

Bulletin No. 28

of the

of the

July 1, 1942, to July 1, 1944

and the

W. H. STRAYER, CHAIRMAN	BAKER
S. H. WILLISTON	PORTLAND
NIEL R. ALLEN	GRANTS PASS

F. W. LIBBEY
DIRECTOR

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 Fourth Biennial Report of
the Department of Geology and Mineral Industries,
covering activities of the Department for the period
from July 1, 1942, to and including June 30, 1944.

Respectfully,

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

Portland, Oregon
November 1, 1944

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INTRODUCTORY STATEMENT

This report describes the activities of the State Department of Geology and Mineral Industries from July 1, 1942, to and including June 30, 1944, which is the end of the fiscal year immediately preceding a regular meeting of the Legislature.

Even before this country entered the war, the Department was engaged mainly in making investigations of war minerals and encouraging their production. After December 7, 1941, Departmental work was wholly concerned with these activities. During 1943, the submarine menace was largely overcome and imports of mineral supplies needed in the war program increased greatly. Thus the need for domestic production of such supplies, as determined by the War Production Board, became less critical, and Government agencies ceased to urge new and increased production of those minerals on which Oregon had largely concentrated. Departmental activities, therefore, were modified in the latter part of 1943 and the first half of 1944, and more attention has been given to nonmetallics, particularly those products which might bear on postwar employment.

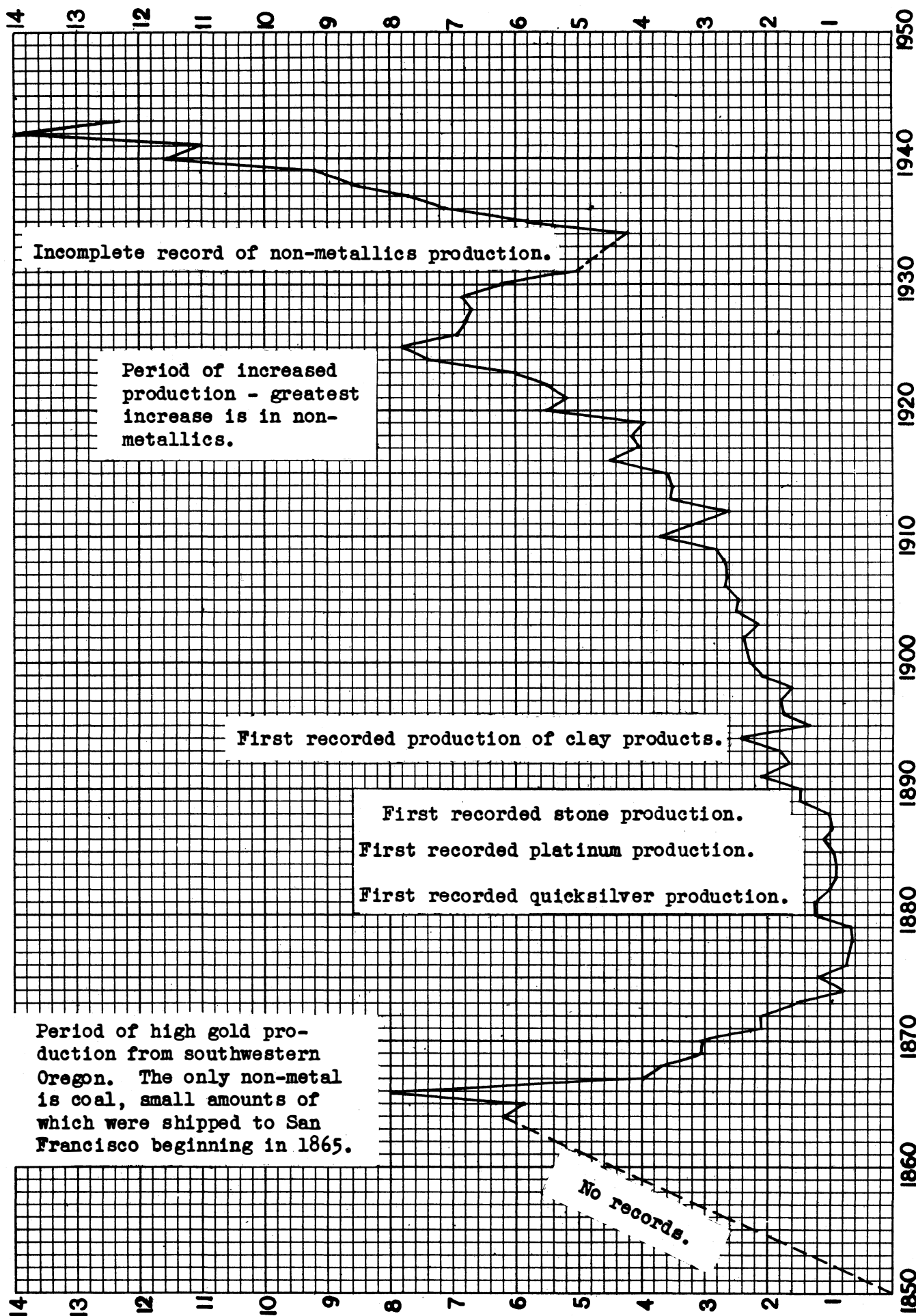
Exploration by the Department of ferruginous bauxite deposits located 25 to 35 miles northwest of Portland in northern Washington County, has shown large tonnages of such material. Because of their quality and nearness to markets, it is believed that these deposits are of considerable economic importance.

There has been a great increase in activities connected with studies by oil companies of the petroleum possibilities of the State, and the Department has recently added to its staff a paleontologist with wide experience in oil and gas development.

A large amount of work has been done on a project set up by the 1943 Legislature which directed the Department to study and report upon the Coos Bay coal field. This project will be described later in this report.

The various Departmental projects and activities are described in detail under appropriate headings on the following pages.

VALUE OF OREGON MINERAL PRODUCTION IN MILLIONS OF DOLLARS



OREGON MINERAL PRODUCTION

Mineral production in Oregon during the period covered by this report has been influenced largely by the Government's need for war mineral supplies and by the demand for construction materials needed in military installations.

The U. S. Bureau of Mines estimates total value of mineral production for the State in 1942 at \$14,065,572, of which metallic products were valued at \$3,159,860 and nonmetallics, \$10,905,712. The Bureau estimates total value in 1943 at \$12,310,000, of which metallics were valued at \$1,346,000 and nonmetallics at \$10,964,000.

In October 1942, all gold mines were closed by Government order, and the value of Oregon's gold production in 1942 dropped to \$1,618,155 compared with \$3,379,775 in 1941. In 1943, the value dropped to \$38,395 and represented, in the main, only that gold shipped in fluxing ore to smelters. Removal of restrictions on gold mining ostensibly will depend on manpower needs in war industries.

Quicksilver was one of the very few minerals whose price was allowed to increase according to war demands. High prices stimulated domestic production so that it, combined with large imports, increased supplies to a high level in 1943. This accumulation of metal caused cancellation of Government contracts and removal of price support. During the latter part of 1943 and the first part of 1944, the price dropped from approximately \$196 per flask f.o.b. New York to about \$100 a flask (July 1944). A progressive drop in production has resulted. In 1943, Oregon produced 4,651 flasks (76 pounds each) valued at \$907,922 compared with 6,935 flasks valued at \$1,361,687 in 1942. In 1943, there were 16 producers compared with 23 in 1942. Of the 16 producers in 1943, production came mainly from two mines. These two are the only producers in July 1944.

Early in the war period, chromite imports were cut off and the need for domestic production, as determined by the War Production Board, was very great. Two large privately owned plants, together with a Government-owned concentrator, were constructed in the Marshfield-Bandon-Coquille area for the purpose of producing chromite concentrates from chromite sands in marine terraces. Production from these plants began and continued for a short time in 1943. The Government then decided that production of such concentrates was not necessary because of imports of higher grade chromite in sufficient quantity, and the plants were closed down. Production of hard-rock chromite from Josephine County has continued fairly consistently, and there has been some production of somewhat lower grade hard-rock chromite from Grant County.

During 1943 and the first half of 1944, a small but regular production of antimony ore has been maintained from one mine in Baker County. A small amount has also been produced from one mine in Jackson County.

Production of limestone, used in making portland cement, has continued at a fairly high level. A new project for producing agricultural limestone has been started in Jackson County. A small production of burned lime has been maintained in Josephine County.

Sand, gravel, and stone production increased considerably in 1942 due to war construction, and is estimated by the U. S. Bureau of Mines to have been valued at \$7,132,600. In 1943, production of these materials fell off and is valued by the Bureau at \$5,307,979.

A small production of coal was maintained in the Coos Bay area from a few small mines. There was a much greater demand for the coal than these mines could supply. Early in 1944 one of them was taken over by a new company which has made considerable progress in carrying out plans to mine and wash coal in a modern plant and on a fairly large scale.

Other nonmetallics which added to the State's mineral production were crushed quartz and granite for poultry grit from a plant in Jackson County; processed diatomite, used largely as a filter aid, from Deschutes County; and clays and clay products principally from the Portland area.

Construction of a new plant to produce silica sand, mainly for steel foundry use, was started at Eugene early in 1944. The plant should be in full production in January 1945.

In 1942 and 1943, the following materials contributed to the State's mineral production: antimony ore, asbestos, cement, chromite, clay, coal, copper, diatomite, semi-precious gem stones, gold, lead, lime, manganese ore, mercury, platinum metals, pumice, sand and gravel, silica (quartz), silver, and stone.

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 its work 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 is composed of the following members:

W. H. Strayer, Baker, Chairman, appointed 1941.
S. H. Williston, Portland, appointed 1943.
Niel R. Allen, Grants Pass, appointed 1944.

Mr. Albert Burch, who had been a member of the Governing Board since the Department was organized in 1937, died in October 1943. His public service on this as well as other State boards and commissions was marked by unselfish devotion to duty, wise counsel, and a farsighted grasp of problems encountered.

