

## OREGON MINERAL PRODUCTION RESISTS DOWNWARD TREND

By Ralph S. Mason\*

The total value of minerals produced in Oregon in 1961 was only slightly less than that reported for 1960, which broke all previous records. The U.S. Bureau of Mines reports that Oregon minerals last year were valued at \$51,467,000. This figure is exclusive of recycled lime used in pulp and paper plants valued at \$3,455,000, which was included in the Bureau's canvass for the first time this year, bringing the total to \$54,922,000 as shown in Figure 1. Although the mineral industry supplies vitally needed materials to all basic industries and construction activities and is in turn affected by their trends, it was able to resist the downward curve better than the heavy industries commonly used as business indices. Building permits declined 6 percent, highway contracts were off 14 percent, and heavy engineering awards dropped 51 percent. The mineral industry decreased only slightly over 5 percent by comparison.

Newest development in Oregon's mineral industry during the year was the commencement of off-shore oil exploration by four major petroleum companies. This is a long-range program which employs highly specialized equipment similar to that which has been successful in locating oil off the California and Gulf States coasts. Thirteen major oil companies and one independent operator made geophysical and geological surveys in the state during the year. One well southeast of Lakeview was abandoned early in the year at a depth of 9,759 feet. By year's end over 100,000 acres of land were under lease for oil exploration in the Willamette Valley and surrounding areas.

The production of sand and gravel and crushed stone, long the two top-value mineral commodities, amounted to nearly \$35,000,000 in 1961. This figure is down slightly from 1960, owing to reduced demand for sand and gravel but partly offset by a small increase in the quarrying of stone. Smelting of ferronickel at the Riddle plant operated by Hanna continued on a round-the-clock basis, with production approximately equal to the previous year.

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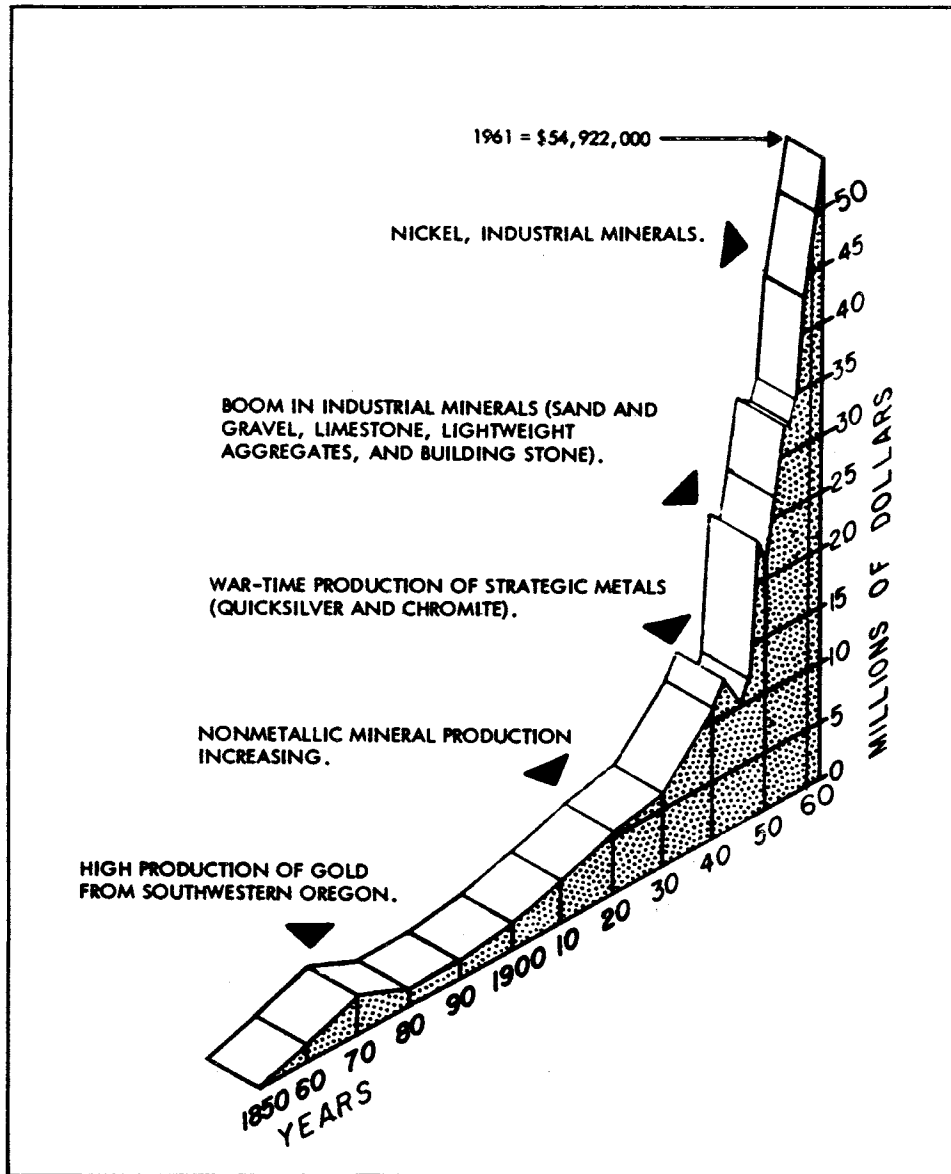


Figure 1. Oregon mineral production, 1850-1961. Values shown are from the U.S. Bureau of Mines Minerals Yearbooks. Periods when important factors influenced the rapidly expanding mineral economy are indicated by arrows. Note steep rise in the production of industrial minerals following World War II in response to demand for construction raw materials.

