 1966.

Idaho mineral production gained 8.0 percent in value this year to a total of \$8.7 million.

Washington's estimated value of mineral production for 1968 reached \$82.7 million. This was less than a one-percent increase over the 1967 value of \$82.1 million.

The reports were released by Mark L. Wright, Chief of the Albany Office of Mineral Resources, Albany, Oregon. They were prepared under the direction of A. J. Kauffman, Jr., Physical Science Administrator, Albany Office of Mineral Resources.

Highlights of the preliminary reports by states:

MONTANA

As production of copper resumed in the State following the 8-month copper strike, firm prices for copper led to increasing production during the latter part of the year. The Anaconda open-pit operation at Butte set a one-day production record of 306,944 tons of material removed, exceeding the current daily average by more than 25,000 tons. Included were 57,947 tons of ore, 69,430 tons of leach material, and 179,567 tons of waste.

More

Uuno M. Sahinen, Associate Director of the Montana Bureau of Mines and Geology, reported at the December meeting of the Northwest Mining Association that 251 mining operations were active in the State. At least 134 of these operations reported some production during the year. Several major exploration companies were active in Montana, and 23 new mining companies were incorporated during the year.

An increase in the average market price of gold to \$38.74 per ounce, stimulated interest in gold production and exploration throughout the State and resulted in a 31-percent increase in gold production from 9,786 ounces in 1967 to 12,799 ounces in 1968.

The total iron ore production in the State came from the Iron Cross mine of R & S Iron Co. near Radersburg. Production increased 30 percent from 1967 to 13,000 tons of ore. The ore, mined by open-pit methods, was used by the cement industry.

Although less than half the total production in 1966, lead output more than doubled over the previous year to 1,890 tons. Byproduct lead output, affected by the copper strike, was still far below normal, but an increase in shipments from small lead-zinc-silver mines added to the total production. Lead production was reported from 89 operations throughout the State.

Continuing declines in demand for manganese concentrates resulted in a reduction in the total amount of manganese shipped to approximately 6,000 tons of concentrates. No manganese ore was mined in the State during the year, and stockpile shipments from The Anaconda Company and Taylor-Knapp Co. to other users accounted for all the manganese production attributed to the State in 1968.

The Anaconda Company announced the discovery of nickel-bearing ore near Columbus in both Stillwater and Sweetgrass Counties. About 30 men were engaged in exploration efforts which included geological mapping, geophysical and geochemical work, diamond drilling, and sampling. The diamond-drilling program indicated nickel-copper values lying close to the surface where open-pit mining methods would be feasible.

Production of silver continued to be more than 60 percent below the 1966 level as the total byproduct silver output was reduced by the copper strike. The rising price of silver continued to arouse interest in locating and developing silver deposits in mining regions throughout the State.

Minerals Engineering Co. reopened its Beaverhead County tungsten mill which had been idle for seven years. Full production, employing 25 men, was resumed in August. The mill, which was shut down for economic reasons, was rebuilt and a chemical plant which produces ammonium paratungstate was added to the complex. Another 30 men were employed for mining at the Calvert mine, about nine miles west of Wise River.

Output of zinc continued to be derived from both byproduct production from copper mining operations and various small lead-zinc-silver operations. Production declined 34 percent from 1967 as only 2,209 tons of zinc was recovered from ores mined in the State.

Production of nonmetals--cement, clays, gypsum, lime, sulfur and vermiculite--increased during 1968, while phosphate rock and talc declined compared with 1967 totals.

Output of bituminous and subbituminous coal and lignite increased substantially over the previous year's figure.

IDAHO

Mineral production in Idaho increased 8.0 percent in value during the current year. As in the past, silver was the leading value product of the State's total mineral production of \$118.1 million. The increase in value of silver production was due entirely to the 1968 record average price of \$2.14 per ounce. Total silver output actually declined six percent.