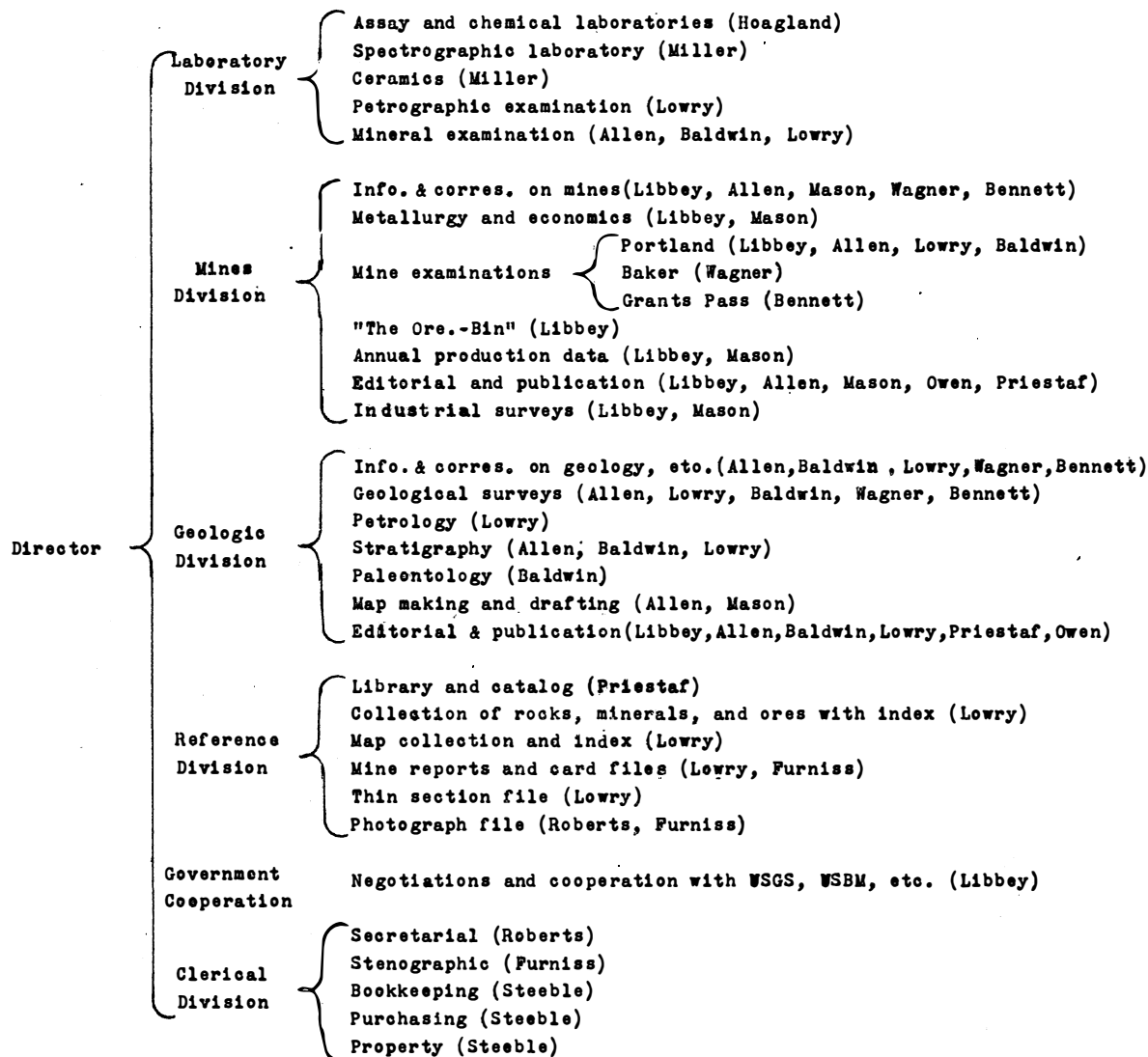
The regular personnel of the Department as of June 30, 1944, is as follows:

F. W. Libbey, Acting Director, Mining Engineer
John Eliot Allen, Chief Geologist
Harold C. Harrison, Spectroscopist, Chief Chemist (on leave)
L. L. Hoagland, Assayer
Ralph S. Mason, Engineer
Wallace D. Lowry, Assistant Geologist
Ewart M. Baldwin, Assistant Geologist
W. A. G. Bennett, Associate Geologist, Grants Pass
Norman S. Wagner, Associate Geologist, Baker
Esther W. Miller, Ceramic Engineer, Spectroscopist
Joyce B. Priestaf, Assistant Geologist
F. A. Steeble, Accountant
June Roberts, Secretary
Frances H. Furniss, Stenographer
Lillian F. Owen, Multigraph Operator
Geraldine Simmons, Stenographer, Grants Pass
Lola May Ward, Stenographer, Baker

Earl K. Nixon, who had been Director of the Department since its establishment in 1937, resigned effective May 1, 1944, in order to take a position as western manager of mineral exploration for a private company. Mr. Nixon's work was characterized by unflinching energy, timely planning, and executive ability of a high order.

During the period covered by this report, three members of the staff entered the armed services; three left to work for the U. S. Geological Survey; one joined the geological staff of the U. S. Army Engineers; and three resigned in order to work for private industry.

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 Board must determine and promulgate general policies and rules for the conduct of the Department.

When this country entered the war, the need for domestic production of war minerals was critical and the Board adopted the policy of centering all Departmental activities on encouraging development and production of these materials. Thus the State geological survey work, formerly conducted during each field season in cooperation with Oregon State College and the University of Oregon, was suspended until the emergency should become less critical.

During the past few months, supplies of war minerals are reported to have been sufficient for all war needs with a few minor exceptions, and it has seemed expedient to the Board to transfer some of the Departmental activities to those pointing toward peace-time operations. New industries are needed for postwar employment, and the Department now should bend every effort in giving assistance to development and production of the State's minerals which might be used in such industries.

Early in 1943, assayers employed in field laboratories at Baker and Grants Pass resigned to work for private industries. Satisfactory replacements could not be obtained at that time due to manpower shortage. Therefore the Board ruled that field laboratories should be closed for the duration of the war, and that all assay work should be done during the emergency period at one central laboratory which was set up at Portland.

At all times the Board has endeavored to maintain a proper balance between economic and scientific studies. The need for both is apparent. Investigations of individual ore deposits, as well as economic studies concerned with operating and marketing problems, are highly important in developing the mineral industry of the State. Scientific studies, including areal geologic mapping, paleontology, petrography, and the use of spectroscopy in the determination of minute amounts of diagnostic elements in rocks and soils, are of comparable importance in providing useful and usable knowledge of the State's resources. Such studies are often essential in providing facts upon which economic studies may be based.

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 1945-1947.

<u>Department of Geology & Mineral Industries</u>	<u>1941-1943</u>	<u>1943-1945</u>	<u>Requested 1945-1947</u>
	<u>July 1 - June 30</u>	<u>July 1 - June 30</u>	<u>July 1 - June 30</u>
Salaries and Wages	\$ 68,070.00	\$ 89,860.00	\$ 94,320.00
Gen., Oper., & Maint.	24,160.00	30,285.00	29,900.00
Capital Outlays	3,725.00	4,725.00	3,000.00
Special Requests	11,400.00	9,500.00	9,000.00
	<u>\$107,355.00</u>	<u>\$134,370.00*</u>	<u>\$136,220.00*</u>
<u>Spectrographic Laboratory</u>			
Salaries and Wages	\$ 6,350.00		
Gen., Oper., & Maint.	1,300.00		
Capital Outlays	6,600.00		
	<u>\$ 14,250.00</u>		
TOTALS	\$121,605.00	\$134,370.00*	\$136,220.00*

* Joint request of Department of Geology and Mineral Industries and Spectrographic Laboratory for 1943-1945 and 1945-1947.

The increase in appropriations requested for the 1945-1947 biennium is in Salaries and Wages and is necessary in order to maintain an efficient staff. Rents have been increased 20 percent. In the request, provision is made for employment of one assayer who would take over the work of one field laboratory when the Board decides that it is practical to reopen the field laboratories. The assayer now on the staff will then be transferred from the Portland office to the other field laboratory.

HEAD OFFICE

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, 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.

Statistics of activities at this office are given below:

Number of visitors at the Portland office	4,611
Pieces of mail received at Portland office	17,584
Pieces of mail sent out of Portland office (not including new publications)	28,415
Number of qualitative determinations made	478
Number of quantitative determinations made	2,253

Similar data for field offices at Baker and Grants Pass are given on page 9.

FIELD OFFICES AND ASSAY LABORATORIES

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 (July 1942 to April 1943)	265
Number of quantitative determinations made (July 1942 to April 1943)	1,240
Number of business callers	6,379
Number of business letters written	2,345

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 war mineral supply became less critical, inquiries have to a large extent been more concerned with minerals which would have a peace-time market. A considerable interest is evidenced in construction materials, resumption of gold mining in general, and opportunities and localities available for placer mining in particular.

SPECTROGRAPHIC LABORATORY

The 1941 Legislature provided for the establishment of a Departmental spectrographic laboratory. Equipment was purchased and installed during that year and the laboratory service began to function early in January 1942. Since then, the work of the laboratory has continually expanded; it has reached the stage where it is in use practically every working day, and considerable work is piled up ahead.

There are three principal classes of work for which the spectrograph is used: (1) Qualitative analysis of mineral samples to determine presence or absence of specific elements. Such determinations can usually be made more quickly and dependably with the spectrograph than by any other method. (2) Quantitative analysis in which a complete analysis of all elements present in a sample is provided within the accepted limits of accuracy, and much more quickly than by any other method. (3) Research work on specific problems, usually in determining minute quantities of diagnostic elements in samples. Such analytical work may be done acceptably only by means of the spectrograph.

Aside from routine qualitative and quantitative analyses, the principal short-range spectrographic projects have been as follows: analyses of zinc die-cast alloys for a local war plant; analytical work in connection with spectrographic control of aluminum alloys used in airplane construction; analyses of specimens and samples to provide evidence for the Crime Detection Board; analyses of samples of condenser pipes from a quicksilver plant to determine the cause of their quick deterioration; analyses of samples for the State Board of Health; and control work in analysis of mercury to provide silver-free mercury, essential in manufacture of munitions.

