

# Contents

Preface	v
Acknowledgements	x
<b>I Class field theory: From Artin’s course in Hamburg to Chevalley’s “Éléments idéaux”</b>	<b>1</b>
Claude Chevalley’s thesis on class field theory and his notion of “Éléments idéaux”	3
Introduction	3
1 The quest for reciprocity laws	5
2 Interlude: Global versus local	9
3 Class field theory – up to 1931	11
4 Chevalley’s thesis	14
5 A letter from C. Chevalley to H. Hasse, June 20, 1935	18
6 Chevalley’s paper “La théorie du corps de classes” of 1940 and beyond	22
Letter from Claude Chevalley to Helmut Hasse, June 20, 1935	25
Letter from Helmut Hasse to Claude Chevalley, June 28, 1935	35
<b>II Creating a life: Emil Artin in America</b>	<b>39</b>
Emigration, immigration and pre-remigration	41
Introduction	41
1 Emigration to America	41
2 American mathematics, circa 1937	44
3 At the University of Notre Dame	46
4 Indiana University	48
5 Princeton University	50
6 Concluding thoughts	53
Letter from Solomon Lefschetz to Father John O’Hara, January 12, 1937	55
<b>III The collaboration of Emil Artin and George Whaples</b>	<b>57</b>
The work of Artin and Whaples – a conceptual breakthrough in algebraic number theory	59
Introduction	59
1 Courses in class field theory in 1931/32	59
2 Artin and Whaples	60

3	Joint papers of Artin and Whaples . . . . .	62
4	Whaples on his “own feet” . . . . .	67
5	Beyond the work of Artin and Whaples . . . . .	69
	George Whaples’ application to the Institute for Advanced Study, School of Mathematics, Princeton, N. J., February 10, 1941 . . . . .	73
<b>IV</b>	<b>Margaret Matchett: Artin’s student at Indiana and her thesis</b>	<b>77</b>
	Margaret Matchett and her thesis “On the zeta function for ideles” . . . . .	79
	Introduction . . . . .	79
1	Towards a biography of Margaret Matchett . . . . .	79
2	A brief overview of zeta functions and Hecke $L$ -series . . . . .	84
3	The thesis “On the zeta function for ideles” . . . . .	89
	Margaret Matchett’s Doctoral Dissertation “On the zeta function for ideles”	99
<b>V</b>	<b><math>L</math>-functions by James W. Cogdell</b>	<b>127</b>
	$L$ -functions and non-abelian class field theory, from Artin to Langlands	129
	Introduction . . . . .	129
1	$L$ -functions before Artin . . . . .	130
2	Artin $L$ -functions . . . . .	136
3	A Hecke interlude . . . . .	150
4	A historical interlude . . . . .	152
5	Artin and Hecke reconciled: The Langlands program . . . . .	153
6	Functoriality . . . . .	158
<b>VI</b>	<b>Automorphic <math>L</math>-functions by Robert P. Langlands</b>	<b>163</b>
	Letter from Robert Langlands to André Weil, January 1967 . . . . .	165
	Funktorialität in der Theorie der automorphen Formen: Ihre Entdeckung und ihre Ziele . . . . .	175
	Einführung . . . . .	175
1	Jugenderinnerungen . . . . .	175
2	Yale University . . . . .	180
3	Princeton . . . . .	182
4	Kalifornien . . . . .	187
5	Wieder Princeton . . . . .	188
6	Der Brief . . . . .	192
7	Yale und Bonn . . . . .	199
8	Das Institute for Advanced Study . . . . .	204
9	Die Mathematik als Zugang zur geistigen Welt . . . . .	209

Contents

xiii

Photo credits

211

Bibliography

213

Index

229