Sharp increases in the use of volcanic cinders and scoria for highway construction were reported. The attractive "red roads" of central Oregon are constructed of this material, which has excellent frost resistance and greater volume per ton than standard crushed stone or sand and gravel. Although still at a very low level, the production of gold managed to increase 37 percent over 1960, with a total of \$37,000 reported. Mercury mining practically came to a standstill with only 138 flasks retorted. Quarrying of limestone decreased 19 percent, due chiefly to lessened demand for cement in large dams. Limestone was also used in the manufacture of burnt lime and calcium carbide, in agriculture, and in the sugar, paper, and metallurgical industries.

Table 1 summarizes the state's mineral production for 1961 together with a comparison for the preceding year. Mineral industry employment and payrolls for the past two years are tabulated in Table 2. Oregon's mineral industry is active in every county in the state, and extends directly or indirectly into every community as well. In sharp contrast to many of the state's income-producing activities, which are highly seasonal and characterized by severe though temporary labor shortages followed by periods of wide-scale unemployment, the mining industry tends to maintain a more measured and even course throughout the year. Mineral production by counties is shown in Figure 2. Principal mineral commodities contributing to each county total are shown in the order of their value. Exactly half of the counties show increases in the value of minerals produced over the previous year.

Mineral production casualties in the state during the year included the shutting down, after 40 years of production under various ownerships, of the Lower Bridge diatomite deposit in northern Deschutes County. The Gas-Ice Corp. plant near Ashland also ceased production, after having recovered approximately 50 million pounds of dry ice from a series of drilled wells which yielded carbon dioxide. The plant was established in 1945. On the positive side, the production of uranium increased to 15,162 pounds of contained uranium oxide. Two mines, both in Lake County, contributed all of the ore; the Lucky Lass produced 2,000 pounds and the White King approximately 13,000. The open pit at the White King was unwatered by the Thornburg Mining Co. and ore recovered from the pit walls. All of the uranium ore from the two mines was shipped to Vitro Corp. at Salt Lake City, Utah, for treatment. The old Lakeview Mining Co. mill was purchased by Kermac Nuclear Fuels Corp. in March, but was not placed in operation during the year.

Zinc production in Oregon reached a 10-year high with the shipment of 38 tons of ore containing 3 tons of recoverable zinc from the Musick

TABLE 1. Mineral Production in Oregon, 1960 - 1961 <sup>1/</sup>						
Mineral		1960		1961		Note
		Short tons (unless otherwise stated)	Value (thousands)	Short tons (unless otherwise stated)	Value (thousands)	
Clays . . . . .	thousand short tons	318	\$ 370	294	\$ 357	1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
Copper (recoverable content of ores, etc.) . . . . .	short tons	6	4	2/	2/	
Gold (recoverable content of ores, etc.) . . . . .	troy ounces	835	29	1,054	37	
Iron ore (pigment material) . . . . .	long tons	-	-	829	2/	
Lime . . . . .	thousand short tons	2/	2/	82	1,702	
Lime (recycled) . . . . .	thousand short tons	-	-	139	3,455	2/ Figure withheld to avoid disclosing individual company confidential data.
Mercury . . . . .	76-pound flasks	513	108	138	27	
Nickel (content of Ore and concentrate) . . . . .	short tons	13,115	5,246	12,860	2/	
Pumice . . . . .	thousand short tons	2/	2/	203	481	
Sand and gravel . . . . .	thousand short tons	17,673	16,170	12,299	13,680	
Silver (recoverable content of ores, etc.) . . . . .	troy ounces	284	3/	2,022	2	3/ Less than \$500.
Stone . . . . .	thousand short tons	4/16,913	4/19,721	17,272	20,939	
Uranium ore . . . . .	short tons	2/	2/	2,160	66	4/ Revised figure.
Zinc (recoverable content of ores, etc.) . . . . .	short tons	-	-	3	1	
Value of items that cannot be disclosed: Asbestos, carbon dioxide (1960), cement, diatomite, gem stones, lead (1961), and values indicated by footnote 2/ . . . . .			14,124		15,557	5/ Total adjusted to eliminate duplicating value of raw materials used in manufacturing cement and lime.
Total <sup>5/</sup> . . . . .			4/54,520		54,922	

