OBJECT LESSONS AND HOW TO GIVE THEM: SECOND SERIES FOR INTERMEDIATE AND GRAMMAR SCHOOLS

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649659845

Object Lessons and How to Give Them: Second Series for Intermediate and Grammar Schools by George Ricks

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

GEORGE RICKS

OBJECT LESSONS AND HOW TO GIVE THEM: SECOND SERIES FOR INTERMEDIATE AND GRAMMAR SCHOOLS

Trieste

THE OBJECT LESSON BOOK

By GEORGE RICKS B.Sc. (Lond.)

NATURAL HISTORY OBJECT LESSONS

2

A Manual for Teachers and Pupil Teachers

OBJECT LESSONS AND HOW TO GIVE THEM First Series for Primary Schools

31 - 2.5g

OBJECT LESSONS AND HOW TO GIVE THEM Second Scries for Intermediate and Grammar Schools

OBJECT LESSONS

AND HOW TO GIVE THEM

25

1.

Second Series

FOR INTERMEDIATE AND GRAMMAR SCHOOLS

BY GEORGE RICKS B.Sc. (LOND.)

INSPECTOR OF SCHOOLS TO THE SCHOOL BOARD FOR LONDON AUTHOR OF "NATURAL HISTORY DIJECT LESSONS" ETC.

.

BOSTON, U.S.A. D. C. HEATH & CO., PUBLISHERS 1893

•

*

-

4

S.C.

4

23

| PURSON | INTRODUCTIO |) M | 1 10 " | OBJECT | LBREO | N8, A | ND H | ow 1 | 10 ar | VB TH | ем " | | PA9B ix |
|--------|-------------|-----|---------------|--------|-------|-------|------|------|-------|-------|------|----|------------|
| | INTRODUCTIO | ĸ | TO | OBJECT | LEGS | ONS | FOR | 108 | IOR | AND | SHAL | OB | |
| | SCHOOLS | • | • | 10, | | | 50 | | | | • | | Tiv |

FIRST STAGE.

| I SOLID AND | D LIQI | σīb | 12:00 | 2.2 | 20 | 70 | • | | | | | \$ |
|---------------------------|--------|-----------------|--------|------|---------------|-------------|------------|----|--------|----|----|----|
| II.— ⁺⁴ PROPER | TIBS ' | " OP | BODIES | | | | | • | | • | | 5 |
| IIIWEIGHT | | 1 | 10 | • | | - | | | | | | 7 |
| IVPOROUS. | 4860 | REES | ·T. | | 195 | 1 | 22 | | ÷. | | 1 | 9 |
| VPOROUS B | ODIE | 1. T | ILTERS | | \$ 3 | | | 2 | | ě. | | 11 |
| VINON-ABBO | RBBN | TB | (a -) | • | | ŧ۵. | •3 | | * | | 54 | 13 |
| VII.—SOLUHLE | | | | | •00 | •3 | | | | | | 14 |
| VIII SOLVENTS | -wa | TER, | ALCOH | IOL, | & C. | • | | | | | | 15 |
| IX | ۲. | , | | | | | | | | | | 17 |
| X HARD AN | D 808 | T | 8. 1 | | | • | | | | | | 18 |
| XI.—BRITTLE, | TOUG | и, т | LEXIBL | .8 | 9 . 28 | 19 | | | | | | 20 |
| XII ELASTIC | × | a ⁸² | a : | • | 0.00 | 4 0 | ×. | • | | | 3 | 21 |
| XIII FLASTIC | | | a. 1 | | • | H 15 | * 3 | • | | | | 28 |
| XIV PURIBLE | | | 2002 | 0.5 | • | ** | | | * | | | 25 |
| XVON SOME | FUE | HBR | PROPI | BHTI | ES OF | THE | COMM | 0N | METALS | | | 26 |
| XTILEAD . | | | | | | | | | | | | 27 |
| XVII — BULPHUR | 6 | | • | | 10.0 | • | • | • | • | • | • | 30 |

ł

SECOND STAGE.

