

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
702 Woodlark Building
Portland 5, Oregon

Bulletin No. 42

Seventh Biennial Report
of the

**State Department of Geology
and Mineral Industries**

of the
STATE OF OREGON

July 1, 1948, to July 1, 1950

To His Excellency the Governor
and the
Forty-sixth Legislative Assembly



1950

STATE GOVERNING BOARD

NIEL R. ALLEN, CHAIRMAN	GRANTS PASS
H. E. HENDRYX	BAKER
MASON L. BINGHAM	PORTLAND

F. W. LIBBEY
DIRECTOR

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To His Excellency, Douglas McKay
Governor of the State of Oregon
and to
The Forty-sixth Legislative Assembly of the State of Oregon

Sirs:

We submit herewith the Seventh Biennial Report of the
Department of Geology and Mineral Industries, covering
activities of the Department for the period from July 1, 1948,
to and including June 30, 1950.

Respectfully,
Niel R. Allen
H. E. Hendryx
Mason L. Bingham

Portland, Oregon
November 9, 1950

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OREGON'S MINERAL INDUSTRY

Introduction

The period covered by this report has been characterized by high construction activity and large production of nonmetallic minerals. This activity was less in 1949 than in 1948 and reflected a decrease in private financing. Government financing increased to a high proportion of the total.

Metallic mining continued to decline. High costs and a fixed price for gold have made gold mining unprofitable. Quicksilver mining ceased completely in this country in 1950. Oregon's chief producer during World War II, the Bonanza mine, closed down in late 1949. The low market price of mercury caused by heavy imports from Europe, together with greatly increased cost of production, made operation of domestic mines unprofitable. Whether domestic quicksilver production could be built up promptly in case of a war emergency is doubtful.

In general, exploration activities are much less than before World War II. Government taxation policies discourage new mining enterprises, especially those which might be conducted by small operators. In addition, mining risk capital has nearly disappeared. Government financing is available to certain large operators but this source of capital is usually not available to the small operator who wishes to explore a raw prospect.

Value of Production

The total value of Oregon's mineral production in 1948 was \$24,980,000. In 1949 the value was \$20,680,000. The following table gives a breakdown of the production for 1948 as estimated by the U.S. Bureau of Mines. A similar breakdown for 1949 is not yet available (August 1950) but value of nonmetallic mineral production for 1949 was approximately \$20,000,000 according to a preliminary estimate of the Bureau.

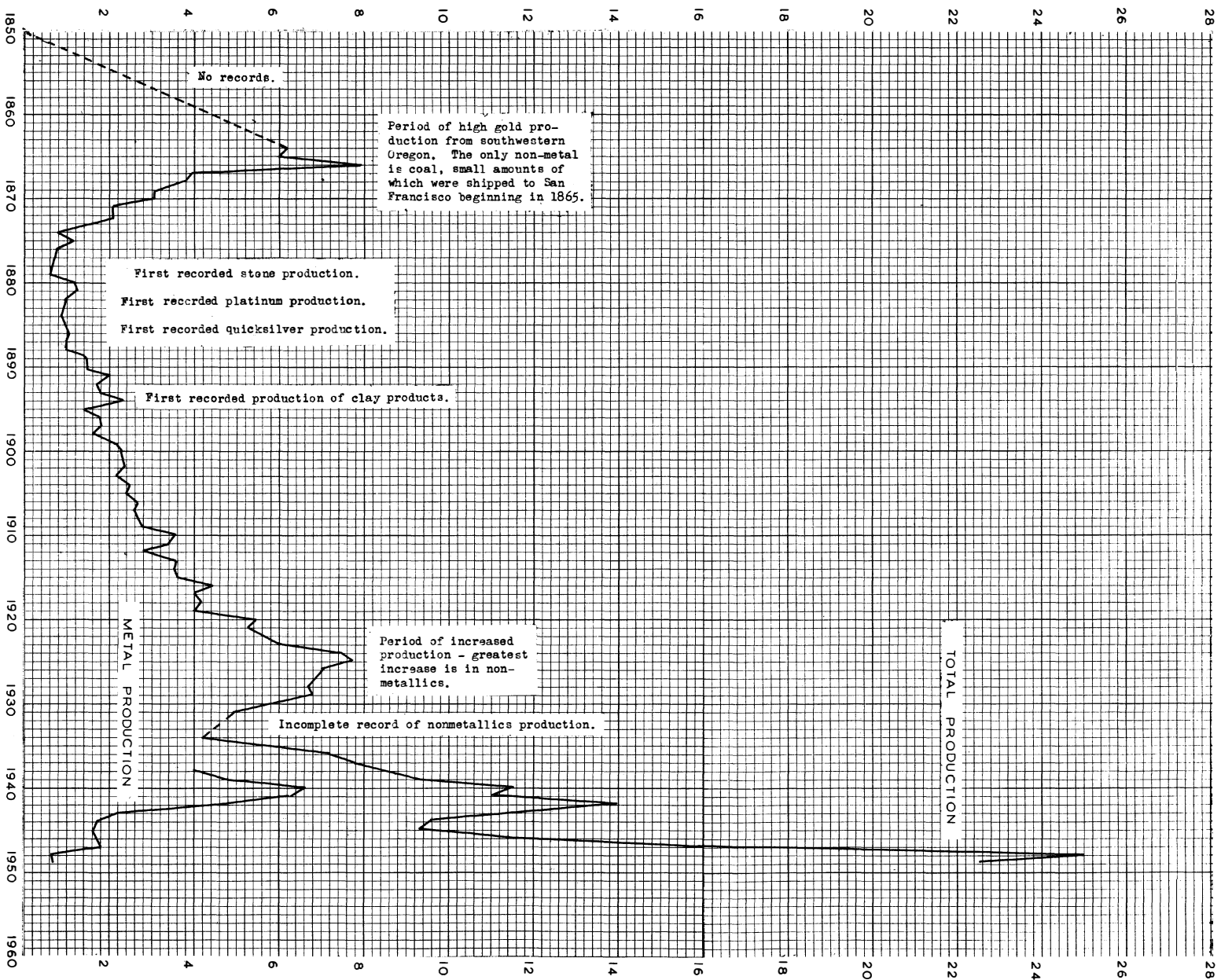
Mineral Production of Oregon in 1948 ^{1/}

		<u>Quantity</u>	<u>Value</u>
Chromite	short tons	3,345	^{2/}
Clay, raw	do ...	172,168	\$ 128,586
Copper	do ...	2	868
Gold	troy ounces	14,611	511,385
Lead	short tons	7	2,506
Mercury	flasks	1,351	103,338
Pumice	short tons	106,277	307,274
Sand and gravel	do ...	8,384,755	10,628,889
Silver	troy ounces	13,596	12,305
Stone	short tons	3,682,420	5,733,658
Other: Cement, chromite, diatomite, heavy clay products, perlite, and quartz		----	7,551,000
Total			\$24,980,000

^{1/} Preliminary.

^{2/} Value included with "Other."

OREGON MINERAL PRODUCTION (IN MILLIONS OF DOLLARS)



Metallics

Gold and silver

Gold lode mining has been almost at a standstill. There have been a few small underground operations, but the State's lode gold production has been principally a by-product from sulphide ores shipped to copper smelters. The largest production of shipping ore has come from the Buffalo mine in Grant County and the Champion mine in eastern Lane County. Gold mines were shut down by War Production Board Order L-208 in October 1942. No consideration was given gold operators in the way of providing maintenance. Therefore, most underground mines were allowed to fill with water and otherwise deteriorate. The cost of reopening these mines is not warranted under present conditions of high costs and the same fixed price of gold obtained before the war. Three of the gold dredges which were shut down by L-208 resumed after the war and continued through 1948 and 1949. There was no increase in number of dredging operations.

Seasonal hydraulic operations were continued both in the northeastern and southwestern parts of the State with the majority in Josephine County where approximately 40 separate operations were active during the winter and spring seasons.

In 1949 nearly 90 percent of the State's gold production came from placers. In 1948 the figure was approximately 83 percent.

Mercury

As mentioned above, the Bonanza quicksilver mine closed during 1949. A small amount of development work on quicksilver properties in the Ochoco Mountains area was conducted during both 1948 and 1949. One of these properties, the Amity mine on Johnson Creek, did underground development and installed some equipment. A small amount of prospecting work was carried on at a quicksilver property in the southern part of Steens Mountains in Harney County.

Chromite

In August 1948 the Oregon Chrome mine in Josephine County finally closed down because of high operating costs compared to market price of chrome. This mine had been an important producer during World War II. From a national defense standpoint it is unfortunate that it was obliged to close down and remove its underground equipment. No other Oregon chrome properties have operated since World War II. Some development work has been done on chromite sand deposits north of Bandon, but this work has been aimed principally at recovery of gold and platinum.

Antimony

Exploration of a low-grade antimony deposit in Crook County was conducted during both 1948 and 1949. Exploration of antimony deposits in Baker and Jackson counties, active during World War II, was suspended in 1948.

Nonmetallics

Limestone

The largest demand for limestone in the State is for portland cement, and because of the high construction activity, portland cement plants have operated at capacity. The Oregon Portland Cement Company, with quarries at Lime in Baker County and at Dallas in Polk County, has kilns both at Lime and at Oswego. The Beaver Portland Cement Company has its quarry on Marble Mountain south of Wilderville in Josephine County and its kiln at Gold Hill in Jackson County. Limestone is transported by railroad from the quarry to the kiln, a distance of 28 miles. In 1949 the Pacific Carbide and Alloys Company, Portland, purchased the Enterprise Lime Company quarry and plant at Enterprise, Wallowa County, from the Reconstruction Finance Corporation. Production from the quarry has been used in making calcium carbide in Portland. About 41,400 tons of agricultural limestone was used in the Willamette Valley in 1948 and about 53,200 tons in 1949.

Sand, gravel, and crushed rock

Practically all plants produced at capacity during the past two years due to activity in the construction field. Because of the high price for timber, logging companies continued to operate at a high rate which meant more forest roads and more rock surfacing for these roads. Value of Oregon's production of sand, gravel, and crushed stone used in construction in 1948 amounted to more than \$16,000,000 and was larger than that of any other state in the Pacific Northwest.

