CONTENTS

Introduction. A HISTORICAL OUTLINE OF THE THEORIES OF PACKING AND COVERING

1	Lattice packing of spheres pa	ge 1
2	Lattice packing of convex sets	5
3	Packing of convex sets	10
4	Covering	16
	Chapter 1. PACKING AND COVERING DENSITIES	
1	Introduction	21
2	Invariance of the packing density	26
3	Invariance of the covering density	31
	Chapter 2. THE EXISTENCE OF REASONABLY DENS	E
1	Packing of convex sets	33
2	The volume of the difference set	37
	Chapter 3. THE EXISTENCE OF REASONABLY ECONOMICAL COVERINGS	
1	Covering most of space	40
2	Covering the whole of space	43
	Chapter 4. THE EXISTENCE OF REASONABLY DENSE LATTICE PACKINGS	
1	Averages over certain sets of lattices .	48
2	Existence theorems for lattice packings	52

Chapter 5. THE EXISTENCE OF REASONABLY ECONOMICAL LATTICE COVERINGS

1	Approximation of convex sets by cylinders page	55
2	Approximation of convex sets and spheres by generalized cylinders	56
3	Lattice covering of nearly half of space	57
4	Lattice covering of most of space by generalized cylinders	60
5	Lattice covering of space with convex sets and spheres	64
	Chapter 6. PACKINGS OF SIMPLICES CANNOT BE VERY DENSE	
1	Packing of sets and their difference sets	69
2	Packing of simplices	71
	Chapter 7. PACKINGS OF SPHERES CANNOT BE VERY DENSE	
l	The Voronoi polyhedra	74
2	The dissection of the Voronoi polyhedra	77
3	The inequality of Blichfeldt and its application to the Voronoi polyhedra	78
4	The density of a packing of spheres	80
5	Daniels's asymptotic formula	85
	Chapter 8. COVERINGS WITH SPHERES CANNOT BE VERY ECONOMICAL	
l	The dual subdivision	91
2	The solid angles of a simplex	94
3	Coverings of space with spheres	98
Bil	bliography	104
Ini	der	