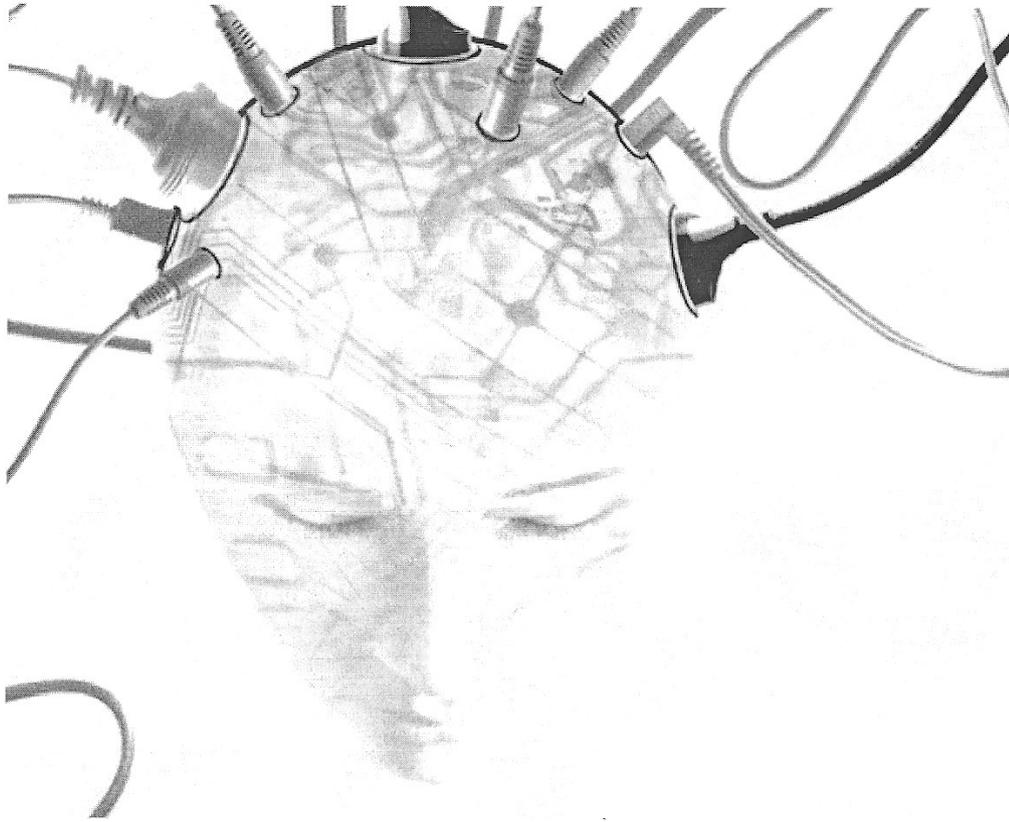


Spirituality in the Age of Artificial Intelligence



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Declaration of originality

Except where reference is made in the text, this research essay contains no material published elsewhere. No other person's work has been used without due acknowledgement in the main text of the research essay. This research essay has not been submitted for the award of any degree or diploma in any other institution.

Signature:.....

Date:.....

Philippa Mary Power

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Abstract

My purpose is to explore the future for its spirituality. I will analyse specific futuristic predictions and debates about artificial intelligence (AI), centring on Ray Kurzweil's concept of evolutionary technology culminating in The Singularity, a predicted time when human, but largely artificial intelligence, will dominate life as we know it.

Kurzweil's technological milieu of AI, enhanced humans and spiritual machines will be considered for its philosophical roots, its significance to consciousness and free will and its fit with theological notions of eschata. I suggest that the evolution of scientific knowledge has coincided with more tolerant, compassionate and productive spirituality in which forgiveness becomes imperative and conclude that there is much to be learnt about the human condition and spirituality from progress in artificial intelligence.

Key words

Future spirituality, Artificial Intelligence (AI), Ray Kurzweil, evolutionary technology, The Singularity, enhanced humans, spiritual machines, consciousness, free will, eschata, forgiveness, hope.

Introduction

“Technology will match and then vastly exceed the refinements and subtleness of what we regard as the best of human traits.”¹

This is how Ray Kurzweil describes the most important implication of “The Singularity” ... “the destiny of the human machine civilisation”.² This thesis will consider future directions for spirituality in the context of such technological advance, the race between biology and technology in the evolution of man and, in particular, the merging of biological and artificial intelligence. Futurist prognoses such as “the Singularity”³ will be considered, emphasising spiritual implications of merging biological with artificial intelligence and, potentially, overtaking of the former by the latter.

Human spirituality here includes both formalised religious constructs and generalised notions of spirit as a state, or form, beyond the material.⁴ The compass of this paper is limited to specific prognoses regarding artificial intelligence, spirituality and associated behaviour. It does not purport to comprehensively define the extensive topic of what spirituality is and/or may be.⁵

¹ Ray Kurzweil, *The Singularity Is Near. When Humans Transcend Biology* (London: Gerald Duckworth and Co. Ltd., 2005), 9.

² *Ibid.*, 5. See also Vernor Vinge (Department of Mathematics, San Diego State University) who first wrote on “Singularity” as a post human era caused by the “imminent creation by technology of entities with greater than human intelligence” – *The Coming Technological Singularity* presented at the Vision 21 symposium sponsored by NASA et al in March 1993, printed in the Winter 1993 issue of *Whole Earth Review*.

³ In mathematics the Singularity is a value beyond any limit, infinity. In physics “Singularity” refers to a point of zero size with infinite density of mass and, therefore, infinite gravity. It denotes unimaginably large values. Conceptually, Kurzweil compares this to particles from a glow called Hawking Radiation after Stephen Hawking, which gives some light into what is happening inside the black hole.

⁴ Perhaps even the immaterial and ultimate reality, see Ewert Cousins in *Modern Esoteric Spirituality* (Faivre, Antoine & Needleman, Jacob, Crossroad Publishing, 1992), Preface, a mechanism for ascertaining the “deepest values and meanings by which people live.” See also Philip Sheldrake, *A Brief History Of Spirituality* (Wiley-Blackwell, 2007), 1-2.

⁵ See, for example, Philip Sheldrake, *Spaces For The Sacred Place, Memory And Identity* (Baltimore, John Hopkins University Press, 2001) and his work in interconnecting societal space, history and theology as formative to spirituality, Philip Sheldrake, *Christian Spirituality As a Way Of Living Publicly: A Dialectic Of The Mystical And The Prophetic In Minding The Spirit, The Study Of Christian Spirituality*, Elizabeth A. Dreyer and Mark S. Burrows (Baltimore: John Hopkins University Press) 282-298 and David Hay, *Something There: The Biology Of The Human Spirit* (Darton, Longman and Todd Ltd., 2006) for analysis and argument in support of biological bases for human experiences of spirituality – relative to religious and nonreligious spiritual experience.

Critiques of Kurzweil go to the question of the nature of spirituality, an immaterial and theist orientation peculiar to man, or a more cosmically available state of consciousness.

Intelligence here means thinking states, more than an ability to know and requiring understanding. Artificial means not real, not from nature and specifically, from technology and nonbiological.

Artificial Intelligence (AI)⁶ here is used as a collective term for technology that performs a variety of knowing, reasoning and/or understanding tasks, not biological intellect/entities per se. There is a significant shift, when men's devices are no longer of the natural world and are machines that do things by themselves and/or become part of the man, doing things for him. What becomes both of the machine and the man; can the former obtain spirituality and/or the latter lose it?

Two futurist predictions related to "The Singularity" will be considered; the first, "enhanced" humans, who will have their biology, including brains, supplemented and replaced with technology, such as nanobots and secondly, machines so advanced as to be similar to and more capable than, human intelligence and, arguably, spiritual. In this milieu, will humans be diminished spiritually, what will the spiritual capacities of machines be and how will enhanced humans and enhanced machines relate to each other on things spiritual? In behavioural human/machine contexts, the nature of consciousness, moral interaction and concepts of free will are recurring issues.

The human inclination to be spiritual will be considered, both as to next world desire for immortality and in this world the desire for deeper, contemporary, meaning and purpose, beyond the immediate and the tangible. Both desires involve and require some knowledge of facts and logical cognitive processes. They also involve and require amorphous and intuitive responses, of an illogical and, perhaps, unscientific nature. The latter may be difficult to replicate, because scientific technological replication aims at order, predictability and, ultimately, simplicity. Factual knowledge can be coded and

⁶ The appropriate classification of artificial intelligence as a science is a larger debate beyond the compass of this paper. J.A. Campbell has argued that it is currently a protoscience containing abstractions including heuristics and models: "One feature which distinguishes AI from other sciences is that it refers to objects which are created by humans, rather than objects which exist in nature. AI can also be viewed as a technology, since technologies also deal with created objects. Most technologies, however, differ from AI in having their parameters set by a sciences of the materials from which they themselves are created." J.A. Campbell, *On Artificial Intelligence (Artificial Intelligence Review, 1986)*, 1, 3-9.

replicated, but can intuitive randomness? And what of that which is not, arguably, even intuitive, the mystical? The issues and answers may be more complex than science would hope, but still be solvable.

Prognoses of human intelligence being supplanted by machine intelligence, further appear to provide challenges to the core spiritual superiority of man, as opposed to the rest of nature/creation, in many formalised religious constructs. Kurzweil comments in his Epilogue to *The Singularity Is Near*, entitled “Human Centrality,” quoting Stephen Jay Gould ... “The most important scientific revolutions all include, as their only common feature, the dethronement of human arrogance from one pedestal after another of previous convictions about our centrality in the cosmos,”⁷ then argues that “we are central after all. Our ability to create models — virtual realities — in our brains, combined with our modest-looking thumbs, has been sufficient to usher in another form of evolution : technology. That development enabled the persistence of the accelerating pace that started with biological evolution. It will continue until the entire universe is at our fingertips.”⁸

The significance of such developments, in the area of spirituality, has been debated for some years, primarily in the USA, with the extension of futurist prognoses to encompass the possibility of “Spiritual Machines.”⁹ From this arise issues as to what is a person, an human person, consciousness and intelligence itself and indeed whether humans are free agents, computers, or “really software stuck in increasingly obsolete, fleshy hardware?”¹⁰ Suggest George F. Gilder and Jay W. Richards, “although Artificial Intelligence may seem like an esoteric topic with little relevance to anything else, in fact, many of the most important questions we face from technology to theology converge in this single subject,”¹¹ questions too extensive to comprehensively deal with in this Masters Thesis. Those I will concentrate on are: issues of consciousness, as related to spirituality, in particular Kurzweil’s analogy to machines being potentially conscious

⁷ Kurzweil, *The Singularity Is Near*, 487, and see Stephen Jay Gould, *Jove’s Thunderbolts; Natural History* 103.10 (October 1994): 6-12; Chapter 13 in *Dinosaur in a Haystack: Reflections in Natural History* (New York: Harmony Books, 1995).

⁸ Kurzweil, *The Singularity Is Near*, 487.

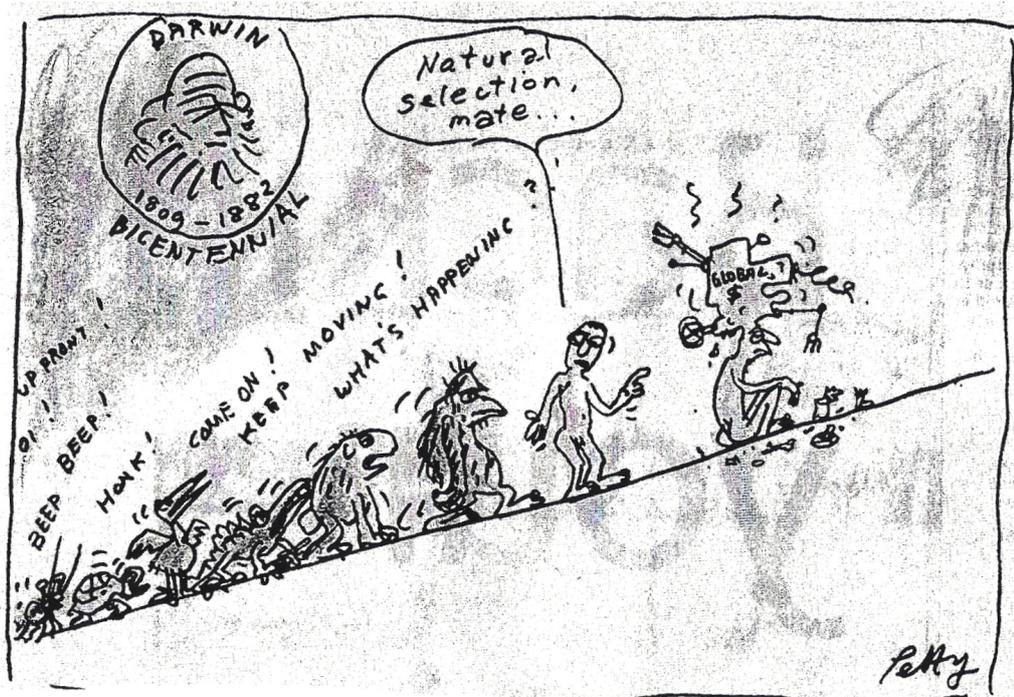
⁹ See in particular Ray Kurzweil, *The Age of Spiritual Machines. When Computers Exceed Human Intelligence* (New York: Viking Penguin, 1999).

¹⁰ George Gilder and Jay W. Richards, chapter entitled *Are We Spiritual Machines? The Beginning Of A Debate*, in Jay W. Richards et al, *Are We Spiritual Machines?: Ray Kurzweil vs. The Critics Of Strong A.I.* (Seattle: Discovery Institute, 2002), 3.

¹¹ *Ibid.*, 3.

and therefore spiritual, moral issues connected with machine spirituality (spirituality having both an inner component in the subject and an outer, active component associated with moral behaviour) and the extent to which research into replicating human intelligence artificially, has cast doubt on the extent to which human wills may truly be free.

May I set the scene with a picture saying a thousand words, Bruce Petty's cartoon in *The Age* on the 9th of February, 2009, commemorating the bicentenary of the birth of Charles Darwin.



The debate which will ensue is about evolution; biological, technological, spiritual and how they may all contribute to ultimate truth.

Chapter One

The Singularity

Kurzweil's précis of his Singularity is as follows;

A future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed. Although neither Utopian nor Dystopian, ... (it) will transform the concepts that we rely on to give meaning to our lives, from our business models to the cycle of human life, including death itself. Understanding the Singularity will alter our perspective on the significance of our past and the ramifications for our future. To truly understand it inherently changes one's view of life in general and one's own particular life.¹²

Further, "The key idea underlying the impending Singularity is that the pace of change of our human-creative technology is accelerating and its powers are expanding at an exponential pace."¹³ "Before the middle of this century, the growth rates of our technology – which will be indistinguishable from ourselves – will be so steep as to appear essentially vertical.... the growth rates will be finite but so extreme that the changes they bring about will appear to rupture the fabric of human history. That, at least, will be the perspective of unenhanced biological humanity."¹⁴

Kurzweil's main texts which develop this subject are: *The Singularity Is Near. When Humans Transcend Biology*;¹⁵ *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*¹⁶ and *The Age of Intelligent Machines*.¹⁷ His philosophical position is basically materialist, proposing that ideas come from matter rather than higher or divine intelligence, although he does propose a transcendence of intellect in his sixth epoch of evolution (which is referred to in more detail later), as being something short of the infinite:

¹² Kurzweil, *The Singularity Is Near*, 7.

¹³ *Ibid.*, 7-8.

¹⁴ *Ibid.*, 9.

