

1883

# REPORT OF TERRITORIAL GEOLOGIST AND MINING ENGINEER

OFFICE OF THE  
TERRITORIAL GEOLOGIST AND MINING ENGINEER,  
CHEYENNE, WYO., December 1, 1883.

To Hon. William Hale, Governor of Wyoming:

SIR—Herewith, in compliance with the law, I have the honor to submit my report as Territorial Geologist and Mining Engineer for 1882 and 1883.

I am, very respectfully,

Your obedient servant,

G. E. BAILEY, E. M.

It was with keen enjoyment that the Territorial Geologist accepted his appointment to a field with which he had become somewhat familiar during various trips and visits within the last ten years, and which he knew to be full of valuable resources, as well as one of the richest and most interesting regions in the world to the student of geology and mineralogy.

### PRELIMINARY WORK.

In entering upon a systematic survey of such a large area, one must necessarily spend a large portion of the first year in the field becoming acquainted with its general features,

and laying out the work so as to take up in order those regions and resources that are most important.

### DIFFICULTIES OF THE WORK.

In attempting to solve the problems connected with a certain valuable deposit or a group of mines, it is often necessary for the geologist to examine a large area of country, and gradually close in his examinations at the point of difficulty, taking him away from the highways to the canons, among the peaks, and along the mountain streams. In this way most of the mountain ranges of the south half of the Territory have been traversed.

### GOOD MAPS NEEDED.

In order to report correctly upon one locality, one must know the relation of the rocks there to those in the adjoining regions, and must have good maps upon which to record his observations and thus connect them. During the last year I have prepared maps from the plats in the United States Land Office, for field use as the occasion demands.

### FIELD WORK.

The nature of the field work accomplished will be seen from the "Report on Resources," given in another place. I received my appointment August 15, 1882, and commenced work at once, spending all the time in the field that office and other work would permit. The total time spent in traveling and field work is 231 days.

### CORRESPONDENCE.

The correspondence connected with such work is necessarily great, and is constantly increasing; many of the letters written require great care and study, as the expenditure of considerable sums of money often depends upon the information contained.

### OFFICE WORK.

The office work of making maps, drawing geological sec-

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tions, recording observations, examining minerals and labeling and preserving specimens is very great; while during the past so much time has been taken during office hours by interviews that a large portion of the usual routine work was necessarily performed during the evening.

#### BOOKS, MAPS, ETC., COLLECTED.

During my visit to Washington last February every effort was put forth to secure copies of every report, pamphlet, and paper that contained any reliable information concerning the Territory; also every map embracing this region in whole or part. The result of this, and extensive correspondence with individuals, has been as follows: Large volumes on the geology and mineral resources of Wyoming, 26; pamphlets, 174; maps, 42; photographs of scenery, large, 236; small, 147; wood cuts, etc., 182.

#### SPECIMENS.

There being no fund to pay for transportation, it has been an impossibility to preserve many choice and valuable specimens; but there are labeled and packed away in one of the cellars in Cheyenne over a ton of specimens of ores and fossils that would grace any cabinet, and which should be placed where they could be seen and used.

#### MAPS.

Herewith present to you two maps which suggest the methods that could be used with advantage and profit to record the results of examinations made.

The first is an economic map of the lower half of the Territory, showing timber, coal, copper, iron, soda, oil, gold, silver, grazing regions, and land capable of irrigation. This map, with the elevations of important points, would be of value if published.

The second map is one showing the various geological formations over that portion of the Territory that has been

examined, either personally or by the United States geological surveys. The work has been fitted to Holt's map for convenience, but it is impossible to give detail in a map of so small a scale. All records in the office are on a scale of four miles to the inch.

#### AREA OF WYOMING.

In mapping various portions of the Territory, my attention has been called to the published areas in square miles. Wyoming is bounded by the 27th and 34th meridians, west of Washington, and the 41st and 45th parallels. This area, according to the standard formula of Deloros for computing terrestrial surfaces, is 100,284 9-10 square miles. This, of course, includes all reservations, which are really a part of the Commonwealth of Wyoming.

#### EXPENSES.

The average expense of field work, including horse and wagon hire, food, instruments, road, ranch and hotel expenses, repairs, tents and an occasional assistant, has been about six dollars a day. The total amount so expended since commencing work has been as follows:

|   |            |
|---|------------|
| Laboratory and assay office rent.....                             | \$ 30,00   |
| Office rent, twelve months, at \$10.....                          | 120 00     |
| Chemicals and apparatus.....                                      | 52 40      |
| Stationery and postage.....                                       | 62 35      |
| Map paper, township plats, water colors, drawing instruments..... | 64 70      |
| Photographs.....  | 14 00      |
| Express on books.....   | 6 00       |
| Freight on specimens.....   | 15 75      |
| Traveling and field expenses.....                                 | 1,340 25   |
| Total.....  | \$1,705 45 |

Traveling expenses could be reduced if the Geologist owned a team, tents, etc., and was equipped to go into the

19. Graphite—Deposits of Albany and Carbon counties.

20. Gypsum—Deposits of Laramie, Albany and Uinta counties.

21. Forestry—A list of trees with the specific gravity of the woods; percentage of ash; weight per cubic foot; relative value for fuel; areas in each county; quality of timber; protection of; damage by fires; statistics of production.

