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BIENNIAL REPORT
OF THE
STATE GEOLOGIST
OF THE
STATE OF WYOMING



C. E. JAMISON, State Geologist

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The State Geologist

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The State of Wyoming

September 30th, 1912



C. E. JAMISON, State Geologist

CHEYENNE, WYO.
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1912

BIENNIAL REPORT

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The State Geologist

The Eleventh State Legislature appropriated the sum of \$5,000 to cover the expense of work carried on by the State Geologist during the years 1911 and 1912. There was on hand September 30th, 1910, the sum of \$446.81, remaining from the fund appropriated by the Tenth State Legislature.

From September 30th, 1910, until February 1st, 1911, when the writer was appointed State Geologist, there was, apparently, but little work of importance carried on. During the seasons of 1911 and 1912 the field-work outlined below was completed, two reports were published, two are in the hands of the printers, and one is now in preparation.

FIELD WORK

Work in the field is necessarily the basis of all geologic investigations. Before reports can be written detailed studies must be made of specific areas. The work of the past two years is outlined below:

1. An area of about 500 square miles in south-central Fremont County was surveyed and a geologic map prepared on a scale of one inch to the mile;

2. An area of about 50 square miles in Converse County was surveyed and mapped on a scale of one inch to the mile;

3. An area of about 75 square miles in Carbon County was surveyed and mapped on a scale of one inch to the mile;

4. An area of about 100 square miles in Natrona County was surveyed. A map on a scale of two inches to the mile is now in preparation.

Aside from the detailed work above-mentioned the following-named points were visited:

Albany mining district, Albany County;
Bear Lodge mining district, Crook County;
Centennial mining district, Albany County;
Conant Creek coal field, Fremont County;
Coal-fields north of Sheridan, Sheridan County;
Encampment mining district, Carbon County;
Esterbrook mining district, Converse County;
Fox Park district, Albany County;
Glenrock oil field, Converse County;
Powder River oil field, Johnson County;
Prospective oil fields near Lusk, Converse County;
Prospective oil fields near Shoshoni, Fremont County;
Rock River district, Albany and Carbon Counties;
Rock Springs district, Sweetwater County;
Silver Crown district, Laramie County.

Before the end of the present field season the oil fields in southern Uinta County; prospective oil fields near Buffalo, Johnson County; prospective oil fields on the line of the Laramie, Hahn's Peak & Pacific Railway, Albany County; the Copper Mountain mining district, Fremont County; and oil fields in Park and Big Horn Counties will probably be visited.

PUBLICATIONS

In May, 1911, a report on the general resources of the State was published. The edition of this report, which consisted of 2,000 copies, has long since been exhausted.

In December, 1911, a report on the geology and mineral resources of a portion of Fremont County was published. Only sixty copies of this report remain on hand.

In conjunction with the State Board of Immigration an edition of the mining laws, together with a brief resume of mining in Wyoming, was published in February, 1912.

Two reports, the one describing the Douglas oil field, Converse County, the other dealing with a prospective oil field near the western border of Carbon County, are now in the hands of the printers.

A report, describing in detail the geology of and development in the Salt Creek oil field, Natrona County, is now in preparation.

Numerous articles descriptive of the mineral resources of Wyoming have been prepared for and published in the various mining, geologic, and scientific journals.

CORRESPONDENCE

In the twenty months which have elapsed since the writer assumed the duties of the office 1821 letters bearing on the geology and mineral resources of the State have been received. More than 70 per cent. of these came from without the State. Inquiries in regard to Wyoming oil fields came from England, France, Germany, Belgium, Norway, Sweden, Italy, Austria, Netherlands, Russia, China, and Canada. A classification of the correspondence is given below:

Requests for geologic maps, reports, and other literature dealing with the mineral resources of the State, 721;

Inquiries in regard to the various oil fields, 423;

Inquiries in regard to coal, 85;

Inquiries in regard to metallic minerals and mines, including gold, copper, iron, lead, nickel, platinum, tin, and zinc, 147;

Inquiries in regard to non-metallic minerals other than coal and oil, including clays, stone, cement, gypsum, onyx, mica, potash, graphite, chromite, asbestos, artesian and mineral waters, etc., 336;

Requests for determinations of rocks and minerals, 109.

EXAMINATIONS

In accordance with the provisions of Chapter 22, Wyoming Compiled Statutes, 1910, examinations of mines, prospects and oil lands were made and fees collected as indicated below. All fees collected have been covered into the State treasury.

