

CONTENTS

Preface xi

Acknowledgments xv

A Note on Spelling and on the Names of Components xvii

1 Velocipedes and Their Forerunners 1

Mobility before the velocipede 1

A shortage of oats necessitates horseless transport 8

Diffusion of the single-track velocipede 19

The clampdown on two-wheelers and the return to multi-track velocipedes 27

The first roller-skate patents 28

Stable velocipedes for anxious riders 30

The quadricycle years 31

Roller skating gains momentum 34

2 Front Drive 37

Unresolved questions about the origins of front drive 38

The French velocipede and its series production 53

Diffusion to Europe and America 63

Why not drive the rear wheel? Why not use steam or electric power? 71

3 Wire Wheels 83

The evolution of the high-wheeler 84

The high-wheeler 97

High-wheel tricycles 106

4 Indirect Drive 125

Lever-and-crank drives 126

Swinging-lever and linear drives 127

Belts and pulleys 130

Shaft drive 134

Spur-gear drive 144

Chain drive 148

Asymmetric chainwheels 151

- 5 The Safety Bicycle** 155
 - Early attempts to produce a safer bicycle 156
 - Diamond-frame rear-drive safeties 160
 - Cross-frame rear-drive safeties 166
 - Dwarf front-drivers 169
 - The triumph of the diamond frame 170
 - Steel as a frame material 171
 - Other frame materials 178
 - Cycling spawns the airplane 184
- 6 Comfort** 187
 - Tires 187
 - Sprung supports for saddles 200
 - Sprung handlebars 207
 - Wheel suspension 209
- 7 Improving Transmission** 221
 - Evolution of the automatic freewheel 222
 - The early development of multi-speed gearing 229
 - Epicyclic gearing 236
 - Derailleurs 243
 - Automatic and continuously variable gears 247
- 8 Braking** 257
 - Taking the heat out of speed 257
 - Tire brakes 258
 - Rim brakes 266
 - Brakes in or attached to the hub 279
- 9 Saddles, Pedals, and Handlebars** 291
 - Saddles 291
 - Seat posts 298
 - Pedals 298
 - Handlebars 311
- 10 Lighting** 321
 - Candle lanterns and oil lanterns 321
 - Battery-powered lamps 325
 - Acetylene lamps 328
 - Tire-driven dynamos 332
 - Early dynamo designs 332
 - Toward the dominance of the “bottle” dynamo 335

- Hub dynamos 344
- Spoke dynamos 347
- Bottom-bracket (roller) dynamos 347
- Battery backup 349
- 11 Luggage 351**
 - Simple horizontal rear racks 353
 - Beam racks 358
 - Front racks 358
 - Fittings for sports equipment 361
 - Panniers 361
 - Baskets 365
 - Saddlebags 367
 - Handlebar bags 368
 - Rack-mounted holdalls 369
 - Tool bags 370
 - Child seats 370
 - Sidecars 376
 - Trailers 377
 - Cargo bikes 380
- 12 Racing Bicycles 385**
 - The evolution of frame geometry 386
 - Horses for courses 388
 - Frame materials 393
 - Aerodynamics 400
 - Riding position and aero-bars 402
 - Other aerodynamic components 404
 - The effect of regulations 411
- 13 Military Bicycles 413**
 - Early military use of bicycles 414
 - Design features of military bicycles 420
 - Folding or separable military cycles 423
- 14 Mountain Bikes 433**
 - Origins 434
 - Advantages 436
 - Changes in suspension and in frames 438
 - Derivatives of mountain bikes 444

- 15 Small-Wheeled Bicycles** 447
 - Early small-wheelers 448
 - Vélocio's experiments with small wheels 451
 - Early portable bicycles 454
 - British small-wheelers, 1960s–1980s 459
 - Folders 461
 - High-performance small-wheelers 465
 - Ultra-small wheels 466
 - BMX 469
 - Small-wheeled bicycles today 471
- 16 Recumbent Bicycles** 473
 - Early recumbents 474
 - The recumbent boom of the 1930s 478
 - Recumbents after World War II 485
 - The recumbent revival of the 1970s and its aftermath 487

- Appendix A**
 - Debunked Priority Hoaxes 493
- Appendix B**
 - Davies's Lecture "On the Velocipede" (May 1837) and Spencer's Report of the Defeat of the Dandy or Hobby-Horse 503
- Appendix C**
 - Bicycle Aesthetics 521
- Appendix D**
 - The Parts of a Bicycle 527

 - Select Literature 529
 - References 537
 - Index 549