

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
329 S. W. Oak Street
Portland, Oregon

Bulletin No. 13

First Biennial Report
of the
**State Department of Geology
and Mineral Industries**
of the
STATE OF OREGON
1937-1938

TO HIS EXCELLENCY THE GOVERNOR
and the
FORTIETH LEGISLATIVE ASSEMBLY



EARL K. NIXON
DIRECTOR

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To His Excellency, Charles H. Martin,
Governor of the State of Oregon,
and
The Legislative Assembly of the State of Oregon.

Sirs:

We have the honor of submitting to you the First
Biennial Report of the Department of Geology and
Mineral Industries of the State of Oregon cover-
ing the period from July 1, 1937 to December 31,
1938.

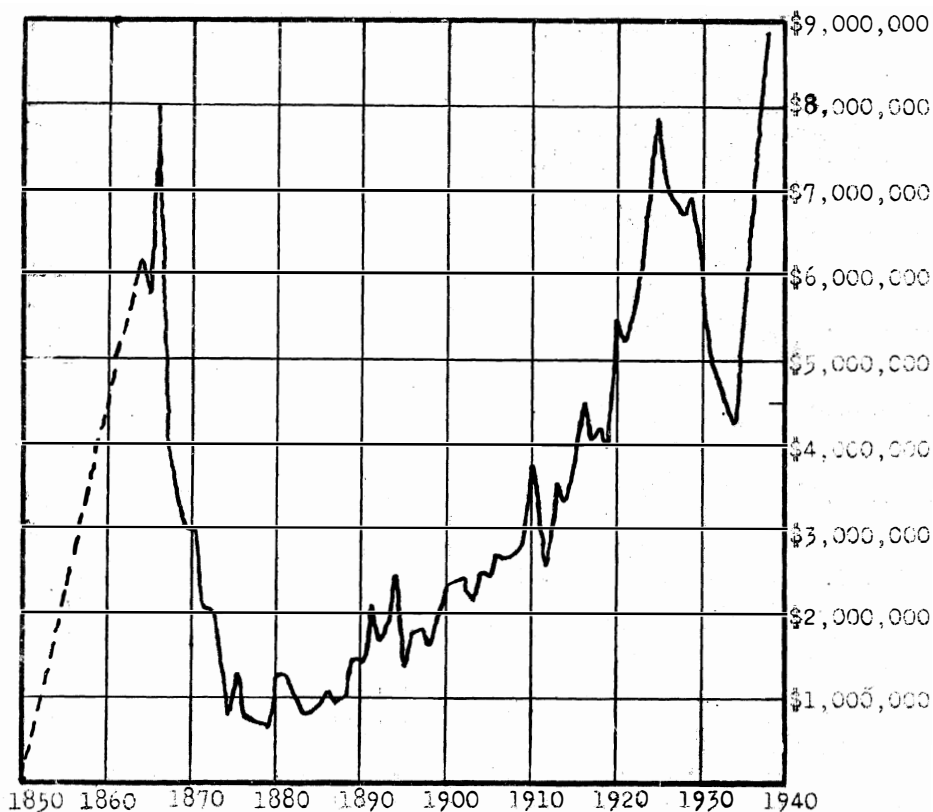
W. H. Strayer
Albert Burch
E. B. MacNaughton
Board

Portland, Oregon.
January 1st, 1939

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VALUE OF OREGON MINERAL PRODUCTION TO AND INCLUDING 1938



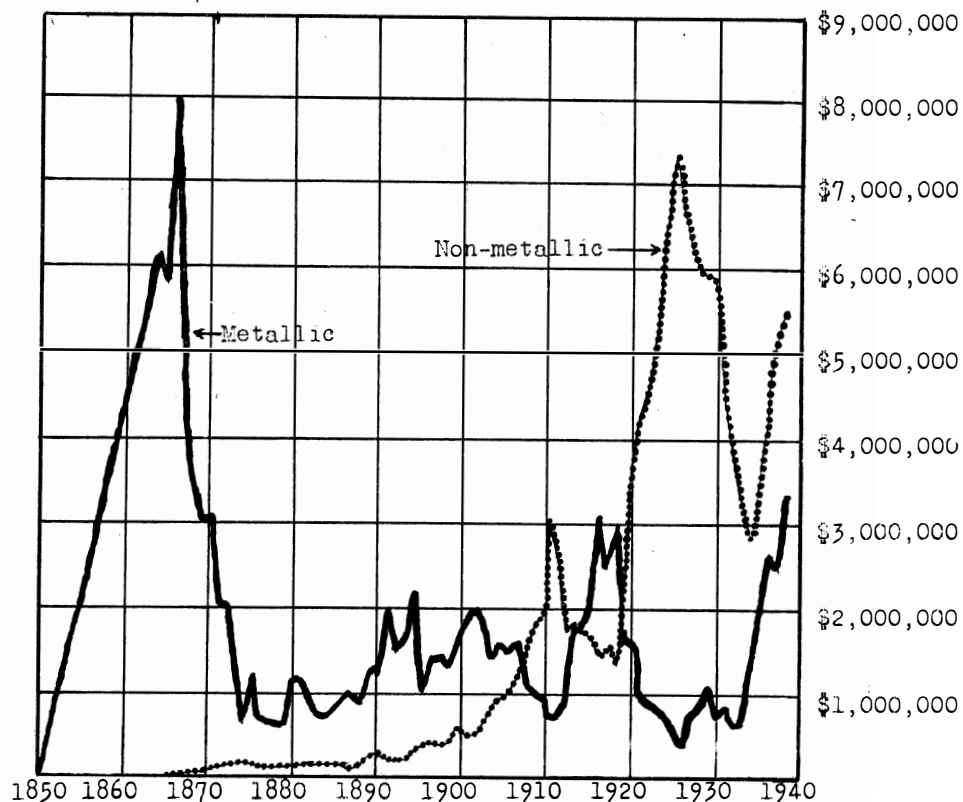
Total value of Production of Metals	\$132,000,000
Total value of Production of Non-Metals	118,000,000
Total of all Oregon Mineral Products	<u>\$250,000,000</u>

The peak of production at 1865-1866 was due to the high output of gold from hydraulic mining in South-western Oregon.

The peak around 1925 was due mainly to increased output of non-metallics.

Since 1933 the increase is due equally to non-metallic and to quicksilver and gold productions, - the latter being encouraged by a higher price for the metal.

VALUE OF OREGON METALLIC AND NON-METALLIC MINERAL PRODUCTION
to and including 1938.



The value of metallic production is estimated at
\$2,392,133 for 1937; \$3,400,000 for 1938.

Value of the non-metallic production is estimated
at \$5,234,776 for 1937; \$5,500,000 for 1938.

The percentage of increase for all mineral produc-
tion in Oregon from 1937 to 1938 is 16 2/3%.

Introductory Statement

This report for the last three-quarters of the 1937-1938 biennium covers the activities of the Oregon State Department of Geology and Mineral Industries, which started functioning July 1, 1937.

The Oregon Bureau of Mines and Geology was discontinued in 1923 and there was no state department devoted to geology, mining or mineral industries until the present department was established by the 39th Regular Session of the Legislature, with Hon. Charles H. Martin as Governor.

Certain considerations had to be taken into account in order to plan activities that would be of most value to Oregon during this first period:-

- The kinds and uses of Oregon minerals produced in the past.
- The status and needs of present mining and mineral industries.
- Raw material needs of new industries to come with cheap power.
- Need for basic geology, metallurgy, and technical research.
- Limitations imposed by lack of topographic surveys, lack of smelting facilities, poor markets, high transportation costs, and investor reluctance.

The program then outlined and followed was balanced among:-

- Taking inventory of Oregon mining and mineral industries.
- Encouragement of present industries by giving advice and helping with assaying, metallurgy, engineering and geology.
- Encouragement of new industries by hunting new mineral deposits and making economic studies based on present conditions.
- Doing as much geological field surveying as funds allowed.
- Instilling confidence in Oregon mining by discouraging unsound practice and dishonest or ill-advised promotions.

The most important activities carried out by the Department under the above program are described in this report, beginning at page 5. Costs of the various projects are indicated at appropriate places.

What the Department, if continued, plans to do in the future is outlined beginning page 33.