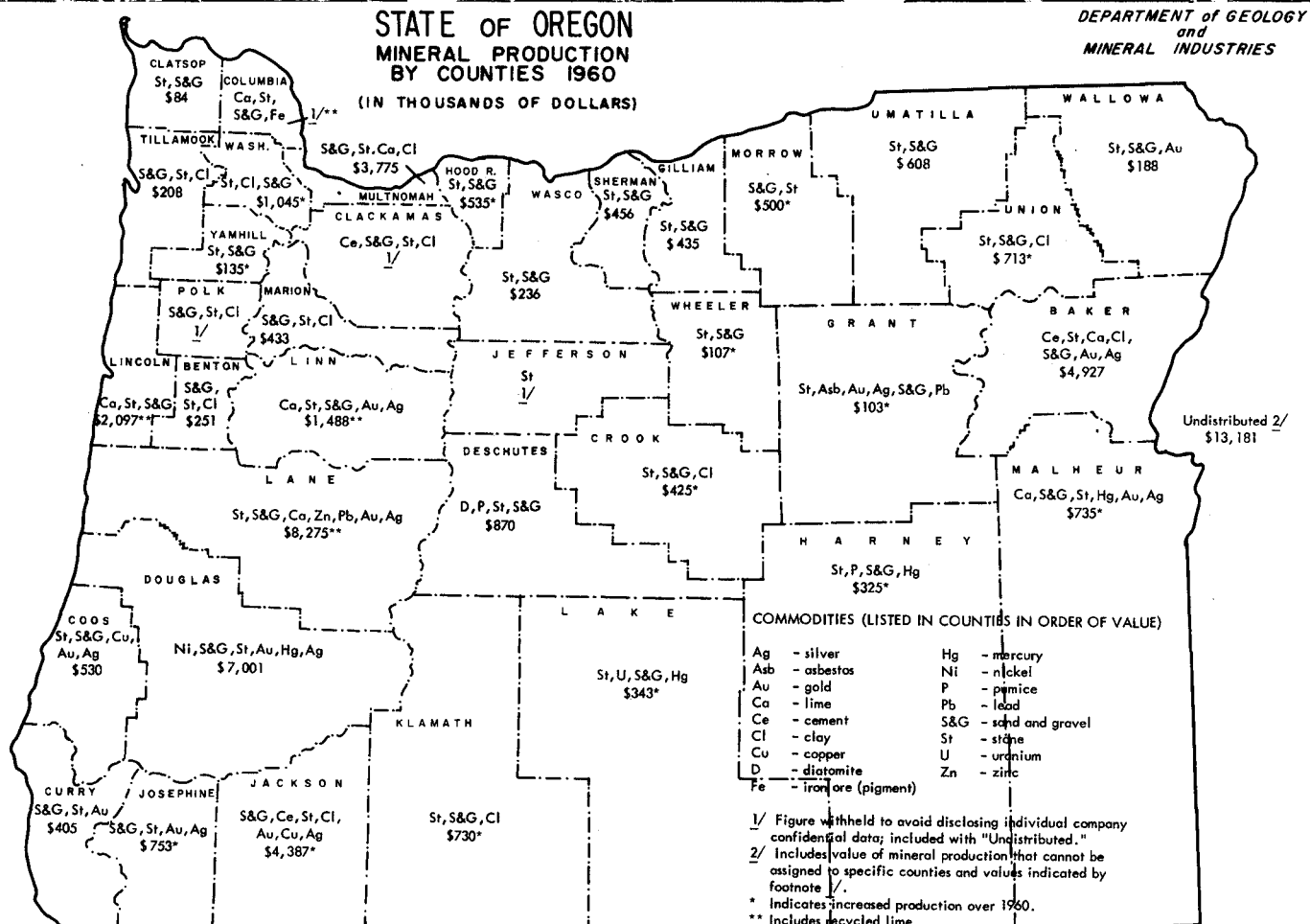
TABLE 2. Oregon Mineral Industry Employment and Payrolls*				
	Employment	1960	Employment	1961
		Payrolls		Payrolls
1. Mining . . . . .	1,181	\$ 6,662,000	1,112	\$ 6,558,000
2. Mineral manufacturing . . . . .	2,860	16,740,000	2,674	16,216,000
3. Primary metals . . . . .	5,751	37,128,000	5,532	36,662,000
4. Miscellaneous . . . . .	796	4,786,000	821	5,274,000
Totals . . . . .	10,588	65,316,000	10,139	64,710,000

\*Oregon State Employment Department figures.

# STATE OF OREGON MINERAL PRODUCTION BY COUNTIES 1960

(IN THOUSANDS OF DOLLARS)

DEPARTMENT of GEOLOGY  
and  
MINERAL INDUSTRIES



Mine in the Bohemia District of Lane County. Also showing a steady growth, despite notoriously inefficient mining methods, lack of coordinated effort, a complete decentralization of management, and with small operations scattered over most of the state, the semi-precious gem "industry" continues to grow. Outstanding among the communities in the state which are attempting to encourage the rockhounds is the City of Prineville. The Crook County Chamber of Commerce distributes maps and information about local diggings and has even located its own claims which are open to the public. At year's end other communities in the state were laying plans to provide the public engaged in this fast-growing activity with help and information.

