

Contents

A NOTE FOR THE READER.....	VII
ABOUT THE AUTHOR/CONTRIBUTORS	VII
ACKNOWLEDGEMENTS	VIII
CONFLICTING INTERESTS	VIII
FOREWORD	XV
PART 1: BASICS FIRST	1
1 INTRODUCTION	3
1.1 BACKGROUND	4
1.2 AN ESSENTIAL QUESTION	6
1.3 DELIMITATION	7
2 METHODS AND BASIC TERMINOLOGY	9
2.1 OUTLINE OF THE TEMPLATE MODEL	9
2.2 MODELLING METHODOLOGY	10
2.2.1 Step 1: Defining the 3 rd Level Mereonic Function	10
2.2.2 Step 2: Getting an Overview of the Knowledge Domain	10
2.2.3 Step 3: Matching the Template Model with the Application Domain's Functionality.....	10
2.2.4 Step 4: Filling Details for the Micro-Micro-Level Functions	12
2.2.5 Step 5: Defining the Emergent Properties	12
2.2.6 Step 6: Identifying Holes in the Model	12
2.2.7 Step 7: Evaluation of the Model	12
2.3 QUALITY MANAGEMENT OF INPUT SOURCES	13
2.4 THE CONCEPT OF PERSPECTIVES	14
PART 2: THE UNIFYING THEORY OF EVOLUTION	15
3 PERSPECTIVES IN EVOLUTION	17
4 MATERIALISATION: READYING FOR THE EVOLUTIONARY PRESSURE, SURVIVAL OF THE FITTED	25
4.1 PHYSICAL FOUNDATION BEHIND EVOLUTION, 'INEVITABLE EVOLUTION THEORY'	26
4.1.1 Self-Organised Criticality and Punctuated Equilibria	27
4.2 GENOTYPE CHANGE AS DRIVER OF EVOLUTION, 'STANDARD EVOLUTIONARY THEORY'	28
4.2.1 Self-Organised Criticality and Punctuated Equilibria	29
4.3 REGULATION OF GENE EXPRESSION AS DRIVER OF EVOLUTION, 'EXTENDED EVOLUTIONARY SYNTHESIS'	29
4.3.1 Epigenetics as an Evolutionary Factor	31
4.3.2 Plasticity	32
4.3.3 Genetic Stabilisation and Disruptive Selection	34
4.3.4 Genetic Accommodation and Phenotypic Accommodation	35
4.3.5 Genetic Assimilation and Compensation	36
4.3.6 Modularity and Supergenes	36
5 COMMUNICATIVE INTERACTION: CONTRIBUTING RELATIONAL ASPECTS TO EVOLUTIONARY PROCESSES	39
5.1 INTER-INDIVIDUAL DYNAMICS, 'INEVITABLE EVOLUTION THEORY' ..	40
5.1.1 Communication	40

5.1.2	<i>Frequency-Dependent Competitive Interaction</i>	41
5.2	KIN SELECTION, 'STANDARD EVOLUTIONARY THEORY'	42
5.2.1	<i>Altruism and Inclusive Fitness</i>	42
5.2.2	<i>Cooperation</i>	45
5.2.3	<i>Greenbeards</i>	46
5.2.4	<i>Reciprocity</i>	46
5.2.5	<i>Aposematism</i>	47
5.2.6	<i>Prokaryotic Adaptive Immunity System</i>	47
5.3	REGULATORY ADAPTATION, 'EXTENDED EVOLUTIONARY SYNTHESIS'	48
5.3.1	<i>The Genetic/Epigenetic Foundation of Behavioural Patterns</i>	48
5.3.2	<i>Plasticity</i>	50
5.3.3	<i>Prokaryotic Adaptive Immunity System</i>	52
6	STABILISATION: BALANCING EFFICIENCY AND EFFECTIVENESS AT EVOLUTION	55
6.1	META-POPULATION DYNAMICS, 'INEVITABLE EVOLUTION THEORY'	57
6.1.1	<i>Flock Dynamics</i>	57
6.2	META-POPULATION DYNAMICS (GROUP SELECTION), 'STANDARD EVOLUTIONARY THEORY'	58
6.2.1	<i>Multilevel Selection</i>	58
6.3	GROUP DYNAMICS (ACQUIRED TEAM BEHAVIOUR), 'EXTENDED EVOLUTIONARY SYNTHESIS'	62
6.3.1	<i>Acquired Team Behaviour</i>	62
7	PRIORITIZATION: MAXIMISING EFFECTIVENESS OF EVOLUTION	65
7.1	COLLECTIVE DECISION-MAKING, 'INEVITABLE EVOLUTION THEORY'	67
7.1.1	<i>Decision Making in Relation to Dispersal/Migration</i>	70
7.2	COLLECTIVE DECISION-MAKING, 'STANDARD EVOLUTIONARY THEORY'	71
7.2.1	<i>Scaling from the Individual to a Group</i>	71
7.2.2	<i>Overall Mechanisms of Animal Decision-Making</i>	71
7.2.3	<i>Handling Conflicting Information</i>	73
7.2.4	<i>Moderating Mechanisms for Decision-Making</i>	74
7.2.5	<i>Personality and Group Decision-Making</i>	75
7.2.6	<i>Decision Making in Relation to Dispersal/Migration</i>	76
7.2.7	<i>Decision-Making in Fission-Fusion Societies</i>	77
7.2.8	<i>In Summary</i>	77
7.3	CULTURAL FACTORS IN EVOLUTION AND SURVIVABILITY, 'EXTENDED EVOLUTIONARY SYNTHESIS'	78
7.3.1	<i>Cultural Group Selection</i>	82
7.3.2	<i>Decision Making in Relation to Informed (Adaptive) Dispersal/Migration</i>	84
8	DIFFERENTIATION: SURVIVAL OF THE FITTEST ORCHESTRATION	85
8.1	ORCHESTRATION AT EVOLUTION, 'INEVITABLE EVOLUTION THEORY'	86
8.1.1	<i>Interspecies Dynamics</i>	86
8.1.2	<i>Time and Timing</i>	90
8.1.3	<i>Fidelity</i>	91