Set-up of the Department

Under the law which created this Department (Oregon Laws of 1937, Chapter 179) certain duties were outlined to:-

1. Conduct geological and mineral resource studies.
2. Carry out scientific and economic studies pertaining to utilization of raw materials.
3. Co-operate with Federal and other agencies in such studies.
4. Serve as a bureau of mineral information, to conduct a mineral survey of the state, to bring up to date the mines catalog, to publish reports of studies, statistics, etc.
5. Conduct a State Geological Survey.
6. Collect specimens and develop a museum containing said specimens, samples, maps, models, etc.
7. Start a mining and geological library.
8. Make qualitative and quantitative mineral assays.
9. Study minerals and ores and processes for their improved treatment.
10. Establish state assay laboratories for free assaying of ores for citizens of the state.
11. Give a grubstake loan of \$50 each to qualified prospectors, the loan to be repaid and also a royalty to the state of 10% of returns from claims staked.

The Department is administered by a Governing Board of three citizens who serve for four-year periods (except the present members who were appointed for 4-, 3-, and 2-year terms). The Governor of Oregon selects the Governing Board, subject to the approval of the senate. The Board members serve without compensation but receive travelling expenses. They meet at least four times each year. The Board may make contracts with other Federal and state agencies, may receive gifts and legacies and make use of same for the best interests of Oregon.

It causes to be published a Biennial Report of departmental activities. 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 goes to the State Treasurer for the account of a "departmental fund". The accounts of the Department must be audited annually.

The following sums were appropriated for each of the years 1937 and 1938:

Departmental	\$20,000.	
Assay Laboratories	10,000	
Grubstake loan	<u>20,000</u>	50,000.

Personnel

The Governing Board of the Department consists of the following (beginning March 1937):

W. H. Strayer, Baker, Chairman	4 years
Albert Burch, Medford	3 years
E. B. MacNaughton, Portland	2 years

Future appointees hold office for 4-year periods.

The regular active personnel of the department is as follows:-

At Portland Office - Headquarters

Earl K. Nixon, Director. Mining Geologist
Arthur M. Swartley, Cons. Mining Engineer
Ray C. Treasher, Geologist
F. W. Libbey, Mining Engineer
H. E. Crain, Bookkeeper
Ruth VanMeter, Secretary and Typist.
F. A. Steeble, Typist and Multigraph

At Baker State Assay Laboratory

John Eliot Allen, Field Geologist
Leslie L. Motz, Assayer and Metallurgist

At Grants Pass State Assay Laboratory

J. E. Morrison, Mining Geologist
Albert A. Lewis, Assayer

On certain studies and projects carried out by the Department, specialists or technical consultants have been temporarily employed on a per-diem or contract basis.

Extra office and stenographic help is employed both at the head office and at the laboratories when especially needed.

Policies

During this first period of the Department's work, studies and activities have been carried out which were selected primarily for their practical and economic application. In other words, strictly scientific and academically technical considerations have been subordinated to those of more immediate practical and economic value.

The Department realizes that scientific and technical research as applied to geological, mining, metallurgical, and industrial problems, is a most critical need in this state. However, in 1937 and 1938, we needed most to take stock of Oregon's known mineral resources, to learn the needs of present industries by studying them, to carry out certain economic studies for establishing the basis for new industries to utilize known mineral deposits, to encourage certain mining operations by giving direct technical advice, to encourage others by arranging metallurgical assistance, and to help still others including an army of prospectors and small operators by giving practical advice on operation, exploration, financing, etc.

From now on departmental activities of technical and scientific nature will receive more stress; more attention will be given to metallurgical problems with the expectation of enhancing commercial utilization of both metallic and non-metallic raw materials; the amount of geologic surveying will be about tripled the coming season; suspected new mineral raw materials will be sought and new processes for utilization studied.

On the premise that more industries, more payrolls, and more consuming population will be the greatest aids in guaranteeing Oregon's prosperity, this Department will continue to stress the importance of electro-metallurgical and chemical industries which may use Bonneville power. And the Department will carry out such studies as may aid in the establishment of such industries.

The profit factor, direct or indirect, must be present in any study or consideration selected to receive the attention of this Department.

One policy of this Department shall always be followed, namely, reports of studies made shall always be compiled and published at the earliest possible time after completion of the work, - so that the greatest practical use can be made of the data obtained. It must not and will not wait months and months or years, thus becoming stale or obsolete.

State Assay Laboratories

State Assay Laboratories were established at Grants Pass and at Baker soon after the Department began to function on July 1, 1937, in compliance with the requirements of the Act creating the Department. The assayer at each laboratory makes qualitative and quantitative analyses for various metals such as gold, silver, lead, copper, zinc, molybdenum, chromium, platinum, manganese, tungsten, etc. Advice is given inquirers as to rock types and to questions concerning mineralization. Cyanide (leaching) tests are sometimes made.

Any citizen of Oregon is entitled to two free assays in any 30-day period, but no samples are accepted from engineers or others making mine examinations for purposes of evaluation. In this respect the state laboratories are not in competition with custom assayers. All work and technical advice is free.

At each laboratory the Department has established headquarters for a field geologist or mining geologist. These men spend about four-fifths of their time in the field visiting mines, helping with geological problems on surface or underground, helping small operators and prospectors by giving geological or engineering advice, sampling in connection with special studies, gathering data on mineral production, and in making geologic surveys for the Department. Where an operator has a problem of some magnitude, or where a report involving evaluation is desired, the matter is declined by the department geologist, who asks the operator to call in a practicing consultant. The services of these department geologists are free and, judging by the fact that the calls for their time are double their capacity for compliance, their services are of as much benefit to the mining communities as are those of the assayers.

During the 16 months the laboratories have been in operation, the two have made 7969 assay determinations, have had about 11,300 callers, have handled some 5280 letters.

During this same period the field geologists have visited and made reports on some 275 properties and, of course, have visited many others, some several times, for the purpose of giving advice or for other reasons.

Administration of Grubstake Loan

During 1937, a total of 342 grubstake loans were issued to applicants who qualified and were selected by the county courts or commissioners of the counties where the applicants resided. Owing to the year being half gone when the Department started functioning, and to the necessity of getting the grubstakers into the field as soon as possible, the Department, not yet well organized, was unable to give the county courts much help in selecting prospectors best equipped by experience and knowledge to make good.

In any event, a number of the 1937 grubstakers made satisfactory progress; some did little; and a few did nothing. In all, some 51 claims were staked and recorded.

In 1938, it was decided that applicants for the grubstake should, as far as possible, be referred to a committee including the County Court, sheriff, county relief agent, and an engineer of this Department. In this manner a considerably better, and smaller, group of grubstakers was selected for the current year. They staked some 172 claims, of which 56 were recorded.

Claims staked at the higher elevations by 1937 grubstakers could not be examined by Department field men until the summer of 1938, and with the 1938 grubstakers in the field early this spring, the two field geologists were kept busy much of the year hunting for and following up the work of these men. In fact, a lot of the director's time and that of one engineer in the head office, as well as a great deal of bookkeeping and stenographic service, was required in the administration of the grubstake loan. The law states that the work of the grubstakers must be followed up, their claims examined, and all help given by the Department.

It is yet too early to say what will be the net benefit to Oregon of the grubstake Act. To date no outstanding find has been made, but it must be remembered that mines are not put into production in a few months with the funds of an average prospector.

Below is a table covering administration and results of the grubstake Act:

	<u>1937-1938</u>
Loans granted	568
Claims staked and actually recorded	107
Prospectors sending in reports	387
Number of men who did satisfactory work	
according to Department records	75-100
Number of prospectors returning loan	5
Amount of royalty returned to date	\$7.20
Average age of prospectors.	52
Number of assays made for grubstakers	740

Mines Inspection Service

Mine operators and property owners frequently ask that someone from the Department "look over their property" and give them advice on some phase of geology, engineering, operation or financing. This is done in all possible cases, by one of the field geologists from the branch office, by the director, an engineer or geologist from the head office, that is, by whomever is closest or best equipped to do the job in question.

The director is in the field nearly half of the time; the field geologists are out most of the time, and engineers from the Portland office make frequent trips to areas in western Oregon.

In this manner the Department is able to give much direct assistance to operators, to mine and claim owners, and also to keep in constant touch with the mineral producers and the needs of the industry.

As there is no official mine inspector or safety engineer for mining in this state, the Department practically assumed this duty as regards mine safety at the smaller mines. In at least one case in southern Oregon, a serious accident was probably averted by the Department engineer getting some miners out of an opening in anticipation of the cave-in which followed.

The Department has been asked by the State Industrial Accident Commission to prepare a state-wide safety code for mining.

Mining and Mineral Information Service

This service to citizens of Oregon is one of the most important activities of this Department. It takes a great share of the staff's time and for that reason costs the most money; yet the results of this personal service are difficult to report or demonstrate in any tangible way.

