INTRODUCTION.

The Department of Geology and Natural Resources is the principal medium of information for the people of the State, regarding its natural raw materials. This information is given out in the following ways:

1. By work of State Geologist and assistants in the field.
2. By publication and distribution of Annual Reports.
3. By publication and distribution of bulletins and circulars.
4. By lectures by State Geologist and assistants.
5. By office consultation with citizens of the state regarding the location and uses of natural resources.
6. By correspondence with citizens and investors.

All of the above assistance is rendered the citizens of the state, and even to citizens of other states, free of charge. In addition to the above it often becomes the duty of the State Geologist to warn citizens against fake advertisements and investments in dishonest schemes and propositions.

No other Department in the State can so well attend to the above lines of duties as a State Department of Geology and Natural Resources, located in the capital city of the State and under the management of a careful and conscientious State Geologist. Such a Department and such an official give a color of certainty and authority to recommendations regarding the State and its resources.

The principal natural resources of the State are coal, clays, limestones, sandstones, sands, gravels, oils, gas, mineral water and soils. It is the purpose and custom of the Department of Geology to investigate one or more of these resources in the field, and later give out the information gathered in the field in the different ways mentioned in second paragraph of this introduction.

The question has been asked: "Will not these investigations be completed in the near future, and will not the day come when there will be no need of a Department of Geology?" The most direct answer to such inquiries is that the development and use of our natural resources is just in its infancy.

Each year, and we dare say each month, some new use of some one of our natural resources is discovered, and this new use necessitates a new kind, or variety, of such resource. To illustrate, about twenty years ago the principal use for clay was for brickmaking. Today there are twenty varieties of brick, and each variety takes a different kind of clay, or a different mixture of clays, and clays are used in making a hundred different other products than brick and each product requires a different clay. It is a part of the work of the Department of Geology to find varieties of clay suitable for these products. Who can say that the future will not require a hundred more varieties in clays and their products? And what is true of clays is also true of the other natural resources mentioned above. Thus it is seen that the work of the Department of Geology widens and becomes more important to the citizens of the State as the years go by.

It has been the custom of the Department to elect, each year, a certain one of our resources for the major part of the investigations and work.

During the year 1916, the investigation of the Soils of the State were continued both as a State Survey, and under a cooperative agreement with the U. S. Bureau of Soils. The importance of this work is emphasized by the increased demand for agricultural food products, both in this country and in foreign countries, as a consequence of the European war. The purpose of the Soil Survey is to increase both the areal and intensive sides of farming by investigating the soils from the geological standpoint, leaving the strictly cropping or cultural side of the work to Purdue University and the Agricultural Extension Management.

The investigations conducted by the Department of Geology, covered the following points:

1. Examination of soil material in the field.
2. Topography and physiographic situation of soils.
3. Sources and derivation of materials.
4. Agencies through which material has accumulated.
5. Elements in classification of soil types.
6. Selection of samples of soil types in a county.
7. Chemical and mechanical analyses of soil types.
8. Mapping of soils by counties.
9. Writing report.

The elements entering into the above topics include:

1. Color of Soil.

2. Color of subsoil.
3. Texture of soil.
4. Texture of subsoil.
5. Structure of subsoil.
6. Substratum, if any.
7. Parent material.
    1. Glacial.
    2. Residual.
8. Hardpan, if any.
9. Drainage.
    1. Natural.
    2. Artificial (tile).

Investigation and information on all of the above points, assists the farmer materially in handling his soils, and in his cropping and cultural methods. In pursuance of the above investigations, from three to six counties are selected each field season for work. During the year 1916, work was done in four counties, viz., Benton, Carroll, Porter and Wabash. The latter county, however, was not completed in time for this report.

The work in Benton County was done by Grove B. Jones of the U. S. Bureau, assisted by Mr. J. B. Brill of the Department of Geology. These men spent some four months in their investigations and completed a splendid soil map of the county.

Carroll County was surveyed by Mr. C. P. Erni and C. C. Beals of the Department of Geology, and the results of their work will be of benefit to the farmers and land owners of that county.

