THE GEOMETRY OF THE WEDDLE MANIFOLD W_p*

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During the last few years our secretaries have been so active in organizing interesting programs at the regular meetings that surveys of progress in the more important fields of mathematics have been presented to the Society quite recently. At the meeting last April in New York, reports on Algebraic Geometry were given. I have therefore felt impelled to change in some measure the traditional character of this biennial address, and to select a topic somewhat more special than usual. Lest this justification may seem too hollow, let me add that this change is in the direction of my personal interest in mathematics. For the benefit of those members present who are not specialists in geometry, I hope to illustrate by relatively simple early cases the general aspect of the problem, emphasizing those methods whose extension presents no difficulty. A technical account of the novelties presented will appear in the April number of the American Journal of Mathematics.

The Weddle manifold W_p has the dimension p in the linear space S_{2p-1}, the first case for $p=2$ being the long known Weddle quartic surface in S_3. Let us consider first its group-theoretic character. We all are familiar with the quadratic Cremona involution,

$$I_{yz}: \qquad x_i x_i' = y_i z_i, \qquad (i = 0, 1, 2;\ x,\ x' \text{ in the same plane}),$$

which has F-points at the vertices of the triangle of reference and which interchanges the points y and z. Its fundamental importance is due to the fact that the entire group of Cremona transformations in the plane is generated by the group of collineations and by the single element I_{yz} above. For every larger limit for i, $(i=0, 1, 2, \cdots, r)$, this involution I_{yz} persists; and it, together with the group of collineations, generates the *regular* Cremona group in S_r. When $r \geqq 3$, this regular Cremona group is no longer the entire Cremona group of the space. The regular

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