

**INTERMEDIATE ARITHMETIC
ON THE INDUCTIVE METHOD,
WITH PARALLEL MENTAL
AND WRITTEN EXERCISES**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649153848

Intermediate arithmetic on the inductive method, with parallel mental and written exercises by
J. W. Nicholson

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. W. NICHOLSON

**INTERMEDIATE ARITHMETIC
ON THE INDUCTIVE METHOD,
WITH PARALLEL MENTAL
AND WRITTEN EXERCISES**

F. Caponi
INTERMEDIATE

ARITHMETIC

ON THE INDUCTIVE METHOD, WITH PARALLEL MENTAL
AND WRITTEN EXERCISES

BY

J. W. NICHOLSON, A. M.

*Professor of Mathematics in the Louisiana State University and Agricultural
and Mechanical College*

NEW ORLEANS

PUBLISHED BY F. F. HANSELL & BRO.

PRACTICAL EDUCATIONAL SERIES.

Chambers' Twenty Lessons in Book-keeping.

Hansell's Penmanship.

Nicholson's Primary Arithmetic.

Nicholson's Intermediate Arithmetic.

Nicholson's Complete Arithmetic.

Entered according to Act of Congress in the year 1885, by

F. F. HANSELL & BRO.,

In the office of the Librarian of Congress, Washington, D. C.

PREFACE.

THE chief difference between a good and an inferior Arithmetic is not so much a question of matter and rules, as it is of method in the presentation and development of principles. In the former, few mathematicians would be bold enough to lay claim to originality; but in the latter every one will, perhaps, admit there is room for improvement.

In the preparation of this three-book series, consisting of a Primary, an Intermediate, and a Complete Arithmetic, the author has been influenced by the following considerations:

1°. Arithmetic treats of the *whole* and its *parts*. These are the magnitudes or objects about which Analysis and Synthesis are conversant, and on the consideration of which depends the solution of every problem. Hence, the early introduction of these terms, and frequent reference to them in the deduction of succeeding principles, are of the greatest importance.

2°. By Induction a pupil is led by easy steps, by familiar illustrations and commonplace parallelisms, into a clear apprehension of principles and definitions. Hence, each subject should be introduced with inductive exercises.

3°. Pupils advance intelligently in any new subject just in proportion as they perceive in it a continuation of the principles with which they are familiar. Hence, whatever of sameness and of difference there is in the old and the new should be made as conspicuous as possible.

4°. Mental and written work are equally important, and should be mutually supplemental. A problem intended for written work should, in general, be preceded by a parallel question designed for mental, and also as an inductive exercise.

5°. The representing of objects by the first letters of their names, as, **A** for apple, and **B** for boy or box, is not only a matter of convenience, but serves to lead pupils into the habit of generalization.

6°. Pictures assist the child to some extent in the conception of combining and resolving numbers by counting, adding, subtracting, etc., but are not so useful in this particular as objects themselves. Hence, the introduction of object exercises is a prominent feature of the first two books of the series.

On the whole, the series is not the product of preconceived opinions as to what should constitute matter and method, but the embodiment of the results of many years experience in teaching mathematics.

The present treatise is intended primarily to prepare pupils for the Complete Arithmetic; secondly, to meet the wants of those who desire only a knowledge of those practical applications of numbers which are most frequently used in ordinary business transactions. It is divided into two parts.

The First Part is devoted to a few lessons in primary arithmetic, embodying the more important features of the "Grube Method," with such additions as to bring it into conformity with the principles already enunciated. This part may be omitted by those who have completed the Primary Arithmetic, at the discretion of the teacher.

The Second Part embraces a very thorough elementary course in Notation and Numeration, Addition, Subtraction, Multiplication, Division, Divisors and Multiples, Common and Decimal Fractions, United States Money, Compound Numbers, some Important Practical Applications, and Percentage, including Commission, Profit and Loss and Interest. Special attention is invited to the simple, progressive, and practical treatment of these subjects, especially Division, Fractions, Decimals and Interest.

The Author acknowledges his indebtedness to many writers upon this subject, both of this and of other countries, whose able treatises have been consulted with pleasure and profit.

J. W. N.

BATON ROUGE, LA., *June*, 1885.

CONTENTS.

PART I. INDUCTIVE ARITHMETIC.

	PAGE
LESSON I. Counting 10.....	7
“ II. The Number Two.....	9
“ III. The Number Three.....	11
“ IV. The Number Four.....	14
“ V. The Number Five.....	17
“ VI. The Number Six.....	21
“ VII. The Number Seven.....	25
“ VIII. The Number Eight.....	28
“ IX. The Number Nine.....	31
“ X. The Number Ten.....	35

PART II.

Notation and Numeration.....	41
Addition.....	54
Subtraction.....	71
Multiplication.....	87
Division.....	102
Short Division.....	113
Long Division.....	115
Divisors and Multiples.....	126
Common Fractions.....	132
Reduction.....	138
Addition.....	146
Subtraction.....	148
Multiplication.....	152
Division.....	156
Decimal Fractions.....	164
Reduction.....	168
Addition.....	170

	PAGE
Decimal Fractions—	
Subtraction	171
Multiplication.....	172
Division	172
United States Money	174
Reduction.....	175
Addition, Subtraction, Multiplication, and Division.....	177
Bills and Accounts.....	178
Compound Numbers.....	181
Linear Measure	181
Reduction.....	182
Square Measure.....	183
Solid or Cubic Measure.....	185
Liquid Measure	186
Dry Measure.....	188
Troy Weight	189
Avoirdupois Weight.....	190
Apothecaries Weight	191
United States Money.....	192
English Money.....	192
French Money	193
Measure of Time.....	193
Circular Measure	195
Paper Measure and Miscellaneous Table.....	196
The Old French Measure.....	196
Compound Addition.	198
Compound Subtraction	198
Compound Multiplication.....	200
Compound Division	200
Important Applications.....	204
To find the time between two dates.....	204
To find the area of rectangular surfaces.....	205
To find the volume of rectangular solids	206
To find the capacity of tanks in gallons.....	207
To find the capacity of bins or granaries in bushels. .	208
To find the number of board feet in a plank or board.	208
Percentage.....	211
Commission	214
Profit and Loss	215
Interest.....	217

PART I.
INTERMEDIATE ARITHMETIC.

LESSON I.

COUNTING TEN.

First Row	. . .	a																		
Second "	. . .	a	a																	
Third "	. . .	a	a	a																
Fourth "	. . .	a	a	a	a															
Fifth "	. . .	a	a	a	a	a														
Sixth "	. . .	a	a	a	a	a	a													
Seventh "	. . .	a	a	a	a	a	a	a												
Eighth "	. . .	a	a	a	a	a	a	a	a											
Ninth "	. . .	a	a	a	a	a	a	a	a	a										
Tenth "	. . .	a	a	a	a	a	a	a	a	a	a									

DIAGRAM OF A'S.

Count the a's in each row, beginning at the top.

Count the a's in each row, beginning at the bottom.

Which is the first row? The second? The third?
The fourth? etc.

How many a's are in the first row? The third row?
The ninth? The fifth? The second? The seventh?
The fourth? The eighth? The sixth? The tenth?