Clay

Brick and tile plants of the State, principally in the northwestern part, have experienced an active demand for their products, and most plants have operated at capacity. The Pacific Stoneware Company of Portland, which makes stoneware and flower pots, is the only other consumer of Oregon clay. A small quantity of local clay is used in some of the art potteries and ceramic studios of the State. The Department has continued its search for a white kaolin which would be satisfactory as a paper-coating clay, but the search has so far been unsuccessful.

Perlite

In 1949 a perlite acoustical tile plant was built at Frieda on the Deschutes River south of Maupin in Wasco County by Dant & Russell, Inc., Dantore Division, and several new houses were built for the staff. The tile plant is now in operation (August 1950). In addition, the furnace plant continues to put out perlite plaster sand which enjoys an expanding market in the Northwest. Other perlite projects in the State have been planned but so far none has been started. The use of perlite continues to expand in many parts of the country. During 1949 the Department carried on research to study the possible use of perlite as a substitute for feldspar in ceramic glaze.

Pumice

Oregon pumice production is centered principally around Bend and Chemult in Deschutes and Klamath counties respectively. Seven producers operated during the period covered by this report. Annual production is approximately 100,000 tons valued at more than \$300,000. Two of the producers are marketing a plaster sand. One has a plant for the manufacture of concrete pipe and uses all of its production for that purpose. Research is being carried on at Washington State College to study

the use of pumice as a lightweight aggregate. Results have not been published, but much progress has been made in determining proper mixes, proper methods of curing, and the best methods of laying building blocks in a wall. The Department has studied use of pumice in ceramic glazes and has cooperated with the Raw Materials Survey and Oregon State College in tests of the use of pumicite as a pozzolanic material.

Haydite

There are now two plants in the Portland area producing an expanded shale for use as a lightweight aggregate mainly in building blocks. One of the plants is near Sunset Tunnel on the Sunset Highway in Washington County and the other is in north Portland. Both plants use the same type of raw material which is known as Keasey shale, a highly fossiliferous siltstone.

Diatomite

The Great Lakes Carbon Corporation has operated the plant at Lower Bridge near Terrebonne in Deschutes County at capacity. Output is marketed under the trade name of Dicalite and has a great variety of uses in the chemical and construction industries.

Coal

There has been only a relatively small amount of activity in coal mining and nearly all of it has been at Coos Bay. The South Slough mine has installed mechanical mining equipment formerly owned by the Coast Fuel Corporation who used it at the Southport mine. Output from the coal operations at Coos Bay has been to supply local demand. A few other coal-prospecting operations have been attempted during the past two years but so far have resulted in no production.

Silica

The Bristol Silica Company, Rogue River, Jackson County, has continued to operate a quartz quarry and a granite quarry (both in Jackson County) to supply poultry grit and also some metallurgical silica.

Gemstones

This Oregon industry is a combination of commercial lapidaries and hobbyists. Oregon is famous for its agates and "thunder eggs," and collectors from all over the West come to the State in order to obtain the material. Part of it is sold to lapidaries and part goes into private collections. Some collectors buy and sell agates and other mineral specimens as a business aside from their regular employment. It is impossible to determine the dollar value of this business but it is relatively large. If it were possible to separate the commercial from the non-commercial production, it would probably be found that the value of the raw stones sold commercially would be many thousands of dollars; the value of the cut and polished stones would be of the order of several hundred thousand dollars.

Exploration Activities

Bauxite

Exploration of ferruginous bauxite by Alcoa Mining Company ceased in 1949 because all deposits owned by the Company in Washington and Columbia counties had been proved by drilling and test-pitting. If in the future other properties are acquired, further drilling will be done. The company continues to maintain its office and laboratory at Hillsboro in Washington County. Alcoa has been exploring these deposits intensively for the past five years, and, although no figures have been released, reserves now amount to many millions of tons. The Department discovered the bauxite in 1944. The deposits are important to the economy of the State, and from a national defense standpoint are highly important to the nation.

During 1949 bauxite was found east of Mehama and north of the Little North Santiam River. Samples analyzed by the Department show relatively high-grade material. Only a small amount of test-pitting has been done by the owners (August 1950) and no estimate of possible quantity of material may as yet be made.

In 1948 the Department did a small amount of exploratory drilling on high-silica bauxite found in Clackamas County. The amount of work done was insufficient to prove possible quantity of material in reserve, but samples indicated that deposits in this area would be unsuitable for alumina production as long as lower-silica material is available.

Asbestos

Early in 1950 the Asbestos Corporation of Canada, with plant and mines at Thetford Mines, Quebec, started exploration on an asbestos deposit located about 5 miles north of Mt. Vernon in Grant County. Diamond drilling and test trenching were in progress at the time this report was written (August 1950). Plans of the company include exploration in other potential serpentine asbestos areas in the State. Since Oregon has large areas of serpentine, possibilities of finding workable deposits appear favorable.

Nickel

The M. A. Hanna Company has leased the Nickel Mountain nickel deposit near Riddle in Douglas County. This company plans to investigate the metallurgy and economics of making available the low-grade nickel in this deposit. The U. S. Bureau of Mines has been carrying on metallurgical tests of this nickel ore aimed at direct smelting to a stainless steel. Results are reported as encouraging.

The Department has suspended its exploration of nickel-bearing laterite in Douglas, Josephine, and Curry counties until new favorable areas are found. It is believed that the work done indicates quality of these deposits. The quantity could not be determined because of the expense involved. In addition to nickel, the deposits contain an important amount of chromite.

The U. S. Bureau of Mines, Mining Division, has carried on exploration of a sulphide nickel deposit located north of Rogue River in Jackson County. Diamond drilling and underground lateral work were done. Results of this exploration are not yet available in a published report.

Oil and gas testing

Some further drilling was done during 1948 and 1949 in the Burns area with no encouraging results, and as this is written (August 1950) no test drilling there is in progress. A test is being drilled near Vale but no oil or gas indications have so far been found. Other tests in eastern Oregon are planned by independent operators, but none of the major oil companies has indicated interest in doing exploration work.

SET-UP OF THE DEPARTMENT

Duties of the Department, as set forth in the law which created it (Oregon Laws, 1937, Chapter 179), are outlined as follows:

- (1) Conduct geological and mineral resource studies.
- (2) Carry out economic studies pertaining to utilization of mineral raw materials.
- (3) Cooperate with Federal and other agencies in studies of value to the State.
- (4) Serve as a bureau of mineral and geological information, compile and keep up-to-date a mines catalog, prepare and publish reports of investigations, mineral statistics, etc.
- (5) Conduct a State geological survey.
- (6) Collect specimens and develop a museum of mineral and geological specimens, maps, and other objects representative of mineral industry activities.
- (7) Collect a mining and geological library.
- (8) Make qualitative mineral determinations.
- (9) Study minerals and ores as well as processes for improved ore treatment.
- (10) Make quantitative determinations of ores and minerals.
- (11) Make spectrographic analyses.
- (12) Administer act regulating drilling, prospecting for, production, and conservation of natural gas and oil (Oregon Laws, 1949, Chapter 365).

The Department is administered by a Governing Board of three citizens who serve for four-year periods. The Governor of the State selects the Governing Board, subject to the approval of the State Senate. The Board members serve without compensation but receive traveling expenses. They meet at least four times each year. The Board may make contracts with Federal and other State agencies and may receive gifts and legacies and make use of them for the best interests of Oregon.

The Board causes to be published a biennial report of departmental activities, as well as reports of investigations and surveys as required under the law. It selects the Director of the Department who has charge of the work of the Department and who subscribes to the same oath of office as other State officers. The Director employs assistants and fixes their remuneration with the approval of the Governing Board. Money received from sale of maps and bulletins and from other sources is paid to the State Treasurer to be credited to a "departmental fund." The accounts of the Department are audited annually.

The Board has continued to maintain a head office of the Department at Portland and field offices both at Baker and at Grants Pass.

PERSONNEL

The Governing Board of the Department was composed of the following members as of June 30, 1950:

Niel R. Allen, Grants Pass, Chairman, reappointed 1948.

H. E. Hendryx, Baker, reappointed 1947.

Mason L. Bingham, appointed 1949.

Mr. Mason L. Bingham was appointed by the Governor in 1949 to succeed Mr. E. B. MacNaughton whose term expired and who did not desire reappointment.

The regular personnel of the Department as of June 30, 1950, was as follows:

F. W. Libbey, Director

Hollis M. Dole, Geologist

L. L. Hoagland, Assayer and Chemist

Ralph S. Mason, Mining Engineer

Thomas C. Matthews, Spectroscopist

Margaret L. Steere, Geologist

R. E. Stewart, Geologist

Norman S. Wagner, Geologist (Baker)

David J. White, Geologist

Harold D. Wolfe, Geologist (Grants Pass)

