

C O N T E N T S

Preface		vii
Chapter I.	Introduction	
	1. <i>A brief historical sketch</i>	1
	2. <i>Methodological characterization</i>	7
Chapter II.	Geometry and Kinematics of the Phase Space	
	3. <i>The phase space of a mechanical system</i>	13
	4. <i>Theorem of Liouville</i>	15
	6. <i>Theorem of Birkhoff</i>	19
	6. <i>Case of metric indecomposability</i>	28
	7. <i>Structure junctions</i>	32
	8. <i>Components of mechanical systems</i>	38
Chapter III.	Ergodic Problem	
	9. <i>Interpretation of physical quantities in statistical mechanics</i>	44
	10. <i>Fixed and free integrals</i>	47
	11. <i>Brief historical sketch</i>	52
	12. <i>On metric indecomposability of reduced manifolds</i>	55
	13. <i>The possibility of a formulation without the use of metric indecomposability</i>	62
Chapter IV.	Reduction to the Problem of the Theory of Probability	
	14. <i>Fundamental distribution law</i>	70
	16. <i>The distribution law of a component and its energy</i>	71
	16. <i>Generating functions</i>	76
	17. <i>Conjugate distribution functions</i>	79
	18. <i>Systems consisting of a large number of components</i>	81

Chapter V.	Application of the Central Limit Theorem	
	19. <i>Approximate expressions of structure functions</i>	84
	20. <i>The small component and its energy. Boltzmann's law</i>	88
	21. <i>Mean values of the sum functions</i>	93
	22. <i>Energy distribution law of the large component</i>	99
	23. <i>Example of monatomic ideal gas</i>	100
	24. <i>The theorem of equipartition of energy</i>	104
	25. <i>A system in thermal equilibrium. Canonical distribution of Gibbs</i>	110
Chapter VI.	Ideal Monatomic Gas	
	26. <i>Velocity distribution. Maxwell's law</i>	115
	27. <i>The gas pressure</i>	116
	28. <i>Physical interpretation of the parameter</i>	121
	29. <i>Gas pressure in an arbitrary field of force</i>	123
Chapter VII.	The Foundation of Thermodynamics	
	30. <i>External parameters and the mean values of external forces</i>	129
	31. <i>The volume of the gas as an external parameter</i>	131
	32. <i>The second law of thermodynamics</i>	132
	33. <i>The properties of entropy</i>	137
	34. <i>Other thermodynamical functions</i>	145
Chapter VIII.	Dispersion and the Distributions of Sum Functions	
	35. <i>The intermolecular correlation</i>	148
	36. <i>Dispersion and distribution laws of the sum functions</i>	156
<i>Appendix</i>		
	<i>The proof of the central limit theorem of the theory of probability</i>	166
Notations		176
Index		178