
ADMINISTRATIVE REPORTS

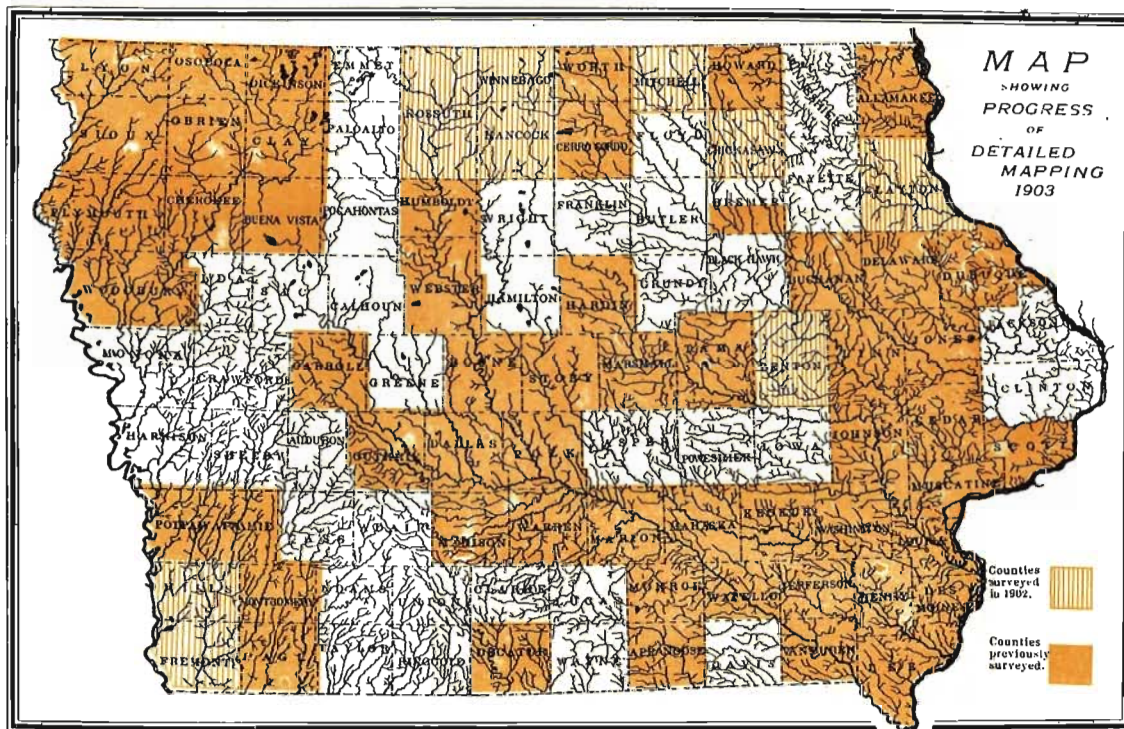


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ELEVENTH ANNUAL
Report of the State Geologist.

IOWA GEOLOGICAL SURVEY,
DES MOINES, DECEMBER 31, 1902.

To Governor Albert B. Cummins and Members of the Geological Board:

GENTLEMEN:—I have the honor to report that during the year 1902 the work of the Iowa Geological Survey has been prosecuted in accordance with the plans approved by you at the beginning of the working season. The area covered by the year's work has been larger than during any previous year since the Survey was organized. In carrying out the plan agreed upon, the counties of Kossuth, Winnebago and Hancock were investigated by T. H. Macbride, Mills and Fremont were surveyed by J. A. Udden, Mitchell and Chickasaw by S. Calvin, A. G. Leonard worked in Clayton county and T. E. Savage in Tama and Benton. The work on Monroe and Howard was revised and the completed reports on these counties are now ready for publication. Ira A. Williams devoted some time to completing the field work on the clays and the clay industries of the state, and the monograph on this subject, which has for some time engaged the attention of S. W. Beyer and his associates, is practically ready for the printer. The annual collection of Mineral Statistics for the state, by S. W. Beyer, one of the valuable features of the work of the Survey for a number of years, is continued, and his report is herewith submitted. W. H. Norton has kept up the work of collecting data from deep borings, and has thus

extended our knowledge of the manner in which the different formations, as they pass farther and farther beneath the surface, vary in respect to thickness and composition. M. F. Arey served as a volunteer assistant in making the Survey of Mitchell county and rendered acceptable and valuable service.

During the year volume XII of the regular series of reports was printed and distributed. The administrative work of the Des Moines office, such as superintending the engraving of maps and illustrations, the printing, proof reading, binding and distribution of the reports, and all the other details that can best be supervised at the state capitol, has been done by the Assistant State Geologist, A. G. Leonard, assisted by the Secretary, Miss Nellie E. Newman.

