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

Bulletin No. 32

Fifth Biennial Report

of the

State Department of Geology and Mineral Industries

of the

STATE OF OREGON

July 1, 1944, to July 1, 1946

TO HIS EXCELLENCY THE GOVERNOR
and the
FORTY-FOURTH LEGISLATIVE ASSEMBLY

To His Excellency, Earl Snell,
Governor of the State of Oregon
and to
The Legislative Assembly of the State of Oregon

Sirs:

We submit herewith the Fifth Biennial Report of the Department of Geology and Mineral Industries, covering activities of the Department for the period from July 1, 1944, to and including June 30, 1946.

Respectfully,

W. H. Strayer
S. H. Williston
Niel R. Allen

Governing Board

Portland, Oregon
October 1, 1946

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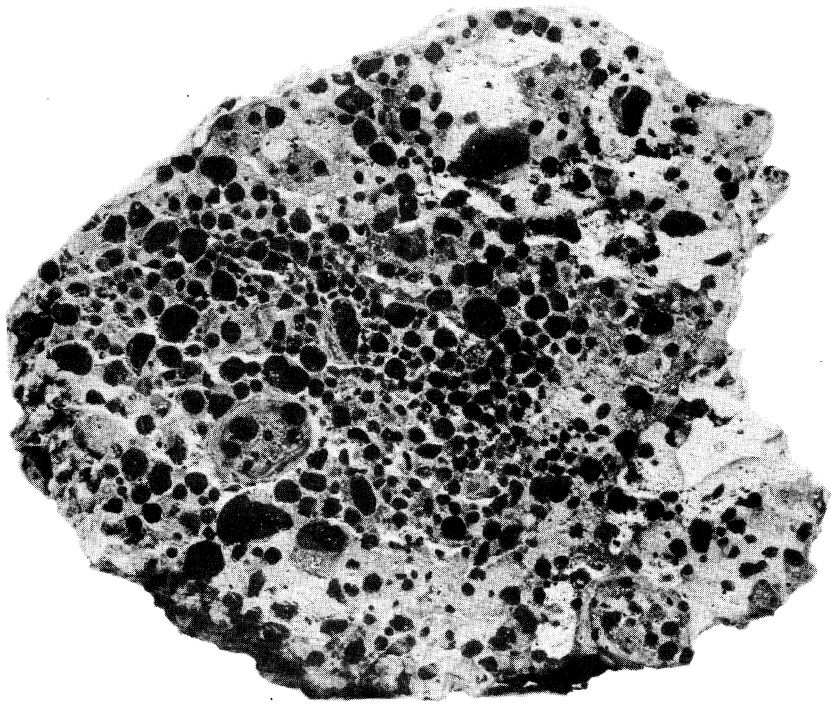


The specimen of ferruginous bauxite, pictured above, is typical of the upper part of the ore section of extensive deposits in northwestern Oregon. It consists of very dark brown oölites in a light brown matrix and contains irregular seams and small masses of whitish bauxite. The brown color is due to contained iron. Alcoa Mining Company is engaged in a large program of exploration of these deposits in Washington and Columbia Counties.

INTRODUCTION

This report describes the activities of the State Department of Geology and Mineral Industries from July 1, 1944, to and including June 30, 1946, which is the end of the fiscal year immediately preceding a regular meeting of the Legislature.

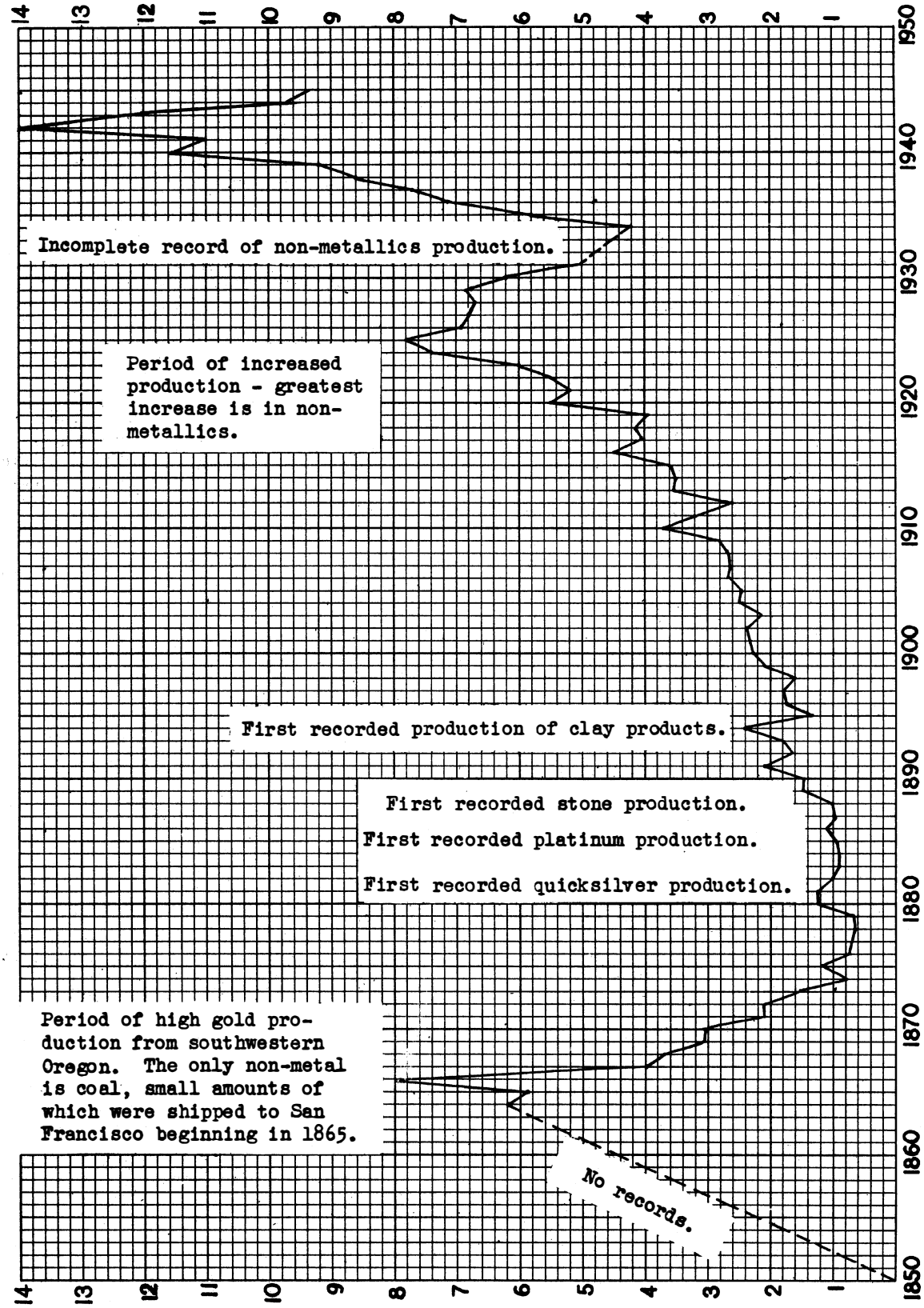
The first half of this period, which was the last year of the war, was characterized by a progressively lessening need for domestic production of war minerals, and the Department's activities were governed accordingly. Field mapping of the State geological survey, suspended during most of the war period, was resumed. Studies were started or continued on nonmetallics which were or might be in demand for construction materials, and in general, the Department resumed peacetime activities.

Since publication of the preceding biennial report there have been new developments in the State's mineral industry in which the Department has taken an important part.

In 1944 the Department discovered high-iron bauxite deposits in Washington County. Subsequent work showed widespread occurrence in other counties of northwestern Oregon, mainly in Columbia and Marion counties. There seems little doubt that these deposits form the largest reserve of low-silica aluminous ore in the United States. A preliminary report was published in 1944 and a comprehensive bulletin in 1945. Immediately after publication of the preliminary report, Alcoa Mining Company investigated the deposits and started an exploration program. This has included an intensive drilling campaign in Washington and Columbia counties, and chemical analytical work at a laboratory established at Hillsboro. In addition, many carloads of the ore have been shipped to East St. Louis, Illinois, for metallurgical testing work. Results aimed at producing alumina to supply the company's aluminum reduction plant at Vancouver are reported by the company to be encouraging. Pig iron will be a by-product in production of alumina. Recently the company announced plans for bringing in limestone from Alaska to the Lower Columbia River area. As limestone would be needed as a flux for the Oregon ore and not for any other phase of Alcoa's present operations, it may be presumed that the company has definite plans for putting the Oregon ore into production. This would mean an important new industry for Oregon.

During the past two years, several of the major oil companies have had geologists in the State studying oil and gas possibilities. The Department has furnished information on Oregon geology to many of them, especially when they started work in what was to them a new field. The Department also cooperated with the Oil and Gas Division of the U.S. Geological Survey in compiling a geologic map of part of northwestern Oregon. Aimed primarily at assisting in oil and gas studies, the Department started a long range project to determine stratigraphic sequence of the State's sedimentary formations. Part of the project involves correlation by means of microfossil study.

Two of the oil companies have drilled three deep tests (in addition to the test by the Phillips Petroleum Company at Coos Bay, abandoned on March 11, 1944, at a depth of 6941 feet). The Texas Company drilled to a depth of 5660 feet at a location about 6 miles south of Clatskanie in Columbia County, and to a depth of 9263 feet at a location about 15 miles southwest of Portland on Cooper Mountain in Washington County. The first hole was abandoned September 25, 1945, and the second May 10, 1946. Richfield Oil Company drilled to a depth of 7885 feet at a location in the Portland Hills west of the city limits. This hole was abandoned June 6, 1946. None of these three tests gave evidence of the presence of oil or gas. It was announced in the press on October 23, 1946, that the Texas Company would drill a third test at a location about 2 miles east of Mist in Columbia County.


14 13 12 11 10 9 8 7 6 5 4 3 2 1
1950
1940
1930
1920
1910
1900
1890
1880
1870
1860
1850
Incomplete record of non-metallics production.
Period of increased production - greatest increase is in non-metallics.
First recorded production of clay products.
First recorded stone production.
First recorded platinum production.
First recorded quicksilver production.
Period of high gold production from southwestern Oregon. The only non-metal is coal, small amounts of which were shipped to San Francisco beginning in 1865.
No records.

The Department began to investigate Oregon perlite deposits in 1944. This material, a volcanic glass, has the property of expanding in volume when heated properly, and forms a product valuable for its insulating and accoustical characteristics. Fairly accessible deposits were known on the Deschutes River, south of Maupin in Wasco County, and on Dooley Mountain, western Baker County. Investigations of the deposits on the Deschutes River were started by Dant and Russell, Inc., in 1945, and are well along in 1946. Prospects are that these deposits will be the basis for another new Oregon industry.

The various Department projects and activities are described in detail in the following pages.

OREGON MINERAL PRODUCTION

During the first half of the period covered by this report, war mineral production in the State declined because Government price support was removed. With the ending of the war, the decline continued and chromite mining ceased in the first half of 1946. Resumption of gold dredging began in the last half of 1945 and there has been much activity in production of construction material in 1945 and 1946.

According to the U.S. Bureau of Mines, total value of Oregon's mineral production in 1944 was $9,668,000, of which metallic products, mainly quicksilver and chromite, were valued at $766,000, and nonmetallics at $8,891,000. The Bureau estimated that the total value of production in 1945 was $9,398,000 of which metallic products were valued at $680,000, and nonmetallics at $8,718,000.

In 1942 all gold mines were closed by a Government order which was not rescinded until July 1, 1945. Since that time several dredges have resumed operations both in the northeastern and southwestern parts of the State. Lode gold mines, closed because of the war, have not resumed owing to adverse conditions such as excessive cost of reopening deteriorated openings and the generally high cost of operation. Value of production of gold in 1945 was $161,000 which was derived mainly from dredge output during the last few months of the year. In 1946 gold production increased owing to increased dredge production. The outlook for reopening gold lode mines remains clouded. An extensive examination of gold mining properties in the Bourne district of western Baker County is being conducted by the Consolidated Mining and Smelting Company of Canada, one of the largest mining companies in the world.

