SHORTER NOTICES

The Theory of Integration. By L. C. Young. Cambridge University Press, 1927. vii+52 pp.

This is one of the well known Cambridge Tracts in Mathematics and Mathematical Physics. A detailed discussion of the contents in therefore superfluous, as the chief duty of the author is to present the material intelligibly and accurately; in this case these requirements are satisfied. On the other hand it seems to the reviewer desirable to call attention to two defects of another kind. As the author points out in his preface, "the object of small treatises of this kind is to enable the general student to gain rapid access to the various branches of Modern Mathematics." Viewed in this light the title is somewhat misleading, as the book deals almost exclusively with W. H. Young's theory of integration. Although this is stated in the preface, it is to be feared that the general student would not realize that he had read *a* theory of integration and was still unacquainted with the one most widely known. The other defect is the total absence of references to the literature. Surely a small, well chosen bibliography should be included in any book of this kind.

W. A. WILSON

Integral Bases. By W. E. H. Berwick. Cambridge University Press, 1927. 95 pp.

This new Cambridge tract contains the author's investigations of the problem: *To determine an integral base for an algebraic field given by an arbitrary equation* $f(x)=0$. This problem can be reduced to the determination of a partial base for all primes p dividing the discriminant of $f(x)$. For this case the author has, as he asserts in the preface, evolved various new methods, which can also be used for finding the decomposition of p in prime-ideals. "Failing cases exist, but the approximations given are sufficient to cover nearly any numerical equation not specially constructed to defy them."

The method is, in brief, the following: Let

$$f(x) \equiv \phi_1(x)^{a_1} \cdots \phi_r(x)^{a_r} \pmod{p}$$

be the decomposition of $f(x)$ in prime-functions (mod p); then $p = A_1 \cdots A_r$, where all ideals A are relatively prime. To find the further decomposition of A, we write $f(x)$ in the form

$$f(x) = \sum Q_i(x) p^{\alpha_i} \phi(x)^i,$$

where $Q_i(x) \not\equiv 0$ (mod $p, \phi(x)$) and construct the Newton polygon to the lattice-points (i, α_i). Then $A = B_1^{\lambda_1} \cdots B_u^{\lambda_u}$, where k is the number of sides and λ_i certain constants. Under certain conditions the prime-ideal decomposition of p and the corresponding partial bases can be found in this way.

The author seems to be unaware of the fact that his new method and his results have already been completely evolved in my paper *Zur Theorie*