

**UNIVERSITY OF THE STATE OF
NEW YORK; NEW YORK STATE
MUSEUM. 23D REPORT OF THE
STATE GEOLOGIST. 1903**

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New York State Museum

FREDERICK J. H. MERRILL, Director

23d REPORT OF THE STATE GEOLOGIST

1903

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CONTENTS

Geology	6
Maps	6
Precambrian and crystalline rocks.....	6
Pleistocene	8
Economic geology	12
Mineralogy	13
Peat: its Formation, Uses and Occurrence in New York. Arthur L. Parsons.....	15
Notes on the Gypsum Industry of New York. Arthur L. Parsons	89
Abrasives of New York State. Harry C. Magnus.....	158
Minerals not Commercially Important. Herbert P. Whit- lock	180
Distribution of Hudson Schist and Harrison Diorite in the Westchester County Area of the Oyster Bay Quadrangle. F. J. H. Merrill, assisted by H. C. Magnus.....	193
The Northeast Extremity of the Precambrian Highlands. F. J. H. Merrill, with map by T. Nelson Dale.....	195

University of the State of New York

New York State Museum

23D REPORT OF THE STATE GEOLOGIST 1903

To the Regents of the University of the State of New York

I submit herewith my report as State Geologist for the fiscal year ending Sep. 30, 1903. As usual, this report is mainly administrative, and the more important papers based on the results of the year's work are issued as bulletins to permit of earlier and wider distribution.

Respectfully yours

FREDERICK J. H. MERRILL

GEOLOGY

The work of this division has continued along the lines of investigation previously in progress. As usual, the autumn, winter and spring have been occupied with the preparation of maps and other matter for publication, and the summer season has been devoted to field work.

Maps

The demand for an up to date geologic map of New York, of moderate size, has led to the preparation for the publication of a new edition on the scale of 15 miles to the inch, which shall extend a short distance beyond the New York State boundary in all directions, so as to show the geologic relations in the immediately adjoining territory. Tracings of the 5 mile base map for reduction to the scale of 15 miles to the inch were prepared under the supervision of Mr C. C. Vermeule, while tracings of the territory adjacent to New York have been prepared in the office by Mr H. H. Hindshaw. The manuscript was placed in the hands of the contractors for engraving, Messrs A. Hoen & Co., in September, and the map will probably be issued within 12 months.

The hypsometric map issued with the 21st Report of the State Geologist has met with a reception indicating much appreciation of its value, and, in accordance with the request of Professor Landreth, is to form a plate in the next report of the State Water Storage Commission, by permission of the University.

Accompanying this report is a map of New York State which shows, by various conventions, the distribution of its mineral resources.

Pre-Cambrian and crystalline rocks

In August the State Geologist took up a comparative study of the rocks of eastern Berkshire county, Mass., as an important help in working out the classification of the crystalline rocks of the Highlands of Putnam county, and the adjacent territory in New York, on which he has been engaged at intervals since 1884. In this he was aided by Mr H. C. Magnus, who had formerly taken part in the work on the Highland area between West Point and Peekskill, and who was occupied during the spring with the

mapping of that portion of Westchester co. included in the Oyster Bay quadrangle.

Two weeks were spent in the Berkshire region and two weeks more in the study of the pre-Cambrian and other crystalline rocks on the shores of Long Island sound between New London on the east and Fairfield on the west.

Then, returning to Pittsfield, some further time was spent in reconnaissance trips from Williamstown on the north to South Norwalk on the south and eastward as far as Springfield. In the course of this work much benefit was derived from conferences with Professors Dale at Pittsfield, Cleland at Williamstown and Gregory at New Haven.

This work has been necessitated by the great mass of geologic investigation carried on in western New England during the past 15 years, on formations in part identical with those of south-eastern New York.