1. At the request of Mr. Russell Thorp, president of the Washakie Hydro-Carbon Mining Company, an examination of that company's lease on the Wind River Indian Reservation was made in June, 1911. A report, with maps, was prepared and submitted to Mr. Thorp, and, as the examination required a detailed survey of the lands, a fee of \$100 was charged.

2. A preliminary examination of the Silver Crown mining district, Laramie County, was made in July, 1911, at the request of the Industrial Club of Cheyenne. A number of mines, or prospects, were inspected and a report was

submitted to the Industrial Club, for which no charge was made.

3. In November, 1911, an examination of the Arizona mine, Silver Crown district, was made and a report submitted to the Otego Mining Company. As the examination required but one day a fee of \$25 was charged.

4. In January, 1912, a report on oil lands near Lander was made for Mr. M. M. Gilchrist. As all the facts were at hand and no field work was necessary a fee of \$25 was charged.

5. In April, 1912, an examination of the Rock Springs district was undertaken for the purpose of locating an artesian well for the town of Rock Springs. No fee, other than the necessary expense, was charged.

6. In May, 1912, an examination of prospective oil lands near Rock River, Albany County, was made for Mr. Frank Cooper of England. The examination required much detailed work and a fee of \$145.55 (30 pounds sterling) was charged.

7. At the request of a number of residents of Lusk an examination of prospective oil fields in the northern part of Converse County was made in June, 1912. No fee was charged, residents of Lusk paying the necessary field expense.

8. In August, 1912, an examination of oil fields near Glenrock, Converse County, was made at the request of Mr. P. E. Caplane. A detailed survey was made and maps prepared, for which a fee of \$75 was charged.

9. At the request of Mr. W. H. Taylor an examination of copper prospects near Encampment, Carbon County, was made in September, 1912. As the examination required only one day on the ground a fee of \$25 was charged.

EXPENDITURES

Below is given a list of funds available and expenditures from September 30, 1910, to September 30, 1912:

By balance from appropriation of Tenth State Legislature	\$ 446.81	
By appropriation of Eleventh State Legislature	5,000.00	
By one-half interest in carpet, State Examiner's	20.00	
By refund from State Immigration Commission, one-half cost of printing mining laws	52.00	
To railway and stage fares	\$ 590.76	
To hotel and board while traveling	321.70	
To assistant, field and office	1,231.20	
To field expense—		
Team	\$374.75	
Cook and teamster	147.10	
Provisions	174.54	696.39
To furniture and instruments		487.80
To stationery and printing		1,039.83
To postage, telephone and telegrams		222.38
To assaying		61.65
To miscellaneous		118.79
To balance		748.51
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	\$5,518.81	\$5,518.81

PLANS FOR THE FUTURE

Field work as mentioned below will be carried on during the next two years if the necessary funds are available. A report will be issued on the completion of each investigation.

1. A detailed survey of the oil and gas fields in Big Horn and Park Counties;
2. A detailed survey of oil fields near Moorcroft, Crook County;
3. A detailed survey of oil fields in southern Uinta County;

4. An investigation of the mineral resources of the Black Hills region, Crook and Weston Counties;
5. An investigation of the mineral resources of the Centennial district, Albany County;
6. An investigation of the mineral resources of the Big Horn Mountains;
7. A study of the iron ore deposits north of Rawlins, Carbon County;
8. A study of the asbestos deposits of the State;
9. A study of the phosphate beds in the western portion of the State;
10. A preliminary investigation of the mineral resources of the northern portion of Uinta County;
11. A study of the limestone and shale beds throughout the State for the purpose of determining the most advantageous point for the location of a Portland cement plant;
12. The preparation of a geologic map of the State.

APPROPRIATIONS

To carry on the work outlined above an appropriation of at least \$15,000 for the two years will be necessary. The expenditures will be divided about as follows:

Traveling and field expense:	
Railway and stage fares	\$2,000
Hotels, board and provisions	1,800
Teams, etc.	1,200
Assistants, field and office	4,800
Printing	3,000
Instruments, furniture, etc.	750
Postage, telephone, and telegraph	1,000
Assaying and chemical work	300
Miscellaneous	150
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TOTAL	\$15,000

For the purpose of comparison the appropriations made by various states for their geological surveys are given below: (Period of two years)