Long-range research projects were: exhaustive analytical work, both spectrographic and chemical, in an investigation of the reported occurrence of tin at Juniper Ridge in Harney County; research on relationship between pinning of sheep and lack of certain chemical elements in the feed; participation in a cooperative project with the Oregon Agricultural Experiment Station and the U. S. Department of Agriculture in an investigation of soil nutrition and the effect on nut orchard growth of minor elements in soils; also cooperative program with State Agricultural Experiment Station and a Wasco County farm group to investigate cause of disease and poor yield of stone fruits and vegetables; development of a method for analyzing samples for the rare alkali metals - a problem of extreme importance in connection with cement and concrete; and studies to determine amount of mercury losses in established plant procedures, and methods to decrease such losses.

Dr. H. C. Harrison, spectroscopist and chief chemist of the Department, was granted a leave of absence in May 1944 when he received a commission in the Navy. Some of the research work he had begun will be postponed for the duration of the war. His former assistant, Miss Esther Miller, took over his work in the spectrographic laboratory.

The Governing Board has set up rules for analysis of commercial samples by the laboratory, and these rules are contained in a Department publication describing the spectrographic laboratory.

Statistics relating to the work of the laboratory are given below (July 1, 1942, to June 30, 1944):

Number of qualitative analyses . . .	1,163
Number of quantitative analyses . .	326
Receipts from custom analyses . . .	\$798.70

CERAMIC WORK

It is believed that the Department can do work of much value to the State by research and tests on ceramic materials. Such work could be of assistance to ceramic industries already established and could also provide the basis for new industries.

In order to carry out this testing work, equipment has been installed in the assay laboratories at Portland by Miss Esther Miller, a member of the Department's staff and a graduate ceramic engineer.

A ceramic test kiln which provides more than a cubic foot of firing space has been built. Kiln walls, constructed of $4\frac{1}{2}$ inches of fire brick, $2\frac{1}{2}$ inches of insulating fire brick, and $\frac{1}{2}$ inch of sheet asbestos, provide excellent insulation. A Denver Fire Clay inspirator burner of the atmospheric type allows a gradual rise in temperature which conforms to the American Ceramic Society qualifications for clay testing. The kiln is to be used mainly for determining shrinkage, volume change, and the firing behavior of Oregon clays and ceramic materials. A PCE furnace, constructed at the Grants Pass laboratory a few years ago, was rebuilt and will be used to determine the softening point of clays. The high temperature (approximately 3250° F) required for this testing is obtained by two oxyacetylene torches. A volumeter, used to find the volume of clay specimens, has also been made.

The procedure for testing clays consists of determining screen size, plasticity, and drying properties; shrinkage, volume change, porosity, and absorption at various temperatures; and the softening point of the material. Such firing defects as scumming, bloating, and warpage are to be noted. This procedure indicates the type of clay and its probable uses. Non-ceramic tests which demonstrate uses as paper fillers, drill muds, and oil bleaches will be conducted when it is found from preliminary investigation that the material warrants such testing.

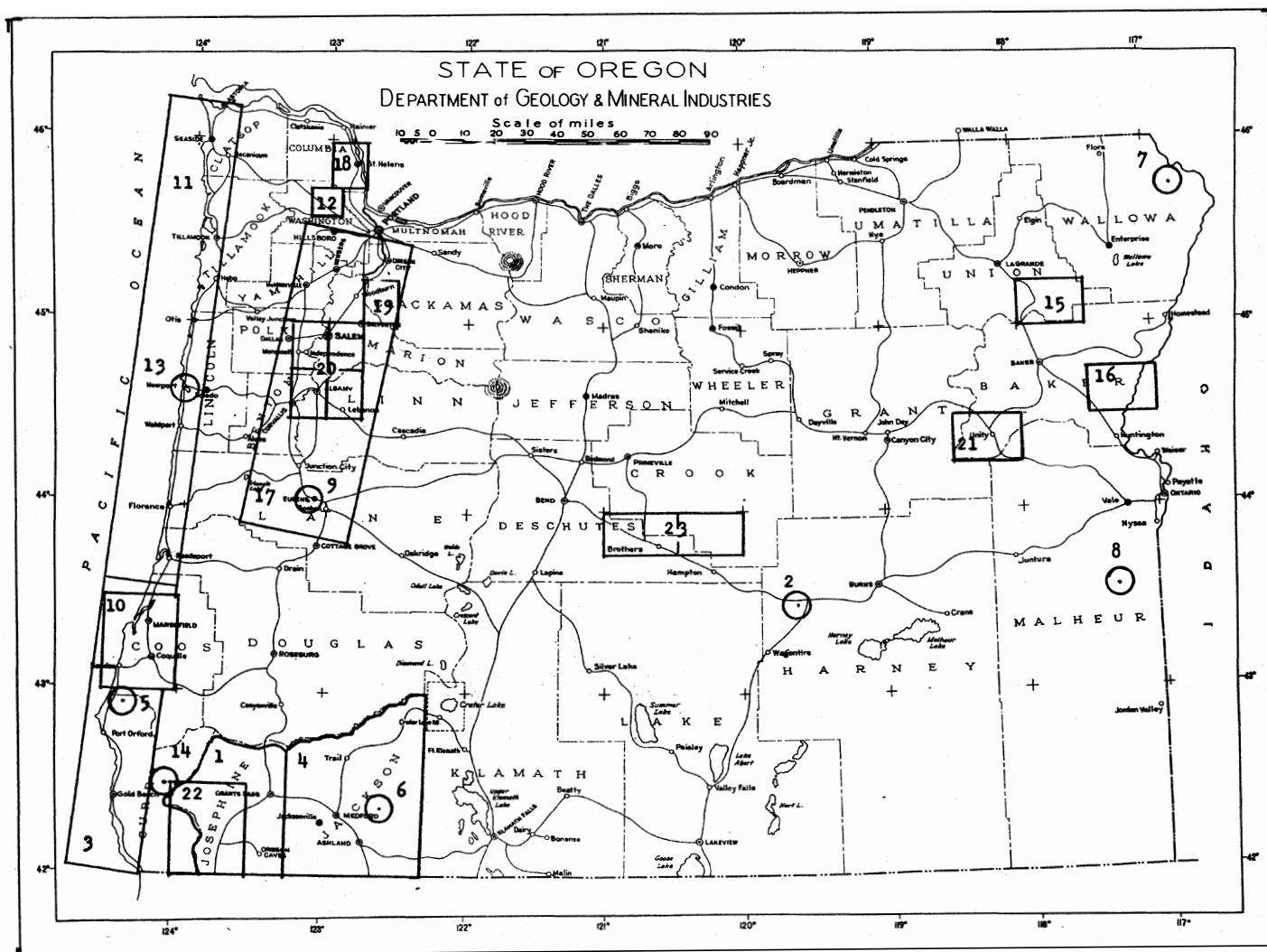
It is possible to adapt the above equipment to more specific testing of clays and to a variety of research projects of ceramic nature.

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.



INDEX MAP SHOWING AREAL DISTRIBUTION OF FIELD STUDIES

LIST OF STUDIES MADE

Refer to
Index Map
No.

(A) Studies published during the period July 1, 1942, to June 30, 1944:

Bulletins -

- 1 No. 14-C, Vol. II, Sec 1, Metal Mines Handbook,
Josephine County.
- 2 No. 23, Investigation of Reported Occurrence of Tin
at Juniper Ridge, Oregon.

No. 25, Third Biennial Report of the Department.
- 3 No. 24, Origin of the Black Sands of the Coast of
Southwest Oregon.
- 4 No. 14-C, Vol. II, Sec. 2, Metal Mines Handbook,
Jackson County.

No. 26, SOIL: Its Origin, Destruction, and Preservation.

G.M.I. Short Papers -

- 5 No. 9, Some Manganese Deposits in the Southern Oregon
Coastal Region.
- 6 No. 10, An Investigation of the Tyrrell Manganese Deposit
and Other Similar Properties in the Lake Creek District,
Oregon.
- 7 No. 11, Notes on Some Mineral Deposits in the Area Surrounding
the Junction of the Snake and Imnaha Rivers in Oregon.

Miscellaneous Papers -

- 8 No. 4, Calcite Occurrences Near the Owyhee Reservoir,
Malheur County, Oregon.
- 9 No. 7, Memorandum on Steel Foundry Sand at Eugene, Oregon.

No. 5, Coal Situation in Portland-Vancouver Area.

No. 6, Coal Situation in Portland-Vancouver Area
(Supplement).

The Ore.-Bin

(B) Studies made but not published during the period July 1, 1942, to June 30, 1944:

Bulletins -

- 10 No. 27, Geology and Coal Resources of the Coos Bay
Quadrangle.

- 11 No. 29, Economic Resources of the Beach Deposits of the Oregon Coast, Coos Bay to Columbia River.

G.M.I. Short Papers -

- 12 No. 12, Preliminary Report on High-Alumina Iron Ores in Washington County, Oregon.
 No. 13, Antimony in Oregon.

Miscellaneous Papers -

- 13 Newport Landslide, Lincoln County.
14 Horse Sign Butte Iron and Vanadium Deposit.

Geologic Map Series -

- 15 Geology of the South Half of the Telocaset Quadrangle, Oregon.
16 Geology of the Pine Quadrangle.

(C) Studies made previous to July 1, 1942, and not yet published on account of war conditions:

G.M.I. Short Paper -

- 17 Willamette Valley Limestones.

Geologic Map Series -

- 18 Geologic Map and Geology of the St. Helens Quadrangle.
19 Geologic Map and Geology of the Molalla Quadrangle.
20 Geologic Map and Geology of the Albany, Lebanon, Salem, and Stayton Quadrangles.
21 Geologic Map and Geology of the North Half of the Ironside Mountain Quadrangle.
22 Geologic Map of the Kerby Quadrangle*.
23 Geologic Map and Geology of the North Half of the Hampton and Brothers Quadrangles.