¹⁵ See note 1

¹⁶ See note 9

¹⁷ Ray Kurzweil, *The Age Of Intelligent Machines* (Cambridge MA.: MIT Press, 1999)

The material world inherently evolves, and each stage transcends the stage before it. ...evolution moves toward greater complexity, greater elegance, greater knowledge, greater intelligence, greater beauty, greater creativity, greater love. And God has been called all these things, only without any limitation: infinite knowledge, infinite intelligence, infinite beauty, infinite creativity and infinite love. Evolution does not achieve an infinite level, but as it explodes exponentially it certainly moves in that direction. So evolution moves inexorably toward our conception of God, albeit never reaching this ideal.¹⁸

Salvation of sorts and eschata for Kurzweil are to be found in becoming “one with our more rapidly evolving, durable and reliable technology (with) ...immortality... somewhere downstream from the flow of cosmic evolution, with its ever accelerating rate of returns.”¹⁹ Suggest Gilder and Richards, “Kurzweil’s seems to be a substitute vision for those who have lost faith in the traditional object of religious belief... (eventually appealing) to the idea of God (and Kurzweil seeks)...transcendence in an intellectual culture that has lost its faith in the Transcendent.”²⁰

Kurzweil’s scientific prognoses have some solid and existing factual bases and, therefore, implications for us all, no matter what our philosophical, or religious inclinations. They potentially alter both the subjective and objective milieu in which we function spiritually. The next section summarises the bases of Kurzweil’s prognoses.

1.1 Summary of the Principles involved with The Singularity

Kurzweil’s thesis relies on the following:²¹

1. That technical innovation is accelerating and doubling every decade.
2. The power (interpreted as price-performance, speed, capacity and bandwidth) of information technologies is growing exponentially faster, now doubling the value about every year, including the amount of human knowledge. Kurzweil’s simple chart setting out the comparisons between linear and exponential growth²² neatly depicts the principle of exponential growth.

¹⁸ Kurzweil, *The Singularity Is Near*, 476.

¹⁹ Jay W. Richards et al, *Are We Spiritual Machines?*, 11.

²⁰ *Ibid.*, 11.

²¹ Kurzweil, *The Singularity Is Near*, 25-29.

²² *Ibid.*, 10.

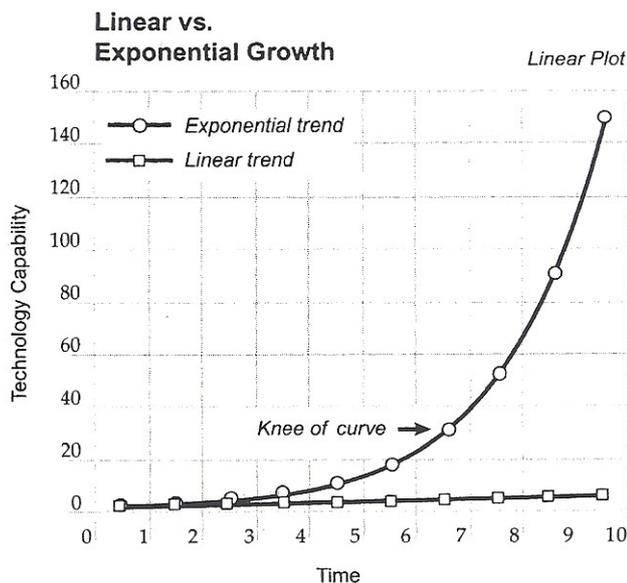


Table 1: Kurzweil’s table of Linear versus Exponential Growth
 Linear growth is steady, exponential growth becomes explosive

3. Information technology has a second level of exponential growth (referred to as the exponent), which is exponential growth at the rate of exponential growth, based on the assumption that as technology becomes more cost effective, there are more resources deployed towards its advancement. The two diagrams set out below depicting exponential growth of computing in the twentieth century through to the twenty-first century and the growth in super-computer power, indicate the extent of the exponential growth of computing and information technology.²³

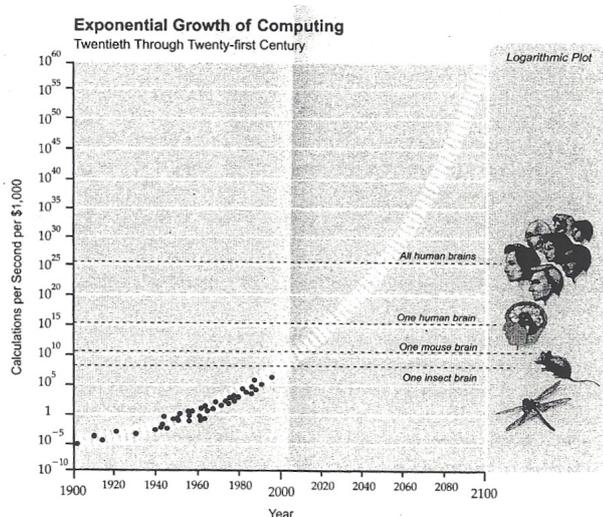


Table 2: Kurzweil’s table of Exponential Growth of Computing Twentieth through Twenty-first Century

²³ Kurzweil, *The Singularity Is Near*, 70-71.

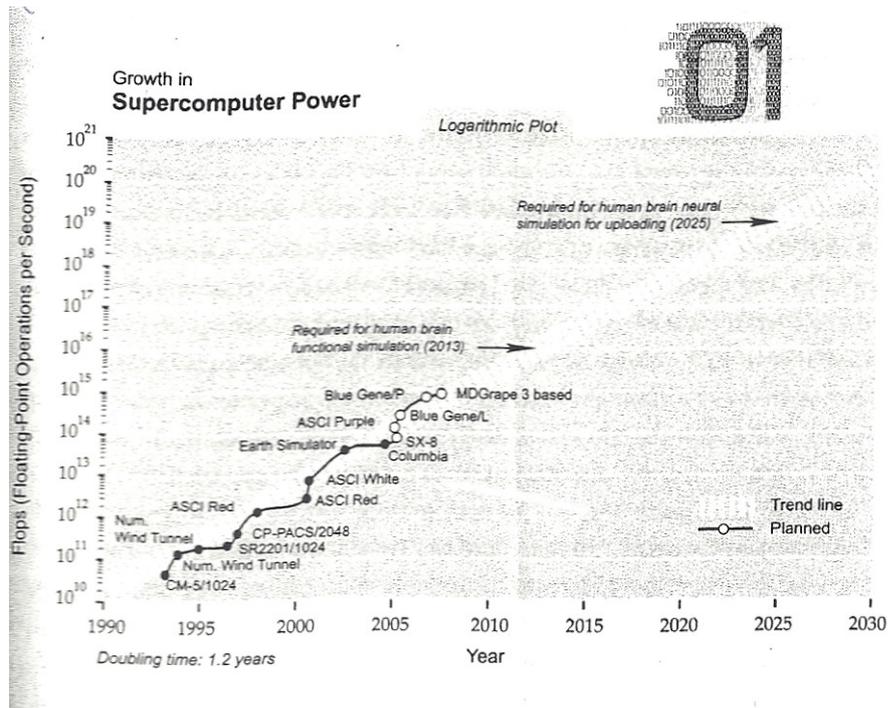


Table 3: Kurzweil's table of Growth in Supercomputer Power

4. Human brain scanning, one of the exponentially improving technologies, is doubling each year, including reverse engineering (referred to as decoding) of the human brain's principles of operation, the prognosis being that we will have a detailed understanding of how all the regions of the human brain work.
5. There will be the hardware to emulate human intelligence, via super computers, by the end of this decade, with personal computer devices by the end of the following decade and effective software models of human intelligence by the mid 2020s. Intelligence, indistinguishable from that of biological humans in computers, will exist by the same time.
6. There will be a combination of the traditional strengths of human intelligence and machine intelligence; the former strengths include the ability to recognise patterns that are based on subtle, invariant properties, human ability to apply insights and infer principles from experience, including information gathered through language, together with the ability to create mental models of reality and to conduct "what-if" experiments by varying aspects of these models.
7. The strengths of machine intelligence include the ability to remember billions of facts precisely and recall them instantly and once done, to be performed repeatedly at a high speed with optimal accuracy, without tiring. Machines can also share their knowledge at extremely high speed compared with the low speed of human

knowledge, sharing through language and nonbiological intelligence and will be able to download skills and knowledge from other machines and eventually from humans.

8. Machines will process and switch signals at close to the speed of light, i.e., about 300 million metres per second, compared with 100 metres per second in biological brains, i.e. a ratio of at least 3 million to one. Machines will have access to all the knowledge of the Internet and be able to master it; they will pool their resources, intelligence and memories.

Here Kurzweil gives an interesting analogy. In such pooling, two machines or a million machines, can join together and become one and then become separate again and multiple machines can do both at the same time, i.e. become one and separate spontaneously. “Humans call this falling in love, but our biological ability to do this is fleeting and unreliable.”²⁴ Kurzweil summarises these as “the traditional strengths,” being pattern recognition ability in the biological human intelligence and the speed memory accuracy knowledge and skill sharing abilities of non-biological intelligence. He says this combination will be “formidable”²⁵

9. Machine intelligence will have complete freedom of design and architecture in the sense that it will not be constrained by biological limitations, such as slow speeds of interneuronal connections, or fixed skull size and, therefore, will be consistent in performance at all times.
10. In the partnership of the nonbiological and biological – the former will continue to have the benefit of double exponential growth, referred to earlier. Once machines can do the things that humans can do, only at far higher speeds and capacities, they will have access to their own designs, which Kurzweil refers to here as “source code” and compares to human ability to manipulate by biotechnology (changing genetic and other information processes underlying biology). His prediction is that machines will be able to manipulate their own nature, as humans have learned to do biologically.

²⁴ Kurzweil, *The Singularity Is Near*, 26. See also Marvin Minsky, *The Emotion Machine* (New York: Simon & Schuster, 2006), 11, referred to in more detail later in this paper. Minsky considers, in great detail, emotions and artificial intelligence. He says love is “a kind of suitcase-like word,” including many attachments and a love for love itself.

²⁵ At point 5 previously, is Kurzweil’s prediction that the machines’ intelligence will in fact emulate the human form and, therefore, one wonders how long this “formidable” partnership will be a cooperative and balanced arrangement.

11. Biology has “inherent limitations” based on living organisms being built from proteins that are folded from one-dimensional strings of amino acids. Protein based mechanisms lack speed and strength. Organs and systems will be able to be re-engineered in our biological bodies and brains to be vastly more capable.
12. The architecture of the human brain is “profoundly limited.”²⁶ There is room for only about one hundred trillion interneuronal connections in each human skull. Kurzweil gives the analogy that the increase in the larger cerebral cortex, plus increased gray matter tissue in brains over a slow timescale of biological evolution, gave greater cognitive ability to humans over other primates. He says machines will be able to reformulate their own designs and augment their own capacities without limit by using nanotechnology-based designs. These will occur without size, or energy consumption increases.

Machines use fast three-dimensional molecular circuits more than one million times faster than the electrochemical switching used in our brains. Each of these circuits will be based on nanotubes, being tiny cylinders of carbon atoms that measure about 10 atoms across which are five hundred times smaller than today’s silicon-based transistors.
13. Nanotechnology will, in addition to the improved nonbiological intelligence, enable the manipulation of physical reality at the molecular level. This nanotechnology will include nanobots, i.e. robots designed at the molecular level measured in millionths of a metre, such as “respirocytes” which are mechanical red-blood cells. Nanobots will have many roles within the human body, including reversing human ageing, where it has not occurred through biotechnology, such as genetic engineering. Nanobots will interact within biological neurons to vastly extend human experience by creating virtual reality *from within the nervous system* (my italics). Millions of nanobots in the capillaries of the brain will also vastly extend human intelligence.
14. Once nonbiological intelligence is introduced into the human brain, which Kurzweil argues has already started with computerised neural implants, the machine intelligence in our brains will grow exponentially, at least doubling in power each year, contrasting with biological intelligence, which is, effectively, a fixed capacity. The result is that the nonbiological portion of our intelligence will

²⁶ Kurzweil, *The Singularity Is Near*, 27.

“ultimately predominate.”²⁷ Nanobots, called foglets, that can manipulate image and sound waves, will bring the morphing qualities of virtual reality to the real world.

15. Human ability to understand and respond appropriately to emotion, referred to as emotional intelligence, (on which I will elaborate later), is one of the forms of human intelligence that will be understood and mastered by future machine intelligence. Kurzweil says some of our “emotional responses are tuned to optimise our intelligence in the context of our limited and frail biological bodies”²⁸ and that future machine intelligence will also have “bodies,” including virtual bodies in virtual reality, using foglets in order to interact with the world, but these nano-engineered bodies will be far more capable and durable than biological human bodies “thus, some of the ‘emotional’ responses of future machine intelligence will be redesigned to reflect their vastly enhanced physical capabilities”²⁹
16. Virtual reality, from within the nervous system, will compete with real reality in terms of resolution and believability and, increasingly, our experiences will take place in virtual environments in which we can become different people, both physically and emotionally. He gives an example of one’s romantic partner, who will be able to select a different body for the other partner, than you might select for yourself and vice-versa.
17. The next development exhibits elements of infinity. This comes about via “the law of accelerating returns continuing until non-biological intelligence becomes close to “saturating” the matter and energy in our vicinity of the universe.” Saturation in this context means using the matter and energy patterns for computation to an optimal degree, which is based on current understanding of the physics of computation. Approaching “this limit, the intelligence of our civilisation will continue its expansion in capability by spreading outward towards the rest of the universe... (and) the speed of this expansion will quickly achieve the maximum speed at which information can travel.” Here we have “the destiny of the universe” with the entire universe becoming saturated with our intelligence and

²⁷ Kurzweil, *The Singularity Is Near*, 28.

²⁸ *Ibid.*, 28.

²⁹ *Ibid.*, 29.

“we will determine our own fate rather than have it determined by the current ‘dumb,’ simple, machine-like forces that rule celestial mechanics.”

The time this will take will depend on whether or not the speed of light is an immutable limit, the “possible subtle exceptions (or circumventions) to this limit” which “the vast intelligence of our civilisation will in the future be able to exploit.”³⁰

1.2 So what will this time be like?

Kurzweil says he has difficulty in speculating what life would be like in this projected future,³¹ but stresses that future machines will be essentially human, albeit not biological and that most of the intelligence of our civilisation will be ultimately non-biological, as part of the continuing evolutionary process. He argues it is not the end of biological intelligence “even if it is thrown from its perch of evolutionary superiority.”³² As the non-biological forms will be derived from biological design, civilisation will remain human and more exemplary of what we regard as human, than it is currently. Our “understanding of that term will move beyond its biological origins.”³³

The Singularity will represent the culmination of the merger of our biological thinking and existence with our technology, resulting in a world that is still human but that transcends our biological roots. There will be no distinction, post-Singularity, between human and machine, or between physical and virtual reality. If you wonder what will remain unequivocally human in such a world, it’s simply this quality: ours is the species that inherently seeks to extend its physical and mental reach beyond current limitations.”³⁴

Further, due to the continuing evolutionary process he describes, “we will witness in the order of 20,000 years of progress, (when measured by today’s rate of progress), or about one thousand times greater than what was achieved in the 20th Century.”³⁵

Kurzweil’s position relies on “evolution (being) a process of creating patterns of increasing order... (and)... that it’s the evolution of patterns that constitutes the ultimate story of our world.”³⁶ He “conceptualises the history of evolution – both biological and

³⁰ Kurzweil, *The Singularity Is Near*, 29.

³¹ *Ibid.*, 29-30.

³² *Ibid.*, 30.

³³ *Ibid.*, 30.

³⁴ *Ibid.*, 9.

³⁵ *Ibid.*, 11, and see also more generally *The Age of Spiritual Machines*.

