PSEUDO-COVARIANTS OF AN n-IC IN m VARIABLES IN A GALOIS FIELD THAT CONSIST OF TERMS OF THIS n-IC*

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Let us consider the n-ic in m variables

$$(1) \qquad f(x_1, x_2, \cdots, x_m) = \sum a_{i,j,\cdots,k} x_1^i x_2^j \cdots x_m^k = 0,$$

where $i, j, \cdots, k = 0, 1, 2, \cdots, n$, and $i+j+\cdots+k=n$; also where the coefficients and variables represent numbers in a Galois field of order p^n. If we subject (1) to the transformation

$$(2) \qquad \rho x_\lambda = \sum \alpha_{\lambda\mu} x'_\mu ,$$

where $\lambda, \mu = 1, 2, \cdots, m$, and the coefficients and variables represent numbers in the same Galois field, we obtain

$$(3) \qquad \begin{aligned} f'(x'_1, x'_2, \cdots, x'_m) &= \sum a_{i,j,\cdots,k}(\alpha_{11}x'_1 + \cdots + \alpha_{1m}x'_m)^i \\ &\quad \cdot (\alpha_{21}x'_1 + \cdots + \alpha_{2m}x'_m)^j \cdots (\alpha_{m1}x'_1 + \cdots + \alpha_{mm}x'_m)^k \\ &= \sum a'_{i,j,\cdots,k} x_1'^i x_2'^j \cdots x_m'^k = 0. \end{aligned}$$

We note from (3) that the only terms in (1) that can furnish terms in the primed variables whose factors all have exponents less than p (the prime modulus of this Galois field) are those terms in (1) whose factors all have exponents less than p. Therefore if such terms are present in (1), the n-ic has what we shall call a pseudo-covariant consisting of the above-mentioned terms of (1), that has the form

$$(4) \qquad \sum a_{r,s,\cdots,t} x_1^r x_2^s \cdots x_m^t ,$$

where $r+s+\cdots+t=n$ and $r<p, s<p, \cdots, t<p$. The set of terms (4) contribute also other types of primed terms to (3) after we use (2) on (1), but no other terms in (1) except the set (4) furnish (3) with primed terms of the same type as the unprimed terms of (4).

If (1) has no terms of the form (4), we note that only the terms in (1) having each just one factor of the form x_i^u, where

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