A tabulation of the number and kinds of requests for information pertaining to mines, mining properties, mining laws, minerals, mineral industries, and mineral identification would be a task beyond our facilities. These requests come to the head office and to the assay laboratories, - many of them referred to this Department for reply by other state departments, colleges, chambers of commerce, influential citizens and public office holders.

Suffice it to say that an average of 55 letters is handled by the head office each working day. This does not include press bulletins, clearing house reports and technical publications sent out.

From 10 to 25 visitors call at the head office of the Department each working day. Presumably this number will be substantially increased when facilities are available for a proper museum display of Oregon mineral and ore specimens.

In addition the Department provides a so-called clearing house service for the purpose of getting buyer and seller together. A form is provided on which the property owner describes his vein or placer deposit and all conditions, together with terms of sale or lease. The data are condensed and published along with other similar offers, to a sizable mailing list. Inquirers are referred directly to the property owners. The Department acts merely as a clearing house, takes no responsibility for the statements made. The service is gratis.

Technical Studies Made and Bulletins Issued

During this first year and a half of the Department's work, a number of studies or projects were carried out which resulted in the publication of bulletins. Ten of these publications have been completed and issued, not including one four-color geologic map; one bulletin which is now in the hands of the State Printer, one which is ready to go to press, and five which are well along in preparation.

Certain other studies have been made which have not resulted in published bulletins. These may furnish a basis for future reports.

The ten published bulletins, and the 4-color geologic map are described on the following pages. Manuscripts in press, and in preparation, are also described.

It is expected that funds will not permit the publication of as many bulletins in any future year as was done in 1938. However, by the use of a duplicating device (as in the case of this report) and relatively inexpensive office help, and by making small initial issues, several publications should be made each year.

Bulletin No. 1

"Mining Laws of the State of Oregon", compiled and arranged by the State Department of Geology and Mineral Industries, 1937. 32 pp.

Purpose of this bulletin was to provide the general public with the Oregon mining laws brought up to date. This was in answer to numerous inquiries.

Nature of the Report. Oregon Laws, 1937, Chapter 179, which created the State Department of Geology and Mineral Industries, is set forth. Chapters on laws pertaining to mining claims and regulation of mining, gas and oil wells, liens on mines, leases on state mineral lands, power development fees, and miscellaneous provisions, are given.

Result. Copies of these laws are now available in a form that makes it unnecessary to search through various law volumes, and the prospector is able to get a reasonable idea of the statutes which govern his activities. Wide sale of the bulletin followed its issue.

Cost. The first edition of 1000 copies was prepared by the state printer and a second edition of 750 copies was prepared by this office on the duplicating machine. The total cost was \$248.31. The bulletins are sold at 10¢ each, which includes mailing and postage.

Bulletin No. 2.

"Progress Report on Coos Bay Coal Field", by F. W. Libbey, 1938. 14 pp., 3 maps, 1 plate, 2 tables.

Purpose. The bulletin reports on the present mining operations in the Coos Bay coal field and presents the marketing problems of the operators as well as the possibilities of increased development of the local industry.

Nature of the Study and Report. A short field study of the operating mines of the area was made, and information on production, transportation, and marketing was secured. Descriptions are given of the Southport, Overland, Thomas, and Alpine Mines. Total reserves are indicated. Analyses, operating costs, transportation costs, and a comparison of unit values of some competing fuels are given.

Results. The study shows that the field has real potentialities and is a valuable resource of the State. Recoverable coal is estimated at 4,000 tons an acre above a depth of 2,000 feet and underlying an area in excess of 25,000 acres. The coal, classed by the U.S.G.S. as good grade, sub-bituminous, is well adapted to mechanical stoker use and has certain advantages for household heating. There are important possibilities for its application in by-product manufacture. Retail outlets for this coal could be increased by using modern methods of merchandising, since it should be a more economical fuel for household heating than some out-of-state coals now sold widely in Oregon. There has been a demand for this bulletin by persons interested in developing Oregon's resources. Dissemination of facts concerning the advantages of using Coos Bay coal in domestic heating should result in increased production and greater activity in the field.

Cost. 200 copies of this bulletin were prepared in this office by the office duplicating machine, and the total cost of field work and printing was \$307.01. The bulletin has a sale price of 10¢, which includes mailing and postage.

Bulletin No. 3

"The Geology of Part of the Wallowa Mountains", by C. P. Ross.
(In co-operation with the United States Geological Survey).
74 pages, 6 plates, 2 figures, including geologic maps.

Purpose. This bulletin was published in order to make available to the public the results of a geologic survey made in 1921, the cost of which was borne by the United States Geological Survey and the State of Oregon. Other factors justifying this publication were renewed interest in tungsten and molybdenum, which are known to occur in the area, and the fact that the Department planned to carry out a state geological survey in adjacent territory.

Nature of the Study and Report. This geologic reconnaissance of some 450 square miles of the southern part of the Wallowa Mountains was made by C. P. Ross and assistant of the U. S. Geological Survey. A geologic map was prepared in which some 19 different lithologic and stratigraphic units were distinguished, and reports were made on the various mines. The map and report were not intended to represent the ultimate in geologic surveying, but, as far as funds would permit, to present data which might be of value to prospectors.

Funds were not available with which to publish the report upon completion of the field work, and the manuscript became buried in the U. S. G. S. files. At the request of the State Department of Geology and Mineral Industries, the manuscript was somewhat revised by Mr. Ross. The information on mines was deleted because it was 17 years out of date and therefore considered valueless. The director of the Federal Bureau granted the Department permission to print and issue the report.

Results. Both a geologic map and report of the southern portion of the Wallowa Mountains are available to the public. Use of this map should assist intelligent prospecting in the area and confine exploration to areas most favorable to mining.

Cost. This figure does not include funds spent by the state of Oregon in 1921. Fifteen hundred copies of the report and map were prepared by the state printer at a cost of \$519.86. The report is sold for 50¢, which includes cost of mailing and postage.

Bulletin No. 4

"Quicksilver in Oregon", by C. N. Schuette. 1938. 172 pages, 27 figures including maps.

Purpose. The importance of quicksilver as a strategic war mineral, the fact that Oregon ranks second in United States production, that no review of the quicksilver situation in Oregon had been made in recent years, and that it was known that many properties had come into production since the last review, made it advisable that this study be undertaken.

Nature of the Study and Report. Mr. C. N. Schuette, one of the leading specialists in quicksilver, was retained to examine prospects and operating properties in Oregon and prepare the report. Information was obtained from mine owners and operators all over Oregon. An analysis was made of the economics of quicksilver, the effect of the quicksilver tariff, and recent developments in the metallurgy of quicksilver.

Result. As this bulletin represented the first state-wide survey of quicksilver occurrences, and included valuable and pertinent information about the economics of production and metallurgy, it has become the "bible" of many quicksilver operators in Oregon. Certain portions of the bulletin have sufficient interest to appeal to quicksilver specialists in other parts of the world. Many demands for it have come from foreign countries.

Cost. The Department carried out this entire investigation. A total of approximately \$1,100 was paid Mr. Schuette for his services and expenses. Fifteen hundred copies were prepared by the State Printer. The total cost of the project was \$2,604.69. The report sells for \$1.15 which includes cost of mailing and postage.

Bulletin No. 5

"Geological Report on part of the Clarno Basin, Wheeler and Wasco Counties, Oregon", by Donald K. Mackay, 1938. 8 pp., 5 plates, 1 topographic and structural contour map.

Purpose. This survey was to determine the nature of the geologic structure of an area in the Clarno Basin and to form an opinion as to whether or not oil companies should be permitted to finance drilling operations in this area by selling stock to the public.

Nature of the Study and the Report. A field survey party mapped the topography of the area some 20 miles square, and prepared a structural contour map of key beds. The survey was confined largely to the Clarno formation of upper Eocene or lower Oligocene age. These data permitted the conclusions which accompany this report.

Results. The structural contour map showed the existence of a structural terrace on the flank of a low-dipping monocline. The Clarno well was located on a saddle and not on the highest part of the terrace. However, it was sufficiently well located, in the opinion of the Department, so that if the structure were to be productive of oil, this well should have been a small producer. A terrace similar to the one which is present is often productive when found in known oil regions or in oil bearing strata. The result of the survey was that this Department recommended to the State Corporation Commissioner that the persons drilling the Clarno well be allowed to sell sufficient stock to furnish funds for an accurate test on the well that had been drilled, but not funds for deepening or drilling a new one. The well has since been tested carefully and has not come into production.

Cost. The field work, in labor and expenses, cost about \$700. 400 copies of the bulletin were prepared by this office on the Multigraph-Duplicator, and the total cost of the project was \$817.26. The bulletin sells for 25¢, which includes the cost of mailing and postage.

