

Contents in Detail

Preface xv

1	Biological Roots of Developmental Psychology	1
	Biology and psychology	2
	The Darwinian legacy	3
	<i>The anecdotalists and the origin of comparative psychology</i>	6
	<i>Some early conceptions of psychological development</i>	11
	Principles of developmental science	16
	<i>Dynamic systems and development</i>	24
	<i>Psychobiology</i>	31
	How can biology and psychology be integrated?	32
	<i>The two disciplines</i>	32
	<i>Current disciplinary trends</i>	35
	The hazards of the interdisciplinary endeavor	37
	The lure of biological explanations	43
	Summary	45
2	Biology and Psychology: Problems for a Synthesis	47
	The hierarchy of science	48
	<i>The hierarchy</i>	48
	<i>Some inversions in the hierarchy of biology and psychology</i>	49
	a. Genes and behavior	49
	b. Hormones and behavior	52
	c. Psychoneuroimmunology	59
	Reductionism	62
	<i>The distinction between necessary and sufficient conditions</i>	66
	<i>The usefulness of reductionism</i>	70
	Culture-biology dualism	71

	<i>Assumptions underlying culture-biology dualism</i>	72
	a. Culture and biology are separable	72
	b. Several meanings of the word biology	73
	c. Notions of developmental inevitability	74
	<i>Methodological consequences of the dualist assumptions</i>	76
	a. The separation of culture and biology	76
	b. Reification	76
	The biological imperative	78
	<i>The fallacy of value-based scientific arguments</i>	79
	<i>The naturalistic fallacy</i>	82
	Summary	84
3	The Beginnings of a Resolution: A Modern Synthesis	85
	The concept of innateness	86
	<i>The semantic confusion</i>	86
	<i>The conceptual confusion</i>	88
	Keeping questions distinct	92
	<i>Functional questions</i>	92
	<i>Function as separate from causation</i>	96
	<i>Causal questions</i>	98
	a. Proximate causation	98
	b. Phylogenetic causation	98
	c. Ontogenetic causation	99
	<i>Why do birds sing?</i>	101
	A holistic and epigenetic approach to developmental and comparative psychology	109
	<i>Schneirla's perspective on development</i>	110
	<i>The fusion of maturation and experience</i>	113
	<i>The concept of experience</i>	115
	<i>The temporal characteristics of development</i>	119
	<i>The relationship between evolution and development</i>	120
	a. Phyletic levels	120
	b. Functional order	122
	<i>The relationship between the organism and its behavior</i>	124
	Summary	125
4	Evolution and Development	127
	The influence of Darwin and Mendel	129

	<i>Darwin, Wallace, and the growth of evolutionary thought</i>	130
	<i>Darwinian evolution</i>	135
	<i>Mendel and differentiating characters</i>	137
	The synthetic theory	138
	<i>Sociobiology</i>	142
	a. Societies as adaptations	143
	b. The genetic measure of fitness	146
	c. Human sociality	149
	<i>Problems with the synthetic theory</i>	156
	a. Organisms as mosaics of adapted traits	158
	b. Linear path from gene to trait	160
	c. The niche concept, speciation, and macroevolution	165
	Alternatives to the synthetic theory	167
	<i>Organism-environment coevolution</i>	168
	<i>The union of developmental and evolutionary biology</i>	171
	<i>Evolutionary ontogenesis</i>	172
	Summary	179
5	Genetics and Development	181
	Human behavioral genetics	183
	The types of geneticists	186
	<i>The origin of the field of genetics</i>	187
	<i>The search for the gene</i>	188
	Methods of behavioral genetic analysis	193
	<i>Unifactorial methods</i>	193
	<i>Multifactorial methods</i>	203
	a. Heritability	203
	b. Twin and adoption studies	206
	c. Developmental sources of variance	210
	Molecular genetics and development	216
	<i>Genetics and conception</i>	218
	<i>Genetics and DNA</i>	219
	a. DNA, the gene, and proteins	221
	b. Transcription and translation	222
	<i>Regulation of gene expression</i>	226
	a. Immediate early genes	228
	b. Hormones and their receptors	231