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

PUBLICATIONS

A complete list of publications is given on the final page of this report. Descriptions of publications issued prior to July 1, 1942, are contained in preceding biennial reports. Following are descriptions of publications issued during the period from July 1, 1942, to July 1, 1944.

Bulletin 14

Title: Oregon Metal Mines Handbook, by the staff. 14-C, Vol. II, Sec. 1, Josephine County. (229 pp., index, areal map with geologic overprint, 1942)

Purpose and Scope: One of the duties of the Department under the law is to compile and keep up-to-date a mines catalog. Each volume of this catalog series describes mineral properties in a geographic unit, made up of one or more counties; this volume describes properties of record in Josephine County. The purpose of the catalog is to meet the need for a permanent and continuing record of the State's mineral industry, and such a record is always in demand by engineers and mine operators who wish to obtain information on a mining property or mining district.

Cost: \$749.56 for 775 copies. Price 75 cents each.

Bulletin 23

Title: An Investigation of the Reported Occurrence of Tin at Juniper Ridge, Oregon, by H. C. Harrison; geology by John Eliot Allen. (54 pp., 4 plates, index map, 1942)

Purpose and Scope: Over a period of years, reports were received by the Department of the occurrence of tin in commercial quantities at Juniper Ridge, west of Burns, Harney County. Although the Department failed to find tin in preliminary sampling at the locality, the reports persisted, and it was decided to investigate the matter thoroughly. A large number of tests were made both in the field and in Department laboratories. Results were negative. The bulletin gives a detailed description of the investigation and results.

Cost: \$431.53 for 750 copies. Price 40 cents each.

Bulletin 24

Title: Origin of the Black Sands of the Coast of Southwest Oregon, by W. H. Twenhofel. (25 pp., 6 figures, index map, 1943)

Purpose and Scope: The need for a study of the origin of the "black sands" of the southwest Oregon coast was emphasized by large-scale projects undertaken mainly in 1942 to investigate and produce chromite from these sands because of the strategic nature of chromite at that time. A study of origin may be of great assistance in exploration and prospecting. Dr. Twenhofel, an authority on sedimentation, was engaged to make the study and prepare the report. He spent the

summer of 1942 in the field and examined all the known occurrences of the coastal black sand deposits in Oregon, south of Coos Bay. The report was printed by the State Printer.

Cost: \$417.44 for 1000 copies. Price 30 cents each.

Bulletin 25

Title: Third Biennial Report, State Department of Geology and Mineral Industries, January 1, 1941 - July 1, 1942 (36 pages).

Purpose and Scope: This bulletin was prepared according to the law creating the Department. It describes activities for an 18-month period instead of 24 months, in order to conform to Section 92-802, O.C.L.A., which changed the period of biennial reports from calendar to fiscal years.

Cost: \$208.63 for 500 copies. No charge.

Bulletin 14

Title: Oregon Metal Mines Handbook, by the staff. 14-C, Vol. II, Sec. 2, Jackson County. (208 pages, index, areal map with geologic overprint, 1943)

Purpose and Scope: Same as described under the Josephine County volume on page 15.

Cost: \$832.48 for 756 copies. Price 75 cents each.

Bulletin 26

Title: SOIL: Its Origin, Destruction, and Preservation, by W. H. Twenhofel. (47 pages, 35 illustrations, 1944)

Purpose and Scope: The serious effects of soil erosion upon agricultural lands are treated in this bulletin from the standpoint of a geologist who has made an intensive study of the subject. His object, as well as the object of the Department, is to emphasize as strongly as possible to farmers and to the public at large, the need for preserving our agricultural land from the very serious effects of erosion which have in the relatively recent past destroyed so much valuable farmland. The author traces the origin of soil and its fertility, shows by numerous examples how farmland areas have been totally destroyed as far as their agricultural use is concerned, and outlines measures which should be taken to prevent destructive erosion.

Cost: \$600.73 for 2009 copies. Price 45 cents each.

G.M.I. Short Paper 9

Title: Some Manganese Deposits in the Southern Oregon Coastal Region, by Randall E. Brown. (6 pp., geologic map, 1942)

Purpose and Scope: In order to encourage production of manganese ore, an essential war mineral, the Department investigated manganese deposits in Curry County with particular attention given to the McAdams property, from which some ore had been shipped during the first World War.

A geologic map of this area was prepared in order to obtain information concerning origin and extent of the possible ore. Brief descriptions are given of some other known occurrences.

Cost: \$35.80 for 750 copies. Price 10 cents each.

G.M.I. Short Paper 10

Title: An Investigation of the Tyrrell Manganese Deposit and Other Similar Properties in the Lake Creek District, Oregon, by Wallace D. Lowry. (15 pp., 6 plates, 3 figures, geologic map, 1943)

Purpose and Scope: The district described in the paper contains deposits of disseminated manganese oxides and had some production during the first World War. The investigation described in the report was made in order to determine possibilities of producing this important war mineral to supply war needs. A geologic map was prepared and a detailed study made of ore possibilities as shown by recent development work. Some other manganese prospects in the area were examined.

Cost: \$76.33 for 412 copies. Price 15 cents each.

G.M.I. Short Paper 11

Title: Notes on Some Mineral Deposits in the Area Surrounding the Junction of the Snake and Imnaha Rivers in Oregon, by F. W. Libbey. (17 pp., 5 plates, frontispiece, 1943)

Purpose and Scope: Reports of occurrences of copper deposits led to the investigation of this relatively inaccessible area. The report describes the ore deposits and gives detailed results of sampling and analysis. The veins containing copper offer little encouragement for development of commercial ore deposits. Several maps and sketches are incorporated in the report.

Cost: \$74.31 for 500 copies. Price 15 cents each.

Miscellaneous Paper 4

Title: Calcite Occurrences near the Owyhee Reservoir, Malheur County, Oregon, by Wallace D. Lowry. (5 pp., index and locality maps, 1943)

Purpose and Scope: The Department undertook this investigation because of the need for the production of optical calcite for war purposes. Calcite veins that contain some fairly clear crystalline masses were known to occur in this area, but none with crystals perfect enough for optical purposes has been found. The report describes the geology of the area and the mineralogy of calcite deposits. Although some clear crystals were found, they were not of sufficiently large size for commercial use.

Cost: \$17.69 for 90 copies. Price 10 cents each.

Miscellaneous Papers 5 and 6

Title: Coal Situation in Portland-Vancouver Area, by R. S. Mason, 1943.

Purpose and Scope: These reports, consisting of a principal report and a supplement, give the results of a survey of demand and supply of coal in the Portland area. War conditions had made transportation of fuel difficult; moreover reports of actual fuel supply were conflicting. The Department believed it desirable to obtain unbiased figures. The study showed that fuel supplies were at a very low level. They proved to be sufficient only because of the exceptionally mild winter.

Cost: \$43.64 for 200 copies. Free of charge.

Miscellaneous Paper 7

Title: Memorandum on Steel Foundry Sand at Eugene, Oregon, 1944.

Purpose and Scope: Portland steel foundries have depended in the past mainly on silica sand brought in from Illinois. This investigation was undertaken in order to provide definite information on quality of the Eugene sand for making steel castings, and included foundry tests as well as field work. The Department originally investigated the sand in 1937 in its survey of refractory clay occurrences in northwestern Oregon. Results, as given in the present paper, show that the Eugene sand is equal in quality to the Illinois sand for foundry use.

Cost: \$58.60 for 200 copies. Free of charge.

The Ore.-Bin

This small monthly periodical is prepared and multigraphed in the office of the Department. Monthly circulation is 474 copies, 362 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 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. The Ore.-Bin serves also for announcement of new publications, and publishes statistics on Oregon mineral production as soon as they are available.

STUDIES MADE BUT NOT PUBLISHED

During the Period July 1, 1942, to June 30, 1944

Bulletin 27

Geology and Coal Resources of the Coos Bay Quadrangle, Oregon

This study, by Department geologists and engineers, authorized by the 1943 Legislature and paid for jointly by the State and Coos County, was begun in April 1943 and field work was continued for about a year. The work included both geologic mapping and exploration by drilling and sampling. Since the field work was completed, preparation of the manuscript and maps has been in progress.

The report is ready for the printer (October 1944) and it is hoped that it can be published by January 1, 1945.

As a part of this study, Mr. M. D. Curran of the firm of M. D. Curran & Company, consulting engineers of New York and St. Louis, was employed by the Department to study the economics of producing Coos Bay coal with especial attention given to by-product possibilities. Mr. Curran's report will be appended to the bulletin.

Bulletin 29
Economic Resources of the Beach Deposits of the Oregon Coast
Coos Bay to Columbia River

Dr. W. H. Twenhofel prepared this report for the Department after he made field studies along the coast in the summer of 1943. The report is a companion study to Bulletin 24, Origin of the Black Sands of the Coast of Southwest Oregon. The manuscript is nearly ready for multigraphing (October 1944) and will be published as soon as possible.

G.M.I. Short Paper 12
Preliminary Report on High-Alumina Iron Ores
in Washington County, Oregon

The Department conducted an investigation of these deposits which included surveying, drilling, and sampling. Potentially large tonnage of easily minable ore was indicated. Both pig iron and alumina may be produced from these ores, and nearby markets are available for these products in the Northwest. It is especially important to have a local source of alumina to supply the aluminum reduction plants established on the lower Columbia River. There is need of proving a larger available tonnage, and of doing sufficient metallurgical testing work in order to develop the most economical process for treating these ores. The Department is continuing field work in exploring the deposits. A preliminary report was published in August, subsequent to the period covered by this biennial report.

G.M.I. Short Paper 13
Antimony in Oregon

The survey of antimony deposits was begun by Mr. N. S. Wagner, field geologist stationed at Baker, at a time when national supplies were critical, and it was desired to increase exploration for and production of this important war mineral. The supply situation has been relieved and at present antimony is not classed as critical. The report will be published during October 1944.