C. W. F. Jacobs, Ceramist (half-time)

F. A. Steeble, Accountant

June A. Roberts, Secretary

Lillian F. Owen, Multigraph Operator

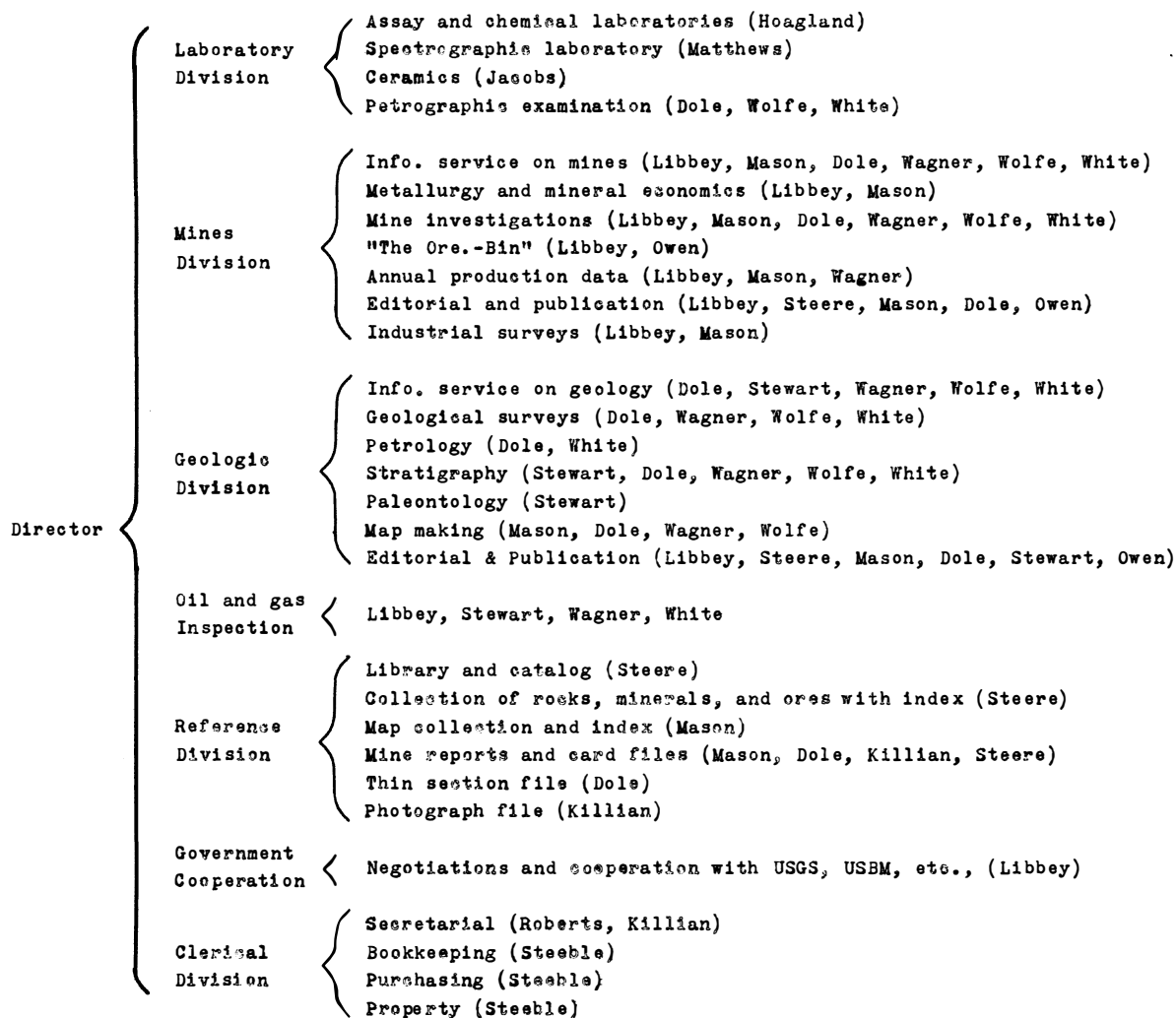
Loris M. Killian, Stenographer

Arline M. Sims, Stenographer (Grants Pass)

Marguerite L. Beedon, Stenographer (Baker)

Some temporary employees have been hired during the period covered by the report for clerical and miscellaneous office work, drafting, laboratory, and field work. They are included in a list on a following page giving compensation and expenses of employees.

ORGANIZATION WITHIN THE
STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES



POLICIES

Under the law which created the Department, certain duties are specified. Supplementing and implementing these duties, the Governing Board must determine and promulgate general policies and rules for the conduct of the Department.

As has been pointed out in previous reports, industrial minerals are becoming more and more important in the State's economy. The Board realizes, as it has always realized, that there is an ever increasing need for industrial mineral studies both of sources of supply and of markets. Industries are constantly making inquiries of the Department concerning possible sources of industrial minerals, and the Department should be in a position to answer such inquiries fully. At the same time it is recognized that in order to give complete answers exploration is usually required, and any extensive exploration is beyond the available facilities and funds of the Department. This applies to metallic as well as nonmetallic investigations. Insofar as personnel has been available the Department has studied markets and technology of industrial minerals known to occur in Oregon with the end in view of encouraging new industries to establish operations in this State. These activities will be continued.

Although the Board recognizes that there is an increasing need for industrial mineral studies, it does not believe that there should be a decrease in geological surveying or strictly scientific studies, since these usually form the necessary foundation for economic studies.

MINERAL INDUSTRY INFORMATION SERVICE

One of the most important duties of the Department is to provide information on the mineral industry of the State, as well as to answer inquiries concerning a wide range of subjects relating to mineral occurrences and the geology of Oregon and other states. Requests for information are continually received by letter, telephone, telegraph, and personal calls. Although the larger proportion of inquiries comes from residents of the State, a great many are received from people living outside the State and not uncommonly from residents of foreign countries. Federal Government departments and bureaus frequently make use of this departmental service.

During the past two years, perhaps the most frequent inquiries have been concerned with sources and markets of industrial minerals, but there have been many questions received on mining regulations relating to location and assessment work, coal deposits, oil possibilities, economic geology of specific mines and areas, mineral localities in the State, and for publications. In spite of the depression in gold mining, prospecting for gold has a widespread attraction, and persons often inquire of the Department for advice concerning the localities where there are the best chances of finding gold.

APPROPRIATIONS

The Department's activities are supported by money appropriated by the Legislature out of the State's general fund. Appropriations received by the Department are divided into accounts classified as follows: Salaries and wages; general, operating, and maintenance expense; capital outlays; and special requests. Funds appropriated for use under one classification may not be used for expenditures in a different classification. All departmental expenditures are evidenced by warrants drawn on the State Treasurer and are audited by the office of the Secretary of State.

In addition to appropriative funds, the Department maintains a separate account with the State Treasurer into which go monies received from sale of departmental publications, from gifts, or from cooperating agencies. Warrants approved by the Budget Director are then drawn on this account to cover payment of expenses incurred by the Department.

The following headings give appropriations made by the last two legislatures as well as funds requested for the biennium 1951-1953.

	<u>1947-1949</u>	<u>1949-1951</u>	<u>Requested</u> <u>1951-1953</u>
<u>Department of Geology</u> <u>& Mineral Industries</u>	<u>July 1 - June 30</u>	<u>July 1 - June 30</u>	<u>July 1 - June 30</u>
Salaries and wages	\$ 112,024.00	\$ 127,333.00	\$ 130,132.00
Gen., Oper., and Maint.	38,755.00	36,573.00	46,840.00
Capital outlays	2,900.00	5,950.00	3,100.00
Special requests	<u>11,500.00</u>	<u>9,000.00</u>	<u>11,000.00</u>
Total	\$ 165,179.00	\$ 178,856.00	\$ 191,072.00

The increase in appropriations requested is due to increased cost of operation in Departmental activities. Salaries and wages are governed by State Civil Service and Budget Director regulations. The increase requested in this account is due to State Civil Service merit increases for one year of the new biennium according to instructions of the Budget Director. No increase in staff is planned for. The increase of general, operating, and maintenance is needed to continue activities at about the same scale as in the 1949-1951 biennium except that it is planned to step up field work in war mineral investigations. In addition there will be increased expenses caused by moving and setting up equipment in the new State office building in Portland. Some of this equipment will require extreme care in moving. A smaller amount for capital outlays will be needed in the 1951-1953 biennium. Under special requests the increase is requested in order to match funds with the U.S. Geological Survey for construction of a State Geologic Map by the Survey. In previous years the Department has had a cooperative agreement with the Geologic Branch of the Survey according to which quadrangle geologic mapping was done by the Survey and the maps were published by the Department. Under the new arrangement the cooperative agreement would cover a long-range project for construction of a State map instead of quadrangle mapping.

HEAD OFFICE AND ASSAYING SERVICE

The administrative office of the Department is at 702 Woodlark Building, Portland. Included at this location are a spectrographic laboratory, a chemical laboratory including fire assaying equipment, a petrographic laboratory, crushing and grinding equipment, cutting and polishing equipment, drafting room, museum, multigraphing equipment, library, and offices for the staff.

Principal duties at this office are, aside from clerical, taking care of the information service; preparing, editing, and multigraphing reports for publication; analytical and testing work on mineral samples; and cataloging publications and specimens for the library and museum.

A free assaying service is maintained by the Department. Samples are received at either the field offices or the head office and are assayed at the head office laboratory. According to the law establishing the Department, a single person or group of persons may submit no more than two samples in a 30-day period. Such samples must be from an original prospect or property within the State, and the service is given without charge in return for information on the origin of the sample including the location from which it was obtained. This service may not be given to engineers in the sampling of properties for the purpose of evaluation nor to operating mines which are milling or shipping ore.

Statistics of activities at this office from July 1, 1948, to July 1, 1950, are given below:

Number of visitors at the Portland office	4,466
Pieces of mail received at Portland office	19,492
Pieces of mail sent out of Portland office (not including new publications)	17,138
Number of qualitative determinations made	704
Number of quantitative determinations made	4,865
Petrographic examinations (excluding thin sections) . . .	508
Number of thin sections analyzed	37
Microscopic examinations for State Board of Health . . .	43

Similar data for field offices at Baker and Grants Pass are given on the following page.

FIELD OFFICES

Two field offices are maintained, one for eastern Oregon at Baker and one for western Oregon at Grants Pass.

Each field office is staffed with a field geologist and a part-time stenographer and clerk. Duties of the geologist include obtaining information on mines and prospects for the Department's files and mines catalog, supplying information on minerals and mineral properties, advising prospectors concerning their problems, and inspecting mines and prospects at owners' requests as a part of mineral resource studies.

The field geologists are continually called upon for mineral industry and geological information about their territories by prospectors, examining engineers, and geologists.

Pertinent statistics concerning the work of these field offices for the two-year period are as follows:

	<u>Qualitative</u> <u>Determinations</u>	<u>Business</u> <u>Callers</u>	<u>Business</u> <u>Letters</u>
Baker	595	2,140	690
Grants Pass	580	3,239	481
Total	1,175	5,379	1,171

SPECTROGRAPHIC LABORATORY

The spectrographic laboratory has three principal functions from the standpoint of division of work of the spectroscopist: (1) Qualitative analysis of mineral samples to determine presence or absence of specific elements. Such determinations can usually be made much more quickly and dependably with the spectrograph than by any other method. (2) Quantitative analysis of samples in which all elements are determined in percentages within the accepted limits of accuracy, and in a small fraction of the time required for quantitative chemical analysis. Very small percentages of some elements may be determined more accurately with the spectrograph than by any other method. (3) Research work on specific problems, usually in determining minute quantities of diagnostic elements. Such work may be done acceptably only with the spectrograph.

During the biennium the principal use of the spectrograph has been for qualitative determinations of all kinds of mineral substances. It has been especially valuable in determining presence or absence of rarer metals, especially uranium and thorium, in which interest has greatly increased since World War II. Custom analyses included quantitative control work on alloys for casting and heat treating operations as well as quantitative analyses of rare earths. The laboratory is equipped with a Geiger counter and all samples received are tested for radioactivity.