8.2	ORCHESTRATION AT EVOLUTION, 'STANDARD EVOLUTIONARY THEORY'	91
8.2.1	<i>Speciation</i>	91
8.2.2	<i>Specialisation</i>	94
8.2.3	<i>Time and Timing</i>	97
8.2.4	<i>Fidelity</i>	98
8.3	ORCHESTRATION AT EVOLUTION, 'EXTENDED EVOLUTIONARY SYNTHESIS'	99
8.3.1	<i>Speciation</i>	99
8.3.2	<i>Specialisation, Eusociality</i>	101
8.3.3	<i>Time and Timing</i>	107
8.3.4	<i>Fidelity</i>	113
9	EVOLUTION OF EVOLVABILITY, SURVIVAL OF THE FITTEST EVOLUTIONARY MECHANISMS	115
9.1	INEVITABLE EVOLUTION, 'INEVITABLE EVOLUTION THEORY'	116
9.2	EVOLUTION OF EVOLVABILITY, 'STANDARD EVOLUTIONARY THEORY'	118
9.2.1	<i>Population Genetics</i>	120
9.2.2	<i>Horizontal Gene Transfer and Selfish Genes</i>	121
9.3	HOMEORHESIS, 'EXTENDED EVOLUTIONARY SYNTHESIS'	122
9.3.1	<i>Population Genetics</i>	124
9.3.2	<i>Constructive Neutral Evolution</i>	129
9.3.3	<i>Horizontal Gene Transfer and Selfish Genes</i>	131
10	INTEGRATION OF PHENOTYPE WITHIN THE ENVIRONMENT, NICHE CONSTRUCTION	133
10.1	NICHE CONSTRUCTION, 'INEVITABLE EVOLUTION THEORY'	135
10.2	NICHE CONSTRUCTION, 'STANDARD EVOLUTIONARY THEORY'	135
10.3	NICHE CONSTRUCTION, 'EXTENDED EVOLUTIONARY SYNTHESIS'	136
PART 3: DISCUSSION		139
11	PRE-LIFE EVOLUTIONARY CHANGES	141
12	STRENGTHS AND WEAKNESSES OF THE WORK	143
12.1	SELF-ASSESSMENT AND ASSESSMENT OF ASSUMPTIONS	143
12.2	REFLECTIONS ON THE QUALITY CRITERIA	144
12.3	POTENTIAL BIAS	146
12.4	REFLECTIONS ON THE VALIDITY OF THE UNIFYING MODEL	146
13	CONCLUSION	149
PART 4: INFORMATION MODEL		151
14	THE MEREON MATRIX'S TEMPLATE INFORMATION MODEL	153
14.1	ABOUT THE MEREON MATRIX	153
14.2	ABOUT THE MODELLING METHODOLOGY	157
14.2.1	<i>Step 1: Defining the 3rd Level Mereonic Function</i>	157
14.2.2	<i>Step 2: Getting an Overview of the Knowledge Domain</i>	158
14.2.3	<i>Step 3: Matching the Template Model with the Application Domain's Functionality</i>	158
14.2.4	<i>Step 4: Filling Details for the Micro-Micro-Level Functions</i>	160
14.2.5	<i>Step 5: Defining the Emergent Properties</i>	160
14.2.6	<i>Step 6: Identifying Holes in the Model</i>	160
14.2.7	<i>Step 7: Evaluation of the Model</i>	160