Bulletin No. 6

"Preliminary Report on Some of the Refractory Clays of Western Oregon", by Hewitt Wilson and Ray C. Treasher. 1938. 93 pp., 48 figs., including maps and tables. (In cooperation with the U. S. Bureau of Mines and the University of Washington).

Purpose. Published information indicated that Oregon contained no refractory clay deposits although this impression was known to be incorrect. The purpose of this study and report was to obtain and present facts as to whether or not refractory clay materials can be obtained in western Oregon for use in manufacturing fire-brick, furnace linings, and other refractories, which will doubtless be in demand for use in Bonneville electrometallurgical industries.

Nature of the Study and Report. The work consisted of making a field survey and inventory of materials which might serve as high-refractory clay products. In order to do this, the Department made a cooperative arrangement for the burning and testing of samples at the non-metallics laboratory of the United States Bureau of Mines at Seattle. Ray C. Treasher of this Department was in charge of field geology, mapping, and sampling; and Hewitt Wilson, ceramic engineer of the U. S. Bureau of Mines, was in charge of the burning tests and their interpretation. Samples were tested for shrinkage, ultimate fusion, and other qualities bearing on value of the deposits as refractory brick material. Careful chemical analyses were made of all samples. Some 46 localities were examined, most of which are within easy reach of water transportation. Four of the most important districts were described in detail in the report. Tonnage estimates of visible reserves were made and operating conditions discussed.

Results. The study demonstrated that, contrary to former opinion, large quantities of high-grade refractory clays are present in the Willamette Valley-Columbia River area, - deposits sufficient to supply all future needs for such material in the Northwest. At the present time the Willamina Clay Products Company is constructing a plant which will be in production of refractory brick and other clay products in 1939.

Cost. Cost of field work approximated \$900, laboratory work \$550. Dr. Wilson's salary was contributed by the U. S. Bureau of Mines. 1000 copies of the report were prepared in this office by the office duplicating machine, and the total cost of the project was \$2628.73. The bulletin sells for 45¢, which includes mailing and postage.

Bulletin No. 7

"Gem Minerals of Oregon", by Dr. H. C. Dake. 1938. 16 pages, 5 plates.

Purpose. This bulletin was prepared in response to a wide public demand for information on the gem minerals of the state, and to call attention to an important mineral resource of Oregon.

Nature of the Study and Report. The manuscript was prepared by Dr. Dake, and its use was permitted without cost to the state. Each of the gem minerals is described and some reference is made to general localities.

Results. The bulletin has had wide circulation among those who are interested in gem minerals and lapidary work in various parts of the United States and in some foreign countries.

Cost. Cost was limited to publication. The bulletin was prepared in the head office on the duplicating machine. A first edition of 2,000 copies was followed by a second of 800. Total cost was \$158.28. A price of 10¢ is charged for it which includes mailing and postage. Cuts for the plates were loaned by "The Mineralogist" magazine and by Dr. Lazell.

Bulletin No. 8

"An Investigation of the Feasibility of a Steel Plant in the Lower Columbia River Area", by Raymond M. Miller. 1938. 55 pages, 25 tables, 2 figures. (In cooperation with Columbia County, Oregon).

Purpose. The purpose of this study was to determine, on the basis of available market, cost and availability of coke, limestone, ore, etc., whether an integrated steel industry for the Portland area should deserve serious consideration. The imminence of Bonneville power and the expectation of electrometallurgical industries, in any event, gave point to the making of the present study.

Nature of the Study and Report. The study was made by the Department in cooperation with Columbia County, which contains the only known deposits of iron ore in the State. Raymond M. Miller, consulting metallurgist, who had previously made a report along somewhat similar lines for the War Department engineers, was retained to make this report.

The present study is not a duplication of the report mentioned above, for it goes thoroughly into the market situation; it is confined to the proposition of an integrated steel industry rather than electric furnaces, and it takes into account the situation and costs under the present Bonneville rate structure.

Results. The study indicates that installation of a modern integrated steel plant on the lower Columbia River deserves serious consideration. The present depressed condition of business makes investors reluctant to undertake such an expenditure, but is the feeling of the Department that the Portland area may expect such an industry within a reasonably few years.

Judging by communications received by the Department, there is some renewed interest in the steel plant idea as an outgrowth of the publication of this bulletin.

Cost. Excluding the time of the director, who collaborated to some extent on the report, the cost for the preparation of 500 copies on the office duplicating machine, together with Mr. Miller's fee, was \$670.08. The bulletin sells for 40¢, which includes cost of mailing and postage.

Bulletin No. 9

"Chromite Deposits in Oregon", by John Eliot Allen, and others, 1938. 71 pp., 17 figs., and 2 plates.

Purpose. The purpose of this study was mainly to take inventory of Oregon's chromite resources. This was particularly justified in the light of present interest in strategic war minerals, and the probability of demand for this mineral in connection with Bonneville electrometallurgical industries. It was further justified by much ignorance of the value of chrome properties in the minds of claim owners and prospectors.

Nature of the Study and Report. John Eliot Allen, for two years field geologist for the Rustless Steel Corporation, has studied and examined more chrome deposits and has a more intimate knowledge of their occurrences in Oregon than anyone else. Although this information was gained while Mr. Allen was employed by the corporation, the Rustless Steel Company was kind enough to allow him free access to their files and to use all information in his possession in the preparation of this report.

More than 150 chrome deposits were studied in the field and all the most important of these are described in the report. Methods of prospecting were outlined and the geology of chromite deposition is carefully described.

Of particular interest in this bulletin is a chapter on the economics of chrome by H. F. Byram, vice-president of the Rustless Mining Company, the Oregon operating subsidiary. Doctor F. W. Lee's report of his geophysical survey on a chromite property in southwestern Oregon is also included in the report. The latter was through cooperation with the United States Geological Survey.

Results. Conclusions from the study of the structure and geology of the deposits have lead to a new concept of the origin of Oregon chromite ore bodies. The explanation of this, in the report, will prove of value in further prospecting for chromite deposits. Another result of the study is the conclusion that substantial developments in the chrome mining industry must await the installation in the Bonneville area of a chrome reduction plant. This is because transportation to points of consumption on the eastern seaboard will not permit Oregon ores to compete with foreign ores mined with cheap labor and coming into the country duty free. Another result of the study is the indication from the work of Dr. Lee, geophysicist of the United States Geological Survey, that magnetic prospecting may be a substantial aid in prospecting for chromite.

The first issue of 500 copies of the bulletin was exhausted in a relatively short time so a reprint is being made.

Cost. The total cost of this project was \$535.51. A first edition of 500 copies was prepared by the office duplicating machine, and the bulletin sells for 50 cents.

Bulletin No. 10

"Placer Mining on the Rogue River, Oregon, in its Relation to the Fish and Fishing in that Stream", by Dr. Henry Baldwin Ward, 1938. 31 pp., 6 plates, 2 tables.

Purpose. Owing to a controversy between miners and fishermen in the Rogue River drainage, it seemed highly desirable to obtain some scientifically accurate facts as to what are the actual effects of the placing in the streams of muddy water from placer mines. The purpose of this project was to study these effects in an impartial way, to determine the facts, and to publicize the findings.

Nature of the Study and Report. Dr. Henry Baldwin Ward of the University of Illinois, one of the nation's foremost ichthyologists, was retained by the Department to make an impartial study on the Rogue River. Dr. Ward spent a month in the area during the low stage of the river when no mining was in progress, and another month during the spring of 1938 when mining was at its height and when muddy water was being placed in the streams by placer operations. During the first period, Dr. Ward was assisted by Mr. Swartley of the Department who was able to outline the effects of natural erosion and stream deposition, both of which bear strongly on the question in hand.

Dr. L. E. Griffin of Reed College carried out experiments on live fish, both in muddy water and in clear water, to determine the effects on their life and habits. The conclusions represent views of the best authorities that are available and should be acceptable.

Results. The result of the study was the publication by this Department of Dr. Ward's report, which outlines his findings and conclusions. They are substantially that muddy water from placer mining is not inimical to fish and fish life. The experiments of Dr. Griffin substantiate these conclusions.

The bulletin has had a very wide demand, both on the part of conservationists and mining people in various parts of the country. It has resulted in editorial comment in various coast papers, mining journals, and scientific publications.

Cost. Salary and expenses of Dr. Ward and Dr. Griffin totaled about \$1600. The balance included salaries of Department officials, and the cost of preparing, printing, and proofing 1250 copies by the state printer. Total cost of project, \$2604.91. The sale price is 35¢, including mailing and postage.

