Huntting Reports.

Mining Developments and Future Needs of Washington

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By

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During the past year we have had a moderately high level of exploration activity in the State of Washington, and I think it would be safe to say that this has been to a large extent a product of the relatively good prices for the base metals and for silver. Unfortunately, we cant report any startling new discoveries that have been made during the year, but several of the exploration projects are of enough interest to warrant mention.

Production by Pend Oreille Mines & Metals Co., the State's largest zinc and lead producer, during the first 9 months of the year was down slightly from that for the same period a year earlier. Ore mined was 496,000 tons, down 1 percent from the previous year; zinc concentrate produced was down 10 percent; but lead concentrate was up about 1 percent.

The only other important producer of zinc and lead during the year was the Van Stone mine of the American Smelting and Refining Co. This open-pit mine and 1,000-ton mill is in north central Stevens County about 12 miles south of Northport. The pit is operated two shifts to keep the mill running at capacity 24 hours per day.

A little farther north and east in the same county in the Leadpoint district is the old Anderson pit, now renamed the Calhoun mine, which is being opened up as an underground mine by the American Zinc, Lead and Smelting Co. It is expected that the mine and 1,000-ton mill will be ready to start production early next year. American Zinc shut down its Grandview property at Metaline Falls late in 1964 and shifted its crew and equipment to the Calhoun property.

The State continues as an important producer of gold, thanks to the Knob Hill-Gold Dollar mine at Republic in Ferry County and the Gold King mine in Chelan County. In 1964 these were the second and third largest lode gold mines in the United States. Day Mines, Inc. of Wallace, Idaho, has an interest in both of these properties. Day's Gold Dollar property at Republic is adjacent to the Knob Hill mine and is operated by Knob Hill Mines, Inc. Day owns a 30 percent interest in L-D Mines, the operator of the Gold King mine at Wenatchee, Chelan County. The mine is reported to have produced approximately $13\frac{1}{2}$ million in gold in the past 16 years. The company recently was awarded an O.M.E. contract to explore its "B-Reef." Government participation will amount to $66,630. The contract calls for shaft sinking, crosscutting, drifting, raising, and long-hole drilling.

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In the Swauk district in Kittitas County, placer gold was produced by Gold Placers, Inc. The company used a dry-land washing plant, reported to have a capacity of 250 yards per hour, to rework ground that for the most part was mined by hand methods in the early days. The plant is interesting in that the screening section is located in the pit, and the gold-bearing material that passes through the screens is pumped up to the gold-recovery section which is on the bank about 150 feet away. The gold-recovery section consists of an endless rubber belt about 5 feet side and about 25 feet long to which are volcanized rubber riffles. The belt is stationary while operating, but the riffles are cleaned by rotating the belt.

The record high prices paid for mercury have stimulated renewed interest in the Morton district in Lewis County. Small-scale exploration and some high-grading of old workings have resulted in the production of a few flasks of mercury by each of at least two lessees.

Copper production in the State during the year was practically zero, as it has been since the closure of the Howe Sound mine in 1957. However, exploration for copper continued, mainly in the Cascade Mountains. Bear Creek Mining Co. continued its previous year's diamond drilling on the Gilbreath property on the Middle Fork of the Snoqualmie River in King County, but at the end of the season they dropped their option on the property. In the same district geologic mapping and diamond drilling were done on the Rainy copper property by Cougar Development Co., and to the south in the same county, the Mono copper prospect in the Miller River district was diamond drilled by Banff Oil Co. of Calgary.

In Okanogan and Ferry Counties the Colville Indian Reservation was the scene of large-company mineral exploration for the first time in years. Bear Creek Mining Co. held a 20,000-acre lease from the Colville Tribe, on which they did geologic mapping, geochemical work, and shallow drilling in the Keller district in southern Ferry County. Cascade Natural Gas Co. held a 3,200-acre lease in the Central Peak area on the reservation in Okanogan County.

In the northeastern part of the State, several properties were under development, and a few had small production. Among these were two in central Pend Oreille County--the silver property of the Silver King Mining and Milling Co. west of Jared and the lead-silver property of Rocky Creek Silver Mine, Inc. west of Tiger.