| 1WATEDITS PROPERTIES | | • | 10 | * 2 | ۰ | | 28 | 35 |
|----------------------|----|----|----|------------|---|---|----|----|
| IL-WATERA ROLVENT . | | • | 1 | • | | • | | 87 |
| 54 | 4: | 22 | 4 | | | | | |

| 125800 | | | | | | | | | | | | PAGE |
|---------------|-------|-------|----------|--------|-------|------|------------|------------|--------------|-----|---|------|
| UIWATER A | * TAP | OUR. | DBW | • | a : | × | • | • | • | • | • | 40 |
| IVWATER A | a Poe | , MI | r, cL | 000, | HAIN, | AND | STEA | × | 1923 - S | | • | 41 |
| VWATER AN | 8 800 | W A.S | D ICH | | | 12 | 1.2 3 | • | | | | 45 |
| VIMBRCURY, | OR O | 10101 | | H | ¥ | 2 | S. 1 | . 1 | | | | 46 |
| VIIAIR-A SU | BITA | NGB, | INVISI | BLE, | ocovi | PIBS | SPACE, | HAS | WHIC | HT | | 48 |
| VIIIAIR PRESS | BE IN | ALL | DIRB | MOLTON | 8 | | 98 - Ì | ÷ . | • | | • | 50 |
| IX AIN IS BL | ASTIC | ÷. | | | | | s e | • 1 - S | •3 3 | • 3 | • | 52 |
| X 648 . | •0 | | | | | | 51 1 | • | • | • | | 64 |
| UCUAL-GAS | | • | | | | | | • | | | • | 56 |
| EGTAR . | | 2 | 8 | ÷. | | | 8 i | | | | | 58 |
| ATTCARBONIO | ACID | | 8 | ų. | ě. | 3 | \$ I | | a n 1 | | | 60 |
| XIVPARAPPIN | OIL | | | 1 | | 2 | 8 I | <u>i</u> 1 | | | | 62 |
| EVCANDLES | ¥2 | 2 | . | | | | a - | ¥ . | • • | • | • | 64 |
| XVI SOAP-BUNI | LES | AND | WHAT | THE | TRA | CH | | | | • | • | 65 |
| XVII-BALLOONS | | * | : E | 8 | | | 18 i | • % | • | | • | 68 |

THIRD STAGE.

| I MOLECULES | 8 | × | ÷ | | | | ×. | | ÷ | | 73 |
|-------------------|------|--------|---------------------|-------|----|------------|-----|----------|------------|------------|-----|
| IIBTATES OF MA | FTER | | * | | × | | 8 | 100 | | 3. 1992 | 75 |
| IIIADHESION . | | æ | | | | | | | | 3.00 | 71 |
| IV | TRAC | TION | | | | | • | | | | 79 |
| VPROPERTIES | DE E | SOLIDE | BIP | LAINE | D | 3 4 | | | 19 | | 81 |
| VIPORCE OF GRA | VITY | | HT. | 53 | ÷, | 1 | 2 | 10 | 8.8 | | 83 |
| VII.,-THE SURPACE | OF A | riout | D AT | REST | 18 | AUVAYS | LEV | EL | 6 4 | 1000 | 85 |
| VIIIPRESSURE IN 2 | LIQU | ID8. I | | æ | 36 | D. | | | 34 | | 87 |
| IX PRESSURE IN | LIQU | IDS. C | I. | | | | | | | | 90 |
| I BUOYANCE OF | FIGT | пря | | | | | | | | | 92 |
| XIWEIGHT OF TH | - | MOSPE | BRB | | | 15 | 2 | | | | 94 |
| XIIPRESSURE OF | THE | ATMON | PHER | Б. | | ÷. | | | | | 97 |
| XIII | IR. | 83 | 27 | | | 2 | 2 | 22 | 8 | 1. | 99 |
| XIV THE SYRINGE | 10 | | | | ÷ | | | 14 | 63 | 10 | 101 |
| XV THE CONMON I | UMP | | - | ÷. | | | | | | | 103 |
| XVI PORCE-PUMPS | •00 | | | | - | | | 30 3. | 0.5 C. | 1.4 | 106 |
| XVIITHE SIPHON | | 2 | | 3 | 0 | 2 | 3 | | Ĩ. | ÷., | 108 |
| XVIIITHE AIR-PUMP | | | | 2 | | 1 | | 8 | | 15 | 111 |
| | | | | | | | | | | | |

vi

.

1

1

I.

