

APPLIED GEOLOGY. PART I

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649433681

Applied Geology. Part I by J. V. Elsdon

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

J. V. ELSDEN

**APPLIED
GEOLOGY. PART I**

APPLIED GEOLOGY

"THE QUARRY"

The Organ of the Stone, Marble,
Slate, Lime, and Cement Trades

TECHNICAL ARTICLES BY WELL-KNOWN EXPERTS.

PROFUSELY ILLUSTRATED.

Price 6d. Monthly. Annual Subscription, 7/- post free.

"THE QUARRY" PUBLICATIONS

1. **THE GUERNSEY QUARRIES.**

By G. C. GREENWELL, F.G.S., M.INST.C.E. Price 6d.
post free.

2. **QUARRIES AND WORKS OF THE DONEGAL
GRANITE QUARRIES, LTD.** (*Out of print.*)

3. **MINING AFFAIRS IN THE ARGENTINE RE-
PUBLIC.**

By H. D. HOSKOLD, Inspector-General of Mines of the
Argentine Republic, and Director of the Government Depart-
ment of Mines and Geology. Price 6d. post free.

4. **PORTLAND STONE.** Price 3d. post free.

5. **APPLIED GEOLOGY. PART I.**

By J. V. ELDEN, B.Sc.(Lond.) Price 5s. post free.
(Part II. in course of preparation).

"THE QUARRY" PUBLISHING Co., LTD.,
5 ARUNDEL STREET, STRAND, LONDON, W.C.

APPLIED GEOLOGY

83157

James Vincent
BY
J. V. ELSDEN B.Sc.(Lond.)

PART I

WITH NUMEROUS ILLUSTRATIONS

PRICE FIVE SHILLINGS

LONDON

"THE QUARRY" PUBLISHING Co LTD

5 ARUNDEL STREET STRAND WC

1898

PREFACE TO PART I

CIRCUMSTANCES have made it necessary to publish the earlier chapters of this work separately, while the later portion is still appearing in the pages of the *Quarry*.

To those who may read the following pages I would, therefore, point out that these preliminary chapters scarcely give an adequate idea of the scope of the completed work.

The scarcity of books dealing with the practical side of geology has been long felt ; but it will be for others to judge how far this attempt to supply that want may have been successful. My difficulty throughout has been an attempt to combine as much geology as the practical man should know with as much practical detail as should interest the geologist.

I lay no claim to any originality, and have freely used all available sources of information as to the facts recorded in this volume. A more complete acknowledgment of these sources will be published at the conclusion of the work.

J. V. E.

STORRINGTON, 1898.

Readers. M. V. P. 5-12-38

CONTENTS OF PART I

	PAGE
PREFACE	v
CHAPTER I	
Aim and Scope of the Subject—Method of Treatment—Geological Surveying—Outcrops—Thickness of Strata—Maclaren's Rule	1
CHAPTER II	
True and Apparent Dip—Calculation of True Dip by Formula and by Graphic Construction—Dip and Strike Problems—Use of Dip Diagrams	16
CHAPTER III	
Irregularities in Stratified Rocks—Thinning out of Beds—Unconformity and Overlap—Curved Strata—Faults—Normal Faults	35
CHAPTER IV	
Reversed Faults—Surface Indications of Faults—Practical Influence of Faults in Mining and Quarrying—Calculation of Throw—Search for Dislocated Veins: Zimmermann's Rule	53
CHAPTER V	
Economic Minerals—Stratified Ore Deposits—Placer Gold and Platinum Deposits—Stream Tin—Iron Sands—Bog Iron Ore—Clay Ironstone—Manganese Beds—Bauxite—Red Hæmatite—Magnetite—Copper Shales—Metalliferous Sandstones—Witwatersrand Gold Conglomerates	71

CHAPTER I

Aim and Scope of the Subject—Method of Treatment—Geological Surveying—Outcrops—Thickness of Strata—Maclaren's Rule.

Aim and Scope of the Subject.—Geology, in its practical application, appeals to all who are concerned in the development of the mineral resources of the earth. Its aim is directed, in the first place, to the discovery of useful minerals and to a correct estimation of their quality, quantity and accessibility. Upon the accuracy of this knowledge depends, in a great measure, the success of industrial ventures connected with the mineral productions of the globe, as well as the surface capabilities of a country as regards improvement by agricultural or engineering schemes. To the agriculturist, the land valuer, the architect, the engineer and the manufacturing chemist, to all, in fact, who make use of the raw materials supplied by the mineral kingdom, a practical acquaintance with the principles of geology is essential to the highest degree of success. The agriculturist derives assistance from geology, not only in ascertaining the nature and properties of the soil overlying the rocks beneath, but also in determining to what extent that soil is capable of improvement by admixture with the mineral materials, whether chalk, sand or clay, which the neighbourhood affords. The land valuer cannot neglect the consideration of valuable minerals which either are or may be found in workable quantities on an estate, the after discovery of which has often led both to an enormous increase in the value of property, and also not infrequently to expensive litigation. The architect must be acquainted

with the durability of the different building stones, and their adaptation to the various purposes which he has in view. The engineer is confronted at every turn by geological problems upon which the success or failure of his schemes depend; while the manufacturing chemist, whose raw materials are of a mineral nature, must keep a watchful eye upon the discovery of fresh sources of supply, and upon new methods of diminishing the cost of his productions.

But if geological knowledge is necessary to so many different arts and sciences, how much more is it essential to the miner and the quarryman who are directly concerned in the extraction of useful minerals from the earth's crust? It is not easy to explain why this necessity is not more fully recognised, unless it be due to the fact that the majority of geological text-books are so laden with theory that the practical aspect of the science is either lost sight of or altogether ignored. Not that theory should be despised as altogether useless to the practical man. Theory generally precedes practice, and if the converse has often been true in the case of many geological discoveries, this is due in a large measure to the fact that geology as a science is of more recent date than the arts of mining and quarrying. If we balance the successes of our mining and engineering forefathers against the many failures which have resulted from ignorance of geological phenomena, we should find overwhelming proof of the assistance which is to be derived from a proper acquaintance with the science of geology. As examples of the value of combining theory with practice, it is only necessary to remember the splendid geological deductions which led up to the recent discovery of coal in the south-east of England, or the successful search for phosphate deposits in the cretaceous rocks of France, which was based entirely upon their analogy with those of England. Even a knowledge of fossil species becomes helpful in the identification of geological horizons in widely separated localities.