

The daily world in which we live came about by imaginative investigation of possibilities, discarding those that don't work: the adaptive process that is a central theme of this book, enabled by a modicum of randomness at the macro- and micro-levels, interacting with necessary physical processes. And it is these processes that also allow the emergence of the ordinariness of everyday life (Fig. 8.10): which actually is quite extraordinary. Bottom-up effects are crucial to emergence. Physics underlies all. Nevertheless, the vitality of life, which arises from physics, transcends it.

## References

1. H. Abadzi, *Efficient Learning for the Poor: Insights from the Frontier of Cognitive Neuroscience* (The World Bank, Washington, DC, 2006)
2. D. Abbott, P.C.W. Davies, C.R. Shalizi, Order from disorder: the role of noise in creative processes. *Fluc. Noise Lett.* **02**, 1 (2002)
3. R.L. Ackoff, Systems thinking and thinking systems. *Syst. Dyn. Rev.* **10**, 175–188 (1994)
4. R.L. Ackoff, F.E. Emery, *On Purposeful Systems: An Interdisciplinary Analysis of Individual and Social Behavior as a System of Purposeful Events* (Aldine, 2005)
5. U. Alon, *An Introduction to Systems Biology: Design Principles of Biological Circuits* (Chapman and Hall, 2006)
6. N. Ambady, The mind in the world: culture and the brain. *Assoc. Psychol. Sci.* **24**(5–6), 49 (2011)
7. B.B. Armbruster, F. Lehr, J. Osborn, *The Research Building Blocks for Teaching Children to Read: Put Reading First* (National Institute for literacy, 2000). <http://lincs.ed.gov/publications/pdf/PRFbooklet.pdf>
8. P.W. Atkins, The limitless power of science, in *Nature's Imagination: the Frontiers of Scientific Vision*, ed. by J. Cornwell (Oxford University Press, Oxford), pp. 122–132
9. G. Auletta, G. Ellis, L. Jaeger, Top-down causation: from a philosophical problem to a scientific research program. *J. Roy. Soc. Interface* **5**, 1159–1172 (2007). arXiv:0710.4235
10. D. Barton, *Literacy: An Introduction to the Ecology of Written Language* (Blackwell, Malden, Massachusetts, 1994)
11. Y. Bar-Yam, "General Features of Complex Systems" *Encyclopedia of Life Support Systems* (EOLSS UNESCO Publishers, Oxford, UK, 2002)
12. C. Baugh, Correlation function and power spectra in cosmology, in *Encyclopedia of Astronomy and Astrophysics*, ed. by P. Murdin (IOP Publishing, 2006)
13. S. Beer, *Brain of the Firm* (Wiley, 1994)
14. N. Bellomo, A. Elaiw, A.M. Althiabi, M.A. Alghamdi, On the interplay between mathematics and biology: Hallmarks toward a new systems biology. *Phys. Life Rev.* **12**, 44–64 (2015)
15. R.P. Benthal, *Doctoring the Mind: Why Psychiatric Treatments Fail* (Penguin, 2009)
16. P.L. Berger, *Invitation to Sociology* (Anchor Books, 1963)
17. G.L. Bissex, *Gnys at Wrk: A Child Learns to Write and Read* (Harvard University Press, Cambridge, 1985)
18. C. Bloch, *Chloe's Story: First Steps into Literacy* (Juta Academic, 1997)
19. C. Bloch, *Enabling Effective Literacy Learning in Multilingual South African Early Childhood Classrooms* (University of Cape Town, PRAESA, 2005)
20. C. Bloch, *Theory and Strategy of Early Literacy in Contemporary Africa with Special Reference to South Africa* (PRAESA, University of Cape Town, 2006). *Occasional Papers No. 25*
21. G. Booch, *Object-Oriented Analysis and Design with Applications* (Addison Wesley, New York, NY, 1994)

22. R. Borowsky, J. Cummine, W.J. Owen, C.K. Friesen, F. Shih, G.E. Sarty, fMRI of ventral and dorsal processing streams in basic reading processes: insular sensitivity to phonology. *Brain Topogr.* **18**, 233–239 (2006)