³⁶ Kurzweil, *The Singularity Is Near*, 14.

technological – as having occurred and to occur in six epochs,³⁷ diagrammatically set out as follows:

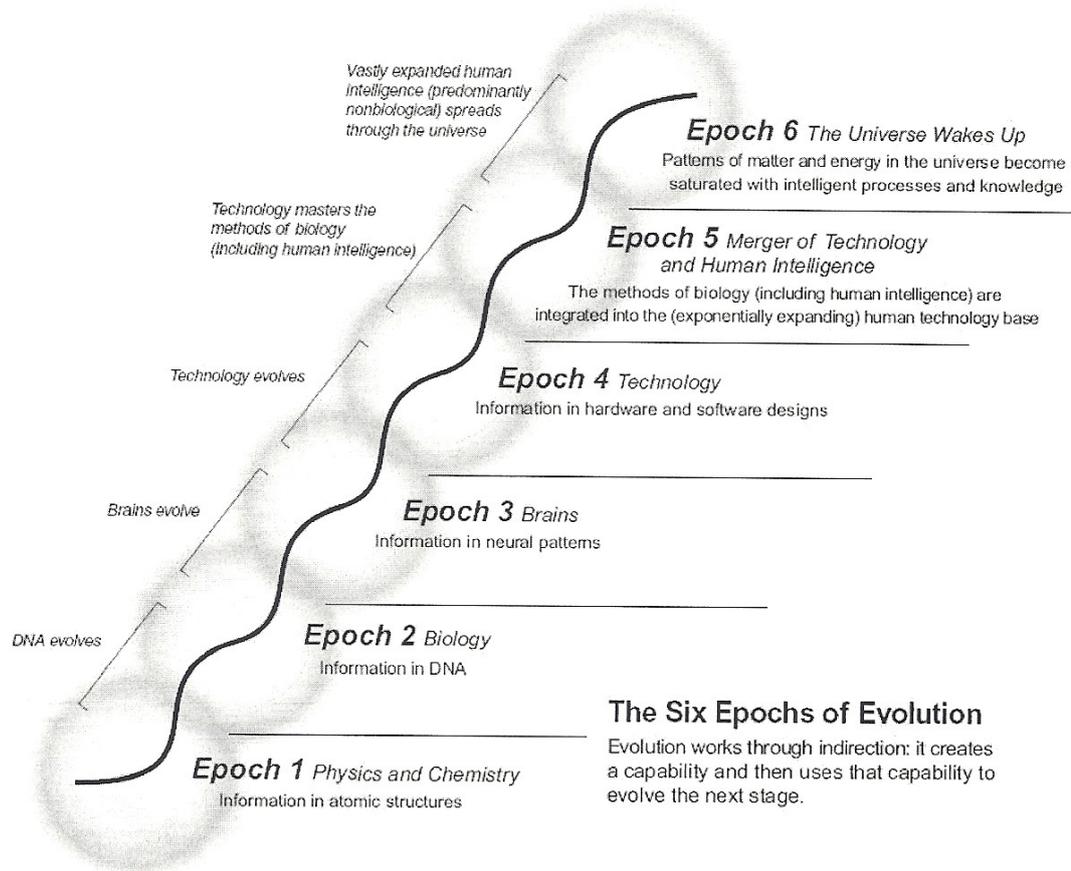


Table 4: Kurzweil’s Six Epochs of Evolution³⁸

Epoch 1 was the emergence of physics and chemistry and information in atomic structures, Epoch 2 being biology with its information in DNA, Epoch 3 being brains with information in neural patterns, Epoch 4 being technology with information in hardware and software designs, Epoch 5 is the merger of technology and human intelligence — the methods of biology (including human intelligence) are integrated into the (exponentially expanding) human technology base and Epoch 6, which he entitles “the universe wakes up,” involves patterns of matter and energy in the universe becoming saturated with intelligent processes and knowledge.³⁹ Kurzweil produces numerous graphs that chart “attributes that are growing exponentially... (in) order and complexity.”⁴⁰ In Epoch 5 there will be “the merger of the vast knowledge embedded in

³⁷ Kurzweil, *The Singularity Is Near*, 14.

³⁸ *Ibid.*, 15.

³⁹ *Ibid.*, 15.

⁴⁰ *Ibid.*, 20.

our own brains with vastly greater capacity, speed and knowledge-sharing ability of our technology... (which) will enable our human-machine civilisation to transcend the human brain's limitations of a mere 100 trillion extremely slow connections."⁴¹ His prognosis is that "the Singularity will begin with this fifth Epoch and will spread from earth to the rest of the universe in Epoch 6."⁴²

1.3 What Are Humans Becoming

Kurzweil stresses the role of imagination "because we will still be constrained in our creations to what we can imagine...we will have to reconsider our ideas about the nature of human life and redesign our human institutions."⁴³ "In our brains, the massively distributed nanobots will interact with our biological neurons. This will provide full-immersion virtual reality incorporating all of the senses, as well as neurological correlates of our emotions, from within the nervous system. More important, this intimate connection between our biological thinking and the nonbiological intelligence we are creating will profoundly expand human intelligence"⁴⁴

Kurzweil predicts warheads utilising nanobot-based weapons and cyber weapons, plus "once our brains are online we'll be able to download new knowledge and skills." The purpose of work will be to create knowledge, from music and art to math and science and the role of play will be to create knowledge. Work and play will overlap. He says we are becoming cyborgs as part "of a long-standing trend in which we grow more intimate with our technology."⁴⁵ But he maintains a role for the aesthetic, which may be difficult to comprehend.⁴⁶ "We will progress in variations of human body version 2.0 to human body version 3.0," predicting that by the early 2030s we will have eliminated the heart, lungs, red and white blood cells, platelets, pancreas, thyroid and all the hormone-producing organs; kidneys, bladder, liver, lower oesophagus, stomach, small intestine, large intestine and bowel and what is left will be the skeleton, skin, sex organs, sensory organs, mouth and upper oesophagus and brain, ultimately arguing that, what we may

⁴¹ Kurzweil, *The Singularity Is Near*, 20.

⁴² *Ibid.*, 14. See also page 20-21; with more predictions on the intelligent destiny of the universe at 342-364.

⁴³ *Ibid.*, 299.

⁴⁴ *Ibid.*, 300.

⁴⁵ *Ibid.*, 309.

⁴⁶ *Ibid.*, 310.

wish to maintain of the vital functions, are those of communication and pleasure.⁴⁷ But “even with our mostly nonbiological brains we’re likely to keep the aesthetics and emotional import of human bodies, given the influence this aesthetic has on the human brain.”⁴⁸ I will return to this issue later, in the context of the tens of thousands of years of inherited genes we humans have that impinge on both our intelligence and consciousness.⁴⁹

Kurzweil says “responses to emotions and our highest aspirations...are properly regarded as *emergent properties*...that result from the interaction of the human brain with its complex environment.”⁵⁰ He argues, further, that future nonbiological entities (it is unclear as to whether he means fused biotech entities, or strictly machine entities here) will display the intelligence and emotionally rich reactions (such as “aspirations”) of humans.⁵¹ He predicts that machines will be conscious, as nonbiological intelligent entities; whether they are conscious is “a political and psychological prediction, not a scientific or philosophical judgement.”⁵² This will be because “many humans, ultimately the vast majority of humans will come to believe... nonbiological entities are conscious.”⁵³ To Kurzweil the question of consciousness “is not a scientific one, it is a philosophical (question)... the fundamental philosophical question.”⁵⁴ His argument for machine consciousness is developed, as we shall see, to one of machine “spirituality.”

1.4 Considerations of philosophical roots / Consciousness and the Soul

One perception of a dismissive reader could be that Kurzweil is a futurist locked into science and technology, with little appreciation of the metaphysical. Analysis of some of his earlier works is instructive, both as to his philosophical roots and spiritual concerns.⁵⁵

⁴⁷ Kurzweil, *The Singularity Is Near*, 307.

⁴⁸ *Ibid.*, 310.

⁴⁹ See also Minsky, *The Emotion Machine*, 2.

⁵⁰ Consistent with Minsky’s approach in *The Emotion Machine*, to which I will return later in this paper.

⁵¹ Kurzweil, *The Singularity Is Near*, 476.

⁵² *Ibid.*, 475.

⁵³ *Ibid.*, 475.

⁵⁴ *Ibid.*, 475, and an issue I will deal with further.

⁵⁵ One may give as comparison Karl Rahner’s philosophical roots influencing his later theological positions. See, for example, *Spirit In The World*, translated by William Dych, (London: Herder & Herder, 1979) and *Foundations Of Christian Faith: An Introduction To The Idea Of Christianity* translated by William Dych, (London: Darton, Longman & Todd, 1978), and the influence of Martin Heidegger.

1.4.1 Philosophical Bases For Kurzweil's Singularity

Kurzweil's conscious, therefore arguably spiritual, machine, was earlier considered in some detail in the context of mind as machine in *The Age of Intelligent Machines*.⁵⁶ Considering what he refers to as "philosophical roots," he returns to Plato and "the coexistence of material and mystical phenomena in nature," "the level of reality that cannot be rationalised" and an "acceptance of a rational level of reality combined with its emphasis on the limits of reason and logic."⁵⁷ From this "core of the duality of existence in the rational and mystical, is the issue of consciousness and free will."⁵⁸ Referring to Plato's theory of the Forms, "consciousness is not an attribute of the mechanics of thinking, but rather the ultimate reality of human existence. Our consciousness, or "soul" is immutable and unchangeable."⁵⁹ The result is that our interaction with the physical world is on a mechanical level of our complex thinking, that process in a complex environment and with the soul immutable and unchanging, which cannot learn or partake in reason, because it would have to change to absorb and respond to experience. Hence, Kurzweil summarizes that Plato "expressed satisfaction with positing consciousness in either the rational processes of the natural world, or the mystical level of the ideal Form of the self or soul."⁶⁰

Kurzweil goes on to consider the "even deeper paradox...in the concept of free will."⁶¹ Plato's "corpuscular physics," with fixed rules of cause and effect, would mean that human decision making is predetermined, a contradiction to human freedom to choose and, therefore, a challenge to the concept of free will. Free will is equally uncomfortable in the soul, because it is a "mystical plane" without the "rational cause and effect mechanics of the natural world."⁶²

Kurzweil's view is that Plato believed in an "irreducible paradox at the core of the issues of consciousness and free will"⁶³ and finds support for irreducible paradox in examples of twentieth century physics, giving two, of electromagnetic radiation and the location of

⁵⁶ See note 17

⁵⁷ Kurzweil, *The Age Of Intelligent Machines*, 26.

⁵⁸ *Ibid.*, 26.

⁵⁹ *Ibid.*, 26.

⁶⁰ *Ibid.*, 26.

⁶¹ *Ibid.*, 26.

⁶² *Ibid.*, 26.

⁶³ *Ibid.*, 27.

particles in quantum theory.⁶⁴ Kurzweil sees contemporary relevance in Plato's writings for our "dilemmas of the relationship of human thought to the mechanics of the machine."⁶⁵ He argues Plato acknowledged that human thought is governed by natural law which itself is a logical process and that being able to unravel human thought logically through science and logic, is limitless. Logic is not enough, there is a "duality of human thought as both a logical process, and one that transcends pure logic... (and this) represents a necessary coexistence."⁶⁶

Kurzweil sees "the Enlightenment, along with parallel fertile developments in science and theology, as a philosophical movement to restore the supremacy of human reason, knowledge, and freedom. It has its roots in both the artistic, literary, and cultural activity of the previous three centuries (the European Renaissance) and the Greek philosophy of 20 centuries earlier."⁶⁷ Further, with roots in Socrates, Plato and Aristotle, it was "the first systematic reconsideration of the nature of human thought and knowledge since the Platonists."⁶⁸

Kurzweil discusses Descartes' consideration of "the mystery of how mind can arise from non-mind, of how thoughts and feelings can arise from the ordinary matter of the brain, sometimes called the mind-body problem,"⁶⁹ and the famous "I think, therefore I am", our being determined by the existence of our own thought, irrespective of the illusions of our own physicality and of the natural world.⁷⁰ Kurzweil then links thought process to determined interactions of the natural world. The law is embodied in Newtonian mechanics;⁷¹ the "determined order that governed all matter".⁷² Even though Einstein showed that Newtonian mechanics are a "special case" in the relativity theory, the special case is our world.⁷³ The opposition by theologians to Newton, Kurzweil argues,

⁶⁴ Kurzweil, *The Age Of Intelligent Machines*, 27.

⁶⁵ *Ibid.*, 27.

⁶⁶ *Ibid.*, 27. Kurzweil says there is continuing paradox "in the expression of the mystical concept of Forms." But he says also "the logical language of mathematics expresses again the paradox at the heart of Plato's views of human reality and thought" citing the *Epinomis*, Plato states that the "relations of numbers are the key to the whole mystery of nature." *Ibid.*, 28.

⁶⁷ *Ibid.*, 29.

⁶⁸ *Ibid.*, 29.

⁶⁹ *Ibid.*, 29.

⁷⁰ *Ibid.*, 29.

⁷¹ *Ibid.*, 29.

⁷² *Ibid.*, 31. See also note 34 in his text.

⁷³ *Ibid.*, 31.

is grounded in threat to the unique status of man and the notion that predetermined interactions could be extended to processes of the mind.

Kurzweil further draws on Immanuel Kant's metaphysical doctrine of reason in which "human knowledge constitutes the ultimate reality," as opposed to ultimate reality residing in the physical world. He also refers to the notion that there is truth in language and there are innate structures in language as argued by modern linguistics.⁷⁴

He rejects Descartes' dichotomy between the instinctive reflex of the animal and the natural thought of man: Kant's emphasis on the "supremacy of knowledge over other levels of reality"⁷⁵ appears to be a philosophical basis for Kurzweil's subsequent elevation of "knowledge" *per se* (my italics), being the developed evolutionary object of man, who will periodically shed the biological shell for that knowledge, to the point where the biology disappears ultimately to become his Sixth Epoch. Kurzweil clearly thanks Kant for moving metaphysics to be understood via scientific/analytical disciplines, including memory, reason, emotions, and so he calls him "the first logical positivist"⁷⁶

Kurzweil then turns to Ludwig Wittgenstein, who he says determined philosophy as a critique of language, which language limits our worlds, so much so that we cannot think what we cannot say.⁷⁷ Importantly, Kurzweil relies on this position as an intellectual root of artificial intelligence, with human thought becoming a process which he describes as "computation". He summarises Wittgenstein as follows: "We cannot think what we cannot say; we cannot say, or least we ought not say, what is meaningless in language we are speaking; statements in any language are indeed meaningless unless they can be derived from a formal (and therefore computation-like) sequence of

⁷⁴ Daniel Everett, in *Don't Sleep, There Are Snakes: Life And Language In The Amazonian Jungle* (New York: Pantheon Books, 2008) (referred to subsequently in this paper) refutes such positions, including Noam Chomsky's notion that recursion is central to language. Everett's study was of the Amazonian Pirahãs tribe (p.205).

⁷⁵ Kurzweil, *The Age Of Intelligent Machines*, 31.

⁷⁶ *Ibid.*, 32.

⁷⁷ *Ibid.*, 34.

transformations on a database of elementary propositions.”⁷⁸ Further, important to Kurzweil is that “thought is embedded in language.”⁷⁹

Kurzweil’s argument is that Logical Positivism is “the philosophical basis of artificial intelligence,”⁸⁰ which sees metaphysical theories “meaningless,” and of “only emotive force.”⁸¹ By contrast, he says Existentialism rejects Logical Positivism’s meaningful statements as in fact meaningless, or trivial, with the spiritual and emotive life having “the seat of true meaning.”⁸² I will refer to developing enquiries into areas of emotional and spiritual intelligence later. Kurzweil warns, validly, of the necessity “to fully understand the disciplines and traditions” of others in this debate,⁸³ some of which I will deal with later. He gives the example of Hubert Dreyfus, an AI critic who has the view that “intelligence must have a human-like body to truly emulate human intelligence.”⁸⁴ Kurzweil says it is valid when Dreyfus argues that Futurists have been overly optimistic and underestimated the deep nature of many problems with artificial intelligence, but on the other hand, Kurzweil claims Dreyfus has a “limited understanding of computer technology.”⁸⁵ A valid criticism perhaps, for all of us steeped in disciplines not abreast with contemporary scientific knowledge and progress.

1.5 Consciousness, Thinking, The Soul And God

Kurzweil says, if we are looking at “cognitive ability comparable to that of a full range of human intelligence, today’s computers aren’t thinking.”⁸⁶ He says that “eventually (computers will) achieve human levels of intellectual ability (and it is) inherently possible for a machine to think.”⁸⁷ As to intuitive thinking, whether computers seem to be thinking, Kurzweil would argue that generally they do not.⁸⁸ The most difficult

⁷⁸ Kurzweil, *The Age Of Intelligent Machines*, 34.

⁷⁹ Kurzweil is lured by Wittgenstein’s commencement to the *Tractatus*; “The world is all that is the case” (Statement 1) and ending with; “What we cannot speak about we must pass over in silence.” (Statement 7). *Ibid.*, 34-35. See also notes 50 and 51 in his text.

