

1	Building Ethical Arks	1
1.1	Fall and Rise of the Phoenix	2
1.2	Debating Our Critics	4
1.3	Ethical Obligations to Welfare	6
1.4	Who Monitors Welfare in the Zoo?	6
1.5	Good to Great Welfare	11
1.6	Institutional Leadership	13
1.7	Conservation and Welfare	14
2	Defining Animal Welfare	21
2.1	The Scope of Welfare	23
2.2	Identifying the Focus of Welfare	25
2.3	Influences on Welfare	27
2.4	Identifying Appropriate Comparisons	30
2.5	Species-Appropriate Measures of Welfare	30
2.6	Need for Multiple Measures	31
3	Welfare Metrics Applied	35
3.1	Preference and Motivation Tests	36
3.2	Patterns of Behavior	37
3.3	Natural Behavior	37
3.4	Cognitive Bias Assessments	38
3.5	Stereotypic Behavior	39
3.6	Physiological Measures	40
3.7	Research Design	41
3.8	Data Collection	43
3.9	Analyzing Measurement Data	45
3.9.1	Pre-Post Tests (Within-Subject Design)	45
3.9.2	Repeated-Treatment Design	45
3.9.3	Between-Subjects Tests	46
3.9.4	Multi-institutional Studies	46

4	Wellness as Welfare	49
4.1	Differentiating Wellness and Welfare	49
4.2	Practicing Wellness	53
4.3	Managing Mega-fauna	55
4.4	Integrating Wellness	56
4.5	Branding Wellness	57
4.6	Dedicated Wellness Centers	59
4.7	The San Francisco Wellness Initiative	63
4.8	Teaching and Outreaching	66
5	Psychology and Animal Welfare	69
5.1	Psychologists in the Zoo	69
5.2	Ethological Standards for Animal Welfare	73
5.3	Welfare for Elephants	74
5.4	Primate Psychology	75
5.5	Autonomy, Control, and Power	81
5.6	Social Organization	84
5.7	Personality and Welfare	87
5.8	Psychopathology in the Zoo	89
5.9	The Behavioral Basis of Design	91
6	Environmental Enrichment	95
6.1	Types of Enrichment	96
6.1.1	Feeding Enrichment	96
6.1.2	Tactile Enrichment	97
6.1.3	Structural Enrichment	99
6.1.4	Auditory, Olfactory, Visual Enrichment	101
6.1.5	Social Enrichment	104
6.1.6	Human–Animal Interaction	105
6.1.7	Cognitive Enrichment	108
6.2	Issues Regarding Enrichment	109
6.3	Implementation and Evaluation	112
7	Behavior Analysis and Training	119
7.1	Mentors and Partners	121
7.2	Scholars and Leaders	126
7.3	Implementing Behavioral Management	128
7.4	Behavior and Welfare at the Oakland Zoo	131
7.5	Behavior Analysts in the Zoo Workplace	132
8	Designing for Animal Welfare	139
8.1	Field Biology and Zoo Design	141
8.2	Verticality in Zoo Design	143
8.3	Activity-Based Design	145
8.4	Rotating Animals and Habitat	147
8.5	Designing Big; Living Large	149

8.6	Encouraging Constructive Criticism	152
8.7	Thinking Big About Rhinos and Hippos	155
8.8	Simulations and Replications	157
8.9	Unleashing Natural Behavior	160
8.10	When Experts Disagree	161
9	Launching Ethical Arks	167
9.1	Sustainable Science and Welfare	168
9.2	Leaders in the Midst	170
9.3	Strange Bedfellows	172
9.4	“Be the Change!”—Gandhi	174
9.5	Conservation with Utmost Care	176
9.6	Comparative Quality of Life	180
9.7	Going the Distance	183
	References	185
	Index	203