Bulletin No. 11 (in press)

"The Geology and Mineral Resources of Lane County", by Warren D. Smith, 1938.

Purpose. This is the first of a series of county reports on geology and mineral resources. The reports are designed to give the residents of a particular county and others interested a perspective of our natural resources. Ultimately this bulletin, and the other county bulletins, will complete the geologic and mineral resource picture of Oregon.

Nature of the Study and Report. Dr. Warren D. Smith, Head of the Department of Geology, University of Oregon, had a manuscript partially prepared, incorporating the major features covered in bulletin no. 11. A small amount of additional field work was necessary to complete information on certain mining areas. The report will give details of topography, climate, hydrology, geologic formations and underground resources. It will be amply illustrated.

Results. It is expected that this bulletin, and others of its type, will acquaint Oregonians with the economic possibilities of their underground and other natural resources. It will summarize the geology of the county. It is hoped that these studies will create interest in mining and in the cultural value of Lane county's "geologic scenery".

Cost. The estimated costs total \$1080 of which \$400 is allocated for printing by the state printer.

Bulletin No. 12 (in preparation)

"A Geologic Reconnaissance of the Central Portion of the Wallowa Mountain Region".

By Warren D. Smith and others. 1939.

Purpose. To publish in some detail the results of the State Geological Survey work which was done in the Wallowa Mountains during the previous summer.

Nature of the Report. The report will contain a detailed study of the notes, stratigraphic succession, structure, theory of ore deposits, specimens, thin sections of field specimens, and also a more complete description of the mineral deposits of the Wallowa district. This will be chiefly a geological report.

Results. As stated on page 27, it was found that in this region the large areas of granodiorite are practically barren of mineralization and that only in certain contact zones between limestone and granodiorite are there probable ore localities. At least 90% of the entire mountain area is eliminated from immediate consideration as prospecting ground. Publication of this report will make available an adequate basis for future detailed geological work in the area.

Cost. The cost of a 4-color geological map issued immediately after the completion of field work was included in the cost of the State Geological Survey. The cost of compiling, printing and issuing this report, No. 12, is estimated to be of the order of \$300.

Bulletin No. 13

"First Biennial Report of the State Department of Geology and Mineral Industries, 1937-1938."

This report was prepared as a requirement of the law which created the Department.

The cost for 500 copies is about \$167.85.

Bulletin No. 14 (in preparation)

"The Oregon Mines Catalog", by the Department Staff.

Purpose. This is to satisfy the need for a compendium of information relating to Oregon mines and mining properties. The last Oregon mines catalog was published in 1916. Since that time much development work has been done in the older mines and new properties have been opened up. The preparation of this mines catalog is one of the requirements of the act creating the Department.

Nature of the Study and Report. The information contained in this bulletin has been assembled by the Department staff over a period of fifteen months. It represents a great deal of field work and much office compilation. Mines were examined, geology worked out, and sketches made in many cases. Often information had to be obtained from persons familiar with mine workings now inaccessible.

The catalog is being issued in five bulletins corresponding to logical mining divisions within the State. The reason for this was a matter of economy.

In respect to individual mines, the locations, area, ownership, production, general geology, and sketches of the underground development are given as far as possible. A complete index of all known mining properties in the State will be a feature of the catalog, and this index will be repeated in each of the five bulletins which make up the catalog.

Results. This bulletin will be a valuable reference to anyone interested in Oregon mines, particularly to the investor.

Cost. The total cost of the bulletin is estimated to be \$2600.00.

Bulletin No. 15 (in preparation)

"Field Identification of Minerals for the Oregon Prospector",
compiled by Ray C. Treasurer.

Purpose. This bulletin is intended to provide Oregon prospectors with information on the identification of minerals using only tests that can be applied in the field. It is primarily for the man who is untrained technically, and will be sold at a price that a prospector can afford to pay.

Nature of the Study and Report. Information is given explaining the various mineral tests and suggestions made concerning selection of field equipment. Included are discussions of the need and use of such tools as the hand lens, hammer, streak plate, magnet, etc. The various minerals that the prospector is likely to find are described in non-technical language. Summary tables are given to aid the prospector in rapidly determining his mineral. A glossary of all necessary technical terms is added.

The bulletin does not pretend to be an original study. The data have been taken from various textbooks and condensed and clarified for the use of a layman.

This bulletin is one of a short series being prepared by the Department for encouraging and assisting Oregon prospectors.

Results. In Oregon, whose mineral raw materials are so relatively undeveloped, the necessity for encouraging intelligent prospecting is obvious. This is undertaken with pleasure and sincerity by this Department. The results of the Department's encouragement and advice to prospectors in the last seventeen months have been reflected in the staking of numerous claims, some of which have interesting possibilities for future mineral production. It is the Department's belief that the result of this publication of Mineral Identification will further materially assist this group of men who actually go into the hills and seriously search for minerals.

Cost. It is estimated that this bulletin will cost \$447, if printed by the state printer. Should it prove advisable to prepare it on the office duplicating machine, the cost will be about two-thirds of \$450, or about \$300.

Bulletin No. 16 (in preparation)

"Geology of Salem Hills and North Santiam Basin", by T. P. Thayer.

Purpose. This bulletin will make available desired information, together with a geologic map, which has not previously been published. Its publication will assist in meeting an objective of this Department that accurate and pertinent data on Oregon geology and mineral resources should be made available for general use.

Nature of the Study and Report. The original field study was made by Dr. Thayer as one of the requirements for a Doctor of Philosophy degree at California Institute of Technology. The author has revised this thesis, selecting such portions as will explain the excellent geologic map which accompanies this report. The map covers an area reaching from Salem to Mount Jefferson and 12 to 30 miles wide.

The original manuscript and map are supplied to this Department without cost. In order properly to make geologic formations distinguishable, the map will be lithostated in four colors, similar to the Wallowa map which will accompany Bulletin No. 12.

Results. The bulletin will be a valuable addition to the geologic knowledge of Oregon. The map and text provide a cross-section of the western slope of the Cascade Mountains, and will enable other investigators to correlate these data northward and southward.

Cost. The estimated cost of preparing this bulletin on the office duplicating machine and having the four-color map printed by a lithostater is about \$720.

Bulletin No. 17 (in preparation)

"Primer of Geology and Guide to Prospecting in Oregon", by Earl K. Nixon.

Purpose. The bulletin is intended to give Oregon prospectors practical ideas on proper methods of each kind of prospecting in this state. It is written by one who has had much practical and technical experience. The language, style, and ideas are to be presented in a manner easily understood by the untrained prospector.

Nature of the Study and Report. The report will start with several chapters on simple geology. From these a prospector may learn to reason from cause to effect in interpreting the various mineral and geological conditions he finds in his travels. The report will give details of just how to proceed with prospecting for placer, lode deposits, coal, and so forth. Certain fundamental information, such as rock identification and the causes of various types of mineralization, is given. There follow chapters on exploration, evaluation of prospects, and financing. Each mineral of commercial importance known in the State is treated in such a fashion as to make clear to the prospector its commercial importance, its market situation, and its uses.

The bulletin is one of a short series being prepared by the Department to encourage and assist prospectors in intelligent search for and development of ore deposits in this State.

Results. It is hoped that this bulletin will give the prospector, who is untrained technically, and at a cost which he can afford, a handbook which will help him understand what he is doing and prevent him from following wills-of-the-wisp.

Cost. Estimated cost of preparing this bulletin is \$225.

State Geological Survey of 1938

The first State Geological Field Survey of the present Department was carried out during the summer of 1938 as one of the requirements of the law which created this Department.

The main or northern portion of the Wallowa Mountain region was selected for this survey for several reasons: the country is little known geologically; the survey would carry northward and complete the reconnaissance work done by Ross and published in Bulletin No. 3 of this Department; the area was suspected of containing deposits of the strategic war minerals tungsten and molybdenum; the area is known to contain important deposits of black marble which are not in production; and it was desirable to eliminate certain large areas as being unfavorable for prospecting.

A party of ten including a cook spent six weeks in the area, covering and mapping in a reconnaissance manner some 350 square miles of mountainous country. Dr. Warren D. Smith, head of the Department of Geography of the University of Oregon, was in charge of the field work. Ray C. Treasher and John Eliot Allen of this Department, Lloyd Ruff and Wayne Lowell were party leaders. Particular attention was paid to contact relationships of the granodiorite-limestone zone. A reconnaissance topographic base was furnished by the United States Forest Service.

