

Table of Contents

	Preface	iii
1.	<u>Introduction</u>	1
2.	<u>Classical Correlation Polytopes and Propositional Logic</u>	
2.1	Introduction	11
2.2	Survey of the Propositional Calculus	18
2.3	Correlation Polytopes	21
2.4	The Bell-Wigner Polytope	25
2.5	The Clauser-Horne Polytope	27
2.6	Symmetries and Some Inequalities for $c(n,S)$	30
2.7	The Computational Intractability of the Generalized Bell Inequalities	33
2.8	Correlations and the Entropy Principle	46
2.9	Notes and Remarks	49
3.	<u>Quantum Correlations</u>	52
3.1	Introduction	52
3.2	Probability in Quantum Mechanics	53
3.3	The Lattice of Closed Subspaces of a Hilbert Space	57
3.4	A Note on Gleason's Theorem	61
3.5	Quantum Correlation Polytopes	63

3.6	"Superficial" Violations of Classical Probability	76
3.7	Violation of the Clauser-Horne Inequalities	78
3.8	Violation of Bell Inequalities	82
3.9	More General Violations of Classical Constraints	84
3.10	Preliminary Discussion of the Results: Bohr's Views and Antirealism	86
3.11	Hidden Variables and the Principle of Locality	92
3.12	Notes and Remarks	97
4.	<u>Quantum Logic</u>	100
4.1	Quantum Correlation Polytopes and "Truth"	100
4.2	Formal Development of Quantum Logic	102
4.3	Kochen and Specker Theorem	109
4.4	Realistic Quantum Logic I: Conspiratorial Interpretation	117
4.5	Realistic Quantum Logic II: The Operational Interpretation	126
4.6	Realistic Quantum Logic and the Entropy Principle	130
4.7	Non-Realist Quantum Logic	135
4.8	Notes and Remarks	136
5.	<u>Hidden Variables and Kolmogorovian Models</u>	138
5.1	Classical Hidden Variable Theories	138
5.2	Critique of Classical Hidden Variable Theories	143

5.3	Non-Classical Hidden Variables - The Geometric Analogy	147
5.4	Kolmogorovian Models of Quantum Statistics: Mathematical Introduction	150
5.5	Kolmogorovian Models of Quantum Statistics	162
5.6	Kolmogorovian Models and Axiomatic Set Theory	172
5.7	Notes and Remarks	175
6.	<u>Philosophical Remarks</u>	176
6.1	Physical Realism and Quantum Mechanics	176
6.2	Quantum Theory and the Foundations of Probability	182
6.3	Mathematical Models and Physics	189
	<u>References</u>	197