in algebra, follow chapters on ratio and proportion, logarithms, arithmetical and geometrical progressions, the binomial theorem, inequalities, and exercises in physics.

The style is simple and the problems are numerous; the function notion is introduced and used in eight different places; the sine, cosine, tangent and cotangent functions are used in the solution of right triangles; correlation with geometry is made through problems involving geometric principles; graphic methods are used frequently; proper emphasis is placed upon translation from English to algebra and from algebra to English; historical notes and pictures of famous mathematicians appear in many places.

While the book as a whole seems to be a satisfactory text, yet we find a few points to criticise. Since ∞ is not a number symbol in elementary algebra, we dislike "The symbol ∞ denotes an exceedingly large number," etc., page 4. "The exponent 0 shows that x is used no times as a factor of the product, or has dropped out and so does not affect the product of the other factors," page 146, seems an unfortunate expression and not helpful in emphasizing the important fact that any number with a zero exponent is equal to unity. In the treatment of imaginaries it is feared that the student will miss the importance of expressing in the i-form before attempting operations with imaginaries. In variation the almost obsolete notation is used which many wish to see eliminated; the better equality form is mentioned but not sufficiently emphasized to avoid the difficulties students usually have with the language of variation. In the theory of the quadratic the general form $ax^2 + bx + c = 0$ seems much better and is more usual than the form $x^2 + px + q = 0$ which the author uses; $p^2 - 4q$ is certainly not the usual or common form of the discriminant of the quadratic.

ERNEST B. LYTLE.

Complete Business Arithmetic. By GEORGE H. VAN TUYL. New York, American Book Company, 1911. 4 + 416 pp.

ONE of the most serious problems which we have to face in the teaching of elementary mathematics at the present time relates to the work in our commercial courses. The world is far from coming to a decision as to what mathematics is best suited to the training of the boy and girl who propose to enter the field of commercial activity. The school of educators

who believe in nothing but the immediately practical would admit only arithmetic, while those who believe that the person who is to succeed in any line of activity must have come in contact with all of the great fields of human interest, and in particular with mathematics, will demand at least some slight knowledge of algebra, geometry, and trigonometry.

In this country our schools of commerce have emphasized the work in arithmetic, rarely paying any attention to the adapting of algebra to their purposes, or giving any consideration to the important field of measurement. In this we are distinctly behind the schools of Germany, Switzerland, and Austria, to name the three countries which have given the most attention to the subject.

The work of Mr. Van Tuyl is typical of what we are doing in this country, and if it is not up to the ideal standard the blame is, to a great extent, due to the fact that we have not seriously attacked the problem of the curriculum. It seems very strange that a student who is using a book of this kind should need to be drilled upon the combinations in addition (page 31), or to have the simple process of multiplication explained to him (page 52), especially as the more difficult process of ordinary division is not explained at all. It is difficult to see why a student in commercial arithmetic should be spending his time in finding the prime factors of 12,464 (page 61), the greatest common divisor of 6,859, 11,191, and 3,610 (page 63), or the least common multiple of 36, 45, 72, 105, and 150 (page 64). In this era of the decimal fraction and of approximations, it is hard to justify the reduction of $\frac{3125}{}$ to an integer (page 72), or $1846\frac{3}{7}$ to an improper fraction (page 73). It would also trouble us to say what commercial interest is touched by such problems as the simplification of $\frac{7}{15}$ of $22\frac{1}{2} \div \frac{3}{13}$ of $\frac{26}{33}$. Why a subject like compound proportion (page 116), or even simple proportion as a method of solving commercial problems, and particularly with the old symbol (: :), should have place in a modern book like this it would be hard to tell, and it would be even more difficult to justify the expenditure of time necessary for dividing 8Kl. 7Hl. 5Dl. 7l. 6dl. 4cl. 5ml. by 5 (page 149).

On the other hand, the drill on the checking of computations, the work in graphs, and a considerable part of the work in elementary business principles have much to commend them.

One lays down the book with the feeling that our commercial

courses in this country have not advanced as rapidly as our ordinary curriculum, and that, in spite of the good features mentioned above, this work will not help to improve the unfortunate situation.

DAVID EUGENE SMITH.

Text-book of Mechanics. By LOUIS A. MARTIN, JR. Vol. III: *Mechanics of Materials,* 1911, xiii + 229 pp. Vol. IV: *Applied Statics,* 1912, xii + 198 pp. 12mo. New York, John Wiley and Sons.

THE first two volumes of this text* deal with theoretical mechanics. The volumes under review, together with a projected volume on applied kinetics, will constitute a course in applied mechanics.

Volume III presents the usual theory of the deflection of beams by simple or compound stresses, statically indeterminate beams, struts and columns (eccentric loading, buckling, etc.), elastic failure, and envelopes. Also the principle that the external work done by the applied forces must equal the total resilience due to bending and shear is extensively used to determine deflections; and the equations of several elastic curves are very neatly found in this way. There is no treatment of curved bars, flat plates, or rotating disks, nor any mention of core sections in eccentrically loaded columns, but the problem of avoiding tension in such columns is treated briefly.

A fairly extensive range of applications is covered in the problems; but one is rather surprised at the omission of any applications to the distribution of steel in large reenforced concrete tanks, inasmuch as so many of these are now in use, at least in the west. Moreover, it might be well to include in a later edition a comparison of the various formulas for long columns as regards typical results, and also to insert a convenient collection of the most important tables and formulas. This would not hurt the book as a text and would make it more attractive for reference purposes.

The author says in the preface that he has attempted "to produce a book which will encourage the student to think and not to memorize, to do and not simply to accept something already done for him; but which still furnishes sufficient material in the way of explanation and example so that he

* Reviewed in this BULLETIN, vol. 16 (1909), pp. 144–7.