22. Agriculture—Soils; irrigable lands; grazing areas; theory and practice of irrigation; duty of water; water rights; statistics of production; alfalfa, etc.

23. Physical geography of Wyoming; mountain ranges; water areas; list of over 600 elevations of towns, camps, plains, peaks and heads and mouths of streams.

24. A list of minerals found in Wyoming.

25. A list of birds found in Wyoming.

Considerable information has been collected on the following subjects and regions which deserve careful examination before detail reports are made:

Rawlins mining district, Carbon county.

Laramie mining district, Crook county.

Ernest mining district, Carbon county.

Seminole mining district, Carbon county.

Centennial mining district, Albany county.

Laramie Peak mining district, Albany county.

Miners' Delight mining district, Sweetwater county.

Jenny's Stockade oil district, Crook county.

Beaver oil district, Carbon county.

Rattlesnake oil district, Carbon county.

Shoshone oil district, Sweetwater county.

Popoagie oil district, Sweetwater county.

Building stones, limes, cements, mica, marble, clays, etc.

#### COST OF REPORTS.

In some respects the present Pennsylvania reports are the best issued. They consist of a series of small volumes, or pamphlets, each embracing one subject, such as iron, coal, oil, etc. In this way every one can cheaply procure the special information desired, and the State is saved the heavy expense of publishing large, bulky volumes. With the exception of a few volumes for exchange, the entire edition is sold at cost of printing. Such a series of pamphlets on the resources mentioned would be the cheapest and best, as each could in this way be advertised as soon as the examinations were finished, instead of waiting until the whole field had been passed over. These pamphlets could be sold and the proceeds used in publishing the next in order.

#### PRESERVING SPECIMENS.

The value of a public collection of the coals, oils, building stone, cements, irons, sulphur, soda, graphite, mica, kaolin, and gypsum; and the copper, gold, silver and lead ores; illustrating the resources of the Territory, could not be estimated in dollars and cents; but it would do a vast amount of silent work among miners, manufacturers, settlers and capitalists. Such a collection accessibly located would be visited by thousands every year, and would constantly bring our resources into more prominent notice, thus securing large pecuniary returns to the treasury. There is little doubt but that a modest appropriation for this purpose would be supplemented by donations from prominent citizens, and land from some city or railroad; and secure the erection of a plain, substantial building that would contain the collections mentioned, as well as those of the Fish Commissioner and the Wyoming Academy of Science; besides giving room for the laboratory of the Geologist, and office and work rooms for the Geologist and Fish Commissioner.

## BENEFITS OF THE OFFICE.

It is a recognized principle that the Government should help the State, and it is equally true that the State should make such investigations as private interest are unable to accomplish. It must necessarily be of the greatest benefit to the Territory to keep at its capital an office where its citizens, non-residents and foreigners can have access to reliable information relating to the vast resources of the Territory.

## ASSAY OFFICE.

The material of the Territorial Assay office was placed in my hands for safe keeping early in the year. It is a valuable part of the laboratory necessary to carry on general investigations; but it is not to the best interests of the Territory to make assays for individuals. Reliable assayers are numerous and easily reached, while the prices are within the means of the poorest. It is impossible for the Geologist to remain at home in order to attend to this class of work.

## SUPPLIES NEEDED.

Whoever carries on the work of the Territorial Geologist and Mining Engineer needs and should have the following assistance provided:

A good team, wagon, tent, camp outfit, barometer, tracing compass, etc.

A laboratory equipped for qualitative and quantitative analyses of ores, minerals, cements, oils, irons, etc.

A room for trimming, cleaning and labeling minerals, fossils, etc.

An office and library for preparing maps, reports, etc.

A room for displaying specimens collected.

The present appropriation must, according to the law, cover all expenses, while it is a sum barely sufficient to maintain a family of two in this city. The present incum-

vent of the office has, therefore, rather than permit the time to be wasted, paid from his own means, over and above the salary received, some \$1,700, besides expending some \$500 advanced by outside parties.

An appropriation of \$2,500 or \$3,000 per annum would do a great deal toward covering field, laboratory and publication expenses. Such a fund should be payable on vouchers, and drawn upon monthly, as quarterly payments have and will cause vexatious delays and the loss of valuable time.

An appropriation for the salary of the Geologist, payable monthly, as there is no other officer of the Territory who has to travel so large a portion of his time and therefore needs ready money.

An appropriation of ——— dollars for a Territorial museum.

## COST OF OTHER SURVEYS.

The following shows the range of cost among the fifteen States that are prosecuting surveys: Indiana, \$5,000 per year; Georgia, \$10,000 per year; New York, \$25,000 per year; Pennsylvania, \$50,000 per year.

## PROSPERITY OF THE TERRITORY.

During the last year and a half much has been done to attract the attention of outsiders to the resources of Wyoming; and to show that capitalists are interested, it is only necessary to mention the names of

The Wyoming Copper Company.

The Copper King Mining Company.

The Wyoming Improvement Company.

The Wyoming Land and Development Company.

The Graff Oil Company.

The Dupont Soda Company.

The Union Pacific Soda Works.

The Union Pacific Paint Company.