23. R. Borowsky, C. Esopenko, J. Cummine, G.E. Sarty, Neural representations of visual words and objects: a functional MRI study on the modularity of reading and object processing. *Brain Topogr.* **20**, 89 (2007)
24. V. Brattka, M. Hendtlass, A.P. Kreuzer, On the uniform computational content of computability theory. <http://arxiv.org/abs/1501.00433>
25. J. Bronowski, *The Ascent of Man* (Little Brown and Co., Boston, 1973)
26. J. Bruner, *Child's Talk: Learning to Use Language* (Norton, New York, 1983)
27. J.T. Cacioppo, J. Decety, Social neuroscience: challenges and opportunities in the study of complex behavior. *Ann. N. Y. Acad. Sci.* **1224**, 162–173 (2011)
28. B. Cambourne, Toward an educationally relevant theory of literacy learning: twenty years of inquiry. *Read. Teach.* **43**, 182–190 (1995). doi:10.1598/RT.49.3.1
29. D.T. Campbell, Downward causation, in *Studies in the Philosophy of Biology: Reduction and Related Problems*, ed. by F.J. Ayala, T. Dobzhansky (University of California Press, Berkeley, 1974)
30. N.A. Campbell, J.B. Reece, *Biology* (Benjamin Cummings, San Francisco, 2005)
31. S.T. Chan, S.W. Tang, K.W. Tang, W.K. Lee, S.S. Lo, K.K. Kwong, Hierarchical coding of characters in the ventral and dorsal visual streams of Chinese language processing. *Neuroimage* **48**, 423 (2009)
32. J.-P. Changeux, A. Connes, *Conversations on Mind, Matter, and Mathematics* (Princeton University Press, 1995)
33. T. Chouard, Breaking the protein rules: if dogma dictates that proteins need a structure to function, then why do so many of them live in a state of disorder? *Nature* **471**, 151 (2011). doi:10.1038/471151a
34. D. Chowdhury, Stochastic mechano-chemical kinetics of molecular motors: a multidisciplinary enterprise from a physicist's perspective. *Phys. Rep.* **529**, 1–197 (2013)
35. P. Churchland, *Plato's Camera: How the Physical Brain Captures a Landscape of Abstract Universals* (MIT Press, 2012)
36. C.W. Churchman, *The Systems Approach* (Delacorte Press, 1968)
37. P. Clayton, *Mind and Emergence: From Quantum to Consciousness* (Oxford University Press, Oxford, 2004)
38. P. Clayton, P.C.W. Davies (eds.), *The Re-emergence of Emergence* (Oxford University Press, Oxford, 2006)
39. S. Conway Morris, *Life's Solution: Inevitable Humans in a Lonely Universe* (Cambridge University Press, Cambridge, 2005)
40. S. Conway Morris (ed.), *The Deep Structure of Biology* (Templeton Foundation Press, 2008)
41. F. Crick, *Astonishing Hypothesis: The Scientific Search for the Soul* (Scribner, 1995)
42. A. Davis, To read or not to read: decoding synthetic phonics, in *IMPACT: Philosophical Perspectives on Education Policy*, vol. 20 (Wiley, 2013). <http://onlinelibrary.wiley.com/doi/10.1111/2048-416X.2013.12000.x/epdf>
43. T. Deacon, *The Symbolic Species: The Co-evolution of Language and the Human Brain* (Penguin Books, London, 1997)
44. T. Deacon, Universal grammar and semiotic constraints, in *Language Evolution*, ed. by M. Christiansen, S. Kirby (Oxford University Press, Oxford, 2003), pp. 111–139
45. G. Deco, E.T. Rolls, Neurodynamics of biased competition and cooperation for attention: a model with spiking neurons. *J. Neurophysiol.* (2005). doi:10.1152/jn.01095.2004
46. G. Deco, E.T. Rolls, R. Romo, Stochastic dynamics as a principle of brain function. *Prog. Neurobiol.* **88**, 1–16 (2009)
47. S. Dehaene, *Reading in the Brain: The New Science of How We Read* (Penguin, London, UK, 2010)
48. H.L. de Jong, Levels of explanation in biological psychology. *Philos. Psychol.* **15**, 441–462 (2002)

49. S. Dodelson, *Modern Cosmology* (Academic Press, San Diego, 2003)
50. M. Donald, *A Mind so Rare: The Evolution of Human Consciousness* (W. W. Norton, New York, 2001), pp. 29–36