⁸⁰ *Ibid.*, 35.

⁸¹ *Ibid.*, 35.

⁸² *Ibid.*, 35 and also note 56 in his text.

⁸³ *Ibid.*, 36.

⁸⁴ *Ibid.*, 38. Hubert and his brother, Stuart Dreyfus say human intelligence does not result in human “thinking machines.” See Hubert C. Dreyfus and Stuart B. Dreyfus, *Mind Over Machine: The Power Of Human Intuitive And Expertise In The Era Of The Computer* (New York: Free Press, 2000).

⁸⁵ Kurzweil, *The Age Of Intelligent Machines*, 38.

⁸⁶ *Ibid.*, 461.

⁸⁷ *Ibid.*, 461.

⁸⁸ Kurzweil describes what he calls a “naïve expert” experiment with six children aged 7 to 9. Questions asked were: whether computers remember, learn, think, have feelings; whether they like them; and

question is “conscious intentionality.”⁸⁹ He questions whether computers, which eventually will have the same “apparent intelligence as real people,” will be able to pass any behavioural test of intelligence, whether they have genuine intentionality or free will, or whether they are just knowing their programs, whether there is a difference between conscious free will and following a program and whether this distinction makes a difference. His personal preference is for “a more subjective concept of consciousness, the idea that consciousness is a reality appreciated only by its possessor. Or perhaps... consciousness is the possessor of the intelligence, rather than the other way around.”⁹⁰

Understanding the complexities of consciousness, intelligence and their relationship is, I argue, crucial, to both alteration via technology of spiritual qualities in humans and the ability of technology to replicate human spirituality in a machine. Kurzweil grapples with the notion of detecting consciousness objectively (which he says he cannot do). He does say a subjective view of consciousness is possible, i.e. if you ask something, including the machine, if it thinks it’s conscious and it says “yes”, then it is. “Unless of course, it is programmed to lie.”⁹¹

Kurzweil has an interesting argument about objective consciousness based on quantum mechanics which “ascribes a physical reality to consciousness.” He argues what happens in quantum mechanics is limitations in observation and the impact of conscious observation on the underlying reality of what is observed. In other words conscious observation actually changes the property of a particle. “Observation of the same particle by a machine that was not conscious would not have the same effect.”⁹²

Quantum mechanics is consistent with the tradition in philosophy that equates

whether the computers like them. For the first two questions there was an immediate affirmative, for the third, eventually also affirmative, for the fifth, an immediate response that the question was silly and a definite yes to their liking computers. Kurzweil acknowledges that the children responded according to their understanding of the terms used, but says on the basis of these particular “computers those children had experience with are not conscious, that they do think, and therefore thinking does not require consciousness.” Kurzweil, *The Age Of Intelligent Machines*, 39 In his postscripts, *ibid.*, 459-463, Kurzweil revisits this experiment in the context of whether machines can reach levels of intelligence. This is in the context of whether humans are fundamentally different from machines, the answer (depending) on our definition of the word “think”. Hence, to the children in the experiment, using outwardly observable behaviour of their performance, computers could be said to be thinking. *Ibid.*, 460.

⁸⁹ Kurzweil, *The Age Of Intelligent Machines*, 461.

⁹⁰ *Ibid.*, 461.

⁹¹ *Ibid.*, 461-462.

⁹² *Ibid.*, 462.

fundamental reality to knowledge, as opposed to knowledge being a reflection of some other fundamental reality. In quantum mechanics, “observing the velocity of a particle affects not only the preciseness of its location but also the preciseness of the location of certain types of “sister” particles, and the same particle interaction that produced the particle whose velocity we just observed.”⁹³ He says “quantum mechanics, being the only theory in physics to ascribe a specific role to consciousness beyond simply saying that consciousness is what may happen to matter that evolves to high levels of intelligence according to physical laws...may imply a way to physically detect consciousness.”⁹⁴

As to “what is knowledge?” Kurzweil says that facts aren’t knowledge. For information to become knowledge, there must be relationships between ideas and for the knowledge to be useful, the links describing how the concepts interact “must be easily accessed, updated, and manipulated.”⁹⁵ “Human intelligence is remarkable in its ability to perform these tasks. However, it is almost more remarkably weak at reliably storing the information on which knowledge is based.”⁹⁶ Computers are the opposite and complementary to humans, with vastly superior abilities to store and retrieve knowledge rapidly.⁹⁷

We need to consider how the human brain results in thinking and then decision making: Is that thinking different from the thinking of other species and nature at large, other than a quantitative ability measured as a sophistication, rather than difference related to higher being, or soul? In *The Age of Spiritual Machines. When Computers Exceed Human Intelligence*,⁹⁸ Kurzweil develops on his previous considerations of free will and the issue of consciousness, specific, it would seem, to the human species. He refers again to Plato’s profound paradox inherent in the concept of consciousness and an

⁹³ Tom Ray (algorithm theorist, Professor Zoology, University of Oklahoma and developer of digital evolution software known as Tierra) says Kurzweil has got this wrong. “Kurzweil does not understand that it is the act of measurement that causes the collapse of the wave function, not conscious observation of the measurement... subsequent conscious observation of the measurement is irrelevant.” Chapter entitled *Kurzweil’s Turing Fallacy* in Jay W. Richards et al, *Are We Spiritual Machines?*, 117.

⁹⁴ Kurzweil, *The Age Of Intelligent Machines*, 462. Minsky, in contrast, criticizes attempting to emulate physicists’ success in explaining physical things via a small number of simple laws. He says “we need to find more complicated ways to explain our most familiar mental events” (and arguably be able to ultimately replicate them) an approach I will return to. Marvin Minsky, *The Emotion Machine*, 2.

⁹⁵ Kurzweil, *The Age Of Intelligent Machines*, 284.

⁹⁶ *Ibid.*, 284 and Note 1 in his text.

⁹⁷ *Ibid.*, 284.

⁹⁸ See note 9

human's apparent ability to freely choose.⁹⁹ Considering the free will paradox with predetermination and randomness, he says the former arises if all is physical cause and effect and when the latter is added, the purposefulness of free will is eroded. If free will is in the soul, this does not work, as reason and learning are not in the soul, which Kurzweil says has a mystical simplicity. He refers to a "deeper truth" perceived only by illuminating the opposing sides of a paradox.¹⁰⁰ He even compares Descartes with Buddhist notions of consciousness as the primary reality.¹⁰¹

It is worth considering here that perhaps human reason is not equipped to explain questions of consciousness, free will and the soul, logically. We devise reward based ideologies in both religious forms and secular constructs, such as legal systems, that require freedom of choice to both make sense and to attempt a fair organisation of, this life. An ultimate spiritual being, in image like us, who will make sense of things in the next life, utilizing a performance based reward system, seems a natural human extension; a perceptive projection into the next life of the way humans act in this life. We may, however, start with the simple existence of a notion of a higher self and aspiration to life after death and ask: Do these notions and aspirations come from something? Perhaps there is uniquely spiritual substance. Duns Scotus¹⁰² may seem old fashioned in an era of foglets, but has validity in this context. His individuation, that not all created substances are composites of form and matter, purely spiritual substances do exist and one and the same substance can have more than one substantial form, is apt.¹⁰³ Our efforts to logically and/or scientifically explain such concepts are limited by and descriptively bound around human biological "hardware" as it has evolved from time to time and the biological human software of experience. But does the very existence of such queries, give them integrity?

⁹⁹ Ray Kurzweil, *The Age of Spiritual Machines*, 57.

¹⁰⁰ *Ibid.*, 58.

¹⁰¹ *Ibid.*, 60.

¹⁰² Blessed Johannes Duns Scotus, Scottish medieval philosopher and theologian c. 1265 to 8 November 1308. His *Univocity of Being* theory held that existence is the most abstract concept we have, applicable to everything that exists. He found there is no distinction between essence and existence, contrary to Aquinas. He may be somewhat challenged by AI!

¹⁰³ See John Duns Scotus, *Early Oxford Lecture On Individuation*, translated by Allan B. Wolter, OFM, Franciscan Institute, St. Bonaventura, N.Y. 2008. Scotus argued humans have at least two substantial forms, the soul and the form of the body and the "haecceity" is the ultimate unity of unique individual, as opposed to common nature (features existing in any number of individuals). Only the individual exists as a dominating principal of the understanding of reality. Intuitive, as opposed to abstract, cognition gives the present existence or non-existence of an individual. The separate human soul state intuitively knows the spiritual.

Scotus' argument for the existence of God is simple and seemingly logical and scientifically sound, as he proves that existence through its effects. An infinity of things that are essentially ordered is impossible, as the totality of caused things that are essentially caused, is itself caused. So it is caused by some cause which is not part of the totality, otherwise it would be the cause of itself; as the whole totality of dependent things is cause and not on anything belonging to that totality.¹⁰⁴ Scotus did not have the benefit of Darwinian evolution, nor astrophysics, but the Big Bang beginnings still suffer from “nothing comes from nothing” problems. Kurzweil's sixth epoch transcendence has its genesis in evolution, rather than a creative spirit, yet has much in common with an anticipated eschaton, a journey to ultimate truth consistent with, although theologically different from, the ultimate truth to which Wolfhart Pannenberg, (to whom I will refer later), for example, would say we are heading: Man's fate. It cannot be ignored that Scotus' emphasis and purpose in proving both the existence of a separate spiritual self and a creative being is fundamentally different from Kurzweil's search for meaning and prognoses based on what he is able to actually observe.

1.6 Virtual Reality and Spirituality For Enhanced Humans

Neural implant technology and virtual reality are existing indicia of the technology Kurzweil relies on for his predictions. This technology involves sensory inputs to brains, such that there is an interaction between the virtual and real.¹⁰⁵ So arises the concept of “real virtual reality”¹⁰⁶ and issues of the senses and their responsibility in decision making with what the virtual body is doing, such as encounters in and the role of romance. Neural implants will mean one can have an experience with anyone, virtually.¹⁰⁷ Once neural implants are “commonplace” there will be the ability to produce both virtual sensory experience and also feelings associated with these experiences. “The ability to control and to reprogram our feelings will become even

¹⁰⁴ See in particular William A. Frank, *Duns Scotus, Metaphysician* (West Lafayette IN: Purdie University Press, 1995).

¹⁰⁵ Ray Kurzweil, *The Age of Spiritual Machines*, 145.

¹⁰⁶ *Ibid.*, 146.

¹⁰⁷ *Ibid.*, 148 Kurzweil backs this up with references to experiments with animals; such as stimulating a specific small area of the hypothalamus with injections of testosterone, which can bring about in animals either female or male, sexual behaviour, depending on which area of the hypothalamus is stimulated.

more profound in the late twenty-first century when technology moves beyond mere neural implants, and we fully install our thinking processes into a new computation medium – that is, *when we become software*.¹⁰⁸ Moral questions arise with which religions have grappled in less sophisticated knowledge circumstances for centuries. Spiritual thinking processes and associated consciousness will all be part of this software.

Kurzweil describes spiritual experience as “a feeling of transcending one’s everyday physical and mortal bounds to sense a deeper reality (playing) a fundamental role in otherwise disparate religions and philosophies... and appears to encompass a broad range of mental phenomena... It represents a particularly brilliant flower in the phenomenological garden.”¹⁰⁹ He argues that once we know the computational processes that give rise to mental experiences, regardless of their nature and derivation, then we will be able to understand “its neurological correlates” and there will be “the opportunity to capture our intellectual, emotional, and spiritual experiences, to call them up at will, and to enhance them.”¹¹⁰ Kurzweil gives the example of BGM (brain generated music). This process involves monitoring of alpha waves, in a range of 8-13 cycles per second, which are associated with deep meditative states, as compared to beta waves, which are about 13-28 cycles per second and are associated with routine conscious thought. “Music is generated by the computer according to an algorithm that transforms the user’s own brain-wave signal.”¹¹¹ Kurzweil makes the interesting observation that when you listen to your BGM not on a computer, that is, just as music, “the same sense of transcendence” does not occur.¹¹²

Kurzweil also considers “the God spot,” a tiny locus of nerve cells in the frontal lobe which appears to be activated during religious experiences, based on work by

¹⁰⁸ Ray Kurzweil, *The Age of Spiritual Machines*, 150.

¹⁰⁹ *Ibid.*, 151.

¹¹⁰ *Ibid.*, 151.

¹¹¹ *Ibid.*, 151. He also refers to the Relaxation Response, a by-product of yoga, as an example and other forms of meditation which are associated with reduced levels of epinephrine (adrenaline) and norepinephrine (noradrenaline) and, therefore, blood sugar, blood pressure, breathing and heart rates.

¹¹² *Ibid.*, 152. Cultivating spiritual brain responses through meditation is common in Eastern religious practice. In Buddhism, there is the concept of pure “perception,” seeing all as pure, peaceful, joyful, and enlightened. Cognitive behaviour therapy has a similar orientation, replacing bad stimuli with good.

neuroscientists at the University of California at San Diego.¹¹³ For “enhanced humans” the argument follows that once neurological correlates to a variety of spiritual experiences are determined, we will be able to enhance these experiences in the same way that we enhance other human experiences. In this next stage of evolution, when humans will be significantly “more capable and complex than humans today, our capacity for spiritual experiences and insight is also likely to gain in power and depth.”¹¹⁴

That spirituality and/or mysticism is linked to chemical brain experience is a logical area of scientific enquiry, as the brain is the source and/or the conduit of various forms of consciousness. Such enquiry includes mystical experience accommodated by drugs, through meditation, use of mantra and altering bodily states by fasting.¹¹⁵ If chemical and/or organic substances of a drug nature can affect the brain to promote mysticism and/or healing, for example, then any technological enhancement of the brain, such as through nanotechnology, must affect the spiritual experience. The issue may become more one of consciousness in dealing with how the brain operates, enhanced or unenhanced. It is also one of reality and how the brain interprets it.¹¹⁶

1.7 Spirituality For Machines

Kurzweil’s argument for spiritual machines appears to be simply this: “Just being – experiencing, being conscious—is spiritual, and reflects the essence of spirituality,”¹¹⁷ albeit in a broad mental spectrum.¹¹⁸ I will explore that broad spectrum later. His causal emphasis of consciousness equals spirituality, rather than spirit giving rise to consciousness, contrasts with “The biblical story... (in which)... the spirit is simply the

¹¹³ Ray Kurzweil, *The Age of Spiritual Machines*, 152. See also the work of Danah Zohar and Ian Marshall, referred to at page 51 here and notes 250, 255 and 260.

¹¹⁴ *Ibid.*, 152.

¹¹⁵ Barbara Bradley Hagerty, *The Science Of Spirituality. The God Chemical: Brain Chemistry and Mysticism* (NPR May 26th 2009)

¹¹⁶ Studies of pain and the brain have found that while the brain acknowledges the danger of pain through tissues via the spinal cord, it is not on its own sufficient to cause pain. Examples are given of “phantom limb pain” where “the actual body part doesn’t even exist, but it hurts, yet the brain imaging studies show activity in all the same brain areas, including the virtual limb.” David Butler and Lorimer Moseley, *Explain Pain*, (Adelaide, South Australia: Noigroup Publications, ISBN 0 9750910, 2003), 22 and 39.

¹¹⁷ Ray Kurzweil, *The Age of Spiritual Machines*, 153.

¹¹⁸ *Ibid.*, 151.

dynamic principle of life, and the soul is the creature which is alive and yet remains dependent on the spirit as the transcendent origin of its life.”¹¹⁹

Wolfhart Pannenberg says further:

The term ‘spirit’ in its broad application to the total sphere of life refers to the fact that the self-transcending activity of organic life is to be explained within a broader context as it is provided by the process of evolution toward a definitive self-assertion of life, but also by its abundant production of fragmentary symbols of the power and beauty of life, the results of its self-creative and self-integrative activity that anticipates the final goal of the evolutionary process.¹²⁰

As to what the “nature” of the machines created by humans will be, Kurzweil says those machines will be derived from human thinking, surpassing humans in their capacity for experience and “will claim to be conscious, and thus to be spiritual. They will believe they are conscious. They will believe that they have spiritual experiences. They will be convinced that these experiences are meaningful.”¹²¹ He argues, further, that because of our historical inclination for the human race to anthropomorphise the phenomena we encounter “twenty-first century machines – based on the design of human thinking – will do as their human progenitors have done – going to real and virtual houses of worship, meditating, praying, and transcending – to connect with this spiritual dimension.”¹²²

Kurzweil seems to be saying that machines will have the ritualistic needs of their makers.¹²³ How technology may emulate those needs, would be a replication of a complex process in humans.

