

**THE GEOLOGIST'S TRAVELING HAND-
BOOK: AN AMERICAN GEOLOGICAL
RAILWAY GUIDE, GIVING THE
GEOLOGICAL FORMATION AT
EVERY RAILWAY STATION**

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The Geologist's Traveling Hand-Book: An American Geological Railway Guide, Giving the Geological Formation at Every Railway Station by James Macfarlane

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JAMES MACFARLANE

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THE GEOLOGIST'S TRAVELING HAND-BOOK.

AN AMERICAN
GEOLOGICAL RAILWAY GUIDE,

GIVING THE

GEOLOGICAL FORMATION AT EVERY RAILWAY STATION,

WITH

NOTES ON INTERESTING PLACES ON THE ROUTES,

AND

A DESCRIPTION OF EACH OF THE FORMATIONS,


BY

JAMES MACFARLANE, PH. D.,

AUTHOR OF "THE COAL-REGIONS OF AMERICA," AND ONE OF THE COMMISSIONERS OF THE SECOND
GEOLOGICAL SURVEY OF PENNSYLVANIA,

WITH THE COÖPERATION OF THE STATE GEOLOGISTS, AND OTHER SCIENTIFIC GENTLEMEN.

NEW YORK:
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1879.



THE OBJECTS AND USES OF THIS WORK.

1. FOR THOSE WHO ARE NOT GEOLOGISTS.

The United States are intersected by numerous railroads leading in all directions, and nearly every one has occasion more or less to travel on them for considerable distances. In these railway journeys no person who has the least power of observation can fail to notice the peculiarities in the scenery and the great variety in the formations of rock to be seen in the railway cuts and cropping out on the hillsides. If we always had a professor of geology for our traveling companion, we would be glad to learn from him what these various formations of rock are, what place they occupy in the series of strata that are visible on the earth's surface, and their mineral and other productions; also at what other localities the same rocks occur, and whether they are entirely new to us or the same we have seen elsewhere. This work is a substitute for the supposed traveling professor of geology, giving in a small space the names of the geological formations which occur along the lines of the railroads, and in another part of the book is to be found a plain but full description of each of them. There are also foot notes directing attention to interesting geological places and objects on the routes of the railroads. One object of the work is to teach persons not versed in geology something of this science during the tedious and unprofitable hours of traveling, without study, not as in a text book, but by pointing to the things themselves as seen at railway stations and through the windows of a railway car.

No person could be so stupid as to travel all over the United States without learning the name of a single state or city through which he passes, yet how few persons know even the names of the geological formations on which they have spent their lifetimes. Every one is taught geography, and there is scarcely a child of sufficient age who cannot tell the name of the town, county and state in which he lives. But geology, which is just as well worth knowing, is neglected, and there is but little opportunity for learning any thing practically in regard to it from those about us. This is not owing to a want of a desire for knowledge, but to a want of instruction in this science, and of the practical application of what is learned by adding local geological information in a handy, cheap and accessible form, and this, which no other work affords, it is the aim of this book to furnish.

There are some kinds of knowledge too that cannot be obtained from books, but must be gathered by actual observation. The inspection of a formation in nature, which is pointed out to you, will teach you more in regard to it in a few minutes than you could learn from lectures or from reading books in as many hours, and the lesson so received will be better remembered. This book is intended as an intelligent guide to such observations. It tells you where the various formations are, and you can then see for yourself in traveling what they are.

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How lonely would be a journey on which you would see not a single face that you know, and how different it would be if every one you meet were an old friend. So to the tourist new charms must be given to scenery, however attractive it may already be, if he knows something about its geology. The rocks, mountains, valleys and plains, although he sees them for the first time, are old friends in perhaps new and interesting forms. He meets them with a certain pleasure, for he understands what he sees and he is given the materials for many a happy hour of quiet and profitable reflection at home, on what he has seen on his railway journey.

2. FOR GEOLOGISTS.

But while the book is thus intended primarily as a series of object lessons for those to whom geology is yet a novelty, for the purpose of exciting an interest in, and which may ripen into a love for the science, it is believed that, being in a more convenient form than geological maps, and as no other work has attempted what is here done, all geologists, and especially students, will find it a most useful hand book on their railway journeys as well as for reference at home. It will be useful in laying down the geology in colors on any map which gives the railroads. Accurate geological maps can thus be made without expense, and there is no better exercise for students. It will also be invaluable in selecting a route of travel for geological study or for pleasure, and no geologist should make an excursion over new ground without this guide. It is a scientific catalogue of the great panorama that passes with its ever shifting scenery before the eyes of the American railway traveler, and even an artist finds a catalogue of a picture gallery very necessary. No geologist need be told that it embraces the result of a vast amount of learning, labor and research in a very small compass, and a minuteness of local geology for which he might ransack libraries in vain, and which no one man could possibly furnish. Many men for many years have devoted the finest talents in America to the study of the geology of these states, and all have contributed by their published reports, or by direct original contributions to this work, portions of the knowledge which is here indexed, otherwise it would not be becoming for the author to say so much in its praise. In order that the guide might be as accurate as possible the assistance of the state geologist of each state, or that of some scientific gentleman best acquainted with its local geology, has been invoked to revise and correct the list of formations found along the railroads. Without a single exception, and with characteristic devotion to the cause of science,* this aid has been very cheerfully and promptly rendered, and in not a few instances, where the necessary information was only in the knowledge of these gentlemen, they have filled in the geology from original sources not yet published. Due credit is given to all contributors in the notes of the proper chapter. The general accuracy of the book can be relied upon as to the formations of each locality as they were understood at the time of its publication, and it may be regarded as in harmony with the latest results of geological research. If errors are found, consider the great number of railroad stations and you will wonder there are so few.