It was found that granodiorite areas were poor prospecting ground and that the mineralization was particularly concentrated in the tectite zone at the granodiorite-limestone contacts. Thus the survey virtually eliminated 90% of the territory as being unworthy of further prospecting. The remaining 10% may contain mineable mineral deposits and these areas should be carefully examined and explored.

The geologic mapping was done in a preliminary or extensive rather than in an intensive manner. This is justified where the country is little known, where the geology is well-exposed and the surface not too heavily covered by soil and forest.

A 4-color geologic map of the area was compiled, lithostated and ready for issue within 30 days after completion of field work. This is perhaps a record .. although not so intended .. for a technical issue of this kind. The reason for rushing the issue was in order to make it available to those keenly interested in the immediate development of the region. The idea, however, is in line with the policy of this Department to release the results of all studies immediately after completion.

Cooperation with Federal Agencies

United States Bureau of Mines

1. Late in 1937 the Department made an arrangement with the U. S. Bureau of Mines laboratory at Reno, Nevada, for metallurgical tests on samples selected by department engineers at mines in the Bourne-Sumpter district of eastern Oregon. The results of these tests indicate a considerably higher recovery of metal values with present day standard milling equipment than was obtained in the old days when these mines were necessarily closed down.
2. The Department made an arrangement with the U. S. Bureau of Mines non-metallic laboratory at Seattle and with the University of Washington for burning tests and interpretation of same in connection with the study by departmental geologists of Oregon refractory clays. This work is covered in Bulletin No. 6.
3. The Department arranged with the Seattle laboratory of the U. S. Bureau of Mines for carrying out tests on Coos Bay coals to determine their adaptability for present types of mechanical furnace stokers. The tests indicate that western Oregon coals are well adapted to this use.

United States Geological Survey

1. The Department entered into an arrangement with the United States Geological Survey whereby the manuscript prepared by the U. S. Geological Survey in 1921 on the geology of part of the Wallowa Mountains was revised and furnished to this Department for printing and issue. Bulletin No. 3 covers this work.
2. The Department entered into an arrangement with the United State Geological Survey and the Rustless Iron and Steel Corporation which resulted in a brief geophysical survey by Dr. F. W. Lee, geophysicist of the U. S. Geological Survey. This survey was made on a chromite deposit in southwestern Oregon to outline the usefulness of magnetic methods in prospecting and exploration for chromite. The result, which is favorable, is covered in Bulletin No. 9.

Co-operation with the Corporation Commissioner of Oregon

The State Corporation Commissioner refers to this Department those persons who make application to him for sale of securities in mining and oil in this state.

This Department then looks into the propositions in question as to their soundness as mining or oil enterprises. It forms an opinion based on its own information or on a report on the property by an accredited engineer, and makes a recommendation to the Commissioner. After weighing all evidence, he decides, and either approves or denies the applications.

Thus, the Commissioner has the benefit of unbiased technical advice submitted by men familiar with mining and oil matters who are also interested in guaranteeing that Oregon mining and oil enterprises shall be on a sound and businesslike basis, and that investors in such stocks sold in Oregon shall have confidence in the properties under consideration.

It is believed that the Corporation Commissioner's willingness to carry out the present co-operation with this Department is an evidence of his sincere desire for sound industries in Oregon.

For many years past, investors have looked askance at mining issues in Oregon, because, as in many other states, there have been a large number of illegitimate, unsound, ill-advised mining and oil promotions. This need not be the case, and it is believed that the situation is changing under the present arrangement.

This Department leans just as far backward to facilitate the operations of mining and oil people who give evidence of being sound and "right" with their plans, as it leans forward to be hardboiled with those it believes to be unsound, inexperienced, or not properly prepared to start a mining enterprise.

Starting Museum Collection

The collection of mineral, ore and fossil specimens from throughout the state, and the establishment of a museum for the pleasure of, and for study by, the citizens of Oregon is one of the duties of this Department imposed by the law which created it.

Up to this time, funds have been inadequate for the rental of quarters for such a museum. The collection of specimens, however, has gone ahead and arrangements for museum space will be made as soon as funds are available.

The head office of the Department has recently been moved to the ground floor of the Lewis Building at 329 S. W. Oak Street, Portland, where window space, although somewhat limited, is available for the display of mineral specimens. This space will be enlarged and museum facilities expanded as the collection increases and as funds permit.

Meanwhile, citizens of the state are invited to visit the head office and the state assay laboratories at Baker and at Grants Pass, where modest mineral collections are accessible.

Work on a State Geological Map of Oregon

No complete geological map of the State of Oregon has ever been published.

Several generalized geologic maps have been prepared, but they are indeed so generalized as to be of small use to geologists and engineers. The United States Geological Survey, the Oregon Bureau of Mines and Geology, and geologists working with private capital and various sponsorships, have surveyed and mapped various areas within the state.

This Department is assembling these data and reducing them to a common base. As soon as sufficient material has been assembled to justify a reasonably acceptable preliminary geologic map of Oregon, it will be prepared and released.

Geologic surveying in Oregon is seriously handicapped by the lack of adequate topographic maps. In fact, only half of the State has been covered by topographic surveys, and much of this work is on an inadequate scale.

During the 1938 field season, this Department mapped some 350 square miles in the Wallowa Mountains. This same season, the United States Geological Survey completed the geologic mapping of the Medford quadrangle.

Non-Metallics Mineral Survey

It has been the habit for many years of the United States Bureau of Mines to assemble data and statistics annually covering both the metallic and non-metallic mineral production of each of the states of the Union, and to issue such figures in the form of a Minerals Yearbook.

The Bureau's figures on metallic mineral production for Oregon are excellent and quite complete, but its figures on non-metallics are incomplete and its classifications somewhat vague. This Department felt justified in making a brief canvass of the current non-metallic mineral producers of this state in order to obtain more accurate total mineral production figures.

This canvass of non-metallic producers has placed the Department in much closer touch with the industry and in this way it is in much better position to understand and to assist with some of the problems of the non-metallic producers.

It is expected that, with the list of producers brought up to date by the present canvass, the assembling of figures can be carried out properly and adequately in the future by the U. S. Bureau of Mines without further assistance from this Department.

Mineral Production

On pages III and IV are given tabulations of the total mineral production, both metallic and non-metallic, of Oregon, from 1850 to and including 1938. The figures for 1938 are, of course, estimated, but it is believed they are quite close.

Note that the production curves are rising sharply and that the increase of 1938 over 1937 is about 16 2/3%.

Oregon's total annual mineral production should reach ten million dollars during 1940.

Future Plans of the Department

Presupposing the continuation of appropriations which are not smaller than in 1937 and 1938, the Department plans to carry on its present plan, which is based on a five-point program as follows:

- (1) Encouraging underground mining by:-
 - a. Making geological surveys and giving technical advice on special problems to mine operators.
 - b. Giving assistance on metallurgical problems with Department laboratory facilities and by cooperating with U. S. Bureau of Mines in this regard.
 - c. Giving practical advice on questions of mine operation, exploration and development, and finance to small operators.
- (2) Encouragement of placer mining and dredging by:-
 - a. Carrying out desirable studies on certain problems affecting dredging and hydraulic mining.
 - b. Outlining geological conditions in prospective dredging areas to the many inquirers looking for ground.
 - c. Giving engineering and operating advice to the smaller hydraulic operators.
- (3) Encouragement of non-metallic production by:-
 - a. Carrying out economic studies of utilization of such materials.
 - b. Doing metallurgical work on separation and treatment of non-metallic minerals.
 - c. Hunting for new deposits of non-metallics.
- (4) Encouragement of new industries by:-
 - a. Making studies of reduction processes used elsewhere and probably applicable here.
 - b. Publicizing known deposits and desirability of their development.
 - c. Making economic studies covering utilization, transportation, marketing, etc., to demonstrate feasibility of new industries.

- (5) Gathering, interpreting, and publishing geologic and scientific information on the rocks, formations, and mineral resources of Oregon, which is a prerequisite for economic considerations listed above. This includes:
- a. State Geological Survey.
 - b. Detailed separate geologic studies of favorable or critical areas.
 - c. Stratigraphic, paleontologic, and the historical studies.
 - d. Special emphasis on collection of information on strategic war minerals to guarantee full cooperation with the Federal Government in time of emergency.

New developments, new processes, new uses, and new needs for mineral products are rapidly appearing, and the selection, consideration, and solution of these problems are necessary functions of this Department. It should serve as an alert clearing house of ideas and information. The mineral production of Oregon -- nearly \$9,000,000 in 1938 -- should reach the ten million mark by 1940. It is not too much to expect that this figure will be doubled within a few years with proper encouragement and attention to the needs of the industry. New methods of utilization, and new industrial enterprises should come with cheap power and a larger consuming population.

