

MAINE STATE LEGISLATURE

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FOURTH BIENNIAL REPORT

OF THE

STATE SURVEY COMMISSION

OF THE

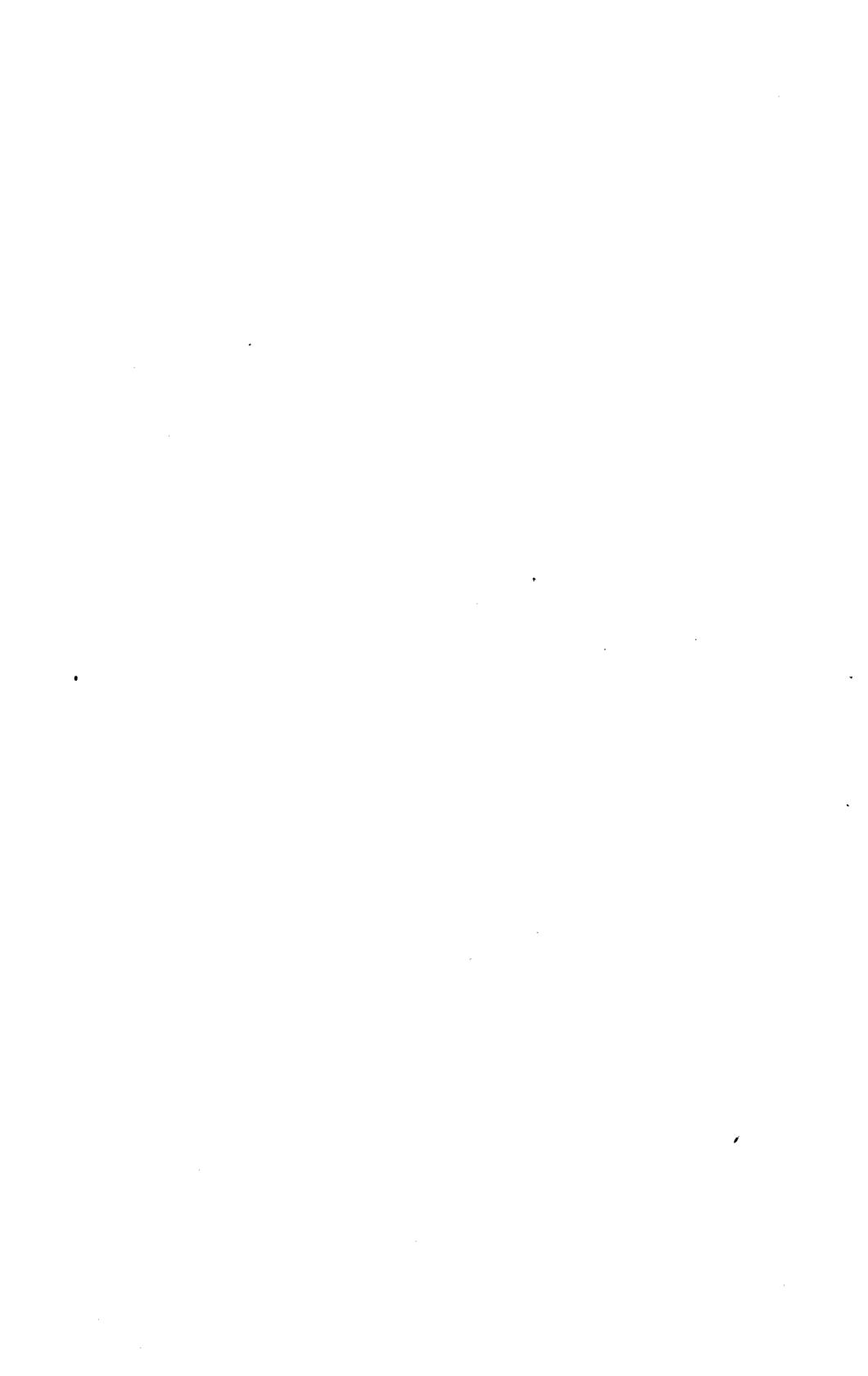
STATE OF MAINE

1905-1906.

AUGUSTA

KENNEBEC JOURNAL PRINT

1907



STATE OF MAINE.

STATE SURVEY COMMISSION.

To His Excellency, William T. Cobb, Governor of Maine.

Sir: The State Survey Commission, in accordance with the provisions of the law, hereby presents a summary of the work accomplished under its supervision, with a detailed account of its expenditures, for the years 1905 and 1906.

The enlargement of the scope of work of this Commission by preceding legislatures rendered its former name of Topographic Commission somewhat inappropriate and hence the Legislature of 1905, by act, ordered that it should hereafter be known as the State Survey Commission. The Board, with one exception, remains as it stood at the time of our last report. Hon. William Engel, who had served faithfully as a member since the beginning of the Survey, was forced to resign by reason of ill-health and Nathaniel M. Jones was appointed to fill the vacancy. The present organization of the Board is as follows: Leslie A. Lee, Chairman and State Geologist; Charles S. Hichborn, Secretary and Treasurer; Nathaniel M. Jones.