Quicksilver is an important war mineral and production in Oregon, as well as other quicksilver producing states, was greatly stepped up during the early war period. Stocks increased and Government price support was removed resulting in a drastic reduction in price which caused a drop in domestic production below consumption. The price then strengthened but in 1945 a large amount of the metal was imported, mainly from Spain, and the price weakened again. In October 1946 the price was about $96 a flask, about half the high wartime price. Always hanging over the industry is the threat of Spanish imports. Production and price of Spanish mines are cartel controlled.

During the first part of the war, emphasis was placed on production as against development of ore to replace that mined out. Consequently developed reserves in quicksilver mines (as well as other metal mines) were greatly depleted, and the relatively low price for the metal offers little incentive for spending development money.

In 1944 Oregon production was 3159 flasks, valued at $373,899 from three mines. By far the largest part of this amount came from two producers, the Horse Heaven Mine in Jefferson County and the Bonanza Mine in Douglas County. The Maury Mountain Mine in Crook County produced 35 flasks from 7 tons of ore. In December 1944 a fire destroyed the surface plant at Horse Heaven and the mine has not since produced except for a few flasks obtained in cleaning up work. Total production in 1945 was 2450 flasks valued

at $337,225, nearly all from two producers respectively, the Bonanza Mine with 2350 flasks and the Maury Mountain Mine with 66 flasks, the latter from 13 tons of ore - a remarkable record as far as grade of ore is concerned.

Chromite, another important war mineral, was shipped from Curry, Grant, Jackson, and Josephine counties in 1944. By far the largest production came from the Oregon Chrome Mine in Josephine County. This property, under the management of W. S. Robertson, shipped 5890 short tons averaging 45 percent chromium oxide, according to the U.S. Bureau of Mines Minerals Yearbook. In 1945 the property shipped 2148 tons which was about 78 percent of the total shipped by Oregon producers. Shipments were made from two counties, Josephine and Curry.

The Government ceased purchasing chromite at ore purchasing depots December 31, 1945, and the market price declined. All Oregon properties shut down except the Oregon Chrome Mine which made some shipments to private industry. It closed down, however, in June 1946 because of inability to mine and sell the ore at a profit.

During 1944 and 1945 the Gray Eagle Mine in Baker County shipped a small tonnage of high-grade antimony ore to a Government ore purchasing depot, as well as several cars of gold-antimony ore to a Salt Lake City smelter.

Limestone has been produced mainly for making portland cement but a large amount is produced annually for agricultural stone, paper mill rock, and for use in the sugar mill at Nyssa. Two portland cement companies are the largest producers of limestone. They are the Oregon Portland Cement Company, with quarries at Lime in Baker County and at Dallas in Polk County, and cement plants at Lime and Oswego; and the Pacific Portland Cement Company, with limestone quarry at Marble Mountain in Josephine County and cement plant, together with shale quarry, at Gold Hill in Jackson County. Agricultural limestone has been produced by the Sullivan Lime Company with a crushing plant at Rogue River, Jackson County, and by the Oregon Lime Products Company with quarry and crushing plant at Dallas, Polk County. The Enterprise Lime Company which produces burned lime has a quarry and lime kiln near Enterprise in Wallowa County.

According to the U.S. Bureau of Mines, sand, gravel, and stone produced in 1944 was valued at $6,130,800. In 1945 value was $5,579,328 exclusive of sandstone and unclassified stone.

Coal has been produced from the Coos Bay coal field in small amounts by hand methods in recent years. In 1944 a new project was started in this field using mechanical methods of mining, and in 1944 produced 10,000 tons. In 1945 a constant production was maintained during development with total output of over 30,000 tons.

Silica sand of high quality for steel foundry use is being produced from a deposit near Eugene by Silica Products Oreg., Ltd. The washing plant was completed in January 1945. Production in 1945 was 2833 tons.

For a number of years crushed quartz and crushed granite have been produced by the Bristol Silica Company at a plant at Rogue River in Jackson County. Both quartz and granite are sold for poultry grit. Quartz is sold also to foundries for use as metallurgical silica. In 1944 output was 2500 tons of quartz and 2200 tons of granite; in 1945 output was 1800 tons of quartz and 3200 tons of granite.

Clay products, mainly as building and fire brick; diatomite from Terrebonne, Deschutes County, used largely as a filter aid; and pumice for light-weight aggregate from Deschutes and Klamath counties have been important nonmetallic products.

Oregon is an important producer of agate material in demand by lapidaries. No exact estimate of value of production may be made because of the large number of people engaged in collecting both for commercial purposes and for private collections.

In 1944 and 1945 the following materials contributed to Oregon's mineral production: antimony ore, asbestos, cement, chromite, clay, coal, copper, diatomite, semi-precious gem stones, gold, lead, limestone and lime, mercury, platinum metals, pumice, sand and gravel, silica and silica sand, silver, stone, and zinc.

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.

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, 1946:

W. H. Strayer, Baker, Chairman, appointed 1945.
S. H. Williston, Portland, appointed 1943.
Niel R. Allen, Grants Pass, appointed 1944.

Senator W. H. Strayer, chairman of the Governing Board since the Board was first organized in 1937, died on October 18, 1946. A great part of Senator Strayer's life was devoted to unselfish public service. He represented Baker County continuously in the Legislative Assembly from 1915 to the time of his death, and for the past several years he was dean of the State Senate, where he was an authority on rules and procedure. His colleagues in the Senate held him in affectionate high regard and sought his counsel and advice on all important legislation. He was largely responsible for the law setting up the Department and was devoted to its best interests, especially those aims designed to encourage prospecting and development. Senator Strayer was widely known and as widely esteemed.

Mr. E. B. MacNaughton, Portland, was appointed on October 24 to serve as a member of the Board for the unexpired term of Senator Strayer.

The regular personnel of the Department as of June 30, 1946, was as follows:

F. W. Libbey, Director
John Eliot Allen, Geologist
Wallace D. Lowry, Geologist
Ewart M. Baldwin, Geologist
Hollis M. Dole, Geologist, Grants Pass
Norman S. Wagner, Geologist, Baker
R. E. Stewart, Stratigraphic Geologist
Ralph S. Mason, Mining Engineer
Esther W. Miller, Ceramic Engineer and Spectroscopist
L. L. Hoagland, Assayer and Chemist
F. A. Steeble, Accountant
June A. Roberts, Secretary
Lillian F. Owen, Multigraph Operator
Anna J. Ritter, Stenographer, Grants Pass
Patricia J. Conro, 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

- **Director**
  - **Laboratory Division**
    - Assay and chemical laboratories (Hoagland)
    - Spectrographic laboratory (Miller)
    - Ceramics (Miller)
    - Petrographic examination (Allen, Baldwin, Lowry)
  - **Mines Division**
    - Info. & corres. on mines (Libbey, Allen, Mason, Wagner, Dole)
    - Metallurgy and economics (Libbey, Mason)
    - Mine examinations
      - Portland (Libbey, Allen, Lowry, Baldwin)
      - Baker (Wagner)
      - Grants Pass (Dole)
    - "The Ore.-Bin" (Libbey)
    - Annual production data (Libbey, Mason)
    - Editorial and publication (Libbey, Allen, Lowry, Mason, Baldwin, Owen)
    - Industrial surveys (Libbey, Mason)
  - **Geologic Division**
    - Info. & corres. on geology, etc. (Allen, Baldwin, Lowry, Wagner, Dole, Stewart)
    - Geological surveys (Allen, Lowry, Baldwin, Wagner, Dole)
    - Petrology (Lowry)
    - Stratigraphy (Stewart, Allen, Baldwin, Lowry)
    - Paleontology (Stewart, Baldwin)
    - Map making and drafting (Allen, Lowry, Mason, Baldwin, Wagner, Dole)
    - Editorial & publication (Libbey, Allen, Baldwin, Lowry, Owen)
  - **Reference Division**
    - Library and catalog (Owen)
    - Collection of rocks, minerals, and ores with index (Lowry)
    - Map collection and index (Lowry)
    - Mine reports and card files (Lowry, Mason)
    - Thin section file (Lowry)
    - Photograph file (Roberts)
  - **Government Cooperation**
    - Negotiations and cooperation with USGS, USBM, etc. (Libbey)
  - **Clerical Division**
    - Secretarial (Roberts)
    - Bookkeeping (Steeble)
    - Purchasing (Steeble)
    - Property (Steeble)

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.

Early in the first half of the period covered by this report, the Board decided that less emphasis should be placed on wartime activities because of the decreased need for domestic war mineral production. With the ending of the war, the Department resumed all peacetime activities. Among these activities it was decided by the Board that as much attention as possible should be given to studies of nonmetallic minerals which are becoming of increasing importance in the mineral industry everywhere. In addition, the Board authorized resumption of the State geological survey, and mapping was begun in Jackson and Polk counties in 1946.

Department assay laboratories formerly at Baker and Grants Pass were closed during the war emergency because of manpower shortage, and all assaying and analytical work was done at a central laboratory at the Portland office. Early in 1946 the Board decided that the field laboratories should be re-established as soon as funds could be made available.

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 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. 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.

The Board recognizes that there is an increasing need for industrial mineral studies, but 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 concerning 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 that war period when strategic mineral supplies were critical and all possible domestic sources of supply were being sought, the Department received and replied to a great number of inquiries, took part in many conferences, and supplied various memorandum reports, all concerned with the State's mineral resources.

Since the matter of domestic war mineral supply ceased to be critical, inquiries have to a large extent been more concerned with minerals which would have a peacetime market. Great interest is evidenced in construction materials, gold mining in general, and opportunities and localities available for placer mining in particular.

Several geologists of the large oil companies have conferred with members of the Department staff on Oregon geology, and some of them have gone over all maps and reports bearing on geology of the State available at the Department's office.

APPROPRIATIONS

The Department's administrative and field activities are carried out with money appropriated by the Legislature out of the State's general fund. Appropriations received by the Department are divided among the following classifications which are self-explanatory: 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 the receipt of 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 are then drawn on this account to cover payment of expenses incurred by the Department, but the fund is used primarily to augment amounts allotted for printing since the fund comes mainly from sale of publications.

The following headings give appropriations made by the last two Legislatures as well as funds requested for the biennium 1947-1949.

Department of Geology & Mineral Industries	1943-1945 July 1 - June 30	1945-1947 July 1 - June 30	Requested 1947-1949 July 1 - June 30
Salaries and wages	$ 89,860.00	$ 94,920.00	$ 110,984.00
Gen., Oper. & Maint.	30,285.00	29,900.00	38,755.00
Capital outlays	4,725.00	5,000.00	4,600.00
Special requests	9,500.00	11,000.00	12,000.00
Totals	$134,370.00	$140,820.00	$ 166,339.00

The increase in appropriations requested for the 1947-1949 biennium is mainly in the salaries and wages account because of the need for increasing salaries to meet increased living costs. The salary rate requested for technical employees is below that in effect for equivalent jobs of the U.S. Civil Service. Rent for quarters in the Woodlark Building, Portland, has been increased nearly 30 percent.

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 and ceramic furnace, a petrographic laboratory, crushing and grinding 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 are given below:

Number of visitors at the Portland office	2,943
Pieces of mail received at Portland office	16,337
Pieces of mail sent out of Portland office (not including new publications)	15,274
Number of qualitative determinations made	435
Number of quantitative determinations made	4,740
Petrographic examinations (excluding thin sections)	336
Thin sections analyzed	80

Similar data for field offices at Baker and Grants Pass are given below.

FIELD OFFICES

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

As stated under "Policies," the assay laboratories of the field offices at Baker and Grants Pass were closed in 1943 for the duration of the war, and since that time samples submitted at these offices have been sent to the Portland laboratory for analyses.

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.

During the early war period the field geologists were continually called upon by private and Government engineers for information on location and economics of strategic mineral deposits in their territories.

