

## Preface to Volume 2.

This volume consists of continuations of the following three chapters:

Chapter 1 (Part 2), Chapter 2 (Parts 3A, 3B),<sup>3</sup> Chapter 5 (Part 2).<sup>4</sup>

The main content of each chapter is summarized at the beginning of each chapter (in this volume). In Chapter 1 (Part 2), we generalize the calculation of  $\zeta_{\Gamma}(u)$  (of Part 1) to the cases where the quotient  $G/\Gamma$  may not be compact and  $\Gamma$  may not be torsion-free, after some detailed studies of elements of  $\Gamma$  with parabolic and elliptic real parts. In Chapter 2 (Parts 3A, 3B), we consider certain differential equation whose solutions define the given uniformization of algebraic function field, and show that such an equation can be *uniquely* characterized algebraically and can be “carried over” to algebraic function fields with arbitrary constant fields of characteristic zero, provided the given algebraic function field is “arithmetic” (or “ample”; see Chapter 2). In Chapter 5 (Part 2), we give a detailed formulation and proof of the formerly announced results on “non-abelian classfields” over  $K = \mathbb{F}_{p^2}(\bar{j})$  ( $\bar{j}$ : a variable over  $\mathbb{F}_{p^2}$ ), attached to the group  $\Gamma = PSL_2(\mathbb{Z}^{(p)})$ . (To each normal subgroup  $\Gamma'$  of  $\Gamma$  with finite index, a finite Galois extension  $K'$  of  $K$  called the “ $\Gamma'$ -classfield” is defined, and  $\dots$ ).

Here, the author wishes to express his sincere gratitude, in addition to those persons mentioned in the preface to Volume 1, to Professor J. P. Serre for valuable and stimulating discussions and remarks given during his stay in Tokyo in October 1968.

Tokyo, May 1969,      Y. IHARA

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<sup>3</sup> Talked in a seminar at the University of Tokyo in December 1968, and lectured in a short course at Osaka University in May, 1969.

<sup>4</sup> Lectured at the University of Tokyo in Spring Term, 1968 (except §§29~ 33, which were added in making this note).