Antimony, a byproduct from silver ore, was leached from silver concentrates and recovered at the Sunshine Mining Company's electrolytic plant as cathode metal. Yearly production remained constant at 823 short tons valued at 33 cents per pound.

A 20 percent decline in production of copper resulted from the continuation of the nationwide copper strike.

Despite an increase in the average price of gold for the year to \$38.74 per ounce, Idaho's output hit a record low of 2,808 ounces. The increased price for gold, however, spurred exploration activity.

Mercury production increased 21 percent in 1968 over the 1967 figure, while the value increased 34 percent; the average market price rose to \$542 per flask from \$489 the previous year.

Production of silver declined six percent this year as a result of the continuing loss of byproduct silver from operations affected by the copper strike; vanadium declined 33 percent because of depressed market conditions; and zinc was down only two percent from last year.

For nonmetals, cement production and shipments were increased an estimated 13 percent over 1967, though masonry cement shipments were lower; the quantity and value of garnet shipped by producers in Idaho increased 16 and 6 percent compared with respective totals of the previous year; phosphate rock production of marketable value was estimated four percent greater than the 1967 total; the production of pumiceous materials was estimated to be moderately greater than the output for the previous year, while combined output of sand, gravel and stone was estimated at 16.5 million tons, compared with 13.2 produced in 1967.

WASHINGTON

Gold and silver increased in value of production in Washington by 25 and 114 percent, respectively. The large gain in silver value was caused primarily by the rise in its selling price rather than a 114-percent increase in actual output.

About a quarter of all aluminum produced in the United States came from Washington plants. Bureau of Mines estimates showed total U. S. aluminum production to have declined in 1968. Estimates for Washington showed an increase;

thus the State's percentage of total output rose from 23 to 24 percent. Alumina was shipped into the State for final processing.

New starts and expanded operations were reported by several companies. Reynolds Metals Co. started a new potline at Longview several months ahead of schedule. The 40,000 ton-per-year addition boosted the annual capacity to 110,000 tons. Harvey Aluminum, Inc. signed a contract to purchase 200,000 kilowatts of power to operate a new aluminum smelter to be built near John Day Dam. The Port of Everett announced an agreement with Anaconda Aluminum Co. to finance a \$3.3 million transfer facility on the Everett waterfront.

An estimated 225,000 tons of 1.5 percent copper has been blocked out by Mono Mine, Inc., which announced plans for a 200-ton-per-day mill at its King County property, east of Seattle.

Lead output increased, but zinc decreased for the current year. Mercury from the Morton area in Lewis County, was reported for the first time since 1965. Although no production of uranium was noted in Washington, much prospecting was in progress on and around the Spokane Indian Reservation.

For mineral fuels, August 23 marked the beginning of construction of the \$206 million coal-fired steam-electric power plant of Pacific Power & Light Co. and Washington Water Power Co. The same companies awarded a contract to Dravo Corp. for removing 100,000 cubic yards of coal from a test pit site at Tono coal field for development of their power plant operation. Atlantic Richfield Co. announced plans for construction of a 100,000-barrel-per-day petroleum refinery at Cherry Point, 11 miles northwest of Bellingham.

A Bureau of Mines report on beryllium deposits in the Northwest indicated the areas included were Calispell Peak and Granite-Ruby Creek in Washington, and the Avon mica district in Northern Idaho. The source of this beryllium was low-grade quartz veins and idocrase tactites. Increased demand has been anticipated in supersonic aircraft, missiles, nuclear reactors, and space vehicles.

Nonmetals for the State showed abrasive, chemical, and refractory-grade crude silicon carbide continued to be manufactured by Carborundum Co. at Vancouver. Abrasive-grade crude silicon carbide was shipped to abrasive-grain sizing plants in the eastern United States for further processing into material suitable for bonded and other abrasive products. Other grades of crude silicon carbide were used by the steel industry as a furnace additive, and by the petroleum industry as a catalyst in refining crude oil.

