

**THIRTIETH AND THIRTY-FIRST ANNUAL REPORTS OF THE
STATE GEOLOGIST.**

IOWA GEOLOGICAL SURVEY,
DES MOINES, DECEMBER 31, 1922.

To Governor Nathan E. Kendall and Members of the Geological Board:

GENTLEMEN: I transmit to you herewith a report on The Stratigraphy of the Mississippian Formations of Iowa by Dr. Francis M. Van Tuyl, and a report on The Mineral Production in Iowa in 1921 and 1922 by Dr. James H. Lees.

The report by Doctor Van Tuyl is based on field and laboratory studies extending over several years. The formations which are described are of economic as well as scientific importance. They contain valuable deposits of clay, building stones, road material, and cement rock; several of the formations are known the world over for their profusion of fossil remains. Furthermore, the type sections of the Burlington and Keokuk limestones which represent members of the standard Mississippian column of North America occur in this State. It was discovered also that one formation exists in Iowa which had not previously been known to be in the State, and many new facts were obtained regarding the thickness, character, stratigraphic relations, fauna, and distribution of the deposits which had not been recognized by earlier investigators. The remarkably well developed geodes of the Warsaw formation, specimens of which appear in many of the mineralogical museums of the world, are described in detail, and many puzzling features regarding their origin are explained. The diagonal belt-like outcrops of the Mississippian formations in Iowa are ascribed to a late Mississippian tilting and erosion which outlined the Western Interior Geosyncline, later occupied by a sea from which rocks of Coal Measures age were deposited.

I recommend that the papers of Doctor Van Tuyl and Doctor Lees be published as Volume XXX of the Survey. This volume will constitute the Thirtieth and Thirty-first Annual Reports of the Iowa Geological Survey.

Respectfully submitted,

GEORGE F. KAY,
State Geologist.

