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A BRIEF HISTORY OF THE OREGON PORTLAND CEMENT CO.

By F. E. McCaslin, President

The following article, "A Brief History of the Oregon Portland Cement Co.," was a speech presented to the Oregon Advertising Club of Portland on October 21, 1964 by Mr. F. E. McCaslin, president, Oregon Portland Cement Co. It is reproduced here for two reasons: 1) to illustrate the vital role played by this segment of the state's mineral industry in the development of the Northwest, and 2) to impress upon the people of Oregon that our mineral industry encompasses more than the mining of the glamour minerals gold, silver, and uranium. Cement, limestone, sand and gravel, shale, clay, stone, and silica -- all are mineral materials essential to the growth of the industrial world and all are available in Oregon.

As this article indicates, the companies engaged in supplying these basic materials are often business concerns formed by local citizens who have a genuine interest in their communities. In short, these are good businesses and a credit to their region. This article is timely in that 1965 marks the 50th anniversary of the Oregon Portland Cement Co. The Oregon Department of Geology and Mineral Industries congratulates the Oregon Portland Cement Co. for its part in the building of the state and wishes it well in the years to come.

Hollis M. Dole
State Geologist

Introduction

"Portland cement is the product obtained by finely pulverizing clinker, which is produced by calcining to incipient fusion an intimate and properly proportioned mixture of argillaceous and calcareous materials, with no addition subsequent to calcination except calcined or uncalcined gypsum."

This definition is not as austere as it sounds. It really means that we take two different types of rock, one a high-grade calcium (or calcareous) rock and the other containing iron, aluminum, and silica, found in clays or shales and technically known as argillaceous rock. We crush and mix

them in proper proportions, then change the product into a slurry form by grinding the mixture into an extremely fine powder mixed with water. The slurry is then fed into the upper end of a sloping and revolving kiln. In some plants the kilns are as much as 450 to 500 feet in length. Into the kiln at the lower end is injected a flame, frequently produced by natural gas, which develops a temperature of 2,500° to 3,000° F.

The product which comes from the kiln, after an approximately two-hour exposure, is called "clinker." The clinker is treated to a finish grinding process, at which time gypsum is added to control the setting time of the finished product. The material produced is portland cement.

History of Portland Cement

In the days of the Roman Empire, a cement was used to produce concrete that rather closely approached the concrete of today. The ruins of many structures remain to attest to this fact. The Roman Forum, the Appian Way, the Aqueduct, and numerous other structures contain cement in somewhat the same form as we know it now.

During the Middle Ages the secret of making this type of cement seems to have been lost and not re-discovered until the 18th century. As early as 1756, Englishmen were working with mortars in an effort to develop a hydraulic cement -- a cement which would harden under water or when water was applied to it. One of the earliest of these experimentations was carried on by John Smeaton, an English engineer and builder of lighthouses, who discovered some of the intricacies of the process by heating mixtures on his kitchen stove.

In 1824, Joseph Aspdin, an English bricklayer, who had been experimenting since 1811, took out patents on an improved cement. He called it portland cement, because it resembled in color a building stone found on the Isle of Portland, an island off the English coast near the town of Leeds, England. One of the important parts of Mr. Aspdin's discovery was the necessity of burning his hard limestone at high temperatures.

The first portland cement to be produced in the United States was probably made by the Coplay Works at Valley Forge, Pennsylvania, around 1866. Shortly thereafter, several plants were built in the Lehigh Valley of Pennsylvania, which is still the largest producing area for portland cement in the country.

It was not until about 1900 that the quantity of cement manufactured in this country equalled the imports from Europe. In 1900, 8,482,000 barrels were manufactured in the United States. This figure grew rapidly. In 1910 it reached 76,549,000 barrels. Last year it was expected that the consumption of portland cement would reach an all-time high of 365 million

barrels with a value of $1,171,000,000. The rated capacity of the industry today is approximately 481 million barrels. Thus, it will be noted that the cement business, in our generation, has become one of the major industries of the country.

Some 60 separate companies operate 180 plants in 39 states and Puerto Rico. The greatest concentration of plants is still in the Lehigh Valley of Pennsylvania, where 17 now have an installed capacity of 42 million barrels. On the west coast, the cement industry achieved its foothold between 1909 and 1920. Plants were built in the Los Angeles area, northern Washington at the town of Concrete, and in eastern Washington at Metaline Falls and Spokane.

The Organization of O.P.C.

The first news in Portland about the Oregon Portland Cement Co. was broken in the August 2, 1908 issue of the morning Oregonian. The announcement was made that portland cement was at last to be manufactured in Portland. The Oregonian article mentioned the site of the plant merely as being in the suburbs of Portland on the Willamette River, where both rail and water transportation were available. Actually, the location was in Oswego.

The origin of the new industry took place at a meeting of the Portland Commercial Club, now the Portland Chamber of Commerce. Tom Richardson was manager of the Commercial Club at that time and at that meeting he introduced C. W. Nibley of Salt Lake City to the prominent business-men of Portland. Mr. Nibley was president of a cement company in Utah.

A considerable amount of money was pledged for construction of the new cement plant. It was not until 1909, however, that the Portland Cement Co. was incorporated with the following directors: Aman Moore, Alex Nibley, Edward Cookingham, Tom Richardson, Andrew C. Smith, C. E. Ladd, W. F. Burrell, Paul C. Bates, Wirt Minor, A. L. Mills, Joseph N. Teal, T. B. Wilcox, W. A. Gordon, J.C. Ainsworth, and George Lawrence.

