

Contents

PART I by Karl R. Popper

Chapter P1 Materialism Transcends Itself	3
1. Kant's Argument	3
2. Men and Machines	4
3. Materialism Transcends Itself	5
4. Remarks on the Term "Real"	9
5. Materialism, Biology, and Mind	11
6. Organic Evolution	11
7. Nothing New Under the Sun. Reductionism and "Downward Causation"	14
8. Emergence and its Critics	22
9. Indeterminism; the Interaction of Levels of Emergence	32
Chapter P2 The Worlds 1, 2 and 3	36
10. Interaction; The Worlds 1, 2 and 3	36
11. The Reality of World 3	38
12. Unembodied World 3 Objects	41
13. Grasping a World 3 Object	43
14. The Reality of Unembodied World 3 Objects	46
15. World 3 and the Mind-Body Problem	47
Chapter P3 Materialism Criticized	51
16. Four Materialist or Physicalist Positions	51
17. Materialism and the Autonomous World 3	56
18. Radical Materialism or Radical Behaviourism	60
19. Panpsychism	67
20. Epiphenomenalism	72
21. A Revised Form of J. B. S. Haldane's Refutation of Materialism	75
22. The So-called Identity Theory	81
23. Does the Identity Theory Escape the Fate of Epiphenomenalism?	86
24. A Critical Note on Parallelism. The Identity Theory as a Form of Parallelism	88
25. Additional Remarks on Some Recent Materialist Theories	93
26. The New Promissory Materialism	96
27. Results and Conclusion	98

XIV

Chapter P4 Some Remarks on the Self	100
28. Introduction	100
29. Selves	101
30. The Ghost in the Machine	104
31. Learning to be a Self	108
32. Individuation	112
33. Self-Identity: The Self and Its Brain	115
34. The Biological Approach to Human Knowledge and Intelligence	120
35. Consciousness and Perception	124
36. The Biological Function of Conscious and Intelligent Activity	125
37. The Integrative Function of Consciousness	127
38. The Continuity of the Self	129
39. Learning from Experience: The Natural Selection of Theories	132
40. Criticism of the Theory of Unconditioned and Conditioned Reflexes	135
41. Kinds of Memory	139
42. The Self Anchored in World 3	144
Chapter P5 Historical Comments on the Mind-Body Problem	148
43. The History of Our Picture of the Universe	148
44. A Problem to be Solved by What Follows	151
45. The Prehistoric Discovery of the Self and of World 2	153
46. The Mind-Body Problem in Greek Philosophy	159
47. Conjectural <i>versus</i> Ultimate Explanation	171
48. Descartes: A Shift in the Mind-Body Problem	176
49. From Interactionism to Parallelism: The Occasionalists and Spinoza	181
50. Leibniz's Theory of Mind and Matter: From Parallelism to Identity	184
51. Newton, Boscovich, Maxwell: The End of Ultimate Explanation	189
52. The Association of Ideas as an Ultimate Explanation	194
53. Neutral Monism	196
54. The Identity Theory After Leibniz: From Kant to Feigl	199
55. Linguistic Parallelism	202
56. A Final Look at Materialism	205
Chapter P6 Summary	209
Bibliography to Part I	211
PART II by John C. Eccles	
Preface	225
Chapter E1 The Cerebral Cortex	227
1. Résumé	227
2. Anatomical Introduction	229
3. The Columnar Arrangement and the Modular Concept of the Cerebral Cortex	235
4. Modular Interaction	240
4.1 Patterns of Module Action and Interaction	242
5. The Connectivities of Cortical Areas	244
6. Connectivities of the Limbic System	247
Chapter E2 Conscious Perception	250
7. Résumé	250

8. Introduction	252
9. Cutaneous Perception (Somaesthesia)	253
9.1 Pathways to Primary Sensory Area in Cortex	253
9.2 Temporal Analysis of Cutaneous Perception	256
9.3 Secondary and Tertiary Sensory Areas	259
10. Visual Perception	261
10.1 Retina to Primary Visual Area in Cortex	261
10.2 Stages in Reconstitution of the Visual Image	264
10.3 The Perceived Visual Image	270
11. Auditory Perception	271
12. Olfactory Perception	272
13. Emotional Colouring of Conscious Perceptions	273
14. Epilogue	274
Chapter E3 Voluntary Movement	275
15. Résumé	275
16. Introduction	276
17. The Motor Unit	277
18. The Motor Cortex	280
19. Voluntary Movement	282
20. The Cerebellar Controls of Voluntary Movement	286
20.1 The Closed Loop via the Pars Intermedia of the Cerebellum	288
20.2 The Open-Loop System via the Cerebellar Hemispheres	289
21. The Open-Loop Circuits via the Basal Ganglia	290
22. Synthesis of the Various Neuronal Mechanisms Concerned in the Control of Voluntary Movement	290
23. General Discussion	293
Chapter E4 The Language Centres of the Human Brain	295
24. Résumé	295
25. Introduction	296
26. Aphasia	296
27. Experiments on Exposed Brains	300
28. Intracarotid Injections of Sodium Amytal	301
29. The Dichotic Listening Test	302
30. The Self-Conscious Mind and Speech	304
31. Anatomical Substrates of Speech Mechanisms	305
32. The Acquisition of Language	309
Chapter E5 Global Lesions of the Human Cerebrum	311
33. Résumé	311
34. Introduction	313
35. Investigations on the Human Brain After Commissural Section-Commissurotomy	313
36. Discussion on Commissurotomy	325
37. Investigations on the Human Cerebrum after Gross Lesions and Hemispherectomy	329
38. Discussion on Hemispherectomy	330
39. Summary of Linguistic Abilities Disclosed by Global Lesions	333
Chapter E6 Circumscribed Cerebral Lesions	334
40. Résumé	334
41. Introduction	336

XVI

42. Temporal Lobe Lesions	336
43. Parietal Lobe Lesions	341
44. Occipital Lobe Lesions	344
45. Frontal Lobe Lesions	345
46. The Limbic System	349
47. The Dominant and Minor Hemispheres	350
Chapter E7 The Self-Conscious Mind and the Brain	355
48. Résumé	355
49. Introduction	357
50. Self-Conscious Mind and the Brain	358
51. Hypothesis of Interaction of Self-Conscious Mind and the Liaison Brain	361
52. The Hypothesis of Cortical Modules and the Self-Conscious Mind	365
53. Sleep, Dreams and Various Forms of Unconsciousness	370
54. Plasticity of "Open" Modules	373
55. Summary	373
Chapter E8 Conscious Memory: The Cerebral Processes Concerned in Storage and Retrieval	377
56. Résumé	377
57. Introduction	379
58. Structural and Functional Changes Possibly Related to Memory	380
59. The So-called Growth Theory of Learning	385
60. The Role of the Self-Conscious Mind in Short-Term Memory	388
61. The Role of the Hippocampus in Learning and Memory	390
62. Hypothesis of Neuronal Happenings in Memory Storage	394
63. Memory Retrieval	399
64. Durations of Memories	402
65. Plastic Responses of Cerebral Cortex	403
66. Retrograde Amnesia	405
Bibliography to Part II	407
PART III Dialogues Between the Two Authors	
Dialogue I	425
Dialogue II	437
Dialogue III	449
Dialogue IV	461
Dialogue V	471
Dialogue VI	485
Dialogue VII	498
Dialogue VIII	510
Dialogue IX	521
Dialogue X	532
Dialogue XI	548
Dialogue XII	562
Bibliography to Part III	567
Index of Names	569
Index of Subjects	577