

THIRTY-SIXTH ANNUAL REPORT

OF

Department of
Geology and Natural Resources

I N D I A N A

EDWARD BARRETT
State Geologist

1911

THE STATE OF INDIANA,
EXECUTIVE DEPARTMENT,
April 15, 1912.

Received by the Governor, examined and referred to the Auditor of State for verification of the financial statement.

OFFICE OF AUDITOR OF STATE,
INDIANAPOLIS, April 16, 1912.

The within report has been examined and found correct.

W. H. O'BRIEN,
Auditor of State.

APRIL 17, 1912.

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MARK THISTLETHWAITE,
Secretary to the Governor.

Filed in the office of the Secretary of State of the State of Indiana.

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Secretary of State.

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ED D. DONNELL,
Clerk Printing Board.

*State of Indiana,
Department of Geology and Natural Resources.*

INDIANAPOLIS, IND., April 15, 1912.

Thos. R. Marshall, Governor of Indiana:

MY DEAR SIR—I transmit herewith for your inspection and approval, the manuscript of the Thirty-sixth Annual Report of the Department of Geology and Natural Resources of Indiana, the same being for the calendar year 1911.

Respectfully submitted,

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INTRODUCTION.

BY EDWARD BARRETT.

The work of the department for the year 1911 was conducted along six lines dealing with the geological features and natural resources of the State, enumerated as follows:

1. Glaciation in Its Relation to the Soils of the State.
2. Soil Survey of a Portion of Central and Western Indiana.
3. Water Powers of Rivers of Northern Half of the State.
4. The Pleistocene Age and Its Vertebrata.
5. The Oil and Gas Fields.
6. Hypsometry of Indiana.

A synopsis of each of the above subjects is here given, both as to the manner and areal extent of the investigations. In the body of this volume each field assistant gives an elaborate discussion of his investigations of the work assigned him. The bulk of the investigations made by the State Geologist and his field assistants during the year 1911 is so intimately related to the question of glaciation that it is deemed best to discuss at some length the Ice-Sheet Theories. In order to avoid repetition, early last spring the State Geologist notified the field assistants to avoid a detailed discussion of glaciation in their reports, he expecting to cover the subject in sufficient detail to embrace all its relations.

Prof. O. P. Hay submitted his paper on The Pleistocene Age and Its Vertebrata on April 1st, and in it he necessarily discusses the Ice Age in relation to its Vertebrate Fauna; this discussion encroaches but little on the paper by the State Geologist who deals mostly with the Soil phase of Glaciation. The Iceberg and Ice-Sheet Theories are discussed at some length, the writer indicating which theory in his judgment is most deserving of acceptance. There is no phase of geology so important to the student, the farmer, or the geologist in acquiring a thorough knowledge of soils as the question of glaciation.

Soil Survey.—This survey is of paramount importance to the farmer, the gardener, and the landowner. Since it is important to

these classes of people, it touches the welfare of the whole people, inasmuch as the welfare of the whole people depends upon the products of the soil.

The first soil survey ever made in Indiana was by the U. S. Bureau of Soils, of which Milton Whitney is chief, and the work was done by geologists, chemists and soil men of the above department. Below are some of the counties, with the year of survey: Posey, 1902; Madison, 1903; Marshall, Spencer and Warrick, 1904; Tippecanoe, 1905; and Marion in 1907. Other counties were surveyed by this Bureau later. The work done by the U. S. Bureau was on its own initiative, and not in co-operation with the State. The first soil work done by the State of Indiana was in 1907, mostly in the unglaciated portion of the State.

Knowing the importance of the soil survey, the present Geologist, on taking charge of the department, January 1, 1911, organized a large soil force, working in harmony with the methods of the U. S. Bureau. Four areas were selected for soil work and placed in charge of competent field men. The work in the counties of Hancock, Shelby and Johnson was done by Prof. Allen D. Hole, of the Chair of Geology at Earlham College, Richmond, Indiana. Prof. Hole was formerly with the U. S. Geological Survey, and the State Surveys of Iowa and Illinois, and brought to his work a rich, ripe and painstaking experience that few States are fortunate enough to receive.