Shipments of portland cement from five producing plants in Washington totaled 6.4 million barrels valued at \$21.4 million.

Lime output advanced 20 percent over the 1967 total, largely due to more primary open-market lime manufactured for chemical and construction purposes by Pacific Lime, Inc., Tacoma.

Crude magnesite output by Northwest Magnesite Co., at the Red Marble and Finch quarries near Chewelah, Stevens County, declined 29 percent from last year's total.

Olivine output, advancing 11 percent over the 1967 production, was marketed principally for use as foundry sand to consumers in the Western States and Canada.

Combined output of sand, gravel and stone did not change appreciably from the 1967 total of 42.6 million tons valued at \$46.6 million. However, larger construction awards were granted to contracting agencies for highways, dams and power projects, public works, and general building activities than last year.

OREGON

Increases in consumption of sand, gravel and stone accounted for over 70 percent of the total production value and gained 22 percent over last year's value. All other minerals showed only slight changes. The Oregon mineral sector appeared to stabilize after the tremendous decline in 1967.

The National Science Foundation awarded \$553,000 to Oregon State University for the purpose of broad studies related to the seas. Matching funds of \$500,000 were granted by the State. Some work will be done in marine minerals and mining. The Bureau of Mines has been working in a combined effort with the University testing for "black sands" deposits off the Oregon and California coasts. These deposits are a potential source of chromium, gold, platinum, and other minerals.

Albany has become a center for space age metals: columbium, zirconium, and titanium. Wah Change Albany Corp., Oregon Metallurgical Corp., TiLINE, Inc., and REM Metals Corp., which has planned expansion, are located in the area. Recently a new company, Zirconium Technology Corp., was formed.

Low-cost power provides an incentive for metal companies to locate in Oregon. Portland General Electric Co. awarded a \$60 million contract for constructing a nuclear power plant on the lower Columbia River. Completion is expected in late 1974. Existing firms in the metals industry are expected to benefit.

Georgia-Pacific Corp. completed its gypsum research laboratory at the Tigard Industrial Park. Most of the research was proprietary. Studies have been conducted for new product development, quality control, and manufacturing improvements.

Aluminum production in Oregon increased four percent compared with that of the previous year. Harvey Aluminum, Inc., produced nearly 91,000 tons of aluminum at The Dalles plant during the fiscal year ending September 30. Reynolds Metals Co. announced that a new 40,000-ton potline would be added at the Troutdale plant with completion expected by early 1971.

A small tonnage of copper was mined from two properties--the Bolivar, Coos County, and the Copper Queen, Baker County. Bear Creek Mining Co. and Cyprus Mines Co. drilled properties in eastern Baker County. Both companies expect to continue exploration, subject to evaluation of the completed drilling.

For ferroalloys, the Union Carbide Co., Portland, produced low-iron and standard ferromanganese and silicomanganese. The manganese ore used came largely from Brazil and was supplemented by ore purchases from the General Services Administration stockpile. Total furnace capacity was directed to manganese alloy products, which excluded output of ferrosilicon.

Preliminary estimates indicate 15 ounces of gold produced in Oregon, all of which came from lode mines. Omega Mining Co., Ltd., Vancouver, B. C., holding approximately 1,500 acres of mining claims in the Bourne area of Baker County, announced a major mining program to extract gold-silver ore from the Columbia Lode which traverses the area.

Construction began on the Cascade Steel Rolling Mills, Inc., plant at McMinnville. The firm was to produce steel reinforcing bar and angles, with capacity to be 50,000 tons of steel annually.

Mercury output was 940 flasks, nearly the same as that for 1967.

Hanna Mining Co. mined 1,186,700 tons of 1.4 percent nickel laterite ore at the Nickel Mountain mine, Douglas County.

Oregon Metallurgical Corp., Albany, completed construction of an ingot melting plant capable of producing ingots 30 inches in diameter. This expansion resulted in increasing ingot capacity to approximately 17 million pounds annually. Advancement of engineering in an effort to complete backward integration of the titanium sponge plant was significant.

