ADVANCED ARITHMETIC

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Advanced Arithmetic by Charles E. Chadsey & Hubert M. Skinner

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ADVANCED ARITHMETIC

Trieste

ADVANCED ARITHMETIC

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PREFACE

The work in Arithmetic in the upper elementary grades must accomplish two aims. It must retain or secure accuracy and reasonable rapidity in the mechanical manipulation of figures; and it must develop, so far as the maturity of the pupil and the time limits of the school program permit, the power to utilize the arithmetical processes presented in the solution of problems of the types that one may reasonably expect to find in ordinary life. These aims have been kept constantly in mind.

To eliminate the useless, the obsolete, and the unnecessarily technical and complex, and thus to secure sufficient opportunity for emphasis of the essential, is one of the commendable tendencies of the time. In the effort to accomplish this, and yet to retain what should be found in a standard arithmetic, which necessarily is frequently used for reference, topics are presented in the simplest manner consistent with clearness and accuracy.

The authors realize that the importance of certain topics varies in different localities and in different schools; and they suggest that where, for any reason, some topic is not deemed fundamentally necessary to secure the essential results desired, it may be treated as useful and interesting information, and need not be mastered in the thorough manner required in the case of other topics. It is believed, however, that no topics have been included that have not a legitimate place, or that do not deserve about the relative emphasis which is given in this series.

Where time problems are given as tests of readiness and quickness of work, as on pages 9, 12, 18 and 22, additional practice should be given to pupils who require more than average time for their solutions. Teachers are urged to devise tests revealing the relative ability of the pupils, and to supple-

ment the drill for the slower ones in such a way as to prevent unreasonable divergences in power at the end of the year's work. The time tests are inserted in order to call the attention of the teacher to this need for a careful observation of the powers and progress of the *individual pupil.*

The extended treatment accorded to the Metric System (which is in universal use throughout the world except among the English-speaking peoples) is deemed advisable at this time, because of our rapidly-growing intercourse with the American lands to the southward, and because of the claims which the science, as well as the commerce, of the great world makes upon it. Its nomenclature has been carried to the field of electricity and other sources of power, and may be expected to enter further fields of universal interest. There is no good reason why either the teaching or the study of this marvelously simple and interesting system should be dreaded or slighted as it has been in the past. The man or woman of to-day cannot afford to be ignorant of it, and youth is the proper time for its mastery.

For expert advice in the proportioning of the work, and its adaptation to specific grades, and for sedulous care in the arrangement of its parts, in supervising its make-up, acknowledgment is made to Mr. James C. Thomas, whose long and fruitful experience in school-book publishing qualifies him to be of the greatest service in all the innumerable details.

Credit is due to Mr. Charles L. Spain, Assistant Superintendent of the Detroit City Schools, for the valuable material supplied in the "Exercises for Practice" given on pages 251-266.

In the confident hope that we have combined, in their proper proportions, exercises to develop accuracy and facility in working with numbers, and topics of genuine value, with illustrative problems of a really practical nature, insuring the development of judgment on the part of the pupil, we present this advanced book of the series to the consideration of all interested in the teaching of the subject.

CHARLES E. CHADSEY
HUBERT M. SKINNER

September, 1914

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REVIEW OF DEFINITIONS AND PRINCIPLES

Numeration is reading numbers written in figures.

Notation is writing numbers in figures.

Arabic figures consist of nine *digits* (taking their name from the fingers of the human hand) and the cipher, which is used to fill vacant places in written numbers. There is no figure to represent the tenth digit, or unit. When this is reached the circuit of units is complete, and this circuit is called a *ten*, and written in the next *order*, or place of figures.

A full period consists of three orders, numbered from the right. The first order is *units;* the second, *tens;* the third, *hundreds.*