

Contents

Preface	v
Acknowledgements	x
I Class field theory: From Artin’s course in Hamburg to Chevalley’s “Éléments idéaux”	1
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
II Creating a life: Emil Artin in America	39
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
III The collaboration of Emil Artin and George Whaples	57
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
IV	Margaret Matchett: Artin’s student at Indiana and her thesis	77
	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
V	L-functions by James W. Cogdell	127
	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
VI	Automorphic L-functions by Robert P. Langlands	163
	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

Photo credits	211
Bibliography	213
Index	229