

**THE ART OF SOLVING PROBLEMS
IN HIGHER ARITHMETIC. WITH
A CHARTER ON THE ARITHMETIC
OF LATITUDE AND LONGITUDE**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649447732

The Art of Solving Problems in Higher Arithmetic. With a Charter on the Arithmetic of Latitude and Longitude by J. Hunter

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J. HUNTER

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THE ART OF SOLVING
PROBLEMS IN HIGHER ARITHMETIC

WITH A CHAPTER ON THE ARITHMETIC OF
LATITUDE AND LONGITUDE

*A TRAINING BOOK FOR SENIOR SCHOOLBOYS AND FOR
EXAMINATION CANDIDATES*

BY THE
REV. J. HUNTER, M.A.

LONDON
LONGMANS, GREEN, AND CO.
1884

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PREFACE.

It is to be regretted that the practice of what is called *coaching* and *cramming* should ever have to be resorted to in Arithmetic—a science which, in the deliberate study of it, involves a discipline so conducive to the proper growth of intellect.

In the pursuit of any kind of useful knowledge it has often been found that they who, by themselves, have patiently and perseveringly grappled with difficulties have attained the best success. And, certainly, teaching, which in former times gave too little assistance, ought now to leave more in the hands of independent effort than it commonly does.

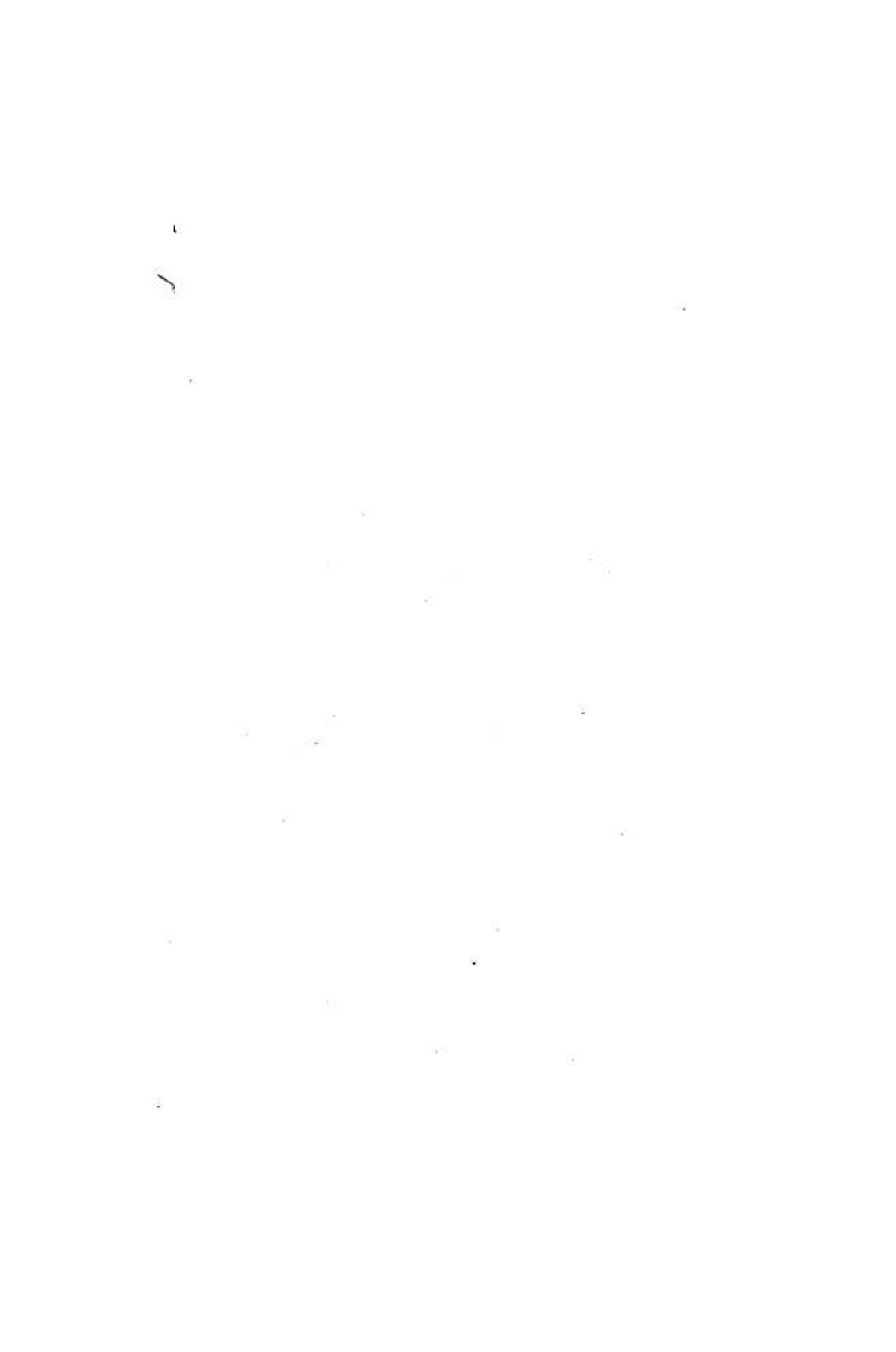
There is, however, one portion of Arithmetic in which, more than in any other, a learner requires help, if it can be given with reference to some broad, general principle; it is the department of Miscellaneous Problems in Higher Arithmetic, when no particular Rule seems to be indicated as sufficient for solution. Help is here wanted, we say, if it can be given with reference to some broad, general principle, not merely augmenting knowledge, but impregnating the mind itself to make it grow; and it has appeared to the