The Governing Board has set up rules for the commercial analysis of samples by the spectrograph. These rules are given in detail in a Department publication describing the spectrographic laboratory. Statistics covering the work of the laboratory are given below:

Total number of analyses made	1,184
Custom analyses made	158
Receipts from custom analyses	\$ 801.35

CERAMICS

During the period covered by this report the Department employed a ceramist on a half-time basis according to an arrangement with the Oregon Ceramic Studio. The Studio and the Department agreed to employ the ceramist jointly on work divided equally between the two agencies. An experienced ceramist from the New York State College of Ceramics started work July 1, 1948.

There is an almost unlimited field for development of uses for Oregon clays and clay-working industries. There is also the need for seeking sources of certain types of clay to meet a particular demand. This has been brought home to the Department by the need of one of the paper companies for a local source of white kaolin now brought across the continent in large amounts from Georgia. Research has included the study of adaptation of volcanic glasses as a ceramic glaze. Such an adaptation would provide a cheap substitute for feldspar in colored glazes.

MINERAL DEPOSIT INSPECTIONS

In making mineral resource studies, it is at times necessary to make an inspection of property at the owner's request. Frequently such requests are received from persons who have had no experience in mineral matters and who wish to obtain advice on whether or not their land contains commercial minerals. Sometimes advice may be given based on samples submitted. At other times an inspection is necessary in order to obtain reliable technical information and to advise the owners concerning the need and kind of work required for preliminary exploration. Limited time and personnel do not permit prospecting a considerable area unless evidence is plain that such work might bear on and be a part of regional investigations designed to develop the State's mineral resources.

Inspections of active and inactive mines, as well as undeveloped prospects, are frequently made in order to provide information for the Mines Catalog. In all regional geologic mapping, examination of mine openings and development work is necessary in order to obtain all available geological evidence.

It is felt that one of the most important duties of the Department is to keep in close touch with prospecting activities, for prospecting is basic to the existence of a mineral industry. To this end the free assaying service is maintained as given under "Head Office." Also rock and mineral determinations are made which often include petrographic study of thin sections. In addition, new discoveries are inspected whenever they are brought to the Department's attention in order to give all technical assistance possible to the prospector.

PUBLICATIONS

A complete list of Department publications is given at the end of this bulletin. The following publications have been issued during the biennium covered by this report:

Bulletin No. 1, "Mining Laws of the State of Oregon," third printing by the State Printer. 1500 copies cost \$451.49.

Bulletin No. 16, "Field Identification of Minerals for Oregon Prospectors and Collectors," fourth printing, multigraphed by the Department. 965 copies cost \$700.47.

Bulletin No. 36, Parts VI-VIII, "Two Papers on Foraminifera from the Tertiary of Western Oregon and Western Washington" by Joseph A. Cushman, and Roscoe E. and Katherine C. Stewart, and "One Paper on Mollusca and Microfauna of the Wildcat Coast Section, Humboldt County, California" by Roscoe E. and Katherine C. Stewart. Contains 9 plates of foraminifera from localities in California, Washington, and Oregon. 1270 copies printed by the State Printer cost \$1094.

Bulletin No. 38, Sixth Biennial Report of the Department. 650 copies multigraphed by the Department cost \$488.48.

Bulletin No. 40, "Preliminary Description of the Geology of the Kerby Quadrangle, Oregon" by Francis G. Wells, Preston E. Hotz, and Fred W. Cater, Jr., 1949. Published as a cooperative project with the U.S. Geological Survey. Contains an 8-color map in pocket. 1877 copies of text, 2232 copies of map lithographed by A. Hoen & Company, Baltimore, cost \$1941.34.

Bulletin No. 41, "Ground-Water Studies in Umatilla and Morrow Counties" by Norman S. Wagner, 1949. Contains more than 200 well logs and a generalized geologic map. 460 copies multigraphed by the Department cost \$654.78.

G.M.I. Short Paper No. 18, "Radioactive Ores the Prospector Should Know" by David J. White, 1949. Contains basic information on radioactive ores and an index map showing the most favorable areas for prospecting. 1200 copies multigraphed by the Department cost \$177.98.

G.M.I. Short Paper No. 19, "The Brick and Tile Industry in Oregon" by John Eliot Allen and Ralph S. Mason, 1949. Contains descriptions of 20 producing plants together with production statistics and other information on Oregon's clay products industry. 1200 copies multigraphed by the Department cost \$213.26.

Preliminary Geologic Map of the Kerby Quadrangle, Oregon, by Francis G. Wells, Preston E. Hotz, and Fred W. Cater, Jr., 1948. Issued as a part of Bulletin 40 but available as a map without the bulletin.

Index to Geologic Mapping, 1948, and Index to Topographic Mapping, 1948, multigraphed on 8½ x 11 sheets cost \$8.30.

A Description of Some Oregon Rocks and Minerals by Hollis M. Dole, 1950.

A multigraphed text of 50 pages issued in connection with the Department's project of distributing sets of typical Oregon rocks and minerals. The text includes a classification of rocks and a description of specimens in the sets together with an outline of their uses, occurrences in the State, and other pertinent information. 516 copies cost \$230.77.

Exploration work on nickel-bearing laterite in southwestern Oregon was carried on during the summer of 1948 and 1949. Results of this work were published in the Ore.-Bin.

The Department explored a deposit of high-silica ferruginous bauxite by auger-hole drilling near Estacada in Clackamas County and a brief report was published in the Ore.-Bin.

The Ore.-Bin. This small monthly periodical is prepared and multigraphed in the office of the Department. Monthly circulation is 829, 382 of which are sent free to legislators, Oregon libraries, educational institutions, and a restricted exchange list. A yearly subscription charge of 40 cents is made to cover cost of assembling and mailing. The principal value of such a publication is to present the mineral industry viewpoint on problems affecting that industry, and to provide pertinent information on Oregon mining and geology. The Ore.-Bin serves also for announcement of new publications, and publishes statistics on Oregon mineral production as soon as they are available.

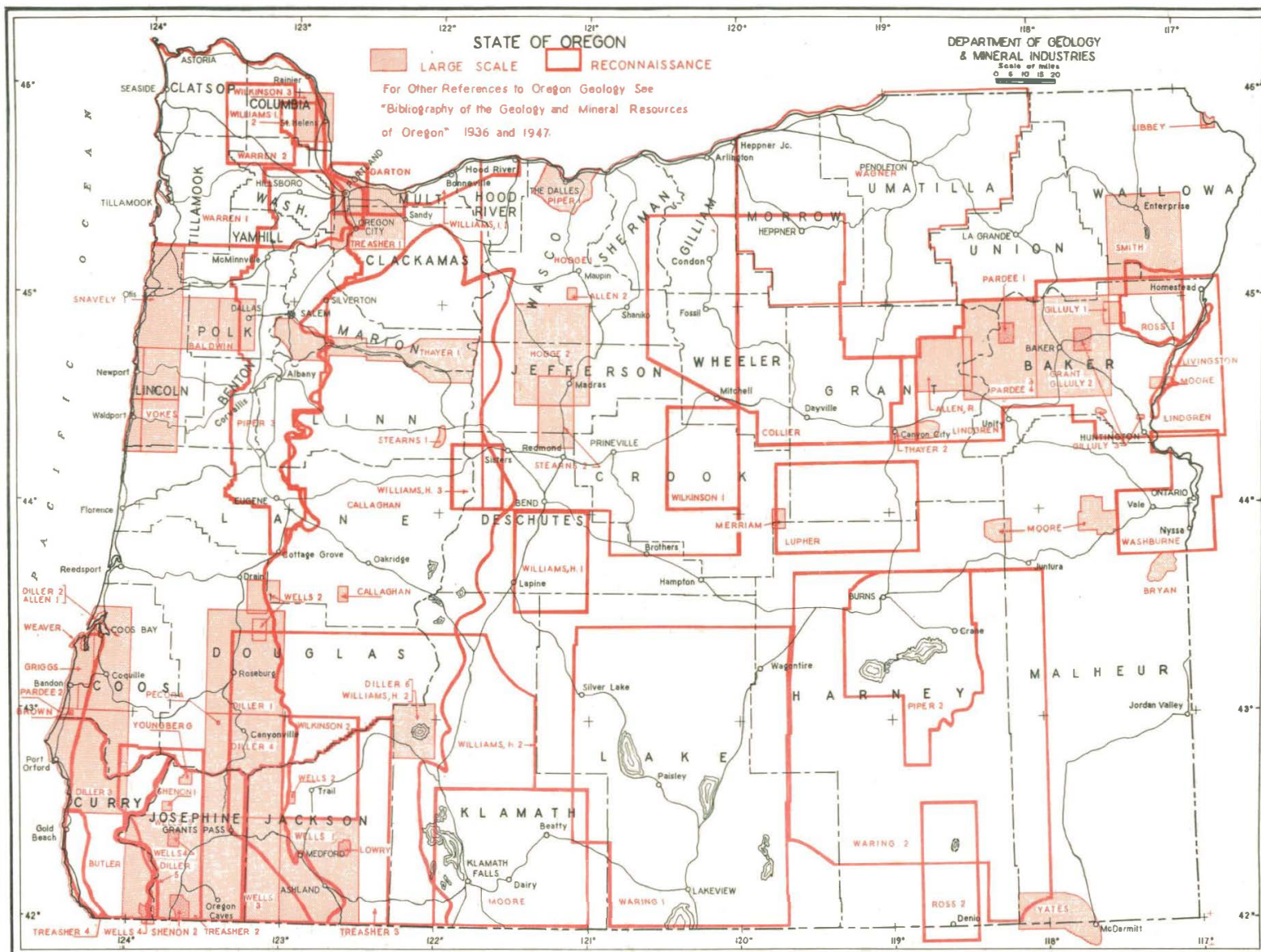
Unpublished Studies

The following studies have been completed but reports have not been published either because of the expense involved or because other reports had priority. Information on these studies is on open file at the Department's Portland office.

The southwest quarter of the Pine quadrangle in southern Baker County was mapped by Mr. J. Paul Fitzsimmons who started mapping in this area as a member of the Department's staff prior to World War II. He completed the mapping as a part of his doctorate thesis at the University of Washington. It is planned to publish the thesis as a Department bulletin in 1951.