Metallurgical plant activity during 1961 saw continued development in the processing and fabricating of reactive and other space-age metals. Oregon Metallurgical Corp., Wah Chang Corp., and Oregon Precision Industries, plus the U.S. Bureau of Mines Metallurgy Research Center, all located at Albany, were engaged in research, beneficiation, reduction, smelting, casting, forging, or fabricating a long list of once-rare metals. In the Portland area Sierra Metals Corp. began construction of research facilities to develop high-temperature materials and processes for space craft.

Interest in fossil fuels as a source of energy for the generation of base-load electrical power continued as Pacific Power & Light Co. turned its attention to the coal seams in Squaw Basin in southern Coos County. Pacific has also investigated the reserves on Eden Ridge adjacent to the basin. The Coos Bay coal field, which has a long record of production dating back to the 1850's, was inactive during the year although several investigations were conducted by private firms. The Coos County coals are high-volatile, sub-bituminous with a high ash and moisture content.

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#### AEROMAGNETIC MAP OF THE LEBANON QUADRANGLE

The U. S. Geological Survey recently issued Map GP-212, "Geologic interpretation of the aeromagnetic map of the Lebanon Quadrangle, Linn and Marion Counties, Oregon," by R. W. Bromery. The map with text included may be purchased from the U. S. Geological Survey, Federal Center, Denver, Colorado, for 50 cents.

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## OREGON EARTHQUAKES, 1841 THROUGH 1958

by

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That the State of Oregon is tectonically active is evident from the records of earthquakes (Townley and Allen, 1939, etc.). As it was so ably put by Dr. Perry Byerly (1952) in his Condon Lecture, "Oregon is not free of earthquakes -- it has no immunity (as all fervently wish it had). It lies between two states which have violent shocks. Moreover, Oregon's history is very short. It will not be safe to ignore the possibility (even the probability) that Oregon may have violent shocks in the future."

It is difficult to do more than augment the excellent work done by previous investigators interested in earthquakes in this area. This research presents the earthquakes previously compiled for the state (see figure 1) and, in addition, augments the list\* by literature search and revises statistics of earthquakes when evidences support such changes. However, only those shocks whose epicenters are in Oregon (or off the Oregon coast) are presented here; therefore, those shocks in previous lists that were felt in Oregon but originated elsewhere have been deleted.

During the period of time to which this report is applicable, only 14 of the earthquakes occurring in the state had an intensity greater than V. The average intensity of the shocks was about IV. Of the 240 events, 73 occurred at sea and 167 occurred in the state. For the majority of those occurring on land, the epicentral locations were approximated from felt reports.

Figure 1 shows the approximate locations of earthquakes occurring in Oregon and at sea off the Oregon coast. Epicenters are encircled. The heavier circles indicate earthquakes having intensities greater than V. No attempt has been made to correlate in detail the on-shore epicenters with tectonic features of the area. The accuracy of epicenter location by "felt reports" is considered to be limited, and associating an epicenter with a given fault would be misleading. However, general

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\*Because of its length, the list of earthquakes could not be published in The ORE BIN. The list, together with this report, will appear in a future issue of the Bulletin of the Seismological Society of America.

# EARTHQUAKES IN OREGON

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⑤⑥ LOCATION OF SHOCK ON LAND.  
(NUMBER IS CROSS REFERENCE TO  
THE TABLE OF SHOCKS TO BE  
PUBLISHED IN THE BULLETIN OF  
THE SEISMOLOGICAL SOCIETY  
OF AMERICA)

□ LOCATION OF SHOCK AT SEA

○ EXACT LOCATION UNKNOWN.