Construction work began on the plant in 1910. Machinery and equipment were ordered and the project appeared to be on its way. The new portland cement was to be known as the "Red Rose Brand." The organization was headed at that time by Aman Moore. Difficulty was experienced in assembling the total necessary funds to complete this approximately $2,000,000 project. That was a rather substantial sum for those pre-inflation days. In fact, it would be comparable to some $8,000,000 today.

In 1915, R.P. Butchart of Victoria, B.C., who was a prominent financier in Canada and president of the British Columbia Cement Co., Ltd., of Victoria, became interested in investing in the Oregon plant. Incidentally, the famous Butchart Gardens are located in a former lime-rock quarry of the

Aerial view of Oregon Portland Cement Co. quarry and preparation plant at Durkee, Baker County. High-grade limestone is shipped by rail and truck to sugar refineries, paper mills, and metallurgical plants in the Northwest. (Photo courtesy of Photo-Art)

Aerial view of the Oregon Portland Cement Co. plant at Oswego, Clackamas County. Note proximity of the plant to rail, highway, and deep water transportation, all used in delivering cement to Northwest customers. (Photo courtesy of Western Ways)

B.C. Cement Co. at Tod Inlet, near Victoria. Mr. Butchart was soon joined by Charles Boettcher of Denver, Colorado, president of several cement companies in the Middle West.

A complete reorganization of the company took place, the name was changed to Oregon Portland Cement Co., and the brand name of the product to "Oregon." Incorporation of the company under the present name took place August 15, 1915, which will result in the company's achieving its 50th anniversary this year. The new directorate in 1915 contained some of the original names and some new ones. They were: R.P. Butchart, Edward Cookingham, George Lawrence, Arthur H. Devers, F.I. Fuller, A. S. Pattullo, Chester V. Dolph, and L.C. Newlands. Lawrence C. Newlands came from Victoria, B.C., to become vice president and general manager, a position which he held until 1937, when he became president. He held the position of president until his death in 1942. I was chosen as his successor in September of 1942.

The first several years of operation were difficult, due to the various factors of low volume, the entry of our country into World War I, resultant high labor rates, etc. However, following the close of the war, business became better and all past dividends were paid up and have been paid regularly ever since.

It was decided by the stockholders to build a second plant in Oregon, and the Sun Portland Cement Co. was built at the town of Lime, near Huntington, Oregon. This plant was completed and placed in operation in November, 1923. It was built to serve western Idaho, eastern Oregon, and southeastern Washington. Original capacity was 500,000 barrels per year. Because of some overlapping of stockholders, the "Sun" company and the "Oregon" company were merged in September of 1926.

Business was reasonably good in the 1920's, and when the depression started in 1929, we had a contract at the Lime, Oregon plant for supplying cement to the Owyhee Dam in southwestern Idaho. This job lasted until 1932 and helped the company to maintain its dividend record throughout the depression years. The company has been able to maintain an unbroken dividend record since the early 1920's.

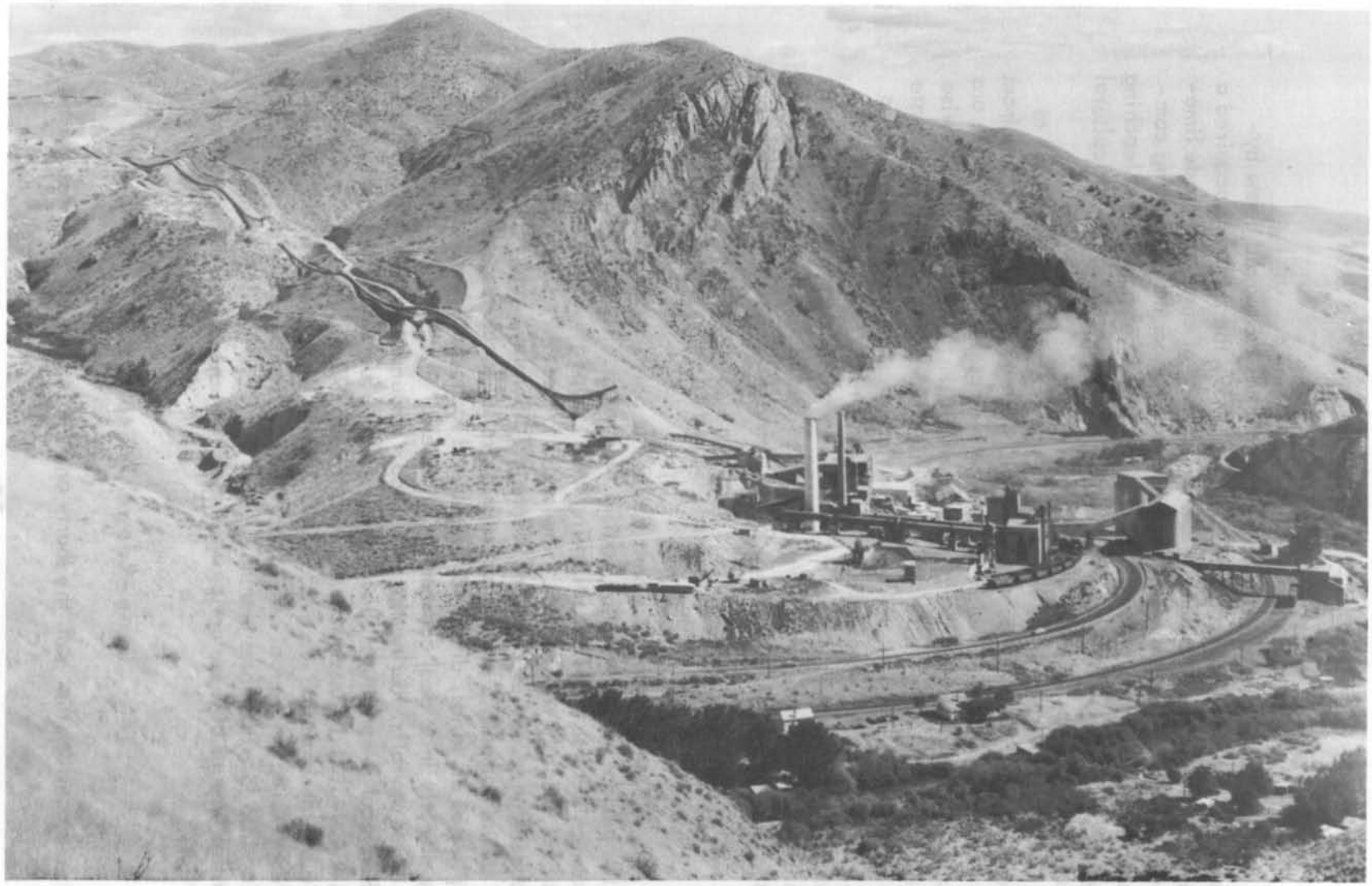
The company went through the thirties without spectacular incident. Between the late thirties and July of 1950, the corporation retired more than $2,500,000 of preferred stock, about one million of which was cumulative preferred. Since that time, the company has had only its present common stock outstanding. This stock has since been split four to one and has experienced numerous stock dividends. I have some brief data on the record of our common stock over the past 10 years. By buying 100 shares of this stock on January 10, 1954, at the then existing price of $21 per share, with total investment of $2,100, and retaining all stock dividends

