SHORTER NOTICE.

Allgemeine Formen- und Invariantentheorie; Band I. Binäre Formen. By W. Fr. MEYER. Leipzig, Göschen (Sammlung Schubert, volume XXXIII), 1909. viii + 376 pp.

IN accordance with the general plan of the Schubert series, the treatise on invariants commences with concrete examples to lead up to general theorems, presupposes no previous knowledge of the subject, yet presents a systematic discussion which includes all the essentials of this important discipline.

The entire theory of the quadratic equation, as developed in elementary algebra, is reproduced in all detail, and the same ideas are applied to systems of equations. Anharmonic forms, involutions, Jacobians, are all explained and illustrated.

Now come linear substitutions, first translations, then inflations, and finally reciprocations. The general substitution is shown to be made up of these three, and those functions which are unchanged by the three elementary operations are therefore invariant under the general substitution. Conversely, the linear substitutions generate groups which may be classified as one, two, or three parameter groups, according to Lie.

Properties of the self corresponding elements of a general substitution and of the double elements of an involution are treated in a manner that makes this chapter a valuable appendix to a course in projective geometry.

The preceding elementary and very concrete discussion occupies 118 pages; it is followed by a chapter of 40 pages on bilinear and quadratic forms, with an introduction of the concept of the differential operator. Here again every transformation is built up from the elementary ones, the effect of each operation upon functions of the coefficients being minutely examined. As an appendix some twenty pages are now added on symbolic representation, no use of which is made in any part of the book except in the appendix at the end; in the latter the fundamental theorem is proved that every invariant can be expressed symbolically in terms of the elementary determinant forms. While this theorem is perhaps desirable for the sake of completeness, it is presented from such a different point of view that the discussion is out of harmony with the rest of the book. The treatment is so concise that the proof of the theorem will hardly be convincing to the reader, let alone any possibility of using the new method in his own work.