Contents

•••••		•••••
	Part 1 Assembling the tools for the job	
1	Introduction: the limits of fossil evidence	3
	Palaeoanthropology has a problem	3
	What can be done?	6
	Further reading	7
2	How to reconstruct evolutionary history	9
	Linnean taxomony	9
	Evolution	9
	Evolutionary taxomony: cladistics	11
	Molecular taxomony Primate and human evolutionary relationships	14
	Inventing ancestors	$\begin{array}{c} 17 \\ 27 \end{array}$
	Further reading	30
3	What is intelligence and what is it for?	31
	Politics of intelligence	31
	IQ tests for animals?	32
	Intelligence as adaptation	33
	Dangers of everyday observations	35
	Innate tendencies and learned behaviour	37
	Facets of intelligence	38
	Behaviour and representation Postscript: developmental and cognitive ideas on	39
	intelligence	40
	Further reading	40
	Turnor rounny	- 11
	Part 2 Changing views of learning and imitation	
4	How animals learn	45
	The traditional story of animal learning	45
	Individual learning channelled by genetic constraints	48
	Further reading	53

viii Contents

5	Why animals learn better in social groups	54
	The demise of imitation as an explanation of all social	
	learning in animals	54
	Stimulus enhancement	56
	Response facilitation	58
	Emulation	59
	Modelling social influences that affect existing brain records	61 63
	Further reading	00
6	Imitative behaviour of animals	64
	Imitating sounds	64
	Imitating actions	65
	Evidence of imitation by animals	71
	Further reading	79
	Part 3 Insight	
7	Understanding how things work	83
	Object permanence	83
	Solving problems with the insightful use of objects	84
	Explorative play with objects	86
	Tool-using and tool-making	88
	Further reading	99
8	Understanding minds: doing and seeing, knowing	
	and thinking	100
	Causal agency	102
	Visual perspective-taking: appreciation of geometry	104
	Joint role comprehension	106
	Knowing about knowledge	107
	Understanding intentions and accidents	109
	Reflecting on oneself	111
	Further reading	118
9	What use is a theory of mind?	119
	The intentionality problem	119
	Tactical deception	124
	Teaching	140
	Further reading	145
10	Planning and thinking ahead	146
	Prediction machines	146

ix

247

	Computation	147
	Mental simulation of intentional action: imagination	150
	Thinking in animals	151
	Anticipating the future	154
	Ape mentality: why not more?	158
	Further reading	161
11	Apes and language	162
	Cognitive foundations for language in animals	163
	Trying to talk with other species	172
	Further reading	174
	Part 4 Evolutionary causes and consequences	
12	Food for thought	177
	Finding food	179
	Obtaining food	183
	Further reading	194
13	Machiavellian intelligence	195
	Social complexity: it's who you know	196
	Sharing food, making friends, keeping allies	199
	Learning to manipulate and deceive	203
	Knowing about others' social lives	205
	Further reading	209
14	Testing the theories	210
	Estimating complexity	210
	Estimating intelligence	212
	Brain enlargement reflects intelligence	213
	Allometry: getting the right scale of measurement	214
	Primate brain sizes	215
	Testing the theories Further reading	$\frac{218}{221}$
15	Taking stock	222
	The pattern of intelligence among animals	222
	How humans became intelligent: reconstruction of	444
	evolutionary history	227
Ref	ferences	235
	references	

Index