The work in Porter County was in charge of Mr. Thomas M. Bushnell of the U. S. Bureau of Soils, assisted by Mr. Wendell Barrett, an under-graduate student of Purdue University. Under these men a careful plane table map was made in the field and the soils carefully investigated and classified. The written report appears in another part of this volume.*

The review of Whitley County was written by Mr. John H. Shiltz, of Columbia City, a man who is thoroughly familiar with every feature of the county in detail. Later a detailed survey of the soils will be made and published.

In the review of the oil and gas fields it is the purpose to discuss conditions in the most encouraging portions of the state. It will

*After waiting several months for the completion of the map of Porter County by the U. S. Bureau of Soils, we are compelled to send the 41st Annual Report of the Department to press without the report on Porter County. This will appear in the 42nd Annual Report.

be noticed that the most encouraging prospects at present are in the southwestern quarter of the state, particularly in Pike, Sullivan, Gibson and Daviess Counties; next to these would come Martin and Spencer Counties. There are good indications of oil structures in Lawrence County, where there appears to be an anticline near Heltonville, extending in a southeasterly direction beyond the Baltimore & Ohio S. W. Railroad. The State Geologist has not yet completed his investigations regarding this prospective oil structure, but sufficient data is at hand to show that the highest point in this anticline is about two miles north of the big tunnel of the B. & O. S. W. Railroad. In the annual report of Mr. Floyd E. Wright, State Supervisor of Natural Gas, mention is made of the Heltonville Oil Well and the probable depth of the pay sand.

For more than six years the State Geologist has been advocating the preservation of regions of picturesque natural scenery for State Park purposes. He has delivered more than one hundred illustrated lectures on the following areas: Lakes, Sand Dunes, Rivers, The Shades, Turkey Run, Canyon of McCormick's Creek, Brown County, Scenes on the Ohio, Marengo and Wyandotte Caves, White Water Valley and many other choice regions. In the latter part of 1915, Hon. Samuel M. Ralston, then Governor of Indiana, appointed a State Park Commission, and this Commission has taken over on behalf of the State of Indiana, two of the above mentioned tracts for state parks, viz., "The Canyon of McCormick's Creek" and "Turkey Run", and it is hoped that in the next few years other parks will be added.

The data for the article on the Sand Dunes was furnished by Mr. A. F. Knotts, of Gary, Indiana, who has made the Sand Dunes of northern Indiana and Illinois a study for years. Mr. Knotts has treated the subject of the Dune area from a geological as well as a descriptive standpoint, thus making the article appeal to the scientist, the student, the casual reader, and the tourist.

Each year the correspondence of the State Geologist increases by reason of the growing interest of the people in the geography, geology and natural resources of the state.

