PALEONTOLOGY

Paleozoic Flora and the Fauna of the Coal Measures.

INTRODUCTION

In former years the object of a Geological Survey was limited to explorations of the mineral riches of the land and to the study of the fossil remains, which, found in the rocks, serve as guides for the determination of Geological Periods, or Formations. Now that the field which the human mind is called to explore has been widely expanded by discoveries of every kind, giving origin to many new industries, Geological Surveys are called upon to give an account of all that may be valuable to the inhabitants of a country and of all that may interest the world at large. The characters of the land, its chemical components, its adaptation to culture, the divers kinds of minerals, the plants and animals of the present epoch as well as those which have lived in former periods, the remains left by former races of human beings, those of animals and vegetables left in the strata composing the crust of the earth; all have to be carefully studied and recorded. For if the present inhabitants have the need and the right to know about the material value of their land, the world at large has a right to know all that pertains to natural history, in order to gather the facts that constitute the history of the world from its origin, through the different periods of its existence.

In my e orts of the past years, I included as a contribution to science, a description of some of the fossil remains of animals especially marine shells, corals, etc., found in the rocks of Indiana and serving as characters to recognize the succession of the Geological Formations of the State. This part has been generally received with great favor. As the greatest riches of the minerals of Indiana, lie in its coal beds which are entirely composed of plants, I have thought it advisable to give an exposition of the vegetable remains, which found in connection with coal beds, indicate the nature of their compounds. The plants of the coals of North America have been already described in many valuable works or Geological Reports, especially in those of Pennsylvania, Illinois, Arkansas, Ohio, etc. And, therefore, the number of new or not yet known species is probably limited, and few could be furnished from Indiana. But until now, we have no kind of book servicable to direct the study of the fossil plants, no manual of the Principles of Vegetable Paleontology which, in my opinion, would be very useful to the students of all the Scientific Institutions of our State and country.

The only man deeply versed in that part of Natural History, is Prof. Leo Lesquereux, of Columbus, Ohio, who, as an intimate friend and fellow-citizen of Professor Agassiz, was encouraged by him to come to America, and who, since his arrival here in 1848, has given the most of his time to the study of the fossil plants of North America. His studies published in numerous State and Government Reports fill many volumes, and as a Paleontologist, Lesquereux is as widely known in Europe as he is in this country. I have, therefore, proposed to him to prepare for this Report, a Manual on the Principles of Vegetable Paleontology, and I now offer it to the State as a work which will be of great value to the students and colleges of Indiana, and to those of the United States, and which at the same time may be read with pleasure and profit by all persons interested in the coal beds. It will enable every one to study and analyze the beautiful specimens of fossil plants abundantly found in our Coal Measures.

The work forcibly limited to the plants of the Paleozoic times has been prepared with the greatest care. It illustrates in beautiful plates the characters of the plants which facilitate the understanding of the descriptions. I consider it, therefore, as a

publication that will greatly enhance the value of the Geological Reports of Indiana.

The foregoing Vegetable Paleontology is followed by descriptions and figures of the characteristic animal remains of the same period, by Dr. C. A. White, Paleontologist of the United States Geological Surveys, of the Smithsonian Institute, and former State Geologist of Iowa.

The best specimens have been selected for this purpose by Dr. White, and the work has been done with his usual fidelity and ability. These shells, etc., designate the horizon of stone coal—of the Coal Measures—they are not found except within a short distance above or below Coal seams; hence are indicators of minerals to be expected, as emphatic and plain as if the rocks in which they are found were labeled in black letter English.

The drawings of the animals, shells, corals, etc., are by Dr. McConnel, of Washington City, and will bear comparison with similar work prepared in any age, State, or Nation.

The State Geologist admits that he is glad to present this work, and its illustrations, prepared by the best experts in the Special Departments of Science, to the citizens of Indiana—to some extent a contribution to science throughout the world.

JOHN COLLETT,
State Geologist.