Pertinent statistics concerning the work of these field offices are as follows:

Number of qualitative determinations made	239
Number of business callers	3,659
Number of business letters written	1,282

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 war period the spectrograph was used for making analyses of metals and alloys for control work in some of the war plants. Also in 1945 a project involving the determination of rare alkalies in feldspars was finished. This project was sponsored by the Geological Society of America. Since the war ended, the laboratory has been occupied almost entirely in routine spectrographic analyses. Miss Miller, spectroscopist, has carried on clay-testing work in addition to the spectrographic work. Consequently, there has not been opportunity to engage in research for which the spectrograph is especially adaptable. It is planned to take up such research projects just as soon as possible.

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:

Number of analyses made	1214
Receipts from custom analyses	$577.40

CERAMICS

In 1943 and 1944 equipment for the testing of Oregon clays was installed. This equipment included a test kiln, potentiometer and thermocouple, pyrometric cones, molds for making specimens, glassware, and mixing bowls. Oregon clays were tested for use in brick, whiteware, refractory, and stoneware industries. Dry, wet, and fired properties such as shrinkage in drying and firing, water of plasticity, absorption, defects, visible properties, and mineral type were determined. A collection of specimens of fired clays was begun and may be seen at 702 Woodlark Building.

Some clays possess properties which eliminate them for ceramic purposes when used alone, but when these clays are blended with other clays and raw materials, properties can be developed which readily adapt the mixture to ceramic use. Consequently a project for the development of low-fired, light-colored ceramic bodies was carried on and several good compositions were developed.

In this project the following clays have been studied: kaolin washed from the silica sand deposit of Silica Products Oreg., Ltd., at Eugene, Lane County; white-burning clay from the Willamina Clay Products Company, Willamina, Yamhill County; kaolin-type clay from the Franzen farm, Mayger, Columbia County; bentonite from the Hamish deposit, eastern Jackson County; white volcanic ash from a deposit north of St. Helens, Columbia County; and diatomite from Harper, Malheur County. Results of this study, to be published, should be of benefit to Oregon art potteries and ceramic industries interested in producing light-colored wares.

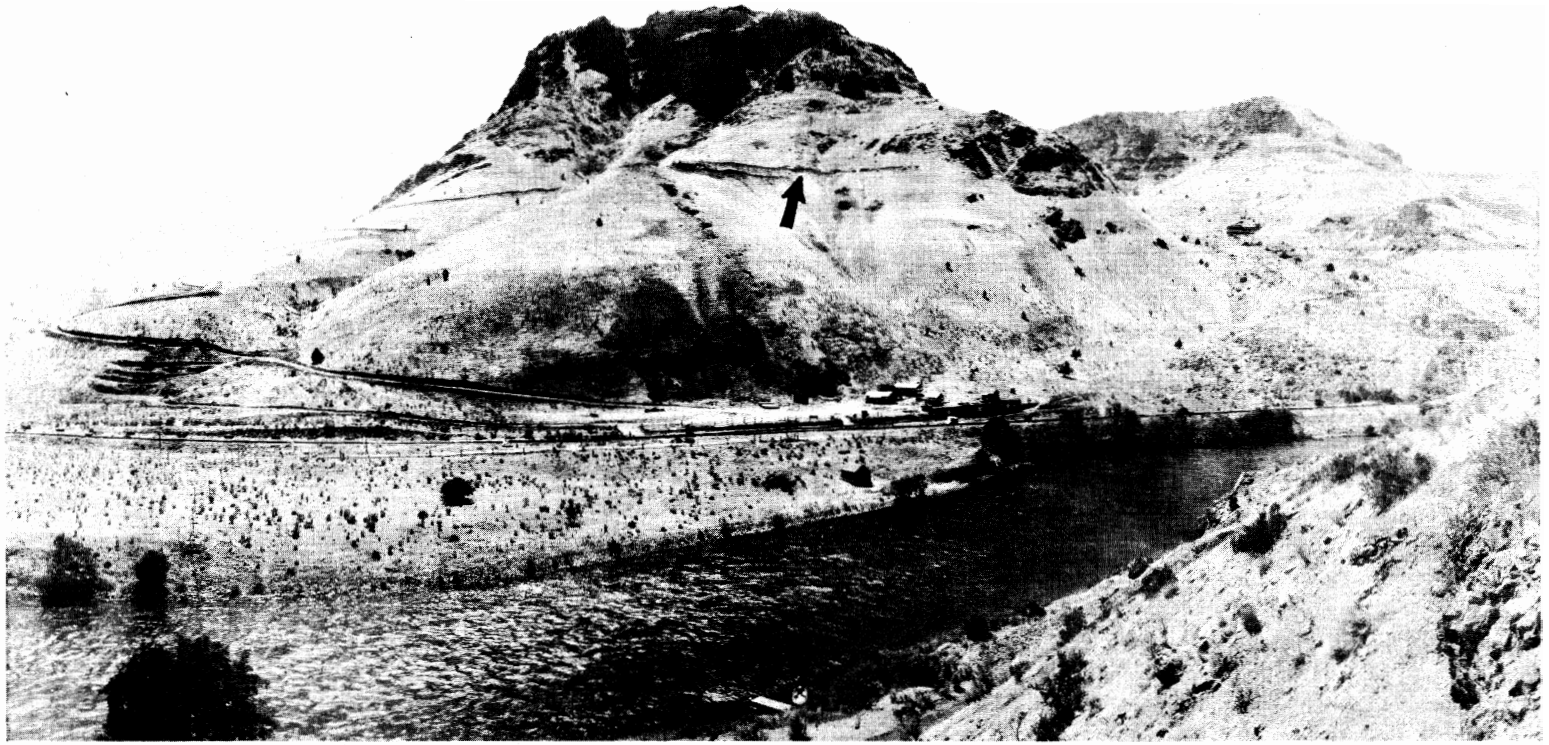
MINERAL DEPOSIT INSPECTIONS

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. In other instances an inspection is necessary in order to obtain reliable technical information and to advise the owners concerning the need for and kind of work required for preliminary exploration.

Some requests for inspection of property are received with which the Department is unable to comply. These are instances in which prospecting over a considerable area is required in order to determine commercial mineral possibilities. Limited time and personnel do not permit such projects 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 keep Departmental records up-to-date and to provide information for the Mines Catalog. In all regional geologic mapping, examination of any mine openings and development work is necessary in order to obtain evidence on rock formations and structure.

It is felt that one of the most important duties of the Department is to keep in as close touch as possible 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.



View of Lady Frances perlite mine south of Maupin, Wasco County looking west across Deschutes River.

ACTIVE MINING OPERATIONS IN OREGON
September 1946
(not including sand and gravel companies)

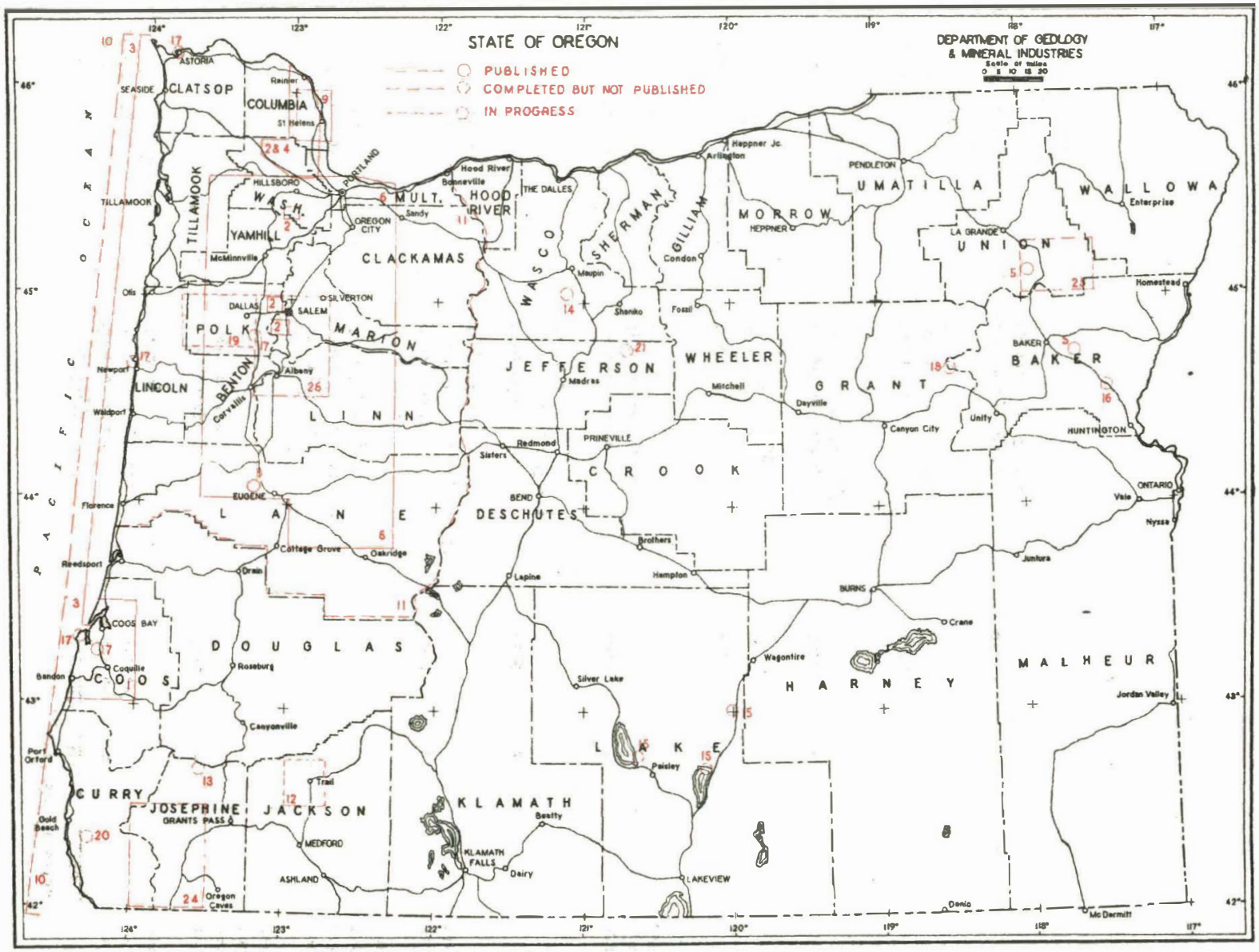
Name	Location	Product	Producing	Developing	Remarks
Argonaut Mine Argonaut Mine, Oregon, Ltd. Baker, Oregon	Baker County NW¼ sec. 19, T. 8 S., R. 37 E.	Gold		x	
Associated Dredging Company Bates, Oregon	Grant County Vincent Creek, SW¼ sec. 31, T. 10 S., R. 35 E.	Gold	x		Dragline, floating washing plant.
B-H Dredging Company Medford, Oregon	Josephine County Sucker Creek, sec. 1, T. 40 S., R. 7 W.	Gold	x		Dragline, floating washing plant.
B and M Placers T.D.Waite & Louis Gerlinger 212 N. 6th Street Grants Pass, Oregon	Josephine County Rogue River, sec. 4, T. 35 S., R. 7 W.	Gold	x		Hydraulic.
Bonanza Mine Bonanza Mines, Inc. Sutherlin, Oregon	Douglas County sec. 16, T. 25 S., R. 4 W.	Quick-silver	x		
Bristol Silica Company Rogue River, Oregon	Jackson County SE¼ sec. 30, T. 36 S., R. 3 W.	Crushed quartz & granite	x		
Buckham Placer Verne Strong Wolf Creek, Oregon	Josephine County Wolf Creek, sec. 7, T. 33 S., R. 5 W.	Gold	x		Hydraulic; active when water is available.
Bull Run Mine Vison & Hardy Unity, Oregon	Baker County near Unity, NE¼ sec. 2, T. 14 S., R. 36 E.	Gold		x	
Bunker Hill Mine (Robertson Mine) Wm. Robertson, 921 Washington Grants Pass, Oregon	Josephine County sec. 2, T. 35 S., R. 9 W.	Gold		x	
Christy Pumice Quarry H. W. Christy Chemult, Oregon	Klamath County SW¼ sec. 9, T. 27 S., R. 8 E.	Pumice	x		Shipments for concrete aggregate.
Coyote Mine (Cougar Mine) O.E.Wyre Grants Pass, Oregon	Josephine County Coyote Creek, NE¼ sec. 22, T. 33 S., R. 5 W.	Gold		x	

