

**REPORT OF A GEOLOGICAL
RECONNOISSANCE OF THE STATE
OF INDIANA, MADE IN THE YEAR
1837 AND 1838, IN CONFORMITY TO
AN ORDER OF THE LEGISLATURE**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649513468

Report of a Geological Reconnaissance of the State of Indiana, Made in the Year 1837 and 1838,
in Conformity to an Order of the Legislature by D. D. Owen

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

D. D. OWEN

**REPORT OF A GEOLOGICAL
RECONNOISSANCE OF THE STATE
OF INDIANA, MADE IN THE YEAR
1837 AND 1838, IN CONFORMITY TO
AN ORDER OF THE LEGISLATURE**

R E P O R T
OF A
GEOLOGICAL RECONNOISSANCE
OF THE
STATE OF INDIANA,

MADE IN THE YEAR 1837,

IN CONFORMITY TO AN ORDER OF THE LEGISLATURE.

BY D. D. OWEN, M. D.,
STATE GEOLOGIST.

PART FIRST.

INDIANAPOLIS:
JOHN C. WALKER, STATE PRINTER.
1859.

PREFATORY REMARKS.

In perusing Geological Reports, the general reader is often at a loss to comprehend much of the matter they contain, as they are couched in language familiar only to those who may have devoted themselves to scientific pursuits. It is doubtless difficult, and in some cases almost impossible to describe scientific facts, without either employing scientific terms, or else entering into long and tedious explanations; yet the most important and practical among geological facts may be generally described in a plain and familiar manner. In this view the present observations on the Geology of Indiana are thrown into as popular and concise a form as possible, and the publication of more detailed scientific facts reserved for some future occasion, when the Geology of the country shall be farther developed.

REPORT.

To the Honorable,

the Legislature of Indiana:

GENTLEMEN—In fulfillment of my duty as Geologist of the State of Indiana, and in accordance with the instructions contained in an act, entitled “An act to provide for a Geological Survey of Indiana,” approved February 6, 1837, I have commenced a geological examination of our State, of which I beg to communicate to you the results, in the following

REPORT:

Before entering on the more immediate objects of this report, a few words in reference to the general character and principles of the science of Geology may not be useless nor out of place, and will serve to elucidate the subsequent part of this report.

The science of Geology, of comparatively modern date, is now universally conceded to be one, not of mere curious inquiry, but of vast practical utility. It indicates, not only to the closet philosopher a boundless field of conjecture, whereon to erect theories of creation and systems of the world; but, to the manufacturer, the raw material whence mineral riches are abundantly derived, and to the farmer, the means of improving soils that nature seems to have disfavored.

In older States, and more thickly settled countries,

science, going hand in hand with commercial enterprise, has already seized upon all the mineral riches that more immediately present themselves. Here, in our young State, comparatively untrodden by the footsteps of inquisitive science, we have a rich and productive field on which to imitate their enterprise and rival their discoveries.

Even the imperfect survey which time has yet permitted, has amply established the fact that our citizens often unconsciously tread over hidden stores of mineral riches, which, when the researches of science shall have brought to light, the enterprise of this age of improvement will quickly seize upon, increasing at once the fortunes of individuals and the resources of the State. The entire western portion of Indiana proves, on examination, to be rich in coal; and though our forests, in a measure, supply the place of this mineral, for the time being, the axe is busily at work among them, and the rapid increase of steam power, calling incessantly for fuel, is thinning them out from year to year.

If it be argued, as it frequently is, that the researches of science are usually curious rather than profitable, I reply, first, that this greatly depends, in the case of geology, upon the course pursued by the geologist; and, secondly, that many scientific questions and learned-sounding classifications, which at first sight appear to involve considerations of an abstract nature alone, do, in fact, lead to the solution of most practical and profitable problems.

I have considered it my duty, while surveying a country as new as ours, to remember that a State just settling is like a young man starting in life, whom it behooves to secure to himself a competency before he indulges in unproductive fancies. I have considered it the most important object to search out the hidden resources of the State, and open new fields of enterprise to her citizens. That object effected, time enough will remain to institute inquiries (which a liberal policy for-

bids us to overlook) of a less productive and more abstract character; inquiries which are interesting in a scientific, rather than a commercial, point of view.