● INTENSITIES GREATER THAN V

• CITY

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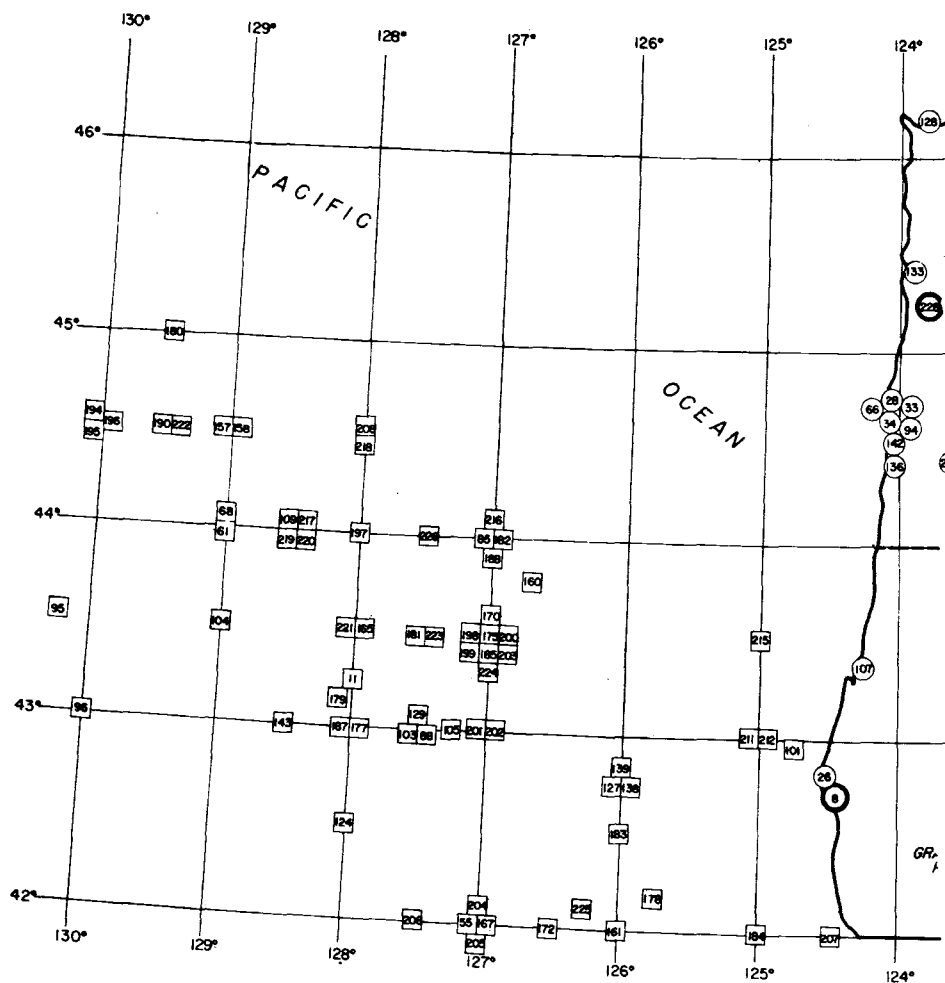
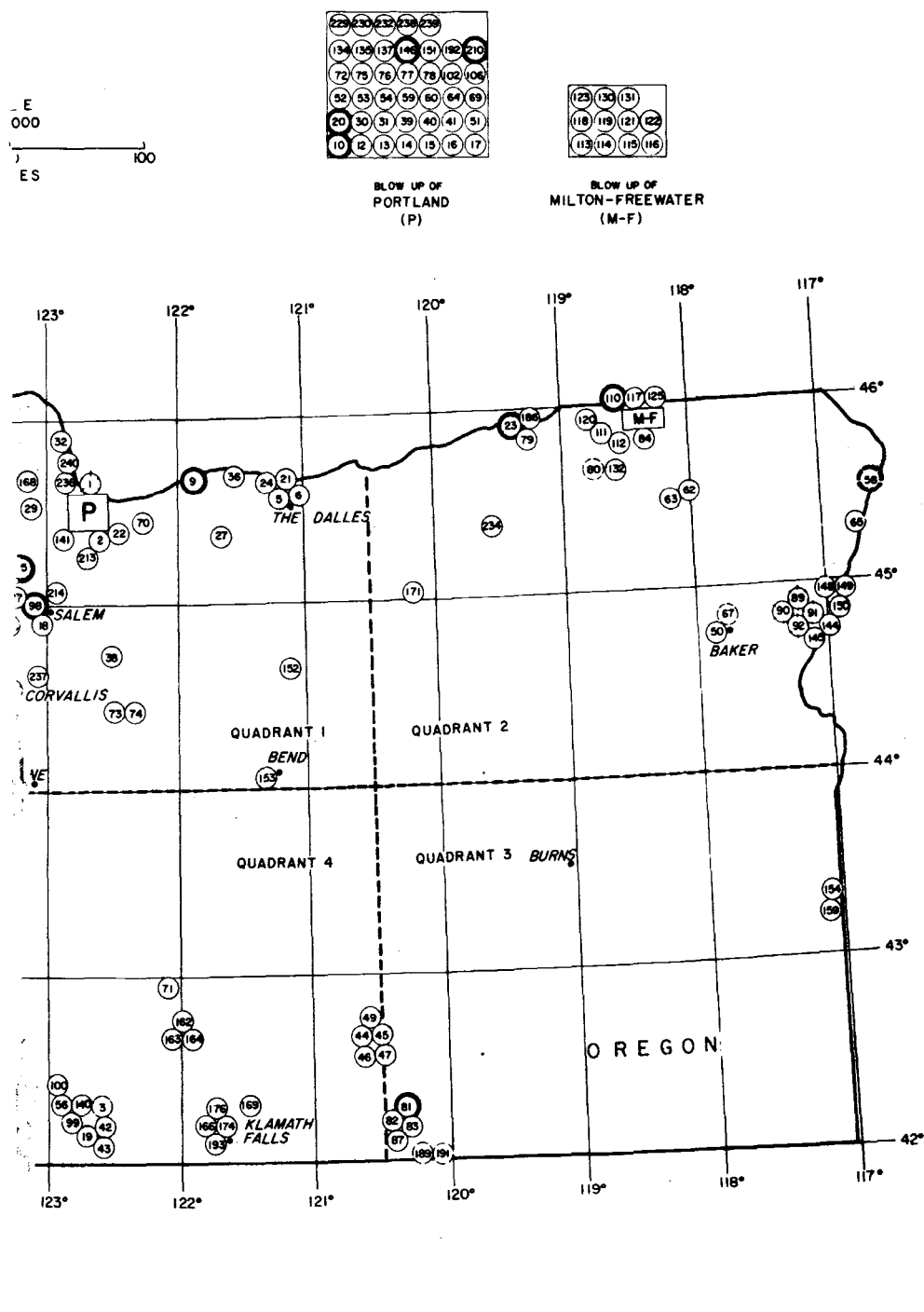