and splits until January 1, 1964, the purchaser would have 497 shares. At the current price of $23, this would amount to $11,431. In addition, cash dividends were paid him during that period of $2,965, making a total return of $14,396 from the $2,100 investment.

Plant Expansion

Throughout the early years, the company's capacity had remained at the original size with one 500,000 barrel kiln at each plant. In the mid-1940's, it became apparent that additional capacity was indicated, and in 1947 a second and larger kiln was installed at Oswego at a cost of $1,156,939. This new kiln had a capacity of 750,000 barrels of finished cement per year, bringing the total for the Oswego plant to 1,250,000 barrels per year. In the 1950's further expansion seemed to be in order, and in 1956 and 1957 another large kiln was installed at Oswego, bringing the capacity to two million barrels per year, or quadrupling the size of that plant. A second and larger kiln was also installed at Lime, Oregon, during this period, bringing the capacity of that plant to its present size of 1,200,000 barrels per year, which resulted in somewhat more than doubling its capacity. During the 10 years ending at the close of 1963, the company spent on new construction at its plants a total of $9,500,965.54. Approximately a half million was expended in 1964 on further expansion.

We are constantly endeavoring to widen our marketing area, and this year are constructing a distribution plant at Kennewick, Washington. This plant will serve the area which includes the cities of Kennewick, Pasco, Richland, Hanford, and Walla Walla. This is a rapidly growing area and one which we can serve readily either by water or by rail. We have at Kennewick a site containing approximately four acres which is not only on the Columbia River and the mainline railroad but is also convenient for trucking. The capacity of this distribution plant will be 1,000 barrels per hour. Bulk and sacked cement of all types will be available for loading on either customers' trucks or on common carrier. The plant will have a 3,000-barrel, 4-compartment storage capacity and a 60' by 60' warehouse and office. We are quite familiar with this area, having supplied the cement for both Ice Harbor and Lower Monumental Dams. We believe that this vicinity will develop into a good marketing area. The Battelle Memorial Institute has recently obtained the contract for future nuclear research at the Hanford Works and is committed to an expenditure of $9,000,000 within the next five years. This, we believe, will also attract industries of other types.



Aerial view of Oregon Portland Cement Co. plant at Lime, Baker County. Raw limestone from quarry is delivered to the kilns via the conveyor belt shown. (Photo courtesy of Oregon Portland Cement Co.)

By-Products

During rather recent years, the company has developed a few by-products which have proved profitable. In 1959, the company acquired a deposit containing approximately 40 million tons of chemical-grade limestone at Durkee, Oregon. This rock is used by sugar manufacturing companies in their refining process, by pulp and paper companies for bleaching purposes, by steel companies and others. We also manufacture agricultural lime and limestone flour at our Oswego plant.

As Oswego grew from a hamlet to a small city, we were obliged to make a substantial investment at the plant there to eliminate the dust from the stack. This was done at a cost of approximately $1,500,000. We are now collecting in excess of 99½ percent of all dust which would otherwise go up the stack. We are more than meeting the requirements of the State Air Pollution Authority. We check our stack regularly and frequently to see that this collection efficiency is maintained. We were fortunate in finding a ready market for the material so collected, and last year sold in excess of 25,000 tons, which was collected through our electric precipitators. It is used largely by manufacturers of asphalt roofing as a filler.

A Local Company

The Oregon Portland Cement Co. is the only locally owned and operated cement company in the Pacific Northwest. The present Board of Directors is made up of the following men: Ralph H. Cake, Arthur H. Fields, David H. Leche, Lawrence F. Newlands, Prescott W. Cookingham, Hillman Lueddemann, C.B. Stephenson, Kenneth T. Shipley, and F.E. McCaslin. All of the company's expenditures for payrolls, local purchases of fuel and supplies of all kinds, dividends distributed to stockholders, etc., find their way directly into local commercial channels.

Our payrolls, during the year 1963, amounted to $2,769,808.11. Other local expenditures, including supplies, fuel and power, amounted to $2,404,043.31. These two items totalled $5,173,851.42. Total dividends paid out during 1963 were $563,708.10. Eighty percent of our stockholders reside in Oregon, resulting in an additional amount of $450,966.48 going into local business channels. Further, if any profits are made, a substantial amount of these are plowed back into new construction, as noted earlier.