To this Commission are intrusted the following duties; to provide for the preparation and completion of a topographic map of the State, in continuation of the plan by which the entire area of the United States will ultimately be mapped; to investigate and map out the water resources of the streams, lakes and ponds of the State with reference to the complete development of its water power; and to examine, map and report upon the geological occurrence, nature, location and extent of such mineral products as may appear to be of value. Under the provisions of the law this Commission entered into a contract with the general government whereby the work outlined above should be done by the United States Geological Survey and the State Commission in cooperation. The cost of the field work of these surveys is met jointly by the State of Maine and the general government, the director of the United States Geological Survey agreeing thus to expend an amount equal to that appropriated for these purposes by the State. The results so obtained are published by the United States Geological Survey without expense to the State. The Commission is intrusted with the arrangement of the de-

tails of the surveys, with the supervision and inspection of the work as it proceeds, with the final approval or disapproval of the maps and reports, and with the disbursement of the funds appropriated by the State. The advantages of this cooperative plan of proceeding lie in the fact that by it the State secures the services of men who are especially trained experts in their respective lines of work and are in the permanent employ of the United States, while the expense to the State is less than one half the actual cost of the work.

The usual arrangements were made for the years 1905 and 1906 and suitable parties were kept in the field during each season for surveying in the three branches of topography, hydrography and geology. Their work was supervised and inspected by the Commission and below is given a summary of the results:

TOPOGRAPHY.

The following maps or atlas sheets have been completed, engraved, printed and made available since our last report; namely, Bingham, Matinicus, Monhegan, Rockland and Tenant Harbor. Besides these, the four sheets, Blue Hill, Castine, Deer Isle and Vinal Haven have been reengraved on one half the usual scale, to provide a map for geological purposes. The Forks sheet and the Lewiston sheets are completed and in process of engraving. The Poland sheet is partially completed, while the preliminary triangulation has been done for the Fryeburg and Hiram sheets. Twenty additional sheets are under control, the primary triangulation having been done.

The total area now mapped includes about 9460 square miles. There are in print 44 atlas sheets. Each sheet is 16 1-2 by 20 inches and represents an area of approximately 215 square miles. The scale is one mile to the inch and differences of level are shown by contour lines, one for every 20 feet of height. On the Monhegan sheet the experiment of tinting the wooded areas has been tried and it is to be hoped that all sheets hereafter issued may be so colored. In connection with other work, lines of precise levels were run from tide water at Portland to Brunswick and from Portland to Hiram and Fryeburg. In the early days of the survey no permanent bench marks were placed. Now bronze and aluminum tablets, properly inscribed, are set in suitable localities, and the opportunity was taken to place such marks in the regions traversed by the above mentioned lines of levels.

On the part of the United States the charge of the work has been in the hands of Mr. H. M. Wilson, Geographer, and the heads of field parties were, for 1905, Mr. T. Foster Slaughter; for 1906, Mr. Glenn S. Smith and Mr. Hersey Munroe.

HYDROGRAPHY.

At the time of our last report the survey of the Kennebec river had proceeded as far as Moosehead Lake. During the past two seasons parties have continued the work, mainly on the tributaries emptying into the Lake. The examination of the connecting lakes, Brassua, Long, Wood, Attean and others, has been thorough and maps of the more important ones have been prepared in great detail. The immediate problem was to determine the availability of reservoir sites for the storage of surplus water. The results are surprising, even to those best acquainted with the region. The contour of the country, the extent of the drainage basins, the amount of rainfall and the practicability of building dams for storage basins are such that the question of a reliable and permanent supply of water for all the water powers of the Kennebec river, and for other uses, becomes a simple one to answer. The cost of building suitable dams will be comparatively inexpensive and the damage by flowage will be at a minimum. Vast quantities of water may thus be retained until it is desirable to use it. Should this plan be put into effect the water resources of the river would become immensely more valuable. Maps and plans showing its results are now available. Four additional sheets of the river survey from Skowhegan to Moosehead Lake and one sheet showing its profile from tide-water at Hallowell to the Lake, thus completing the work, have been printed and published since our last report. Mr. H. K. Barrows the United States hydrographer in charge, has prepared an extensive paper on the Water Resources of the Kennebec, which is now in press and will soon be issued as one of the Water Supply Papers of the United States.

The Penobscot River from Bangor to North Twin Lake was surveyed in 1904. A series of maps, five in number, illustrating the results, has been engraved, printed and published. During a portion of the past two seasons parties have completed the survey of the West Branch from North Twin Lake to North West Carry and maps for this portion of the river will soon be completed.

On the Androscoggin parties have been engaged for the two seasons and the work has progressed as far as Errol Dam in the Rangeley region. The maps of the results are in preparation.