FIGURE 1.  
 AND OFF THE COAST OF OREGON  
 THROUGH 1958



trends are shown on the map. The grouping of epicenters in the Klamath Falls, Grants Pass, Salem, Portland, The Dalles, Milton-Freewater, and Baker areas are, in the least, associated with the local faulting in these areas. The disclosure of any major trends of epicenters in Oregon will have to depend on more accurate and complete epicenter location.

The probable extension of the San Andreas Fault is clearly exhibited by the off-shore epicenters striking northwest off the coast of Oregon. Undoubtedly, some of the epicenters are associated with faults other than the main San Andreas Fault, but more data are needed to decipher any fault patterns.

In determining how complete Fig. 1 was with regard to the number of on-shore events, two Oregon newspapers, The Record-Courier of Baker and The Evening Herald of Klamath Falls, were investigated for reports of shocks in different 10-year periods. From this study, it is estimated that Fig. 1 is about 90 percent complete with regard to written records of earthquakes.

In Fig. 1, Oregon is divided approximately in the center into four quadrants, designated 1, 2, 3, and 4. These quadrants have been used in estimating the completeness of current earthquake reporting in the state. The percentage of Oregon population in each quadrant is compared with the percentage of the earthquakes that have been reported from that quadrant. Table 1 shows these results:

Table 1

<u>Quadrant</u>	<u>Percent of total population (1940 Census)</u>	<u>Percent of total number of earthquakes (1841-1958)</u>
1	66	51
2	8	25
3	3	5
4	23	19

From this statistic, it is evident that the number of earthquakes shown in Fig. 1 as having occurred in Oregon is dependent upon the population and the distribution of the population. This is a consequence, partially, of the average earthquake in the state being small (average intensity of IV), and the fact that many are not felt and, hence, not reported.

Figure 2 is a graph showing the number of earthquakes occurring in 10-year periods versus the population in Oregon for the same 10-year

