

QE145  
T2

U  
911  
T

~~Handwritten scribbles and lines at the top of the left page.~~

Laura Mackay C.

Handwritten notes in the middle of the left page, including a checkmark and some illegible text.

Laura Mackay C.

Handwritten notes at the bottom of the left page, including the number '1' and 'N.Y.'.

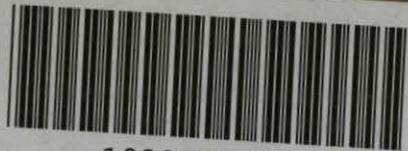
~~Handwritten scribbles and lines at the top of the right page.~~

#18

Handwritten notes in the middle of the right page, including the name 'Laura Mackay'.

Laura Mackay C.

Handwritten notes at the bottom of the right page, including the name 'Laura Mackay' and other illegible text.



1020056728

*Lauro Martiney Co.*

*Lauro Martiney Co.*

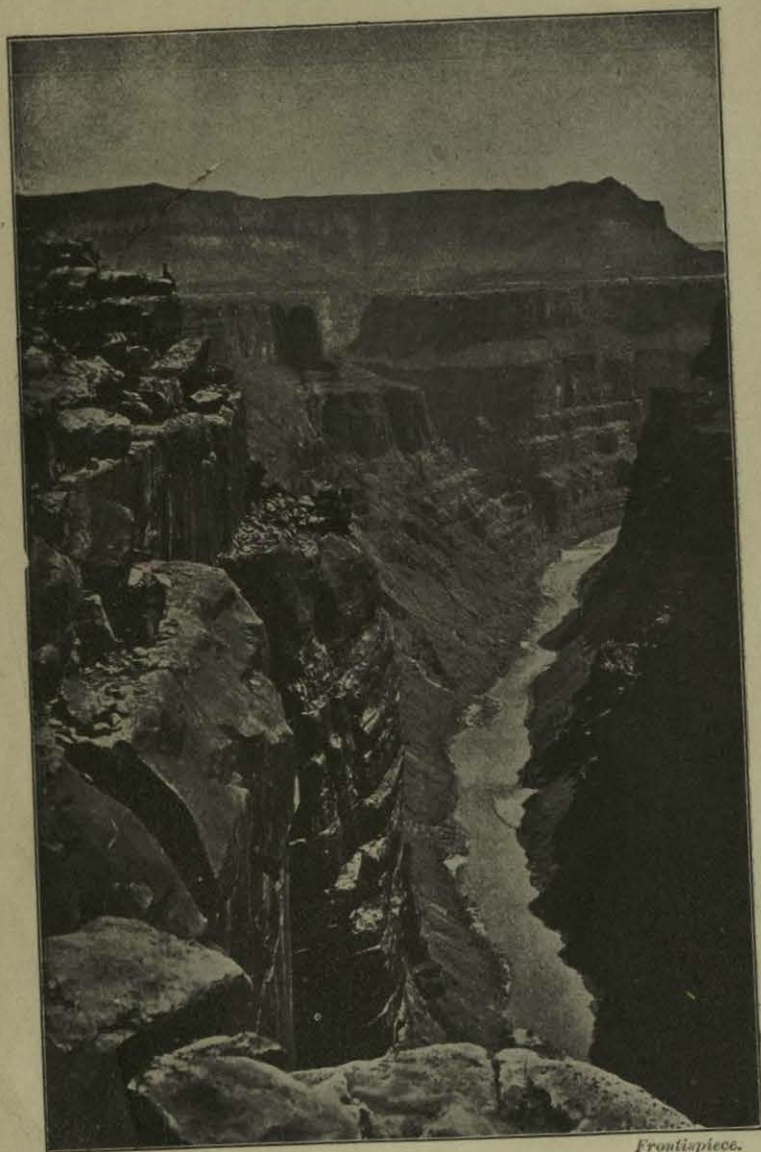


FIG. 1.—The Colorado Canyon.

*Frontispiece.*

NEW

# PHYSICAL GEOGRAPHY

BY

RALPH S. TARR, B.S.

PROFESSOR OF DYNAMIC GEOLOGY AND PHYSICAL GEOGRAPHY  
AT CORNELL UNIVERSITY

AUTHOR OF "ECONOMIC GEOLOGY OF THE UNITED STATES," "ELEMENTARY  
GEOLOGY," "PHYSICAL GEOGRAPHY OF NEW YORK STATE," ETC.  
AND CO-AUTHOR OF "TARR-MCMURRY GEOGRAPHIES"

New York

THE MACMILLAN COMPANY

LONDON: MACMILLAN & CO., LTD.

1913

*All rights reserved*

15432

9L QE145  
72  
911  
T.

COPYRIGHT, 1903,  
By THE MACMILLAN COMPANY.

Set up and electrotyped Published January, 1904. Reprinted  
May, 1904; January, August, October, 1905; April, November,  
1906; September, 1907; January, October, 1908; January, 1909;  
January, July, 1910; April, August, 1911; February, 1912;  
September, 1912. Reprinted March, 1913. Reprinted April, 1913.