14.2.8	Step 8: Assessing Supplementary Information from the Mereon Matrix.....	162
15	THE OVERALL MEREON MATRIX MODEL OF HUMAN MOLECULAR GENETICS.....	163
16	EXTENDING PARTS OF THE TEMPLATE INFORMATION MODEL.....	167
16.1	F6(F4(F1)) READYING FOR THE EVOLUTIONARY PRESSURE: SURVIVAL OF THE FITTED.....	168
16.2	F6(F4(F2)) COMMUNICATIVE INTERACTION CONTRIBUTING RELATIONAL ASPECTS TO EVOLUTIONARY PROCESSES	169
16.3	F6(F4(F3)) BALANCING EFFICIENCY AND EFFECTIVENESS OF EVOLUTION	171
16.4	F6(F4(F4)) MAXIMISING PRIORITIZATION FOR EFFECTIVENESS OF EVOLUTION	172
16.5	F6(F4(F5)) DIFFERENTIATION, SURVIVAL OF THE FITTEST ORCHESTRATION	173
16.6	F6(F4(F6)) EVOLUTION OF EVOLVABILITY.....	175
16.7	F6(F4(F7)) INTEGRATION OF PHENOTYPE WITHIN THE ENVIRONMENT, NICHE CONSTRUCTION	176
17	ASSESSMENT AGAINST SUPPLEMENTARY INFORMATION FROM THE TEMPLATE INFORMATION MODEL	179
17.1	STRUCTURAL ASPECTS.....	179
17.2	FIRST PRINCIPLE 0, SPATIAL-TEMPORAL NEXUS.....	180
17.3	FIRST PRINCIPLE 1, UNITY AND DIVERSITY	180
17.4	FIRST PRINCIPLE 2, CONTEXT AND CORE	181
17.5	FIRST PRINCIPLE 3, POSSIBILITIES	181
17.6	THE GENESIS	181
17.7	JITTERBUGGING.....	182
17.8	INPUT, THROUGHPUT, AND OUTPUT (CHAPTER 6, PAGE 105 IN [2]) ..	182
17.9	QUANTITATIVE ASPECTS.....	183
17.10	BREATHING AND BIRTHING	184
17.11	IN SUMMARY	184
18	REFLECTING ON VALIDITY.....	185
18.1	VALIDITY OF THE TEMPLATE INFORMATION MODEL	185
18.2	THE RISK OF BIAS	186
18.2.1	<i>Local Minima Bias</i>	186
18.2.2	<i>Judgemental Bias</i>	187
18.2.3	<i>Hypothesis Fixation</i>	187
18.2.4	<i>Circular Inference</i>	188
18.2.5	<i>Inclusion Bias</i>	189
18.2.6	<i>In Summary</i>	190
18.3	VALIDITY OF THE UNIFYING THEORY OF EVOLUTION	190
18.3.1	<i>Indicators of Validity</i>	190
18.3.2	<i>Mastering the Template Information Model</i>	192
18.3.3	<i>Confounding Factors in the Resulting Model</i>	192
18.3.4	<i>The Chicken & Egg Problem Explained</i>	193
18.3.5	<i>The Literature's Lack of Insight into Actual Mechanisms</i>	193
18.3.6	<i>Exploitation of References</i>	193
18.3.7	<i>What about the Author's (Lacking) Prior Insight into Evolution?</i> 194	

18.3.8	<i>What about That, Which is Still Unknown?</i>	194
18.4	OPPORTUNITIES FOR A GENERAL SYSTEMS THEORY?	195
18.5	POSTSCRIPT.....	196
18.5.1	<i>Back to the Essential Question</i>	196
18.5.2	<i>Now, What about the Existing Evolutionary Theories?</i>	196
18.5.3	<i>What's the use of The Unifying Theory?</i>	197
18.5.4	<i>Competing or Conflicting Unifying Theories?</i>	197
18.5.5	<i>Lessons Learned</i>	199
19	REFERENCES.....	201
	INDEX.....	213