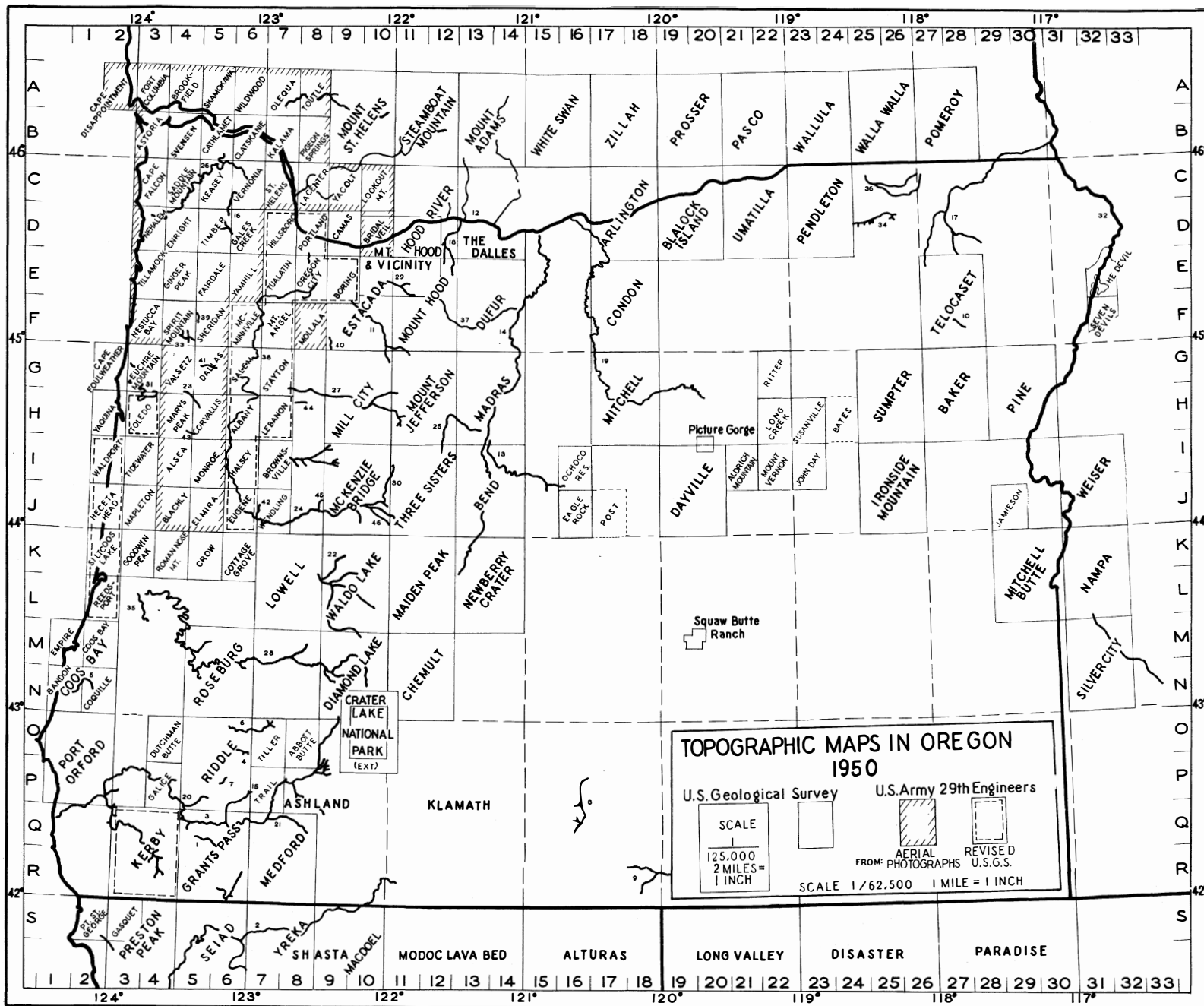
A geologic map of the Willamette River Basin, together with a text describing the geology and mineral resources of the basin, was prepared during the spring of 1950 for the Governor's Resources Advisory Committee.

Two test pits at Alkali Lake in Lake County have been under observation periodically by the Department since 1945. These pits were prepared, one by excavating an old pit and the other as an entirely new excavation, to determine experimentally the growth of soda ash in both types of potholes. No conclusive evidence has thus far been obtained except that apparently an old pothole will renew its contents in about three years. This estimate would probably be unreliable if the saline or moisture content of the playa should change.



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TOPOGRAPHIC MAPS OF OREGON — 1950

15-Minute Quadrangles
(Scale 1:62,500)

30-Minute Quadrangles
(Scale 1:125,000)

River Surveys

Name	Loca- tion	Cont. Int.	Date	Name	Loca- tion	Cont. Int.	Date	Key No.	Name
* Abbott Butte	O- 8	50	1947	* Arlington	D-18	50	1941	1	Applegate River
" Albany	H- 6	25	1944	* Baker	H-28	100	1934	10	Catherine Creek
* Aldrich Mountain	I-21	50	1943	* Bend	J-14	50	1940	8	Chewaucan River
o Alsea	I- 4	50	1942	* Blalock Island	D-20	50	1944	11	Clackamas River (WSP 349)
o Astoria	B- 3	20	1939	* Chemult	N-12	50	1941	12	Columbia River
* Bandon	N- 1	50	1944	* Condon	F-18	50	1916	5	Coquille River
* Bates	H-24	Underway		* Coos Bay	N- 2	100	1937	4	Cow Creek
o Blachly	J- 4	50	1942	* Dayville	J-20	100	1936	13	Crooked River
*" Boring	E- 9	25	1944	* Diamond Lake	N-10	100	1926	41	Dallas Reservoir
o Bridal Veil	D-10	100	1942	* Dufur	F-14	100	1945	9	Deep and Camas creeks
x Brownsville	I- 7	40	1950	* Estacada	F-10	100	1938	14	Deschutes River (WSP 344)
* Camas	D- 9	25	1942	* Grants Pass	R- 6	100	1930	15	Evans Creek
o Cape Falcon	C- 3	50	1940	* Hood River	D-12	100	1940	16	Gales Creek
* Cape Foulweather	G- 2	50	1944	* Ironside Mountain	J-26	100	1908	45	Gate Creek
o Cathlamet	B- 5	20	1941	* Kerby	R- 4	100	1942	17	Grande Ronde River
o Clatskanie	B- 6	25	1942	* Lowell	L- 8	100	1942	7	Grave Creek
* Coos Bay	M- 2	50	1945	* Madras	H-14	100	1931	18	Hood River
* Coquille	N- 2	50	1945	* Maiden Peak	L-12	100	1944	46	Horse Creek
o Corvallis	H- 2	50	1942	* McKenzie Bridge	J-10	100	1940	3	Illinois River (see Rogue)
* Cottage Grove	K- 6	25	1921	* Medford	R- 8	100	1945	19	John Day River (WSP 377)
* Crow	K- 5	50	1945	* Mill City	H-10	100	1941	44	Jordan Reservoir
o Dallas	G- 5	50	1942	* Mitchell	H-18	100	1926	20	Jump-off Joe Creek
* Dutchman Butte	O- 4	50	1948	* Mitchell Butte	L-30	50	1921	2	Klamath River
* Eagle Rock	I-16	50	1948	* Mt. Hood	F-12	100	1944	21	Little Butte Creek
o Elmira	J- 5	50	1942	* Mt. Jefferson	H-12	100	1938	22	Lookout Point
* Empire	M- 1	50	1944	* Newberry Crater	L-14	100	1935	23	Luckiamute River
o Enright	D- 4	100	1941	* Pendleton	D-24	50	1935	24	McKenzie River
* Euchre Mountain	G- 3	50	1943	* Pine	H-30	100	1941	25	Metolius River
* Eugene	J- 6	5&10	1940	* Port Orford	P- 2	100	1944	42	Mohawk River
o Fairdale	E- 5	100	1942	* Riddle	P- 6	100	1942	40	Molalla River
o Gales Creek	D- 6	25	1943	* Roseburg	N- 6	100	1942	26	Nehalem River
* Galice	P- 4	50	1948	* Sumpter	H-26	100	1939	27	North Santiam River
o Ginger Peak	E- 4	100	1942	* Telocaset	F-28	100	1932	28	North Umpqua River
* Goodwin Peak	K- 3	50	1943	* The Dalles	D-14	50	1941	3	Rogue River
*" Halsley	I- 6	10&25	1941	* Three Sisters	J-12	100	1941	29	Sandy River (WSP 348)
*" Heceta Head	J- 2	50	1944	* Umatilla	D-22	50	1921	27	Santiam River (WSP 349)
x He Devil	E-32	50	1922	* Waldo Lake	L-10	100	1944	30	Separation Creek
" Hillsboro	D- 7	25	1943	* Weiser	J-32	100	1916	31	Siletz River
* Jamieson	J-29	40	1950					32	Snake River
* John Day	I-23	50	1943					27	South Santiam River
o Kalama	B- 7	20	1943					6	South Umpqua River
o Keasey	C- 5	100	1943					33	South Yamhill River
*" Lebanon	H- 7	25	1944					34	Umatilla River
* Long Creek	H-22	40	1950					35	Umpqua River
* Mapleton	J- 3	50	1945					36	Walla Walla River
o Marys Peak	H- 4	50	1942					37	White River
" McMinnville	F- 6	25	1943					22	Willamette River (Lookout Pt.)
o Molalla	F- 8	25	1943					38	Willamette River (WSP 349,378)
o Monroe	I- 5	50	1942					39	Willamina Creek
" Mount Angel	F- 7	25	1943					43	Wren Reservoir
* Mount Vernon	I-22	50	1943					33	Yamhill River (see S. Yamhill)
o Nehalem	D- 3	100	1943						
o Nestucca Bay	F- 3	100	1942						
* Ochoco Reservoir	I-16	50	1950						
" Oregon City	E- 8	25	1945						
" Portland	D- 8	25	1940						
* Post	J-17	Underway							
*" Reedsport	L- 2	50	1942						
* Ritter	G-22	40	1950						
* Roman Nose Mt.	K- 4	100	1945						
o Saddle Mountain	C- 4	100	1943						
*" Salem	G- 6	25	1940						
x Seven Devils	F-32	50	1920						
o Sheridan	F- 5	100	1942						
*" Siltcoos Lake	K- 2	50	1942						
o Spirit Mountain	F- 4	100	1942						
" Stayton	G- 7	25	1944						
o St. Helens	C- 7	25	1943						
* Susanville	H-23	40	1950						
o Svensen	B- 4	20	1940						
* Tidewater	I- 3	50	1945						
o Tillamook	B- 3	100	1942						
* Tiller	O- 7	50	1946						
o Timber	D- 5	100	1941						
* Toledo	H- 3	50	1946						
* Trail	P- 7	50	1945						
*" Tualatin	B- 7	25	1943						
o Valsetz	G- 4	50	1942						
o Vernonia	C- 6	25	1943						
" Waldport	I- 2	50	1942						
* Wendling	J- 7	40	1950						
o Yamhill	E- 6	100	1942						
* Yaquina	H- 2	50	1946						

SPECIAL MAPS

Name	Loca- tion	Cont. Int.	Scale
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Crater Lake Nat'l Park	O-10	50	1:62,000
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Crater Lake and vicinity	P-11	50	1:48,000
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Mt. Hood and vicinity	E-12	100	1:125,000
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Picture Gorge (advance)	H-20	5	1:24,000
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Squaw Butte Ranch (advance)	M-20	50	1:48,000
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STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

702 WOODLARK BUILDING
PORTLAND 5, OREGON

KEY TO SYMBOLS

* Map published by U.S. Geological Survey, obtainable from the Denver Federal Center, Denver, Colorado.

x Map published by U.S. Geological Survey, quadrangle incomplete.

o Map printed by the U.S. Army, 29th Engineers.

