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Notes

Preface

- 1 By 'information system' we mean far more than mere computer systems, and include every aspect of collecting, disseminating, analysing and utilizing 'information'.

Chapter One

- 1 From 'Akasha', the Sanskrit word meaning 'space'.
- 2 In the original Greek this is 'ΕΝ ΟΙΔΑ ΟΤΙ ΟΥΔΕΝ ΟΙΔΑ'.
- 3 The authors refuse to disrupt the text with politically correct references to he/she, him/her, his/hers. In this book they are describing their own personal delusions (their refined ignorance), and since both are male, they will use a gender-free 'he' when referring to the third person singular. They have no objections should female readers choose to feminize the text with global edits. There are, however, sections where they do use 'she' where for clarity they need to differentiate between two separate third persons – furthermore, the text will always refer to the imagined reader of this book as 'her'.
- 4 A similar paradox appears in the famous ancient quotation: 'Epimenides the Cretan says all Cretans are liars'.
- 5 The book expands on issue of 'zero' in Chapter 5.
- 6 Higgs boson a.k.a. the God particle, proposed by Professor Peter Higgs as an 'explanation' of how the universe holds itself together. The multi-billion dollar Large Hadron Collider that came online in CERN on 10 September 2008 will be leading the hunt.
- 7 <http://www.viscog.com> and for the full story read (Chabris & Simons, 2010).

Chapter Two

- 1 For the uninitiated, 'the Scottish play' is what superstitious actors call Shakespeare's *Macbeth*.
- 2 Some American geologists support Plutarch's suspicions that the high priestess at Delphi made her predictions while 'high' from sniffing a gas (ethylene) that seeped up through a rock fissure under the temple.
- 3 An excellent introduction and a list of further readings may be found in the Encyclopaedia Britannica.
- 4 For instance, the notion of profiling and belief that 'identity' can be captured in a database.
- 5 A peculiarly sixteenth-century spelling of 'forward'.
- 6 There are books galore based on the 2012 prediction – see for example Douglas, D. (2009), *The Mayan Prophecy 2012: The Mayan Calendar and the End of Time*, London: Godsfield Press.
- 7 Rees, N. (1997), *Cassell Companion to Quotations*, London: Cassell.
- 8 The late Douglas Adams, a proselytizing technophile, gave the answer 42 to this ultimate question in his *Hitchhiker's Guide to the Galaxy*. At the behest of 'a group of hyper-intelligent pan dimensional beings', the giant computer Deep Thought took seven and a half million years to come up with '7 times 8 equals 42', which in ridicule makes exactly the same point as this book. This was quite unintentional on Adams's part: he was not making a philosophical joke – once, in a private conversation, he informed Ian Angell that he used the solemn announcement of this ironical statement simply because it sounded funny.
- 9 Hawking, S. (2001), *Universe in a Nutshell*, London: Bantam Press.
- 10 The famous quotation of American composer Charles Ives.

Chapter Three

- 1 For a treatise on the case of Galileo the interested reader may refer to Professor Paul Feyerabend's study in Feyerabend (1975).
- 2 What Alexander Pope actually wrote was 'All discord, harmony not understood' in *An Essay on Man* (1733), Epistle 1, line 289.
- 3 Many of the qualifications do not qualify the qualified to do anything; these merely differentiate (often arbitrarily), separate and place in order (a hierarchy), thereby sustaining order in society.

Chapter Four

- 1 Allusion: an expression designed to call something to mind without mentioning it explicitly.
- 2 From Hamlet, Act II, scene ii by Shakespeare.
- 3 The five senses of Aristotle are used here for rhetorical purposes. We deliberately ignore the many other senses proposed by neurologists including balance, pain, temperature difference etc.
- 4 The authors' mutation of Descartes's *Cogito Ergo Sum* – 'I think, therefore I am.'
- 5 A common variant on the Socrates quotation 'I know nothing except the fact of my ignorance' found in *Lives of Eminent Philosophers* by Diogenes Laertius. See note 2 of Chapter 1 above.
- 6 One of the many variants of this quotation; attributed to both Alexandre Dumas *filis* and Mark Twain.

Chapter Five

- 1 Measurement is the comparison with an artificially designated standard unit (an ideal).
- 2 There are many competing claims about who invented zero, although there is unambiguous documentation of the great Indian Astronomer Aryabhata using the concept in the sixth century AD.
- 3 <http://www.johnstonsarchive.net/nuclear/radeventdata.html> (statistical summary of radiation accidents and other events causing radiation casualties).

