

Class formations III

By Yukiyoſi KAWADA

(Received Nov. 25, 1955)

This paper is a continuation of our former papers (Kawada [7], Kawada-Tate [8]) concerning class formations and their application in algebraic function fields in one variable. After some preliminaries in §1 we shall consider in §2 the system of groups $\{W(K/k)\}$ in a class formation, which was investigated by A. Weil [12] in case of number fields. We shall arrange the formulas for $\{W(K/k)\}$ so that we are able to consider their inverse limit groups in §3. The sections §4, §5 are devoted to the application of the results in §2, §3 to the case of algebraic function fields. There we shall find the explicit structure of these groups $\{W(K/k)\}$ and their limit groups using the formulations in [8].

The results of A. Weil [12] were treated cohomology-theoretically first by T. Nakayama and G. Hochschild [5], [10]. Though the results in §2, §3 of this paper are not published hitherto in the literature, they would be known by mathematicians working in this field. The author does not claim any priority on these results. It should be mentioned that there are unpublished investigations of E. Artin and J. Tate concerning the structure of the inverse limit groups of $\{W(K/k)\}$ in case of number fields. Also the explicit structure of $\{W(k)\}$ in Theorem 6 (§5) was suggested by J. Tate. The author wishes to express his hearty thanks to Professor John Tate for his discussions during the preparation of this paper.

§ I. Preliminaries

I. We repeat here some necessary preparations from Part I (Kawada [7]) which we need later. Let k_0 be a fixed ground field and \mathcal{Q} be a fixed infinite separable normal algebraic extension of k_0 . Let \mathfrak{K} be the set of all finite extensions of k_0 which are contained