Long-Range Prospects

We consider that both the short- and the long-range prospects for the

cement industry in the Pacific Northwest are favorable. The area appears to be on the threshold of rapid growth. The nation is now becoming more aware of the opportunities existing in this part of the country.

In the construction field, many large buildings and projects are planned for construction in the near future. In the current category of construction, one might mention several buildings, such as: the Urban Renewal Development at an estimated cost of $56,000,000 now under way; the Equitable Savings & Loan Assn. Building now approaching completion; the multi-million-dollar Coliseum Gardens, high-rise apartments and shopping center; Somerset West -- 1,000 new houses per year projected for 10 or 12 years; the Federal Office Building; the Bank of California Building; and the Georgia-Pacific Building, as well as others which will change the downtown skyline.

In the category of other major projects, we could mention such jobs as the following. Some of these contracts were awarded in 1964 and the others will be within a two-year period. These projects are:

Project Name	No. of Barrels
Little Goose Dam	800,000
Hells Canyon Main Dam (spring, 1965)	900,000
Blue River Dam	100,000
Lower Granite Dam	500,000
Dworshak Dam (Bruce's Eddy)	2,500,000
High Mountain Sheep Dam	1,000,000
Hells Canyon (fishways & tunnel)	47,000
Lower Monumental Dam, 2nd section	600,000
Mossyrock Dam	600,000
Foster Dam	90,000

Although these projects bring many millions of dollars into the economy of the area, we don't wish to leave the impression that we rely too heavily on jobs of this type. Large jobs such as these are in addition to our regular day-to-day commercial business. We serve approximately 75 ready-mix plants and many dealers in our area, the largest of which uses more than 200,000 barrels annually.

We look forward to a bright future for the Pacific Northwest and plan to grow with it. It is one of the least exploited areas in the nation. The Director of Business Research of the Pacific Northwest Bell Telephone Co. has recently compiled a rather exhaustive report on trends in population and households for the period of 1960 to 1975, for the Pacific Northwest states. This report shows that the population of Oregon will increase 19.06

percent between 1960 and 1970. In the next five years it will increase another 9.8 percent. For the State of Washington, the increase between 1960 and 1970 is similar to that of Oregon, 19.17 percent, and for 1970 to 1975 another 11.7 percent.

The Pacific Northwest is abundant in natural resources. Aside from its vast lumber and wood products industry, Oregon is rapidly obtaining a large and diversified industrial complex without major government installations.

Our significant advantages in natural resources, climatic conditions, plentiful hydroelectric power at desirable rates, favorable labor market, and excellent cultural, educational, and recreational facilities -- together with an unlimited supply of the purest water in the nation -- are certain to continue to attract industry and population, both of which strengthen and build our economy. We look forward to another 50 years of operation with renewed inspiration, optimism, and confidence.

Acknowledgments

No history of the Oregon Portland Cement Co., even though very brief, would be complete without giving credit to a few men who have devoted many years to the company advancement. First, I would mention L.C. Newlands, who served as chief executive officer from 1915 to 1942. His son, Lawrence F. Newlands, is now secretary and treasurer of the company. David H. Leche joined the company in 1916 and served as general superintendent at both Oswego and Lime for many years, but in more recent time has been first vice president and in charge of operations, and has supervised new construction and expansion. Another man who joined the company about the time we started at Oswego was H.R. Shipley. He advanced to the position of general superintendent of all our operations, which position he held until his death about a year ago. His son, Kenneth T. Shipley, is now vice president in charge of sales.

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SCIENTIFIC SOCIETIES TO MEET IN PORTLAND

The Oregon Academy of Sciences and the Northwest Scientific Association will hold a joint meeting at the Sheraton Hotel in Portland April 9 and 10, 1965. The eight sections at which papers will be presented include Botany-Zoology, Chemistry-Physics-Mathematics, Engineering, Forestry, Geology-Geography, Science Education, Social Sciences, and Soil and Water Conservation. Details of the program will be announced later.

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ALBANY-NEWPORT AREA AEROMAGNETIC MAP PUBLISHED

U.S. Geological Survey map, Geophysical Investigations 481, was published this month. The map is entitled "Aeromagnetic map of the Albany-Newport area, Oregon and its geologic interpretation" by R.W.Bromery.

The survey was made in 1954 to assist with the state geologic mapping project. The map covers an area of 1,200 square miles. Thirty-four east-west traverses were flown, one-half mile apart and approximately 750 feet above the ground.

A preliminary aeromagnetic map of the Albany-Newport survey was released to open file in February 1962 by the U.S. Geological Survey. The preliminary map and accompanying text have been revised in the recent publication. Maps are available from the Geological Survey office at Federal Center, Denver, Colo., 80225. The price has not yet been announced.

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COAL STUDY IN OPEN FILE

"The Correlation of Coal Beds in Squaw Basin and Part of Eden Ridge, T. 33 S., R. 11 W., Southwestern Oregon," by Russel G. Wayland, has recently been made available by the U.S. Geological Survey as an open-file report. Included in the 34-page record are cross sections, correlation diagrams, logs of holes, coal analyses, and a geologic map.

The open-file report is not intended for future publication. Its purpose is to present new information in order to resolve a conflict in correlation of Squaw Basin and Eden Ridge coal beds dating back to 1914. New core-hole data, photogeologic interpretation, and a broader understanding of the stratigraphy of the area have allowed reinterpretation of the distribution and relative position of the coal beds.

The coal occurs in the Tyee Formation of middle Eocene age. Typical Tyee consists of sandstone units 2 to 10 feet thick that grade upward into carbonaceous siltstone. In the map area, carbonaceous shales and coal partings occur at the tops of most graded units of the Tyee.