Name	Location	Product	Producing	Developing	Remarks
Dicalite Quarry The Dicalite Company Terrebonne, Oregon	Deschutes County near Deschutes River, sec. 16, T. 14 S., R. 12 E.	Diatomaceous earth	x		
Double H Mine G.S.Holmes, San Marina Dr. Los Angeles, California	Jackson County 2 mi. SE of town of Rogue River, NW¼ SW¼ sec. 27, T. 36 S., R. 4 W.	Gold		x	
Enterprise Lime Company Enterprise, Oregon	Wallowa County at Enterprise	Burned lime	x		Black marble quarry 7 miles from plant.
Golden Dredging Company Bates, Oregon	Grant County Middle Fork John Day River sec. 7, T. 11 S., R. 34 E.	Gold	x		Near Caribou Creek.
Graham Dredge Graham Bros. & Ashcraft Grants Pass, Oregon	Josephine County Rogue River, sec. 1, T. 34 S., R. 8 W.	Gold	x		Suction dredge in river near Grave Creek.
Gray Eagle Mine A. Brandenthaler Baker, Oregon	Baker County Virtue Flat, NW¼ sec. 7, T. 9 S., R. 41 E.	Antimony Gold	x		
Gray Eagle Mine B. Timaeus, 1206 East M St. Grants Pass, Oregon	Jackson County T. 34 S., R. 4 W.	Gold		x	
Helena Mine Kenneth Watkins 1153 Taylor St. Corvallis, Oregon	Lane County sec. 18, T. 23 S., R. 2 E.	Gold Silver Copper Zinc	x		Smelting ore shipped to Tacoma.
Ibex Mine Ibex Gold Mining Company Baker, Oregon	Baker County Head of McCully Creek sec. 10, T. 9 S., R. 36 E.	Gold		x	
Ida Mine Braeco Mines, lessee East G. Street Grants Pass, Oregon	Josephine County on Louse Creek, secs. 25 & 26, T. 35 S., R. 5 W.	Gold		x	
Johnson Placer Johnson Bros. & Christine Grants Pass, Oregon	Jackson County Pleasant Creek, sec. 22, T. 34 S., R. 4 W.	Gold	x		
Jones Limestone Quarry F.I.Bristol, Mgr. Grants Pass, Oregon	Josephine County sec. 31, T. 38 S., R. 5 W.	Agric. limestone	x		Stone hauled to crushing plant at Rogue River.

Name	Location	Product	Producing	Developing	Remarks
Lady Frances Mine Dant & Russell, Inc. Portland, Oregon	Wasco County on Deschutes River NE¼ sec. 24, T. 6 S., R. 13 E.	Perlite		x	Pilot furnace plant at St. Helens, Oregon.
Lime Products Company T. T. Leonard, Dallas, Oregon	Polk County sec. 11, T. 8 S., R. 6 W.	Lime-stone	x		Produces agricultural limestone.
Loye Corporation Quarry Loye Corporation 237 N.E.Broadway Portland, Oregon	Baker County Pleasant Valley sec. 24, T. 10 S., R. 41 E.	Building-stone blocks		x	Light-weight, gray tuff in sawed blocks.
Maury Mountain Mine Eickemeyer Bros. Post, Oregon	Crook County Maury Mountains secs. 10 & 15, T. 17 S., R. 19 E.	Quick-silver	x		
McGee Group Chadwell Bros. Baker, Oregon	Baker County sec. 20, T. 9 S., R. 42 E.	Gold	x		East Eagle Creek.
McTimmons Prospect Mr. McTimmons Rogue River, Oregon	Jackson County sec. 19, T. 33 S., R. 4 W.	Gold	x		Worked in summer months only.
Monroe Dredge Monroe Bros. Galice, Oregon	Josephine County sec. 1, T. 34 S., R. 8 W.	Gold	x		Suction dredge in Rogue River south of Grave Creek.
Mother Lode Mine (Red Cloud) J.R.Davies, lessee Box 653 Medford, Oregon	Jackson County sec. 21, T. 32 S., R. 2 W.	Quick-silver		x	
Mountain View Mine Braeco Mines East G. St. Grants Pass, Oregon	Jackson County sec. 17, T. 34 S., R. 4 W.	Gold Copper		x	
Northwestern Granite Company Haines, Oregon	Baker County sec. 27, T. 7 S., R. 39 E.	Monu-mental stone	x		Quarries, saws, and polishes monuments.
Overland Mine Rudberg, Chard & Anderson Rt. 1, Coos Bay, Oregon	Coos County NE¼ sec. 9, T. 27 S., R. 13 W.	Coal	x		

Name	Location	Product	Producing	Developing	Remarks
Old China Hill Mine Forest More Wolf Creek, Oregon	Josephine County sec. 27, T. 40 S., R. 8 W.	Gold placer		x	
Oregon Portland Cement Co. (Quarries) Portland, Oregon	Baker and Polk Counties secs. 26, 27, 34 & 35, T. 13 S., R. 44 E. and sec. 12, T. 8 S., R. 6 W.	Cement and lime-stone	x		Kilns at Lime and Oswego.
Pacific Portland Cement Co. Quarry Portland, Oregon, and Gold Hill, Oregon	Josephine County sec. 30, T. 37 S., R. 6 W.	Cement and lime-stone	x		Kiln and shale quarry at Gold Hill.
Paradise Mine Tom Billings, lessee Marial, Oregon	Curry County sec. 27, T. 32 S., R. 10 W.	Gold		x	
Pine Creek Placers Pine Creek Placer Company Hereford, Oregon	Baker County secs. 2, 3, and 10, T. 12 S., R. 39 E.	Gold	x		
Placeritas Mining Company Huntington, Oregon	Malheur & Baker Counties secs. 16, 20, and 21, T. 13 S., R. 42 E.	Gold		x	In Mormon Basin drag-line dredge.
Porter Bros. Dredging Company Granite, Oregon	Grant County T. 6 S., R. 35 E., T. 9 S., R. 35 E.	Gold	x		On Granite, Clear, Olive, and Crane Creeks.
Pyx Mine Jess Edwards, lessee Baker, Oregon	Grant County sec. 2, T. 10 S., R. 35 E.	Gold		x	Greenhorn District.
Rainbow Mine C. H. Kapschull Deerfield, Illinois	Baker County sec. 22, T. 13 S., R. 42 E.	Gold		x	Mormon Basin in Baker and Malheur Counties.
Randall Mine Wilbur Reed Macomb, Illinois	Malheur County sec. 17, T. 13 S., R. 42 E.	Gold		x	Mormon Basin.
Robert E. Mine W. D. Bowser 803 East D Street Grants Pass, Oregon	Curry County sec. 23, T. 38 S., R. 10 W.	Gold	x		Small high-grading operation.

Name	Location	Product	Producing	Developing	Remarks
Roxanna Group Holtzclaw Bros. Central Point, Oregon	Jackson County sec. 5, T. 34 S., R. 2 W.	Quicksilver	x		Small high-grading operation
Silica Products, Oreg.,Ltd. 808 Couch Bldg. Portland, Oregon	Lane County near Eugene	Silica sand	x		Produces steel-foundry sand
Solar Development Company Consolidated Mining & Smelting Company (lessee) Trail, B.C.	Baker County secs. 26, 32, and 33, T. 8 S., R. 37 E.	Gold		x	North Pole-Columbia lode- under investigation.
Southport Mine Coast Fuel Corporation Coos Bay, Oregon	Coos County secs. 14, 15, 22, and 23, T. 26 S., R. 13 W.	Coal	x		Mechanized mine.
South Slough Mine Leonard Gibbs Bandon, Oregon	Coos County S½ sec. 2, T. 27 S., R. 14 W.	Coal	x		
Sterling Placers Paul Pearce Jacksonville, Oregon	Jackson County Tps. 38 and 39 S., R. 2 W.	Gold	x		Hydraulic operation worked for many years.
Sumpter Valley Dredging Co. Sumpter, Oregon	Baker County secs. 11 and 12, T. 10 S., R. 37 E.	Gold	x		
Tip Top Mine M.B.Pearson, lessee Cave Junction, Oregon	Josephine County sec. 12, T. 40 S., R. 7 W.	Gold	x		
Wards Placers Newall E. Ward Unity, Oregon	Baker County NE¼ sec. 1, T. 14 S., R. 36 E.	Gold		x	
Wilhoit Coal Mine T.G.Mandrones 2747 N.E.18th Avenue Portland, Oregon	Clackamas County W½ sec. 15, T. 6 S., R. 2 E.	Coal		x	



INDEX MAP SHOWING AREAL DISTRIBUTION OF FIELD STUDIES

DESCRIBED IN FIFTH BIENNIAL REPORT

LIST OF STUDIES MADE

Index Map. No.	Series No.	
		(A) Studies published during the period July 1, 1944, to June 30, 1946:
		Bulletins -
1	27	Geology and coal resources of the Coos Bay quadrangle.
---	28	Fourth biennial report of the Department 1943-1944.
2	29	Ferruginous bauxite deposits in northwestern Oregon.
3	30	Mineralogical and physical composition of the sands of the Oregon coast.
		G.M.I. Short Papers -
4	12	Preliminary report on high-alumina iron ores in Washington County.
---	13	Antimony in Oregon.
5	14	Notes on building-block materials in Eastern Oregon.
6	15	Reconnaissance geology of limestone deposits in the Willamette Valley.
		Miscellaneous Papers -
7	8	Progress report on coal mining activities.
8	9	Eugene sand casting results.
---	---	THE ORE.-BIN, monthly publication, Vols. VI-VIII.
		Geologic Map Series -
1	8	Geologic map of the Coos Bay quadrangle (Bulletin No. 27).
9	9	Geologic map of the St. Helens quadrangle.
		(B) Studies completed but not published during the period July 1, 1944, to June 30, 1946.
		Bulletins -
9	31	Geology of the St. Helens quadrangle.
---	---	Bibliography of the geology and mineral resources of Oregon.
10	---	The Oregon coast.
11	14-D	Oregon metal mines handbook for northwestern Oregon.
13	---	Mines and prospects of the Mount Reuben area, Josephine County.

Index Map No.	Series No.	
		G.M.I. Short Papers
14	16	Perlite deposits near the Deschutes River, Wasco County.
15	17	Saline deposits of Lake County.
---	---	Blending tests on Oregon clays.
		Miscellaneous Papers
---	---	Map of Oregon showing principal mineral deposits.
16	---	Geology of a travertine deposit in Baker County.

(C) Studies in progress

Bulletins

17	---	Foraminifera from the Tertiary of Oregon
		a. Astoria Miocene foraminifera from Tenth and Harrison Streets, Astoria, Clatsop County.
		b. Astoria Miocene foraminifera from Agate Beach, Lincoln County.
		c. Eocene foraminifera from Helmick Hill, Polk County.
		d. Lower Coaledo (Upper Eocene) foraminifera from Sunset Bay, Coos County.
12	---	Geology of the Trail quadrangle, Jackson County.
18	---	Geology of the Vinegar Hill area, Grant County.
19	---	Geology of the Dallas and Valsetz quadrangles.
---	---	An elementary textbook of Oregon geology.
		G.M.I. Short Papers
20	---	Preliminary investigation of laterite in Red Flats area, Curry County.
21	---	Geology of the Oregon King mine area, Jefferson County.
		Geologic Map Series
12	---	Geologic map of the Trail quadrangle.
19	---	Geologic map of the Dallas quadrangle.
19	---	Geologic map of the Valsetz quadrangle.
24	---	*Geologic map of the Kerby quadrangle.
25	---	Geologic map of the south half of the Telocaset quadrangle.
26	---	Geologic maps of the Albany, Lebanon, Salem, and Stayton quadrangles.
---	---	State geologic map.