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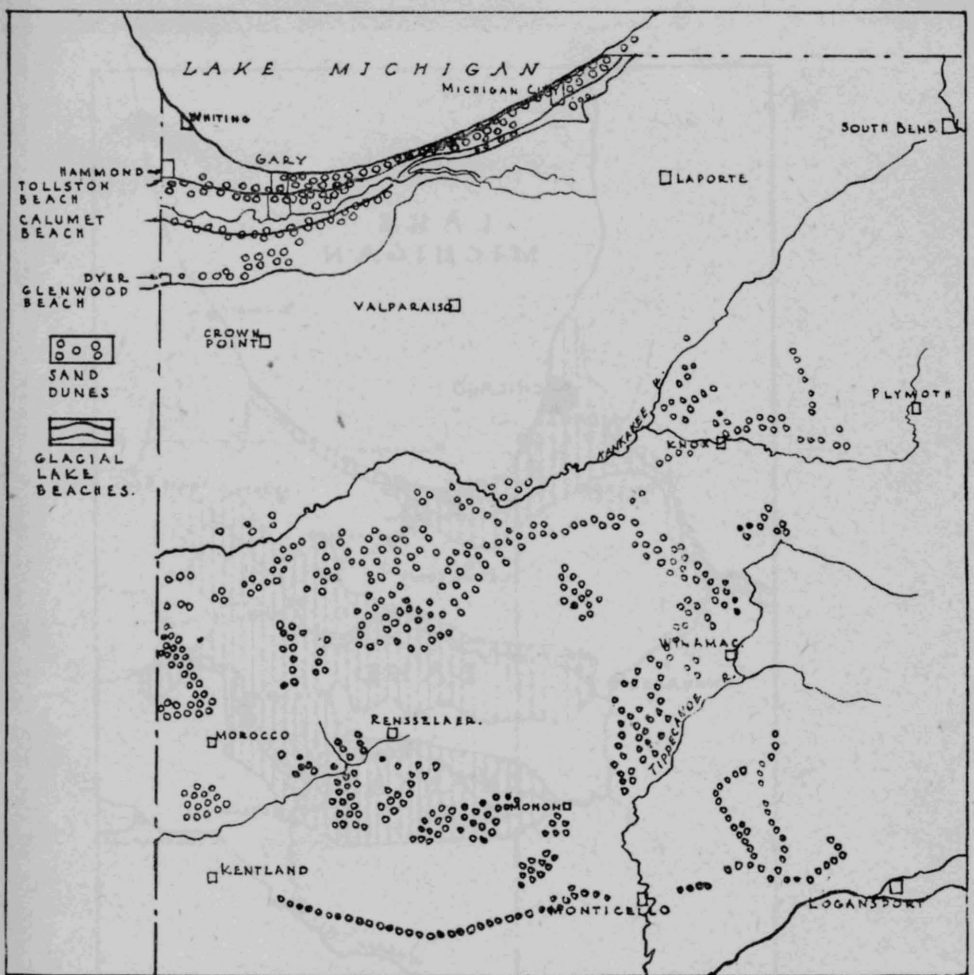
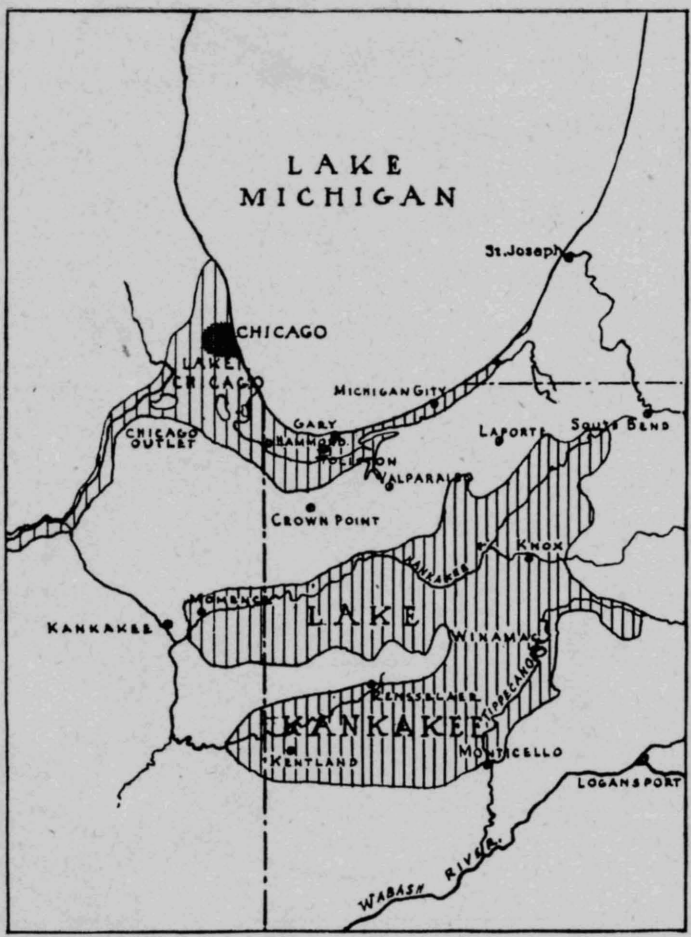


Map showing probable extent and location of Lake Beaches and Sand Dunes of former ages.



Map showing probable extent and location of former Lakes Kankakee, and Chicago.