" Map revised by U.S. Army, 29th Engineers, on U.S. Geological Survey topographic base.

Studies in Progress

The preparation of a geologic quadrangle map is generally a tedious process which extends over two or more years depending upon personnel, area of the quadrangle, and nature of the terrain. Reconnaissance surveys, however, are generally less exacting and consume much less time. Results of laboratory studies which have been undertaken by the Department may usually be obtained in a matter of months depending upon the scope of the work. Following are studies now current:

Geology of the Trail quadrangle, Jackson County, Oregon. Mapping of the quadrangle by Dr. W. D. Wilkinson of Oregon State College has been completed, but the text to accompany the geologic map has not been finished.

Geology of the Galice quadrangle, Josephine County, Oregon. This map is being prepared by the U.S. Geological Survey according to a cooperative arrangement with the Department. Publication is planned for 1951.

Geologic maps of the Salem, Albany, Lebanon, and Stayton quadrangles. Field work on these maps was completed several years ago but subsequent changes in a portion of the area make necessary a revision of at least two of the maps.

Geologic reconnaissance work was done in the Pueblo Mountains area of southern Harney County in 1949. The area will be studied further during the succeeding biennium.

Geologic mapping of the Tolocaset quadrangle was continued by N. S. Wagner, field geologist of the Department stationed at Baker. This is a part-time project and date of publication cannot now be predicted.

Geologic mapping of the 15-minute Dutchman Butte quadrangle in southwestern Oregon north of the Galice quadrangle was started in 1949 and continued in 1950.

Discovery of scheelite, an ore of tungsten, in the Ashland district in 1949 prompted the Department to make a topographic and geologic map of a restricted area. The object of this work was to study the structure in order to assist prospecting for this valuable war mineral. A geological report of this area will be published.

The postwar boom in construction increased the demand for lightweight aggregates such as pumice, expanded shale, and volcanic tuffs. The Department has published several articles on the State's pumice industry in the Ore.-Bin as well as reports on expanded shale and a unique rhyolite tuff located in Crook County which has possible use as a building stone. A G.M.I. Short Paper on Oregon's lightweight aggregate industry is nearly completed.

The Department's ceramist, C.W.F. Jacobs, made an extensive series of tests on the application of Oregon's volcanic glass in producing ceramic glaze. A G.M.I. Short Paper has been prepared and published since the close of the biennium covered by this report.

PRESS RELEASES

Issued from July 1, 1948, to July 1, 1950

- No.
- 94 "Oregon 1947 Mineral Production Reaches New High" - July 20, 1948
- 95 "New Bauxite Discovery" - September 25, 1948
(Announcement of discovery of bauxite near Estacada)
- 96 "New Bulletin with Geologic Map Issued" - April 21, 1949
(Bulletin No. 40)
- 97 "State Department Issues Uranium Handbook" - May 19, 1949
(G.M.I. Short Paper No. 18)
- 98 "Ground-Water Studies in Umatilla and Morrow Counties" - May 25, 1949
(Bulletin No. 41)
- 99 "Oregon's Brick and Tile Industry" - August 12, 1949
(G.M.I. Short Paper No. 19)
- 100 "State Department Bulletin Helps in Oil Search" - December 27, 1949
(Bulletin No. 36, parts VI-VIII)

COOPERATIVE WORK

Formal cooperative work has been continued with the Geologic Branch of the U.S. Geological Survey. The agreement calls for matched funds, and \$3,000 was provided for the State's share in the 1949-1951 budget.

The Department has cooperated on an informal basis with the Oil and Gas Division of the Survey in its mapping project in northwestern Oregon, and with the U.S. Bureau of Mines in nickel exploration in Jackson County.

An arrangement, effective July 1, 1948, was made with the Oregon Ceramic Studio to share the services of a ceramist on a fifty-fifty basis.

The Department has worked in close cooperation both with Oregon State College and with the University of Oregon on mutual problems connected with the State's mineral industry. Members of the departments of geology, engineering, and chemistry cooperated helpfully in work on the various problems. Some special projects in which members of the staffs of these institutions participated are listed under Publications.

In connection with silicosis studies by the State Board of Health, the Department cooperated by determining petrographically the silica content of samples submitted by the State Board.

As a project to assist schools, sets of 16 minerals and rocks designed especially for grade-school students have been assembled in small cardboard boxes. A simplified description of the specimens, written in a nontechnical manner, accompanies each of the sets. A more comprehensive set of 30 rocks and minerals has also been prepared and a description of the specimens is supplied in multigraphed form. In response to a continued and ever-increasing demand from schools throughout the State for mineral and rock specimens, the Department has prepared a limited number of sets containing 60 rocks and minerals. A 50-page pamphlet containing a full description of each of the specimens, together with notes on occurrences of the mineral or rock within the State and uses or possible uses for them has been prepared. These large sets are at present distributed to the schools on a circulation basis only. The Department has been unable to keep up with the demand for either the 30 or 60 mineral sets since considerable time and labor is involved in procuring the specimens in the field and preparing them.

The Department is a regular port of call for many school and college student groups. During the past biennium a start was made toward the preparation of organized program material that can be presented to these groups. As a result of this work a series of kodachrome slides has been made which depicts some of the more interesting phases of Oregon's mineral industry and geology. A set of slides has also been prepared showing the methods used in the analysis of samples received in the Department for gold and silver.

Members of the Department staff are frequently called on to give talks before various professional societies, civic groups, and schools, as well as to prepare articles for newspapers and professional publications throughout the country.

The Department has worked in cooperation with the Raw Materials Survey, a nonprofit organization privately financed, in several projects including a study of possible salt sources and research on volcanic ash as a pozzolanic material. This last project was in cooperation also with Oregon State College.

SUMMARY

(1) During the period covered by this report, value of production of non-metallic minerals increased substantially compared to the previous biennium. In 1948 total value of mineral production in the State was approximately \$25,000,000; In 1949 slightly more than \$22,400,000 according to the U.S. Bureau of Mines (October 1950). Nonmetallic properties have produced at capacity owing to the large and continuing demand for materials used in construction. A large proportion of the financing for construction projects has come from the Federal Government.

(2) Metals produced are gold, silver, copper, lead, zinc, and mercury. The principal production has been from gold and silver, and the base metals except mercury have resulted as by-products from smelter shipments. Value of metals produced in 1948 was about \$630,000; in 1949 value was about \$680,000. Ninety percent of the value of gold production has come from three dredges in Eastern Oregon. Most of the copper, lead, and zinc was contained in smelter shipments from the Bohemia district of eastern Lane County and the Buffalo mine in eastern Grant County. Mercury production, which amounted to about \$93,000 in 1949, ceased entirely when the Bonanza mine, one of the mainstays of quick-silver production in the United States for the past ten years, closed down in November 1949. Chromite production ceased in 1948 when the Oregon Chrome mine in Josephine County closed down because of low market price for chromite.

(3) Production of perlite increased considerably in 1949 when the new plant of Dant & Russell, Inc., Dantore Division, was completed at Frieda south of Maupin in Wasco County. The production of plaster aggregate was stepped up and an acoustical tile plant was built and put into production. Demand for the plaster aggregate has continued to expand since production was started in 1947.

(4) Exploration work on oxidized nickel deposits in southwestern Oregon was continued by the Department. In 1949 the M. A. Hanna Company started metallurgical testing work on the nickel ore from the Nickel Mountain deposit located near Riddle in Douglas County. It is reported by the company that if this testing work is successful a pilot plant for treatment of the ore will be built. Examination and exploration work on some sulphide deposits of southwestern Oregon by the U.S. Bureau of Mines is being continued.

(5) Drilling and sampling by Alcoa Mining Company of ferruginous bauxite deposits discovered in northwestern Oregon by the Department was nearly concluded in 1949. All deposits owned or leased by the company have been thoroughly explored. Only a small amount of exploration work is being done on one deposit at present (September 1950). Whether or not Alcoa will build a plant to treat Oregon ores is unknown. The company still maintains an office, laboratory, and geological staff at Hillsboro, Oregon. Bauxite is the raw material from which aluminum is obtained. The Northwest, and especially the lower Columbia River area, is becoming increasingly important in aluminum production, both primary and fabricated. A rod and wire mill was built by Alcoa at Vancouver, Washington, in 1950. In 1949 about half the total domestic output of primary aluminum came from Northwest plants. The Department has been keenly aware of the need for building up domestic reserves of bauxite and has made many investigations of reported occurrences. Outside of the original discoveries, bauxite has been verified in two places - near Estacada, Clackamas County, and near Mehama, Marion County, respectively. Insufficient exploration work has been done to determine quantity and quality of these two occurrences but sampling by the Department of the Clackamas County deposit shows high-silica content which would make the material undesirable for aluminum production.

(6) The Department has continued geological mapping in two quadrangles, one in Baker and Union counties, and one in Douglas County.

