GEOLOGICAL EXCURSIONS; OR, THE RUDIMENTS OF GEOLOGY FOR YOUNG LEARNERS

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649358953

Geological excursions; or, The rudiments of geology for young learners by Alexander Winchell

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

ALEXANDER WINCHELL

GEOLOGICAL EXCURSIONS; OR, THE RUDIMENTS OF GEOLOGY FOR YOUNG LEARNERS



GEOLOGICAL EXCURSIONS;

OR.

THE RUDIMENTS OF GEOLOGY

FOR YOUNG LEARNERS.

BY ALEXANDER WINCHELL, LL.D.,

PROFESSOR OF CHOLOGY AND PALMONTOLOGY IN THE UNIVERSITY OF MICHIGAN.
FORMERLY DIRECTOR OF THE GEOLOGICAL SURVEY OF MICHIGAN.
AUTHOR OF "SKETCHES OF CHEATRON," "WOOLD LIFE,"
ETC., ETC.

Science-teaching should begin early in the school-course.—
PRESURENT Essey, Harvard University.

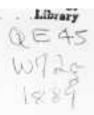
FIFTH EDITION

CHICAGO: S. C. GRIGGS AND COMPANY. 1889.

COPTRIGUE, 1884. By S. C. GRIGGS AND COMPANY.







CONTENTS.

PREVATORY NOTE	-	٠		Page 1
A WORD WITH THE TEACHER		•	7,0	5
Some Practical Suggestions				
STANDARD SAMPLES OF MINERALS AND ROCKS		5	10	11
EXCURSION I.—In the Garden. Organic and Inorganic			-	13
EXCURSION IL—In the Garden and Field, Boulders and Sand	5	100	10	15
EXCURSION III To the Gravel Bank, The Drift	5 8	*	<u>.</u>	21
EXCURSION IV.—To Another Gravel Bank, Springs and Wells	**	*1	ti	26
EXCURSION V.—To Our Laboratory. How Things are Put Together	*:5	*	5	30
EXCURSION VI To the Field.				7027
QUARTZ	*	**)	**	36
# / S (C) # (S (C) #				

EXCURSION VII.—To the Field,		
THE FELDSPARS	•	40
EXCURSION VIII.—To the Field.		
CALCITE		46
EXCURSION IX.—To the Field.		
THE MICAS, HORNBLENDE AND TALC		50
EXCURSION X.—Among the Boulders.		
Quartzose Rocks	(54
EXCURSION XI.—Among the Boulders.		
MICACEOES ROCES		57
EXCURSION XII With the Stone Uniter.		
Hornblendie Rocks	+	62
EXCURSION XIII.—To the Marble Yard.		
Calcareous Rocks	: 53	69
EXCURSION XIV To the Clay Pit and the Field.		
Argillacrous Rocks	10	74
EXCURSION XV.—To the Specimen Drawers.		
Exercises in Identifications		78
EXCURSION XVI,-By the Waterside.		
Sediments	•	81
EXCURSION XVII.—In the Gorge.		
DECAY AND EBOSION OF ROCKS	***	87

CONT	20.00	MCC-
ALCOHOL: N	0.00	100

V.

EXCURSION XVIII.—At the Rocky Ledge.	
STRATA AND SYSTEMS OF STRATA	95
EXCURSION XIX.—To the Diagrams,	
How the Strata Enwrap the Earth	101
EXCURSION XX.—To the Geological Map.	
How to Understand a Geological Map	109
EXCURSION XXI,—To the Geological Map.	
Geological Sections	116
EXCURSION XXII To the White Mountains.	
The Eozoic Rocks	123
EXCURSION XXIII.—To the Upper Mississippi,	
CAMBRIAN (OR LOWER SILURIAN) ROCKS AND HISTORY	131
EXCURSION XXIV.—To Niagara Falls.	
Silurian Rocks and History	140
EXCURSION XXV.—To Mackinge.	
Devonian Rocks	146
EXCURSION XXVI.—To Burlington, Iowa,	
The Lower Carboniferous Rocks	153
EXCURSION XXVII,—To the Cont Mines.	
THE COAL MEASURES	160
EXCURSION XXVIII.—To Selma, Alabama.	
Ture Mesozote Rocks	168

CONTENTS.

EXCURSION XXIX,—To Claibo	rne,	AL	aba.	ma.				
THE TERTIARY FORMATIONS			1	5	90	5	•	173
EXCURSION XXX.—To the Riv	er I	all	ey.					
QUATERNARY FORMATIONS .	20	95	9	*:	\times	ť	27	178
EXCURSION XXXI To Switze	rlan	d.						
ABOUT GLACIERS	100	*)	*	*0	(*:	\mathfrak{F}	185
EXCURSION XXXII.—Through	the	Age	es.					
ABOUT THE PLANTS AND AND	MAL	8 (1)	FT	HE	Pa	ST		191
QUESTIONS ON THE TEXT	- 4-	200	14					505

PREFATORY NOTE.

ADDRESSED TO TEACHERS AND SCHOOL OFFICERS.

THAT the elements of geology are so seldom taught either in our primary or secondary schools is a circumstance to be regretted. No tendency seems manifest toward any improvement in this particular. In Michigan, which enjoys a justly high reputation for the excellence of its schools and teaching, even less geology is studied in school than was customary a dozen years ago. No knowledge whatever of this subject is required for entrance into the University of Michigan in the "Classical Course," nor in the "Scientific Course," nor in the so-called "English Course"-though in the last two courses the candidate is given his option between preparation in Chemistry, Geology, Zoölogy and Physiology. Of necessity, Physiology, which is generally taught in the schools, is almost always the chosen subject, though next to this stands Chemistry. Practically, therefore, the study of geology in the University begins with the clements in every course. A similar state of things exists in most of our colleges. There is no course where geology is a prerequisite, so that the student on entering may find himself in position to push on to some advanced knowledge of the subject. One would anticipate that a course specifically denominated "Scientifie," would demand a more extended scientific preparation than the old "Classical" course, and that a science which has done as much for industry, civilization and culture as geology has, would not fail to be enumerated among the requirements.

Since geology is not so required for entrance into college, it has ceased to be taught in the schools—as if geology had no