

# MAINE STATE LEGISLATURE

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PUBLIC DOCUMENTS OF MAINE:

1905

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

DEPARTMENTS AND INSTITUTIONS

For the Year 1904.

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VOLUME IV.

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AUGUSTA  
KENNEBEC JOURNAL PRINT  
1905

THIRD BIENNIAL REPORT

OF THE

Topographic Survey Commission

OF THE

STATE OF MAINE,

1903-1904.

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AUGUSTA  
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## REPORT.

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

SIR:—The sixty-ninth legislature, by act, Public Laws of 1899, chapter 99, created a Topographic Survey Commission and charged it with the preparation and completion of a topographic map of the State. The seventy-first legislature, by resolve, enlarged the scope of the work of the commission and authorized a hydrographic and a geological survey, upon the terms provided for by the original act, and in accordance with the plan for the development of the natural resources of the State first presented to the legislature.

Under the provisions of the law this commission was empowered to make a contract with the general government whereby the mapping of the State, the measurement and mapping of the waterpowers and the examination of its geology should be done by the United States Geological Survey. The cost of the field work of these surveys was to be 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 were to be published by the United States Geological Survey without expense to the State. The commission was entrusted with the arrangement of the details of the surveys, with the supervision and inspection of the work as it proceeded, with the final approval or disapproval of the maps and reports and with the disbursement of the funds appropriated by the State.

The organization of the board of commissioners is as follows: Leslie A. Lee, chairman and State geologist; Charles S. Hichborn, secretary and treasurer; William Engel.

The commissioners have made the contracts and agreements as above described. Under plans mutually satisfactory the director of the United States Geological Survey has sent parties into the State for surveying along the three lines of topography, hydrography and geology. Their work has been supervised and duly inspected by the commission and following is a report on the results obtained during the years 1903 and 1904.

#### TOPOGRAPHY.

Since our last report the following new maps or atlas sheets have been printed and made available: Anson, Bar Harbor, Bluehill, Cherryfield, Deer Isle, Mount Desert, Petit Manan, Swan Island, Vinalhaven.

The engraving of the Bingham sheet is nearly completed. Four more sheets, covering the region from Rockland to Boothbay, have been surveyed and a beginning has been made on the sheet just north of Bingham. The total area now mapped includes 6,122 square miles. There are in print 36 atlas sheets. Each map is about 16½ by 20 inches and represents an area of approximately 215 square miles. The scale is nearly one mile to the inch and differences of level are shown by contour lines, one for every 20 feet of height. Each sheet is engraved on copper and printed in three colors—black for all artificial features, as roads, railways, houses, etc.; blue for all water features, as lakes, rivers, etc.; and brown for contour lines representing the surface relief, or the shapes and slopes of hills, valleys, etc.

Mr. T. Foster Slaughter has been in charge of the topographic party. In the course of the field work incident to the mapping 187 points were accurately located by trigonometric methods, 1,633 miles of road traverse were run, every bend and every house being accurately located. There were run 403 miles of spirit levels, in the course of which 22 permanent bench marks were established and the elevations of 1,207 positions accurately determined and marked.

#### HYDROGRAPHY.

The hydrographic work may be classified under three heads, viz., making river profiles and surveys, measuring the flow of streams and collecting rain-fall data. Under the first come the

surveys of the Kennebec and the Penobscot. On the Kennebec a line of precise levels was run from tide-water, at Hallowell, to the outlet of Moosehead lake, a distance of 135 miles. All falls, rapids, shoals and islands were located and the banks mapped with contour intervals of ten feet. Permanent and temporary bench marks were set at suitable intervals.

A similar survey of the Penobscot has been begun, now extending from tide-water at Bangor to Chesuncook lake. The published reports of these surveys will contain maps and profiles of the rivers, together with descriptions of the banks and other data useful for determining the industrial availability of the streams and opening many possibilities of water power for manufacturing purposes not heretofore developed.

Stations for the measurement of the flow of streams have been maintained at the following localities:

St. John river drainage basin:

Fish river at Wallagrass.

Aroostook river at Fort Fairfield.

