

Contents

Preface	ix
Preface 2005	xi
PART I: NOTES ON NOTES OF THURSTON	1
<i>R.D. Canary, D.B.A. Epstein, P.L. Green</i>	
A New Foreword	3
Chapter I.1. (G, X) -structures	31
I.1.1. (G, X) -structures on a manifold	31
I.1.2. Developing map and holonomy	32
I.1.3. Convexity	34
I.1.4. The developing map and convexity	37
I.1.5. The deformation space	38
I.1.6. Thickenings	41
I.1.7. Varying the structure	44
Chapter I.2. Hyperbolic structures	49
I.2.1. Möbius groups	49
I.2.2. The thick–thin decomposition	50
I.2.3. The nearest point retraction	51
I.2.4. Neighbourhoods of convex hyperbolic manifolds	52
I.2.5. Convex thickenings	56
Chapter I.3. Spaces of hyperbolic manifolds	59
I.3.1. The geometric topology	59
I.3.2. ε -relations and approximate isometries	66

Chapter I.4. Laminations	76
I.4.1. Geodesic laminations	76
I.4.2. Minimal laminations	80
Chapter I.5. Pleated surfaces	89
I.5.1. Introduction	89
I.5.2. Compactness properties of pleated surfaces	91
I.5.3. Realizations	105
PART II: CONVEX HULLS IN HYPERBOLIC SPACE, A THEOREM OF SULLIVAN, AND MEASURED PLEATED SURFACES	117
<i>D.B.A. Epstein, A. Marden</i>	
Chapter II.1. Convex hulls	121
II.1.1. Introduction	121
II.1.2. Hyperbolic convex hulls	121
II.1.3. The nearest point retraction	122
II.1.4. Properties of hyperbolic convex hulls	125
II.1.5. Metric on convex hull boundary	128
II.1.6. Hyperbolic convex hulls	132
II.1.7. Limits of lines and planes	134
II.1.8. Ridge lines	135
II.1.9. The roof	136
II.1.10. Lowering the roof	138
II.1.11. The bending measure	141
II.1.12. The boundary is a complete hyperbolic manifold	144
II.1.13. Finite approximations to the convex hull boundary	148
II.1.14. Convergence of laminations	150
Chapter II.2. Foliations and the epsilon distant surface	153
II.2.1. Introduction	153
II.2.2. The epsilon distant surface	153
II.2.3. From infinity to the epsilon surface	159
II.2.4. Extending a lamination to a pair of orthogonal foliations	166
II.2.5. Some standard vector fields	170
II.2.6. Lipschitz line fields in the hyperbolic plane	172
II.2.7. Foliation coordinates	176
II.2.8. Formulas in the hyperbolic plane	182

Contents vii

II.2.9. Flat equidistant surfaces	186
II.2.10. Foliations on the convex hull	187
II.2.11. Three orthogonal fields	190
II.2.12. The equidistant surface from a finitely bent convex hull boundary	193
II.2.13. Surfaces equidistant from a general convex hull boundary	195
II.2.14. The map ρ	196
II.2.15. Numerical results	208
II.2.16. Counterexample	208
Chapter II.3. Measured pleated surfaces	211
II.3.1. Introduction	211
II.3.2. Finite quakebends	211
II.3.3. Norms	213
II.3.4. Products of rotations about geodesics	214
II.3.5. The quakebend cocycle	217
II.3.6. The quakebend map	219
II.3.7. Invariance	219
II.3.8. Deformations	221
II.3.9. Derivatives	222
II.3.10. Second variation	226
II.3.11. Varying the lamination	228
Appendix	239
Addendum 2005	255
PART III: EARTHQUAKES IN 2-DIMENSIONAL HYPERBOLIC GEOMETRY	267
<i>W.P. Thurston</i>	
Chapter III.1. Earthquakes in 2-dimensional hyperbolic geometry	269
III.1.1. Introduction	269
III.1.2. What are hyperbolic earthquakes?	271
III.1.3. Associating earthquakes to maps of the circle	276
III.1.4. Examples	281
III.1.5. Earthquakes on hyperbolic surfaces	283
III.1.6. The measure and cause of earthquakes	285
III.1.7. Quasi-symmetries and quasi-isometries	287

PART IV: LECTURES ON MEASURES ON LIMIT SETS OF KLEINIAN GROUPS	291
<i>S.J. Patterson</i>	
Chapter IV.1. The problems with which we shall be concerned	293
Chapter IV.2. A measure on the limit set	300
Chapter IV.3. First fruits	308
Chapter IV.4. Spectral theory	314
Chapter IV.5. Geodesic flows	321