

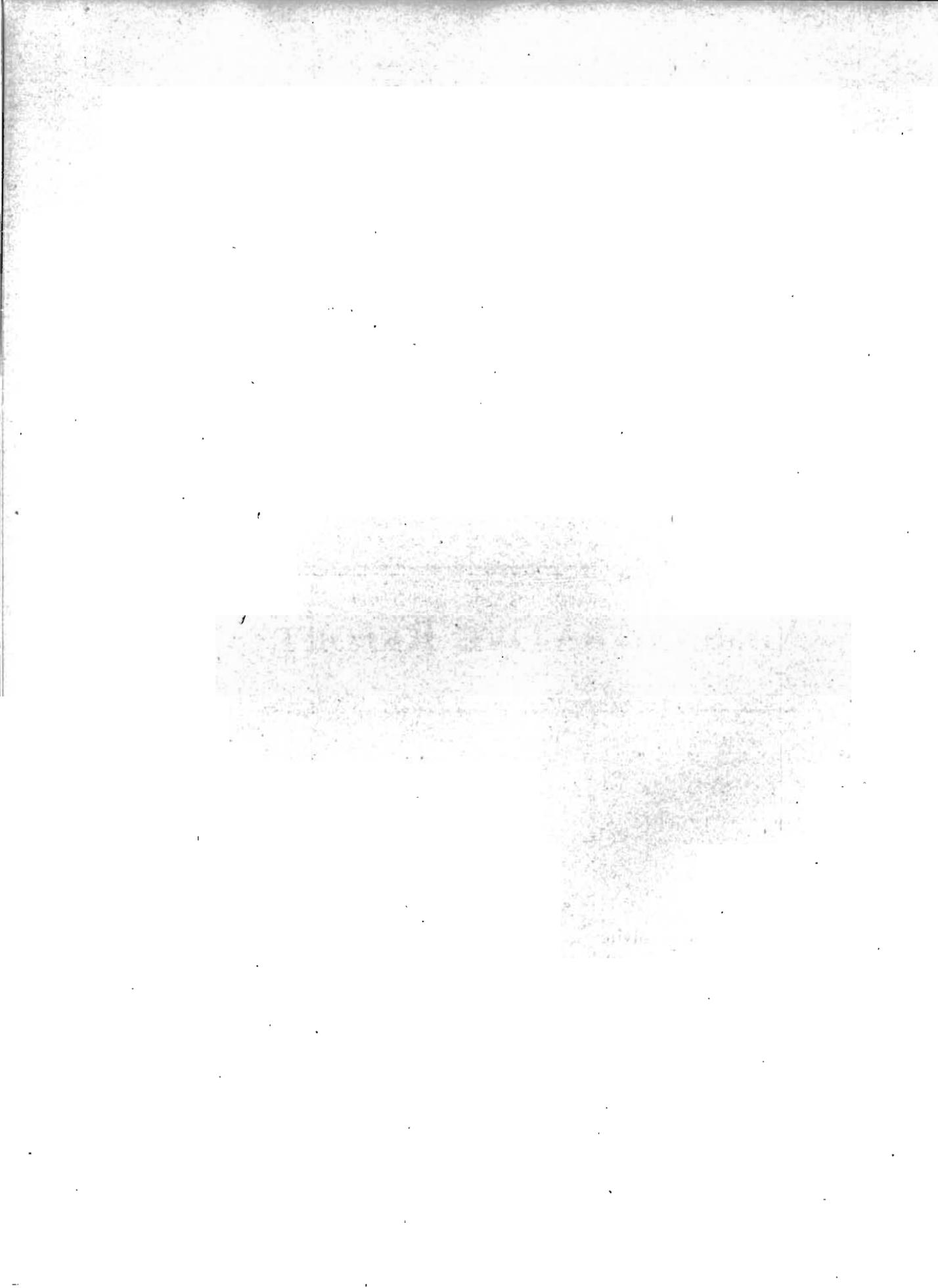
---

---

# ADMINISTRATIVE REPORT

---

---



TWENTY-FOURTH ANNUAL

# Report of the State Geologist

---

IOWA GEOLOGICAL SURVEY,  
DES MOINES, DECEMBER 31, 1915.

