MAGNETISM AND ELECTRICITY

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649641635

Magnetism and Electricity by William Allen Miller

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

WILLIAM ALLEN MILLER

MAGNETISM AND ELECTRICITY



MAGNETISM

AND

ELECTRICITY.

161 PEARL STREET.

1858. 1:5



NEWYORK PUBLIC LIBRARY

PREFACE.

THE following pages, taken from the work of Prof. MILLER, are exhibited in this form in order to complete the course of instruction in the department of Chemistry at the U. S. MILITARY ACADEMY.

NEW YORK PUBLIC LIBRARY

١

.

TABLE OF CONTENTS.

CHAPTER VI.

	32.	NO. 07
		PARAGRAP
ELECTRICITY A	AND MAGNETIS	AM.
Connexion of Electricity with Magnet	ism	184
§ I. MA	GNETISM.	
Leading Characters of Magnetic Act	ion	185
Magnetic Induction		
Preparation of Magnets		187
Influence of Molecular Actions on M	agnetism	
Measurement of the Magnetic Intens	ity of a Bar	189
Magnetism of the Earth :- The Dip.		190
Declination or Variation		191
Variation in the Intensity of the Ka	rth's Magnetism.	192
§ II. STATIO	ELECTRICITY.	
Simple Facts connected with Electric	rity	193
Two Kinds of Electricity		
Insulators and Conductors		
Electroscopes		
Electrical Hypotheses		197
Electrical Induction		198
Faraday's Theory of Induction		199
Distribution of the Electric Charge		200
Electrical Machines	************	
Further Illustrations of Induction		
The Electrophorus		
Spread of Induction		
The Leyden Jar		
Measures of Electricity		
Specific Induction		

NO PARA	GRAPH
Various Modes of Discharge	208
Conduction	209
Development of Heatbis	209
Disruptive Discharge	210
Velocity of Discharge	211
Striking Distance	
Convection	
Other Sources of Electricity	214
Electricity of Vapour	
Atmospheric Electricity	
Aurora-Borealis	
S III. GALVANIC OR VOLTAIC ELECTRICITY.	
Galvani's Discovery	214
Simple Voltaic Circuits.	
Activity of the Conducting Wire	
Action of the Conducting Wire on a Magnetic Needle.	
The Galvanometer	
General Summary of the Effects produced by the Conducting Wire	
The Voltaic Pile:—the Crown of Cups	
Electric Disturbance produced by Contact	
Necessity of Chemical Action to produce Voltaic Action	
Polarization and Transfer of the Element's of the Liquid	
Energy of the Current proportionate to the Chemical Activity	
Direction of the Current dependent on the Direction of the Chemical Action	
Circuits with One Metal and Two Liquids	
General Summary	
Counteracting Currents:—Grove's Gas Battery	231
Daniell's Battery	232
Grove's Nitric Acid Battery	233
Smee's Battery	234
Resistances to the Voltaic Current	235
Differences between a Simple and a Compound Circuit	236
Ohm's Theory	237
Chemical Decomposition: The Voltameter	238
Further Application of Ohm's Theory	
Wheatstone's Rheostat and Resistance Colls	
Processes of Voltaic Discharge	
Conduction	
Conduction by Liquids	
Conducting Power of Gases.	
Disruptive Discharge:—Electric Light	
Discharge by Convection:—Chemical Actions	140
Laws of Electrolysis	41

TABLE OF CONTENTS.	C
	NO. OF
Relative Decomposability of Electrolytes	248
Resemblances between Static and Voltaic Electricity	249
Deluc's Dry Pile	
Water Battery	
§ IV. ELECTRO-MAGNETISM.	
Law of Electro-Magnetic Action: - Tangent Galvanometer	252
Influence of a Conducting Wire in exciting Magnetism	253
Formation of Electro-Magnete	254
Molecular Movements during the Magnetization of Bars	255
Laws of Electro-Magnetism ,	256
Ampere's Theory of Kiectro-Magnetism	257
Mutual Influence of Wires which are conveying Currents	258
Electro-Magnetic Rotations	
Electric Telegraph	260
§ V. Magneto-Electricity.	
Volta-Electric Induction	261
Magneto-Electric Induction	
Ruhmkorff's Magneto-Electric Induction Coil	263
Inductive Action of Current:—Henry's Coils	
Arago's Rotations	
Magneto-Electric Machines	
§ VL THERMO-ELECTRICITY.	
Summary of Facts in Thermo-Electricity	
Thermo-Multiplier	
Reduction of Temperature by the Electric Current	268
§ VII. ANIMAL ELECTRICITY.	
Electrical Phenomena exhibited by the Torpedo	269
Electrical Phenomena of the Gymnotus	270
The Muscular Current in Living Animals	271
	*
§ VIII. RELATIONS OF LIGHT AND MAGNETISM:—DIAMA	
Magnetic Polarization of Light,	272
Magnetism of Bodies in general	273
Diamagnetism	274
Diamagnetism of Gases	275
List of Magnetic and Diamagnetic Bodies	276
Influence of Chemical Composition upon the Magnetic or Diamagnetic	State 277