51. W. Dubitzky, O. Wolkenhauer, H. Yokota, K.-H. Cho (eds.), *Encyclopedia of Systems Biology* (Springer, New York, 2013)
52. R. Dunbar, *Human Evolution* (Pelican Books, London, 2014)
53. J. Dupré, *Human Nature and the Limits of Science* (Oxford University Press, New York, 2002)
54. A. Ebe, What eye movement and miscue analysis reveals about the reading process of young bilinguals, in *Scientific Realism in Studies of reading*, ed. by A.D. Flurkey, E.J. Paulson, K.S. Goodman (Taylor and Francis, London, 2008), pp. 131–152
55. A.S. Eddington, *The Nature of the Physical World* (MacMillan, 1928)
56. A. Eldar, M.B. Elowitz, Functional role for noise in genetic circuits. *Nature* **467**, 167–173 (2010)
57. D. Elder-Vass, *The Causal Power of Social Structures: Emergence, Structure and Agency* (Cambridge University Press, Cambridge, 2010)
58. G.F.R. Ellis, Physics, complexity, and causality. *Nature* **435**, 743 (2005)
59. G.F.R. Ellis, Issues in the philosophy of cosmology, in *Handbook in Philosophy of Physics* ed. by J. Butterfield, J. Earman (Elsevier, 2006), pp. 1183–1285. <http://arxiv.org/pdf/astro-ph/0602280>
60. G.F.R. Ellis, On the nature of causation in complex systems. *Trans. Roy. Soc. S. Afr.* **63**, 69–84 (2008)
61. G.F.R. Ellis, Commentary on ‘An Evolutionarily Informed Education Science’ by David C Geary. *Educ. Psychol.* **43**, 206–213 (2008)
62. G.F.R. Ellis, Top-down causation and emergence: some comments on mechanisms. *J. Roy. Soc. Interface Focus* **2**, 126–140 (2012)
63. G.F.R. Ellis, On the philosophy of cosmology. *Stud. Hist. Philos. Sci. Part B. Stud. Hist. Philos. Mod. Phys.* **46**, 5–23 (2013)
64. G.F.R. Ellis, Necessity, purpose, and chance: the role of randomness and indeterminism in nature from complex macroscopic systems to relativistic cosmology (2014). [http://www.mth.uct.ac.za/~ellis/George\\_Ellis\\_Randomness.pdf](http://www.mth.uct.ac.za/~ellis/George_Ellis_Randomness.pdf)
65. G.F.R. Ellis, D. Noble, T. O’Connor, Top-down causation: an integrating theme within and across the sciences? *Interface Focus* **2**(1) (2012). <http://rsfs.royalsocietypublishing.org/content/2/1/1.short>
66. N.C. Ellis, Emergentism, connectionism and language learning. *Lang. Learn.* **48**, 631–664 (1998)
67. M.B. Elowitz, A.J. Levine, E.D. Siggia, P.S. Swain, Stochastic gene expression in a single cell. *Science* **297**, 1183–1186 (2002)
68. A. Falcon, *Aristotle on Causality*, *The Stanford Encyclopedia of Philosophy* (Spring 2015 Edition). ed. by Edward N. Zalta. <http://plato.stanford.edu/archives/spr2015/entries/aristotle-causality>
69. G. Fauconnier, *Mappings in Thought and Language* (Cambridge University Press, Cambridge, 1997)
70. C. Fernando, E. Szathmáry, P. Husbands, Selectionist and evolutionary approaches to brain function: a critical appraisal. *Front. Comput. Neurosci.* **6**, 24 (2012). doi:10.3389/fncom.2012.00024
71. E. Ferreiro, A. Teberosky, *Literacy Before Schooling* (Heinemann Educational Books, London, 1993)
72. R. Feynman, *The Character of Physical Law* (Modern Library, 1994)
73. R.P. Feynman, R.B. Leighton, M. Sands, *The Feynman Lectures on Physics: Quantum Mechanics* (Addison-Wesley, Reading, Mass, 1965)
74. D. Fleisch, *A Student’s Guide to Maxwell’s Equations* (Cambridge University Press, Cambridge, UK, 2008)
75. R.L. Flood, E. Carson, *Dealing with Complexity: An Introduction to the Theory and Application of Systems Science* (Springer, USA, 1993)

76. A.D. Flurkey, E.J. Paulsen, K.S. Goodman, *Scientific Realism in Studies of Reading* (Laurence Erlbaum, New York, NY, 2008)
