CONTENTS

FOREWORD	10
INTRODUCTION	11
Part One:	
FACTORS GOVERNING ANIMATION	21
1 The Nature of Animation	23
2 The Discovery of the Basic Technique	26
3 Evolution of Style and Timing	29
4 Animation: the Physical Laws	31
5 Animation: the Aesthetic Principles	61
6 The Sound Track	69
The Voice Track	70
The Effects Track	77
The Music Track	78
7 Values in Colour and in Black-and-White	84
8 Animation and the Colour Systems	87
9 The Television Cartoon	89
10 Influences Affecting the Film	91
The Needs of the Advertising Agent	91
The Needs of the Public Relations Officer	101
The Entertainment Needs of the Public	104
Part Two:	
THE USES OF ANIMATION	107
11 Television Commercials	109
12 Advertising Films for Theatres	114
13 Public Relations and Propaganda	116
	5

18 Preparation 159 The Storyboard 159 The Cartoon Characters 163 Sound 168 19 The Production Process 171 Artists and Technicians 209 The Producer 210 The Director 214 The Losigner, Lay-out Artist and Background Artist 216 The Key Animator 218 The Assistant Animator 221 The Inker and Colourist 223 The Checker 224 The Cameraman 225 The Editor 232 The Studio Manager 233 Specialized Technical Animation 234 The Composition and Recording of Music for Animated Films 254 Part Four: 254 OTHER FORMS OF ANIMATION 261 21 Puppet and Object Animation 263 22 The Puppet Film: the Production Process 274 The Medium 278 The Production Process 279 24 The Animation of Still Pictures 287 25 The Work of Norman M	135 139 142 145
The Storyboard 159 The Cartoon Characters 163 Sound 168 19 The Production Process 171 Artists and Technicians 209 The Director 210 The Director 211 The Assistant Animator 218 The Assistant Animator 221 The Inker and Colourist 223 The Cameraman 225 The Editor 233 Specialized Technical Animation 234 The Composition and Recording of Music for Animated Films 237 Costing the Production 254 Part Four: OTHER FORMS OF ANIMATION 261 Puppet and Object Animation 278 The Medium 278 The Production Process 274 The Animation of Still Pictures 279 The Work of Norman McLaren 290 The Production Process for Norman McLaren's Films 291 Specialized Forms of Animation 278 The Production Process 67 The Medium 278 The Production Process 279 The Animation of Still Pictures 287 The Work of Norman McLaren 290 The Production Process for Norman McLaren's Films 291 The Screen Animation 304 Three-Dimensional Animation 304 Three-Dimensional Animation 304 Totalized Animation (from 1951) 305	
The Storyboard The Cartoon Characters Sound 19 The Production Process Artists and Technicians The Producer The Director The Designer, Lay-out Artist and Background Artist The Key Animator The Inker and Colourist The Cameraman The Editor The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 1 Puppet and Object Animation The Production Process The Medium The Production Process The Medium The Production Process The Medium The Production Process The Work of Norman McLaren The Production Process For Norman McLaren's Films The Production Process for Norman McLaren's Films Specialized Forms of Animation The Production Process for Norman McLaren's Films Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	157
The Storyboard The Cartoon Characters Sound 19 The Production Process Artists and Technicians The Producer The Director The Designer, Lay-out Artist and Background Artist The Key Animator The Inker and Colourist The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 11 Puppet and Object Animation The Production Process The Medium The Production Process The Medium The Production Process The Medium The Production Process The Work of Norman McLaren The Production Process for Norman McLaren's Films The Production Process for Norman McLaren's Films Specialized Forms of Animation The Production Process for Norman McLaren's Films Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	159
The Cartoon Characters Sound 19 The Production Process Artists and Technicians The Producer The Director The Designer, Lay-out Artist and Background Artist The Assistant Animator The Inker and Colourist The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation The Medium The Production Process The Medium The Production Process The Medium The Production Process The Work of Norman McLaren The Production Process for Norman McLaren's Films The Screen Animation (from 1931) Three-Dimensional Animation 304 Totalized Animation (from 1951) 305	
Sound 19 The Production Process Artists and Technicians The Producer The Director The Designer, Lay-out Artist and Background Artist The Key Animator The Inker and Colourist The Checker The Cameraman The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	163
Artists and Technicians The Producer The Director The Designer, Lay-out Artist and Background Artist The Key Animator The Inker and Colourist The Checker The Cameraman The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	168
The Producer The Director The Designer, Lay-out Artist and Background Artist The Key Animator The Inker and Colourist The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films Tother Form: OTHER FORMS OF ANIMATION The Puppet Film: the Production Process Silhouette and Flat-Figure Animation The Medium The Production Process The Manimation of Still Pictures The Mork of Norman McLaren The Production Process for Norman McLaren's Films The Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	171
The Director The Designer, Lay-out Artist and Background Artist The Key Animator The Assistant Animator The Inker and Colourist The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films Tilms Totalized Technical Animation The Production Part Four: OTHER FORMS OF ANIMATION The Puppet Film: the Production Process The Medium The Medium The Production Process The Work of Norman McLaren The Production Process for Norman McLaren's Films The Production Process for Norman McLaren's Films Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	209
