ARITHMETIC: AS TAUGHT IN THE TROY EPISCOPAL INSTITUTE

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649062287

Arithmetic: As Taught in the Troy Episcopal Institute by W. F. Walker

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

W. F. WALKER

ARITHMETIC: AS TAUGHT IN THE TROY EPISCOPAL INSTITUTE

Trieste

ARITHMETIC;

AS TAUGHT IN THE

TROY EPISCOPAL INSTITUTE;

By W. F. WALKER, A. M., Principal.

Out of the olde fieldes, as men saithe,
Cometh all this newe corne fro yere to yere;
And out of olde bookes, in good faithe,
Cometh all this newe science that men lere.
Chaucer.

TROY, N. Y.:
ELIAS GATES, 225 RIVER-STREET.

NEW-YORK:
COLLINS, KEESE AND COMPANY, 254 PEARL-STREET.

1841.

N. Tuttle, printer, Troy.

PREFACE.

A NEW ARITHMETIC! Why? Its brief history furnishes the answer.

During the four years last past, the author had under his especial charge this department in the Institute of which he was Principal, and a large portion of the time exclusively performed its duties.

As text books for his classes, many of the various popular works on the subject were, at different times, successively tried, and as many as were tried, were, for some cause, after a while, rejected;—some because the systems were *too new*, that is, too juvenile, as one reason; and in addition, with most of the others, as embracing too much, more than belongs properly to the subject; and, all dissatisfied, on one main account, which was, the almost total deficiency of expositions of principles, independent of numbers.

A consequence of the use of these books was found to be, in so far as reliance was placed on the books, confinement of the mind, rather than invigoration and development, and a reliance on formulas and rules, rather than on the great principles on which they were based; a stopping behind, rather than a looking within the veil.

The mind of the pupil was therefore confused; his views were all dependent and indistinct; his powers of analysis were never exercised vigorously; and his judgment was not made the arbiter of his work. Uncertainty as to results, unless the formulas and rules of his books were applied to square them, almost always characterized him. Therefore, when a practical question was presented, it was not uncommon for him to ask, To what rule does this belong? Instead of being made to see and know that but two principles can apply to numbers, and that they, variously applied, solve every question connected with them; and that the modes of application are always discoverable by an analysis to which the given question points; he felt that with each step of advancement a new principle was to be acquired, and so in learning a multiplicity of new things, out of two only which are as old as quantity itself and the first exercise of mind, became bewildered and disheartened.

The author then commenced writing and culling for his classes, bringing out the true and the necessary, and rejecting all else, with no idea of inflicting on the public the result of his efforts, further than they might be extended through his pupils.

But the laboriousness of writing and transcribing so much as was required daily, caused him to throw his matter in the first part into form, and put it in press, to supply the wants of his own school. When so far committed, in connection with the press, reasons multiplied rapidly for going on with what had been thus begun, and bringing out the whole subject.

To their variety, number, and force, the author yielded; and, as a consequence, now offers to the public a new Arithmetic, embracing old principles, as applied to their various purposes in connection with numbers, in the Troy Episcopal Institute, while he had that institution in charge.

The book might, perhaps, without impropriety, be termed *corsair*; for wherever, in the whole range of books upon the subject, any thing has been found suited to the purpose it has been unhesitatingly appropriated; and, as to *examples*, they have, in almost all cases, been taken from books before the public.

To the book of Lacroix, and to the American edition of it by Farrar, and to the truly excellent work of Hassler, the author acknowledges with gratitude his obligations. They are complete works on the subject; and the author of the present treatise, as their disciple, seeks not to be greater than or even as his masters.

While this general acknowledgement is made, it is hardly necessary to particularize and appropriate the parts in regard to which there is an especial obligation to one or the other.

In the present work there are, no doubt, many faults; some few have already come to the author's notice, and are subjoined as *errata*; and too much is said, perhaps, in illustration and explanation. Should another edition be called for, some of the defects of the present may be remedied. To this end the suggestions of teachers will be thankfully received.

An object especially aimed at in this work, has been to avoid the introduction of matter not pertinent to any practical use, and of that which more properly belongs to other departments of mathematical science. Hence, much that is embraced in most systems of Arithmetic is omitted. An obligation to encumber the work with Algebra, Geometry, Astronomy, Book-keeping, &c., &c., cannot be realized, while so many distinct treatises on those subjects are before the public, in accessible forms, and especially now that the subjects themselves are distinctly and separately taught in by far the larger portion of our schools.

Thus, it will be seen, that proportions are discarded entirely, and the principles of numbers analytically applied to the solution of questions usually referred to them, in a direct and intelligible form, which is substituted for various modes in all the remaining parts of the subject, except the roots.

Indeed the previous parts are regarded simply as preparatory to this, which is recommended to be substituted in all operations involving the true principles of numbers.

When this mode of operation has been once thoroughly acquired, its advantages will be so realized that it will hardly be exchanged, uniform, direct, and intelligible, as it will always be found, for the various modes in general use. It can require but a small share of experience to recommend one mode for many, one rule, short and always applicable and intelligible, for many, in regard to some of which at least, there is often perplexity in the choice and uncertainty in the results.

The principles of numbers can be only those of increase and diminution; the former invariably under the forms, addition and multiplication; the latter under those of subtraction and division. Why then should rules be so multiplied?

These principles are applied in this work, in Part I. to simple or abstract numbers; in Part II. to parts of simple numbers, or simple fractions; in Part III. to denominate numbers, or denominate fractions, as they are termed, after Mr. Hassler; and in Part IV. they are applied to all quantities indiscriminately; for which the other parts are, as already stated, only preparatory; Part V. embraces the roots.

Throughout the first three parts, the principles, and every application of them, are illustrated and explained; with these parts explanations cease, and the pupil is thrown on his own resources, to analyse and develope for himself, except in Part V.

The illustrations will in all cases guide the pupil in the special application of the

principles proposed, and to them alone it is expected the younger classes of pupils will have regard; omitting the explanations, which are abstract reasonings on stated applications of the principles, as presented in the cases and rules, to be analysed, and presented in substance, when more maturity and greater familiarity in operations under the rules, guided by the illustrations, are attained.

It is intended that the cases and rules should be thoroughly committed to memory; that the illustrations should be before the pupil, to show him how the application required is made; that the explanations should be mastered by analysis by older pupils; and the examples are for practice by all.

Before attempting this book, the pupil should become familiar with the Intellectual system of Colburn, a small work which cannot be too highly appreciated or recommended.

The constant reference to earlier modes of combination and to the reasons for them, in succeeding portions, by means of the sections and paragraphs, which are marked throughout the work, it is believed will be appreciated by the teacher, and be of great service to the pupil.

What the author has done for each subject, he need not state; he merely asks attention to each part, *beginning with notation*, and the intelligent teacher, and the practical man of business will discover wherein credit is due, and where not.

Hoping his efforts may contribute, in some measure, to facilitate the acquisition of the principles of this most general, most useful, and most important branch of science, the author commits their result to the public.

May 6, 1841.

CONTENTS.