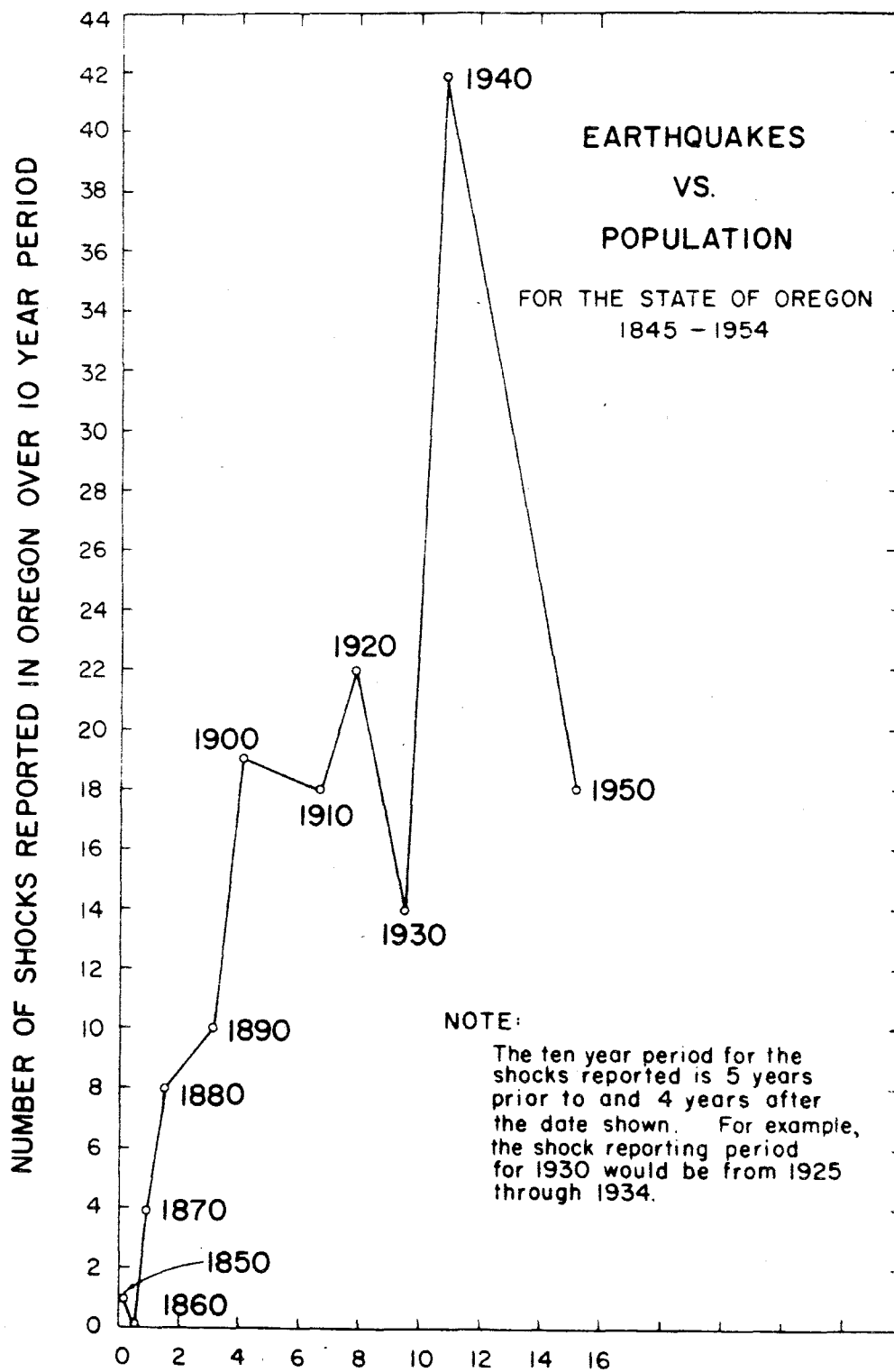


FIG. 2 OREGON POPULATION (HUNDREDS OF THOUSANDS)

period. The number of earthquakes pertain to the state and not to those having occurred at sea. Scientifically, not too much importance should be attached to this plot of data. However, it is evident from Fig. 2 that as the population of Oregon increases so does the number of earthquakes reported as having occurred in Oregon.

This study indicates that earthquake reporting in the State of Oregon is not complete, and that increased instrumentation is needed in the state to better define the seismicity.

### Acknowledgments

The writers wish to thank The Oregonian for the use of its library. We are especially indebted to those employed at The Oregonian library and to Mrs. Etta Judd of the Oregon State University library for their assistance. This work was partially supported by the Office of Naval Research under Contract Nonr 1286(02).

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The Oregon Journal, Portland, Oregon.  
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The Democrat-Herald, Albany, Oregon.  
The Record-Courier, Baker, Oregon.  
The Evening Herald, Klamath Falls, Oregon.

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#### MORE LAND WITHDRAWALS IN DUNE AREA

The U. S. Bureau of Land Management has notified the Department that the U. S. Forest Service has applied for additional land (see The ORE BIN, July 1962) in the Dunes Area to be withdrawn from mineral entry. The application is for 209 acres, which makes a total of 21,333 acres that the Forest Service has asked to have withdrawn in this area so far this year. The reason given for the latest withdrawal is the same as used previously, that "The applicant desires the exclusion of mining activity to permit proper protection for the purpose of conserving, developing, and making accessible for the inspiration, enjoyment, and use of all American people of present and future generations the recreational and scenic resources of the area."

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#### DRILLING PERMIT NO. 49 ISSUED

The Department issued a new drilling permit to John T. Miller of Hubbard, Oregon, on August 24, 1962 for a shallow oil test located about 2 miles south of the City of Dallas. Miller is a water-well contractor who has drilled shallow oil tests in Texas and Montana. He drilled holes in the Dallas area for the Miriam Oil Co. and Ross Miller & Associates in 1956 and 1959. The new drilling will be called "Ray Adams No. 1." Location was tentatively given as SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 8 S., R. 5 W., Polk County. Elevation at ground level is approximately 280 feet.

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## STILL MORE WITHDRAWALS

The U.S. Department of the Interior has announced that all but 925 acres of public domain in Oregon west of R. 8 E. is to be withdrawn from application under the nonmineral public land laws, except the Disposal of Materials Act, and also from leases, permits or easements, and the right-of-way laws. The total area to be withdrawn is approximately 242,417 acres. The Bureau of Land Management notified the public that it desires to use these lands to facilitate their management for multiple uses including sustained yield timber production. As interpreted by the State of Oregon Department of Geology and Mineral Industries, this land will still be open to mineral location and to leasing under the Disposal of Materials Act, but rights-of-way and easements will be curtailed.

The Bureau of Sports Fisheries and Wildlife is withdrawing 159 acres, which will include all of the islands in the Snake River in Oregon, from all forms of appropriation under the public land laws, except that hunting will be allowed and the area will be open to recreational uses. The land is desired for an addition to the Snake River National Wildlife Refuge as a refuge and breeding ground for migratory birds and other wildlife.

