

## THE WORK OF THE STATE GEOLOGICAL SURVEY.

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FRANK W. DEWOLF.

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One is likely to think of our state as essentially agricultural, but Illinois ranks third in mineral production and the latest complete returns, those for 1907, value our output at more than \$152,000,000. The State now ranks second in the production of coal, second for oil, fourth for clay products, and well toward the top of the list for a number of other materials. This creditable showing is nevertheless a mere beginning in comparison with our possibilities.

The study of our geology and mineral resources was authorized by a legislative act of 1851 and for the first six years was in charge of Dr. J. C. Norwood. After him Dr. A. H. Worthen directed the work till its discontinuance and the establishment of the State Museum of Natural History in 1877, of which he was made curator. The present Survey was created in 1905 to operate under the direction of a commission composed of the Governor, the President of the State University and a third member, Dr. T. C. Chamberlin, President of this Academy. Dr. Bain, director of the Survey, regrets that he can not be here to speak of the scope and progress of the work.

The Geological Survey was created to assist in the economical development of our resources. Its functions are broad enough to give it a part in the solution of all public problems into which a knowledge of geology enters. The finding of adequate public water supply, of materials for use on the public highways, of limestone suitable for use on acid soils, the regulation of our rivers and reclamation of undrained lands, bettering of conditions in our coal mines, the better direction of exploration for oil, coal and our other buried resources,—with all these problems, the State Survey is

concerned either alone or in cooperation with other bureaus. The work involves field studies, laboratory tests, library research and study of conditions in other states. When the present Survey was created there was, in a sense, thirty years of back work to do in collecting data and noting changes which had taken place. The work is now well under way and the methods adapted to this field are determined. The rate of progress will depend largely on the funds available.

The Survey is organized into three sections, geologic, topographic and drainage. There is close cooperation with allied bureaus in the state, with the U. S. Geological survey and the U. S. Department of Agriculture. Through fortunate situation at Urbana there has been valuable consultation with geologists, chemists, and engineers of the State University as well as with those of other institutions.

The first necessary step has seemed to be the preparation of topographic base maps. The accompanying map illustrates the progress of this work. The topographic map of the state will be composed of unit quadrangles measuring about 13 by 18 miles each. They serve as a base for geologic studies and also for general engineering and educational purposes. They are prepared in cooperation with the U. S. Geological Survey, and progress so far has been designed especially to meet the need of surveys in our mining regions.

The geologic work has been of several degrees of refinement, detailed reports have been prepared in many of the quadrangles, while general reconnaissance studies of stratigraphy, structure, and mineral resources have been pursued over the state so as to meet pressing needs and to lay the foundations for further detailed work.

The drainage section has worked in cooperation with the Internal Improvement Commission and the Drainage Section of the U. S. Department of Agriculture in the preparation of large scale maps of the overflowed areas along our largest streams. Such work is a prerequisite to any success-

ful attempt to reclaim the land and promote sanitary and economic improvements.

To the present there have been distributed eight bulletins and four circulars. They include data of general geology, petroleum, coal, water resources and miscellaneous subjects, and the first of a series of educational bulletins on physical geography which are designed especially to meet the needs of teachers in our public schools. There are at the present time seven reports ready for the printer, besides others in preparation.

At the last meeting of the Academy a committee was appointed, I believe, to provide a means of cooperation in the collection of records of deep wells in the state. The Survey has organized a new line of research involving the study of underground water resources. This requires the collection and study of drill records, and where possible the study also of the drillings themselves and of the outcropping beds. Members of the Academy can render our work much more efficient, if they will bring to our attention any drilling which may be done for water, coal, or for other purposes throughout the State, and cooperation along this line is urgently requested.