*Field mapping by the U.S. Geological Survey; to be published by the Department.

PUBLICATIONS

A complete list of Departmental publications is given on the final page of this report. Descriptions of publications issued prior to July 1, 1944, are contained in preceding biennial reports. Following are descriptions of publications issued during the period from July 1, 1944, to June 30, 1946.

(A)

Bulletin 27

Title: Geology and Coal Resources of the Coos Bay Quadrangle, Oregon, by John Eliot Allen and Ewart M. Baldwin. (153 pp., geologic quadrangle map, 31 plates, 1944)

Purpose and Scope: This study was planned to provide information which would help to rejuvenate this coal field. The work was authorized by the 1943 Legislature and paid for jointly by the State and Coos County. Geologic and topographic mapping, together with shallow drilling and sampling, were done. In addition to field work by the Department, M. D. Curran of M. D. Curran & Company, engineers of New York and St. Louis, was engaged to study the economics of Coos Bay coal production with especial attention to by-products.

Cost: $2450.80 for 2000 copies (printed by State Printing Department). Price $1.00.

Bulletin 28

Title: Fourth Biennial Report, State Department of Geology and Mineral Industries, July 1, 1942, to July 1, 1944. (29 pp., 3 figs., 1944)

Purpose and Scope: This bulletin was prepared according to the law creating the Department and Section 92-802, O.C.L.A. which changed the period of biennial reports from calendar to fiscal years.

Cost: $163.63 for 600 copies. No charge.

Bulletin 29

Title: Ferruginous Bauxite Deposits in Northwestern Oregon, by F. W. Libbey, W. D. Lowry, and R. S. Mason. (97 pp., 20 illustrations, including maps, November 1945)

Purpose and Scope: These important deposits may be the basis of a new industry for Oregon, and the bulletin presents all the information on the occurrences assembled by the Department primarily for the benefit of potential producers of alumina and possibly pig iron. The work described includes reconnaissance geological surveys, together with some auger-hole drilling, sampling, and topographic mapping in parts of Washington, Columbia, Multnomah, Yamhill, Polk, and Marion counties.

Cost: $714.99 for 858 copies. Price $1.00.

Bulletin 30

Title: Mineralogical and Physical Composition of the Sands of the Oregon Coast from Coos Bay to the Mouth of the Columbia River, by W. H. Twenhofel. (64 pp., 13 tables, 13 illustrations, 1945)

Purpose and Scope: This bulletin is a companion study of Bulletin 24, "Origin of the Black Sands of the Coast of Southwest Oregon." Both were written by Dr. W. H. Twenhofel of the University of Wisconsin, an authority on sedimentation. The main purpose of the study which Bulletin 30 describes was to investigate economic possibilities of heavy sand concentrations on present beaches, and also to give results of investigations of sand characteristics of the various beaches. The survey was made in the summer of 1943.

Cost: $436.25 for 615 copies. Price 35 cents.

G.M.I. Short Paper 12

Title: Preliminary report on high-alumina iron ores in Washington County, by F. W. Libbey, W. D. Lowry, and R. S. Mason. (23 pp., 8 illustrations, 1944)

Purpose and Scope: The report gave first results of the investigation on these potential aluminum ores. The Department felt that because of quality, quantity, and location, the deposits warranted some exploration to encourage production. Therefore auger-hole drilling on several deposits was done, with the most work done on one deposit on Dixie Mountain. Discovery of increasing amounts of bauxitic material led to naming the material ferruginous bauxite instead of high-alumina iron ore. Publication of this report caused Alcoa Mining Company to start exploration. Subsequent field work by the Department enlarged the area containing the deposits and resulted in Bulletin No. 29 which includes all pertinent information first published in this Short Paper.

Cost: $112.10 for 750 copies. Price 15 cents.

G.M.I. Short Paper 13

Title: Antimony in Oregon, by Norman S. Wagner. (20 pp., 4 illustrations, 1 table, 1944)

Purpose and Scope: The study was started when antimony, an important war mineral, was in short supply, and it was desired to promote domestic production in every way possible. The important deposits were visited and their characteristics described.

Cost: $118.19 for 760 copies. Price 15 cents.

G.M.I. Short Paper 14

Title: Notes on building-block materials in Eastern Oregon, by Norman S. Wagner. (6 pp., 1946)

Purpose and Scope: The enormous demand for building materials and the lack of lumber in the postwar period has caused people to turn to building blocks as a substitute for lumber. Several small building-block plants have started up, and there has been a search for knowledge on the use of light-weight aggregate for these blocks. In order to provide some information on aggregates available in Baker County, the Department made up some blocks in a regulation block machine, using different aggregates and, after curing, had them tested for strength. The report gives results of the tests.

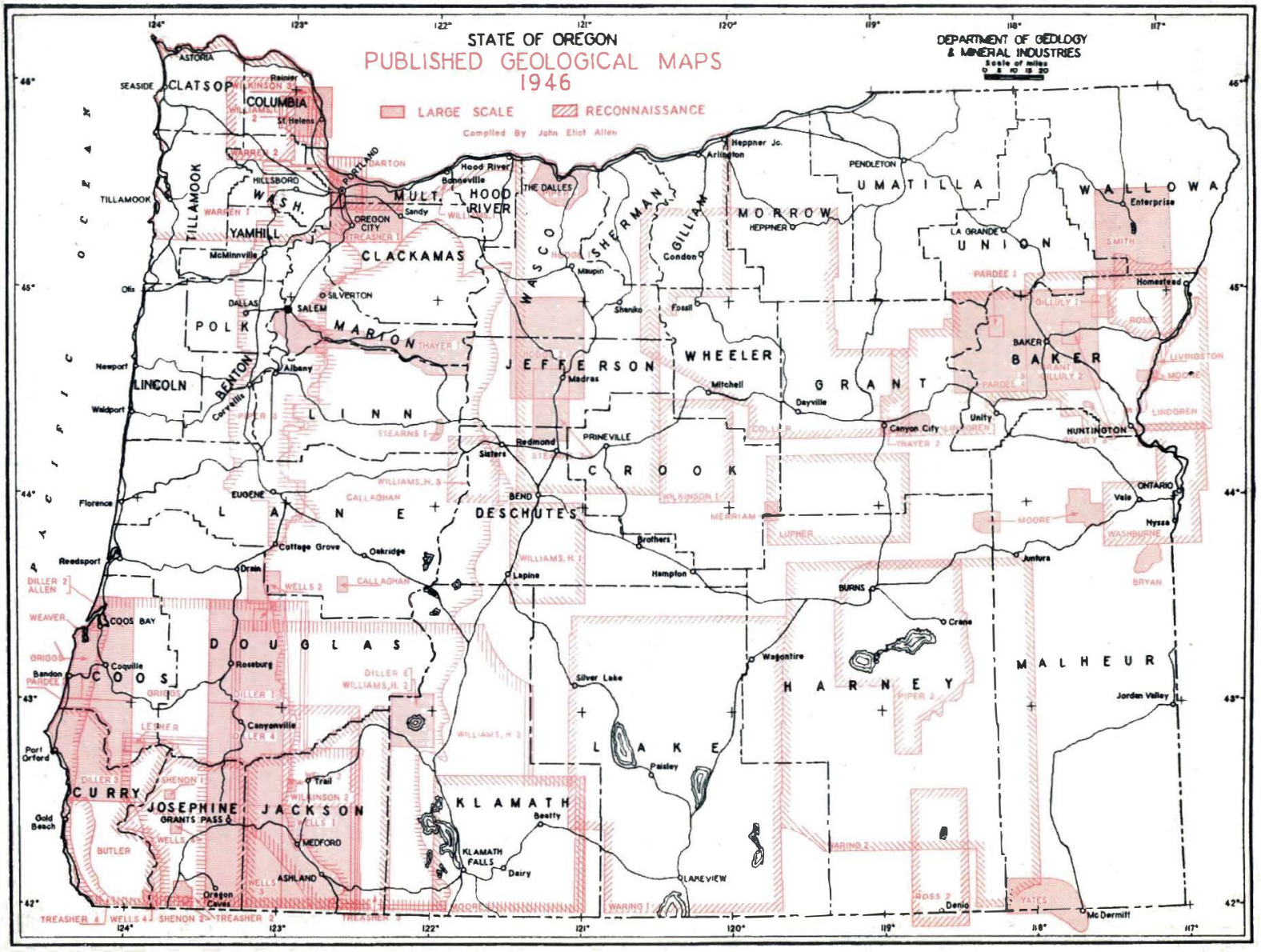
Cost: $34.70 for 640 copies. Price 10 cents.

G.M.I. Short Paper 15

Title: Reconnaissance geology of limestone deposits in the Willamette Valley, Oregon, by John Eliot Allen. (15 pp., 3 illustrations, 1946)

Purpose and Scope: The great farming area of the Willamette Valley needs large amounts of limestone to neutralize acidity and maintain calcium content of crops. Most of the limestone used has been brought in from northeastern and southwestern parts of the State because of high quality in comparison with that of Willamette Valley deposits. The cost to the farmer has been high because of railroad freight. In the hope that higher grade stone might be found in the Willamette Valley than that then known, the Department investigated all reported occurrences. No higher grade deposits were found.

Cost: $92.53 for 742 copies. Price 15 cents.


STATE OF OREGON
PUBLISHED GEOLOGICAL MAPS
1946
LARGE SCALE
RECONNAISSANCE
Compiled By John Eliot Allen
DEPARTMENT OF GEOLOGY
& MINERAL INDUSTRIES
Scale of miles
0 5 10 15 20
PACIFIC OCEAN
CLATSOP
COLUMBIA
TILLAMOOK
WASH.
MULT.
HOOD RIVER
WASCO
SHERMAN
GILLIAM
MORROW
UMATILLA
WALLOWA
UNION
YAMHILL
CLACKAMAS
POLK
MARION
JEFFERSON
WHEELER
GRANT
BAKER
LINCOLN
BENTON
LINN
CROOK
LANE
DESCHUTES
DOUGLAS
COOS
CURRY
JOSEPHINE
JACKSON
KLAMATH
LAKE
HARNEY
MALHEUR
ASTORIA
SEASIDE
Rainier
St. Helens
PORTLAND
HILLSBORO
Hood River
Bonneville
THE DALLES
Arlington
Heppner Jc.
PENDLETON
Enterprise
LA GRANDE
Homestead
TILLAMOOK
McMinnville
Sandy
OREGON CITY
Maupin
Condon
HEPPNER
Shaniko
Fossil
Oils
DALLAS
SILVERTON
SALEM
Newport
Albany
Corvallis
Madras
Mitchell
Dayville
BAKER
Waldport
Sisters
Redmond
PRINEVILLE
Canyon City
Unity
HUNTINGTON
Florence
EUGENE
BEND
ONTARIO
Vale
Nyssa
Cottage Grove
Oakridge
Brothers
Hampton
Lapine
Reedsport
Drain
Juntura
BURNS
Crane
COOS BAY
Coquille
Roseburg
Bandon
Wagontire
Silver Lake
Jordan Valley
Canyonville
Port Orford
Trail
Paisley
Gold Beach
GRANTS PASS
MEDFORD
Beatty
KLAMATH FALLS
Dairy
ASHLAND
LAKEVIEW
Oregon Caves
Denio
McDermitt
124°
123°
122°
121°
120°
119°
118°
117°
46°
45°
44°
43°
42°

PUBLISHED GEOLOGIC MAPS IN OREGON

1946

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Miscellaneous Paper 8

Title: Progress report on coal mining activities, by R. S. Mason. (5 pp., 2 maps, 1944)

Purpose and Scope: This brief study was made in order to bring up-to-date Department records on coal mining activities in the Coos Bay coal field. The principal part of the report is a description of the activities of the Southport mine, by far the largest operation in the district.