It should be recognized that carrying out a program along the above line requires planning as a continuing project. Some studies require many months and even a few years for proper completion. The spectre of possible termination of departmental activities at the end of any biennial period is an unfortunate and inhibiting influence.

The Department with its limited personnel is able to attack only a small number of special studies each biennium in addition to its regular service functions. Listed below are a number of studies and projects which may be said to be "on the calendar". Those of greatest need will be started first. Some are already in progress; a few will require years for completion. Meantime, information is being collected which will serve to simplify and hasten completion of these latter problems.

Economic Studies

1. A study of the feasibility of a lead and zinc reduction plant in the Willamette Valley to serve Cascade mining properties - having especially in mind the Waelz or some other demonstrably successful process which is cheaper to install than the electrolytic type.
2. Tests on recovery and separation of chromite, zircon, etc., from coastal back-beach alluvial deposits, or an arrangement with the U. S. Bureau of Mines to carry out such tests.

3. Investigation of the possibility of beneficiating southern Clackamas County limestone by flotation or otherwise, to provide agricultural lime at a price a farmer can afford.
4. Certain studies pertaining to Oregon dredge practice.
5. A full investigation and report on the Coos Bay, Eden Ridge, and all coals in southwestern Oregon.
6. An investigation of coal deposits near Molalla and in Columbia County.
7. Tests on Oregon coals to demonstrate their adaptability for byproduct plants and hydrogenation.
8. Further studies of deposits of pottery and other special-use clays recently discovered in Willamette Valley.
9. Examination of the known borax deposits of Harney County to demonstrate possibility of utilization for fertilizer.
10. Pumice and pumicite utilization.
11. A study and report on utilization of a large silica deposit recently uncovered.
12. Tests to determine the possibility of using Oregon diatomite in the manufacture of glass brick.
13. Electrostatic separation studies for beneficiation of various minerals.

Studies of Geologic Nature

1. A geologic survey and report on the Portland area.
2. Detailed geologic work in mineralized areas in the Wallowa Mountains in connection with tungsten and molybdenum deposits.
3. Structural and stratigraphic studies in the Coos Bay area in which some gas production has been found recently.
4. Investigation of known occurrences of nickel at Nickel Mountain, near Riddle.
5. Detailed mapping of lime on Connor Creek.
6. Topography and geology of the Canyon City chrome belt.
7. Survey of quicksilver deposits of Tiller area.
8. A study of Oregon's mineral springs.
9. Preparation of bulletin of instructions and "don'ts" to collectors of paleontologic material.

Other Plans and Needs

1. Increasing the amount of geologic surveying to be done each field season.
2. Carrying out the plan already started of making geologic and resource reports by counties.
3. Carrying out further cooperative projects with the U. S. Geological Survey in completing a geologic survey of the State.
4. Consolidation of the assay offices during the slack season to allow one of these to carry out special work in metallurgy and minerals separation. This is being done.
5. Assisting Oregon mine operators with metallurgical problems by making further cooperative arrangements with the U. S. Bureau of Mines research laboratory.
6. Publicizing and encouraging the use of Oregon black marble to the end that it may be developed and used widely.
7. Planning for a future study of the salt deposits in Lake County to demonstrate under what conditions they can be used commercially with cheap power available.
8. An investigation and full report on the placer mining industry in the state.
9. Preparation of a state wide safety code for mining and mineral industries, as requested by the State Industrial Accident Commission.
10. Encouragement of intelligent prospecting in Oregon by publishing a bulletin prepared by the Department outlining practical methods and procedure, and giving an outline of simple mining geology.
11. Continued collection and acquisition of Oregon mineral and paleontological specimens to be used in the Department museums.
12. Survey of non-metallic mineral occurrences, and a bulletin listing them.
13. A brief study of mineral products brought into Oregon from outside to determine possibility of using Oregon minerals instead.

STATEMENT OF EXPENDITURES
of the
OREGON STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
May 1937 to January 1, 1938

(1937)	<u>HEAD OFFICE</u>	<u>LABORATORIES</u>	<u>GRUBSTAKE</u>	<u>TOTAL</u>
Salaries and Wages:	7,699.18	4,090.84	1,755.37	13,545.39
<u>General Expense:</u>				
Private car mileage	836.90	493.37	-	1,330.27
Fares-railroad & stage	582.95	7.55	349.71	940.21
Lodging	364.82	94.34	63.13	522.29
Meals	418.26	123.00	136.07	677.33
Office Supplies	138.44	90.88	41.30	270.62
Telephone & telegraph	177.30	33.49	42.20	252.99
Postage	233.83	71.02	58.04	362.89
Stationery & Printing	4,435.59	49.72	119.46	4,604.77
Rent	392.25	80.46	77.00	549.71
Surety bonds & insurance	27.78	6.00	12.00	45.78
Freight and express	-	40.65	-	40.65
Other Expense	83.46	-	1.93	85.39
	<u>15,390.76</u>	<u>5,181.32</u>	<u>2,656.21</u>	<u>23,228.29</u>
<u>Operating Expense:</u>				
Fuel, light, power, water	54.49	163.31	-	217.80
Electrical supplies & oils	6.68	3.96	-	10.64
Laboratory supplies	64.11	662.01	-	726.12
Films and developer	14.83	8.25	4.89	27.97
Ore analysis	300.00	5.10	-	305.10
Laundry	6.25	-	-	6.25
Newspapers, periodicals, maps	85.60	30.80	11.00	127.40
Other expense	32.50	30.07	29.84	92.41
	<u>564.46</u>	<u>903.50</u>	<u>45.73</u>	<u>1,513.69</u>
<u>Maintenance Expense:</u>				
Alterations	-	130.15	-	130.15
Fixtures, files, counters	-	37.21	-	37.21
Repair equipment	3.50	1.15	1.35	6.00
Instal. heat. light. facilities	-	54.30	-	54.30
Other Expense	4.00	10.00	-	14.00
	<u>7.50</u>	<u>232.81</u>	<u>1.35</u>	<u>241.66</u>
<u>Capital Outlays:</u>				
Office furniture	584.22	59.50	-	643.72
Office and field equipt.	1,112.99	429.15	193.15	1,735.29
Laboratory equipment	215.64	2,848.12	-	3,063.76
Library books	50.54	19.20	-	69.74
Shop & power equipt.	8.10	304.54	-	312.64
Automobiles	2,022.90	-	-	2,022.90
Others	-	3.00	-	3.00
	<u>3,994.39</u>	<u>3,663.51</u>	<u>193.15</u>	<u>7,851.05</u>

SUMMARY

Salaries and wages	13,545.39
General Expense	9,725.79
Operating Expense	1,513.69
Maintenance Expense. . . .	241.66
Capital Outlay	7,851.05
Grubstake Loans	<u>17,100.00</u>
Total	49,977.58
1937 appropriation unspent	<u>22.42</u>
Appropriation	50,000.00

STATEMENT OF EXPENDITURES
of the
OREGON STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
January 1, 1938 to January 1, 1939

(1938)	HEAD OFFICE	LABORATORIES	GRUBSTAKE	TOTAL
Salaries and wages:	14,392.24	7,941.82	6,346.06	28,680.12
<u>General Expense:</u>				
Private car mileage	194.71	14.40	51.68	260.79
Fares-railroad & stage	414.68	20.62	27.45	462.75
Auto fuel and oil	112.95	120.11	472.43	705.49
Auto tires and tubes	66.91	-	20.92	87.83
Auto repairs & renewals	27.84	5.80	78.53	112.17
Other auto expense	132.43	78.70	76.90	289.83
Lodging	330.80	48.80	111.75	491.35
Meals	640.38	76.05	132.60	849.03
Office supplies	502.98	38.37	127.09	668.44
Telephone & telegraph	133.28	-	163.09	296.37
Postage	548.51	4.49	225.25	778.25
Stationery & printing	470.12	18.56	16.69	505.37
Rents	642.50	40.32	799.60	1,482.42
Surety bonds	20.00	-	-	20.00
Auditing service	76.76	-	-	76.76
Freight and express	245.74	29.84	13.00	288.58
Workmens comp.payts.	11.20	-	-	11.20
Restoration fund allot.	21.26	-	-	21.26
Other expense	-	6.33	-	6.33
	<u>18,987.09</u>	<u>8,444.21</u>	<u>8,663.04</u>	<u>36,094.34</u>
<u>Operating Expense:</u>				
Fuel, light, power, water	24.28	312.41	-	336.69
Lab. and field supplies	102.36	412.17	7.05	521.58
Newspapers, periodicals	151.62	-	3.00	154.62
Ore & chemical analyses	-	173.21	3.25	176.46
Other expense	26.46	22.73	2.45	51.64
	<u>304.72</u>	<u>920.52</u>	<u>15.75</u>	<u>1,240.99</u>
<u>Maintenance Expense:</u>				
Alterations	13.03	9.32	8.65	31.00
Repair equipment	7.62	29.55	5.40	42.57
Other expense	-	3.65	4.00	7.65
	<u>20.65</u>	<u>42.52</u>	<u>18.05</u>	<u>81.22</u>
<u>Capital Outlay:</u>				
Office & field equipt.	384.38	153.87	-	538.25
Laboratory equipt.	8.76	382.04	-	390.80
Drafting & field equipt.	100.41	-	-	100.41
Auto accessories	26.77	37.50	-	64.27
Others	40.80	15.68	-	56.48
	<u>561.12</u>	<u>589.09</u>	<u>-</u>	<u>1,150.21</u>