Miscellaneous Paper
Newport Landslide, Lincoln County

Houses on the sea cliff in Newport were damaged and destroyed, and one house above Agate Beach was endangered by landslips, following heavy rains in March 1943. The Department was asked by the State Highway Department to make an investigation. John Eliot Allen and Wallace D. Lowry made a survey and prepared a memorandum report, copies of which were sent to the Highway Department and the householders affected.

In a large part of the sea cliff area north of Newport and extending to Yaquina Head, the underlying rocks are shales which dip toward the sea. The shales are overlain by unconsolidated sand upon which, in places, houses have been built. It is not uncommon for blocks of ground to move toward the sea as erosion by waves cuts away the base of the cliff, thus weakening the support for the shales which then tend to slip along the dip. This movement, even if small, opens cracks on the surface of the block or blocks affected.

Miscellaneous Paper

Horse Sign Butte Iron and Vanadium Deposit

A study of the occurrence of magnetite containing a small amount of vanadium on Horse Sign Butte in Curry County was made in September and October 1942. At that time, domestic supplies of vanadium, which is used mainly in making ferro-alloys, were critically low. Department geologists took samples, prepared a sketch map, and made a memorandum report on this deposit which is in a relatively inaccessible part of the county. The U. S. Bureau of Mines has since done some exploratory work on the deposit. Because of inaccessibility and limited size, the deposit does not appear to be economic.

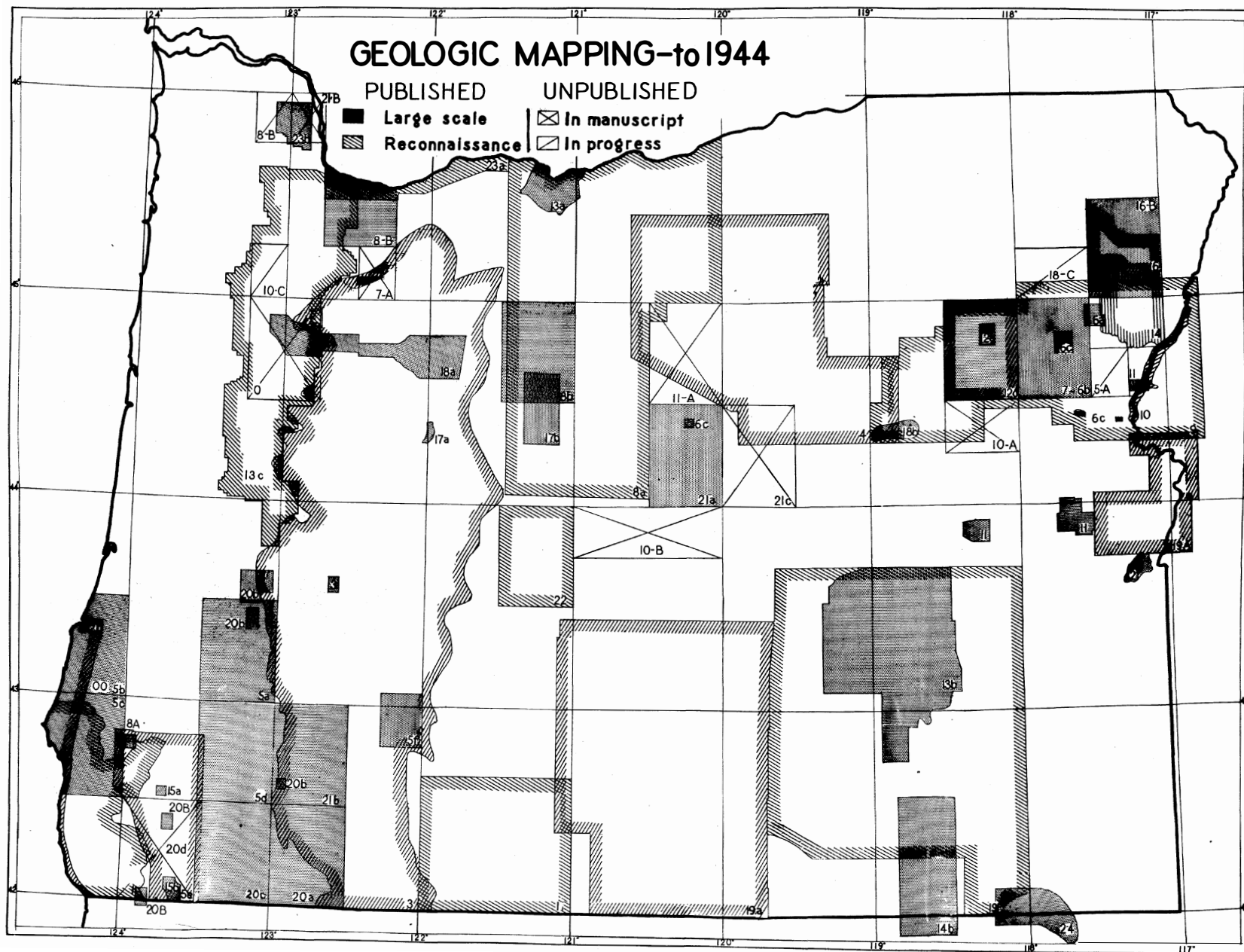
Geologic Map Series

Geology of the South Half of the Telocaset Quadrangle

This quadrangle adjoins the Baker quadrangle on the north. As time permitted in recent months, Mr. N. S. Wagner, field geologist stationed at Baker, mapped parts of this area as a part of a long range project designed to map the geology of the whole quadrangle.

Geology of the Pine Quadrangle

Mapping in the southern part of this area was done by Paul Fitzsimmons, Department assistant geologist, during parts of the summers of 1942 and 1943. The northern half of the quadrangle was mapped by C. P. Ross of the U. S. Geological Survey, and results were published in Department Bulletin 3. Fitzsimmons' early field work was concerned mainly with a study of scheelite possibilities in the Chicken Creek area, because of the need for tungsten in the war program. The completed map was intended to be the basis of a doctorate thesis. Mapping was interrupted when Mr. Fitzsimmons left to work for the U. S. Geological Survey, and completion of this project has been postponed until after the war.