77. B. Flyvbjerg, *Making Social Science Matter: Why Social Enquiry Fails and How it Can Succeed Again* (Cambridge University Press, Cambridge, 2001)
78. B. Flyvbjerg, T. Landman, S. Schram, *Real Social Science: Applied Phronesis* (Cambridge University Press, Cambridge, 2012)
79. V.E. Frankl, *Man's Search for Meaning* (Beacon Press, Boston **1963**, (2006))
80. C. Frith, *Making up the Mind: How the Brain Creates Our Mental World* (Blackwell, Malden, 2007)
81. M. Gellman, *The Quark and the Jaguar* (Abacus, London, 1995)
82. S.H. Gellman (ed.), Molecular recognition. *Chem. Rev.* **97**(5), 1231–1232 (1997)
83. M. Gellman, *The Quark and the Jaguar* (Abacus, 2002)
84. S. Gilbert, *Developmental Biology* (Sinauer, Sunderland, 2013)
85. S.F. Gilbert, D. Epel, *Ecological Developmental Biology* (Sinauer, Sunderland, Mass, 2009)
86. P.W. Glimcher, Indeterminacy in brain and behavior. *Annu. Rev. Psychol.* **56**, 25–56 (2005)
87. K.S. Goodman, Reading: a psycholinguistic guessing game, in *Language and Literacy: The Selected Writings of Kenneth Goodman*, vol. 1, ed. by F.V. Gollasch (London, UK, Routledge and Kegan Paul, 1967), pp. 33–44
88. K. Goodman, *What's Whole in Whole Language: 20th Anniversary edn.* (RDR Books, Muskegon, MI, 2005)
89. K. Goodman, “Afterword: whole language and the pedagogy of the absurd. What's whole in whole language” 20th anniversary edition, in *What's Whole in Whole Language: 20th Anniversary Edition* (RDR Books, Muskegon, MI, 2005)
90. K.S. Goodman, *The Truth About DIBELS: What It Is-What It Does* (Heinemann, Portsmouth, NH, 2006)
91. K. Goodman, *Suffer Little Children to Come to Be DIBELed* (2008). <http://www.u.arizona.edu/~kgoodman/sufferlittlechildren.htm>
92. K.S. Goodman, E.B. Smith, R. Meredith, Y.T. Goodman, *Language and Thinking in School: A Whole Language Curriculum* (Richard C. Owen Publishers, New York, NY, 1986)
93. A. Gopnik, A. Meltzoff, P. Kuhl, *The Scientist in the Crib: What Early Learning Tells Us about the Mind* (Perennial, New York, 1999)
94. M. Gove, Speech on improving the quality of teaching and leadership, given on 5 Sept 2013 at Policy Exchange, London (2013), <http://www.gov.uk/government/speeches/michael-gove-speaks-about-the-importance-of-teaching>. Accessed 3 Nov 2013
95. J. Gottschall, *The Storytelling Animal: How Stories Make Us Human* (Boston, Mariner Books, 2012)
96. P. Gray, *Psychology* (Worth, New York, NY, 2011)
97. S.I. Greenspan, S.G. Shanker, *The First Idea: How Symbols, Language, and Intelligence Evolved from our Primate Ancestors to Modern Humans* (Da Capo Press, Cambridge, Mass, 2004)
98. A.C. Guyton, *Basic Human Physiology* (W. B. Saunders, Philadelphia, 1977)
99. N. Hall, *Writing with Reason* (Hodder and Stoughton, London, UK, 1989)
100. M. Halliday, *Learning How to Mean* (Edward Arnold, London, 1975)
101. A.S. Hansen, E.K. O'Shea, Promoter decoding of transcription factor dynamics involves a trade-off between noise and control of gene expression. *Mol. Syst. Biol.* **9**, 704 (2013)
102. C.M. Harris, D.M. Wolpert, Signal-dependent noise determines motor planning. *Nature* **394**, 780–784 (1998)
103. E. Harrison, *Cosmology: The Science of the Universe* (Cambridge University Press, Cambridge, 2000)
104. L.H. Hartwell, J.J. Hopfield, S. Leibler, A.W. Murray, From molecular to modular cell biology. *Nature* **402**, C47–C52 (1999). Supplement (2 December 1999)
105. D. Haslacher, Beyond the computational-representational brain: why affective neuroscience tells us attitudes must be explained on multiple levels. *Front. Behav. Neurosci.* **8**, 419 (2014)
106. J. Hawkins, *On Intelligence* (Holt Paperbacks, New York, NY, 2004)

