

Jan von Plato

Saved from the Cellar

Gerhard Gentzen's Shorthand Notes on Logic
and Foundations of Mathematics

 Springer

CONTENTS

Preface	vii
PART I: A SKETCH OF GENTZEN'S LIFE AND WORK	
1. Overture	3
2. Gentzen's years of study	9
3. Dr. Gentzen's arduous years in Nazi Germany, 1933–45	12
4. The scientific accomplishments	16
5. Loose ends	50
6. Gentzen's genius	61
PART II: AN OVERVIEW OF THE SHORTHAND NOTES	
1. Gentzen's series of stenographic manuscripts	65
2. The items in this collection	67
3. Practical remarks on the manuscripts	80
4. Manuscript illustrations	84
The German alphabet in Latin, Sütterlin, and Fraktur type	86
PART III: THE ORIGINAL WRITINGS	
1. Reduction of number-theoretic problems to predicate logic	99
2. Replacement of functions by predicates	101
3. Correspondence in the beginning of mathematics	112
4. Five different forms of natural calculi	113
4bis. Two fragments on normalization	116
5. Formal conception of correctness in arithmetic I	119
6. Investigations into logical inference	146
7. Reduction of classical to intuitionistic logic	186
8. CV of the candidate Gerhard Gentzen	189
9. Letters to Heyting	190

10. Formal conception of correctness in arithmetic II	193
11. Proof theory of number theory	209
12. Consistency of arithmetic, for publication	222
13. Correspondence with Paul Bernays	237
14. Forms of type theory	260
15. Predicate logic	265
a. Unnaturalnesses of the ways of inference in formal logic	265
b. Decidability in predicate logic	266
c. Decidability and the cut theorem	267
d. Natural introduction of the calculus <i>LK</i> ?	268
e. Formulation of intuitionistic logic with symmetric sequents	271
16. Propositional logic	275
a. Completeness of the propositional calculus <i>LK</i>	275
b. Correctness and completeness in positive logic	276
17. Book: Mathematical Foundational Research	282
Bibliography for Parts I and II	305
Index of names for Parts I and II	313
Index of names in the Gentzen papers	315