*Scientific men freely give the results of their labors to the world, expecting only in return to enjoy the consciousness of having added by their investigations to the sum of human knowledge, and to receive the credit to which they might justly entitle them. PROF. JOSEPH HENRY.

3. FOR USEFUL, PRACTICAL PURPOSES.

To those who take only utilitarian views and care nothing for pure science, and to all those in any way interested in the country, a means is here furnished for ascertaining the natural advantages or disadvantages of any district where there is a railroad, for it is now pretty well known to all intelligent persons that the capabilities or resources of a country, what it is and what it can become, depend chiefly on its geology.

No one in our day can doubt, that there is a definite and orderly arrangement of the rocks, that it is only in certain rocks that certain useful materials and minerals are to be obtained, and that the soil of each formation has a certain fixed value for agriculture. It was long ago shown that a geological map of England, is a map also of the distribution of its manufactures. Even the kind of people inhabiting a district, often depends on its geology. A considerable portion of the work of geologists, is devoted to tracing out the distribution of the various formations as they come out from beneath one another, and spread over the face of the country. This book is made up of a minute tabular statement or division of all places on the American railways, into classes, some of which yield useful materials or productions peculiar to them. It points out the limits to be observed in searching out new locations producing any material. Besides, if accompanied by a correct scientific knowledge of the country, it will make any man's discovery of anything useful available to his neighbors in hundreds of other places, over the whole region covered by the same formation.

The physical structure of a country being then, the means by which we can learn the range and distribution of useful materials, a strict attention to fossils is necessary, to enable us to determine the relative position of rock groups, each group, within certain limits, holding its own peculiar fossil forms, and certain economic products being confined, over wide areas, either wholly or principally to certain rocks. Many persons, ignorantly confounding the means with the end, think geologists are good authorities upon fossils, but not as to the useful properties of the formations. Sir William E. Logan, the great Canadian geologist, in answer to this objection, once said: "I am not a naturalist; I do not describe fossils, but use them. They are the geologist's friends, who direct him in the way to what is valuable. To get the necessary information from them, you must be able to recognize their aspect, and in order to state your authority, you must give their names. Some of them tell of coal—they are cosmopolites; while some give local intelligence of gypsum, or salt, or building stone. One of them helped us last year to trace out, in Canada, upwards of fifty miles of hydraulic limestone."

But it is not practicable for ordinary readers to understand the difficult science of paleontology; all they can expect to know are the results as ascertained by professional geologists, and those results are given in this little book, for every place on every railroad in America. There are many other things that might have been given, especially the structural geology of each State, geological maps, more minute lists of elevations and general physical geography, but the book contains enough for one little volume to be carried about on railway journeys.

TOWANDA, PA., 1878.

JAMES MACFARLANE.

Business Office, Syracuse, N. Y.

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☞ The Index to the Railroads is at the end of the volume.

Prof. J. D. Dana's Table of the Geological Formations (1878).

Systems or Ages.	GROUPS OR PERIODS.	FORMATIONS OR EPOCHS.	
Age of Man.	20. QUATERNARY.	20. Quaternary.	
Age of Mammals.	19. TERTIARY.	19 c. Pliocene. 19 b. Miocene. 19 a. Eocene.	
Reptilian Age.	18. CRETACEOUS.	18 c. Upper Cretaceous. 18 b. Middle " 18 a. Lower "	
	17. JURASSIC.	17. Jurassic.	
	16. TRIASSIC.	16. Triassic.	
Carboniferous.	15. PERMIAN.	15. Permian.	
	14. CARBONIFEROUS.	14 c. Upper Coal Measures. 14 b. Lower " " 14 a. Millstone Grit.	
	13. SUBCARBONIFEROUS.	13 b. Upper Subcarboniferous. 13 a. Lower "	
Devonian, or Age of Fishes.	12. CATSKILL.	12. Catskill.	
	11. CHEMUNG.	11 b. Chemung. 11 a. Portage.	
	10. HAMILTON.	10 c. Genesee. 10 b. Hamilton. 10 a. Marcellus.	
	9. CORNIFEROUS.	9 c. Corniferous. 9 b. Schoharie. 9 a. Cauda Galli.	
	8. ORISKANY.	8. Oriskany.	
Silurian, or Age of Invertebrates.	7. LOWER HELDERBERG.	7. Lower Helderberg.	
	6. SALINA.	6. Salina.	
	Upper Silurian.	5. NIAGARA.	5 c. Niagara. 5 b. Clinton. 5 a. Medina.
		4. TRENTON.	4 c. Cincinnati. 4 b. Utica. 4 a. Trenton.
			3. CANADIAN.
	2. PRIMORDIAL OR CAMBRIAN.	2 b. Potsdam. 2 a. Acadian.	
	1. ARCHÆAN.	1 b. Huronian. 1 a. Laurentian.	

The numbers and letters of this table are attached to the same formations or their equivalents throughout the book.