

Contents

<i>Acknowledgements</i>	vii
Part I Prologue	1
1 What is the use of chaos?	<i>M. Conrad</i> 3
2 A graphical zoo of strange and peculiar attractors	<i>A. V. Holden and M. A. Muhamad</i> 15
Part II Iterations	37
3 One-dimensional iterative maps	<i>H. A. Lauwerier</i> 39
4 Two-dimensional iterative maps	<i>H. A. Lauwerier</i> 58
Part III Endogenous chaos	97
5 Chaos in feedback systems	<i>A. Mees</i> 99
6 The Lorenz equations	<i>C. Sparrow</i> 111
7 Instabilities and chaos in lasers and optical resonators	<i>W. J. Firth</i> 135
8 Differential systems in ecology and epidemiology	<i>W. M. Schaffer and M. Kot</i> 158
9 Oscillations and chaos in cellular metabolism and physiological systems	<i>P. E. Rapp</i> 179
Part IV Forced chaos	209
10 Periodically forced nonlinear oscillators	<i>K. Tomita</i> 211

11 Chaotic cardiac rhythms	<i>L. Glass, A. Shrier and J. Bélair</i>	237
12 Chaotic oscillations and bifurcations in squid giant axons	<i>K. Aihara and G. Matsumoto</i>	257
Part V Measuring chaos		271
13 Quantifying chaos with Lyapunov exponents	<i>A. Wolf</i>	273
14 Estimating the fractal dimensions and entropies of strange attractors	<i>P. Grassberger</i>	291
Part VI Epilogue		313
15 How chaotic is the universe?	<i>O. E. Rössler</i>	315
<i>Index</i>		321