*To Governor George W. Clarke and Members of the Geological Board:*

GENTLEMEN: The Iowa Geological Survey has carried forward successfully the plans that were approved by the Board at the beginning of the field season of 1915. As in former years, several well-trained instructors and advanced students connected with educational institutions were secured to conduct investigations. These persons have been in the employ of the Survey only during the summer months, when the chief field work of the Survey is done. This policy has enabled the Survey, with a modest appropriation, to accomplish much more, proportionately, than could have been accomplished by other methods with a considerably larger appropriation.

The State Geologist directed the work of the Survey and made some detailed studies of the glacial deposits of the state, especially in southern Iowa and in parts of western Iowa. As a result of these studies a paper entitled "Some features of the Kansan drift in southern Iowa" was published in the Bulletin of the Geological Society of America, Volume 27, pages 115 to 117; and in Volume XXVI of the Reports of the Iowa Geological Survey is a paper entitled "Pleistocene deposits between Manilla in Crawford county and Coon Rapids in Carroll county, Iowa". In these papers some new interpretations of important phases of the glacial and interglacial deposits of Iowa are presented, interpretations which give promise of having considerable significance in solving the complex history of the Pleistocene period. Some of the investigations require detailed studies to be made of the chemical compositions of glacial materials, and it is gratifying to be able to state that Dr. J. N. Pearce of the Chemistry department of the University of Iowa has undertaken to do this work.

During the field season of 1915, Dr. James H. Lees, the Assistant State Geologist, did special work in several of the coun-

ties of the state, particularly in Crawford and Greene counties. When Doctor Lees is not engaged in field work, his time is occupied in editing the reports of the Survey and in furnishing information regarding the resources of the state to those who come to the office or who seek information by correspondence. During the past few years Doctor Lees has performed an important service to the state in connection with an exhibit of some of the mineral resources of Iowa at the State Fair. The State Fair is visited each year by thousands of the citizens of Iowa, and the Survey has felt that there is no more opportune way of having them become acquainted with the resources of the state than by means of an exhibit. To those who visit the exhibit small pamphlets are given in which attention is directed to the publications of the Survey and the interesting features of the geology of the state.

Besides the Director and the Assistant State Geologist the corps employed in the regular work of the State Survey has been about the same as in previous years. Prof. M. F. Arey, Prof. John L. Tilton, and Prof. Bohumil Shimek did work in areal geology; Dr. S. W. Beyer and assistants carried forward investigations on light burning clays; Prof. W. H. Norton continued to collect data regarding underground waters of the state; and Prof. A. O. Thomas and Dr. F. M. Van Tuyl continued their studies on the Devonian and Mississippian systems of rocks, respectively; Mr. Dayton Stoner continued his work on the rodents of the state, and Dr. B. H. Bailey made further investigations of the hawks and owls of Iowa.

In the Administrative Report for 1914, reference was made to an investigation on the Iowan drift by Dr. W. C. Alden of the United States Geological Survey and Dr. M. M. Leighton of the Iowa Geological Survey. This investigation was undertaken in order to settle, if possible, the question whether or not there is sufficient evidence to justify the recognition of the Iowan drift as a drift sheet separate from the Kansan drift. Field work was begun in 1914 and was continued during the summer of 1915. The investigations have confirmed the contention of Doctor Calvin that in northeastern and in northcentral Iowa there is an Iowan drift. In a paper in Volume XXVI of the Reports of the Survey Doctors Alden and Leighton have presented the field evidence upon which their conclusions are based.