GEOLOGIC MAPPING IN OREGON

1944

Published, in manuscript, and in progress

00. Allen, J. E., and Baldwin, E. M., Geology and coal resources of the Coos Bay quadrangle, Oregon: *Oreg. State Dept. Geol. & Min. Ind., Bull.* 27, 1944.
0. Allison, I. S., Geology of the Albany, Lebanon, Salem, and Stayton quadrangles, Oregon: partially mapped.
1. Butler, G. M., and Mitchell, G. J., Preliminary survey of the geology and mineral resources of Curry County, *Oreg.: Oreg. Bur. Mines & Geol., Min. Res. of Oreg., vol. 2, no. 2*, 1916.
2. Bryan, K., Geology of the Owyhee irrigation dam project: *U. S. Geol. Survey W.S.P.* 597-A, 1929.
3. Callaghan, E., and Buddington, A. F., Metalliferous mineral deposits of the Cascade Range in Oregon: *U. S. Geol. Survey Bull.* 893, 1938.
4. Collier, A. J., The geology and mineral resources of the John Day region: *Oreg. Bur. Mines & Geol., Min. Res. of Oreg., vol. 1, no. 3*, 1914.
5. Diller, J. S., *U. S. Geol. Survey Geol. Atlas* (a) Roseburg folio #49, 1898; (b) Coos Bay folio #73, 1901; (c) Port Orford folio #89, 1903; (d) (and Kay, G. F.) Riddle folio #218, 1924; (e) Mineral resources of southwestern Oregon: *U. S. Geol. Survey Bull.* 546, 1914; (f) (and Patton, H. B.) The geology and petrography of Crater Lake National Park: *U. S. Geol. Survey Professional Paper* 3, 1902.
- 5-A. Fitzsimmons, Paul, Geology of the south half of the Pine quadrangle: partially mapped.
6. Gilluly, J., (a) Copper deposits near Keating, Oregon: *U. S. Geol. Survey Bull.* 830-A, 1933; (b) Geology and mineral resources of the Baker quad., *Oreg.: U. S. Geol. Survey Bull.* 879, 1937; (c) (and Reed, J. C., and Park, C. F., Jr.) Some mining districts of eastern Oregon: *U. S. Geol. Survey Bull.* 846-A, 1933.
7. Grant, U. S., and Cady, G. H., Preliminary report on the general and economic geology of the Baker district of eastern Oregon: *Oreg. Bur. Mines & Geol., Min. Res. of Oreg., vol. 1, no. 6*, 1914.
- 7-A. Harper, H. E., Geology of the Molalla quadrangle: partially mapped.
8. Hodge, E. T., (a) Geologic map of north central Oregon: *U. of Oreg. Pub. Geol. Ser., vol. 1, no. 5*, 1932; also *Oreg. State Monographs, Studies in Geol. No. 3*, 1942; (b) Geologic map Madras quad., Oregon: *Oregon State Monographs, Studies in Geol. No. 1*, 1940.
- 8-A. Leshner, C. E., The Eden Ridge coal field, Coos County, Oregon: *U. S. Geol. Survey Bull.* 541-I, 1914.
- 8-B. Lewis, R. Q., Geology of the Vernonia quadrangle, Oregon: Oregon State College, partially mapped.
9. Lindgren, W., The gold belt of the Blue Mountains of Oregon: *U. S. Geol. Survey 22nd Ann. Rept., pt. 2*, pp. 551-776, 1901.
10. Livingston, D. C., A geologic reconnaissance of the Mineral and Cuddy Mt. mining district, Washington and Adams counties, Idaho (incl. Oregon side of the Snake River): *Idaho Bur. of Mines & Geol. Pamphlet* 13, 1924.
- 10-A. Lowry, W. D., Geology of the north half of Ironside Mountain quadrangle: partially mapped.
- 10-B. Lowry, W. D., and Bowman, J., Geology of the north half of the Hampton and Brothers quadrangles: partially mapped.
- 10-C. McKinley, Philip F., Geology of the McMinnville quadrangle: *Oreg. State College*, partially mapped.
11. Moore, Bernard N., Nonmetallic mineral resources of eastern Oreg.: *U.S. Geol. Survey Bull.* 875, 1937.
- 11-A. Packard, E. L., and Buwalda, J. P., Geology of the Mitchell quadrangle: *Carnegie Inst. Wash.*, partially mapped.
12. Pardee, J. T., (a) Faulting and vein structure in the Cracker Creek gold district, Baker County, *Oreg.: U.S. Geol. Survey Bull.* 380-A, pp. 87, 1909; (b) Beach placers of the Oregon Coast: *U.S. Geol. Survey Circ.* 8, 1934; (c) (and Hewett, D. F.) Geology and mineral resources of the Sumpter quad.: *Oreg. Bur. Mines & Geol., Min. Res. of Oreg., vol. 1, no. 6*, 1914; (d) (et al) Preliminary geologic map of the Sumpter quadrangle, Oregon: *Oreg. State Dept. of Geol. and Min. Ind., Map Ser. no. 6*, 1941.
13. Piper, Arthur M., (a) Geology and ground-water resources of The Dalles region, Oregon: *U.S. Geol. Survey W.S.P.* 659-B, 1932; (b) (and Robinson, T. W., and Park, C. F., Jr.) Geology and ground-water resources of the Harney basin, Oregon: *U. S. Geol. Survey W.S.P.* 841, 1939; (c) Ground-water resources of the Willamette Valley, Oregon: *U. S. Geol. Survey W.S.P.* 890, 1942.
14. Ross, C. P., (a) Geology of part of the Wallowa Mountains, Oregon: *Oreg. State Dept. Geol. & Min. Ind., Bull.* 3, 1938; (b) Quicksilver deposits in the Steens and Pueblo Mountains, southern Oregon: *U. S. Geol. Survey Bull.* 931-J, 1942.
15. Shenon, P. J., (a) Geology of the Robertson, Humdinger, and Robert E. gold mines, southwestern Oregon: *U. S. Geol. Survey Bull.* 830-B, 1933; (b) Geology and ore deposits of the Takilma-Waldo district, Oregon: *U. S. Geol. Survey Bull.* 846-B, 1933.
16. Smith, W. D. et al, (a) Reconnaissance geol. map of the Wallowa Lake quad., Oregon: *Oregon State Dept. Geol. & Min. Ind., Map Series no. 1*, 1938; (b) (and Allen, J. E.) Geology and physiography of the northern Wallowa Mountains, Oregon: *Dept. of Geol. & Min. Ind., Bull.* 12, 1941.
17. Stearns, H. T., (a) Geology and water resources of the upper McKenzie River Valley: *U. S. Geol. Survey W.S.P.* 597-D, 1929; (b) Geology and water resources of the middle Deschutes River Basin, *Oreg.: U. S. Geol. Survey W.S.P.* 637-D, 1931.
18. Thayer, T. P., (a) Geology of the Salem Hills and the North Santiam River basin: *Oreg. State Dept. Geol. & Min. Ind., Bull.* 15, 1939; (b) Chromite deposits of Grant County, *Oreg.: U. S. Geol. Survey Bull.* 922-D, 1940.
- 18-B. Treasher, R. C., Geologic history of the Portland area: *Oreg. State Dept. of Geol. & Min. Ind., G.M.I. Short Paper* 7, 1942, *Map Series no. 7*.
- 18-C. Wagner, N. S., Geology of the southern half of the Telocaset quadrangle, Oregon: partially mapped.
19. Waring, G. A., (a) Geology and water resources of a portion of south-central Oregon: *U. S. Geol. Survey W.S.P.* 220, 1908; (b) Geology and water resources of the Harney Basin region, Oregon: *U. S. Geol. Survey W.S.P.* 231, 1909.
- 19-A. Washburne, C. W., Gas and oil prospects near Vale, Oregon, and Payette, Idaho: *U. S. Geol. Survey Bull.* 431-A, 1911.
20. Wells, F. G., (a) Preliminary geologic map of the Medford quadrangle, Oregon: *Oreg. State Dept. of Geol. & Min. Ind. Map Series no. 2*, 1939; (b) (and Waters, A. C.) Quicksilver deposits of southwestern Oregon: *U. S. Geol. Survey Bull.* 850, 1934; (c) Preliminary geologic map of the Grants Pass quadrangle, Oregon: *Oreg. State Dept. of Geol. & Min. Ind. Map Series no. 5*, 1941; (d) Preliminary geological map of the Kerby quadrangle: *U. S. Geol. Survey*, partially mapped.
- 20-B. Wells, Page, James, Chromite deposits in the Sourdough area, Curry County, and the Briggs Creek area, Josephine County, Oregon: *U. S. Geol. Survey Bull.* 922-P, 1940.
21. Wilkinson, W. D., (a) Geologic map of the Round Mountain quadrangle: *Oreg. State Dept. of Geol. & Min. Ind. Map Series no. 3*, 1940; (b) Reconnaissance geologic map of the Butte Falls quadrangle, Oregon: *Oreg. State Dept. of Geol. & Min. Ind. Map Series no. 4*, 1941; (c) Geological map of the Dayville quadrangle: partially mapped.
- 21-B. Wilkinson, W. D., and Allen J. E., Geological map of the St. Helens quadrangle, Oregon: *Oreg. State Dept. of Geol. & Min. Ind.*, partially mapped.
22. Williams, H., Newberry Volcano of central Oregon: *Geol. Soc. Am. Bull.*, vol. 46, pp. 253-304, 1935.
23. Williams, I. A., (a) The Columbia River Gorge: Its geologic history interpreted from the Columbia River Highway: *Oreg. Bur. Mines & Geol., Min. Res. of Oreg., vol. 2, no. 3*, 1916; (b) (and Parks, H. M.) The limonite iron ores of Columbia County, Oregon: *Bur. Mines & Geol., Min. Res. of Oreg., vol. 3, no. 3*, 1923.
24. Yates, Robert G., Quicksilver deposits of the Opalite district, Malheur County, Oregon, and Humboldt County, Nevada: *U. S. Geol. Survey Bull.* 931-W, 1942.

STUDIES MADE PREVIOUS TO JULY 1, 1942
And not yet published on account of war conditions

G.M.I. Short Paper
Willamette Valley Limestones

This study included field investigations of possible sources of limestone, and an office study mainly in connection with economics of supplying agricultural limestone to Willamette Valley farms. Because of changes in personnel and the need for further study, the manuscript was not completed. It will be published as soon as possible after the war.

Geologic Map Series

Geologic Map and Geology of the St. Helens Quadrangle

This project was a part of the State geological survey in Columbia County during the field season of 1941, under the supervision of Dr. W. D. Wilkinson of Oregon State College. The geologic map and manuscript describing the geology were prepared before Dr. Wilkinson was commissioned in the U. S. Army. The map and accompanying paper will be published as soon as final drafting of the map can be done.

Geologic Map and Geology of the Molalla Quadrangle

The field work of this study was done by Herbert Harper of Oregon State College, and was the basis of a master's thesis. A fire destroyed some of the records, and preparation of the final map and paper was delayed, but was finished before Mr. Harper was commissioned in the U. S. Navy in 1943. The map will be published as soon as possible.

Geologic Map and Geology
of the Albany, Lebanon, Salem, and Stayton Quadrangles

These four 15-minute quadrangles which together make up a 30-minute quadrangle were mapped under the supervision of Dr. Ira S. Allison of Oregon State College. It is hoped to publish the maps and accompanying paper describing the geology in 1945.

Geologic Map and Geology
of the North Half of the Ironside Mountain Quadrangle

The field work was done during the summers of 1941 and 1942 by Wallace D. Lowry of the Department's staff as a part of a doctorate thesis at the University of Rochester. It is probable that further field work in mapping the south half of the quadrangle will be done before the map is published. The area is included in parts of Baker, Grant, Malheur, and Harney counties.

Geologic Map of the Kerby Quadrangle

The work in this area, which occupies parts of Josephine and Curry Counties, was done by a U. S. Geological Survey party headed by Dr. F. G. Wells. Mapping was interrupted by the war, which diverted activities to intensive studies of war minerals. The Department plans to publish this map, when completed, under a cooperative arrangement similar to that under which the Medford and Grants Pass maps were issued.

Geologic Map and Geology of the North Half of the Hampton and Brothers Quadrangles

This area in central Oregon was mapped by Mr. Wallace D. Lowry and Miss Jean Bowman as masters' theses under the direction of Dr. W. D. Wilkinson of Oregon State College. Additional mapping was done during the summer of 1942 when both Miss Bowman and Mr. Lowry were on the Department's staff. It is planned to publish this map early in the postwar period.

COOPERATIVE WORK

Formal cooperative work with the U. S. Geological Survey was interrupted because of the war, but close association between geologists of the Survey and the staff of the Department has been maintained for the purpose of exchanging information on Oregon geology and mineral deposits.

Both the regional office of the U. S. Bureau of Mines in Portland and the Experiment Station of the Bureau at Seattle have continued mutually helpful relationships with the Department.

Since the State geologic survey was suspended for the duration of the war, there have been no formal cooperative projects undertaken with the University of Oregon and Oregon State College, except the long-range projects with the Oregon State Agricultural Experiment Station mentioned under the heading "Spectrographic Laboratory."

Because the Department and these educational institutions, especially their geological, engineering, and chemical staffs, engage in similar technical work, a close relationship is highly desirable and is being maintained. Cooperative projects should be undertaken whenever practicable and it is believed that they could be of as great mutual benefit in the future as they have been in the past.

Considerable work was done in making silica estimates for the State Board of Health in its survey of industrial plants, with particular attention to silicosis hazards.

POSTWAR PLANNING

The Department has made studies of the possibilities of starting new industrial projects or expanding present industries to provide jobs for post-war work.

Undoubtedly there will be renewed activity in gold mining when restrictions are removed by the Government. A list of gold mines and prospects has been prepared with especial attention given by the field offices to those in their respective areas that have a record of production or have had favorable development records.