The Bunker Hill Company continued its exploration in northeastern Washington, doing geological and geochemical work and drilling. The bulk of their work was in the Gladstone Mountain area of Stevens County, but some was also on Grandview Mines holdings and on Mines Management holdings in the vicinity of the Advance mine.

Nonmetallic or industrial mineral production has been increasing steadily in the State in recent years, and it is expected that production will be up again this year. The construction materials, cement, sand and gravel, and stone are the leading products. Production of stone for stucco dash, terrazzo, roofing chips, and for various building and decorative uses has become an important factor in northeastern Washington.

The cement industry has made the news several times during the past year. Ideal Cement Co. is building a $20 million cement plant in Seattle on the Duwamish Waterway adjacent to its existing dock, cement storage, and bulk shipping facilities. Limestone will be barged in from Texada Island. The source of the clay needed as a source of silica and alumina has not yet been fixed, so, if any of you know where you can find large quantities of clay containing practically zero percent alkalis and that is preferably located on tidewater close to Seattle, perhaps you can do business with Ideal.

During the year Kaiser Cement and Gypsum Corp. leased from the Port of Seattle 22 acres of land adjacent to their existing cement storage and bulk loading plant. It is expected that they will build a cement plant at this location to replace the loss of their subsidiary Olympic Portland Cement Co. plant at Bellingham. As the result of an anti-trust suit, the company was given 4 years in which to sell the plant.

The other cement producer in western Washington, the Lone Star Cement Corp., with two plants, one at Concrete in Skagit County and the other in Seattle, was reported to have retained The Bechtol Corp. to investigate expansion possibilities. The company was reported to have optioned property at Anacortes, and pipelining of raw materials from Concrete to Anacortes was said to be one of the alternatives being considered, but no definite plans have been announced as yet.

Washington has the distinction of being a leading producer of two different magnesium minerals, magnesite and olivine. The Northwest Magnesite Co. plant at Chewelah has been a stabilizing factor in the economy of Stevens County for many years, dating back to about 1919. A "comer" has been the olivine industry based on the production of foundry sand by crushing and screening the massive olivine that makes up the great mass of the Twin Sisters Mountains in Whatcom and Skagit Counties. This is a true "mountain of ore," with practically unlimited reserves. It has been estimated that 160 billion tons of olivine-bearing rock is in an area 4 miles wide by 10 miles long. This is the rock exposed in the vertical distance of about 5,000 feet between the highest and lowest points in the Twin Sisters Mountains. Castings made with olivine foundry sand are superior to those made with conventional silica sand. Growth in olivine foundry-sand production in recent years has been very rapid, averaging more than 40 percent per year.

The mineral olivine contains 28 to 30 percent magnesium. This obviously is much higher grade ore than the 0.13 percent of mganesium contained in sea water, which is the current principal source of the metal. We are hopeful that current research by Kermit Bengtson of Twin Sisters Magnesia and Chemical Corp. on a method to produce magnesium chloride and other chemicals and valuable byproducts from olivine will be successful. If, or similar research could result in effectively creating a tremendous new mineral resource industry for the State. With the increasing demands for greater and greater speeds in the transportation industry more and more light-weight construction materials are being used. I am confident that magnesium, which is one-third lighter than aluminum, will be one of the "metals of the future." The Twin Sisters olivine mass is the largest and purest of any in the United States. We are looking forward to the day when magnesium metal from Washington olivine will be supplementing the Northwest's already important light-metals production of the aluminum and titanium industries.

Future Needs

Time isn't available to any more than barely touch on future needs in the field of minerals. A whole shelf full of reports have been written on this subject by the organization, Resources for the Future, Inc. I would recommend these reports to any of you who may be interested in the long-range future for the various segments of the mineral industry.

The demand for minerals continues to grow. For example, Resources for the Future predicts that consumption of iron and steel in the U. S. will increase by 250 percent between 1960 and the year 2000. In the same period increases are predicted of 230 percent for lead, 380 percent for zinc, 375 percent for copper, and 900 percent for aluminum. This increased consumption will be the result of not only our doubled population that is predicted by the year 2000, but also of our continued increasing per-capita demands for mineral products, as shown in this slide.