St. Croix river drainage basin:

St. Croix river at Spragues Falls near Baring.

Machias river drainage basin:

Machias river at Whitneyville.

Penobscot river drainage basin:

Penobscot river at Montague.

East branch of Penobscot river at Grindstone.

Mattawamkeag river at Mattawamkeag.

Piscataquis river near Foxcroft.

Cold stream at Enfield.

Philips lake outlet at East Holden.

Kennebec river drainage basin:

Kennebec river at The Forks.

Kennebec river at North Anson.

Moose river near Rockwood.

Roach river at Roach River.

Dead river near The Forks.

Carrabassett river at North Anson.

Sandy river at Stark.

Messalonskee river at Waterville.

Androscoggin river drainage basin:  
Androscoggin river at Dixfield.

In addition to these stations we obtain records in co-operation with private parties on flow of rivers as follows:

Penobscot river drainage basin:  
Penobscot river at Millinocket.

Kennebec river drainage basin:  
Kennebec river at Waterville.  
Cobbosseecontee river at Gardiner.

Androscoggin river drainage basin:  
Androscoggin river at Rumford Falls.

Presumpscot river drainage basin:  
Presumpscot river at outlet of Sebago lake.

The work of these gaging stations consisted in taking the daily gage heights of the water and 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.

Rain gages were maintained at The Forks, Danforth and Chesuncook and continuous records kept.

The hydrographic work for 1903 was under the direction of Prof. N. C. Grover and for 1904 under Mr. H. K. Barrows.

#### GEOLOGY.

In planning the geological work it appeared wise to the commission to concentrate its strength upon some limited region, the importance of which was unquestioned, from the point of view both of general geology and its economic value. The region of Penobscot bay was accordingly selected. Dr. George Otis Smith, with Messrs. E. S. Bastin and C. W. Brown as aids, all from the U. S. Geological Survey, was placed in charge. The area, including about 1,000 square miles, has been thoroughly surveyed. All rock formations have been examined and the limits of each formation have been accurately mapped. A report on this work is now in preparation which will be published during the coming year. This will form a part of the final report on the geology of the United States and will be issued in large



folio form, fully illustrated with geological maps. The region covered proves to possess exceptional interest both theoretically and economically. From it comes one-sixth of the production of dressed granite of the United States and one-fourth of the production of paving stones. A special report on the granite is also in preparation. In addition it is hoped, after a further study of the granites of the remaining portions of the State, to issue a treatise on the subject of granite, in which will be included much useful information. Such a work cannot fail to call increased attention to the products of our quarries.

The second kind of geological work was to investigate such problems of economic importance as might arise in any part of the State and assist in disseminating reliable information. The first question of this character related to the possible occurrence of coal, particularly in the region between Calais and Eastport, brought to the attention of the last legislature by a bill calling for the appropriation of \$10,000 for making an examination. No action was taken on this bill except to refer it to the present legislature. The commission in the meantime took up the investigation. Two experienced geologists were sent into the field and the work was accomplished at a cost to the State, under the plan of co-operation with the general government, of less than \$300. Other localities from which reports about coal had come, were visited by these geologists or by members of the commission. The results of these investigations are published by the United States Geological Survey in Bulletin No. 35, copies of which may be obtained free of charge. While the results are all negative, it is still satisfactory to have the question settled, in order that capital may no longer be unwisely invested in the search for coal where it is impossible of occurrence.

Many inquiries about useful minerals and rocks have been answered as fully as possible by the State geologist who has, in cases which required, visited the localities and reported upon them. Dr. Smith has also rendered assistance of this nature. Among the substances which have received attention are garnet, graphite, molybdenite, gold, silver-bearing lead ore, antimony, feldspar, copper, nickel, slate, granite, limestone, clay, diatomaceous earth and peat. A report on molybdenite will soon appear. It is hoped to issue reports on other topics, from time to time, as materials for them are accumulated.