Considering that building construction is likely to experience a considerable revival after the war, attention has been given by the Department to production of building stone in the State. There is no lack of first class material in Oregon, particularly granite and marble, but the building stone industry is highly specialized and competitive. Old, established concerns appear to have a firm hold on the Oregon market. In order to be successful, new projects in Oregon would need to be established by experienced, adequately financed companies, but it is believed that, particularly in new State buildings, special effort should be made by those in authority to utilize Oregon stone wherever stone is required in construction.

In order to stabilize aluminum production in the Northwest, and this is necessary to the prosperity of this region, it is essential to have a local source of alumina to supply the reduction plants already established. The high-alumina clays are one possible source, and production of alumina from these clays will be studied on a large scale by means of the new plant at Salem. Another possible source is the ferruginous bauxite deposits in Washington County. In the hope that a new project or projects could be started to provide jobs, the Department has done considerable work in making available information on these deposits. Characteristics of these deposits point to probable commercial utilization to produce both pig iron and alumina, but only experienced and well-financed groups should undertake such projects.

Expansion in coal mining at Coos Bay, which appears probable, should help to provide new employment. It is believed that the Department, in cooperation with Coos County, has assisted in making this expansion possible.

SUMMARY

The Board believes that the activities of the Department should be continued generally along the same lines as previously followed, but certain projects should be given especial attention, and they are outlined below:

- (1) Several field studies, principally geologic mapping, were completed or nearly completed prior to the period covered by this report, but results have not been published, mainly because of conditions caused by the war. These maps and reports should be published just as soon as practicable.
- (2) It is believed that nonmetallics are going to occupy an increasingly important position in the State's mineral industry. Nonmetallics always grow in importance where populations and industrial activity increase. Therefore, the Department should be alive to all possibilities of utilization of the State's nonmetallic mineral resources. Expansion in production may be slow because of the peculiar marketing problems, but field work, economic studies, and laboratory research are of primary importance in encouraging and promoting such expansion. Clays, silica sand, salines, limestone, diatomite, coal, pumice, asbestos, building stones, and gypsum are among the known commercial nonmetallics in the State.
- (3) A geologic map of the State should be published. Although the geology of some parts of Oregon has not been mapped in detail, enough information is available so that a map may be prepared in sufficient detail to be valuable. There is a consistent demand for such a map, and it is planned to make this a project during the next biennium.
- (4) Volumes of the Mines Catalog which describe mining properties in areas of the State have been published, with the exception of northwestern and southeastern Oregon. Insofar as practicable, work on the catalog, which was interrupted by the war, should be continued and the volumes that describe the areas not now covered should be issued. In addition, there is need of revision of some volumes already published, especially Bulletin 14-A, which covers Baker, Union, and Wallowa counties.
- (5) It is planned to resume the State geological survey work in quadrangle mapping as soon as war conditions will permit.
- (6) As mentioned elsewhere in this report, studies of petroleum possibilities in the State by large oil companies have increased greatly during the past two years. This is caused primarily by the great drain on the country's oil reserves for war use, and the need for exploring new fields. The Department plans to make field studies and prepare regional maps to assist in gaining a better knowledge of the rock formations that might be favorable.
- (7) A report of the geology of the regions traversed by Oregon highways, including geological descriptions of State parks, would, it is believed, have great appeal both to tourists and residents of the State. The report should be accurate technically, but should be prepared primarily for people who are interested in, but not trained in, geology. This project will be undertaken as soon as possible.

In conclusion, the Board wishes to emphasize the value of purely scientific studies by the Department, particularly in research work. Experience has shown that these studies not only may have scientific value, but often have commercial application. Insofar as it is able, the Department should undertake such studies.

COOS COUNTY COAL INVESTIGATIONS ACCOUNT

EXPENDITURES 1943-1944

	Expendi- tures 5/1/43- 6/30/44	Estimated Expendi- tures after 6/30/44	Total Estimated Expendi- tures
<u>Salaries & Wages</u>	\$ 23,570.08	\$ 2,310.00	\$ 25,880.08
<u>General Operation & Maint.</u>	<u>5,725.11</u>	<u>1,726.85</u>	<u>7,451.96</u>
Office Supplies	96.59		96.59
Telephone & Telegraph	15.72		15.72
Post., Fr't & Express	37.72		37.72
Printing		1,497.03	1,497.03
Rents	15.00	20.00	35.00
Employer's Contribut.	467.09	11.56	478.65
Private Car Mileage	75.52		75.52
Fares on R.R. etc.	61.47		61.47
Meals & Lodging	893.60	147.26	1,040.86
Motor Supplies	798.37		798.37
Light & Power	23.50		23.50
Equipment Rentals	1,179.09		1,179.09
Field Supplies	234.23		234.23
Draft. & Bl. Prints	137.37	1.00	138.37
Equipment Repairs	73.92		73.92
Photo Supplies	15.92		15.92
Research Work	1,600.00	50.00	1,650.00
<u>Capital Outlays</u>	<u>1,667.96</u>		<u>1,667.96</u>
Office Furniture	32.65		32.65
Motor Vehicles	1,145.00		1,145.00
Field Equipment	461.51		461.51
Drafting Equipment	28.80		28.80
 TOTAL	 \$ 30,963.15	 \$ 4,036.85	 \$ 35,000.00

OREGON STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

GEOLOGY AND MINERAL INDUSTRIES ACCOUNT
(section 7, chapter 179, Oregon Laws, 1937)
for period June 30, 1941, to June 30, 1943.

Balance, June 30, 1941 \$ 117.84

Receipts

Contribution from Coos County for chromite study	\$ 208.94	
J. A. Maller, refund for expenses J. Adams	12.85	
Refund Bd. of Control for fleet owners' contract, Gen. Electric	42.93	
State Land Board, expenses trip to Agness	13.17	
J. Schulein, contribution for chromite study Coos County	45.25	
Adjustment with State Treasurer's records	1.00	
Reconstruction Finance Corp. for making thin sections	7.50	
Sale of publications	1247.29	
Rental of alidade	10.00	
Miscellaneous sales	37.80	
Metals Reserve Company	77.90	
Refunds for telephone calls, etc.	<u>154.23</u>	
		<u>1858.86</u>
		1976.70

Disbursements

These unappropriated funds were used for departmental expenses where estimates were under or where budgeted funds were insufficient to cover G.O.M. items and Capital Outlays.

1025.88

BALANCE, June 30th, 1943 \$ 950.82

For period June 30, 1943, to June 30, 1944

Balance, June 30, 1943 \$ 950.82

Receipts

Sale of publications	\$ 460.01	
Oregon State College, refund for materials for cooperative program	38.09	
Refund for telephone calls	16.10	
U. S. Geological Survey, rent of part of Grants Pass office	42.00	
Copies of mining reports sold	5.35	
Sale of old faucets at Baker office	1.61	
Transfer of sale of Capital Assets, per Secy. of State	30.25	
Refund for gasoline barrel returned (calcite project)	<u>4.00</u>	
		<u>597.41</u>
		1548.23

Disbursements

Postage		100.00
Supplies for meals (calcite project)	117.72	
Deductions from P/R for board "	<u>105.00</u>	<u>12.72</u>
		<u>112.72</u>
BALANCE, June 30th, 1944		\$ 1435.51

COMPENSATION AND EXPENSES OF EMPLOYEES

<u>Name</u>	<u>Title</u>	<u>Compensation</u> <u>7/1/42-6/30/44</u>	<u>Travel and Expenses</u> <u>7/1/42-6/30/44</u>
Earl K. Nixon *	Administrator	(7507.97	668.55
F. A. Steeble	Intermed. Fiscal Worker	(59.07 (1)
Agatha Cook *	Secretary	3640.00	
F. W. Libbey	Mining Engineer	178.06	
		(8112.33	213.56
John Eliot Allen	Chief Geologist	(139.92 (1)
		(3210.00	323.93
R. C. Treasher *	Field Geologist	(3530.00 (1)	515.17 (1)
Hugh K. Lancaster *	Field Geologist	4300.00	521.02
Wessley Paulsen *	Junior Geologist	2250.00	76.89
Leslie C. Richards *	Assayer	32.74	
June Roberts	Secretary	585.00	2.85
Fern Johnson *	Junior Stenographer	3015.49	
Robert G. Bassett *	Assayer	108.15	
H. C. Harrison *	Chief Chemist	2145.00	235.36
Ralph S. Mason	Engineer	4135.69	105.55
		(2550.00	231.34 (2)
		(1250.00 (1)	338.22 (1)
Jean Bowman *	Junior Geologist	451.00	
Phyllis Hanton *	Junior Stenographer	100.00	
Thomas A. Roy *	Junior Geologist	207.50	
Wallace D. Lowry	Junior Geologist	(4475.00	438.24
		(65.48 (2)
Alice C. Lancaster *	Junior Stenographer	142.45	
Lillian F. Owen	Junior Stenographer	2366.13	
J. Paul Fitzsimmons *	Junior Geologist	(1190.83	
		(561.29 (2)	297.15 (2)
Lucille Baldwin *	Junior Stenographer	223.55	
Joyce B. Priestaf	Junior Geologist	2418.33	
H. Leora Sidwell *	Clerical	18.13	
Robert Verpoorten *	Office Boy	7.00	
Clay Myers *	Office Boy	242.32	
Alma Donaldson	Junior Stenographer	168.36	
Frances H. Furniss	Senior Stenographer	2211.67	
Norman S. Wagner	Field Geologist	4620.00	400.06
Marjorie Hollingworth *	Junior Stenographer	126.36	
Melva Dixon *	Junior Stenographer	25.37	
Ewart M. Baldwin	Junior Geologist	(450.00	
		(2300.00 (1)	347.87 (1)
Ronald Thomas	Office Boy	92.14	
Esther W. Miller	Assistant Chemist	2111.67	
W. H. Twenhofel *	Technical Consultant	(200.00	
		(300.00 (2)	796.65 (2)
Jo Anne Lehman *	Draftsman	224.00 (1)	
Ora L. Dunn *	Junior Stenographer	45.16	
Wynifred M. Smith *	Junior Stenographer	198.87	
Laurie L. Hoagland	Assayer	2975.80	
Robert C. Mackey *	Office Boy	158.93	
Frances Saling *	Junior Stenographer	493.55	
Rowena Harrison *	Clerical	36.50	
Helene M. deJong *	Junior Stenographer	215.42	
J. Francis Cleaver *	Engineer	(238.33	125.55 (1)
		(1842.50 (1)	161.09 (2)
		(458.33 (2)	
John F. Dinkel Jr.	Draftsman	205.80	
L. C. Swanson *	Field Assistant	(123.75	
		(744.75 (2)	83.20 (2)
C. A. Garris *	Laborer	340.00 (2)	
W. P. Harris *	Laborer	198.00 (2)	
C. A. Phillips *	Laborer	192.00 (2)	
W. A. G. Bennett *	Field Geologist	1038.39	60.20
Geraldine Simmons	Junior Stenographer	87.63	
Lola May Ward	Junior Stenographer	50.00	
Laborers (Coos Bay Coal) *		14423.58 (1)	
TOTAL		\$ 95,850.82	6,206.92
Charged to Department G&M		69,486.37	3,046.21
(1)	Coos Co. Coal Inv. a/c	23,570.08	1,525.80
(2)	Special Requests	2,794.37	1,634.91