In northwestern Iowa there is a drift region lying outside the distinctive Wisconsin drift, which, on account of its topography and for other reasons, has been found by different geologists to be difficult to interpret satisfactorily. Some have thought that

the region is covered with drift of Wisconsin age; some have interpreted the area to be covered with extra-morainic Wisconsin; and still others have thought the drift to be Early Wisconsin, Iowan, or Kansan drift. During several field seasons the Pleistocene deposits of northwestern Iowa, including the deposits of the questionable area, have been studied by Dr. J. E. Carman. He has reached the conclusion that the region which lies outside the Wisconsin moraine is covered by drift of Kansan age. An exhaustive report by Doctor Carman on the Pleistocene deposits of northwestern Iowa is now in press and will be published in Volume XXVI of the Reports of the Survey. This report is accompanied by a map which will be of great value to all persons who are interested in the northwestern part of our state.

One of the essential aids of present-day civilization in its relation to land is maps—good maps, accurate maps, maps which are so made as to show clearly the natural features of the surface, such as rivers and creeks, hills and valleys, forests and swamps, as well as those features due to culture, as cities, schools, roads and bridges. Such maps as these are indispensable in many lines of industry and are of great value to many more. By means of them the railroad construction engineer can lay out the route of his right-of-way without the expense of a preliminary survey, the drainage engineer can plot his irrigation or drainage ditch almost better than on the ground, and the autoist can visualize his trip as intelligently at home as he does later on the road.

It is with a realization of these conditions that the Iowa Geological Survey is cooperating with the United States Geological Survey in the making of such maps for the state of Iowa. There is no doubt that the topographic maps which the United States Geological Survey is preparing and publishing are among the best and most accurate of those issued in any country in the world. It is our misfortune that no larger part of the United States is covered by them than is the case—only about forty per cent, after forty years of work. In Iowa only about twenty-seven per cent of the state is included in the area mapped, while seven of her sister states are completely covered and of three others eighty per cent or more is covered.

The usefulness of these maps calls for greater speed in completing the topographic survey of the state and publication of the maps. But to do this increased funds must be available so that larger areas may be surveyed each year than is possible with the limited appropriations now devoted to this work. The anxiety of the Federal Government to cooperate in the work is

shown by its offer to duplicate any amount which the state of Iowa will allot to this survey, and in addition it will pay the cost of engraving and printing. At least ten thousand dollars should be spent each year by the state on the field work in order that the mapping may be completed within a reasonable number of years.

The interest which is taken in this work is shown by the fact that at a recent meeting of the Society of Iowa Engineers enthusiastic endorsement was given the project of hastening the topographic survey of the state. Also similar support was given by the Iowa Academy of Science. Teachers of geography over the state also are interested in this work and its consequent aid in their teaching.

During the year 1915 the Survey continued to cooperate with the Water Resources Branch of the United States Geological Survey in the work of stream gaging and discharge measurements of the important streams of the state.

As in former years, the Iowa Geological Survey cooperated in 1915 with the United States Geological Survey in the preparation of statistics of mineral production in Iowa. The value of the output for the year was \$27,062,950, which is the highest figure of record for the state, and exceeds the value of the output for 1914 by \$761,085. Year by year, for several years, the value of the mineral output of Iowa has increased. During the three years previous to 1915 the values of the outputs were as follows: In 1912, \$22,910,266; in 1913, \$25,612,345; and in 1914, \$26,301,865; a decade ago, in 1906, the value of the output was only \$16,414,447.

Coal continues to be the chief mineral produced in Iowa, clay and clay products ranks second, cement ranks third, and gypsum, fourth. In 1915 these four products had a value of \$25,664,846, which is somewhat more than ninety-five per cent of the total value of all the mineral products. In 1915 the value at the mines of the output of coal was \$13,577,608; in 1914, the value was \$13,364,070. The total tonnage of coal mined in 1915 was 7,614,143, compared with the tonnage of 7,451,022 in 1914. The five leading coal-producing counties in 1915 in order of tonnage were Monroe, Polk, Appanoose, Lucas, and Marion. These five counties produced more than six million tons, Monroe county alone having produced more than two million tons. For the first time in recent years Lucas county now occupies an important place among the coal producing counties of the state. The average number of men employed in coal mining in Iowa in 1915 was 15,549.

