

THE BIENNIAL REPORT

OF THE

Board of Geological Survey

OF THE

STATE OF WASHINGTON,

For the Term

1901-1903.



TACOMA, WASH.,
PIONEER BINDERY & PRINTING CO.,
1903

LETTER OF TRANSMITTAL

To the Legislature of the State of Washington:

The Board of Geological Survey transmits herewith its biennial report for the term 1901-1903, as required by Statute.

Respectfully Submitted,

December 1, 1902.

HENRY MCBRIDE, President,
C. W. MAYNARD, Secretary,
T. F. KANE,
E. A. BRYAN.

BIENNIAL REPORT OF THE BOARD OF GEOLOGICAL SURVEY.

INTRODUCTION.

In response to a general demand from those interested in the development of the mineral resources of Washington, the Legislature of 1901 passed a law providing for a State Geological Survey, and appropriated \$5,000 per year for the carrying on of the same.

Following the plans of some of the older states in which Geological Surveys have been of great utility and benefit, the law provided that the present work of the survey should be as practical as possible, with the following as some of the principal objects: An examination of the economic products of the state, viz., gold, silver, copper, lead, and iron ores, as well as building stones, clays, coal, and all mineral substances of value; an examination of the soils, road-building material, water supplies, artesian wells, water power, etc.; an examination of the physical features of the state with reference to their practical bearing upon the occupations of the people; the preparation of special geographic and economic maps to illustrate the resources of the state; and the publication from time to time of the results of the work of the Survey in reports and bulletins, and the dissemination of these among the people.

ORGANIZATION OF THE GEOLOGICAL SURVEY.

In accordance with the law, and at the call of the Governor, the following gentlemen met upon June 5th, 1901, at Tacoma, and organized the Board of Geological Survey of the State of Washington: Governor Rogers, Lieutenant-Governor McBride, State Treasurer Maynard, President Graves, of the State University, and President Bryan, of the Agricultural College and School of Science. Permanent organization was effected by

electing Governor Rogers as President of the Board and State Treasurer Maynard as its Secretary. Upon the death of Governor Rogers, in December, 1901, his place as President of the Board was taken by Governor McBride. Upon the resignation of President Graves, from the State University, his place on the Board was taken by Acting President Kane.

At the first meeting of the Board of Geological Survey a scientific or survey staff was chosen, consisting of Professor Henry Landes, of the State University, as State Geologist, with Professor Solon Shedd and W. S. Thyng, of the Agricultural College and School of Science, and D. A. Lyon, of the State University, as Geologists. At the meeting of the Board, held in May, 1902, D. A. Lyon, who had removed from the state, was succeeded by C. A. Ruddy, as Assistant Geologist. The Board at its first meeting voted that members of the Survey staff should receive no salaries other than a small per diem allowance for time actually spent in the field work of the Survey.

FIELD AND OFFICE WORK.

In the work of the field seasons of 1901 and 1902, every county in the state was visited by some member of the survey staff. In a state the size of Washington, and with the small appropriation available, the work necessarily had to be of a general or reconnaissance order, with only a little attention to details. The field work of the first season had to do mainly with the collection of sufficient data for a general statement or report upon the mineral resources of the state as a whole. It was felt that such a report as this, while very general in its nature, would serve as a basis for the more elaborate and detailed reports that should follow. The field work for the summer of 1902, as well as a portion of that of the previous summer, had to do with an examination of the ornamental and building stones and of the coal fields of the State.

Since the inauguration of the Survey, a considerable portion of the time of the State Geologist has been taken in making replies to inquiries from our own citizens and from many outside the State, who desire information concerning our mineral resources. It is of course necessary that these replies be carefully prepared, so that the demands of the residents of the State and of outside capitalists may be fully met. While the correspondence has already reached large proportions, it will doubtless greatly increase when the fact that Washington has a Geological Survey becomes better known.

ANNUAL REPORTS.

The annual report for 1901, was ready for distribution in March, 1902. This report embodies the results of the field

work of the first season, and consists of 344 pages, besides 32 pages of illustrations. It is in six parts, as follows:

PART I. Creation of a State Geological Survey and an Outline of the Geology of Washington.

PART II. The Metalliferous Resources of Washington, except Iron.