(7) During the last half of the current biennium the Department has pointed field work at war mineral investigations with particular attention to manganese, tungsten, and nickel. The domestic situation relating to domestic war mineral supplies is very disturbing because of the reliance placed on foreign supplies by Government authorities. Reportedly the Government stockpile which has been built up mostly from foreign sources is inadequate after 5 years of planning and buying of strategic materials. The international situation has focused attention of people experienced in the mineral industry on the need for building up a strong domestic mining industry as a mainstay of national defense. The national stockpile of strategic minerals should be built up for standby reliance but the domestic mining industry should be the main bulwark. Domestic production of mercury, tungsten, manganese, chromite, and antimony has been allowed to decline and in some cases die off. Signs are at this time that the Government is beginning to realize that foreign supplies of essential materials might be unavailable to us in a war emergency and that attention should be concentrated on building up domestic sources.

(8) Investigations by the Department's ceramist have shown that Oregon volcanic glass makes an excellent ceramic glaze. Perlite in particular could be substituted for standard feldspar glazes where a white clay is not essential. A perlite glaze would be much cheaper in the Northwest. The Department has continued its search for a white kaolin that might be used as a paper-coating clay, but without success.

(9) Several field investigations have been made on reported occurrences of radioactive minerals. Only two of these occurrences have shown radioactivity but both proved to be of no present importance.

(10) A study of Oregon's lightweight aggregate industry has been completed by the Department and a report will be issued in 1951.

(11) The Asbestos Corporation of Canada has been exploring an asbestos deposit near Mt. Vernon in Grant County (1950). The company has also been searching for similar deposits in other parts of the State. The Department has cooperated actively with the company by pointing out serpentine areas that contain asbestos and in obtaining samples from these areas.

(12) A reconnaissance survey in southeastern Oregon, mainly in southern Harney County, was undertaken by the Department during 1949. The primary purpose of the project is to obtain evidence on mineral possibilities. It is planned to continue this work during the next biennium.

(13) The Geologic Branch of the U.S. Geological Survey in cooperation with the Department has been making a geologic map of the Galice quadrangle in Josephine County during the past two years. It is hoped to publish this map in 1951. The Oil and Gas Division of the U.S. Geological Survey has been mapping in northwestern Oregon during the same period. The Department has cooperated with the Oil and Gas Division mainly in furnishing information on microfossils which are important in determining stratigraphy.

(14) The Board wishes again to emphasize the need for and value of geologic mapping and other basic geological studies which form the foundation for economic studies. An example of this kind of research is the Department's project involving correlation studies of stratigraphy including studies of foraminifera as given in the Department's Bulletin 36. These studies are basic in setting up an authentic geologic column of the State, and such information has many practical applications.

OREGON STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Comparative Statements of Expenditures 1945-47, 1947-49, and 1949-51

	<u>1945-47</u>		
	Expenditures	G&MI Expenditures	Total Expenditures
	7/1/45- 6/30/47	7/1/45- 6/30/47	7/1/45- 6/30/47
<u>Salaries and Wages</u>	\$ 86,537.82		<u>86,537.82</u>
<u>General, Operating, and Maintenance</u>	<u>27,341.41</u>	<u>533.93</u>	<u>27,875.34</u>
Office Supplies	974.46		974.46
Telephone and Telegraph	759.20	320.37	1,079.57
Postage, Freight and Express	1,199.09		1,199.09
Printing	2,323.16	208.22	2,531.38
Rents	10,327.00		10,327.00
Premiums	148.95		148.95
Contributions: Pub.Emp.Ret.Bd.			
State Civil Service			
State Ind. Acc. Comm.	306.62		306.62
Assessments, Restoration, etc.	158.48		158.48
Auditing	175.02		175.02
Private Car Mileage	136.95		136.95
Railroad Fares, etc.	395.29		395.29
Meals and Lodging	2,215.89		2,215.89
Motor Vehicles	3,886.43		3,886.43
Heat, Light, Water, Power	764.16		764.16
Laundry	64.80		64.80
Laboratory	2,035.79		2,035.79
Library	241.42		241.42
Buildings and fixtures	123.88		123.88
Photos and Blueprints			
Out-of-state travel			
All Other	1,104.82	5.34	1,110.16
Gas-oil well drilling investigation			
Expense, moving to State Office Bldg.			
<u>Capital Outlays</u>	<u>4,216.53</u>	<u>1,267.84</u>	<u>5,484.37</u>
Office furniture and equipment	555.28		555.28
Motor Vehicles	2,685.42	1,267.84	3,953.26
Laboratory and field	958.36		958.36
Library	17.47		17.47
<u>Special Requests</u>	<u>10,684.96</u>		<u>10,684.96</u>
State Geological Survey	5,948.89		5,948.89
Cooperative with U.S. Geol.Survey	3,000.00		3,000.00
Mineral Commodity Survey			
Nonmetallic Survey	852.25		852.25
Investigation of Salt Deposits	883.82		883.82
TOTAL EXPENDITURES	\$128,780.72	1,801.77	130,582.49

	<u>1947-49</u>		<u>1949-51</u>	<u>1951-53</u>
Expenditures 7/1/47- 6/30/49	G&M Expenditures 7/1/47- 6/30/49	Total Expenditures 7/1/47- 6/30/49	Estimated Expenditures 7/1/49- 6/30/51	Funds Requested 1951-53
<u>105,694.58</u>		<u>105,694.58</u>	<u>125,135.80</u>	<u>130,132.00</u>
<u>36,216.06</u>	<u>2,503.54</u>	<u>38,719.60</u>	<u>36,545.46</u>	<u>46,840.00</u>
1,094.20		1,094.20	1,200.00	1,200.00
1,157.05		1,157.05	1,200.00	1,200.00
1,485.21		1,485.21	1,600.00	1,700.00
4,276.58	391.57	4,668.15	2,598.00	3,500.00
13,042.00		13,042.00	15,000.00	15,600.00
200.49		200.49	300.00	300.00
3,190.09	1,612.94	4,803.03	3,297.46	6,800.00
293.28		293.28	275.00	250.00
309.87		309.87	350.00	365.00
135.63		135.63	250.00	250.00
513.88		513.88	500.00	500.00
141.49	192.75	334.24	400.00	400.00
531.39	245.28	776.67	700.00	850.00
1,826.06	61.00	1,887.06	1,500.00	2,500.00
3,029.08		3,029.08	2,800.00	3,500.00
932.95		932.95	1,000.00	1,000.00
96.14		96.14	100.00	100.00
1,787.57		1,787.57	1,500.00	1,800.00
357.26		357.26	300.00	325.00
182.70		182.70	200.00	1,000.00
325.22		325.22	300.00	300.00
496.39		496.39		
791.63		791.63	1,000.00	1,500.00
19.90		19.90	175.00	300.00
				<u>1,600.00</u>
<u>2,870.25</u>	<u>699.85</u>	<u>3,570.10</u>	<u>2,124.89</u>	<u>3,100.00</u>
536.50	213.50	750.00	504.43	500.00
800.00	486.35	1,286.35	1,000.00	1,500.00
1,474.17		1,474.17	517.23	1,000.00
<u>59.58</u>		<u>59.58</u>	<u>103.23</u>	<u>100.00</u>
<u>7,308.64</u>		<u>7,308.64</u>	<u>9,000.00</u>	<u>11,000.00</u>
4,112.86		4,112.86	6,000.00	6,000.00
3,000.00		3,000.00	3,000.00	5,000.00
195.78		195.78		
<u>152,089.53</u>	<u>3,203.39</u>	<u>155,292.92</u>	<u>172,806.15</u>	<u>191,072.00</u>

GEOLOGY AND MINERAL INDUSTRIES ACCOUNT
(section 7, chapter 179, Oregon Laws 1937)

for period July 1, 1948, to July 1, 1950

Balance June 30, 1948

\$ 3533.37

RECEIPTS:

Sale of publications	\$ 2,400.27	
Sale of mine reports, blue prints, etc.	35.82	
Sale of mineral specimen collections	232.67	
Refund from Geological Society of the Oregon		
Country for printing expense	194.24	
Refund for telephone and telegraph tolls, etc.	30.93	
Sale of fuel oil at Grants Pass	7.50	
F. W. Libbey for articles sold to magazines	15.00	
Refund for damages to state car E8-217 (1948)	244.77	
Fleet sales refund	37.06	
Sale of old motor	90.00	
Refunds from auto liability premiums	4.05	
Refund State Printing Board for double pay't	37.00	<u>3329.31</u>
		6862.68

DISBURSEMENTS:

General Operating and Maintenance:		
Office supplies	11.71	
Telephone and telegraph	44.58	
Postage freight and express	81.66	
Printing	423.82	
R.R. Fares	62.30	
Meals and lodging	6.00	
Motor supplies	282.52	
Equipment repairs	7.55	
Out of state travel	218.95	
Blueprints	2.70	
Library	15.00	
Laundry	3.60	
Laboratory and field	2.75	
Contributions to Public Employees Retirement Bd.	<u>1,612.94</u>	
	2,776.08	
Capital Outlays:		
Motors	<u>30.25</u>	<u>2806.33</u>

BALANCE June 30, 1950

\$ 4056.35

COMPENSATION AND EXPENSES OF EMPLOYEES

Name	Title	Compensation 7/1/48-7/1/50	Travel and Expenses 7/1/48-7/1/50
P. W. Libbey	Administrator	11,520.00	(479.56 (132.98 (1) (111.70 (2)
Lillian P. Owen	Clerk Typist II	4,800.00	
Marguerite L. Beeson	Clerk Stenographer I	2,739.10	
June A. Roberts	Clerk Stenographer III	5,121.00	
F. A. Steeble	Accounting Clerk	5,460.00	
Margaret L. Steere	Geologist I	6,927.18	
Norman S. Wagner	Geologist II	8,640.00	(811.72 (28.91 (1)
Hollis M. Dole	Geologist II	(7,536.00 (1,104.00 (1) ((123.90 (281.53 (1) (30.00 (2)
Harold D. Wolfe	Geologist II	8,256.00	305.96
David J. White	Geologist II	(6,836.13 (75.87 (1)	(194.59 (41.50 (1)
R. E. Stewart	Geologist III	(9,312.00 ((43.00 (10.00 (1)
T. C. Matthews	Spectroscopist	9,408.00	28.35 (1)
Ralph S. Mason	Mining Engineer	(8,640.00 ((143.33 (135.16 (1) (33.55 (2)
Laurie L. Hoagland	Chemist II	8,256.00	
Charles W. F. Jacobs	Ceramist	3,072.00	
Irene E. Colvig *	Clerk Stenographer I	2,181.03	
Loris M. Killian	Clerk Stenographer I	3,001.07	
Arline M. Sims	Clerk Stenographer I	180.00	
Charles W. Drew, Jr.	Student Worker	75.50 (1)	77.00 (1)
Dorothy J. Edgerton *	Clerk Stenographer I	1,416.00	
Fred B. Dewey *	Student Worker	978.77	
J. Paul Fitzsimmons *	Geologist II	750.00 (1)	293.35 (1)
Thad E. Furlong *	Chemist I	896.63	
Gladys E. Curtis *	Accounting Clerk	400.00	
Lorne A. Turville *	Laborer I	68.60	64.95
Clarence H. Peterson, Jr.	Laboratory Assistant	395.92	
Irving W. Jones *	Student Worker	703.47	86.40
Bonnie E. McCosh *	Geologist I	609.00	
Anna J. Rose *	Clerk Stenographer I	547.40	
Millie M. Donaldson *	Clerk Stenographer I	34.76	
Charged to Department Salaries & Wages or GOM		117,936.06	2,253.41
Charged to Special Requests (1)		2,005.37 (1)	1,028.78 (1)
Charged to G&MI account sec. 7 ch. 179 OL 1937 (2)			175.25 (2)

* Persons who were on staff or were regular employees for some portion of the period.