It was determined that any land in the township (T. 33 S., R. 11 W.) underlain by the Tyee Formation may contain coal and that local coal zones exist at many levels in the stratigraphic section. More drilling for coal was believed warranted.

The report may be consulted at the Department's office in Portland and at its branch office in Grants Pass. Copies from which reproductions can be made at private expense are available at 1031 Bartlett Bldg., 215 West 7th St., Los Angeles, Calif.

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LUNAR CONFERENCE SCHEDULED

Distinguished volcanologists from throughout the world are being invited to an International Lunar Geological Field Conference in the Bend, Oregon area August 22-28, 1965, Governor Mark Hatfield announced in a press release February 5.

The conference is under the joint sponsorship of the University of Oregon Department of Geology and the New York Academy of Science. It is an extension of a symposium on lunar geology held by the New York Academy last year. The program includes a one-day symposium at Bend for the presentation of technical papers, and five days of field tours to geological interest points in the central Oregon area. Internationally known scientific authorities from a dozen countries, including Russia, Japan, Norway, and West Germany are expected to attend.

The conference will focus worldwide attention on the central Oregon area and its potential for lunar base research. Increasing interest is being shown in the area because of last summer's "Astronaut Walks" and astronaut geological field training, as well as several small private research projects.

Because of the combination of volcanological features in the area, some authorities believe it is ideally suited for the development and testing of lunar base facilities and equipment that will be needed in connection with the lunar and space exploration programs.

Conference co-chairmen are Dr. Lloyd Staples, head of the University of Oregon Department of Geology, and Dr. Jack Green, New York Academy of Science. Other members of the general committee are Hollis M. Dole, Oregon State Geologist; Marion Cady, secretary, Lunar Base Research Facilities, Inc., Bend; and Lawrence Dinneen, deputy administrator, Division of Planning and Development, Oregon Department of Commerce.

Financial support to make the conference possible has been committed by a number of Oregon firms and organizations. Supporting sponsors include Pacific Northwest Bell, First National Bank of Oregon, U.S. National Bank of Oregon, Pacific Power & Light Co., Tektronix Foundation, Battelle Memorial Institute, Pacific Trailways, and Bend-Portland Truck Service.

Cooperating State agencies include the Division of Planning and Development of the Department of Commerce, the Department of Geology and Mineral Industries, and the Highway Department.

The schedule of field trips includes visits to inspect lava flows, volcanic terrain and other volcanological features at Mt. Bachelor-Three Sisters area, Newberry Crater, Lava Butte, Devils Hill, Lava River Cave, Belknap Crater, Devils Garden, Derrick Cave, Fort Rock, and Crater Lake.

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THE AGE OF CLEAR LAKE, OREGON

By G. T. Benson*

Clear Lake, in Linn County, is located at the head of the McKenzie River, about seven miles west of the crest of the Cascade Range between Santiam and McKenzie Passes (see accompanying map). The lake, which is close to U.S. Highway 126, is noted for its drowned forest; tall trees still standing on the lake bottom are easily seen in the cold, clear water.

The lake was formed when a lava flow poured into the upper McKenzie Valley, damming the river and ponding its water. The lava came from one of the vents marked by the Sand Mountain line of craters (Williams, 1957). This basalt flow is part of the group of young volcanic rocks in the Santiam-McKenzie Pass area shown on the map. That this volcanism occurred a geologically short time ago is evident from the lack of soil and vegetation on the flows.

The dramatic sight of miles of bare, jumbled lava at McKenzie Pass (see photograph) has long caught the fancy of motorists. To increase the benefit of the area to the public, the U.S. Forest Service is preparing exhibits explaining the geology in the vicinity of Dee Wright Observatory at the Pass. In the course of planning the Forest Service project, the question of the absolute age of the flows at McKenzie Pass was raised. It was apparent that an answer might be obtained from radiocarbon dating.

Carbon-14, a radioactive carbon isotope with a half-life of about 5,570 years, is produced continuously in the atmosphere by cosmic-ray bombardment. The rates of production and decay result in an equilibrium concentration of radiocarbon, or, stated differently, in an equilibrium ratio between radiocarbon and non-radiogenic carbon. Carbon in living tissue is constantly replaced, so that radiocarbon and non-radiogenic carbon are present in the equilibrium ratio. When the tissue dies, however, replacement ceases, and the ratio changes as the radiocarbon atoms decay. The difference between the ratio in dead tissue and the ratio in living tissue is a measure of how long ago the former died. In practice, the date of death of once-living tissue can be determined with adequate accuracy back to about 40,000 years before present (y. b. p.).

Charcoal from trees burned by the hot lava at McKenzie Pass could be used to date the flows. Several searches were made, but no charcoal that could be attributed definitely to burning by lava was found either in the