¹¹⁹ Wolfhart Pannenberg, *An Introduction To Systemic Theology* (Grand Rapids, Michigan: W.B. Eerdmans Publishing Co., 1991), 43.

¹²⁰ Wolfhart Pannenberg, *Toward A Theology Of Nature: Essays On Science And Faith*, essay on *The Doctrine Of The Spirit And The Task Of A Theology Of Nature* (Louisville, Kentucky: Westminster/John Knox Press, 1993), 135.

¹²¹ Ray Kurzweil, *The Age of Spiritual Machines*, 153.

¹²² *Ibid.*, 153.

¹²³ Paul Monk, atheist, poet, historian and writer has noted; “Human beings live with inside stories, they need symbolic orientation, they need rituals. And this is not being patronizing. This is true of all of us. We have memories, and they form our identity. And they aren’t just consisting of facts. If you tell people the world is just the facts, they can’t make sense of that, they literally can’t make sense of that with developing the kind of poetics, kind of shared understanding which enables them to say this is how I experience those facts.” Monk’s is a criticism of new atheists who he sees as “too militant in their negative attack on religion and are not sufficiently allowing that they are going to have to put something in place of religions that are genuinely meeting those existential needs.” Paul Monk is an atheist poet, historian and writer. The above quotation is from an interview with Michael Short for *The Age, The Zone*, Monday May 31st 2010.

We are rooted in our genetic past, still operate in our subjective biology, but are stimulated by much objective phenomena of an increasingly technological nature. AI in humans and machines, despite Kurzweil's hopes, may simply not possess the necessary genetic and social history nexus to human ritual.

Chapter Two

Some Critiques Of Kurzweil’s Machine Consciousness and What It Is To Be “Spiritual”

Having set out Kurzweil’s spiritual/technological stance, some critics should be noted. A range of backgrounds and disciplines is represented in the critiques set out. They are not exhaustive and are directed to issues of spirit and consciousness.¹²⁴ This diversity enriches the debate, as the spirituality being considered here is about “this” and “next world” things, not merely formal religious spirituality, but generalised notions of human spirit.

2.1 Michael Denton¹²⁵

Biologist Michael Denton criticises “the very propositions on which Kurzweil’s strong AI project is based.”¹²⁶ He identifies “vital” properties, which he says are unique to organic systems and “could well include ‘human intelligence’ and perhaps other aspects of what we call ‘human nature’ (and) may never find exact instantiation in artificial man-made systems.”¹²⁷ Essentially, his argument is “that living systems *do* exhibit

¹²⁴ There are, in addition, many critics who focus on aspects of Kurzweil’s computation and associated predictions. Some examples: Theodore Modia, *Forecasting The Growth Of Complexity And Change (Technological Forecasting & Social Change*, October 2005), 980-6; Tom Krazit, *Intel Pledges 80 Cores In Five Years* (CNET News, 26 September 2006); A. Korotayev, A. Malkov and D. Khaltourina, *Introduction To Social Macrodynamics: Compact Macromodels Of The World System Growth* (Moscow: URSS Publishers, 2006; Kortayev A.V.A. *Compact Macromodel of World System Evolution // Journal of World-Systems Research* 11/1 (2005)), 79-93; Joseph Tainter, *The Collapse Of Complex Societies* (London: Cambridge University Press, 1988) and Martin Ford, *The Lights In The Tunnel: Automation, Accelerating Technology And The Economy Of The Future* (Acculant Publishing, 2009).

¹²⁵ University of Otago N.Z., Discovery Institute, author of *Nature’s Destiny: How The Laws Of Biology Reveal Purpose In The Universe* (New York: Free Press, 1998).

¹²⁶ In a chapter entitled *Organism and Matter: The Flawed Analogy* in Richards et al, *Are We Spiritual Machines?*, 79.

¹²⁷ *Ibid.*, 79.

certain very obvious characteristics, including intelligence, the capacity for self-replication, self-assembly, self-reorganisation, anthropomorphological transformations which are without analogy in any human contrivance. Moreover, these are precisely the characteristics which have been viewed since classical times as the essential defining characteristics of the vital or organic realm.”¹²⁸ His argument is that the unique holistic order of “the basic design of organic systems from individual macromolecules to embryos and brains exhibits a unique order which is without analogy in the mechanical realm.”¹²⁹

Denton’s critique effectively is that organisms and machines belong to different categories and says if you leave out the soul, the Greeks’ “holistic model of the organic world is very close to that revealed by biological science.”¹³⁰ He says Kurzweil’s position is contrary to the biological framework of cosmic order.¹³¹

2.2 John Searle¹³²

Philosopher John Searle,¹³³ attacks one of Kurzweil’s “main themes” as “just irrelevant” on the basis that “from everything we know about the brain, and everything we know about computation, increased computational power in the machine gives us no reason whatsoever to suppose that the machine is duplicating the specific neuro-biological powers of the brain to create consciousness. Increased computer power by itself moves

¹²⁸ Richards et al, *Are We Spiritual Machines?*, 87-88.

¹²⁹ *Ibid.*, 88.

¹³⁰ *Ibid.*, 96-97.

¹³¹ See Michael Denton in Richards et al, *Are We Spiritual Machines?* at 78-98, Chapter: *Organism and Machine: The Flawed Analogy*, 97. Elaborates Denton; “And it is not just Kurzweil’s claims that are in doubt. If the traditional vitalist position is true, and organic forms are integral parts of the cosmic order, each being in essence an indivisible self-sufficing unity possessing properties and characteristics beyond those possessed by any machine, properties which might include, for example, intelligent self-organising capabilities, then *all nature becomes re-enchanted*. The whole mechanistic framework of modern biology would have to be abandoned, along with many key doctrines, including the central dogma of genetic determinism, the concept of the “passivity and impotence” of the phenotype and the spontaneity of mutation. Moreover, all theories of the original evolution of life and biological information would have to be reformulated in conformity with vitalistic principles and all explanations based on a mechanistic concept of organisms as fundamentally lifeless contingent combinations of parts - including contemporary Darwinism - would have to be revised. ...they presume that organisms are analogous to artifacts, being in essence contingent and unnecessary, and thus, like human artifacts, require an artificer or craftsman for their assembly.” *Ibid.*, 97.

¹³² Mills Professor of Philosophy and Mind, University of California, author, including *Rationality In Action* (Cambridge: MIT Press, 2001).

¹³³ In a chapter entitled *I Married A Computer* contributed to Richards et al, *Are We Spiritual Machines?*, 72.

us not one bit closer to creating a conscious machine.”¹³⁴ He says Kurzweil suffers “from a persistent confusion between simulating a cognitive process and duplicating it, and even worse confusion between the observer-relative, in-the-eye-of-the-beholder sense of concepts like intelligence, thinking, etc., and the observer-independent intrinsic sense.”¹³⁵ Further, “Kurzweil’s argument about consciousness is based on the assumption that the external behaviour is overwhelming evidence for the presence of the internal conscious ‘states.’... (and Kurzweil’s) notion of ‘functionally equivalent’ is ambiguous precisely between simulation and duplication.”¹³⁶

Kurzweil’s basic argument sees computation and consciousness on a continuum, whereas Searle argues that the computer, no matter how sophisticated, will not become conscious. “The brain, unlike a computer, is designed to produce consciousness,”¹³⁷ a topic to which I will return.

2.3 William Dembski¹³⁸

William Dembski, philosopher and mathematician, has criticisms based on what he refers to as “hollowness.” His essential criticism of Kurzweil is that the latter is materialist. “Humans have aspirations. We long for freedom, immortality, and the beatific vision. We are restless until we find our rest in God... We need to transcend ourselves to find ourselves.”¹³⁹ He argues that any “dispositional properties we attribute to a machine (e.g., goodness, morality, virtue, and yes, even spirituality) properly pertain only to its current state and future potentiality and can be detached from its past. In particular, any defect in a machine is related only to its current state and future potentialities.” But somewhat illogically goes on to say, “Having come to view ourselves as machines, it is no accident that our society looks for salvation in technologies like behaviour modification, psychotropic drugs, cognitive reprogramming,

¹³⁴ Richards et al, *Are We Spiritual Machines?*, 71-72.

¹³⁵ *Ibid.*, 74.

¹³⁶ *Ibid.*, 74.

¹³⁷ *Ibid.*, 4.

¹³⁸ Assistant Professor of the Conceptual Foundation of Science, Baylor University, Discovery Institute and author *The Design Inference: Eliminating Chance Through Small Probabilities* (London: Cambridge University Press, 1998.)

¹³⁹ William Dembski, in a chapter entitled *Kurzweil’s Impoverished Spirituality* in Richards et al, *Are We Spiritual Machines?*, 98-114 at 99.

and genetic engineering.”¹⁴⁰ More cogent is his argument that machines lack “what philosophers call *substantial forms*,” principles “of unity that hold a thing together and maintains its identity over time.”¹⁴¹ He further denotes Kurzweil’s machine spirituality as “the spirituality of immediate experience ... consistent with much of contemporary spirituality, which places a premium on religious experience and neglects such traditional aspects of spirituality as revelation, tradition, virtue, morality, and above all, communion with a non-physical God who transcends physical being.”¹⁴² Hence, “machine spirituality is an impoverished form of spirituality.” He argues machines cannot have God’s presence made known to them by God acting upon them and changing their state, because if that occurred, the machine would “transcend its physical constituents ... Machine spirituality is the spirituality of self-realisation, not the spirituality of an active God who freely gives himself in self-revelation and thereby transforms the beings with which he is in communion.” Dembski goes on to refer to his book *The Design Inference*,¹⁴³ “recent developments in the theory of intelligent design are providing principal grounds against the reduction of intelligent agency to natural causes.”¹⁴⁴

2.4 Tom Ray¹⁴⁵

Tom Ray¹⁴⁶ argues that “raw computing power is not intelligence... Evolution is the only process that is proven to be able to generate (such) levels of complexity...

¹⁴⁰ Richards et al, *Are We Spiritual Machines?*, 103. The following contribution to *The Ethics In Artificial Intelligence Systems* (123helpme.com, 12th September 2010), is an example of the biblically literal approach taken by many commentators.

“If the intelligence of artificial intelligent systems were to surpass the intelligence of humans, AI may have complete control over human beings. However, this is not the plan. In the Book of Genesis, God has given men the authority and responsibility of all things on earth.

Rule over the fish of the sea and the birds of the air

And over every living creature that moves on the ground (Genesis 1:28b)

Artificial intelligence systems would be considered the “living creature that moves on the ground.” So if AI’s intelligences surpass humans’, how would people be able to fulfill this responsibility? It would be disappointing not to be able to fulfill this responsibility just because one was “playing God.” Men should not tamper with God’s work for men do not have the right to create and destroy life.”

¹⁴¹ Richards et al, *Are We Spiritual Machines?*, 103.

¹⁴² *Ibid.*, 105.

¹⁴³ William Dembski, *The Design Inference* (Cambridge: Cambridge University Press, 1998).

¹⁴⁴ Richards et al, *Are We Spiritual Machines?*, 111-112. Compare Leonardo Polo’s God as identity, references in various works translated by Miguel Angel Balibrea, University of Navarra, 2000. The notion means co-existence of beings lack identity on their own. In creatures, the act of being is distinct from essence, existence can only be attributed to God. Leonard Polo, *Salvador DiáTarazone (Transcendental Anthropology)* (Spain, Sudia Poliana, Pamplona: University of Navarra, 1999) 101-115.

¹⁴⁵ Algorithm theorist and Professor Zoology, University of Oklahoma and developer of digital evolution See also note 93 here.

¹⁴⁶ Richards et al, *Are We Spiritual Machines?*, 118-127.

evolution may be capable of magnificent creations in the organic medium but not the digital.”¹⁴⁷ He is wise enough to concede that “preconceptions and limited imagination deriving from our organic-only experience of life and intelligence, make it difficult for us to understand the nature of this new medium, and the forms of life and intelligence that might inhabit it” (referring to the “raw medium of digital computer computation and communications”).¹⁴⁸ Artificial intelligence though “would be a fundamentally alien intelligence, but one which would compliment rather than duplicate our talents and abilities.”¹⁴⁹ Ray says Kurzweil fails to “consider the unique nature of the digital medium”¹⁵⁰ and Kurzweil’s conclusion that, “consciousness, matter, and energy are inextricably linked,” may be true “in the sense that consciousness arises from the interactions of matter and energy, it is not true in the sense that Kurzweil intends it: that quantum ambiguities are not resolved until they are forced to do so by a conscious observer.”¹⁵¹

2.5 Jay W. Richards and George Gilder

Much depends in the above criticisms upon the nature of one’s discipline and disposition. One difference between brains and computers is computers are now all digital, whereas the brain combines digital and analogue methods with most computations performed in the analogue domain.

Richards¹⁵² and Gilder¹⁵³ attempt to reconcile philosophical, theist and other associated positions.¹⁵⁴ They suggest “Kurzweil, Searle, and Ray, are philosophical ‘naturalists or

¹⁴⁷ Richards et al, *Are We Spiritual Machines?*, 127.

¹⁴⁸ *Ibid.*, 127.

¹⁴⁹ *Ibid.*, 126.

¹⁵⁰ *Ibid.*, 116.

¹⁵¹ *Ibid.*, 117.

¹⁵² Philosopher, theologian, Senior Fellow and Program Director, Discovery Institute’s Center For Renewal of Science and Culture, Seattle.

¹⁵³ Senior Fellow, Discovery Institute, author of *Telecosm* (New York: Free Press, 2000). President Gilder Technology Group.

¹⁵⁴ They agree the massive parallelism of the human brain is the key to its pattern recognising abilities, which reflects the strength of human thinking. See Richards et al, *Are We Spiritual Machines?*, 1-11. The brain is massively parallel, performing on the order of 100 trillion computations at the same time, but Kurzweil says, at extremely slow speeds. Mammalian neurons engage in a chaotic dance. Kurzweil assumes if the neural network has learned its lessons well, then a visible pattern will emerge reflecting the network’s decision. Arguably my human knowledge and skills exist in my brain as vast patterns of interneural connections, neurotransmitter connections and other neural elements. Yet Kurzweil talks of the ability to scan someone’s brain and reinstating their personal mind file into a suitable computing medium. “The newly emerging person” will appear to other observers to have very much the same personality, history and memory as the person originally scanned although “it won’t be

materialists.’ They assume, but don’t actually say, that the material world is all there is, or ever was, or ever will be.”¹⁵⁵ They also emphasise that Kurzweil’s definition of spirituality is related to that of consciousness, quite a different position from that taken by Dembski, but also different “from the arid materialism of Daniel Dennett, Steven Pinker, and Richard Dawkins, who treat consciousness as an illusion, (Kurzweil’s) identification of the spirit with consciousness is a naturalistic stratagem.”¹⁵⁶

Gilder and Richards summarise “Conflicting Visions Of The Future - and Reality” with Kurzweil “defining evolution as the purpose of life” which they contrast with Bill Joy’s¹⁵⁷ concerns that “the endless restlessness and creativity of human beings is a threat rather than an opportunity or a gift”¹⁵⁸ and that “the human race has prevailed against the plagues and scarcities of its past, not through regulation or “relinquishment,” but through creativity and faith”. Hence, we must not “give up on freedom and providence” after which “disaster occurs.”¹⁵⁹

If you are a theist, such as Dembski, “human creative freedom flourishes in an environment of top-down law and transcendent order, a monotheism that removes the arbitrary from science and denies the ultimate victory of evil in the universe. From such a perspective one is able to embrace what is good in invention, innovation, and technology, while denying them the last word.”¹⁶⁰

It seems much of one’s attitude to this technology/spirituality argument is based on one’s view of the central or not central role of man in creation, evolution and the universe. In addition, Gilders and Richards say sharing a naturalistic worldview, as do Kurzweil and Jay, restricts options.¹⁶¹ If, as Gilders and Richards say:

- Human intelligence is ultimately the product of a process that didn’t have us in mind.

perfect at first.” See Ray Kurzweil, *The Evolution of the Mind in the 21st Century* essay in Richards et al, *Are We Spiritual Machines?*, 12-55. See also Minsky *The Emotion Machine*, 336-7.