The work now ready for publication embraces Bulletin No. 2, on the Grasses of Iowa, by L. H. Pammel; the Clays and Clay Industries of Iowa, by S. W. Beyer in collaboration with Professors Weems, Marston and others; and volume XIII of the regular series of reports. For the principal subject matter of volume XIII there are herewith submitted reports on Monroe, Tama, Howard, Mitchell, Chickasaw, Mills, Fremont, Hancock, Winnebago and Kossuth counties. This is the largest number of counties heretofore reported on in a single volume. Mills and Fremont are treated by Professor Udden as a single area, and Hancock, Winnebago and Kossuth are grouped together in one report by Professor Macbride.

As usual the demand for copies of the reports has been far in excess of the supply. The repeated calls for copies of the separate county reports for use in connection with the study of Physical Geography in the high schools, indicates a growing use of the publications of the Survey in ways which insures their highest usefulness to the present and future citizens of the state.

The accompanying map shows the progress which has so far been made in detailed areal work. The counties remaining to be covered are all more or less intimately related to areas that

have been studied, and their investigation can now be made with less labor than would be required if the geological structure of adjacent territory were wholly unknown. The collection of data for monographs on coals, building stones and other special subjects is progressing as rapidly as is consistent with necessary thoroughness.

I have the honor to remain, gentlemen,

Yours very sincerely,

SAMUEL CALVIN.

REPORT OF ASSISTANT STATE GEOLOGIST.

IOWA GEOLOGICAL SURVEY,
DES MOINES, DECEMBER 31, 1902.

SIR:—I have the honor to submit the following report upon the work of the past year. The greater part of my time during the first six months was taken up with the duties incident to the publication of volume XII. As usual the regular work of the office included also the furnishing of information in reply to the many letters of inquiry which are constantly being received. The Survey is in this way able to render a service to the general public and to the various companies and organizations which are in search of information regarding the natural resources of Iowa.

Early in March a trip was made to Frederika where indications of oil were reported to have been found. The sinking of wells was discouraged since the facts did not seem to justify the expense of drilling. The excitement was so great, however, that several companies put down holes in search of oil. It is needless to say that none was found. A trip was taken to Wapello county in June for the purpose of examining some deep cuts along the new line of the Chicago, Burlington and Quincy railroad, two miles east of Ottumwa. It was thought that these cuts, some of which are fifty or sixty feet deep, might reveal the presence of the older drift sheet beneath the Kansan, but it did not appear in any of the sections.

As soon as the completion of the printing of volume XII allowed me to leave the office, field work was commenced in Clayton county and continued through August and September. Much

of this county lies within the limits of the driftless area of north-eastern Iowa and southwestern Wisconsin and for countless ages its rocks have been subjected to the erosion of streams and the weathering effects of the atmosphere. The surface is cut by deep, picturesque valleys and gorges, along the sides of which are exposed in succession one rock formation after another. Within this county there occur a greater number of different geological formations than can be found in any other county in the state. It also contains representatives of some of the oldest strata in Iowa. Some of these furnish a very pure white sand suitable for glass making; other beds afford excellent limestone for building purposes and for lime. The areal distribution of the various limestones, sandstones and shales is being carefully mapped with the aid of a topographic map prepared by the United States Geological Survey.

During the past year the following publications have been added to the library of the Survey.

- Mineral Resources of South Dakota. South Dakota Geological Survey, Bulletin No. 3.
- Geological Survey of New Jersey. Annual Report of the State Geologist for 1901.
- Geological Survey of Georgia. Bulletin No. 8. Roads and Road Making Materials of Georgia.
- Missouri Botanical Garden. Thirteenth Report, 1902.
- Twenty-first Annual Report United States Geological Survey, Parts II, III, IV.
- Bulletin United States Geological Survey, Nos. 177-187.
- Jahrbuch der Königl. Preussischen geologischen Landesanstalt und Bergakademie.
- Proceedings of the United States National Museum, Volume 24.
- Verhandlungen der Naturforschenden Gesellschaft in Basel, 1901.
- Verhandlungen der Schweizerischen Naturforschenden Gesellschaft, 1901.
- Mittheilungen ans dem Mineralogischen Institut der Universität Bonn, 1901.
- Actes de la Société Helvétique des Sciences Naturelles, 1900.
- Mineral Resources of New South Wales. Pittman.
- Annual Report of the Minister of Mines, British Columbia, for 1901.
- Transactions of the American Institute of Mining Engineers, Volume XXXI. 1902.
- Geological Survey of Louisiana. Report of 1902.
- Wisconsin Survey. Bulletin No. VIII. Lakes of Southeastern Wisconsin.

Annual Report of the Smithsonian Institution, 1901.

Maryland Geological Survey, Volume IV.

Mineral Resources of Kansas, 1900 and 1901.

Proceedings and Collections of the Wyoming Historical and Geological Society for 1901.

Very Respectfully,

A. G. LEONARD,

Assistant State Geologist.