	FOR INVESTIGATIONS	FOR PRINTING	TOTAL APPROPRIATION
New York	\$56,520	\$50,000	\$106,520
Illinois	80,000	7,600	87,600
California	54,000	7,500	61,500
Wisconsin	50,000	10,000	60,000
West Virginia	59,800	.....	59,800
Washington	55,000	.....	55,000
Maryland	50,000	.....	50,000
Maine	46,000	.....	46,000
New Jersey	33,000	10,000	43,000
North Carolina	30,000	9,000	39,000
Missouri	35,000	.....	35,000
Oklahoma	34,650	.....	34,650
Tennessee	30,000	.....	30,000
Indiana	16,480	10,000	26,480
Georgia	20,000	5,000	25,000
Michigan	22,000	2,800	24,800
Colorado	20,000	3,200	23,200
New Mexico	22,000	.....	22,000
Iowa	16,000	6,000	22,000
Pennsylvania	20,000	.....	20,000
Virginia	20,000	.....	20,000
Florida	15,000	3,000	18,000
Alabama	15,000	2,000	17,000
Kansas	6,000	10,000	16,000
Ohio	15,000	.....	15,000
Mississippi	12,000	2,000	14,000
Arkansas	7,500	2,600	10,100
Nebraska	10,000	.....	10,000
Connecticut	3,000	5,000	8,000
South Carolina	6,800	1,000	7,800
Vermont	5,000	2,400	7,400
Rhode Island	5,000	1,000	6,000
Wyoming	5,000	.....	5,000
North Dakota	2,000	2,000	4,000

Arizona, Kentucky, Louisiana, Nevada, Idaho, Utah, South Dakota, and Texas maintain state geological surveys but figures as to appropriations are not at hand.

THE STATE GEOLOGICAL SURVEY

The geological survey of Wyoming exists for the purpose of obtaining and publishing accurate, definite, and unbiased information on the State's natural resources. It is of direct value to the State in several ways:

1. By determining the value of the State's holdings of mineral lands;
2. By helping to bring into the State new capital for investment;
3. By keeping money in the State through aiding in the establishment of local industries to supply local needs;
4. By bringing additional money into the State through enlarging the output of mines and factories;
5. By leading to added sources of income.

It is of value to the landowner by showing what ores, minerals, and rocks underlie his land; their depth, character, volume, and value, thus affecting the possible sale value of his land.

It is of value to investors by supplying unbiased information upon which investments may be made or industries established.

It is of value to transportation companies by increasing the volume of crude and manufactured materials to be moved, through an increased production and an increased demand.

It is of value to the purchaser by reducing costs through the production in the State of things that must otherwise be obtained from without.

It is of value to the laborer by increasing the demand for labor through the starting of new industries.

The natural resources of any State form the basis of its material advancement, and their development and use measure its wealth and progress. Wyoming is rich in minerals, embracing within its borders a variety of rocks and strata, of ores and minerals, not excelled by any other State in the Union. Yet she is making relatively little use of her resources, and to a large degree is one of the markets for other states. With as large deposits of material suitable for the manufacture of Portland cement as any state in the Union she produces none, obtaining her entire supply from Colorado, Utah, and eastern states. Although there is no reason to believe that Wyoming does not possess mineral deposits equally as rich and large as those of the other Rocky Mountain States, her mineral production, aside from coal, is only one-seventeenth that of Colorado, one-sixteenth that of Montana, one-twelfth that of Utah, one-seventh that of Idaho, and one-third that of South Dakota.

Since 1874 Colorado has had a well-supported geological survey and, no doubt, her pre-eminence in mineral production is in no small degree due to that fact. Wyoming has for years had a geological survey, but it has been so poorly supported that no work of importance could be undertaken. The difference in results obtained by well- and poorly-supported geological surveys is well illustrated by the two states. Colorado, with an appropriation of more than \$10,000 per year stands first among mining states; Wyoming, with \$1,000 per year up to 1911, is a poor last.

To a large degree the slow development of Wyoming's natural resources has been due to lack of publicity. The capitalist looking for investment and the young man looking for an opportunity will go to the place where they have learned authoritatively that the thing they desire exists. The copper producer, seeking new investment, will hardly come to Wyoming when he reads in Kemp's "Ore Deposits of the United States": "Copper prospects have been opened in northern Wyoming, and at other points, but the geological relations have not yet been described."

If Wyoming is to attain the rank to which she is entitled it will be necessary, not only that she realize more fully the extent of her resources and the possibilities of their use, but that she publish these facts to the world.