ECLECTIC EDUCATIONAL SERIES. KEY TO RAY'S NEW HIGHER ARITHMETIC

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JOSEPH RAY

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Trieste

ECLECTIC EDUCATIONAL SERIES.

KEY

TO

RAY'S NEW HIGHER

ARITHMETIC

NEW YORK ✣ CINCINNATI ✣ CHICAGO
AMERICAN BOOK COMPANY

PREFACE.

In the preparation of the following pages, the chief aim has been to serve the teacher. Accordingly, through a great part of the work we have merely indicated the operations required, and have thus saved the space which would be demanded for the full statements of analysis, useful chiefly in recitation drill.

The help afforded by a Key being of very little value under the fundamental rules, this work does not begin with the first exercises of the NEW HIGHER ARITHMETIC.

In most cases, after a short study of an arithmetical problem, the operations themselves, as indicated properly by signs, will suggest the reasoning on which the solution is based. In the solutions here given this has been kept in view, especially where the text-book has presented a *formula*. To the teacher and to the class, alike, it will be advantageous to have the blackboard work written in accordance with this plan; and, on this account, early in the Arithmetic, the subject of Arithmetical Signs has been formally presented.

To read the arithmetical syntax understandingly, and to write it with facility in recording solutions, are acquirements worth far more than they cost. What is

here remarked has special reference to the *written work*. Oral explanation, reaching even to particulars, is not to be set aside; on the contrary, the judicious teacher will still require the minute details of an analysis, especially in the examples designated for such exercise in the Arithmetic.

There are a few instances in which the brevity mentioned above has not been observed. The experienced teacher knows, that, in some cases, the operations may be even very few in number and very simple in kind, while the reasons for them are not correspondingly obvious; in such instances, as also where the chief difficulty of the problem is in the complexity of the operation, we have aimed to give an extended solution. Among the articles under which this has been thought advisable, we may mention Compound Subtraction, Proportion, Commission, Stock Investments, Alligation, the applications of Evolution, and the added Miscellany.

CINCINNATI, *January*, 1881.

KEY TO

RAY'S NEW HIGHER

ARITHMETIC.

MULTIPLICATION.—BILLS AND ACCOUNTS.

Art. 65. (2.)

ST. LOUIS, March 1, 1879.

CHESTER SNYDER,

Bought of THOMAS GLENN.

1879.

			$			
March	1	4 lb. tea, @ 40 ct. a lb.,	1	60		
"	1	21 " butter, @ 21 ct. a lb.,	4	41		
"	1	58 " bacon, " 13 ct. "	7	54		
"	1	16 " lard, " 9 ct. "	1	44		
"	1	30 " cheese, " 12 ct. "	3	60		
"	1	4 " raisins, " 20 ct. "		80		
"	1	9 doz. eggs, " 15 ct. a doz.,	1	35		
					$20	74

Received payment,

THOMAS GLENN.

(5)

Art. 66. (3.)

ALLEGHENY, April 1, 1880.

JAMES WILSON & CO.,

In Acc't with ALLEGHENY COAL CO.

1880.

		Dr.			$	
March	2	To 500 tons coal, @ $2.75 a ton,			1375	00
		Cr.	$			
"	3	By 14 bbl. flour, @ $6.55 a bbl.,	91	70		
"	10	" 6123 lb. sugar, @ 8 ct. a lb.,	489	84		
"	15	" cash on acc't,	687	50	1269	04
		Balance due Allegheny Coal Co., - - - - -			$105	96

CONTRACTIONS IN MULTIPLICATION.

Art. 70. CASE IV.

(1.)	(2.)	(3.)
7023	16642	372051000
99	996	744102
702300	16642000	372795102
7023	66568	
695277	16575432	

Art. 71. CASE V.

(1.)	(2.)	(3.)
38057	267388	481063
48618	14982	63721
228342	534776	3367441
685026	3743432	10102323
1826736	26204024	30306969
1850255226	4006007016	30653815423

(4.)	(5.)	(6.)
66917	102735	536712
849612	273162	729981
803004	308205	4830408
6424032	2773845	43473672
5621028	16643070	391263048
56853486204	28063298070	391789562472

ARITHMETICAL SIGNS.

Art. 86.

(3.)
$$\left.\begin{aligned} 21 \div 3 \times 7 &= +49 \\ -1 \times 1 \div 1 \times 4 \div 2 &= -2 \\ 18 \div 3 \times 6 \div 4 &= +9 \\ 1 \times 4 \times 6 \div 8 &= +3 \end{aligned}\right\} = 59, \textit{ Ans.}$$

(4.)
$$\left.\begin{aligned} 16 \times 4 \div 8 &= +8 \\ -7 + 48 \div 16 &= -4 \\ -3 - 28 \times 0 &= -3 \\ 24 \times 6 \div 48 &= +3 \\ -4 \times 9 \div 12 &= -3 \end{aligned}\right\} = 1, \textit{ Ans.}$$

(5.)
$$\left.\begin{aligned} 16 \div 16 \times 96 \div 8 &= +12 \\ -7 - 5 + 3 &= -9 \end{aligned}\right\} = +3.$$
$$(27 \div 9) \div 3 - 1 = 0.$$
$$91 \div 13 \times 7 - 45 - 3 = 1.$$
Then, $3 \times 0 + 1 \times 9 = 9$, *Ans.*

CONTRACTIONS IN MULTIPLICATION AND DIVISION.

Art. 88. CASE I.

(1.)
3)42200
14066⅔, *Ans.*

(2.)
656400
5
8)3282000
410250, *Ans.*

(3.)
6)1072400
178733⅓, *Ans.*