tackle), cube root (belting problems), Euclid's algorithm of the greatest common divisor and continued fractions* (gearing and screw problems), it would appear that if the course in mathematics is to do nothing more than provide a secure foundation for the work in the shop its abstract content is not likely to be much less extensive than has been usual in secondary schools. The nature of the concrete problems will naturally vary with the requirements of the different schools. But whatever their nature they must be *real* shop problems, that is they must be such that in solving them the pupil is compelled to consider not only the purely mathematical element but also the significance and reasonableness of the numerical data and results and the appropriateness of the algebraic and arithmetic processes used in their solution. Excessive formalism has been the bane of the teaching of abstract mathematics. It is just as common and just as pernicious in the shop as in the class-room.

CHARLES N. HASKINS.

*Die Mathematik in den physikalischen Lehrbüchern.* Von H. E. TIMERDING. Band III., Heft 2. Leipzig, Teubner, 1910. vi + 112 pp.

IN the systematic study of the teaching of mathematics in Germany which is being made under the auspices of the International commission of the teaching of mathematics, the present volume covers the field of the mathematics required and used in the physics of the "Höhere Lehranstalten" and "Hochschulen." The principles of mathematics found in the text-books on physics in use in Germany to-day form the basis of the discussion.

While the author states that the mathematics of physics is mainly of a geometric nature, it is easily seen that he considers the main problem to be concerned with the amount and quality of the infinitesimal analysis used in the texts investigated. Fundamentally, the problem may be stated as follows: The exact theory of most physical phenomena in its development requires a use of the principles of infinitesimal analysis. A scientific attitude toward these problems on the part of the instructor will not allow him to be satisfied with mere formulas or even a confused word picture, or the skillful manipulation of a "near calculus" which may interest but not convince the

* Practical Treatise on Gearing. Brown & Sharpe Mfg. Co., pp. 130–134.