Yet must it be borne in mind, that some of the more abstruse doctrines are essential to the successful prosecution of a search after mineral resources. It might, at first sight, appear that a technical examination of the various geological formations in our State, of their relative superposition and inclination, and of the organic remains they contain, it might seem, to many, I repeat that such examination held out little promise of productive result. Those who would thus decide, are not aware, or must have forgotten, that certain minerals are uniformly found in certain formations — often in one formation only. When, therefore, the character of a formation is known, the geologist can at once decide what minerals are likely to be contained within it, and what other minerals it would be useless to look for there. Thus, the peroxide of tin (tin ore) is never found except in a primary formation; while bog-iron ore occurs in the more recent alluvial and diluvial deposits. It would be equally a waste of time to look for the former amongst fossiliferous rocks, and for the latter in granite or other allied rocks. Instances are numerous of great waste of time and money by those to whom these truths are not familiar. One occurs to me in which the venerable Charles Carroll of Carrollton was, if my memory serve me, a party interested. It happened in Maryland, near Chesapeake Bay. The proprietor of the land chanced to see *lignite* scattered over its surface, and supposing it to be imperfect coal, he and several others sunk a shaft, obtained an experienced practical miner from England, and expended upwards of twenty thousand dollars in anticipation of large profits from a rich coal mine. A scientific gentleman living in the neighborhood, knowing that the formation in which they were at work was one in which coal is not found, endeavored, without success, to dissuade the projectors from their undertaking.

They neglected his remonstrances; and I need hardly add that the search was wholly abortive, and that the expenses incurred proved a dead loss. The above example is the more striking, as the English miner, who came over with the most satisfactory recommendations as a workman of extensive practical experience, positively contracted to find a coal-bed at a certain depth.

Instances might be multiplied, in which appearances have, in a similar manner, deceived the unscientific observer. A black bituminous slate, entirely unfit for fuel, occurs frequently in our State, which is continually mistaken for coal, because it resembles coal-shale, and burns for a short time when thrown on the fire.

Again—sulphuret of iron, of little value, is very frequently picked up as gold and silver ore, on account of its color and metallic appearance. Mica, too, is said to have deceived the avarice of the early settlers of Virginia; the more readily, perhaps, that their imaginations were inflamed by the tales of countless riches amassed by the followers of Cortez and Pizarro in the southern portion of the New World.

Hence the importance of accurate scientific research, and of a general examination of the various geological formations of the State.

But again; the relative ages, and consequently nature and position, of the various members of the stratified formations, is best ascertained, not from the lithological character, (mineral structure of the rock,) but from the occurrence or non-occurrence of the petrified remains of animals and plants, and by the particular nature of these remains. Hence the examination of fossil remains is intimately connected with the discovery of mineral riches.

Those unfamiliar with the science of geology will better appreciate the foregoing, and more easily comprehend the observations contained in the body of the report, by giving their attention to the following brief remarks, containing the

LEADING PRINCIPLES OF GEOLOGY.

When we examine the crust of our earth, with respect to the external appearance of its rock formations, we discover two marked and distinct classes of rocks; one formed out of rounded stony particles, disposed in layers, and frequently containing the forms of animals or plants, termed fossils or petrifications, incased in their substance; the other not made up of rounded component particles, but rather of angular crystals, partaking more or less of regular geometrical forms intruding one upon the other, and never imbedding organic remains. These, in geological language, are termed, the former *stratified or aqueous*; the latter *crystalline, igneous or primitive rocks*.*

Distinctions between stratified and crystalline rocks.

The stratified rocks seem to have been deposited from water, at irregular intervals, throughout a long series of ages; while the crystalline, closely resembling productions of the laboratory and workshops, formed by a gradual consolidation from a molten to a solid state, are believed to have had an igneous origin. These two classes of rocks have been respectively divided, for the sake of distinction, into several groups or subdivisions each of which has its own peculiar ores and minerals.

Origin of stratified and crystalline rocks.

Grouping of the rocks.

The subdivisions of the crystalline rocks depend on differences in their mineral composition, when the lines of demarkation between the subdivisions of the stratified rocks are marked chiefly by decided differences in their imbedded fossils. *This order of succession, in every known portion of our globe, is invariable.* Sometimes, indeed almost always, one or more of the groups is wholly or partially wanting, but their order of succession is *never inverted*. Thus, the first group, if found at all, lies

Rule for the sub-division of rocks.

Order of succession invariable.

* Diagrams accompanied the original manuscript, but, as these were not engraved, reference to them is omitted.