FOURTH STAGE.

| 1.86509 | | 33 | 35 | | | | | | | PAG |
|------------------------|--------------|-------------------|-------|------------|----------------|------|------------|------|------|-----|
| I EFFECT OF BEAT ON | BOD | ans (| 1}. | EXPA | NETON | ANI | D CONTRA | OTI | UN. | 11 |
| IIEFFECT OF HEAT ON | BODI | E8 (| 2) | PIGA | BYACT | ION | AND VAL | POR | ZA- | |
| TION | | 360 ^{°°} | | 8 3 | • | × | | ×. | 20 | 11 |
| IIITRE THERMOMETER | | 3.00 | | • | | | | | | 12 |
| IV FREEZING OF WATE | R. | • | | | | | | | | 12 |
| V BOILING OF WATER- | -00.5 | VEUT | ION | | • | 4 | 1 | | | 12 |
| VI DISTILLATION . | 66 | | | - 20 | <u></u> | | | | | 12 |
| VIIEFFECT OF PRESSUR | NO M | THB | BOI | LING | POINT | OF | LIQUIDS | | | 13 |
| VIIISTEAM AND THE STEA | 11-EX | GINE | 13 | 22 | | | | | 24 | 13 |
| IX CONDUCTION OF HE | LT | LOTE | IND | | | | | | | 13 |
| X RADIATION OF HEAD | rR | ADIAT | 088 | | • | | | | | 13 |
| XI | THE . | A 890% | PTIC | NOP | WATB | BT | VAPOUR J | BT : | THE | |
| ATMOSPHERE . | 122 | 0.2260 | 98 F. | 1999 (S | 192 <u>5</u> 2 | | 19.99 • | | 2002 | 41 |
| MI HEAT THE CAUSE O. | F N O | ROL | IN T | - | ER . | ਼ | 18 | 8 | | 14 |
| XIII DEW AND HOAR-PRO | at | 01452 | - | 48 | | - 23 | - | - | | 14 |
| XIV RAIN, SNOW, HATL, | ALRE | | | | - <u>a</u> | ÷ | | | | 14 |
| XV SPECIFIC HEAT | | | ÷. | 80 | 100 | | | | | 14 |
| XVL-LATENT REAT | 1993 | 1920) | 1.0 | 8 | | Ċ. | | | 2 | 15 |
| XTTCOOLING BODIES AN | - | REST | (r) M | TXTE | DES. | 1 | 0 | 3 | 1 | 15 |
| | | | | | | | | | | |

SUPPLEMENTARY LESSONS ON PROPORTION.

| t. | | 34 | | | | | | | 33 | | | 158 |
|----|---|----|-----|-------|---|------|---|----|----|--|---|-----|
| п. | 4 | 99 | 340 | 33.72 | 8 | - 68 | 1 | 83 | 1 | | 3 | 161 |
| | | | | | | | | | | | | 163 |
| | | | | | | | | | | | | 165 |

FIFTH STAGE.

| (A) | • | * | | ٠ | 3 | | 171 |
|------------|----|------------|------|-------|--------|---------|-----------------|
| * 3 | • | ۰ | | | | | 173 |
| • | • | | | | | | 17ā |
| ÷ . | | | | | | | 178 |
| GARES. | 84 | | | | | | 180 |
| | | * * * * | .::: | .:::: | .::::: | .:::::: | . : : : : : : : |



| L'ESSOIF | | | | | | | | | | PAGE |
|-------------------|------|---------|------------|-----|------|-----|------------|---------------|------|------|
| VI COMBUSTION | | | * | | | 1.5 | 8 9 | | | 182 |
| VIL-TEB CHEMISTRY | . 01 | - | DLB | • | | | | | | 184 |
| VIIIBLEOTRIC AND | MAG | NETTO | POB | CBS | | | | | | 186 |
| II ORNTRE OF GRA | TIV | r. | 48 | | | 2 | | | | 188 |
| ILEVERS AND TH | 111 | USBS S | I. | | | 39 | • | • | | 192 |
| XL-LEVERS AND TE | - | DEES. | - a | e | ۲ | | | 1.90 | | 195 |
| XIILEVERS AND TI | RI | L COES. | -10 | t | | | | | | 197 |
| XIIITHE PULLEY | • | | | | | | | | | 200 |
| XIV THE WEBEL AN | DA | TLE | | | | | | | | 203 |
| XV THE INCLINED | PLA | NB | | 2 | | | | | | 205 |
| IVITHE WEDGE | • | | • | | | ÷. | 33 | | 5363 | 207 |
| XVIITHE SCIEN | • | •0 | • | | | | | 3 6 13 | • | 208 |
| XVIII PRIOTION . | | 3 | | | | | | | | 210 |
| | | | | | | | | | | |

82

1.62

.

83

viii