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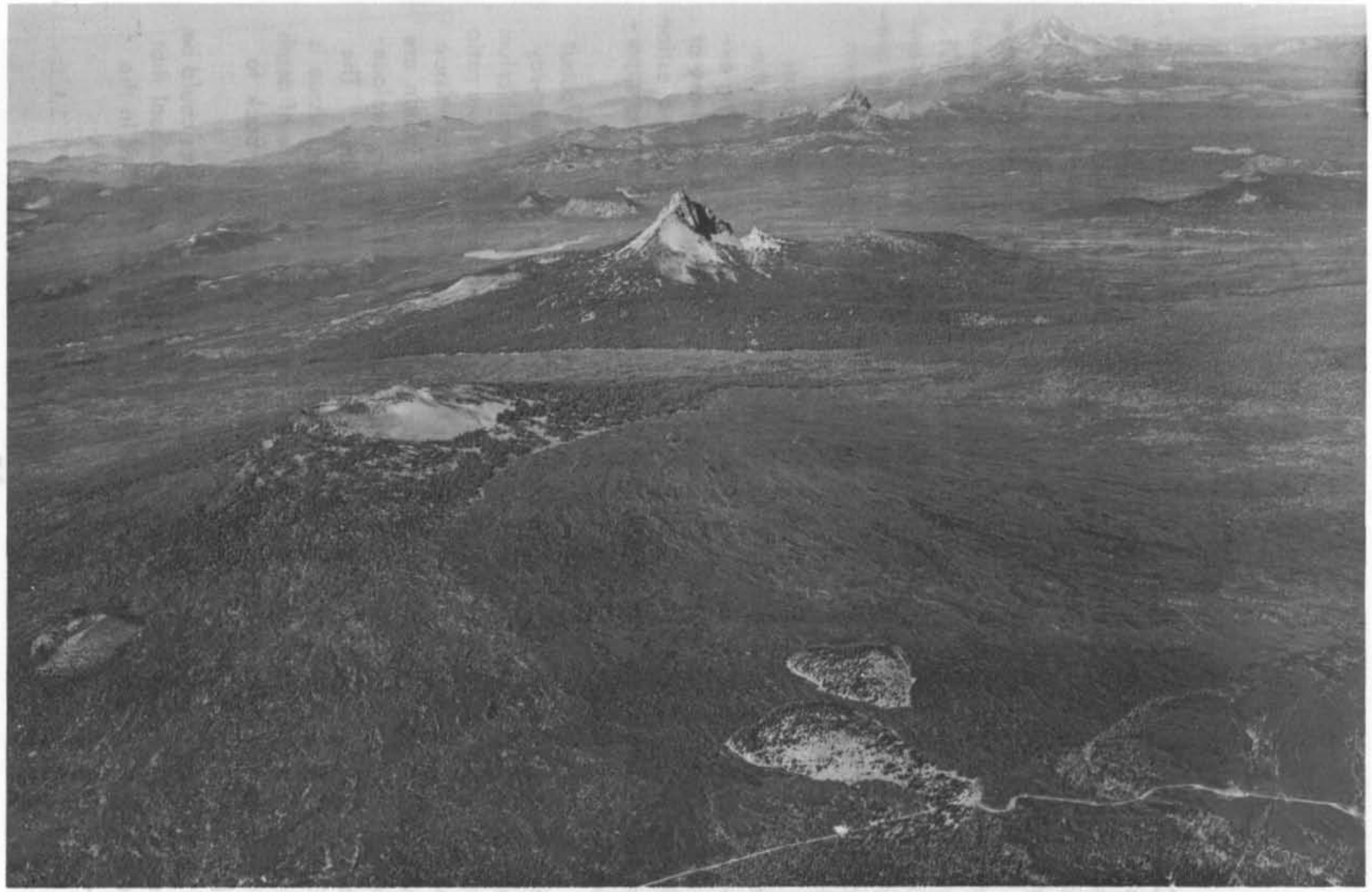
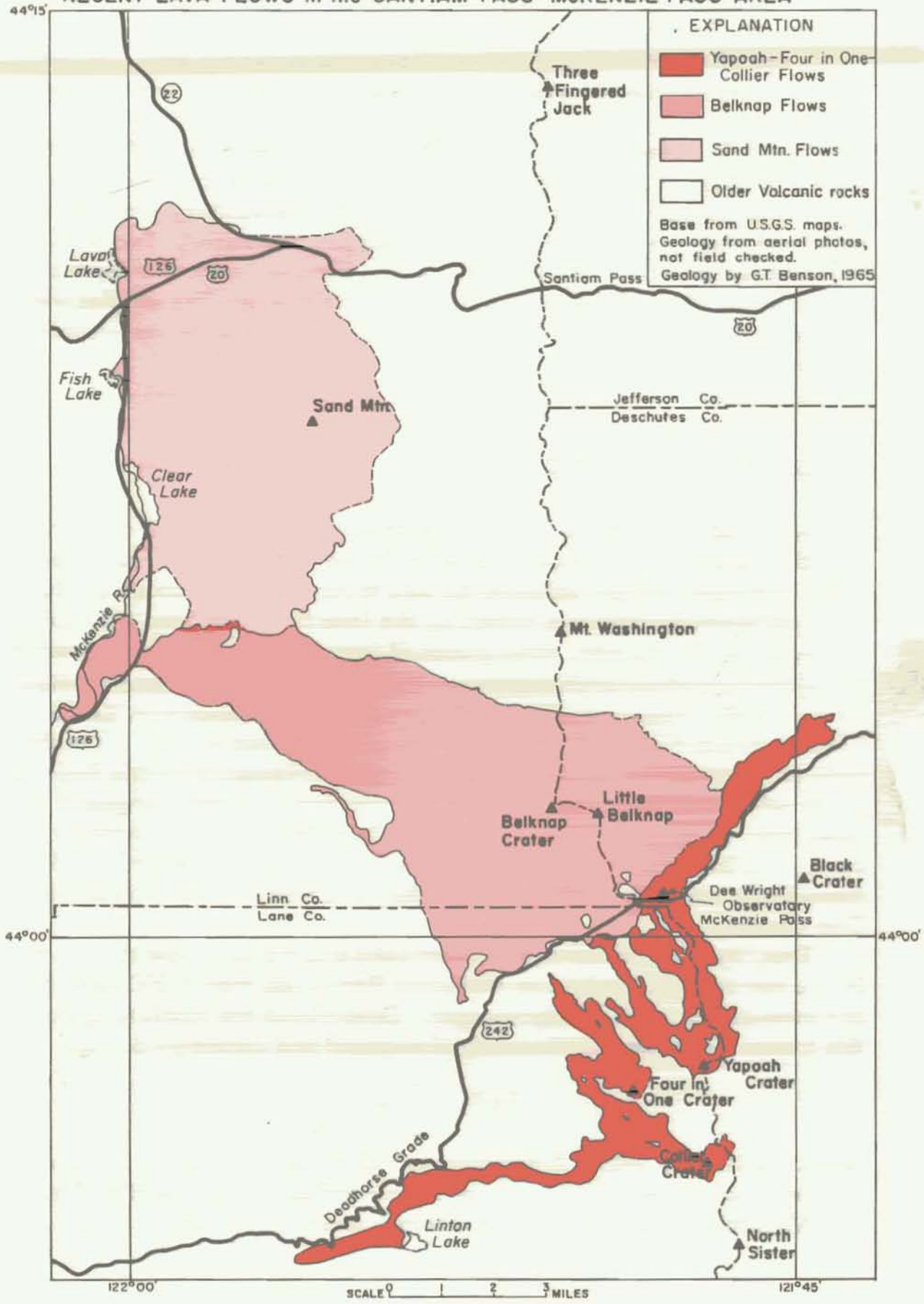


