

find the book well worth reading if for no other reason than to look at the theory from another and entirely different aspect.

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Leçons sur la Théorie des Formes et la Géométrie analytique supérieure. Par H. ANDOYER. Volume I. Paris, Gauthier-Villars, 1900. 8vo, pp. vi + 508. Price, 15 francs.

It would be asserting too much to say that M. Andoyer's first volume fulfills all reasonable expectations. In this volume only binary and ternary forms are treated, the quaternary field being reserved for a second, which is announced as already in press. All who read the author's introduction (lithographed) a few years ago must have expected to find in the present work a treatise not only compendious but also elementary. Compendious it certainly is, covering a surprisingly wide range, but the student beginning in this subject and reading it alone will find it impenetrable. It is lucid, it is concise, but it is extremely condensed. Therein lies, however, its great merit. As a work of reference, or as a syllabus to accompany a lecture course, it will supersede anything hitherto published in the same field. Its field is geometry—invariantive geometry, algebra taking the second place. Accordingly one cannot yet dispense with Salmon, Faa di Bruno, and Elliott. Nor is it intended to precede the study of projective geometry of curves; rather it presupposes a large amount of geometrical knowledge, and aims to recast and systematize it. To quote from the preface: "Je me suis proposé, en l'écrivant, d'exposer d'une façon didactique la théorie des formes et son interprétation géométrique générale."

Binary forms are treated in ten chapters, occupying 145 pages. After two excellent but too compact preliminary chapters, linear and quadratic forms and systems of forms are fully discussed, together with formal treatment of resultants and discriminants. Cubics, quartics, and quintics with their full covariant systems are given, the last only in list without any detail. All systematic discussion of *complete* form systems is excluded, the reader being referred to Gordan and Hilbert. Finally forms in two sets of variables are taken up, otherwise correspondences, and the metric geometry on a line. The chapter most novel in this binary division is that on the doubly quadratic form, or the $(2, 2)$ correspondence on a line. Of course the problem of derived correspondences $(2, 2)$ and the conditions for the occurrence