107. S.B. Heath, *Ways with Words* (Cambridge University Press, Cambridge, 1983)
108. G. Hinshaw, WMAP data put cosmic inflation to the test. *Phys. World* **19**, 16–19 (2006)
109. E.P. Hoel, L. Albantakis, G. Tononi, Quantifying causal emergence shows that macro can beat micro. *PNAS* **110**, 19790–19795 (2013). <http://www.pnas.org/content/110/49/19790>. abstract
110. P.M. Hoffmann, *Life's Ratchet: How Molecular Machines Extract Order from Chaos* (Basic Books, 2012)
111. J.H. Holland, *Adaptation in Natural and Artificial Systems* (MIT Press, Cambridge, MA, 1992)
112. D. Holdaway, *The Foundations of Literacy* (Ashton Scholastic, Sydney, 1979)
113. M. Hoey, *Textual Interaction: An Introduction to Written Discourse Analysis* (Routledge, 2001)
114. M. Hoey, *Lexical Priming: A New Theory of Words and Language* (Routledge, London, UK, 2005)
115. S. Hunston, *Corpora in Applied Linguistics* (Cambridge University Press, Cambridge, 2002)
116. D. Huron, *Sweet Anticipation: Music and the Psychology of Expectation* (MIT Press, Cambridge, MA, 2007)
117. J.S. Hutton, T. Horowitz-Kraus, T. De Witt, S. Holland, Parent-child reading increases activation of brain networks supporting emergent literacy in 3–5 year-old children: an fMRI study. Presentation at *Pediatric Academic Societies* (PAS) annual meeting in San Diego. Session: General Pediatrics and Preventive Pediatrics—Prevention and Early Intervention, 25 Apr 2015
118. J.S. Hutton, T. Horowitz-Kraus, A.L. Mendelsohn, T. DeWitt, S.K. Holland, Home reading environment and brain activation in preschool children listening to stories. *Pediatrics* **136**(3), 466–478 (2015). doi:10.1542/peds.2015-0359
119. P.A. Iglesias, B.P. Ingallis, *Control Theory and Systems Biology* (MIT Press, Cambridge, MA, 2010)
120. C.J. Isham, *Lectures on Quantum Theory: Mathematical and Structural Foundations* (Imperial College Press, London, 1995)
121. L. Jaeger, E.R. Calkins, Downward causation by information control in micro-organisms. *Interface Focus* **2**, 26–41 (2012)
122. J. Kagan, *The Human Spark: The Science of Human Development* (Basic Books, 2013)
123. E. Kandel, *Psychiatry, Psychoanalysis, and the New Biology of Mind* (American Psychiatric Publishing, Washington, DC, 2005)
124. E. Kandel, *The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain, from Vienna 1900 to the Present* (Random House, 2012)
125. E.R. Kandel, J.H. Schwartz, T.M. Jessell, *Principles of Neural Science* (McGraw Hill, New York, 2000)
126. D.E. Knuth, *Selected Papers on Design of Algorithms* (Center for the Study of Language and Information, Stanford, CA, 2010)
127. S.D. Krashen, T.D. Terrell, *The Natural Approach: Language Acquisition in the Classroom* (Alemany Press, San Francisco, CA, 1983)
128. B.-O. Küppers, *Information and the Origin of Life* (The MIT Press, Cambridge, Mass, 1990)
129. J. Le Fanu, *The Rise and Fall of Modern medicine* (Abacus, 2011)
130. J.-M. Lehn, Perspectives in supramolecular chemistry: from molecular recognition towards molecular information processing and self-organization. *Angew. Chem. Int. Ed. Engl.* **27**, 89–121 (1988)
131. J.-M. Lehn, *Supramolecular Chemistry* (Wiley-VCH, Weinheim, 1995)
132. D.J. Levitin, *This Is Your Brain on Music: The Science of a Human Obsession* (Plume, London, UK, 2007)
133. C.S. Lewis, *Of Other Worlds: Essays and Stories* (Harcourt, 1966)
134. O. Lombardi, The ontological autonomy of the chemical world: facing the criticisms, in *Philosophy of Chemistry*, ed. by E. Scerri, L. McIntyre, vol. 306. Boston Studies in the Philosophy and History of Science
135. J.E. Longres, *Human Behaviour in the Social Environment* (F.E. Peacock, 1990)

