

**REPORT OF PROGRESS G.:
THE GEOLOGY OF
SUSQUEHANNA COUNTY
AND WAYNE COUNTY**

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Report of Progress G.: The Geology of Susquehanna County and Wayne County by I. C. White

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I. C. WHITE

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SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA:
REPORT OF PROGRESS
G.

THE
GEOLOGY
OF
SUSQUEHANNA COUNTY
AND
WAYNE COUNTY.

BY I. C. WHITE.

WITH A
GEOLOGICALLY COLORED MAP,
AND 58 SECTIONS.

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LETTER OF TRANSMITTAL.

To His Excellency Governor Henry M. Hoyt, chairman of the Board of Commissioners of the Second Geological Survey of Pennsylvania :

SIR: I have the pleasure to submit the Report of Progress of the Survey in Susquehanna and Wayne counties, in 1880, by Prof. I. C. White.

The principal feature of this report is its classification of the Pocono and Catskill formations, with definite names bestowed, virtually for the first time, on their sub-divisions, or several groups of beds.

This is an important step in the progress of American geology. It has not been known that any such classical differentiation of these thick deposits was practicable. Mr. White has however succeeded in establishing numerous fixed horizons, well defined both by lithological and palæontological marks; and when, during the field season of 1881, he shall have traced the outcrops of these sub-divisions from Pike county westward to the West Branch of the Susquehanna river, we shall be in condition to devise a pretty complete nomenclature for the hitherto unnamed sub-divisions of formations VIII, IX and X in middle Pennsylvania, where their combined thickness varies from 10,000 to 12,000 feet.

This great desideratum has been necessarily postponed to the closing years of the Survey.

I beg to call your attention especially to Mr. White's description of the flat-pebble conglomerates, and to the calcareous breccias, or cornstones, of the district reported on, and to the importance of the latter named rocks to its agriculture.

The two counties under review in this book are uncommonly barren of mineral resources ; neither coal, nor iron ore, nor any other kind of ore existing either at the surface or at a moderate depth. The Marcellus brown hematite ore beds, and the Clinton fossil iron ore beds, if they were deposited within the limits of the district, lie buried now at depths varying in different parts of it between 1000 and 5000 feet.

Although the Venango Oil formation is represented by a group of beds underlying the whole of Wayne and the greater part of Susquehanna county, there is very little to support an expectation of success in boring for oil.

The great salt bearing (*Pocono* No. X,) rocks of the southwestern counties form in this district a few ranges and patches of highland ; and the salt bearing rocks of the State of New York (*Salina*, No. V) lie nearly as deep beneath the surface as the fossil ore beds.

It is possible that at some future time salt brine may be obtained in abundance from wells 3000 feet deep sunk to the *Salina* rocks in the northern townships of Wayne county, and in the northwestern and middle townships of Susquehanna county ; and certainly a deep trial-hole should be bored to test the existence of thick rock-salt deposits at that depth. When such an enterprise is contemplated a pretty exact calculation can be made of the probable depth of the *Salina* formation beneath any chosen locality. The salt shafts of the Rhine valley 3500 feet deep afford sufficient evidence that where beds of rock salt are known certainly to exist great depth is not a bar to exploitation.

Another feature of this report is its frequent description of glacial phenomena :—surface deposits of northern and local *Drift* gravels, sand and clays—moraine ridges and dams of *Drift* in valleys,—crystalline rock fragments in the *Drift* of one small area,—innumerable bowlders and huge isolated blocks of the country-rocks scattered loosely or closely over the whole district,—and scratches and grooves made by the *Mer de glace* on the rock-surfaces, pointing southward and southwestward, at all elevations up to 2100 feet above tide level on the side of Mount Ararat ;—and re-

ferences to all Mr. White's observations on this interesting topic will be found collected in Index B under the head of "Glacial drift."

I am obliged to repeat what I said in my letter prefixed to Report Q' on Erie and Crawford counties, that as Prof. White's manuscript report exhibits views of the erosive ability of moving ice such as those entertained by the ultra glacialists, and in my opinion mischievous (in a purely scientific sense,) I have made myself responsible for the removal from the printed text of most of the sentences which embody those views, seeing that they are not statements of fact, but simply expressions of feeling and hypothetical inferences. All his observed facts are given in the text, and the reader is left at liberty to draw his own conclusions, unbiassed by glacial theories.

With great respect,

Your obedient servant,

J. P. LESLEY.

1008 CLINTON STREET, PHILADELPHIA,

June 17, 1881.

LETTER

Prof. J. P. LESLEY,

State Geologist :

DEAR SIR : I herewith transmit my report on Wayne and Susquehanna counties.

Field work was commenced about the middle of June and continued until the 20th of September. During the last three weeks of my stay in the field an attempt was made to trace the *Cascade sandstone* westward, for the purpose of determining, if possible, its relations to the *Carrollton* and *Salamanca conglomerates*. It was successfully traced into Bradford county and there correlated with the "*Chemung*