¹⁵⁵ Richards et al, *Are We Spiritual Machines?*, 4.

¹⁵⁶ *Ibid.*, 4.

¹⁵⁷ A co-founder of Sun Microsystems.

¹⁵⁸ Richards et al, *Are We Spiritual Machines?*, 9.

¹⁵⁹ *Ibid.*, 9.

¹⁶⁰ *Ibid.*, 9.

¹⁶¹ *Ibid.*, 10.

So, the only designed—and transcendent—intelligence Kurzweil and others envision is a higher technological intelligence evolving from our own, which itself evolved from an unintelligent process.

- In the final analysis, we must be some material combination of computational software and hardware.

After all, what else could we be?

- When our technology achieves a sufficient level of computational architecture and complexity, it will become conscious, like we are.

Otherwise, human consciousness might be something inexplicable in materialistic categories.¹⁶²

Gilders and Richards conclude; “if we seek immortality... (it is) somewhere downstream from the flow of cosmic evolution, with its ever-accelerating rate of returns. Upstream is only matter in motion.”¹⁶³

Searle’s argument is that the brain is the genesis of consciousness and is essentially designed to do just this. Machines/computers have no “mental life” to do this.

Machines cannot produce consciousness without duplicating the actual powers of the brain, “computation is defined entirely in terms of the manipulation of abstract formal symbols.”¹⁶⁴ In response, Kurzweil argues that Searle is underestimating the nature of future “machines due to accelerating exponential growth.”¹⁶⁵ Searle would say this is irrelevant, as one cannot duplicate the specific neurological powers of the brain.

Dembski¹⁶⁶ opposes Kurzweil’s notion that evolution is the purpose of life. He argues that Kurzweil reduces mind to matter, but his real argument is that humans have aspirations, long for immortality and the beatific vision, “we are restless until we find rest in God.”¹⁶⁷ Machines have no history and are only identifiable by their current properties, they lack substantial forms, i.e. the principle in philosophy that holds a thing together. Dembski’s spirituality is one of “an active God” and Kurzweil’s is “impoverished” being of self-realisation.¹⁶⁸ The comparison may be an unfair one. An

¹⁶² Richards et al, *Are We Spiritual Machines?*, 10.

¹⁶³ *Ibid.*, 11.

¹⁶⁴ *Ibid.*, 68.

¹⁶⁵ *Ibid.*, 128.

¹⁶⁶ *Ibid.*, 98.

¹⁶⁷ *Ibid.*, 99.

¹⁶⁸ *Ibid.*, 106.

aspect of Kurzweil's spirituality, not emphasised sufficiently, is that his is "experienced" certainly as he defines it with reference to machines as analogous to consciousness. The consciousness appears to produce the potential spiritual qualities, rather than the consciousness being a product of a larger and unifying spiritual core/energy. He is not attempting to define Teilhard de Chardin's "stuff of the universe" in which "spirit is neither a meta- nor an epi- phenomenon; it is the phenomenon."¹⁶⁹ Neither does he purport to be Karl Rahner's notion of divine self-communication as ultimate fulfillment of human existence. If humans have Rahner's natural knowledge of God and God exists in the present world as grace, God, Holy Spirit exists now within the human person. "Grace... always surrounds man, even the sinner and the unbeliever, as the inescapable setting of his existence."¹⁷⁰ Both Rahner and Dembski may say humans crave the beatific vision, but grace is more to Rahner; it changes human nature supernaturally and is elementary to human existence, such that even non-believers may be saved.¹⁷¹

If grace is the innate human experience of God in this world and, therefore, a fundamental dynamic of both the formal religious salvific construct and human contemporary desire for deeper meaning, then no amount of human enhancement nor machine evolution can vary grace's/God's existence; nor, as Pannenberg would have it, would "spirit," in its broad application to the total sphere of life.¹⁷² However, Pannenberg stresses "spirit refers to the fact that the self-transcending activity of organic life is to be explained within a broader context as it is provided by the process of evolution toward a definitive self-assertion of life, *but also* (my italics) by its abundant production of fragmentary symbols of the power and beauty of life, the results of its self-creative and self-integrative activity that anticipates the final goal of the evolutionary process."¹⁷³ The latter are the tangible of indicia creation. Enhancing the biological conduit and the company it keeps with machines, may alter human perception of spiritual existence. This altered conduit and its technological company may further impact on an human person's ability to freely choose that spiritual state, defined in many religious faiths, as necessary to achieve salvation.

¹⁶⁹ Teilhard de Chardin, *The Spiritual Phenomenon*, German translation (1937) *Werke*, 6:126.

¹⁷⁰ Karl Rahner, *Theological Investigations IV* (Baltimore: Helicon, 1961-9), 181.

¹⁷¹ See Mark Fischer, *The Foundation Of Karl Rahner: A Paraphrase Of The Foundations Of Christian Faith* (Crossroad, 2005).

¹⁷² Pannenberg, *Toward A Theology Of Nature*, 135. *Ibid.*, 135.

¹⁷³ *Ibid.*, 135.

Chapter Three

Kurzweil's Sixth Epoch and "End Times"

The previous critiques do not emphasise dilemmas of ultimate destiny for man which Kurzweil clearly is concerned with. Dembski's intelligent being is the cause (the intelligence designer) and focus of the spiritual relationship, but a relationship that can occur without the object being conscious of it. Being conscious of God's specific presence is not critical to salvation by Karl Rahner's God, nor in modern Catholicism. One may be an anonymous Christian and achieve salvation by sincerely and conscientiously, albeit unknowingly, seeking God.¹⁷⁴ But having contemporary awareness of the consolations of the spirit should, arguably, be man's to enjoy. Utilising the conscious human spiritual quality and "cosmic dimensions of Christian hope," in which "the scale of the cosmos and wondrous fertility inscribed into its emergence are a backdrop, at the very least," Anthony Kelly¹⁷⁵ interprets big theological questions of eschatology. They warrant comparison with Kurzweil's destiny of the universe as foreshadowed in his sixth epoch.

Kelly insists "the dialogue between theology and science continues to be very productive as scientists and theologians have their different ways of envisaging the end... (and we)... cannot but profit from current explorations into the nature of matter/energy and the meaning of time."¹⁷⁶

Kurzweil's transcendence of the intellect and human/machine destiny¹⁷⁷ contrasts with Kelly's final reality, eschaton, or eschata (plural), the last things; issues emerging within the horizon of Christian hope which include "death, particular and universal judgement,

¹⁷⁴ *Lumen Gentium*, paragraph 15.

¹⁷⁵ Professor of Theology, Australian Catholic University. Anthony Kelly, *Eschatology And Hope (Theology In Global Perspective)*, (Maryknoll, N.Y., USA: Orbis Books, 2006).

¹⁷⁶ Kelly, *Eschatology And Hope*, p XI.

¹⁷⁷ Kurzweil, *The Singularity Is Near*, 476 and see page 2, note 18 here.

purgatory, hell, heaven, the resurrection of the body and the destiny of the universe itself.”¹⁷⁸

Kurzweil compares machines pooling resources with what humans call falling in love and as part of the general description of his sixth epoch,¹⁷⁹ but does not deal with Love as a spiritual activity itself and how it may be manifested in his enhanced humans and conscious machines.¹⁸⁰ Discussion of spirituality, without considering love in this big sense, does seem impoverished. By comparison, for Kelly, “the most fundamental ‘last thing’ in all the ‘last things’ that come up for consideration... is the reality of God’s saving love, which is the beginning and end of all created existence. Detached from this all-decisive reality, the variety of eschatological themes would remain abstract and ill-focused.”¹⁸¹ Kelly uses the binders of love and hope to make sense of otherwise distressing eschatological themes, Kurzweil’s universal destiny eschata reach via saturating intelligence. Compare, for example, the latter’s transcendence, which includes “infinite love”¹⁸² with Kelly’s subject chapter on “Heaven As The Vision Of God.”¹⁸³ Says Kelly;

To see God face-to-face is finally to see that God is the limitless, all-surpassing, and all-giving mystery of true life. It will mean seeing God as the generative source of all creation, but always immeasurably more than creation or its limitless other possible forms. This all-and-ever-surpassing transcendent excess of God is technically referred to as the divine ‘incomprehensibility.’ The light of glory is the luminous space in which everyone and everything will appear to manifest the divine radiance. That luminous mystery of God is revealed as limitlessly surpassing the created universe and all other possible universes, and the still-finite mind of the blessed, however enlarged its capacities. Caught up into such infinity, the human spirit finds its basic delight in the joyous experience of knowing that God — Father, Son, and Holy Spirit, is truly God, mystery unbounded. The depths of God are experienced as immeasurable by any created mind, yet as inexhaustibly attractive in its infinite expanse. Such a notion of the beatific vision inspires hope to imagine definitive union with God, not only as the peace of a final homecoming and eternal rest. It is also eternal *life*. It promises the joy of an ever-new beginning in a life of unending, adoring exploration.¹⁸⁴

¹⁷⁸ Kelly, *Eschatology And Hope*, 21.

¹⁷⁹ Item 8 analogy, at page 5 here.

¹⁸⁰ Other than as general anthropomorphic behaviour, see page 22 here and note 122.

¹⁸¹ Kelly, *Eschatology And Hope*, 21. Kelly quotes in his notation Rowan A. Greer, *Christian Hope And Christian Life: Raids On The Inarticulate*, (New York: Crossword, 2001).

¹⁸² See page 2 here and note 18.

¹⁸³ Kelly, *Eschatology And Hope*, 169-174.

¹⁸⁴ *Ibid.*, 173-174.

This description incorporates Kurzweil's infinite superlatives with Dembski's ultimate realisation of humanity in the beatific vision. Words such as limitless, immeasurable, incomprehensible and unbounded are all, by their nature, uncapturable by any physicist's neat and compact laws, nor by philosophical explanation. But they allow Kelly, as a "Christian theologian"... (in)... "the Catholic tradition" to rail against "narrowness or defensiveness" because his "Christian hope implies a limitless overture to an eschatological companionship from which no one is excluded."¹⁸⁵

Kurzweil's sixth epoch is, however, described closely to the manner in which Kelly describes God, "albeit never reaching this ideal."¹⁸⁶ Kurzweil cannot reach the ideal, because his knowledge, broad though it may be in its bases in philosophy and science, has no method to get there. Is faith a process not capable of factual analysis and, therefore, logical replication? It is what gets Kelly and all theologians, across the line. In defence of faith, as Wolfhart Pannenberg so charmingly puts it, "Could it be that, basically, faith is the uncrippled and untainted enactment of the movement and rhythm of all life as it was intended by the creator? Could it be, conversely, that all life in its self-transcendence is related to God?"¹⁸⁷ As to creation, Kelly is able *in faith* to say, "Christ is 'above,' 'before,' and 'beyond' all that is. He is the Word, the unique Son of the Father, and the Lord of all. The world neither utters the divine Word, nor produces Christ, nor contains him. Rather, he causes and contains everything that exists. Yet because he so precedes and exceeds all created reality, he is 'within' the universe in a special manner."¹⁸⁸

Kurzweil strives for immortality via continuity of existence in our morphed intelligence saturating the universe. Such existence may be post biological "death," although that is

¹⁸⁵ Kelly, *Eschatology And Hope*, Preface PXII.

¹⁸⁶ Kurzweil, *The Singularity Is Near*, 476 and page 2 note 18 here.

¹⁸⁷ Pannenberg, *An Introduction To Systematic Theology*, 45. As a specific faith-based proposition, for example, Kelly places "transubstantiation" or Eucharistic transformation in "a larger frame of reference", the first being as "the dynamic context of God's action in the universe at large", the second being "radical sacramentality of the church that is manifest in the Eucharist" Kelly, *Eschatology And Hope*, 188. Kelly sees the Pauline and Johannine descriptions "of how 'all things' are made through him, in him, for him" (*Jn 1:3; 1Cor 8:6; Col 1:16*). In this cosmic vision, Christ is both at the origin and at the end of what is coming to be. He is the one to whom all things are tending. He is the image in which all things are made. So utterly does he fill all dimensions of the universe that Paul declares that "All things hold together in him." (*Col 1:17*). As the coherence of all creation, he both unifies and reconciles... (Scriptural) metaphors of causing, containing, unifying and reconciling aim to express one thing - the cosmic and universal scope of what Christians hope for." Kelly, *Eschatology And Hope*, 188.

¹⁸⁸ Kelly, *Eschatology And Hope*, 188-189.

unclear and understandably so, having regard to both the nature and extent of Kurzweil's predictions. For Kelly, "the instinct of hope recognises that ultimate love must first of all survive the deadliness of death before it can promise a new creation."¹⁸⁹ Hell and Christ's descent there, is doctrinally or "doubly significant" in "it underscores both the reality of the incarnation and the inclusiveness of redemption... There, too, nothing in all creation, nothing in life or death... can separate us from the love of God in Christ Jesus. Love's outreach, then, includes the impenetrable realm of the dead (*Rom* 8:38)."¹⁹⁰

There are analogies in both the approaches of Kelly and Kurzweil, to the writings of Teilhard de Chardin.¹⁹¹ De Chardin's emphasis, like Kurzweil, is the evolutionary process of the universe, but not as a technological process, rather through the power of divine spirit; from a geosphere to a biosphere, then to a noosphere, a type of planetary thinking network, likened to the cerebral cortex in humans, where there is interlocked consciousness, information, awareness. Kelly's hope is also crucial to de Chardin; for example, "between these two alternatives of absolute optimism or absolute pessimism, there is no middle way because by its very nature progress is all or nothing."¹⁹² Similarly, there is also Christocentric emphasis for de Chardin "in one manner or the other it still remains true that, even in the view of a mere biologist, the human epic resembles nothing so much as a way of the cross."¹⁹³ Self transcendence of life equates to spiritual phenomena, but, consciousness is central to de Chardin because it enables him to "imagine" above the animal biosphere, a sphere of reflection, conscious invention and conscious souls in the final stage of evolution becoming the one and only true omega. Ultimately, his, as is Kelly's, is a description of God. Kurzweil's consciousness is relevant to his definition of spirituality because he says that machines will think they are conscious and, therefore, have spiritual abilities. His universal prognosis that follows, is that evolution of the material will lead to concepts of what is God, albeit never achieving them.¹⁹⁴ Prognoses based on exponential technological evolution and a combination of human consciousness and some other consciousness which could

¹⁸⁹ *Ibid.*, 90.

¹⁹⁰ Kelly, *Eschatology And Hope*, 91.

¹⁹¹ French Jesuit paleontologist, biologist and philosopher, born 1st May 1881, died 10th April 1955.

¹⁹² Teilhard de Chardin, *The Phenomenon of Man*, (Harper Perennial, 1955, and English translated version 1959), and *Spirit of the Universe* (English translation 1965, Harper and Row).

¹⁹³ *Ibid.*, appendix added in 1948, 1961 translation, 313.

¹⁹⁴ See note 18, page 2.

develop artificially, is Kurzweil's emphasis. De Chardin's emphasis is essentially human, although so would Kurzweil say is his.¹⁹⁵ However, as I have emphasised, Kurzweil's spirituality as described is experienced and while his accelerating intelligence may explore into, it is not an attempt to define, de Chardin's "stuff of the universe."

Kurzweil, Kelly and de Chardin attempt to describe similar concepts. Each is doing it in terms of their own disciplines, accompanying languages and beliefs. Kelly shares with Dembski the ultimate being/creator which is a type of person. Kelly further conceptualises and interposes big spiritual virtues such as Hope and Love because his discipline allows him the freedom to do so, whereas, as Gilder and Richards point out, "Kurzweil's 'naturalistic worldview' ... dramatically restricts... (his) options."¹⁹⁶ Theologians (at least Christian ones), have their own limitations and biases of sorts, summarised by Wolfhart Pannenberg as "in distinction from the perspective of physics, the theologian looks at the universe field with the dimensions of space, time, and energy from the point of view of the eschatological future."¹⁹⁷ Kurzweil looks to a different, but still "human" future. Dembski, Kelly and de Chardin also anthropomorphise in varying degrees, because we humans see things as humans do, albeit in diverse ways. All have their faiths of sorts, the boundaries which relate to their respective disciplines and the conclusions to which each has come to as a result of their respective life journeys. Each make contributions to our thoughts and thereby, find their place in eternity, whatever that may turn out to be like.