Chapter Six

- 1 Quoted in the Sunday Telegraph, 26 May 1968.
- 2 The notions of negative and positive feedback are revisited in more detail in Chapter 7.
- 3 Theoretically, even the 'insignificant' flapping of a butterfly's wings (originally it was a seagull's wings, but that wasn't so picturesque), through complex feedback, can trigger a major weather feature. This was proposed in Edward Lorenz's 1972 talk to the American Association for the Advancement of Science, 'Predictability: Does the flap of a butterfly's wings in Brazil set off a tornado in Texas?' as reported by Hilborn (1994).
- 4 The Guardian, 17 February 2008: 'Scandal of patients left for hours outside A&E'.
- 5 The first linking of this diabolical trinity is attributed to British Prime Minister Benjamin Disraeli.
- 6 'Markets can remain irrational longer than you can remain solvent.'

Chapter Seven

- 1 This definition is a combination of those given by Ackoff (1981) and Beishon and Peters (1972).

- 2 Strictly speaking ‘... every organization must be *both more and less* than the sum of its parts. It is less, because organization constrains. ... It is more because, when organised, [components] are enabled to do together what none could do alone, or if unorganised, even together’ (Sir Geoffrey Vickers).
- 3 The notion of holism was promoted in the 1920s by Jan Christiaan Smuts, the South African general, prime minister and statesman.

Chapter Eight

- 1 Which came first, the chicken or the egg? The classic causality dilemma within any structural coupling.
- 2 This creates another paradox because notations have to be communicated as well. Interestingly enough, this may create either self-referential processes (whereby a notation like language uses itself to communicate about itself) or structural couplings between different notations. But if a common notation is what is being used for depicting a frame for communication, what are the implications if the notation itself is the frame through which a notation communicates itself? Ultimately, the very fact that we are using language to communicate ideas about the implications of the communicability of language itself (based on observation) contains further paradoxes.
- 3 A more elaborate treatise on the issue of self-referentiality follows in the next chapter.

Chapter Nine

- 1 Resolving a paradox doesn’t mean the paradox goes away, only that it is encapsulated and ignored.
- 2 The observation as a whole does not imply B as a whole – the observation can only ever sample B.
- 3 To be pedantic, never-ending here means only ending with the extinction of the self-stokhastik species.
- 4 The importance was that for the first time, an introduction to *quantum* (and therefore discrete energy) levels was introduced. In this, n could take only positive integer values.
- 5 Isaac Newton described himself (and all scientists) as standing on the shoulders of giants. The original use of this imagery is ascribed to twelfth-century monk, Bernard of Chartres.
- 6 On a more general note, this is exactly what happens with the development of a culture, and with individuals’ acceptance of the world as the way their community describes it.

Chapter Eleven

- 1 Nils Roll-Hansen (2004) in *Lysenko Effect: The Politics of Science*. For thirty years, until the mid-1960s, Soviet agriculture was dominated by the fanatical Trofim Denisovich Lysenko, who claimed his technique of ‘vernalization’ could radically increase wheat yield. The theory fitted the Soviet ideology, and so all evidence to the contrary was suppressed. This is just an extreme case of a ‘Scientific Establishment’ being compromised by the political correctness of the time.
- 2 Following Feynman here, and in the sense of the *natural sciences*, mathematics is a non-science; it is an abstraction that allows physics to formalize its problems, and also to provide the language for their better modelling. We are not debating here the ‘scientific’ value of mathematics and its considerable contribution to physics; we are just re-describing this crucial epistemological distinction with sheer amazement!
- 3 Teaching is the way a self-referential group/system reinforces its particular absurdities. Repeated exposure and the rites of passage of examination ensure that the ideas become ‘sensible’ among initiates.

Chapter Twelve

- 1 This experiment (i.e. *the double-slit experiment with single electrons*) was performed by the Hitachi research group. The reader of this book can find more information about this at: <http://www.hitachi.com/rd/research/em/doubleslit.html> where there is also a short video from this version of the double-slit experiment.
- 2 http://en.wikipedia.org/wiki/File:Double-slit_experiment_results_Tanamura_2.jpg2. http://en.wikipedia.org/wiki/File:Double-slit_experiment_results_Tanamura_2.jpg
- 3 This is typically done by placing a detector at one or both of the two slits (see *The Feynman lectures*).
- 4 ‘Quantum Behavior’, Chapter 37, *The Feynman Lectures on Physics*, Addison-Wesley, Reading, MA, 1964.
- 5 An observation that comes from years of teaching in the field. Equally surprising is the fact that others display a profound enthusiasm for Systems Theory on being introduced to its ideas, regardless of their background field of study.

Chapter Thirteen

- 1 This quotation is taken from Harold Pinter’s acceptance speech of the 2005 Nobel Prize for Literature.