The area comprising Owen and Morgan counties was in charge of J. B. Edmondson, a graduate of Purdue University, Lafayette, Indiana, and fresh from the agricultural laboratories of that institution. Mr. Edmondson went carefully over the area assigned him and supplemented his work with talks to farmers about their soils.

Charles W. Shannon, a graduate of Indiana University, and probably the most experienced soil man in Indiana, had charge of Clay, Vigo, Sullivan and Knox counties, and the people of these counties have the advantage of a report from his hands.

The soils of an area consisting of St. Joseph and Laporte counties were surveyed by E. J. Quinn, a graduate student of Notre Dame University, South Bend, Indiana, and for a time instructor in chemistry in that institution. The department had no more conscientious and industrious field man than Mr. Quinn. He also did the soil work of Bartholomew County, which it seemed for a time would have to go over until next year.

The State Geologist is pleased to announce that he has arranged for co-operative soil work for the year 1912, between the Depart-

ment of Geology and the U. S. Bureau of Soils, and that the soil work of the State will have the benefit of the scrutiny and criticism of that Bureau.

Water Powers.—All of the important rivers of the northern half of the State, including the Mississinewa, Eel, Pigeon, Elkhart, St. Joseph, Tippecanoe, Sugar Creek and the Wabash from Markle to Terre Haute were surveyed. The work was in charge of Mr. W. M. Tucker, of Indiana University, assisted by Mr. J. C. Clark, of Purdue University. Many new power sites were located and estimated, and a number of old sites were surveyed and new estimates made, corrected to new conditions. The work appears in detail in the report of Mr. Tucker.

The Pleistocene Age and Its Vertebrata.—This important scientific paper is the result of years, perhaps a lifetime, of research by Prof. O. P. Hay, of the National Museum, Washington, D. C. There is no one in this country more capable of preparing a paper on this subject than Prof. Hay. In addition to his long experience as college instructor in geology and zoölogy, he has had years of research work in the National Museum at Washington. Besides the above resources for preparation, he visited many museums of Natural History, such as Philadelphia, New York and Chicago in preparing his report, examined skeletons, and made measurements and photographs.

The Oil and Gas Fields.—There was no survey of these fields made as a special assignment. The Chief Supervisor of Gas, Mr. William E. Morse, has been in the field continually, and conditions and new developments are noted in his report. Great good has been accomplished by his work of checking the waste of gas, and every precaution has been made to conserve the gas, without discouraging the legitimate development of the oil industry. The tendency of gas and oil investments is to attempt the development of these resources by deeper drillings in new areas, rather than in the old fields.

Hypsometry of Indiana.—Practically no topographic work has been done by the State of Indiana. Small areas in Spencer, Warrick, Monroe, Clay, Lake and Allen counties have been surveyed by the U. S. Geological Survey, but these have never been followed up by any State work. In view of this, the present Geologist prepared for this volume exhaustive tables of altitudes from profiles furnished him by the railroads operating in Indiana. A more extended discussion of hypsometry, or topographic work, appears in another part of this report.

Museum and Department Library.—The most of the material in the museum needs rearrangement, classification and cataloging. No inventory of the museum and library collections was ever made and none ever furnished to the writer.

In the Department of Relics no systematic arrangement has ever been made. At the present date, however, a rearrangement of this material is being made into chronological and historical periods, and it is the purpose to supplement this work with like work in the Department of Minerals. Many of the files of the State Reports, from the various States, are incomplete, and an attempt is now being made to fill out these files by securing copies from State Geologists.

Glass, Moulding and Sawing Sands.—Many inquiries were received during the year as to the possibilities of the State in regard to the above varieties of sands. With these inquiries in view, the writer visited a number of places having sand deposits and a number of analyses were made. The investigations, however, could not be completed in time for this report. The work will be continued during the coming season and the results will be incorporated in the Annual Report for 1912.

Correspondence.—Much of the State Geologist's time was occupied during the past year in answering hundreds of letters of inquiry from citizens and corporations touching the natural resources of the State. Many samples of minerals have been sent to the Department for examination and analysis, and all such have been attended with promptness and exactness.