Cost: $20.56 for 339 copies. No charge.

Miscellaneous Paper 9

Title: Eugene sand casting results, by Wallace D. Lowry. (6 pp., 3 illustrations, 1945)

Purpose and Scope: This brief report was issued to show the very favorable results obtained in a Portland steel foundry by the use of Eugene silica sand in moulds. The Department wished to publicize the fact that Eugene sand is equivalent or superior to Illinois sand for steel foundry use, and that early tests by the Department have been verified in continuous use.

Cost: $26.40 for 264 copies. No charge.

The Ore.-Bin

This small monthly periodical is prepared and multigraphed in the office of the Department. Monthly circulation is 601 copies, 407 of which are sent free to Legislators, State libraries, educational institutions, and a restricted exchange list. A yearly subscription charge of 25 cents is made to cover cost of assembling and mailing.

The Ore.-Bin is designed to provide information on the mineral industry of interest to the layman as well as to persons directly connected with the industry. The circulation is not a true measure of its widespread effect, as it is frequently quoted in mining magazines and in the press.

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.

Geologic Map Series

Geologic Map of the Coos Bay Quadrangle

This 15-minute quadrangle map was prepared in connection with the State-Coos County coal survey described in Bulletin No. 27. It is issued with the bulletin, and is included in the cost of the bulletin.

Geologic Map of the St. Helens Quadrangle

Field work was started on this project in 1941 as a part of the State geological survey. Work was interrupted by the war. Mapping was resumed in 1945 when major oil companies started intensive studies of northwestern Oregon, and this quadrangle became a key area. The map was issued in November 1945, as soon as it could be prepared. The bulletin describing the geology will be issued in 1946.

Cost: Lithographing 1500 maps $322.04. Price 30 cents.

(B) Studies completed but not published during the period July 1, 1944, to June 30, 1946.

Bulletin 31

Title: Geology of the St. Helens quadrangle.

Purpose and Scope: This bulletin has been prepared in connection with the geologic mapping and study of the quadrangle and will be issued in 1946. This is a key area for the study of Tertiary formations in northwestern Oregon and some new concepts of the stratigraphic relationships of these formations are outlined.

Bulletin

Title: Bibliography of the geology and mineral resources of Oregon.

Purpose and Scope: This compilation is a supplement, with some expansion in organization, of the "Bibliography of Oregon Geology and Mineral Resources" prepared in 1936 by R. C. Treasher and E. T. Hodge under the sponsorship of the State Planning Commission. Over 1000 titles of publications issued in the past ten years are listed and cross-indexed.

Bulletin

Title: The Oregon coast.

Purpose and Scope: A bulletin on the Oregon coast has been prepared by Dr. Warren D. Smith, head of the Department of Geology and Geography at the University of Oregon. It is a handbook of geology and geography of the coastal region, written especially for the layman. Because of the need for such a book in supplying information to tourists and students, the Department is sponsoring publication. It may be published in conjunction with another public agency.

Bulletin 14-D

Title: Oregon metal mines handbook for Northwestern Oregon.

Purpose and Scope: Like other volumes of the mines handbook series this is a compilation of reports on mining properties and mineral deposits of record. The area covered is that north of Douglas County and west of the crest of the Cascades to the coast. The 13 counties included are Benton, Clackamas, Clatsop, Columbia, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill. Preparation of the bulletin has been completed except for final editing.

Bulletin

Title: Mines and prospects of the Mount Reuben area, Josephine County.

Purpose and Scope: In the summer of 1945 Mr. Elton Youngberg, then field engineer for the Department at Grants Pass, made a study of the economic geology of the area extending from Mount Reuben to the Rogue River in the extreme northern part of Josephine County. This area contains several old properties that have not produced for many years. It also contains the Benton mine which just prior to the last war was the largest lode gold producer in Oregon. The field study was made to get information on ore genesis of the various deposits and to study structural control.

In publishing this survey it is hoped that encouragement may be given for further investigations of some of the old properties by private groups. The bulletin contains underground maps of many of the old properties, and all available information concerning the properties has been assembled.

G.M.I. Short Paper 16

Title: Perlite deposits near the Deschutes River, Wasco County.

Purpose and Scope: Perlite is a relatively new industrial mineral. It has the valuable property of expanding many times in volume when heated under certain conditions, forming a very light weight material much in demand for its insulating qualities. As a part of its postwar program the Department started to investigate perlite deposits and has been able to assist investigators who wish to find favorable sources of perlite. One project, that of Dant & Russell, Inc., is well along toward commercial production. The deposit is located on the Deschutes River, about 10 miles south of Maupin, Wasco County. This Short Paper describes the geology of the mine and also the treatment process.

G.M.I. Short Paper 17

Title: Saline deposits of Lake County.

Purpose and Scope: An investigation of these deposits was started in 1944 and continued for a short time in 1945. Dr. Ira S. Allison, professor of geology at Oregon State College, was employed to assist in this investigation because of his extensive experience in studying the geology of this area. The report describes the methods of field testing and gives analyses of saline samples obtained at three of the deposits, located at Summer, Abert, and Alkali Lakes respectively. Most attention is given to the deposit at Alkali Lake, as that appears to be the most favorable for possible commercial production.

G.M.I. Short Paper

Title: Blending tests on Oregon clays.

Purpose and Scope: The object of these tests was to determine ceramic properties of different blends of Oregon light-colored clays and some other easily available light-colored materials. Some clays used alone are not satisfactory for ceramic wares, but may be made suitable by blending with other clays having somewhat different properties. Test pieces were made and fired, and the results are tabulated. This paper will be of practical use to anyone wishing to produce light-colored wares.

Miscellaneous Publications

Map of Oregon Showing Principal Mineral Deposits

This map has been prepared to meet a long-felt need in answering the continual inquiries concerning the location of the principal mineral deposits in the State. The base map is in black and white; the deposits are shown in red. Scale is 1:1,000,000.

Geology of a Travertine Deposit in Baker County

Travertine is a spring deposit of calcium carbonate. Because the travertine located south of Durkee, Baker County, is relatively free of impurities, the Department made a reconnaissance survey and prepared a topographic and geologic map of the deposit. This map is a part of the Short Paper describing the occurrence. The study was designed to provide preliminary information that might encourage exploration and production.

The present potential market for such material appears to be for agricultural stone in the Willamette Valley, but railroad freight cost from eastern Oregon is a great obstacle to marketing such stone.

(C) Studies in Progress

Foraminifera from the Tertiary of Oregon

(a) Astoria Miocene foraminifera from Tenth and Harrison Streets, Astoria, Clatsop County.

(b) Astoria Miocene foraminifera from Agate Beach, Lincoln County.

(c) Eocene foraminifera from Helmick Hill, Polk County.

(d) Lower Coaledo (Upper Eocene) foraminifera from Sunset Bay, Coos County.

This bulletin, containing separate chapters as listed, is part of a project to provide stratigraphic control for geologic mapping in Oregon. Very little has been published concerning classification or geologic ranges of microfossils of the Pacific Northwest, and this bulletin will be charting new fields. It is believed that results from this project will provide valuable information to operators interested in developing Oregon's economic resources. This applies not only to oil and gas development, but all geological investigations in which stratigraphic sequence is an important factor. This may apply to any geologic mapping which may be the basis for economic studies.

Geology of the Trail Quadrangle

In 1941 a preliminary geologic map of the 30-minute Butte Falls quadrangle was published by the Department as a part of the State geological survey. The work, supervised by Dr. W. D. Wilkinson, Professor of geology, Oregon State College, was planned especially to study quicksilver deposits in this area. No topographic base map was available so that geologic mapping was handicapped, and some problems were encountered which made it seem advisable to postpone publication of a bulletin on the geology until further field study could be made. Moreover work on the State geological survey was suspended because of the war. A topographic map of the 15-minute Trail quadrangle, the southwest quarter of the Butte Falls quadrangle, became available this year. Dr. Wilkinson, who received his discharge from the Army in 1945, was employed to prepare the geologic map of the Trail quadrangle and the bulletin describing the geology, both of which would be simplified because of his previous studies in the area, and because of the available topographic map. It is hoped that the bulletin and the geologic map can be published together.

Geology of the Vinegar Hill Area, Grant County, Oregon

This bulletin will describe the geology and ore deposits of an area in the Greenhorn Mountains, eastern Grant County. The principal developed deposits are in the Morning Mine. The study was made by Mr. Rhesa Allen during the summer of 1946 as a part of his doctorate thesis to be submitted to Cornell University. The Department sponsored the study and agreed to pay $125 on completion of the field work and $125 when the manuscript is submitted for publication.

Geology of the Dallas and Valsetz Quadrangles

This study is a project of the State geological survey. Mapping was started in the spring of 1946 and continued through the summer by one Department geologist. It was hoped that besides being a contribution to the geologic history of the Coast Range, this work would enlarge limestone reserves, and possibly reveal stone higher in grade than known deposits in the Willamette Valley. In this latter regard present prospects are not encouraging.

An Elementary Textbook of Oregon Geology

Some work has been done in preparation of a book on Oregon geology that would provide answers to continual requests for geological information from schools and grade school students in every part of the State.

G.M.I. Short Papers

Title: Preliminary investigation of laterite in Red Flats area, Curry County.

Purpose and Scope: The purpose of this reconnaissance was to investigate the possibility of nickel enrichment in the laterite resulting from weathering of peridotite in this area. Some auger holes were put down in test localities and careful sampling was done. Complete analytical results have not yet been obtained.

Title: Geology of the Oregon King Mine, Jefferson County.

Purpose and Scope: In this area near Ashwood, Jefferson County, interesting deposits of base metal sulphides containing silver with some gold occur. A start has been made in studying the area to explore possibilities of extension of ore bodies beyond their present known limits. Topography has been mapped and further geological studies will be made when the mine is unwatered and the lower levels of the Oregon King Mine have been made accessible.

Geologic Map Series

Trail Quadrangle

This 15-minute quadrangle was mapped by Dr. W. D. Wilkinson during the summer of 1946 as described under the bulletin on the geology of the Trail quadrangle.

Dallas and Valsetz Quadrangles

These two 15-minute quadrangles are located side by side in western Polk County with a small strip of the Valsetz quadrangle lying in Lincoln County. The two were mapped together because of similarity of areal geology in both quadrangles. The maps will be published separately.

Kerby Quadrangle

Mapping of this 30-minute quadrangle located west of the Grants Pass quadrangle was started by a U.S. Geological Survey party before the war. Work was suspended in 1942 and was resumed in the summer of 1945 and continued in 1946. When completed, the map will be issued by the Department under a cooperative arrangement similar to that under which the Grants Pass and Medford quadrangles were published.

Telocaset Quadrangle

Some mapping was done in this 30-minute quadrangle during 1945 by Mr. N. S. Wagner, Department field geologist stationed at Baker, as part of a long range project. Press of other duties prevented mapping work here in 1946. The quadrangle is located in Baker and Union Counties.

Albany, Lebanon, Salem, and Stayton Quadrangles

Mapping of these 15-minute quadrangles was done under the supervision of Dr. I. S. Allison, professor of geology at Oregon State College. Nearly all of the mapping has been completed, but some additional field work is necessary before the final drafts are prepared.

State Geologic Map

Work on the construction of a State Geologic Map has been started. Cartographic units to be used have been tentatively selected and organized. Because of the relative magnitude of the job and the need for comprehensive checking of plans, an advisory committee has been appointed to confer and advise on specific problems. The committee is composed of the following: Dr. E. L. Packard, head of the Department of Geology, Oregon State College; Mr. A. M. Piper, District Geologist, Division of Ground Water, U. S. Geological Survey; Mr. L. L. Ruff, geologist, U. S. Army Engineers, Northwest Division; Dr. W. D. Smith, head of the Department of Geology and Geography, University of Oregon; Dr. F. G. Wells, geologist, U. S. Geological Survey.