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## JURISDICTION OF FEDERAL DISTRICT COURTS ALTERED

On September 6 the Senate passed, with amendments, a bill (H.R. 1960) to make it possible to bring actions against Federal Government officials and agencies in U.S. district courts outside the District of Columbia which, because of existing limitations, may now be brought only in the U.S. District Court for the District of Columbia. House action on the amendments is necessary before the measure can be cleared for the President's action.

This legislation does not create new liabilities or new causes of action against the U.S. Government. In its report on the bill, the Senate Judiciary Committee pointed out that, to facilitate review by the Federal courts of administrative actions, it does these things: (1) It specifically grants jurisdiction to the district courts to issue orders compelling Government officials to perform their duties and to make decisions in matters involving the exercise of discretion, and (2) it permits an action to be brought against a Government official in a judicial district where defendant resides, or in which the cause of action arose, or in which any real property involved in the action is situated, or--if no real property is involved--where the plaintiff resides.

"The Committee is of the view," the report said, "that the current state of the law respecting venue in actions against Government officials is contrary to the sound and equitable administration of justice." Noting that U.S. attorneys are present in every Federal judicial district, the report said that requiring the Government to defend Government officials and agencies in places other than Washington, D.C., "would not appear to be a burdensome imposition."

The report continued: "On the other hand, where a citizen lives thousands of miles from Washington, where the property involved is located outside of the District of Columbia, where the cause of action arose elsewhere, to require that the action be brought in Washington is to tailor our judicial processes to the convenience of the Government rather than to provide readily available, inexpensive judicial remedies for the citizen who is aggrieved by the workings of Government." (American Mining Congress Bulletin Service, September 14, 1962).

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#### HOUSE COMMITTEE APPROVES REVISED WILDERNESS BILL

The full House Interior Committee, after approving one amendment of particular interest to the mining industry, on August 30 ordered favorably reported the greatly revised Wilderness bill (H.R.776) endorsed earlier by its Public Lands Subcommittee. At the same time, the Committee directed its chairman, Rep. Wayne N. Aspinall (Colo.), to attempt to bring the bill up for a House vote under suspension of the rules, a procedure which limits debate to 40 minutes, bars amendment, and requires a two-thirds majority of those present for passage. No report has as yet been filed on this bill, and the date of the measure's consideration by the House is still in doubt.

As approved by the Committee, the House bill is not nearly as restrictive nor does it embrace as large an over-all area as the Wilderness bill (S.174) passed last year by the Senate. Unlike the Senate measure, the House measure as approved by the full Committee would permit the location of mining claims in wilderness areas for 25 years to January 1, 1988 (the subcommittee had set this period at only 10 years); it would make reasonable provisions for prospecting and mining operations in the wilderness areas; it would set aside only 6.8 million acres (primitive areas are not included), and it would prohibit any additions to the wilderness except by positive Act of Congress. (American Mining Congress Bulletin Service, September 14, 1962).

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## SPARTA QUADRANGLE FIRST OF NEW MAP SERIES

The first of the department's new Geologic Map Series (GMS-1) is now available. It is "Geology of the Sparta Quadrangle, Oregon," by Harold J. Prostka, who mapped the area in 1959 and 1960 as part of a doctoral thesis in geology from Johns Hopkins University.

While Mr. Prostka's report was still in manuscript form, it was instrumental in the selection of the site for the Blue Mountains Seismological Observatory, which was dedicated September 22 near Sparta.

The Sparta quadrangle was named after the old gold camp of that name which lies about 30 miles northeast of Baker. It encompasses an area of approximately 220 square miles along the southern edge of the Wallowa Mountains. The multicolored map, accompanied by descriptive text, delimits 20 geologic units ranging in age from Paleozoic to Recent and includes igneous, sedimentary, and metamorphic rocks. It may be purchased from the department's offices in Portland, Grants Pass, and Baker. The price is \$1.50.

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## CANADIAN LIMESTONE SHIPPED TO OSWEGO, OREGON

The arrival at Oswego on August 27 of the Island Exporter, the world's largest ocean-going deck cargo barge, with a cargo of 8,700 tons of limestone from Texada Island, British Columbia, marked the beginning of what promises to be a large movement of this material. Oregon Portland Cement Co. expects to import approximately 400,000 to 500,000 tons annually during the next 10 years for use in its Oswego cement plant. Next month a second barge, the Island Importer, will be placed in service to assure a 10,000-ton-a-week delivery schedule from Blubber Bay at the northern tip of Texada Island, 430 sea miles from Oswego.

Oregon Portland Cement Co. has been supplying its Oswego facility with high-grade limestone from a company-owned quarry adjacent to its cement plant located at Lime in Baker County. A considerable saving in freight prompted the switch to Canadian limestone. The plant at Lime will continue to use the limestone from the nearby quarry and shipments may be made to the Oswego plant as the occasion warrants.

To accommodate the huge barges at Oswego new unloading facilities had to be constructed and a 20-foot channel dredged from the Ross Island Bridge to Oswego.

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