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

OREGON STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Comparative Statements of Expenditures 1942-43, 1942-44, and 1943-45

	Expendi- tures 7/1/41- 6/30/43	1941-1943 G&MI * Expendi- tures 7/1/41- 6/30/43	Total Expendi- tures 7/1/41- 6/30/43
<u>Salaries & Wages</u>	\$ 63,596.11		63,596.11
<u>General, Operation & Maint.</u>	<u>23,267.66</u>	<u>1,025.88</u>	<u>24,293.54</u>
Office Supplies	1,126.09	15.74	1,141.83
Telephone & Telegraph	908.59	227.19	1,135.78
Postage, Freight-Express	1,299.31	11.52	1,310.83
Printing & Advertising	3,294.71	66.50	3,361.21
Rents	6,154.20		6,154.20
Premiums	60.25		60.25
Employer's Contributions	258.38	1.50	259.88
Assessments, Restoration	54.68		54.68
Auditing & Accounting	245.78		245.78
Private Car Mileage	295.08	175.00	470.08
Fares on R.R., etc	750.88	52.02	802.90
Meals & Lodging	2,168.59	16.40	2,184.99
Motor Vehicles	2,313.24	185.19	2,498.43
Heat-light-water-power	902.83	10.11	912.94
Laundry	30.81	4.69	35.50
Laboratory-research	1,424.93	16.26	1,441.19
Educational	221.64		221.64
Buildings & Fixtures	807.55	23.35	830.90
All Other	950.12	57.26	1,007.38
Beach Sands		162.84	162.84
Contribution to Spec.Lab.		.31	.31
<u>Capital Outlays</u>	<u>3,433.75</u>		<u>3,433.75</u>
Office Furn. & Equipt.	430.84		430.84
Laboratory & Field Equipt.	1,277.89		1,277.89
Vehicles & Equipment	1,614.75		1,614.75
Books	107.21		107.21
All Other	3.06		3.06
<u>Special Requests</u>	<u>10,674.92</u>		<u>10,674.92</u>
State Geological Survey	4,771.10		4,771.10
Coop. U.S.Geol. Survey	4,040.07		4,040.07
Quicksilver Resurvey	1,363.75		1,363.75
Beach Sands	500.00		500.00
Strategic & Critical Min.			
Nonmetallic Survey			
Investigation of Salt Deposits			
TOTAL EXPENDITURES	\$ 100,972.44	1,025.88	101,998.32

* Items paid out of G&MI Account (see page 26)

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

Expendi- tures 7/1/42- 6/30/44	<u>1942-1944</u> G&I * Expendi- tures 7/1/42- 6/30/44	Total Expendi- tures 7/1/42- 6/30/44	<u>1943-45</u> Estimated Expendi- tures 7/1/43- 6/30/45**	<u>1945-47</u> Funds Requested for 1945-47**
\$ 69,486.37		69,486.37	80,660.88	94,320.00
<u>22,883.69</u>	<u>362.07</u>	<u>23,245.76</u>	<u>24,788.34</u>	<u>29,900.00</u>
913.96		913.96	896.08	900.00
1,098.67	118.61	1,217.28	960.00	1,000.00
1,065.17	100.00	1,165.17	1,067.25	1,000.00
2,889.27		2,889.27	3,662.13	3,500.00
7,504.25		7,504.25	8,536.25	10,500.00
61.96		61.96	75.00	100.00
265.06	1.50	266.56	400.00	600.00
98.42		98.42	136.06	100.00
136.73		136.73	250.00	250.00
317.24		317.24	413.20	400.00
539.02	64.74	603.76	386.35	750.00
1,861.55	16.40	1,877.95	2,200.00	3,500.00
2,080.31	.50	2,080.81	2,121.38	2,500.00
711.35	6.00	717.35	548.10	750.00
30.00	4.69	34.69	50.00	50.00
1,431.18		1,431.18	1,519.39	2,500.00
190.25		190.25	197.15	300.00
512.39	23.35	535.74	500.00	300.00
1,176.91	26.28	1,203.19	870.00	900.00
<u>1,928.48</u>		<u>1,928.48</u>	<u>1,407.62</u>	<u>3,000.00</u>
237.29		237.29	311.63	500.00
1,523.45		1,523.45	1,015.97	1,250.00
74.16		74.16	3.16	1,000.00
92.52		92.52	76.86	100.00
<u>1.06</u>		<u>1.06</u>		<u>150.00</u>
<u>9,786.14</u>		<u>9,786.14</u>	<u>9,100.00</u>	<u>9,000.00</u>
3,348.53		3,348.53	6,000.00	6,000.00
4,040.07		4,040.07	1,000.00	1,000.00
600.00		600.00		
1,797.54		1,797.54	2,100.00	
				1,000.00
				<u>1,000.00</u>
104,084.68	362.07	104,446.75	115,956.84 **	136,220.00 **

PUBLICATIONS

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

BULLETINS

	<u>Price Postpaid</u>
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 W. Oregon, '38: Wilson & Treasher	(out of print)
7. The Gem Minerals of Oregon, 1938: H.C.Dake	0.10
8. The Feasibility of a Steel Plant in the Lower Columbia Area near Portland, Oregon: Revised edition, 1940: R.M.Miller	0.40
9. Chromite Deposits in Oregon, 1938: John Eliot Allen	0.50
10. Placer Mining on the Rogue River, Oregon, in Relation to Fish and Fishing in that Stream, 1938: Henry Baldwin 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 Mtns., '41: W.D.Smith, J.E.Allen & Others	0.65
13. First Biennial Report of the Department, 1937-1938	(out of print)
14. Oregon Metal Mines Handbook: by the staff	
A. Baker, Union, & Wallowa Counties, 1939	0.50
B. Grant, Morrow, Umatilla Counties, 1941	0.50
C. Vol. I, Coos, Curry, Douglas Counties, 1941	(out of print)
Vol.II, Section 1, Josephine County, 1942	0.75
Section 2, Jackson County, 1943	0.75
15. Geology of the Salem Hills & North Santiam River Basin, Oregon, '39: Thos.P.Thayer	(out of print)
16. Field Identification of Minerals for Oregon Prospectors and Collectors, Second edition, 1941: compiled by Ray C. Treasher	0.50
17. Manganese in Oregon, 1942: by the staff	0.45
18. First Aid to Fossils, or What to Do Before the Paleontologist Comes, '39: J.E.Allen	0.20
19. Dredging of Farmland in Oregon, 1939: F.W.Libbey	(out of print)
20. Analyses & Other Properties of Oregon Coals, 1940: H.F.Yancey & M.R.Geer	0.35
21. Second Biennial Report of the Department, 1939-1940	Free
22. Investigation of Reported Occurrence of Tin at Juniper Ridge, Ore., '42: H.C.Harrison	0.40
23. Origin of the Black Sands of the Coast of SW. Oregon, 1943: W.H.Twenhofel	0.30
24. Third Biennial Report of the Department, 1941-1942	Free
25. SOIL: Its Origin, Destruction, and Preservation, 1944: W.H.Twenhofel	0.45
26. Geology & Coal Resources of Coos Bay Quad., 1944: John Eliot Allen & Ewart M. Baldwin	1.00
27. Fourth Biennial Report of the Department, 1943-1944	Free

G.M.I. SHORT PAPERS

1. Preliminary Report upon Oregon Saline Lakes, 1939: O.F.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., Ore., '40: W.D.Wilkinson	(out of print)
4. Flotation of Oregon Limestone, 1940: J.B.Clemmer & B.H.Clemmons	0.10
5. Survey of Non-Metallic Mineral Production of Oregon for 1940-1941: 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	0.15
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. Prelim. Rpt. on High-Alumina Iron Ores in Wash. County, Ore., '44: Libbey, Lowry, & Mason	0.15
13. Antimony in Oregon, 1944: Norman S. Wagner	0.15

GEOLOGIC MAP SERIES

1. Geologic Map of the Wallowa Lake Quad., 1938: W.D.Smith & Others (also in Bull. 12)	0.45
2. Geologic Map of Medford Quadrangle, 1939: F.G.Wells & Others	0.40
3. Geologic Map and Geology of Round Mountain Quad., 1940: W.D.Wilkinson & Others	0.25
4. Geologic Map of the Butte Falls Quad., 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. Prelim. Geologic Map of the Sumpter Quad., 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)	

MISCELLANEOUS PUBLICATIONS

The Ore.-Bin: issued monthly by the staff, as medium for news items about the Department, mines, and minerals. Subscription price per year	0.25
Sampling of Small Prospects and New Discoveries	Free
Oregon Mineral Localities Map	0.05
Landforms of Oregon: a physiographic sketch, (17 by 22 inches) 1941	0.10