Silica sand washing plant of Silica Products, Oreg., Ltd., Eugene, Oregon, where steel foundry sand is produced.

PRESS RELEASES
Issued from July 1, 1944 to June 30, 1946

No.

65 "Governor Announces New Ore Discovery" - July 10, 1944
(ferruginous bauxite in Washington County)

66 "Soil Bulletin Issued by State Geology Department" - August 3, 1944
(Bulletin 26)

67 "Source of Alumina Described" - August 25, 1944
(G.M.I. Short Paper No. 12)

68 "Some Hope for Gold Mines" - September 25, 1944
(gold mines obtaining equipment and material under new W.P.B. policy)

69 "Geologic Report on High Alumina Clay Deposit near Molalla, Oregon" - September 25, 1944 (U.S. Geol. Survey report and map by Robert L. Nichols placed on open file)

70 "Oregon Antimony" - October 11, 1944
(G.M.I. Short Paper 13)

71 "Coos Bay Coal Production" - November 16, 1944
(progress report on activities in the Coos Bay coal field)

72 "Oregon Alumina Reserves Extensive" - April 17, 1945
(bauxite deposits in Washington and Columbia counties)

73 "Bauxite Found near Salem" - May 14, 1945

74 "Exemption of Assessment Work on Mining Claims" - June 7, 1945

75 "Coos Bay Coal Report" - June 7, 1945
(Bulletin 27)

76 "Columbia County Geology Mapped" - November 7, 1945
(St. Helens quadrangle map)

77 "Oregon Bauxite Described" - December 7, 1945
(Bulletin 29)

78 "Oregon Sources of Building Block Materials" - January 29, 1946
(G.M.I. Short Paper 14)

79 "Exemption of Annual Assessment Work Still in Effect" - May 7, 1946

80 "Beach Sand Minerals Described" - May 14, 1946 (Bulletin 30)

81 "Willamette Valley Limestone" - June 24, 1946
(G.M.I. Short Paper 15)

COOPERATIVE WORK

Formal cooperative work with the Geologic Branch of the U.S. Geological Survey, suspended during the war, was resumed in 1945. Matched funds in the amount of $3000 had been provided by the State for geologic mapping during the 1945-1947 biennium. The Department also cooperated with the Oil and Gas Division of the U.S. Geological Survey in the preparation of a geologic map of northwestern Oregon west of the Willamette River and north of latitude 45° 15', which was issued in 1945.

During the period covered by this report the Department assisted in some special projects for the U.S. Army Engineers and one investigation sponsored by the U.S. Navy.

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.

SUMMARY

The Board believes that all of the activities of the Department are of direct benefit to the State, but some of them show more tangible results than others and are listed below:

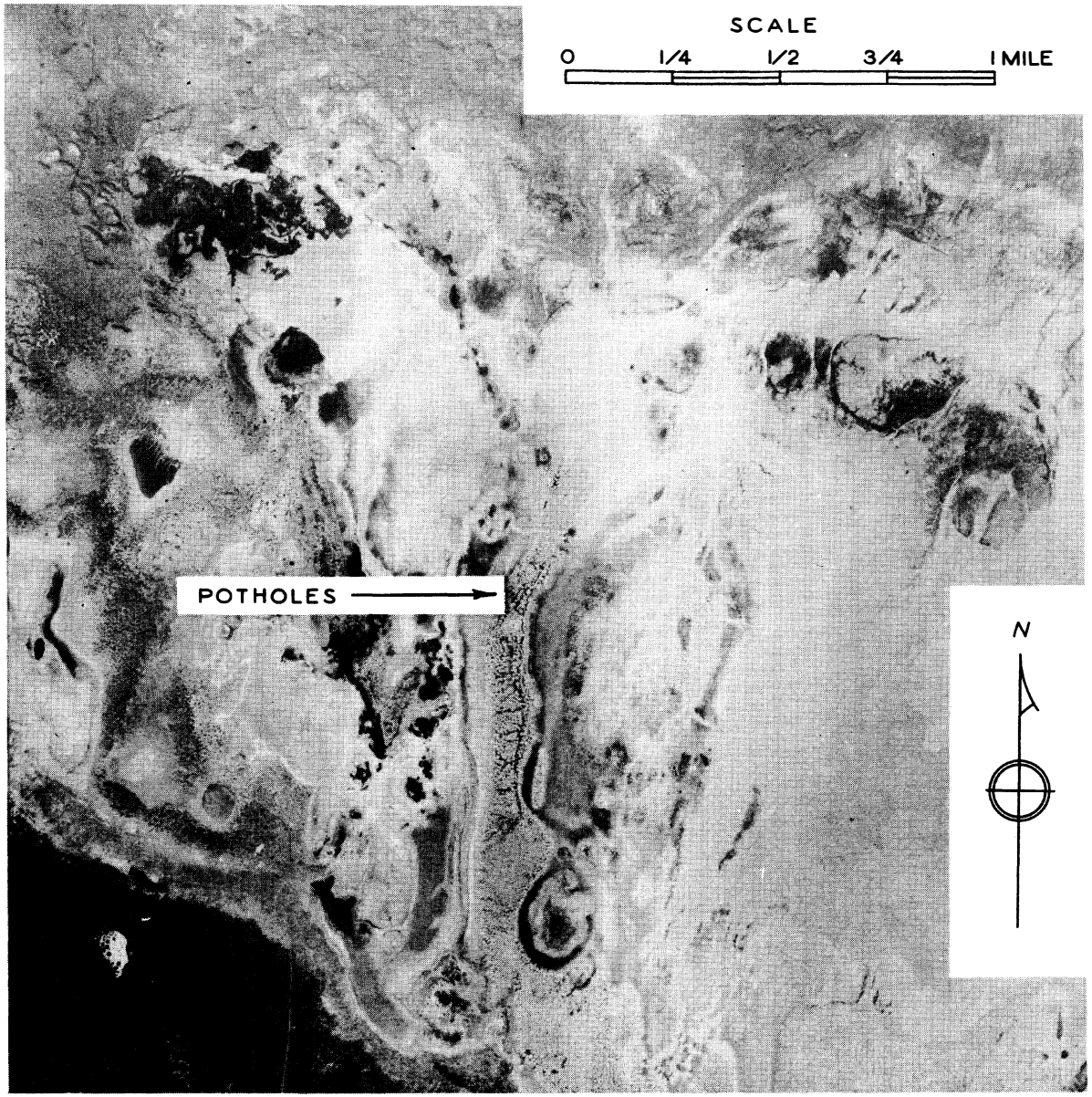
(1) As a direct result of work by the Department, large financial benefits to the State and especially to Washington and Columbia counties have already been realized from the exploration of ferruginous bauxite deposits by Alcoa Mining Company. The exploration is continuing and it seems likely that the deposits will be put into production, resulting in increased financial benefits to the State.

(2) Department field studies on silica sands near Eugene and tests on these sands made by the Department under actual foundry conditions assisted materially in establishing a silica sand washing plant at Eugene for the production of steel foundry sand. The pit run sand contains about 35 percent kaolin which will be valuable as a by-product for ceramic and refractory uses when the scale of operations is large enough to insure a steady supply.

(3) The Department gave assistance to Dant & Russell, Inc., in their search for perlite deposits which has resulted in development of a mine on the Deschutes River in Wasco County. This company has done a large amount of experimental work and is building a pilot plant which will point the way to commercial production.

Certain special projects on which work has been done during the current biennium should be continued. These studies, listed below, are needed to provide basic information to industries seeking Northwest sources of raw materials.

(1) The investigation of salines requires further work, particularly on the interesting deposit at Alkali Lake in Lake County. The largest amount of sodium carbonate is found in natural potholes on this playa, and the Department is attempting to determine the rate of redeposition in a pothole following removal of the original material.



Aerial photograph of Alkali Lake playa, Lake County, showing distribution of potholes containing soda ash.

Tests by the Department have shown that the muds of Summer, Abert, and Alkali lakes are bentonitic with a very fine particle size. Cost of transportation appears to be a major obstacle to commercial use of these clays, but because of their great extent, further study to determine their important characteristics is warranted.

Further work should be done to investigate possibilities of finding commerical deposits of salt, or sources of brine which contain an economic percentage of salt.

(2) The ceramic industry always expands as population increases and as industrialization in other lines expands. Exact knowledge of clay resources of the State is essential to rendering assistance in establishing new ceramic projects. The Department has done some work on Oregon clays both in field studies and in laboratory testing. Much more work is required to obtain comprehensive information on sources of the various types of clays and their more important characteristics. This is of course a long-range project.

(3) Some further search for high-grade bauxite should be made whenever time and personnel are available. Experience gained in geological studies previously made may now be applied to good advantage.

(4) Investigations of silica sand deposits should be continued whenever possible because of their importance in establishing glass and silicon carbide industries.

As stated in previous biennial reports, the Board recognizes the growing importance of industrial minerals and the need for more technical knowledge of Oregon's sources of supply. Insofar as feasible the Department should give greater attention to such studies. The Board wishes to emphasize again the basic need of geologic mapping in studying sources of supply of mineral raw materials, and also the need for greater emphasis on scientific research projects which have application to the mineral industry.

COOS COUNTY COAL INVESTIGATION ACCOUNT

Expenditures
May 1, 1943, to June 30, 1945

Salaries and Wages		$ 25,730.08
General, Operation, and Maintenance		7,601.96
Office supplies	$ 96.59	
Telephone and telegraph	15.72	
Postage, freight and express	37.72	
Printing	1625.45	
Rents	35.00	
Employer's contributions (S.I.A.C.)	477.58	
Private car mileage	75.52	
Fares on R.R., etc.	61.47	
Meals and lodging	1040.86	
Motor supplies	798.37	
Light and power	23.50	
Equipment rentals	1179.09	
Field supplies	234.23	
Drafting and blueprints	138.37	
Equipment repairs	73.92	
Photo supplies	15.92	
Research work	1672.65	
Capital Outlays		1,667.96
Office furniture and equipment	32.65	
Motor vehicles	1145.00	
Field equipment	461.51	
Drafting and blueprints	28.80	
TOTAL EXPENDITURES		$ 35,000.00
Joint Contribution State of Oregon and Coos County, for Coos County Coal Investigation		35,000.00
Balance		00

GEOLOGY AND MINERAL INDUSTRIES ACCOUNT
(section 7, chapter 179, Oregon Laws, 1937)
for period July 1, 1944, to June 30, 1946

Balance June 30, 1944		$ 1435.51
Receipts:		
Sale of publications	$ 1455.63	
Refunds for telephone & telegraph tolls	61.85	
Geological Society Oregon Country refund for printing materials	153.44	
Sales of blueprints and mine reports	23.69	
Supt. of Documents, Washington, D.C., refund for unavailable reports paid for	3.78	
N. S. Wagner, refund for Wrico pen	3.60	
Dant & Russell, Inc., car mileage refund for perlite investigation	17.64	
Refund express charges	.59	
Polaroid Corpn. refund for state car mileage re flight project 12 (USN Bureau of Ordnance)	32.80	
Polaroid Corpn. for preparing map re above project	96.00	
U.S. Geological Survey rent of Grants Pass office space less water rent	27.00	
		1876.02
		3311.53
Expenditures:		
Printing	1366.11	
Blueprints	8.11	
Telephone & telegraph bills	105.30	
Capital Outlays (purchase of Coos County Coal Investigation account assets)	364.91	
		1844.43
BALANCE June 30, 1946		$ 1467.10

OREGON STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Comparative Statements of Expenditures 1942-44, 1944-46, and 1945-47

		1942-1944	
	Expenditures 7/1/42-6/30/44	G&MI Expenditures 7/1/42-6/30/44	Total Expenditures 7/1/42 6/30/44
Salaries and Wages	$ 69,486.37		69,486.37
General, Operation & Maint.	22,883.69	362.07	23,245.76
Office supplies	913.96		913.96
Telephone & Telegraph	1,098.67	118.61	1,217.28
Postage, Freight & Express	1,065.17	100.00	1,165.17
Printing	2,889.27		2,889.27
Rents	7,504.25		7,504.25
Premiums	61.96		61.96
Contribution-Civil Service			
Contribution-Pub. Empl. Retire.			
Contribution-State Ind. Acc. Comm.	265.06	1.50	266.56
Assessments-Restoration etc.	98.42		98.42
Auditing	136.73		136.73
Private Car Mileage	317.24		317.24
Fares on R.R. etc.	539.02	64.74	603.76
Meals and Lodging	1,861.55	16.40	1,877.95
Motor Vehicles	2,080.31	.50	2,080.81
Heat-light-water-power	711.35	6.00	717.35
Laundry	30.00	4.69	34.69
Laboratory	1,431.18		1,431.18
Educational	190.25		190.25
Bldgs. and Fixtures	512.39	23.35	535.74
Out-of-state travel			
Reestablishing Field Laboratories			
All Other	1,176.91	26.28	1,203.19
Capital Outlays	1,928.48		1,928.48
Office Furniture & Equipt.	237.29		237.29
Laboratory & Field Equipt.	1,523.45		1,523.45
Motor Vehicles	74.16		74.16
Books	92.52		92.52
All Other	1.06		1.06
Special Requests	9,786.14		9,786.14
State Geological Survey	3,348.53		3,348.53
Coop. U.S. Geological Survey	4,040.07		4,040.07
Quicksilver Resurvey*	600.00*		600.00*
Strategic & Critical Minerals	1,797.54		1,797.54
Nonmetallic Survey			
Investigation of Salt Deposits			
Commodity Mineral Survey			
TOTAL EXPENDITURES	104,084.68	362.07	104,446.75

* Further encumbered for $600 on Francis Frederick contract.

