

Contents

List of Illustrations	ix
Acknowledgments	xvii
Introduction	xix
1 The Nineteenth-Century Background	3
Non-Euclidean Geometry	3
The Geometry of n Dimensions	6
The Rise of Popular Interest in the New Geometries	10
2 Cubism and the New Geometries	44
Paris 1900-1912: The Fourth Dimension and Non-Euclidean Geometry in Popular Literature	45
The Visual Tradition of “The Fourth Dimension”	57
Chronology of Events	59
The Fourth Dimension and Non-Euclidean Geometry in Cubist Theory and Practice	74
An Alternative View among the Cubists: The Theosophist Kupka	103
Boccioni’s Italian Futurist Critique of Cubism’s Fourth Dimension	110
3 Marcel Duchamp and the New Geometries	117
Duchamp’s Introduction to n -Dimensional and Non-Euclidean Geometry	122
The <i>Large Glass</i>	130
The Notes in <i>A l’infinif</i>	135
Later Works	157
4 The Fourth Dimension and Non-Euclidean Geometry in America	164
Max Weber	167
Gelett Burgess	182
Claude Bragdon	186
New York 1913 and the Armory Show	201
Wartime New York: Duchamp and the Arensberg Circle	218
The 1920s	230
5 Transcending the Present: The Fourth Dimension in the Philosophy of Ouspensky and in Russian Futurism and Suprematism	238
The Secondary Role of Non-Euclidean Geometry and Relativity Theory Before the Revolution	241
Hyperspace Philosophy in Russia: Peter Demianovich Ouspensky	245

Early Russian Futurism and Larionov's Rayonism	255
The Fourth Dimension in Russian Futurist Philosophy: Matyushin and Kruchenykh	265
The Fourth Dimension in the Art of Malevich	274
The 1920s: El Lissitzky and Others	294
6 The New Geometries During World War I and the Postwar Period in France and Holland: Reevaluation and Transformation	300
The Wartime Debate: Severini and Ozenfant	301
Early De Stijl and the Fourth Dimension	313
The Popularization of the Theory of Relativity in France	318
Van Doesburg's Pursuit of an Art for the World of Space-Time	321
Art and Relativity in the 1920s: An Overview	334
Conclusion	339
The New Geometries in Art and Theory 1900-1930	339
The Fourth Dimension and Non-Euclidean Geometry in Art and Theory since 1930	342
Appendix A.	353
The Question of Cubism and Relativity	353
Appendix B.	366
A Chronology of American Articles Popularizing the New Geometries, 1877-1920	366
Appendix C.	368
Of the Book by Gleizes and Metzinger <i>Du Cubisme</i>	368
Bibliography	377
Index	439
Plates	457