PART III. The Non-Metalliferous Resources of Washington, except Coal.

PART IV. The Iron Ores and Coal Deposits of Washington.

PART V. The Water Resources of Washington.

PART VI. Bibliography of the Literature referring to the Geology of Washington.

Of this report an edition of 2,000 copies was printed, 1,000 being bound in cloth and 1,000 in paper. The bound reports have all been distributed, but a few paper copies yet remain in the office of the State Geologist. To those within and without the State, who have desired this report it has been sent without expense to the applicant. A careful record has been kept of the names and addresses of the persons to whom the report has been given, and it is gratifying to note that a large number of requests have come from capitalists and investors, who are interested in the development of the State's mineral resources.

The annual report for 1902, the manuscript of which is now about ready for the printer, is based in part upon field work done in the summer of 1901, but mainly upon the field work of the season of 1902. This report is in two parts, as follows:

PART I. The Coal Fields of Washington.

PART II. The Building and Ornamental Stones of Washington.

FINANCIAL STATEMENT.

Of the appropriation of ten thousand dollars made for the support of the Geological Survey during the biennium, a general summary of the expenditures to the present time (December 1, 1902) is given below. The balance is to be used in defraying the expense of printing the Annual Report for 1902.

Equipment for work of field and office.....	\$ 584.39
Subsistence of field parties.....	2,361.18
Printing and postage, report for 1901.....	1,649.42
Salaries of Geologists.....	1,296.00
Salaries of Field Assistants.....	1,824.31
Expenses of members of the Board.....	54.20
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Total	\$7,769.50
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Balance	\$2,230.50

SUGGESTIONS.

The reports of the Geological Survey represent the results of the researches of the survey staff upon the economic geology of the State. These researches are made in a careful, scientific way, and the reports therefore are thoroughly accurate and reliable. The demand for the reports will steadily increase as the fact that Washington has an active Geological Survey becomes better known within and without the State. It is evident that the edition of two thousand copies, which is all that can be printed each year under the present appropriation, is inadequate, and provision should be made for larger editions of future reports.

In a State where information concerning its mineral resources is in such demand as in Washington, and where immigration is so desirable, it is advisable that the Geological Survey be carried on as expeditiously as possible. As yet, even with the work of the years 1901 and 1902, the Survey can only be said to be fairly started. As rapidly as possible full reports should be made and published on the principal mining districts of the State, on the artesian basins and water power, the soils, clays, road building materials, and other mineral products. Finally, as has been done in nearly all of the eastern states, reports upon the different counties of the State should be made, giving exact information as to the location, extent, and value of all the economic minerals which each county possesses.

In order to hasten the work of the State Geological Survey, and to avoid any duplication of work by the two organizations, it is deemed advantageous by the Board that a plan of co-operation be entered into between the United States Geological Survey and the State Survey. In many of the eastern states such an arrangement has been effected between the national and state surveys, to their mutual advantage. It is hoped that the necessary amendment to the present law may be made whereby the Board of Geological Survey will be empowered to arrange and carry out a scheme of co-operation with the officials of the United States Geological Survey, in the work of the latter in the State of Washington. The following amendment to the law establishing a Geological Survey in the State of Washington is known to be acceptable to the Director of the United States Geological Survey, and its passage is urged by this Board:

The Board of Geological Survey is hereby authorized to make provision for topographic, geologic and hydrographic surveys of the State of Washington in co-operation with the United States Geological Survey in such manner as in the opinion of the said Board will be of the greatest benefit to the agricultural, industrial and geological requirements of the State of Washington, provided that the Director of the United States

Geological Survey shall agree to expend on the part of the United States upon said surveys a sum equal to that expended by the said Board.

In order to carry on the work of the State Geological Survey for the years 1903-1905, the Board asks for an appropriation of ten thousand dollars per year. This amount will permit of co-operation to a limited extent with the United States Geological Survey, will make it possible to have printed larger editions of the annual reports, and will insure a larger amount of field work each season, with a consequent hastening of the general work of the survey.

For a more complete account of the results attained by the State Geological Survey during the biennium, the attention of the members of the Legislature is respectfully called to the Annual Reports for the years 1901 and 1902.