PUBLICATIONS
Oregon Department of Geology and Mineral Industries
702 Woodlark Building, Portland 5, Oregon

Price postpaid

BULLETINS

1. Mining laws of Oregon, 1948, 2d rev., contains Federal placer mining regulations	\$ 0.25
2. Progress report on Coos Bay coal field, 1938: F. W. Libbey	0.10
3. Geology of part of the Wallowa Mountains, 1938: C. P. Ross	0.50
4. Quicksilver in Oregon, 1938: C. N. Schuette	0.50
5. Geological report on part of the Clarno Basin, 1938: Donald K. Mackay	(out of print)
6. Prelim. rept. on some of the refractory clays of Western Oregon, 1938: Wilson & Treasher	(out of print)
7. The gem minerals of Oregon, 1938: H. C. Dake	(out of print)
8. Feasibility of steel plant in lower Columbia area, rev. ed., 1940: R. M. Miller	0.40
9. Chromite deposits in Oregon, 1938: J. E. Allen	(out of print)
10. Placer mining on Rogue River in relation to fish and fishing, 1938: H. B. Ward	(out of print)
11. Geology and mineral resources of Lane County, Oregon, 1938: W. D. Smith	0.50
12. Geology and physiography of northern Wallowa Mountains, 1941: W. D. Smith, J. E. Allen, et al	(out of print)
13. First biennial report of the Department, 1937-38	(out of print)
14. Oregon metal mines handbook: by the staff	
A. Baker, Union, and Wallowa counties, 1939	(out of print)
B. Grant, Morrow, and Umatilla counties, 1941	0.50
C. Vol. I, Coos, Curry, and Douglas counties, 1941	(out of print)
" II, Section 1, Josephine County, 1942	(out of print)
Section 2, Jackson County, 1943	0.75
15. Geology of Salem Hills and North Santiam River basin, Oregon, 1939: T. P. Thayer	(out of print)
16. Field identification of minerals for Oregon prospectors and collectors,	
2d ed., 1941: compiled by Ray C. Treasher	0.75
17. Manganese in Oregon, 1942: by the staff	0.45
18. First aid to fossils, or what to do before the paleontologist comes, 1939: J. E. Allen	(out of print)
19. Dredging of farmland in Oregon, 1939: F. W. Libbey	(out of print)
20. Analyses and other properties of Oregon coals, 1940: H. F. Yancey & M. R. Geer	(out of print)
21. Second biennial report of the Department, 1939-40	Free
22. Inv. f reported occurrence of tin at Juniper Ridge, Oregon, 1942: Harrison & J. E. Allen	0.40
23. Origin of the black sands of the coast of southwestern Oregon, 1943: W. H. Twenhofel	0.30
24. Third biennial report of the Department, 1941-42	(out of print)
25. Soil: Its origin, destruction, and preservation, 1944: W. H. Twenhofel	0.45
26. Geology and coal resources of Coos Bay quadrangle, 1944: J. E. Allen & E. M. Baldwin	1.00
27. Fourth biennial report of the Department, 1943-44	Free
28. Ferruginous bauxite deposits in northwestern Oregon, 1945: Libbey, Lowry, & Mason	1.00
29. Mineralogical and physical composition of the sands of the Oregon coast from	
Coos Bay to the mouth of the Columbia River, 1945: W. H. Twenhofel	(out of print)
30. Geology of the St. Helens quadrangle, 1946: Wilkinson, Lowry, & Baldwin	0.45
31. Fifth biennial report of the Department, 1945-46	(out of print)
32. Bibliography (supp.) of the geology and mineral resources of Oregon, 1947: J. E. Allen	1.00
33. Mines and prospects of the Mt. Reuben mining district, Josephine County, Oregon,	
1947: Elton A. Youngberg	0.50
34. Geology of the Dallas and Valsetz quadrangles, Oregon, 1947: E. M. Baldwin	0.75
35. (1st vol.) Five papers on foraminifera from the Tertiary of Western Oregon,	
1947: J. A. Cushman, R. E. Stewart, & K. C. Stewart	1.00
(2d vol.) Two papers on foraminifera from the Tertiary of W. Oregon and W. Washington,	
1949: Cushman, Stewart, & Stewart; and one paper on mollusca and microfauna of	
Wildcat coast section, Humboldt County, California, 1949: Stewart & Stewart	1.25
36. Sixth biennial report of the Department, 1947-48	Free
37. Geology and mineralization of the Morning Mine and adjacent region,	
Grant County, Oregon, 1948: Rhessa M. Allen, Jr.	0.50
38. Preliminary description of the geology of the Kerby quadrangle, Oregon,	
1949: Francis G. Wells, Preston E. Hotz, and Fred W. Cater, Jr.	0.35
39. Ground-water studies in Umatilla and Morrow counties, 1949: Norman S. Wagner	1.25

PUBLICATIONS

(cont.)

G.M.I. Short Papers

Price Postpaid

1. Preliminary report upon Oregon saline lakes, 1939: O. F. Stafford	(out of print)
2. Industrial aluminum - a brief survey, 1940: Leslie L. Motz	\$ 0.10
3. Advance report on some quicksilver prospects in Butte Falls quadrangle, Oregon, 1940: W. D. Wilkinson	(out of print)
4. Flotation of Oregon limestone, 1940: J. B. Clemmer & B. H. Clemmons	0.10
5. Survey of nonmetallic mineral production of Oregon for 1940-41: C. P. Holdredge . .	(out of print)
6. Pumice and pumicite, 1941: James A. Adams	(out of print)
7. Geologic history of the Portland area, 1942: Ray C. Treasher	(out of print)
8. Strategic and critical minerals, a guide for Oregon prospectors, 1942: Lloyd W. Staples	(out of print)
9. Some manganese deposits in the southern Oregon coastal region, 1942: Randall E. Brown	0.10
10. Investigation of Tyrrell manganese and other nearby deposits, 1943: W. D. Lowry . .	(out of print)
11. Mineral deposits in region of Imnaha and Snake rivers, Oregon, 1943: F. W. Libbey	(out of print)
12. Preliminary report on high-alumina iron ores in Washington County, Oregon, 1944: F. W. Libbey, W. D. Lowry, & R. S. Mason	(out of print)
13. Antimony in Oregon, 1944: Norman S. Wagner	0.15
14. Notes on building-block materials of eastern Oregon, 1946: Norman S. Wagner	(out of print)
15. Reconnaissance geology of limestone deposits in the Willamette Valley, Oregon, 1946: J. E. Allen	0.15
16. Perlite deposits near the Deschutes River, southern Wasco County, Oregon, 1946: J. E. Allen	0.15
17. Sodium salts of Lake County, Oregon, 1947: Ira S. Allison & Ralph S. Mason	0.15
18. Radioactive ores the prospectors should know, 1949: David J. White	0.20
19. Brick and tile industry in Oregon, 1949: J. E. Allen & R. S. Mason	0.20
20. Glazes from Oregon volcanic glass, 1950: C.W.F. Jacobs	0.20

Geologic Maps

Geologic map of the Wallowa Lake quadrangle, 1938: W. D. Smith & others	(out of print)
Geologic map of the Salem Hills and North Santiam River basin, Oregon, 1939: T. P. Thayer	0.25
Geologic map of the Medford quadrangle, 1939: F. G. Wells & others	0.40
Geologic map and geology of the Round Mountain quadrangle, 1940: W. D. Wilkinson & others	(out of print)
Geologic map of the Butte Falls quadrangle, 1941: W. D. Wilkinson & others	0.45
Geologic map and geology of the Grants Pass quadrangle, 1940: F. G. Wells & others	0.30
Preliminary geologic map of the Sumpter quadrangle, 1941: J. T. Pardee & others . .	0.40
Geologic map of the Portland area, 1942: Ray C. Treasher	0.25
Geologic map of the Coos Bay quadrangle, 1944: J. E. Allen & E. M. Baldwin (sold with Bull. 27)	---
Geologic map of the St. Helens quadrangle, 1945: W. D. Wilkinson, W. D. Lowry, & E. M. Baldwin (also in Bull. 31)	0.35
Geologic map of the Dallas quadrangle, Oregon, 1947: E. M. Baldwin (also in Bull. 35)	0.25
Geologic map of the Valsetz quadrangle, Oregon, 1947: E. M. Baldwin (also in Bull. 35)	0.25
Preliminary geologic map of the Kerby quadrangle, Oregon, 1948: Francis G. Wells, Preston E. Hotz, & Fred W. Cater, Jr. (also in Bull. 40)	0.80

Miscellaneous Publications

THE ORE.-BIN: issued monthly by the staff as medium for news about the Department, mines, and minerals. (Available back issues 5¢ each) Subscription price per year	0.40
Oregon mineral localities map (22 x 34 inches) 1946	0.25
Oregon quicksilver localities map (22 x 34 inches) 1946	0.25
Landforms of Oregon: a physiographic sketch (17 x 22 inches) 1941	0.15
Index to topographic mapping in Oregon, 1950	Free
Index to published geologic mapping in Oregon, 1950	Free