TiLINE, Inc., Albany, completed construction of its titanium and zirconium casting plant.

REM Metals Corp., Albany, completed building construction, and planned equipment installation during the first half of 1969, which will complete the company's \$1.5 million expansion program. REM specialized in precision investment casting of titanium, zirconium, and columbium metal.

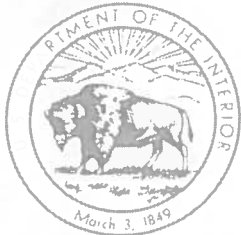
In the uranium field, Gulf Oil Corp., Nuclear Fuels Division, conducted a geologic reconnaissance program over an extensive area in southeastern Oregon. Western Nuclear, Inc., was doing exploration drilling at the White King mine, Lake County. Atlantic-Richfield Co. purchased the uranium plant at Lakeview and was determining the necessary work and investment to make the plant operable.

Seamless titanium and zirconium tubing was to be produced by a new company, Zirconium Technology Corp., in a plant to be built at Albany.

Wah Chang Albany Corp. received a large order from General Electric Co. for zirconium billet, bar, strip, tube, sheet, and other shapes for use in nuclear reactors.

According to the Oregon Department of Employment, the alltime record highs for the civilian labor force, 935,600, and total employment, 899,600, were reached in August 1968. The previous record totals occurred in June 1968. After two years of instability, Oregon reached seasonal adjustments more in line with those of the Nation. Much of this was due to a broadened economic base. While Oregon still depended on the lumber industry, the manufacturing sector made important gains; for example, March manufacturing was up 23 percent over the same period last year. Seventy percent of all manufacturing gains was in the primary industries; 25 percent of all manufacturing was in metal-connected industries. However, Oregon still had a 4.6 percent rate of seasonally adjusted unemployment, compared with a national rate of 3.6 percent. Part of this year's seasonal rate was due to record heavy rains occurring during harvest time, damaging important crops; logging and sawmill production were also limited somewhat.

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Northwest Regional Information Office, Portland, Oregon

DEPARTMENT OF THE INTERIOR

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P. O. Box 3621, 1002 N. E. Holladay Street, 97208--234-3361

BUREAU OF MINES

For Release to PM's January 26, 1968

NEW MINES BUREAU SLIDE RULE CONVERTS WEIGHT TO ATOMIC PERCENT

A new metallurgists' slide rule that quickly and accurately converts weight percent to atomic percent, and vice versa, for many binary alloys and compounds has been devised by the Department of the Interior's Bureau of Mines.

The rule should prove extremely useful to those investigating both new alloys and established binary systems. It saves much time and effort, Bureau researchers say, in conventional calculation to determine one or the other percentage.

"Weight percent" refers to the percentage of a compound's total weight represented by a given element in it. "Atomic percent" expresses the relative number of atoms of each element in a compound. Weight percent is a measurement used in making an alloy, while atomic percent is used to predict its structure and some of its properties.

Circular in form, the slide rule bears inner and outer scales and two movable arms of unequal length that pivot from its center. In use, the arms are set to indicate, first, the two elements of an alloy or compound, then, the conversion from known weight percent to atomic percent or vice versa. Seventy-three elements in the periodic table appear on the rule.

A Bureau report describing the construction and operation of the slide rule has just been placed on open file at the Bureau's Albany (Ore.) Metallurgy Research Center. Titled "Bureau of Mines Circular Rule for Interconverting Atomic and Weight Percent in Binary Compounds," by R. P. Adams and R. A. Beall, the report can be consulted during regular working hours at the Albany Center, Broadway and Queen Avenues, Albany, Ore. Individuals and firms interested in the possibility of constructing the rule for use or sale can obtain permission along with necessary engineering drawings and other data, by writing to the Research Director, Albany Metallurgy Research Center, Bureau of Mines, Box 70, Albany, Ore., 97321.

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