	c. G proteins	232
	<i>DNA and development</i>	235
	<i>The concept of environment in development</i>	238
	Genetics and developmental psychobiology	239
	Summary	241
6	Neuroembryology and the Ontogenetic Origins of Behavior	243
	Embryological development	243
	<i>Morphogenesis</i>	245
	<i>Organicism</i>	248
	<i>Mechanists</i>	249
	Genes and embryology	250
	Embryology and the nervous system	253
	Neuroembryology	254
	<i>The number, movement, form, and connectivity of cells</i>	254
	a. Location	255
	b. Differentiation	256
	c. Survival and death	259
	d. Connectivity	260
	<i>Regional patterns within the nervous system</i>	263
	Variations within and among species	269
	<i>Neuroanatomical polymorphisms and reproductive function</i>	270
	<i>Speciation and neuroanatomical changes</i>	280
	<i>Neuroanatomy and function</i>	283
	Neuroembryology and behavior	285
	Summary	287
7	Behavioral Embryology	289
	Ontogenetic adaptations	290
	Features of embryonic neurobehavioral organization	292
	<i>Sensory input and spontaneous prenatal behavior</i>	293
	<i>Descending control and spontaneous prenatal behavior</i>	295
	<i>Inhibition and spontaneous prenatal behavior</i>	296
	<i>Significance of spontaneous fetal activity</i>	297
	a. Fetal activity as an epiphenomenon	297
	b. Fetal activity as preparation for postnatal behavior	298
	c. Fetal activity as ontogenetic adaptation	298
	d. Continuing questions	299

	Features of neonatal neurobehavioral organization	301
	<i>The role of descending control</i>	302
	<i>Significance of spontaneous neonatal activity</i>	304
	a. Neonatal activity as an epiphenomenon	304
	b. Neonatal activity as preparation	305
	c. Neonatal activity as ontogenetic adaptations	307
	d. Clinical implications	308
	Sources of embryonic experience	309
	Continuity and qualitative change	311
	Some special features of mammalian behavioral embryology	317
	<i>Physiological regulation in neonates</i>	317
	<i>The biosocial to psychosocial transition</i>	323
	<i>Transgenerational effects of life events</i>	328
	Summary	330
8	Cognitive Development and Developmental Psychobiology	333
	Maturation and cognition	335
	Development of infant motor skills	342
	<i>Maturation and neurobehavioral elements</i>	342
	a. Age of appearance	342
	b. Primitive reflexes	343
	c. Construction from reflexes	344
	<i>Gesell's maturational theory</i>	345
	<i>Manual skills</i>	347
	a. Prehension	349
	b. Bimanual coordination and handedness	353
	The development of sensorimotor intelligence during infancy	358
	<i>Piaget's account of sensorimotor intelligence</i>	358
	<i>Do infants have an adult cognitive system?</i>	359
	<i>Neural development and infant intelligence</i>	363
	Aspects of language development	364
	<i>Syntactic theory</i>	365
	<i>Semantic theory</i>	368
	<i>Language as a communicative skill</i>	370
	<i>The neurology of language</i>	373
	Learning and education	376
	Summary	379

9	Animal Behavior, Ethology, and Human Development	383
	Two orientations to animal behavior	383
	The natural history orientation and the ethological approach	387
	<i>Ethology</i>	387
	a. Mechanism and vitalism	387
	b. Natural selection and animal behavior	389
	c. The ethological approach	389
	<i>Human ethology</i>	390
	Contributions of the natural history orientation to the study of human development	392
	<i>Development of new research techniques</i>	392
	a. Description	392
	b. Analysis of social behavior	398
	<i>Clarification of concepts</i>	403
	a. Attachment	404
	b. Critical period	407
	c. Aggression	409
	d. Abnormal	410
	<i>Identification of special features of human development</i>	415
	a. Imitation and teaching	416
	b. Play	419
	c. Society	421
	<i>Identification of issues in human development that need study</i>	423
	a. Self-stimulation	424
	b. New directions	426
	Summary	428
10	Developmental Psychobiology and the Unification of Behavioral Biology	429
	Developmental psychobiology and the unification of biology	433
	The experimental-predictive and historical styles of science	435
	Summary	439
<hr/>		
	References	441
	Glossary	479
	Name Index	489
	Subject Index	501