

## SHORTER NOTICES.

*Grundlehren der neueren Zahlentheorie.* By PAUL BACHMANN.  
Leipzig, G. J. Göschen, 1907. Sammlung Schubert, v. 53.  
11 + 270 pp.

KLEIN has recently \* called attention to the two fundamental types of mathematical development. The one is concerned primarily with the exposition of a given branch of mathematics for its own sake and with its own methods. If this type alone obtained, mathematics would appear as a series of more or less distinct theories — algebra, trigonometry, calculus, etc. — which may show here and there incidental points of contact, but which are not organically connected. The other type of development, on the other hand, is concerned with just this welding together of the various so-called branches into a unified whole. It conceives, for example, the two great divisions of analysis and geometry as being only two different aspects of the same thing. Wherever this second type of development has made itself prominently felt it has meant a gain in power; not simply by giving various interpretations to the same theorem, but, and perhaps chiefly, by making the methods of one theory available for research in another.

All branches of mathematics have felt the influence of this second type of development to a greater or less degree. Even the theory of numbers, which for a while held a certain autonomy in its methods, is at present in its more advanced portions at least in intimate union with other fields, *e. g.*, the theory of functions of a complex variable. In recent years, however, even the elementary portions of the theory of numbers have had to submit to the introduction of matter and methods from another field; viz., that of geometry. To speak of a “modern” treatment of the elementary theory of numbers brings to mind at once the lectures of Klein — that master exponent of the second type of development — during the year 1895–96, and Minkowski’s work on the *Geometrie der Zahlen*. An elementary text on the theory of numbers which makes consistent use of these geometric interpretations and methods where they are available is obviously a great desideratum. It was therefore with much joyful anticipation that the reviewer opened

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\* *Elementarmathematik vom höheren Standpunkte aus*, pp. 180–187.