author of the present publication, that such miscellaneous problems are to a considerable extent reducible to classes, in each of which there is some common characteristic, which, when successively studied and understood, will aid much in the cultivation of general skill. To assist a pupil in the solution of first one problem and then another of a different kind can do little towards good progress; but to confine his attention at one time to a series of similar examples, extracted from a miscellaneous collection, will most effectually train him into an aptitude for the general work of Higher Arithmetic.

After all the aid that may be derived from this manual, it is intended and desirable that it should contain difficulties to be encountered; but in order that time may be duly economised, and opportunity given to the student of estimating his own work, a Key will shortly be published, for such legitimate use as will be readily inferred.

CONTENTS.

CHAPTER	PAGE
INTRODUCTION	1
I. THE SUM AND THE DIFFERENCE OF TWO QUANTITIES BEING GIVEN: TO FIND THE QUANTITIES.	7
II. OF RIGHT-ANGLED TRIANGLES	11
III. QUESTIONS ON COMBINATIONS OF QUANTITIES, ACCORD- ING TO THE RATIO OF THEIR SINGLE VALUES	18
IV. QUESTIONS RELATING TO THE JOINT WORK OF AGENTS OF DIFFERENT POWERS	25
V. PROPORTIONATE AND IRREGULAR DISTRIBUTIONS OF QUANTITIES	31
VI. PROBLEMS RELATING TO THE RATES OF TWO TRAVEL- LERS, ADVANCING TO MEET EACH OTHER, OR ONE FOLLOWING TO OVERTAKE THE OTHER	44
VII. DIFFERENT WAYS OF INDICATING GAIN AND LOSS	52
VIII. VARIETIES OF FORM IN PROBLEMS ON STOCKS	57
IX. INTERIOR AREAS OF RECTANGULAR ROOMS, ETC.	68
X. OF LATITUDE AND LONGITUDE	71
XI. MISCELLANEOUS QUESTIONS	82
ANSWERS	98



THE ART OF SOLVING
PROBLEMS IN HIGHER ARITHMETIC.

INTRODUCTION.

1. The more difficult kind of Miscellaneous Questions, such as are commonly proposed at the end of a Treatise on Arithmetic, consists of problems not so stated as to admit the direct application of any of the regular Rules, but making known some quantity that usually forms the answer to given conditions in a direct elementary example, and suppressing some quantity that usually forms a given condition.

2. Readiness in discerning how such problems are to be solved may be much promoted by the practice of constructing and working examples that invert in various ways the usual order recognised in an elementary Rule.

Take for illustration an example in simple interest, requiring to find the amount of £325 in 3 years at $4\frac{1}{2}$ per cent. per annum. The best way of considering this question is by observing that as the interest on 100 is to be $4\frac{1}{2} \times 3$, or $13\frac{1}{2}$, the amount of 100 will be $113\frac{1}{2}$,

21

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