¹⁹⁵ See again, note 8

¹⁹⁶ Richards et al, *Are We Spiritual Machines?*, 10.

¹⁹⁷ Pannenberg, *Toward A Theology Of Nature*, 44.

Chapter Four

Morality And AI

Spirituality, in its active incarnation, has always had roots in morality. It has moral correlates when it not only involves inner search for value and meaning, but overt action in daily life. This approach is common to Eastern and Western religious traditions and new age orientations. John Bowker has put it thus:

religions demand or at least promote this way of being moral, in which intention, act and value are connected, because they set the whole enterprise of ethics in context of value which is believed to transcend the contingent. Transcendental value is required as a foundation for moral persistence and moral hope... Thus God enters into ethics, not as a source of control alone but as the source of value in the creation of beauty from the beast, and, even more to the point in practice, as a real presence in the encounters of life. These encounters are collective as well as individual, and it means that ethics has as much to do with public as with private excellence.¹⁹⁸

So, religious spiritualities have particular moral emphases linked to service to God and fellow men in particular ways, for example Ignatian Spirituality's emphasis on "Contemplation in Action." "First it is clear that love ought to manifest itself in deeds rather than in words and that love consists of a mutual sharing."¹⁹⁹ Such day-to-day issues of appropriate human/machine conduct are raised by Kurzweil's prognoses. He predicts that human moral intelligence will be replicable in machines²⁰⁰ and makes observations about the relationship of "spindle cells" in the brain to moral and emotional intelligence.²⁰¹ His remaining references to morality (as a spiritual phenomenon) are sparse.²⁰² He does consider how varying consciousness is relevant to our understanding ethics and morality, which impact on our legal systems²⁰³ and I will return to this later in

¹⁹⁸ John Bowker, *The Sacred Neuron* (London/New York: I.B. Tauris and Co. Ltd., 2005), 104-105.

¹⁹⁹ Ignatius of Loyola, *Spiritual Exercises, The Contemplatio*. A spirituality of moral choice and standards is embodied in the exercise of moral action. See David L. Fleming S.J., *The Spiritual Exercises of St. Inatius. A Literal Translation And A Contemporary Reading* (St. Louis: The Institute of Jesuit Sources, 1978)

²⁰⁰ Kurzweil, *The Singularity Is Near*, 8.

²⁰¹ *Ibid.*, 192.

²⁰² *Ibid.*, 369, 374-75.

²⁰³ *Ibid.*, 379.

the context of religious mores and what may be formally defined as choice and sin. The morality of his future machines warrants further analysis.

4.1 Wendell Wallach and Colin Allen – Moral Machines

In *Moral Machines: Teaching Robots Right From Wrong*²⁰⁴ Wendell Wallach and Colin Allen, predict “In the Affective Computing Laboratory at Massachusetts Institute of Technology (MIT), scientists are designing computers that can read human emotions... (There will be) a robot in every home by the year 2020.” They raise the need to think about moral reasoning in robots and project this further to concepts of ethical killing machines.²⁰⁵ They summarise “The mysteries of matter, life, and mind define the three major challenges of science”²⁰⁶ and say the first two were solved in the last century, at least, the keys were found. They ask whether intelligence is computation, or is it biology, or information processing, rather than neuroscience.²⁰⁷ Whilst the number of digital bits in a brain will be overtaken by computers, they consider whether the mind is more than this, taking up Kurzweil’s point that an appropriately programmed computer is a mind and Searle’s counter-argument that “the formal symbol manipulation carried out by a computer following a program, is never sufficient to produce intelligent understanding of anything.”²⁰⁸

They consider real moral agency and the requirement for consciousness, as well as Descartes’ notion of dualism and the combined mechanical body and immaterial mind, the argument that there is something special about the human brain, that there is one “special property” some believe not to be in any computational technology yet developed, that being free will and conscious understanding.²⁰⁹ The argument that free will may be limited to humans, may be because humans feel they “elect” to do certain things. The authors ask what is the source of this feeling and is it required for ethical behaviour?²¹⁰ They argue against the “magical” notion of free will referring to the

²⁰⁴ Wendell Wallach and Colin Allen *Moral Machines: Teaching Robots Right From Wrong* (New York: Oxford University Press, 2009) Introduction, 3.

²⁰⁵ *Ibid.*, 20. The example is given of remotely operated vehicles now deployed militarily (known as ROVs).

²⁰⁶ *Ibid.*, 56.

²⁰⁷ *Ibid.*, 57.

²⁰⁸ *Ibid.*, 58.

²⁰⁹ *Ibid.*, 59.

²¹⁰ *Ibid.*, item 5, 59.

philosopher Daniel Dennett, who says it is not magic, but the ability to choose between multiple options which is the only human freedom and the only thing worth having. Concluding, “Genes, development, and learning all contribute to the process of becoming a decent human being.”²¹¹

Wallach and Allen say the advantages of computers over human brains for responding to moral challenges include a broader range of possibilities in response, but that more rational humans often still choose the first option they like. In contrast, with computers, there will be no interference with emotions, nor influence of prejudice nor greed, if greedy computer systems flourish, they will be greedy for energy or information, not prestige, power, or sex. Computers will be capable of meeting higher standards.²¹²

Wallach and Allen do consider the concept of human morality evolving, albeit in the context of a Darwinian struggle for survival and, that being an amoral context, their notion is that artificial life experiments ought to be able to evolve other morally sensitive agents. They emphasise what emerges out of the evolution is not just the individual entity’s struggle; what emerges from “social interactions and success is environments populated by many species.”²¹³ They say that we are a long way from knowing how to develop systems that can feel pleasure or pain, or have human-like emotions. Robots do not have nerves, neurochemicals, feelings, or emotions, nor are they likely to in the future.²¹⁴ “Smell and touch are particularly important contributors to human emotions and feelings and both supply information germane to making moral decisions.”²¹⁵ The argument seems to be that we need our biology to feel human and to feel humanely, the corollary being we need that same biology to be and feel spiritual.

Wallach and Allen consider “the idea of friendly AI” and futurist concern that in the event of Singularity, or advanced systems of artificial intelligence, it is important to insure that such systems will not destroy humanity and discuss “basic values” that should surround AI morality.²¹⁶ Taken to its extreme, is the fear that humans may be treated no better by robots than they have treated nonhuman animals, or even insects.

²¹¹ Allen & Wallach, *Moral Machines*, 99.

²¹² *Ibid.*, 71.

²¹³ *Ibid.*, 103-104.

²¹⁴ *Ibid.*, 150.

²¹⁵ *Ibid.*, 150.

²¹⁶ *Ibid.*, 192-4.

This fear of humanity being subjugated, together with the responsibility of scientists to address moral considerations, is linked to preserving the spiritual balances in man in a technological world, a world in which not only will machines compete morally with humans, but humans, themselves “enhanced” to varying degrees with technology taking over biology, will need to make appropriate adjustments in behaviour towards each other.²¹⁷

4.2 David Horner – Moral Luck

The argument for greater certainty arising from technology may be more complex. David Horner,²¹⁸ for example, argues that the incidence of “moral luck,” a concept he traces back to Aristotelian ethics, is greater in computer technology.²¹⁹ Horner argues we need: “In Computer Ethics to think in new ways about moral accountability, responsibility and risk. The intrinsic nature of computer technology, its ‘logical malleability’, generates ever-greater levels of complexity, unreliability and uncertainty. He illustrates, “the vulnerability of conventional notions of moral agency, and the attribution of praise and blame, to contingent and unpredictable events, (concluding,) moral luck poses a challenge to the kinds of theoretical approaches often deployed in Computer Ethics.”²²⁰

4.3 Gregory Benford and Elizabeth Malarte – Living with Robots and Cyborgs

Physicist, Gregory Benford, and biologist, Elizabeth Malarte, in *Beyond Human: Living With Robots And Cyborgs*,²²¹ look at machines in the battlefield and all areas of work and culture. They look at body and mind issues and say that “evolution remorselessly selected” the ability for our minds not to “fathom our perceptual machinery,” saying

²¹⁷ Ronald Arkin in *Governing Lethal Behaviour In Autonomous Robots*, also deals with ethical problems in developing autonomous lethal and military robots, decision making processes and military policy makers in the future. He argues that properly designed military robots will be able to lessen civilian casualties than those presently used, and develop an “artificial conscience.” Arkin’s thesis is that robots, cyborgs, humane-oids are robots that may be more ethical than humans in the battlefield. Ronald Arkin, *Governing Lethal Behavior In Autonomous Robots* (Chapman-Hall/CRC:2009).

²¹⁸ University of Brighton, U.K.

²¹⁹ David Sanford Horner, *Moral Luck And Computer Ethics: Gaugin In Cyberspace* (published online 15 July 2010, Springer Science, Business Media B.V. 2010) Horner says computer malleability coupled with the ever-widening contexts of application in turn lead to greater scope for the operation of chance and the phenomenon of moral luck. “Moral luck... bears down most heavily on notions of the professional responsibility of computer professionals and the identification and attribution of praise and blame. It is immunity from luck that conventionally marks out moral value from other kinds of values such as instrumental, technical, and use value.”

²²⁰ Horner, *Moral Luck And Computer Ethics*.

²²¹ Gregory Benford, *Beyond Human: Living With Robots and Cyborgs* (Forge Books, 2008).

evolution held survival and living as paramount; philosophy as to how we know things was secondary and “hidden in the working machinery.” Our knowledge comes from habits and experiences, not in the abstract logic AI schemers hope for.²²² They conclude that consciousness and intelligence in the human mind emerged from the complex human brain, which cannot be reduced to individual components. Therefore, they argue that machines and cyborgs will become sophisticated tools, significantly improving human life, but not replacing it. They promote the idea of robots performing different tasks, such as in outer space, where they may be better equipped to operate than humans. “The destiny of humanity may be to enlist in an unending competition with our own creations, humans and androids and cyborgs and robots sharing a mutual goal – the eventual occupation of the entire galaxy.”²²³

4.4 Human Robot Interaction

Sharing mutual goals may be a complex ethical relationship. HRI, Human Robot Interaction, is an area of research into how humans may relate to intelligent machines. The current emphasis is not, however, on the subjectively conscious robot, but that of relationship to their users. Ethical issues become relevant as “performance criteria” for measurement of interaction have correlated with measurement of human perception and cognition; the value “of service robots lie within the satisfaction of their users.”²²⁴ So Christoph Bartreck, Dana Kulić, Elizabeth Croft and Susana Zoghbi provide measurement tools for what research has shown humans want of their robots, including human-like form, being lifelike in form and motion, being likeable and being perceived to be intelligent and safe. Critical of AI, the authors acknowledge “the difficulty of formalising human behavior... in expert systems ...(which formalisation)... computers require.”²²⁵ What they also highlight is that users’ perception of performance criteria “cannot be measured within the robots themselves”²²⁶ – an acknowledgement of the innate difficulties for machines attaining a level of conscious identity, with any degree of autonomy, spiritual or otherwise. The questionnaires provided to measure users’ robotic perception are (interestingly) entitled “God-Speed” because they are “intended to

²²² Gregory Benford, *Beyond Human*, 245-246.

²²³ *Ibid.*, 256.

²²⁴ Christoph Bartreck, Dana Kulić, Elizabeth Croft and Susana Zoghbi: *Measurement Instruments For The Anthropomorphism, Animacy, Likeability, Perceived Intelligence And Perceived Safety Of Robots (International Journal of Social Robotics, Volume 1, Number 1)*, 71-81.

²²⁵ *Ibid.*, 76.

²²⁶ *Ibid.*, 71.

help creators of robots on their development journey.” Future questionnaires may extend to include “the believability of a robot, the enjoyment of interacting with it and the robot’s social presence”²²⁷ with the prediction that human perception, knowledge and directions of robots will change, the more humans get used to their presence. The emphasis is on human control of an anthropomorphic nature. The authors say we humans endeavor to make our creations like us, just as it seems we make our gods like us, (although theologically it is God who made us like him.) Are we playing God both up and downstream of creation?

The evolutionary process is amoral. Survival relies not upon being the most intelligent nor physically strong, but being most adaptable to change. Yet spiritual being aims, in action, to be morally appropriate. Future spirituality may depend on the nature of future intelligence and consciousness and the extent to which their existence is rooted in the ability for self-reflection, to turn within and not just to know, but to understand that knowing.

²²⁷ Bartreck et al, *Measurement Instruments for Robots*, 78.

Chapter Five

What it is to be Spiritual

We may be able to resolve moral relationships between humans and machines and associated behavioural and even religious issues, but spirituality in humans has several larger complex bases. It intermingles the subjective and objective as we encounter our world, others and ourselves. In Kurzweil's machine world, spirituality may never be known by anyone other than the subject, because it is linked to a subjective state of consciousness. The result is that spiritual states, experiences and beliefs, arguably, could be experienced by any subject (not just a machine) simply by virtue of being conscious. The consciousness itself is not the limit of the spirituality, but rather the tool, or state, which allows the spiritual experience. Hence, the extent to which Kurzweil's spirituality is or is not "impoverished", à la Dembski, cannot be objectively known, as, indeed, the subjective state of any human's spirituality may never be known by other humans (but may be by God). It is difficult, therefore, to argue that spirituality, defined as linked to something divine, but without theism, is nonexistent. Dembski requires a relationship of the subject to an external objective being, in God. In his world, spirituality cannot exist, without that objective being exercising its influence on the subject. Whilst it may be experienced through consciousness in the subject, it does not and, indeed, cannot, emanate from the subject via its consciousness.

The last mentioned perspective arises in formal religious constructs in which subjective spirituality may be a part of the religious experience, but not necessary to it. Formal religion based on dogma and authority, establishes itself as an objective system linked to the objective perpetrator, God. God exists, irrespective of whether the subject is aware of God. Hence Kelly's "God as the generative source of all creation, but *always* immeasurably more than creation or its limitless other possible forms."²²⁸

²²⁸ Kelly, *Eschatology And Hope*, 173.

Formal religious constructs also incorporate the notion that to be spiritual is to be immaterial from the biological organism of the body. The same must, therefore, apply to technological bodily improvements. This existence, in religious parlance perhaps a “soul,” meaning more than mere spirit, is linked during the life of the biological organism to the human body, but separately and lives on, on a nonbiological level, after the death of the organism in Kelly’s “impenetrable realm.”²²⁹ The resurrected body exists not “in physical terms that are relevant to this present state of biological existence.”²³⁰

To many people, being spiritual is also part of a quest to find one’s true self. This self is separate from pure Ego, as it is not exclusively subjective. It also exists objectively, sometimes linked to yearning for ultimate reality beyond the tangible and is environmentally relevant. For many humans, living as we do in a milieu inhabited by other species and levels of consciousness, nature is central.²³¹ I will refer further to the importance of the natural world in human spirituality, but think it helpful first to consider a little further, what consciousness and intelligence may mean and encompass for humans.

5.1 Types of Consciousness

Types of consciousness are relevant to the potential impact of technology on biology and spirituality in the area of intelligence and its various types.

There have been many commentators on “consciousness.” Ken Wilber has proposed an “integral theory of consciousness,” attempting to unite science and spirituality. Central to his integral theory, is his “simultracking,” “in shorthand fashion, the investigation of

²²⁹ Kelly, *Eschatology And Hope*, 91.

²³⁰ *Ibid.*, 175. Kelly writes of this “spiritual body” as matter and spirit belonging to each other in which the resurrected body is interwoven; it has cosmic significance in which the body is radically transformed. *Ibid.*, 174-179.

²³¹ Some argue there are spiritual consequences in quantum physics. Fritjof Capra *The Tao Of Physics: An Exploration Of The Parallels Between Modern Physics And Eastern Mysticism* (3rd Edition 1991 (first edition 1975), Boston MA: Shambhala Publications. ISBN 0877735948)

sensory experience, mental experience, and spiritual experience: the eye of the flesh, the eye of the mind, and the eye of contemplation: all-level, all-quadrant.”²³²

Wilber looks at twelve disciplines with definitions of consciousness.