SUMMARY

Salaries and wages . . .	28,680.12
General expense . . .	7,414.22
Operating Expense . . .	1,240.99
Maintenance Expense. . .	81.22
Capital Outlay . . .	1,150.21
Grubstake Loans . . .	<u>11,300.00</u>
Total	49,866.76
1938 Appropriation unspent	<u>133.24</u>
Appropriation . . .	50,000.00

Statement of Receipts and Disbursements
(1937-1938)

GEOLOGY AND MINERAL INDUSTRIES ACCOUNT
(Section 7, Chapter 179, Oregon Laws 1937)

Receipts

Gifts (Columbia County, Oregon)	250.00	
" (Rustless Steel Corporation)	229.36	
Sale of Department bulletins	547.88	
Refund of gas tax	7.75	
Merchandise returned	9.89	
Sale of laboratory equipment	<u>25.00</u>	1,069.88

Disbursements

Raymond M. Miller	250.00	
United States Geological Survey	229.36	
Clerical service	25.00	
Oregon's San Francisco and New York World's Fair Commission	<u>300.00</u>	<u>804.36</u>

Balance December 31, 1938		265.52
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Statement of Receipts
(1937-1938)

(Relating to Grubstake Loans)
(Section 11 (a), Subsection (e), Chapter 179, OL 1937)

Return of loans by prospectors	225.00
Interest on loans paid by prospectors	7.50
Royalty - mine operation	<u>7.20</u>
Total	239.70

STATEMENT OF COMPENSATION AND EXPENSES OF EMPLOYEES
of the
OREGON STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
May 1937 to January 1, 1939.

		<u>Total Compensation</u>	<u>Travel Expense</u>
Earl K. Nixon	Director	5999.93	1340.16
A. M. Swartley	Cons.Min'g.Engr.	4330.64	160.97
Ray C. Treasher	Geologist	4015.32	398.17
F. W. Libbey	Min'g.Engr.	1661.82	262.34
J. E. Morrison	Min'g.Geologist	3712.50	817.84
Albert V. Quine	Min'g.Geologist	1465.12	450.68
Donald K. Mackay	Min'g.Geologist	958.06	261.29
Albert A. Lewis	Assayer	3492.28	16.37
H. E. Crain	Bookkeeper	2049.50	3.80
Lela Ravenscroft	Clerk	750.00	
F. A. Steeble	Clerk	1597.00	7.45
Ruth Van Meter	Clerk	1404.88	
Robert W. Cline	Lab.Asst.	524.04	
John A. Ross	Lab.Asst.	565.95	83.52
Henry B. Ward	Consultant	1052.50	433.45
C. N. Schuette	Consultant	660.00	231.72
Raymond M. Miller	Consultant	250.00	
Chas.O.Greenwood	Civil Engr.	412.69	70.29
Vera Lawson	Extra Clerk	82.53	
Olga Mitrovich	Extra Clerk	12.00	
Martha Bialy	Extra Clerk	183.75	
Isabelle Rice	Extra Clerk	5.00	
C. R. Stout	Laborer	4.00	
Wayne Beed	Lab.Asst.	184.00	
Mark Hayes	Laborer	3.75	
J. D. Stratton	Laborer	2.50	
Edward Coles	Lab.Asst.	117.85	
Jewel Vance	Extra Clerk	18.57	
L. E. Griffin	Consultant	75.00	25.67
Lila Fitzgerald	Extra Clerk	174.80	
Charles Wood	Extra Clerk	7.19	
Keith Oetting	Extra Clerk	33.75	3.46
Warren D. Smith	Consultant	344.33	63.90
H. F. Byram	Consultant	25.00	
Frederick Hoffstaed	Geologist	54.80	2.22
Wilbur E. Greenup	Geologist	36.27	
Herbert E. Harper	Geologist	28.21	
James S. Weber	Geologist	35.46	13.57
Wayne R. Lowell	Geologist	91.90	
Lloyd L. Ruff	Geologist	109.59	
Forrest Landeen	Cook	54.80	
Robert A. Raphael	Cook	18.00	
John Eliot Allen	Field Geologist	1504.03	324.03
Victor L. Nelson	Draftsman	87.50	
Leslie L. Motz	Assayer	3325.00	24.20
Walter Coles	Lab.Asst.	105.00	
H. E. Ryno	Lab.Asst.	9.00	

		Total Compensation	Travel Expense
George Foulkner	Laborer	7.00	
Edward N. McKinley	Stream Gauger	50.00	
Bertha B. Howe	Extra Clerk	267.00	
Florence Brown	Extra Clerk	14.70	
C. E. Hamilton	Extra Clerk	16.80	
A. C. Edwards	Extra Clerk	5.75	
Ruth Terry	Extra Clerk	130.20	
Ross McDonald	Lab.Asst.	15.00	
L. D. McGuire	Laborer	8.00	
W.H.McGuire	Laborer	12.00	
Helen Patton	Extra Clerk	53.25	
Al Mortenson	Laborer	10.00	
		<hr/>	<hr/>
		42,225.51	4,995.10
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PUBLICATIONS AVAILABLE AT THE HEAD OFFICE OF THE DEPARTMENT
329 S. W. Oak Street, Portland, Oregon

<u>Bulletin:</u>		<u>Price</u>
1	Mining Laws of Oregon.	\$0.10
2	Progress Report on Coos Bay Coal Field, F. W. Libbey	\$0.10
3	Geology of Part of the Wallowa Mountains, C. P. Ross	\$0.50
4	Quicksilver in Oregon, C. N. Schuette	\$1.15
5	Geological Report on Part of the Clarno Basin, Donald K. Mackay	\$0.25
6	Preliminary Report on Some of the Refractory Clays of Western Oregon, Hewitt Wilson and Ray C. Treasher	\$0.45
7	The Gem Minerals of Oregon, H. C. Dake	\$0.10
8	Feasibility of a Steel Plant in the Lower Columbia Area near Portland, Oregon, R. M. Miller	\$0.40
9	Chromite Deposits in Oregon, John Eliot Allen.	\$0.50
10	Placer Mining on the Rogue River, Oregon, in Relation to Fish and Fishing in that Stream, Henry Baldwin Ward	\$0.35
11	Geology & Mineral Resources of Lane County, Oregon, Warren D. Smith (in press)	
12	Geological Reconnaissance of the Central Part of the Wallowa Mountains, Oregon, W. D. Smith and Staff (in preparation) Geological Map in 4 colors to accompany Bulletin No. 12	\$0.20
13	First Biennial Report of State Department of Geology and Mineral Industries, 1937-1938.	
14	Catalog of Mines in Oregon, Staff (in press)	
15	Field Identification of Minerals for Oregon Prospectors, compiled by Ray C. Treasher (in preparation)	
16	Geology of the Salem Hills and Santiam River Area (in preparation) Thos. P. Thayer	
17	Primer of Geology and Guide to Prospecting, Earl K. Nixon (in preparation)	

Miscellaneous Publications

Sampling of Small Prospects and New Discoveries, staff. . .	\$0.06
Clearing House List, issued irregularly, per issue	\$0.06
The Ore.-Bin, Staff, issued monthly, as a medium for news items about the Department, mines and minerals . . .	Free

Oregon Bureau of Mines and Geology

Ore Deposits of Northeastern Oregon, A.M. Swartley, 1914 . .	\$0.50
Report on Oil & Gas Possibilities of Eastern Oregon, John P. Buwalda, 1921	\$0.25
The Limonite Iron Ores of Columbia County, Oregon, Ira A. Williams, 1923	\$0.10
Economic Geological Resources of Oregon, 1912	\$0.25
Road Materials in the Willamette Valley, 1912	\$0.05