Aerial view of McKenzie Pass looking north toward Mt. Washington, Three Fingered Jack, and Mt. Jefferson. Belknap Craters and lava flows in foreground. (Courtesy of Delano Photographics)

RECENT LAVA FLOWS in the SANTIAM PASS-McKENZIE PASS AREA



flows from the Belknap Craters or in the flow from Yapoah Crater, upon which Dee Wright Observatory is located. A direct answer to the question of absolute age of the McKenzie Pass Lava flows must await the discovery of charcoal; but an indirect answer could be obtained from the trees in Clear Lake.

The U.S. Forest Service arranged to have members of the Whitewater Divers, a group of skin divers from Eugene, take samples of the drowned trees. Several sections of trees were obtained in November, 1963, in what must have been one of the first aqualung logging operations. Two samples from one section of a tree about one foot in diameter taken at a depth of about 13 feet below the surface were chosen for dating. The samples were analyzed by Isotopes, Inc., of Woodlawn, N.J., and dates were reported as follows:

Sample a	3,200 ± 220 y. b. p.	sample from center of tree section
Sample b	2,705 ± 200 y. b. p.	sample from outer part of tree section

The two dates appear to be in adequate agreement. Part of the differences should be due to locations of the samples in the tree section. From these dates, the trees in Clear Lake can be said to have drowned about 3,000 years ago when the lake was formed by the lava flow from Sand Mountain.

As shown on the map, three groups of lava flows have been delineated through the use of aerial photographs. The oldest is the Sand Mountain flow, which we now know is about 3,000 years old. Lava flows from Belknap Crater lap onto flows from Sand Mountain, and thus are younger. On the basis of superposition and lack of vegetation, the lavas from Little Belknap Crater which are so conspicuous at McKenzie Pass, are the youngest of the flows from the Belknap Craters. But even these lavas are not the most recent. The Dee Wright flow from Yapoah Crater overlaps the Little Belknap flows and is therefore younger, as are the flows from Collier and Four-In-One Craters.

Thus, by knowing the age of Clear Lake and the lava flow that formed it, we can say that the lava at McKenzie Pass is less than 3,000 years old, and some of it is considerably younger. Determining the absolute age of this freshest lava requires discovery of charcoal and carbon-14 dating.

Reference

Williams, Howel, 1957, A geologic map of the Bend quadrangle and a reconnaissance geologic map of the central portion of the High Cascade Mountains: Oregon Dept. of Geology and Mineral Industries map.

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OREGON'S LOST METEORITES

By Dr. Erwin F. Lange*

Oregon's Port Orford meteorite has gained worldwide fame as a lost meteorite. Interest in the search for this meteorite has now extended over a period of a hundred years without success. In addition to the Port Orford meteorite, there is evidence that other lost meteorites exist in Oregon. The writer has received a number of letters from various places in Oregon referring to locations of supposed meteorites. To date, however, no samples have been received. The following three examples seem to be more authentic and perhaps more information concerning these specimens might be forthcoming.

1. In Pioneer History of Coos and Curry Counties, by Orvil Dodge, p. 442, is the following:

   > One of the largest meteors on record fell on the head of South Slough, Coos County, January 17, 1890, at 11 o'clock atnight, knocking a hole in the hill thirty feet across. It came from the Northwest and lighted up the heavens in fine style. A report, as of thunder, awoke people for many miles around. It was plainly heard at Coquille City. Excavations reveal a chunk of lava twenty-two feet across that resembles slag from an iron furnace.

2. Listed as a doubtful fall in the Prior-Hey catalog of meteorites published by the British museum is a stony meteorite from Mulino, Oregon. A small stony meteorite was sent to the U.S. National Museum in 1927. The meteorite supposedly fell May 4, 1927. The records of the National Museum fail to indicate what happened to the specimen. Newspapers of the area fail to list any unusual meteoritic activity for that date.

3. In January, 1952, an unidentified rancher brought in to J. D. Howard of Klamath Falls a small pice of nickel-iron for analysis. This piece was broken off of a 30-pound mass.

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Mr. Howard, suspecting the specimen to be meteoritic, forwarded it to Dr. H.H. Nininger at Winslow, Arizona for verification. Dr. Nininger found it to be a meteorite. He then attempted to learn the location of the main mass, but so far has been unsuccessful. The small piece of the so-called Klamath Falls meteorite is in the Nininger collection at Arizona State University in Tempe. Somewhere in the Klamath Falls area there must be a 30-pound meteorite.