In the Adirondack region, Prof. H. P. Cushing had prepared to continue his work of previous seasons, but during the past summer the heavy rainfall rendered field work in the woods impossible except on comparatively few days. It had been intended to finish the mapping of the Long Lake sheet; but, for the above reason, only about half of the work was completed. In the area covered, attention was mainly centered on the hard geology, and the experience of previous seasons was corroborated in that the anorthosite was found, in this district, to grade invariably into a gneissoid gabbro along its border and to become involved with, and apparently cut by, a gneissoid and rather basic phase of the adjoining syenite. Later, a short visit was made to the Little Falls region to clear up one or two points connected with its geology.

In the office the areal mapping of the Little Falls sheet has been transferred by Professor Cushing to the revised map of that quadrangle, which has recently appeared, and the maps transmitted for publication. A short report on the petrography of the Northumberland rock was transmitted by him for publication in the 21st Annual Report of the State Geologist. Much time during

the year was devoted to the preparation of a report on the geology of the northern Adirondack region; and it is well advanced toward completion, so that it will be forwarded for publication early next spring.

Pleistocene

During the field season of 1903 Professor J. B. Woodworth continued his work on the Pleistocene geology of the eastern part of the State. Work was begun in the month of April on the remapping of the Harlem and Brooklyn quadrangles, Mr J. W. Goldthwait being charged particularly with the detailed mapping of the outcrops of bed rock not heretofore shown on geologic maps. This work was advanced by Mr Goldthwait during the summer season to the point of showing in detail the surface geology of the major part of the southern half of the Harlem quadrangle and that of the Brooklyn sheet except the area within the city of Brooklyn. The plan of showing the position of the hundreds of small rock exposures in the former area as an index to the distribution of the thin till, rendered the field work necessarily slow. Mr Goldthwait, on account of illness, was forced to leave the field in the middle of August and has not since returned to it. The glacial striations in the mapped portion of the Harlem area was studied in detail and, through the occurrence of newly made sections, some advance was made in differentiating into definite categories, deposits of drift which heretofore have been represented as undifferentiated glacial materials. Another season's field work will be required to complete the area undertaken.

Several days were devoted by Professor Woodworth during the spring and summer to following the progress of the borings made in the western part of Long Island by the Commission for Additional Water Supply. The sections thus obtained threw much additional light on the structure of the outwash plain, particularly in the area of the Hempstead sheet. A detailed investigation was carried on at the same time in the area by the United States Geological Survey, a preliminary report of the observations of which, including data from many deep wells privately undertaken,

has appeared in various journals. Of the large number of samples of gravels, sands and clays obtained by the Commission referred to, small samples were allotted to the State Museum and are now in Mr Woodworth's charge for such use as can be made of them.

From the 6th of July to the 13th of August Professor Woodworth was granted leave of absence in order to attend to his duties as instructor in one of the summer schools of Harvard University. On the 17th of August he proceeded to Norwood N. Y., where he was joined by Professor Coleman of Toronto Can., and, accompanied by that geologist, conducted a rapid review of the shore lines and evidences of marine submergence lying between Mooers Junction and Adams Center on the southern side of the St Lawrence valley. The primary object of this expedition was to obtain the expert advice of a geologist whose familiarity with the similar phenomena on the Canadian side of the St Lawrence and Ontario valleys was deemed of the highest value in settling mooted points regarding obscure indications of shore lines in this district.

In the course of this examination, Professor Coleman found marine shells (*Macoma groenlandica*) in clays on the outskirts of Ogdensburg. Later, Messrs Coleman and Woodworth found abundant traces of marine shells in stratified sands near the boundary line between the towns of Lisbon and Ogdensburg, including *Macoma calcarea* and one specimen of *Cylichna alba*, a very rare shell within the limits of the State, the only other known locality being that at Port Kent, where it was early noticed by Professor Ebenezer Emmons, and where but two specimens have been collected in the course of this investigation. These Ogdensburg localities are at an elevation of about 275 feet above the sea.

At Norwood, sewer openings which were made in the summer of 1903 revealed many new localities of marine shells, invariably *Macoma groenlandica*. On the hill north of the village, those shells were found in the clays from the sewer trench at an elevation of 360 feet above the sea by the aneroid barometer, or an elevation of 370 feet according to the engineer's levels tied to the