The Designer, Lay-out Artist and Background Artist The Key Animator The Assistant Animator The Inker and Colourist The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	210
The Key Animator The Assistant Animator The Inker and Colourist The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	214
The Key Animator The Assistant Animator The Inker and Colourist The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	216
The Inker and Colourist The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films Costing the Production 237 247 258 260 279 270 271 272 274 275 276 277 276 277 277 277 278 279 279 279 279	218
The Checker The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films Costing the Production Part Four: OTHER FORMS OF ANIMATION Puppet and Object Animation Silhouette and Flat-Figure Animation The Medium The Production Process The Medium The Production Process The Work of Norman McLaren The Production Process for Norman McLaren's Films Specialized Forms of Animation Three-Dimensional Animation Totalized Animation (from 1951) 2224 2325 243 254 265 275 276 277 277 278 279 279 279 279 279 270 270 270 270 270 271 271 271 272 273 274 275 277 277 277 277 277 277 277 277 277	221
The Cameraman The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production 254 Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 278 The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	223
The Editor The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	224
The Studio Manager Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 263 25 The Medium 278 The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	225
Specialized Technical Animation The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 263 274 23 Silhouette and Flat-Figure Animation 278 The Medium 278 The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation 304 Totalized Animation (from 1951) 305	232
The Composition and Recording of Music for Animated Films 237 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation The Medium The Production Process 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 Totalized Animation (from 1951)	233
Films 20 Costing the Production Part Four: OTHER FORMS OF ANIMATION 21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 278 The Medium The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 Totalized Animation (from 1951)	234
257 254 Part Four: OTHER FORMS OF ANIMATION 261 21 Puppet and Object Animation 263 22 The Puppet Film: the Production Process 274 23 Silhouette and Flat-Figure Animation 278 The Medium The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 Totalized Animation (from 1951)	
Part Four: OTHER FORMS OF ANIMATION 261 21 Puppet and Object Animation 222 The Puppet Film: the Production Process 274 23 Silhouette and Flat-Figure Animation 278 The Medium 278 The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren 279 The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation 270 Pin Screen Animation (from 1931) 304 Three-Dimensional Animation 304 Totalized Animation (from 1951)	237
OTHER FORMS OF ANIMATION 261 21 Puppet and Object Animation 222 The Puppet Film: the Production Process 274 23 Silhouette and Flat-Figure Animation 278 The Medium 278 The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation 304 Totalized Animation (from 1951) 305	254
21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 278 The Medium The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 305	
21 Puppet and Object Animation 22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 263 274 275 The Medium 278 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren 279 279 287 290 290 291 292 293 294 295 Specialized Forms of Animation 296 Pin Screen Animation (from 1931) 297 298 299 290 290 291 291 291 292 293 294 295 296 297 297 297 297 297 298 298 299 299 299 209 209 209 209 209 209 209	261
22 The Puppet Film: the Production Process 23 Silhouette and Flat-Figure Animation 278 The Medium The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 Totalized Animation (from 1951)	
23 Silhouette and Flat-Figure Animation The Medium The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 305	
The Medium The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304	
The Production Process 279 24 The Animation of Still Pictures 25 The Work of Norman McLaren The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 279 287 290 304 304	
24 The Animation of Still Pictures 25 The Work of Norman McLaren 290 The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation 304 Totalized Animation (from 1951)	
The Work of Norman McLaren The Production Process for Norman McLaren's Films The Production Process for Norman McLaren's Films The Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951)	
The Production Process for Norman McLaren's Films 26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 292 304 305	
26 Specialized Forms of Animation Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 304 305	
Pin Screen Animation (from 1931) Three-Dimensional Animation Totalized Animation (from 1951) 304 304 305	
Three-Dimensional Animation Totalized Animation (from 1951) 304 305	d d
Totalized Animation (from 1951)	
6	

27 Animation for the Widescreen	306
CONCLUSION	309
APPENDIX	311
Opinions About the Future	311
Mathematics in Aid of Animation, by Brian G. D. Salt	319
Film Measurement Tables	332
Principal Films Referred to in this Book	334
Glossary of Animation Terms	336
Selected Book List	343
INDEX	344