Persons having specimens thought to be meteoritic in nature are urged to send them to the State Department of Geology and Mineral Industries or to the writer for examination. A meteorite has value as an object of scientific value only and every one is different in form and composition.

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DALLAS-VALSETZ BULLETIN REVISED

"Geology of the Dallas and Valsetz Quadrangles, Oregon," by Ewart M. Baldwin, published originally in 1948 as Department Bulletin 35 and long out of print, has been revised and is now available in a new edition.

The Dallas and Valsetz quadrangles lie along the eastern slope of the Coast Range and western edge of the Willamette Valley. The area is underlain by a thick sequence of marine volcanic and sedimentary rocks, ranging in age from early to late Eocene, intruded by gabbro and diorite sills and dikes. Impure limestone at one stratigraphic horizon occurs as isolated deposits of varying sizes.

The Department's decision to revise the text and geologic map of Bulletin 35 was based on several factors, namely, easier accessibility into the area than in 1946-47 when it was first mapped; better understanding of the stratigraphy of the Coast Range after 16 years of field mapping by the U.S. Geological Survey and this Department; and lastly, an increased demand for information on the Coast Range as an aid to interpretation of the geology of the Willamette Valley and the continental shelf. The author, Dr. Baldwin, professor of geology at the University of Oregon, who did the original work in the Dallas and Valsetz quadrangles as a member of this Department, has, in the past 20 years, mapped or cooperated in the mapping of approximately 4,000 square miles in the Coast Range of Oregon. The revised edition of these two quadrangles embodies the knowledge he has gained over the years.

Bulletin 35, revised, may be obtained from the Department's Portland office. The price is $3.00.

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OFFSHORE MINING BILL INTRODUCED

Senator E.D. (Debbs) Potts, Josephine County, announced in a press release February 18 that he was introducing a bill to authorize the leasing of the state's submerged lands for mining. Senator Potts stated that the placer minerals gold, platinum, chromite, magnetite, ilmenite, garnet, and zircon have been found on modern beaches and in adjacent marine terraces since shortly after gold was first found on Josephine Creek, a tributary of the Illinois River in Josephine County in 1850, and that there is every reason to believe these minerals occur in untapped commercial quantities beyond the water's edge.

The bill, Potts explained, would place the responsibility of leasing in the hands of the Land Board and all revenues obtained by the board would go to the Common School Fund. Before leasing, the board must find and determine that offshore exploration and mining on a lease would not be inconsistent with the public interest. In making the determination, consultation must be had with other state agencies, including the State Geologist, Highway Engineer, Game Commission, and Fish Commission. Maximum size of individual lease blocks would be 5,760 acres (3 miles by 3 miles). The first two years of the lease would be considered a prospecting period and the board would prescribe the minimum amount of work that must be done in this period. The primary term of the lease would be 10 years, but would continue in effect up to 50 years, so long as minerals were produced in commercial quantities. The rental and royalty charges for the various minerals would be set by the board and would be subject to adjustment at the end of each 20-year period. On areas that are not known to contain minerals, leases would be granted to a qualified person upon application, and on areas known to contain mineral the board would call for sealed bids after a public hearing.

Potts said that specific onshore areas near the ocean which have been mined in the past are Gold Beach, Pistol River, Ophir, Port Orford, Cape Blanco, Bandon, Old Randolph, Whisky Run, and South Slough, all in Coos and Curry Counties. He said that, although there is no record of production for the pioneer period, indications show it could have been substantial. For instance, one report gives the production from Whisky Run as "more than $100,000" during the 1850's-60's. During World War II, Potts stated, the beaches and terraces south of Coos Bay were mined for chromite. It was from the mineral zircon found in these beach sands that the Kroll process for production of the space-age metals, zirconium and hafnium, was perfected at the U.S. Bureau of Mines research center in Albany. The first

atomic submarine, Nautilus, utilized these Oregon-produced metals in its nuclear reactor, plumbing, and utensils.

In recent years, Potts noted, a little mining has been done adjacent to the beaches but, mainly, man has looked wistfully toward the sea wondering if the waters of the ocean cover deposits as rich as those the pioneers worked a hundred years ago on land. Dr. John V. Byrne, Department of Oceanography, Oregon State University, answered this question satisfactorily in the April, 1964 issue of The ORE BIN, and concluded by saying:

> "It is inevitable that the known commercial mineral resources on land will be expended and new deposits must be found to take their places. The day will certainly come when the mineral prospector will be forced to look to the sea for ore deposits. In all likelihood the sea will be exploited successfully long before that day arrives. Advancing technology is bringing us closer to the time when those with initiative and imagination will turn to the sea simply because it is easier to make a profit there than on land. That day may not be far away. In fact - it may be at hand."

Senator Potts remarked that, although Dr. Byrne had indicated placer minerals would be the most likely material to be sought, there was a possibility that the mineral glauconite (a potential source of potash), phosphorite (a potential source of phosphate fertilizer), and even manganese (an essential alloying material for the making of steel) might be found in commercial quantities off the shore of Oregon. Potts stated that passage of this bill would be consistent with the research work at the new Oceanographic Laboratory at Newport and could well restore to its former importance the now depressed mining industry of southwestern Oregon. In addition to supporting research and broadening the state's economic base through increased mining activity, Potts stated, the possible revenues that might accrue to the Common School Fund should not be overlooked.

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SOUTHWEST OREGON GRAVITY DATA AVAILABLE

The U.S. Geological Survey has released for consultation gravity data for southwest Oregon by Richard H. Blank, Jr. consisting of 63 computer printout sheets and one map on a scale of 1:250,000. This report is available for inspection at the Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon. Copies from which reproductions can be made at private expense are available at 504 Custom House, San Francisco, California.

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