	1944-1946		1945-1947	1947-1949
Expenditures 7/1/44-6/30/46	G&MI* Expenditures 7/1/44-6/30/46	Total Expenditures 7/1/44-6/30/46**	Estimated Expenditures 7/1/45-6/30/47**	Funds Requested for 1947-1949**
78,081.79		78,081.79	94,292.05°	111,252.00
24,611.01	1,479.52	26,090.53	28,457.18	38,755.00
876.19		876.19	900.00	900.00
833.36	105.30	938.66	1,000.00	1,000.00
1,015.95		1,015.95	985.52	1,000.00
1,795.71	1,366.11	3,161.82	3,500.00	3,500.00
9,464.00		9,464.00	10,327.00	13,200.00
124.45		124.45	146.00	150.00
			372.98	275.00
				3,000.00
268.14		268.14	318.04	400.00
156.27		156.27	180.69	200.00
410.72		410.72	375.02	400.00
35.60		35.60	133.60	200.00
334.36		334.36	480.90	500.00
1,732.69		1,732.69	2,310.18	3,000.00
3,414.21		3,414.21	3,738.13	3,000.00
709.08		709.08	715.09	750.00
42.93		42.93	50.00	50.00
1,823.14		1,823.14	1,736.74	2,500.00
216.82		216.82	235.62	300.00
233.09		233.09	164.29	250.00
				500.00
				3,000.00
1,124.30	8.11	1,132.41	787.38	680.00
2,265.48	364.91	2,630.39	4,403.77	4,600.00
275.07		275.07	287.25	350.00
1,248.21	364.91	1,613.12	1,073.45	1,500.00
574.85		574.85	3,000.00	2,500.00
167.35		167.35	42.47	100.00
				150.00
2,112.65		2,112.65	9,808.66	12,000.00
1,112.65		1,112.65	6,000.00	6,000.00
1,000.00		1,000.00	3,000.00	3,000.00
			450.00	1,000.00
			358.66	
				2,000.00
107,070.93	1,844.43	108,915.36	136,961.66	166,607.00

* Items paid out of G&MI Account (see page 33).

**State Department G&MI and Spectrographic Laboratory combined.

° Includes $1500.00 estimated contribution to Public Employees Retirement Fund.

COMPENSATION AND EXPENSES OF EMPLOYEES

Name	Title	Compensation 7/1/44-6/30/46	Travel and Expenses 7/1/44-6/30/46
F. W. Libbey	Administrator	10,000.04	663.28
F. A. Steeble	Inter. Fiscal Worker	3,910.00	
June Roberts	Secretary	3,370.00	
Frances H. Furniss	Stenographer	1,505.54	
Lillian F. Owen	Multigraph Operator	3,070.00	
Ralph S. Mason	Engineer	(5,539.58	119.94
		(1,070.42 (2)	108.72 (2)
Elton A. Youngberg *	Engineer	5,243.33	120.02
John Eliot Allen	Chief Geologist	(4,231.13	135.78
		(450.00 (1)	150.82 (1)
		(305.00 (2)	
Norman S. Wagner	Associate Geologist	6,130.00	608.06
Wallace D. Lowry	Associate Geologist	(4,538.07	109.41
		(1,346.12 (2)	6.80 (2)
Joyce B. Priestaf	Assistant Geologist	746.34	
Ewart M. Baldwin	Associate Geologist	(4,471.29	460.55
		(960.00 (1)	
		(578.71 (2)	157.40 (2)
Esther W. Miller	Spectroscopist	5,461.77	
Laurie L. Hoagland	Assayer	6,070.00	
Jo Anne Lehman *	Draftsman	188.17	
John F. Dinkel Jr. *	Draftsman	331.10	
L. C. Swanson *	Field Assistant	370.58 (2)	112.10 (2)
W. A. G. Bennett *	Field Geologist	514.52	20.18
Geraldine S. Coutant *	Stenographer	766.83	
Lola May Ward	Stenographer	554.59	
Nancy Meeker *	Stenographer	28.25	
Ira S. Allison *	Special Assistant	150.00 (2)	32.90 (2)
Daniel W. Jordan *	Laboratory Assistant	233.82	
R. E. Stewart	Paleontologist	(6,440.09	382.65
		(333.33 (2)	
Vivian Clay	Draftsman	297.75	
Dorothy G. Macfarlane *	Laboratory Assistant	256.91	
Norman Nepom	Office boy	67.00	
Vida Williams *	Typist	323.80	
Howard W. Grafton *	Office boy	61.20	
Charlotte A. Hendryx *	Stenographer	230.65	
Eugene R. Ellis	Office boy	620.55	
Lotus Simon *	Laboratory Assistant	303.80	
Clement Flickinger *	Surveyor	(55.00	
		(82.50 (2)	
Alverissa C. F. Miller *	Stenographer	38.38	
Joy B. McCoy	Stenographer	209.60	
Helen M. Eastman *	Stenographer	26.61	
Dona Hall *	Stenographer	136.61	
Diane Chaney *	Stenographer	269.68	
Edward K. Holt *	Laboratory Assistant	360.01	
Suzanne Stokes *	Typist	39.03	
Darlene Crim *	Typist	82.24	
Dorothy J. Hagey	Stenographer	217.75	
Patricia J. Conro *	Stenographer	233.93	
Annabell Tavis *	Stenographer	140.16	
Hollis M. Dole	Associate Geologist	701.67	32.11
Anna J. Ritter	Stenographer	65.00	
		$ 83,728.45	$ 3,220.72
	Charged to Department	78,081.79	2,651.98
(1)	Charged to Coos Bay Coal Investigation a/c	1,410.00	150.82
(2)	Charged to Special Requests	4,236.66	417.92

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

PUBLICATIONS

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

BULLETINS	Price postpaid
1. Mining laws of Oregon, 1942, rev. ed., contains Federal placer mining regulations	$ 0.20
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. report on some of the refractory clays of western Oreg.,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, revised edition, 1940: R.M.Miller	0.40
9. Chromite deposits in Oregon, 1938: John Eliot Allen	0.50
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: Warren D. Smith	0.50
12. Geology and physiography of northern Wallowa Mts., 1941: W.D.Smith, J.E.Allen, et al	0.65
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	0.50
B. Grant, Morrow, and Umatilla Counties, 1941	0.50
C. Vol. I, Coos, Curry, and Douglas Counties, 1941	(out of print)
Vol. 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, Oreg.,1939: T.P.Thayer (map only)	0.25
16. Field identification of minerals for Oregon prospectors and collectors, second edition, 1941: compiled by Ray C. Treasher	(out of print)
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	0.20
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
23. Investigation of reported occurrence of tin at Juniper Ridge,Oreg.,1942: Harrison & Allen	0.40
24. Origin of the black sands of the coast of southwestern Oregon, 1943: W.H.Twenhofel	0.30
25. Third biennial report of the Department, 1941-42	Free
26. Soil: Its origin, destruction, and preservation, 1944: W.H.Twenhofel	0.45
27. Geology & coal resources of Coos Bay quad., 1944: John Eliot Allen & Ewart M. Baldwin	1.00
28. Fourth biennial report of the Department, 1943-44	Free
29. Ferruginous bauxite deposits in N.W.Oregon,1945: F.W.Libbey, W.D.Lowry, & R.S.Mason	1.00
30. 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	0.35
31. Geology of the St. Helens quadrangle, 1946: W.D.Wilkinson, W.D.Lowry, & E.M.Baldwin	0.45
32. Fifth Biennial Report of the Department, 1945-46	Free
G.M.I. SHORT PAPERS	
1. Preliminary report upon Oregon saline lakes, 1939: O.P.Stafford	0.10
2. Industrial aluminum - a brief survey, 1940: Leslie L. Motz	0.10
3. Adv. report on some quicksilver prospects in Butte Falls quad.,Oreg.,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	0.10
6. Pumice and pumicite, 1941: James A. Adams	0.10
7. Geologic history of the Portland area, 1942: Ray C. Treasher	0.15
8. Strategic & 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	0.15
11. Mineral deposits in region of Imnaha and Snake rivers, Oregon, 1943: F.W.Libbey	0.15
12. Preliminary report on high-alumina iron ores in Washington County, Oregon, 1944: F. W. Libbey, W.D.Lowry, & R.S.Mason	0.15
13. Antimony in Oregon, 1944: Normas S. Wagner	0.15
14. Notes on building-block materials of eastern Oregon, 1946: Normas S. Wagner	0.10
15. Reconnaissance geology of limestone deposits in the Willamette Valley, Oregon, 1946: John Eliot Allen	0.15
16. Perlite Deposits near the Deschutes River, Southern Wasco County, Oregon,1946: J.E.Allen	0.15

PUBLICATIONS
(Cont.)

GEOLOGIC MAP SERIES

		Price postpaid
1.	Geologic map of the Wallowa Lake quadrangle., 1938: W.D.Smith & Others (also in Bull. 12)	$ 0.45
2.	Geologic map of the Medford quadrangle, 1939: F.G.Wells & Others	0.40
3.	Geologic map and geology of the Round Mountain quadrangle, 1940: W.D.Wilkinson & Others	0.25
4.	Geologic map of the Butte Falls quadrangle, 1941: W.D.Wilkinson & Others	0.45
5.	Geologic map and geology of the Grants Pass quadrangle, 1940: F. G. Wells & Others	0.30
6.	Preliminary geologic map of the Sumpter quadrangle, 1941: J. T. Pardee & Others	0.40
7.	Geologic map of the Portland area, 1942: Ray C. Treasher	0.25
8.	Geologic map of the Coos Bay quadrangle, 1944: Allen & Baldwin (sold with Bull. 27)	----
9.	Geologic map of the St. Helens quadrangle, 1945: W.D. Wilkinson, W.D.Lowry, & E.M.Baldwin (sold with Bull. 31)	----

MISCELLANEOUS PUBLICATIONS

The Ore.-Bin: issued monthly by the staff as medium for news about the Department, mines, and minerals. Subscription price per year	0.25
Oregon mineral localities map (22 x 34 inches) 1946	0.10
Landforms of Oregon: a physiographic sketch, (17 x 22 inches) 1941	0.10
Index to topographic mapping in Oregon, 1946	Free
Index to geologic mapping in Oregon, 1946.	Free

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