The value of clay and clay products in 1915 was \$6,749,088, a figure which has never been exceeded in the history of the clay industry in the state. The values of the clay products in the three chief clay producing counties were as follows: Cerro Gordo county, \$1,830,220; Webster county, \$1,256,981; and Polk county, \$791,371. Woodbury county ranked fourth, and Dallas county, fifth. Iowa's production of drainage tile alone in 1915 had a value of \$3,802,579; in 1914 the value was \$3,180,836.

In 1915 the three cement plants of Iowa, two of which are at Mason City, the third at Des Moines, produced cement to the value of \$4,119,952, which is the record figure for the state.

The value of sand and gravel in 1915 was \$720,795, of stone and lime \$577,295, of mineral waters \$18,534, and of other products, which includes sand-lime brick, mineral paints and natural gas, \$21,550.

Iowa continues to be an important producer of gypsum. In 1915 the value of the output was \$1,278,128. Although New York state produces a greater quantity of gypsum than does Iowa, the value of the Iowa product exceeds the value of the output of New York. The total production of gypsum in Iowa comes from Webster county, where the evidence indicates that there is an abundant supply for future needs. There is an important deposit of gypsum at Centerville, but thus far no production has come from this locality. The main reason is the difficulty in handling the large amount of water which enters the shaft a few feet above the gypsum. So important are the gypsum deposits of Iowa that the Board, at its last meeting, approved the plan of having them fully described in a report to be published by the Survey. A monograph will be prepared by Dr. Frank A. Wilder, who was at one time State Geologist of Iowa, and who for more than ten years has been President of the Southern Gypsum Company of North Holston, Virginia. The report of Doctor Wilder will be awaited with interest since he is a recognized authority on the subject of gypsum and the gypsum industry.

The office of the Survey continues to render splendid service to the citizens of the state. Among the kinds of service rendered the following may be mentioned:

1. Replying to scores of letters in which information is asked with reference to the geology and mineral resources of the state. In much of this correspondence questions are asked with reference to local geology.
2. Furnishing information in regard to state reports and other publications dealing with the geology and mineral resources of the various sections of the state.

3. Examining and reporting on numerous specimens of minerals and fossils which are submitted by the citizens of the state. Advice is given as to whether or not the minerals are of value or are likely to be found in sufficient quantity to be of commercial importance.

4. Giving advice with regard to reliable firms where analyses and other tests may be made to establish the commercial value of any mineral deposit.

5. Trying to prevent an unfounded rumor from gaining acceptance in the public mind with regard to the reputed discovery of gas, oil, or other product before it leads to large losses and unnecessary excitement.

6. Giving geological facts to city officials, railway companies, and private citizens with regard to water supplies, availability of road materials, etc.

7. Informing citizens regarding the advisability or inadvisability of spending time and investing money in the development of particular deposits of mineral within the state.

I take pleasure in submitting to you the following papers, and recommend that they be published as Volume XXVI, which is the Twenty-fourth Annual Report of the Iowa Geological Survey:

Mineral Production in Iowa in 1915. By George F. Kay.

River Waters in Iowa: A Preliminary Report. By George A. Gabriel.

The Iowan Drift: A Review of the Evidences of the Iowan Stage of Glaciation. By W. C. Alden and M. M. Leighton.

Pleistocene Deposits Between Manilla in Crawford County and Coon Rapids in Carroll County. By George F. Kay.

The Pleistocene Geology of Northwestern Iowa. By J. Ernest Carman.

Respectfully submitted,

GEORGE F. KAY,  
State Geologist.