ACERVO GENERAL

127969



## PREFACE.

NEARLY eight years ago the author published his Elementary Physical Geography, which was followed, two years later, by his First Book of Physical Geography, really a presentation, in briefer and more elementary form, of the matter contained in the earlier book. The growth of the science of physical geography, — which has been little short of marvelous, — the rapid advance in rank which the subject has won for itself in the schools, and the new ideas and new methods of presentation which have come to the author, have, for several years, made him desirous of undertaking a revision of one or both of his texts. When, however, this desire was given concrete form, and systematic attention was paid to the nature of the revision, it became evident that it would mean, not merely a revision, not even a mere rewriting, but a complete destruction of the old book and the construction of an entirely new book, different in plan, in scope, and, in many respects, in subject-matter. Then, for the first time, arose the idea that, since it would be a new book in fact, it would be better to issue it as such than as a new book under an old title. One important reason for reaching this decision was the fact that both the Elementary and First Book are in wide use. A field for them evidently exists, and it appears hardly wise to destroy absolutely that for which there is a demand. Twelve editions of the Elementary have been published and fifteen of the First Book.

The teaching of physical geography is still in its experi-

mental stage, and it is the opinion of many teachers that the ideal method of presentation has not yet been proposed, notwithstanding the several excellent texts which have appeared. The New Physical Geography is still another effort to solve the problem of how best to present the subject to beginning students. The author does not flatter himself that he has produced the ideal; his only hope is that he has done better in his third attempt than he did in the other two.

In the New Physical Geography, treatment of the lands has been placed before that of air and ocean because so many schools commence the study in the fall and take classes into the field. The chapters on atmosphere and ocean have been given less space than in the author's previous books; yet all topics of distinct importance are treated with sufficient fullness to make them clear. Certain subjects that are not universally deemed necessary parts of physical geography are treated in appendixes; it is the belief of the author that each of these should be studied.

Perhaps the most decided difference between the New Physical Geography and the author's other books lies in the introduction of a much fuller treatment of life in its relation to the land, air, and ocean, the human interest of each topic being emphasized. This has been done throughout the text and, at the end of the book, in a series of chapters devoted to that subject exclusively.

Especial pains has been taken to illustrate the book fully. It is believed that an illustration, properly selected, is of the very highest value, — the best substitute for the object itself. Every illustration in the book is introduced for use, and almost every one is referred to at least once in the text. Among these illustrations half tones of photographs predominate, for they alone, of all forms of illustration commonly in

use, present the whole truth. In order that they shall be distinct, the half tones are all printed on glossed paper; but to avoid giving the book undue weight, and to eliminate the trying effect of glossed paper on the eye, the text is printed on a light-weight, dull-finished paper and the half tones on inserted sheets. Besides half tones there are many diagrams, maps, and block drawings, the latter prepared by C. W. Furlong of Cornell University.

As aids to the study of the text, a brief Summary is given at the close of each section, and a Topical Outline and a set of Review Questions are placed at the end of each chapter. It is believed that the great majority of teachers will welcome these aids. No teacher will, of course, be content to follow the questions absolutely and without modification; the individuality of the teacher will appear here, as elsewhere. But these summaries, topics, and questions cover the essentials in the text; and their use as a basis for work, with such modifications and additions as may be deemed necessary, will be a far lighter task than the production of an entire series by the teacher. Thus, relieved of a form of drudgery, time will be available for the expenditure of energy in more profitable lines.

In most of the better schools physical geography is fast becoming a laboratory science, and this is the position it must eventually take wherever taught. In the absence of a laboratory manual, many teachers find it difficult to plan a laboratory course. That this is so is evident from the many letters that the author receives on the subject. With this in mind, a series of Suggestions is appended to nearly every chapter, and one appendix is devoted to maps and laboratory equipment, another to field work. From these suggestions any teacher will be able to select some for use. It is hoped that they may serve as an incentive to additional laboratory and field work.

A very large number of teachers have given the author the benefit of their experience in the form of suggestive criticism. To all of these teachers—making a list far too long to print here—the author is greatly indebted for their kindly interest. They have helped to shape the plan of the book. Among these, however, are several whose suggestions were of such marked value that their aid must be acknowledged individually: Frank Darling, Chicago Normal School; C. S. Jewell, Lake View High School, Chicago; E. C. Case, Milwaukee Normal School; L. O. Towne, Haverhill, Mass.; Emerson Rice, Hyde Park, Mass.; H. L. Rand, Dedham, Mass.; H. L. F. Morse, Troy, N. Y.; Miss Agnes Brown, Rockford, Ill.; and James A. Barr, Stockton, Cal. Special acknowledgment must also be made to Lawrence Martin of Cornell for valuable assistance and suggestion during the preparation of the book.

It goes without saying that the author is profoundly indebted to the host of workers in physiography, from whom he has drawn so much inspiration, suggestion, and fact: Gilbert, Davis, Powell, Geikie, Penck, de Lapparent, Russell, Shaler, Dutton, Chamberlin, Hayes, Campbell, Salisbury, Brigham, Dodge, Dryer, and many others. From the writings of these physiographers the author has culled whatever seemed to him suited to a scheme of elementary instruction; and so numerous, and often so unconscious, is the influence of these fellow-workers, that specific acknowledgment would be quite impossible. Doubtless the most profound influence upon the author is that of his two teachers, Professors Shaler and Davis, the importance of which to him cannot be overestimated. Together with other physiographers, the author further recognizes in Professor Davis a leader in American physiography, from whom even some of the fundamental principles of the subject have been derived. An

examination of the following pages would show the influence of this physiographer in many places, an influence not confined to the pure science, but extending to the pedagogy of the subject as well.

RALPH S. TARR.

ITHACA, N. Y., July 21, 1903.