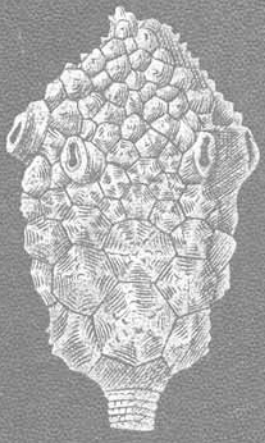

GEOLOGY

OF

TENNESSEE,

BY

JAMES M. SAFFORD, A. M., PH. D.,

STATE GEOLOGIST,

PROFESSOR OF NATURAL SCIENCE IN CUMBERLAND UNIVERSITY,
LEBANON, TENNESSEE.

BY AUTHORITY OF THE GENERAL ASSEMBLY.

NASHVILLE:
S. C. MEECER,..... .....PRINTER TO THE STATE.

1869.

PREFACE.

This Report, and the Map which accompanies it, embody the principal results of the geological surveys and researches made by myself in Tennessee, at intervals during the last twenty years. For six years of this period I acted under the authority of the State. For the remainder of the time, the surveys made, were on my personal account, and their results, in so far as they are here embraced, are a gratuitous contribution to the Geology of Tennessee.

What is presented in this volume is, with its merits and defects, essentially my own. The main part has been worked out laboriously in the field ; and this without assistants, and with inadequate means. These circumstances constitute the only apology I offer for deficiences. The whole work has involved little, if any, less than 10,000 miles of travel.

The results of the labors of others, and especially, of my venerable predecessor, Dr. Troost, when available, have been freely used, and the proper credit given. To a number of my scientific cotemporaries, I am much indebted; their names are given in the course of the Report, and my obligations acknowledged.

To many friends in the State, I am also indebted for encouragement and assistance. To Col. S. D. Morgan, Dr. John B. Lindsley, of Nashville, Hon. Sam. Milligan, formerly of Greeneville, now of Washington, and Col. Wm. Bosson, of Murfreesboro', I am under especial obligations. These gentlemen, ever ready to advance any scientific investigation which, in their opinion, might redound to the interests of the State, deserve prominent niches as patrons of science in Tennessee.

The Report does not claim to be a complete presentation of the Geology of the State; it is rather an introduction to such a presentation, and, so far as it goes, will, I trust, be acceptable.

In 1831, the General Assembly took the first step towards

a geological survey of the State, by appointing Dr. Gerard Troost, then Professor of Chemistry, Mineralogy and Geology in the University of Nashville, to the position of State Geologist, on a meagre salary of five hundred dollars. Dr. Troost was continued in office until 1850. During this time, he made nine Reports, the first two of which, do not appear to have been published, or, if they were, I have never seen them. The most important Reports are the Third, Fourth, Fifth, Sixth and Seventh. These, though short, contain much valuable matter, and have been of essential service to the State The Fifth is the largest, and is an octavo pamphlet of seventy-five pages.

The Legislature, in February, 1854, passed an Act, creating again, the office of "Geologist and Mineralogist of the State," and a few days after, I was elected to fill the place. At the expiration of the first term, (two years,) I was re-elected to the position, and again in 1858.

In 1856, I presented a preliminary Report, which was published under the title of "A Geological Reconnoissance of the State of Tennessee." This was a small volume of 164 pages. In February, 1860, it was thought desirable to publish a full Report on the Geology of the State, so far as it was practicable to do so, and the Report now presented, was commenced then. The work, however, had not proceeded far, when the war, with its ills, came upon us, and soon put a stop to it.

In March, 1868, the Legislature again authorized the preparation of the Report, and ordered it, when ready, to be printed.

After an eventful history, it is now presented to the General Assembly, and citizens of the State.

J. M. SAFFORD.

LEBANON, TENN., April 15, 1869.

NOTES ON THE MAP.

A great amount of labor has been bestowed upon the Map. Many topographical features are original, having been worked out by the author during the progress of the survey. It has been a point to have the State and county boundaries as nearly

correct, as possible. With a few exceptions, the railroads are from the actual surveys.* Aside from its Geology, the Map, so far as it goes, is the best geographical map of Tennessee yet published.

The section in the right-hand lower corner, is intended to illustrate the topography and the geology of the East Tennessee Valley, along the line M—N. It will correct the distorted dip of strata in the right-hand end of the principal section.

With reference to the Map as an Agricultural one, see page 525.

The engraver has, as a general thing, done his work well. A few omissions were observed, after it was too late to supply them. The names *Anderson* and *Clinton,* are wanting in Anderson County, though the boundaries of the county are given. *Maryville,* in Blount County, is also missing. These names, if desirable, can be supplied by those into whose hands copies of the Map may fall.

ROCKWOOD FURNACE IN ROANE COUNTY.

Since the last pages of this book were printed, I have received reliable information as to the furnace above mentioned. It appears that Roane County is but little behind Greene, (§ 1198.) Within fourteen months, the Rockwood Furnace, with all of its appurtenances, including a village of 500 inhabitants, has sprung up like magic, and is now in successful operation. The site of the furnace is near the base of Walden's Ridge, and about four miles from Kimbrough's Landing, on the Tennessee River. The ore used is the dyestone, which is obtained from beds in the Mountain Dyestone Range, mentioned on page 306. It is an interesting fact, that this is the first furnace which has made use of raw coal in the manufacture of iron. The coal is obtained from the crest of Walden's Ridge, and is conveyed directly to the furnace, by a small railroad. Hot-blast is used, with steam as motive power. The production of the furnace, latterly, has been 84 tons of pig metal per week. This

* One of these exceptions, is the West Tennessee portion of the Northwestern Road. The line representing this road should pass through Huntingdon. It may be added, also, that an arm is now in course of construction from Huntingdon to Jackson.

extensive establishment has been constructed and put in operation at a cost of $150,000, by the "Roane Iron Company," under the efficient superintendence and management of Gen. John T. Wilder.

Before closing this preface, I must acknowledge my obligations to Leven S. Goodrich, formerly of Ætna Furnace, but now of Hurricane Mills, (P. O., Waverly,) Humphreys County. Mr. Goodrich is one of our best informed practical iron-masters, and a gentleman of scientific attainments. I am much indebted to him for assistance in researches made in Hickman County.

TABLE OF CONTENTS.

PART I—Physical Geography.

PART II.—Geological Structure and Formations.

PART III.—The Minerals and Rocks of Special Use.