TO PROFESSOR SAMUEL CALVIN,

State Geologist.

REPORT OF PROF. W. H. NORTON, IN CHARGE OF ARTESIAN WELLS.

Professor Samuel Calvin, Ph. D., State Geologist:

SIR:—I have the honor to present the following report of the work of this office during the year 1902.

A complete and trustworthy set of sample drillings from the deep well at the Iowa Hospital for the Insane at Mt. Pleasant was obtained in January, thus giving us a clear geological section of the deeper strata in this area.

In February the office was asked by the Board of Control of State Institutions to supply to the General Assembly an estimate of the depth, strata penetrated, probable quantity and quality of water, and cost of a proposed artesian well at the Hospital for the Insane at Independence. The detailed estimates submitted were in all respects favorable to the drilling of the well, and were made with great confidence, based on the geology of the deeper formations of the region.

The Board of Control also consulted us on several occasions during the progress of the work of sinking the deep well at the Hospital for the Insane at Cherokee, particularly as to the advisability of continuing the boring to greater depths. An excellent record and set of drillings was supplied from this important well, which shed much light on the geology of a region which is so heavily mantled with drift that the place and relations of its stratified rocks have been far from plain. Within the moderate depth of 1,070 feet a supply of about 60 gallons per minute was secured, and the thickness of the Saint Peter, which was here found about 70 feet thick, and the quantity of water which it carries encourage the sinking of other wells in the region. An analysis of the water showed that it was heavily charged with minerals in solution and clear of all organic matter, a result altogether to be expected. No injurious effects are to be apprehended from

its use at the hospital as the minerals dissolved are chiefly calcium and magnesium carbonates with some sodium sulphate.

We were also consulted during the year by the council of the city of Grinnell as to prosecution of the work in drilling a second artesian for the city supply.

To this report as to artesian wells, I may add that early in the spring I was called to Bremer county, whose survey I have nearly completed, to advise as to the location of a deep boring which a company was about to put down at Frederika in search for petroleum. For some months previous—to give the briefest sketch of the circumstances—oil had appeared in two shallow wells of the town, and on this basis two or more oil companies were formed, the lands about the village were leased, and several thousand dollars of stock were sold. An analysis of the oil at the State University had proved it refined kerosene, destitute of either a paraffine or an asphaltum base. And on a personal investigation the source of the oil was clear. The two wells were situated on either side of a general store in which a considerable quantity of kerosene was stored, one being about ten feet away and the other about ninety feet distant. Frederika is built on the sand and gravel terrace of the Wapsipinicon river, underlain at a depth of about ten feet with Devonian limestone. I found that from one of the tanks in the cellar of the store just mentioned there had been a recent considerable leakage, besides the drip which naturally takes place where oil is often drawn from faucets. The quantity of oil which had been pumped from the wells had been greatly exaggerated, and it was with entire confidence that I reported to the company that “in part or whole the kerosene in the wells is due to leakage” and that “the possibility of oil below the surface at Frederika which has not passed through the hands of the Standard Oil Co. is so slight as to be negligible.” It was also pointed out that the attitude of the strata beneath the village,—either a syncline, or a continuous dip to the south,—discourages any search for oil. Considerable confidence had been placed in two reported oil springs, on the river bank, one above and one below the town, as the theory of leakage from the cellar could not apply here; but a careful search failed to find any trace of such springs.

Unfortunately, my advice was received too late; the contract had already been made for the deep well, the foreman was on the ground and the machinery on its way. As is well known, the same advice, given by different members of the Survey, although discredited at the time in several of the leading newspapers of the state, has been amply confirmed by the event. A somewhat expensive experience and some interesting drillings saved from the borings remain as the valuable assets of the oil companies which exploited the Frederika oil field. I should add that so far as known there is not the slightest evidence of fraud on the part of the companies that sold stock and bored the wells. The work of investigating the field was undertaken by them in good faith and with laudable enterprise, but like so many other exploitations for oil and coal and precious metals, in neglect of, or opposition to, the advice of geologists who use the large experience and knowledge gathered by many men in many fields in the settlement of local problems.

I remain your obedient servant,

WILLIAM HARMON NORTON.

Cornell College, Mt. Vernon, Iowa, Jan. 24, 1903.

REPORT OF DR. J. B. WEEMS.

AMES, IOWA, January 22, 1903.

Prof. Samuel Calvin, State Geological Survey, Des Moines, Iowa:

SIR:—I have the honor of making the following report for the Chemical Work of the Survey for 1902.

The work has been limited to the chemical and rational analysis of clays in connection with the investigation of the clays of the state. The samples which have been received have been analyzed and it is hoped that the results will be in suitable form for publication in the near future.

The co-operative work on the soils of the state is also well advanced and the present indication is that the work will be completed during the coming year.

Respectfully submitted,

J. B. WEEMS,
Chemist.