## PUBLICATIONS.

The results of the work of the State Survey Commission should be widely disseminated. To aid in this a list of the maps and reports is given below, including some not yet published but soon to appear. By a law of the United States the maps and folios are sold at the cost of printing, the former at five cents for each sheet, or \$2 per hundred, and the latter at twenty-five cents for each report. All other reports are distributed free of charge. They may be obtained of the director of the United States Geological Survey, Washington, D. C., or of the secretary of the State Survey Commission, Augusta.

## LIST OF COMPLETED MAPS NOW AVAILABLE FOR USE.

The name is taken from the most important place on the sheet. Anson, Augusta, Bangor, Bar Harbor, Bath, Berwick, Biddeford, Bluehill, Boothbay, Bucksport, Buxton, Casco Bay, Castine, Cherryfield, Deer Isle, Dover, N. H., (Kittery), Freeport, Gardiner, Gray, Kennebunk, Mount Desert, Newfield, Norridgewock, Norway, Orland, Orono, Petit Manan, Portland, Sebago, Small Point, Swan Island, Vassalboro, Vinalhaven, Waterville, Wiscasset, York.

Maps of the Kennebec river surveys, Sheet 1, Skowhegan to Madison.

## REPORTS.

The Geology of the Perry Basin in Southeastern Maine, by George Otis Smith and David White. No. 35 of the professional papers.

Contributions to Economic Geology for 1903 contains a report on gold in Maine. Bulletin No. 225.

Contributions to Economic Geology for 1904 will contain reports on granite and molybdenite.

Geologic Atlas of the United States, Penobscot Bay Folio, will contain the report by Dr. Smith described above.

Water Powers of the State of Maine, by Henry A. Pressey, No. 69 of the Water Supply Papers.

Reports on Stream Measurements in other Water Supply Papers and annual reports.

## EXPENDITURES.

The following represent the expenditures by the commission on the part of the State: Topography, \$6,404.50; hydrography, \$1,658.43; geology, \$1,941.84.

The figures do not exactly represent the amount expended in the different branches of the work for the reason that much has been done in field and office work for one branch, by those employed in another. It has been impossible to keep them absolutely separate without detriment to the service. If strictly classified and divided it is probable that the amount actually expended in the hydrographic work would be not far from \$3,000 and in topographic work \$5,000.

The government agrees to expend only an amount equal to that supplied by the State, but by special arrangement with your commissioners a much larger sum has been provided by the department at Washington, in order that the new branches of the work might speedily be brought to such a stage as to demonstrate their real value to the people of our State at the earliest possible date. The expenditures of the government in our State have been, or will be, but little less than \$15,000, an excess over our own appropriation of about \$5,000.

## THE FUTURE OF THE SURVEY.

The utility of these surveys is now beyond question. They have passed the experimental stage and their results are used and highly appreciated by practical men everywhere. Demands for the extension of the work in various directions are quite too great for the commission to meet with the limited funds at their disposal.

The maps form the foundation of all other development. Their usefulness increases in proportion to the extent of the area covered by them. They are already used in the extension of railroads and electric lines, in planning water supplies for cities and towns, in forestry, in the location of sites for new manufacturing industries and in many other ways, and will be indispensable in the coming movement for building good roads.

The greatest assets of Maine are in her water powers. The data collected and published by the hydrographic branch are invaluable in their development. All important streams should

be surveyed to determine their possibilities for power. Each drainage area should be investigated with reference to available storage basins by which the present yearly diminution in the flow of water in our streams may be prevented and the power kept up to the normal averages.

The utilization of our mineral resources is only just begun. There are deposits of building stones, limestone, slate, feldspar, quartz and many other useful minerals, of unexcelled quality, which have not yet been drawn upon. The facts concerning their location, extent and quality should be gathered and made known.

The importance of the collection and dissemination of accurate information about our natural resources cannot be too strongly urged. It is an investment sure to bring ample returns to the State.

#### RECOMMENDATION.

For the continuation of these surveys the commissioners recommend an appropriation of ten thousand dollars for the year 1905 and a like sum for the year 1906.

Respectfully submitted,

LESLIE A. LEE,  
WILLIAM ENGEL,  
C. S. HICHBORN,

*Survey Commissioners of the State of Maine.*

AUGUSTA, MAINE, February 11, 1905.