Stations for the measurement of the flow of streams have been maintained at many localities in all important drainage basins. At these stations the work consists in taking daily gage heights of the water and in making frequent current meter measurements of its flow. From these, rating tables will be constructed and the actual, available working water power determined for each locality. The more complete each series is made, the more accurate the results become. Similar records of value are obtained from several private parties who are interested in the work. The collection and tabulation of rainfall data is also continued.

The loss of water by evaporation from the surface of lakes and streams is not well understood. It is an important problem, since it may seriously affect the matter of storage. Experiments are now in progress for determining with accuracy the rate of evaporation under the varying conditions existing in our State.

Mr. H. K. Barrows, hydrographer, has had general charge of the work on the part of the United States, and has also taken an active share in the details. The chiefs of parties have been Prof. H. S. Boardman, Prof. A. D. Butterfield and Mr. C. R. Adams.

GEOLOGY.

Dr. George Otis Smith has had the direction of the geological work on the part of the United States, and he has also spent much time in the field. With him were associated Prof. T. Nelson Dale, in 1905 and Mr. E. S. Bastin and Prof. C. W. Brown in 1905 and 1906. To Prof. Dale was intrusted the preparation of a report on the granites of the State. He spent the entire season in the work and visited 129 quarries, besides receiving reports from many others. He studied the granites in place, the methods of quarrying, the nature of the rock and other questions which have a practical bearing on the subject. He made a collection of samples from each quarry, which he examined and tested in detail, during the winter of 1905-6. A full report has been prepared which is now in press and will soon be issued as one of the bulletins of the United States Geological Survey. Mr. Bastin, in 1905, undertook the examination of the complete geology of the Rockland region, the seat of the extensive lime

industry. He mapped the area in careful detail and his report will include much valuable information concerning the nature, distribution and extent of the limestone as well as of other rocks. The report will form one of the folio series of final reports on the geology of the United States.

In 1906 Mr. Bastin studied the structure, mode of occurrence and distribution of the pegmatite dikes of the south western part of the State. These dikes contain the feldspar, quartz and mica as they occur in commercial quantities. They also carry the gem-producing minerals, such as tourmaline and beryl, the mining of which is now assuming an industrial importance. He is now preparing a report on the subject.

In view of the fact that peat appears likely in the near future to come into prominence as a fuel it seemed to the Commissioners wise to undertake a preliminary examination into its extent in, and value to, this State. Peat has been shown to be peculiarly valuable for the production of gas for use in gas engines, and an economical source of power. It is widely distributed in Maine. Mr. Bastin visited peat bogs located near most of the important cities and towns of the State and collected samples for testing. The forthcoming report on the subject will no doubt be instructive and serviceable.

Prof. Brown spent both seasons in investigating the area and economic geology of Mount Desert and the adjacent mainland. The geology of this region has been misunderstood by previous investigators and his report will make clear the doubtful points and describe many features of practical value.

In response to requests from many sources the government geologists and the State geologist have investigated and reported upon subjects of minor importance. Brief papers have been published on graphite, molybdenite, clay, slate, granite, limestone and some of the rarer rocks occurring here.

DISTRIBUTION OF RESULTS.

The topographic maps or atlas sheets and the geologic folios are, by a law of the United States, sold at their cost, the former at a price of five cents for each sheet or \$3.00 per hundred, and the latter at twenty-five cents for each report. The hydrographic maps and the other reports, in the form of Bulletins, Water Supply Papers and Professional Papers, are distributed free of cost. They may be obtained of the director of the

United States Geological Survey at Washington, of members of Congress and of the State Commission.

EXPENDITURES.

It is impossible to keep the departments absolutely distinct for the reason that oftentimes the work of one branch overlaps that of another. The Commissioners have kept the expenditures as closely defined as possible, having regard to the best interests of the service.

The general government has been very generous and has fully lived up to its agreement in every respect.

The expenditures on behalf of the State, including all expenses and salary accounts, as per bills approved by the Governor and Council, have been as follows:

For the year 1905,

For Geology	\$2,276 18	
“ Hydrography	4,289 88	
“ Topography	3,433 94	\$10,000

For the year 1906,

For Geology	\$2,415 93	
“ Hydrography	3,612 12	
“ Topography	3,971 95	\$10,000

FUTURE WORK.

Much remains to be done on the lines already indicated. The function of the Commission is to collect and disseminate accurate information regarding the lands, rocks, streams and lakes of the State, everything in fact which will aid in the complete development of her varied natural resources. That it supplies an actual necessity is demonstrated by the eagerness with which the results are called for and the many uses which are made of the facts obtained. The continuation of these surveys to completion is certain to bring increased wealth, population and prosperity to this State.

Respectfully submitted,
 LESLIE A. LEE,
 CHARLES S. HICHBORN,
 NATHANIEL M. JONES,

State Survey Commissioners.

AUGUSTA, Maine, March 1, 1907.