A NEW TYPE OF DOUBLE SEXTETTE CLOSED UNDER A BINARY (3, 3) CORRESPONDENCE*

BY LOUISE D. CUMMINGS

1. *Introduction.* In connection with the Poncelet theorem that if a polygon of n sides can be inscribed in one conic and circumscribed to a second conic then an infinite number of these polygons exist, much investigation, both by elliptic functions and by algebraic methods, has been effected concerning the closure property for the (2,2) correspondence of the double binary forms. For the (3,3) correspondence the direct algebraic attack upon even the point sets of low orders has been, until rather recently, somewhat neglected.

Franz Meyer, among others, studied the (3, 3) correspondence of four points and four planes and obtained the surprising result that if there is a first tetrahedron inscribed in one cubic curve and circumscribed to a second cubic curve there may not be a second tetrahedron, but if there is a second tetrahedron then an infinity of these tetrahedrons occur. The existence of one particular closed set of seven points and seven planes in a (3,3) correspondence, with the poristic property like the Poncelet polygons, was established in 1915 by White† and confirmed by Coble‡ who has investigated the general (m, n) correspondence. While Coble has not attempted an exhaustive classification, he has listed fourteen types, old and new, which are poristic configurations of double binary forms, among them one closed set of five points in a (3,3) correspondence. For periodic sets of six points in a (3,3) correspondence particular results are lacking. In this investigation of the (3,3) correspondence for $n = 6$, two non-congruent types of sextettes have been discovered by

* Presented to the Society, October 25, 1924.

† PROCEEDINGS OF THE NATIONAL ACADEMY, vol. 1 (1915), p. 464.

‡ AMERICAN JOURNAL, vol. 43, No. 1 (Jan., 1921).