THE INVARIANTS OF FORMS UNDER THE BINARY LINEAR HOMOGENEOUS GROUP G_6 MODULO 2*

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1. *Introduction.* The transformation of an arbitrary binary quantic whose coefficients are written without binomial multipliers,

$$(1)\quad f = (a_0, \ldots, a_m)(x_1, x_2)^m = \prod_{i=0}^{m}(r_2^{(i)}x_1 - r_1^{(i)}x_2),$$

by the formulas

$$T:\ x_1 = \lambda_1 x_1' + \mu_1 x_2',\ x_2 = \lambda_2 x_1' + \mu_2 x_2',$$

in which λ_i, μ_j are such residues of a prime p that T ranges over the total group G of order $(p^2 - p)(p^2 - 1)$, leads to the formal modular concomitant system of f. For various reasons $p = 2$ gives rise to exceptions in this theory; thus quadratic congruence theory becomes very special when $p = 2$, and also certain types of modular concomitants exist† for the even modulus that do not exist for $p > 2$.‡

2. *Analogies.* It is a known result of algebraic (non-modular) invariant theory that every concomitant of (1) is a polynomial in determinants of two types, viz. $(r^{(i)}r^{(k)})$, $(r^{(i)}x)$, i. e., linear forms themselves and resultants of pairs of them. Also the complete system of covariants of any number of quadratic quantics,

$$(2)\quad f_1 = (a_0, \ldots, a_2)(x_1, x_2)^2, \ldots,\ f_r = (l_0, \ldots, l_2)(x_1, x_2)^2,$$

is a set of concomitants that can be formed as transvectants of forms f_i taken in pairs.§ The dyadic combinations therefore furnish the complete seminvariant systems, also, but for the invariants it is found that the eliminants of the triadic combinations of the forms $f_1, \ldots, f_r$ are to be added.

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† TRANSACTIONS OF THIS SOCIETY, vol. 19 (1918), p. 110.

‡ Dickson, *The Madison Colloquium Lectures*, Lecture III, p. 33-64.

§ Grace and Young, *Algebra of Invariants*, 1903, p. 161.