SLIDE 1

As you can see, the per-capita demand for minerals has risen at a rapid rate from 1870 to the present, while the per-capita consumption of forest products has dropped considerably and for agricultural products it has risen only very slightly. Per-capita mineral consumption has risen at the average rate of 1½ percent per year in recent years.

These predicted future demands and their trends are extremely important and should be weighed very heavily, not only by the resource industries themselves in planning for the future but even more so by the governmental authorities who are responsible for the establishment of resource-development laws and regulations and for land-management policies. While we are on the subject of land-management policies, I want to mention the Federal Land Law Review Commission.

I am sure that most of you know that the last Congress established this 19-member commission to make a thorough review of all the laws and administrative acts relating to the Federally owned public domain lands, and to recommend appropriate changes. Of course, the mining laws will be an important subject for review, and it is highly important that everyone who is concerned make his views known to the commission. Chairman of the commission is Congressman Wayne Aspinall of Colorado, a well-known friend of the mining industry. Of interest to Washingtonians is the fact that Senator Jackson is a member of the commission, and the 25-member industry advisory board to the commission includes Mr. Bernie Orell, Director of Public Relations for the Weyerhaeuser Co., and two Washington State officials, John Biggs, Director of the Department of Game, and Bert Cole, who is Public Land Commissioner. Any of you who are concerned with the public land laws should make your views known to some or all of these men.

A recently enacted land management law that has considerable bearing on the mineral industry is the Wilderness Act of 1964. One of the provisions of this act required that the Primitive Areas be examined to determine what recommendations should be made regarding their being added to the Wilderness System established by the law. The U.S. Geological Survey and Bureau of Mines were directed to make mineral-resource appraisals in each of the Primitive Areas. During the past summer one party of Bureau of Mines men and three parties of Geological Survey geologists and one geochemical party have been hard at work in the 801,000-acre North Cascade Primitive area in north-central Washington. Based at Twisp, the parties this season concentrated their work in the eastern part of the primitive area in Okanogan County. The central and western parts of the area in Whatcom County will be covered during the next 2 years.

I want to briefly mention two offshore developments. Four oil refineries in the Puget Sound area provide a substantial market for crude oil, but at the present time this demand is supplied by foreign producers, principally in Canada. These refineries represent an important incentive for oil exploration in the Northwest. To date, onshore exploration in Washington has produced a number of "teasers" but no commercial crude oil production. In the past few years the concentration of exploration effort has been offshore, out to as much as 50 or 60 miles off the coasts of Washington and Oregon. Extensive geological, geophysical, and shallow core-hole drilling preceded the competitive bidding for Federal offshore leases that were awarded a little more than a year ago. Several test wells were drilled off the coast of Oregon this year, and we expect that drilling will be done off the coast of Washington beginning next year. We look with envy at our sister State of Alaska, in which oil and gas production is a rapidly growing and important business, and we are confident that Washington will join the ranks of the producers.

The other offshore activity that is of interest is that of the U.S. Bureau of Mines Marine Minerals Technology Center, which is based at Tiburon, California, just north of San Francisco Bay. The Bureau, in cooperation with several private companies, is designing and testing a variety of machines and techniques for testing and mining offshore mineral resources. Of greatest interest, perhaps, are the deep-sea manganese nodules and phosphorite nodules. The Bureau has two ships based at Tiburon. One of these ships, the R/V Perspicacity, spent about 6 weeks this fall in running test lines off the coast of Washington taking bottom samples for laboratory testing. Their program is just getting well started, but I am sure they will have some very interesting reports as they get under way.

As I pointed out earlier, this country's needs for mineral resources are growing rapidly.

SLIDE 2

In response to these needs our national mineral production has increased at a rapid rate, as shown on this chart. For example, from 1870 to 1957 the production of lead increased by a factor of 10; zinc production was 45 times greater in 1957 than it was in 1870; and copper production was 60 times greater.

SLIDE 3

Washington has produced an important part of the country's mineral resources in the past, and our production has been increasing rapidly since 1933, as shown in this graph. We can keep this curve headed healthily upward, if we can have reasonable laws and intelligent and cooperative administration of those laws by the government agencies responsible for the management of public and private lands in this country. We also believe that it is essential in this age of research that the State and Federal agencies that serve the mineral-resource industries be adequately funded so they can do the job that needs to be done in basic and applied research and service in the field of mineral resources.