

**SECOND GEOLOGICAL SURVEY OF
PENNSYLVANIA: 1875. SPECIAL REPORT
ON THE TRAP DYKES AND AZOIC ROCKS
OF SOUTHEASTERN PENNSYLVANIA.
PART I. HISTORICAL INTRODUCTION**

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T. STERRY HUNT

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PART I.

HISTORICAL INTRODUCTION.

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LETTER

BY THE STATE GEOLOGIST.

PHILADELPHIA, *June 14, 1878.*

*To the Governor and Honorable Board of Commissioners
of the Second Geological Survey of Pennsylvania.*

GENTLEMEN: I am happy to present the printed Report which you requested Dr. T. Sterry Hunt—for many years Chemist and Mineralogist to the Geological Survey of Canada, and now Professor of Geology in the Institute of Technology, in Boston,—to prepare.

The resolution of the board is dated August 5, 1875, and specifies the object in view as "a special examination and report on the Trap rocks of Pennsylvania," the Secretary of the Board being requested to communicate with Dr. Hunt. At the meeting of Nov. 4, 1875, the Secretary reported that Dr. Hunt had accepted the task; and the State Geologist reported that Dr. Hunt had already commenced his survey in Southern Pennsylvania, and that it would necessarily involve a study of the Azoic rocks.

The volume in hand will sufficiently attest to this evident necessity.

The survey of the Azoic rocks of Southern and Eastern Pennsylvania has been entrusted to three competent geologists of the regular corps, to wit:

To Professor Frederick Prime Jr. of Lafayette College, Easton, the topographical and geological survey of the Siluro-Cambrian slate and limestone valley of Berks, Lehigh and Northampton counties, including areas of Azoic uplift; together with the Azoic mountains, (and included limestone valleys,) stretching from the Delaware to the Schuylkill

rivers. This elaborate survey has been in progress under Prof. Prime's able direction since the beginning of the survey. The second volume of his reports of progress is about to issue from the press, and his field-party is engaged in finishing the southern border of the mountain-land, including the overlapping edge of the Trias.

To Professor Persifer Frazer Jr. of Philadelphia, was assigned a similar instrumental survey of the Azoic mass of the South Mountain in York, Adams, Franklin and Cumberland counties; including the Siluro-Cambrian limestone contact on the northwestern side, and the Trias contact on the southeastern side, with an enclosed limestone valley. Prof. Frazer's lines however traversed the wide low-lying triangle between the South mountains, the Susquehanna river and the Maryland state-line; occupied by a broad belt of Trias, by two belts of limestone, and a still broader belt of Azoic slates, of unknown relationship. This important and minute survey has been going on since 1874, and is far from completion yet. Prof. Frazer in 1877 continued his personal survey of the York county limestones and Azoic slates and gneisses into and over the whole of Lancaster county, his report of which is nearly ready to go to press. But his field-party continues the slow and laborious work of mapping the South mountains.

To Mr. Charles E. Hall has fallen, in a natural way, as the geologist in charge of the State Museum, the even more difficult task of unraveling the tangled threads of that skein of Azoic gneisses and slates which stretches from the Delaware River at Trenton, across the Schuylkill between Philadelphia and Conshohocken, through Chester and Delaware counties, to the Delaware and Maryland state-lines. Several thousand hand specimens have been collected and arranged in the museum, for study and comparison; and every exposure of rock, however insignificant, is not only represented in the cabinet-series of cross-sections, but located on the map. A long stride has already been made towards the true solution of the problem of our Azoic rocks, and of their relationship to the slate, sandstone and limestone formations which overlie them.

Meanwhile many microscopic and chemical analyses of these enigmatical rocks have been made by Dr. Genth, the Chemist and Mineralogist of the Survey; who has also paid great attention to the species of traps collected, and will continue to make a special study of that subject.

In support of the assiduous studies by these gentlemen of the Azoic rocks in their respective districts, and to further the success upon which they can already congratulate themselves, it was unquestionably desirable to compare their observations and conclusions with those made and reached, by geologists outside of the State, in the Azoic regions of New Jersey, Northern New York, New England, and especially of Canada. No better plan could have been adopted to reach this end than to invite so distinguished a student of Azoic geology as Dr. Hunt to visit those districts of our survey which seemed to correspond with those in the north among which he had spent the best part of his laborious and successful life; and no book could be more useful than one in which he should collate all the known, supposed, and suspected facts of American Azoic geology; with all the accepted conclusions, and proposed hypotheses, published on the subject by the most eminent geologists of the last half century in Europe and America.

We owe therefore a debt of gratitude to Dr. Hunt for this historical monograph, which will supply a deeply felt deficiency in the literature of our science. It is a treasury of notes and suggestions of the greatest value to the geologists of Pennsylvania, and of other States, working in such districts as are occupied at the surface, or are underlaid at moderate depths, by the Cambrian and sub-Cambrian formations; although no final demonstration has been accomplished by the author of those problems of superposition, unconformability, and identification, at which so many geologists are still half despairingly at work. But his opinions of the probable final solutions of these problems will reënforce their own, when they agree, and lead to fruitful discussions when they disagree.

Dr. Hunt's views on one or two points, like that of the relationships of the slates of the great valley, are peculiar