136. G.R. Lyon, J.M. Rumsey (eds.), *Neuroimaging: A Window to the Neurological Foundations of Learning and Behaviour in Children* (Brookes, Baltimore, 1996)
137. P.K. Maini, T.E. Woolley, R.E. Baker, E.A. Gaffney, S.S. Lee, Turing's model for biological pattern formation and the robustness problem. *Interface Focus* **2**, 487–496 (2012)
138. D. Marr, *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information* (W.H. Freeman, San Francisco, 1982)
139. M. Martinez, A. Moyo, Natural selection and multi-level causation. *Philos. Theor. Biol.* **3**, 2 (2011). <http://quod.lib.umich.edu/p/ptb/6959004.0003.002/-natural-selection-and-multi-level-causation?rgn=main;view=fulltex>
140. H.H. McAdams, A. Arkin, Stochastic mechanisms in gene expression. *Proc. Nat. Acad. Sci.* **94**, 814–819 (1997)
141. G. McGhee, *Convergent Evolution: Limited Forms most Beautiful* (MIT Press, Cambridge, Mass, 2010)
142. G. McGhee, *Convergent Evolution: Limited Forms Most Beautiful* (MIT Press, Cambridge, Mass, 2011)
143. A.R. McIntosh, N. Kovacevic, R.J. Itier, Increased brain signal variability accompanies lower behavioral variability in development. *PLOS Comput. Biol.* **4**, e1000106 (2008)
144. A.R. McIntosh, N. Kovacevic, S. Lippe, D. Garrett, C. Grady, V. Jirsa, The development of a noisy brain. *Arch. Ital. Biol.* **148**, 323–337 (2010)
145. R. Meyer, *Phonics Exposed: Understanding and Resisting Systematic Direct Intense Phonics Instruction* (Erlbaum, London, 2002)
146. M. Miodownik, *Stuff Matters: Exploring the Marvelous Materials that Shape our Man-Made World* (Houghton Mifflin Harcourt, Boston, 2014)
147. J. Monod, *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology* (Penguin, 1997)
148. V.F. Mukhanov, H.A. Feldman, R.H. Brandenberger, Theory of cosmological perturbations. *Phys. Rep.* **215**, 203–333 (1992)
149. N. Murphy, W. Brown, *Did My Neurons Make me Do it? Philosophical and Neurobiological Perspectives on Moral Responsibility and Free Will* (Oxford University Press, New York, 2007)
150. N. Murphy, G.F.R. Ellis, T. O'Connor (eds.), *Downward Causation and the Neurobiology of Free Will* (Springer, Heidelberg, 2009)
151. J.K. Nicholson, E. Holmes, J.C. Lindon, I.D. Wilson, The challenges of modeling mammalian biocomplexity. *Nat. Biotechnol.* **22**, 1268–1274 (2004)
152. D. Noble, *The Music of Life: Biology Beyond Genes* (Oxford University Press, Oxford, 2008)
153. D. Noble, A theory of biological relativity: no privileged level of causation. *Interface Focus* **2**, 55–64 (2012)
154. V.G. Paley, *The Boy Who Would Be a Helicopter: The Uses of Storytelling in the Classroom* (Harvard University Press, Cambridge, MA, 1990)
155. Quaker Faith and Practice, 27.22 (Religious Society of Friends, London)
156. R. Penrose, *The Large, the Small and the Human Mind* (Cambridge University Press, Canton, 2000)
157. I. Percival, Schrödinger's quantum cat. *Nature* **351**, 357 (1991)
158. G.A. Petsko, D. Ringe, *Protein Structure and Function* (Oxford University Press, Oxford, 2009)
159. J. Piaget, *Play, Dreams and Imitation in Childhood* (Norton, New York, 1962)
160. D. Purves, *Brains: How they Seem to Work* (FT Press Science, Upper Saddle River, NJ, 2010)
161. A. Rae, *Quantum Physics: Illusion or Reality?* (Cambridge University Press, Cambridge, 1994)
162. C.V. Rao, D.M. Wolf, A.P. Arkin, Control, exploitation and tolerance of intracellular noise. *Nature* **420**, 231–237 (2002)
163. J.M. Raser, E.K. O'Shea, Noise in gene expression: origins, consequences, and control. *Science* **309**, 2010–2013 (2005)
164. R. Rhoades, R. Pflanzer, *Human Physiology* (Saunders College Publishing, Fort Worth, 1989)