1. Cognitive science - anchored in fundamental schemas of the brain/mind, which can be seen as simple or more complex emergent/kinetic connectionist model.
2. Introspectionism, i.e. that consciousness is best understood in terms of intentionality, based on first-person accounts – the inspection and interpretation of immediate awareness and lived experience (not in third person, or objective accounts).
3. Neuropsychology, which is anchored in neural systems, neurotransmitters and organic brain mechanisms. It is based on computer science and is consequently vague about how consciousness is related to organic brain structures.
4. Individual psychotherapy - views consciousness as primarily anchored in an individual organism’s adaptive capacities.
5. Social psychology – by-product of social systems where consciousness is embedded in networks of cultural meaning.²³³
6. Clinical psychiatry, not just based on Freudian metapsychology, but increasingly views consciousness in strictly neurophysiological and biological terms, verging on a clinical identity theory in which consciousness is the neuronal system.
7. Developmental psychology, which views consciousness as a developmentally unfolding process, with substantially different architecture in each of the stages of growth.
8. Psychosomatic medicine, which views consciousness as strongly and intrinsically inter-active with organic bodily processes.
9. Non-ordinary states of consciousness, for example analysing dreams, which is believed to be crucial to a grasp of the nature of consciousness in general.
10. Eastern and contemplative traditions in which ordinary consciousness is a narrow and restricted version of the deeper and higher modes of awareness and the essentials

²³² Kenneth Wilber, *An Integral Theory Of Consciousness* (*Journal Of Consciousness Studies* 4 (1) February 1997).

²³³ Note to 4 and 5: Compare with Freud’s idea of the unconscious such as in *The Interpretation of Dreams*, 1900, and Jung who disagreed with Freud’s concepts of the unconscious, Jung seeing Freud as incomplete and unnecessarily negative. He called this “personal consciousness”, and said there was a second level that he referred to as the “collective consciousness”. Freud had referred to this in the context as an appendix to the rest of the psyche, but to Jung this was where the archetypes themselves resided. Jung also looked at the role of symbolism in the life of the unconscious. See also Carl G. Jung *Collected Works* (London: Routledge & Kegan Paul, 1970).

of consciousness itself can only be grasped in higher postformal and nondual states of consciousness.

11. Quantum consciousness, which views consciousness as being intrinsically capable of interacting with and altering the physical world through quantum interactions.
12. Subtle energies research, which relies on subtler types of bio-energies, beyond the four recognised forces of physics (strong and weak, nuclear, electromagnetic, gravitational), and that these energies play an intrinsic role in consciousness and its activities, such as prana, ki, and chi (for example used in acupuncture).

In his “great chain of Being and Consciousness” Wilber proposes “that the interior dimensions of the human being, seem to be composed of a *spectrum of consciousness*, running from sensation to perception to impulse to image to symbol to concept to rule to formal to vision-logic to psychic to subtle to causal to nondual states. In simplified form, this spectrum appears to range from subconscious to self-conscious to super-conscious; from prepersonal, to personal, to transpersonal; from instinctual, to mental, to spiritual; from preformal to formal to postformal; from instinct, to ego, to God.”

He argues that “it is quite true that consciousness is anchored in the physical brain (as maintained by theories 1, 3, 6, 8). But consciousness is also and equally anchored in interior intentionality (as maintained by theories 2, 4, 7, 10, 11) and intentionality that *cannot* be explained in physicalist or empiricist terms not disclosed by their methods or their validity claims.” Further, “consciousness (is not) finally located in the individual because it is also fully anchored in cultural meaning... Likewise, consciousness is also embedded in, and distributed across, the material social systems in which it finds itself... In short, consciousness is not located merely in the physical brain, nor in the physical organism, nor in the ecological system, nor in the cultural context, nor does it emerge from any of those domains. Rather, it is anchored in, and distributed across, all of those domains, with all of their available levels.”²³⁴

Wilber’s thesis does not appear to challenge the power of technology to objectively enhance humans and machines in and to levels of consciousness, but it does challenge the predictable consequences relative to interior intentionality. Further, definitions of

²³⁴ Ken Wilber, *An Integral Theory Of Consciousness*.

spirituality, being diverse, the extent to which a machine can be spiritual and an enhanced human may be altered in spiritual quality, covers a great spectrum. If one relates the potential for spirituality to the level of consciousness in the categories discussed by Wilber, the spirituality spectrum can at least be discussed.

Dividing the consciousness theories into categories of 1, 3, 6, and 8, i.e. anchored in the physical brain and 2, 4, 7, 10, and 11, anchored in interior intentionality, one can argue that the categories anchored in the brain, if they can be computationally reconstructed, then replicated in technology, for the taught parts of spirituality can be experienced by the machine. For example, a machine can be programmed to accept a certain belief system, a set of dogmas, a hierarchy of authority and accountability. Similarly, those parts of the man's consciousness and links to the spiritual relying on biology in neurons and which can be altered by enhancement, will be affected by the technological advances described by Kurzweil (however they may eventuate). If spirituality arises solely from the nontangible/non material, then any amount of replication in machines, or biological replacement by technology, cannot alter ultimate spiritual reality. However, for humans whose biological portholes to the ocean of spirituality are changed, the view of that ocean must be altered. Spirituality in humans ought not be limited to formal religious experience. The religious framework is an objective one. The spiritual experience may incorporate religion, but is also a subjective encounter. Hence, spirituality as conscious/subjective experience (as Kurzweil would have it) seems central.

Kurzweil's consciousness = spirituality in a machine, appears to emphasise a definitive state. Nobel Prize winner Francis Crick²³⁵ says that consciousness covers a variety of *biological* processes, some of which are non cognitive.²³⁶ He has looked at the brain's

²³⁵ Sack Institute of Biological Studies, San Diego, winner of the Nobel Prize 1962 with James Watson, for discovering the molecular structure of DNA.

²³⁶ Contribution to Rita Carter's work *Mapping The Mind* (Great Britain: Phoenix, 2000. Updated Orion Books, London, 2010), 332-333. He says;

"The biological usefulness of visual consciousness in humans is to produce the best current interpretation of the visual scene in light of past experience (either our own, or that of our ancestors embodied in our genes), and to make this interpretation directly available for a sufficient time of the parts of the brain that contemplate and plan voluntary motor output such as movement or speech.

But there actually seem to be two systems: the rapid acting 'on-line' or unconscious system and the slower, conscious 'seeing system'. To be aware of an object or even an event the brain has to construct a multilevel (for example, lines, eyes, faces), explicit, symbolic interpretation of part of the

active neuronal processes that correlate with consciousness and those which do not, searching for a basic common mechanism(s) which will take into account emotion, imagination, dreams and mystical experiences. He says;

Much neural activity is needed for the brain to construct a representation, most of which is probably unconscious.

Although working memory expands the time frame of consciousness it is not obvious that it is essential. Rather it seems to be a mechanism for bringing an item or a small sequence of items into vivid consciousness, by speech or silent speech. In a similar way, episodic memory, enabled by the hippocampal system, is not essential for consciousness but a person is severely handicapped without it. Consciousness, then, is enriched by visual attention, though attention is not essential for visual consciousness to occur.²³⁷

Consciousness in humans is, therefore, sometimes non-cognitive and continuing to be complex with increased intervention of science into philosophy. One is tempted to think that Kurzweil's conscious machines may in many ways technically replicate human consciousness mechanisms, but in a machine body – they are unlikely to be the same; the consciousness may replicate human behavior, but the essence be fundamentally different.

5.2 Types of Intelligence

Notions of what consciousness encompasses are relevant to the types of intelligence sought to be artificially altered in enhanced humans and replicated in machines.

Howard Gardner proposed in the early 1980's, a theory of multiple intelligences.²³⁸ He proposed intelligence can be broadly divided into spatial intelligence, dealing with spatial judgment and ability to visualise with the mind's eye; linguistic intelligence, to do with words spoken, or written and includes ability for verbal memory and recall; logical-mathematical intelligence, which deals not just with numbers, but reasoning, logic, similar to more accepted notions of intelligence or IQ; kinaesthetic intelligence, relating to the body, its motions and capacity to handle objects, physical action and muscular movement; musical intelligence, relating to sensitivity to sounds, tones, music and correlates with language skills, sensitivity to rhythm, pitch; interpersonal

visual scene. A representation of an object or event will usually consist of representations of man of the relevant aspects of it, which are likely to be distributed over different parts of the visual system.”

²³⁷ Carter, *Mapping The Mind*, 333.

²³⁸ Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books 1983).

intelligence, which relates to interaction with others and sensitivity to others' moods, feelings, motivations, empathy with others; interpersonal intelligence, which relates to inward and reflective capacities, understanding of self; naturalistic intelligence, which relates not just to ability to relate to nature, but environment and finally correlates to some extent to spiritual intelligence, to which I will refer later.²³⁹

There are some obvious correlations between Wilber's extending notions of consciousness to areas of human behaviour and perception beyond "brain work" related, cognitive behaviour. It is not just the neurons of the brain that need to be carefully dealt with in enhanced humans and replicated to produce human intelligence in machines, but also related body functions, individual and collective, relationships, related communities and environmental and cultural milieu. As philosopher Daniel Dennet argued, consciousness is part of complex interaction over time to make a view or approach.²⁴⁰

An important aspect of human intelligence, not easy to identify, far less replicate, is what has been referred to as emotional intelligence. Kurzweil is keenly aware of its importance.²⁴¹ "Emotion... plays a crucial part in the business of making moral judgments. Further, rational judgment is easily derailed by emotion."²⁴² Related to non-cognitive aspects of human intelligence and behaviour, emotional intelligence includes the ability to identify, use, understand and manage emotions.

There are several models of emotional intelligence, generally utilised in studies related to work performance. They include ability-based models and have been explored in contexts of skills in understanding and managing other people.²⁴³

²³⁹ See also Howard Gardner, *Multiple Intelligence: The Theory In Practice* (New York: Basic Books, 1993) Howard Gardner, *Intelligence Reframed, Multiple Intelligences For The 21st Century* (New York: Basis Books, 1999) and Howard Gardner, *Changing Minds: The Art And Science Of Changing Our Own And Other People's Minds* (Boston: Harvard Business School Press, 2004).

²⁴⁰ See Daniel Dennett, *Consciousness Explained* (Boston: Back Bay Books, 1991).

²⁴¹ See his point 15, at page 7 here.

²⁴² Carter, *Mapping The Mind*, 132-133.

²⁴³ Such as, perceiving, using, understanding and managing emotions, models, self-awareness, management awareness and relationship management, what is known as the Bar-On model, which combines emotional and cognitive intelligence and assesses ability to contribute to ability to succeed in life and the trait model which relates to personalities and self-perceived abilities. D. Grewal & P. Salovey, *The Science Of Emotional Intelligence. Current Directions In Psychological Science* (Volume 14-6, 2005) D. Goleman, *Working With Emotional Intelligence* (New York: Bantam Books 1998) R. Bar-On, *The Emotional Quotient Inventory (EQ-I): A Test Of Emotional Intelligence*

Whilst there is criticism of the validity of these theories, these criticisms relate more to them being tools of measurement, than to concept.²⁴⁴ They do purport to go back to Darwinian theory of survival and adaptation and the necessity for emotional expression.²⁴⁵

Sixteen years after his initial text, Gardner considered spiritual, moral, existential and naturalist intelligence.²⁴⁶ He argued there is not just an emotional quotient to intelligence, but a spiritual quotient as well, but as our ability to understand cosmic and transcendent truths is an affective process, there is no scientifically accurate way of investigating these traits. He did not, therefore, identify spiritual intelligence per se and rejected the notion of moral intelligence because it relied on moral judgments and “intelligence by its very nature is value neutral.”²⁴⁷ What Gardner calls existential intelligence is the ability to ask deep questions about life and death; as such it is fundamental to art, religion and philosophy and accordingly an intelligence type; although Gardner cannot locate a part of the brain devoted to it. Perhaps his mistake is that he is looking for it per se, when mental processes and abilities are diffuse and interwoven in the brain.²⁴⁸ His identified criteria are propensities, rather than abilities, including perceptions, intuitions and cognitions that relate to spirituality and religiosity, arguably, central and fundamental, because they relate to guidance of others.²⁴⁹ Such intelligence can relate to deep meanings, purpose and motivations,²⁵⁰ something that

(Toronto: Multi-Health Systems, 1997) and K.V. Petrides & A. Furnham, *The Location Of Trait Emotional Intelligence In Personality Factor Space* (*British Journal of Psychology*, 98, 2007), 273-289.

²⁴⁴ See H.J. Eysenck *Intelligence: A New Look* (ISBN 0765807076, 2000), E.A. Locke, *Why Emotional Intelligence Is An Invalid Concept* (*Journal Of Organizational Behavior*, 2005, 26, 425-431), F.J. Landy, *Some Historical And Scientific Issues Related To Research On Emotional Intelligence* (*Journal Of Organizational Behavior* 2005) 26, 411-424, P.D. Harms & M. Credé, *Emotional Intelligence And Transformational And Transactional Leadership: A Meta-Analysis* (*Journal Of Leadership & Organizational Studies*, 2010) 17(1), 5-17, and S. Cote & C.T.H. Miners, *Emotional Intelligence, Cognitive Intelligence And Job Performance* (*Administrative Science Quarterly*, 2006) 51 (1), 1-28.

²⁴⁵ See R. Bar-On, *The Bar-On Model Of Emotional-Social Intelligence (ESI)* (*Psicothema*, 2006, 18, suppl., 13-25).

²⁴⁶ Gardner, *Intelligence Reframed: Multiple Intelligences For The 21st Century* (New York: Basic Books, 1999).

²⁴⁷ See Howard Gardner, *A Case Against Spiritual Intelligence* (*The International Journal For The Psychology Of Religion*, Volume 10, January 2000, 27-34).

²⁴⁸ See subsequent reference s to the work of Norman Doidge and Marvin Minsky at 6.1.2 pp 65-66 and 6.3 pp 69-73 here.

²⁴⁹ Stephen Covey, *The 8th Habit: From Effectiveness to Greatness* (Simon & Schuster, 2004), 53.

²⁵⁰ Danah Zohar and Ian Marshall, *SQ: Spiritual Intelligence, The Ultimate Intelligence* (Bloomsbury, 2000, ISBN 0747546762).

adds inherent ability and awareness,²⁵¹ can include capacities to transcend the physical, to experience heightened states of consciousness, to sanctify experience, to be virtuous, to use spiritual resources in problem solving²⁵² and further recognition in a conscious sense that we are part of a bigger multi-dimensional reality and an accompanying endeavour for psychological well being for both the individual and collectively.²⁵³ This intelligence type also has a connection between personal and transpersonal self and spirit and awareness of that relationship, not just with a third party creator, but with all creation having something underlying existence. Says Frances Vaughan, such intelligence “may be expressed in and culture as love, wisdom, and service.”²⁵⁴

Danah Zohar and Ian Marshall²⁵⁵ argue there is spiritual intelligence (SQ) and it is the ultimate intelligence. Whereas computers may have high IQ and animals much EQ (emotional intelligence), they say only humans have SQ. They categorise SQ in nine ways: Self-Awareness, which is knowing who you are and how you are connected to the whole universe; vision & values Led, or idealism, which they say children naturally have as they want to serve and further say is definitive of our humanity; the capacity to face and use adversity and learn from our mistakes; being holistic and seeing connections between all things; celebrating diversity in people and ourselves; field independence, or courage, which is linked to a capacity to adapt and be independent; the tendency to ask “why?” compared to quantum physics, where the asking actually creates reality; the ability to re-frame things into a larger context or meaning; and finally, spontaneity, responsible appropriate response to the rest of the world. They use quantum physics and the research of neuroscientist Rodolfo Llinas, connecting consciousness to 40 Hz neural oscillations in human brains. They say these frequencies are identifiable with the soul’s intelligence – our creativity, the ability to alter our environment and question the meaning of life, come from this neural source. However, they also adopt religious links, using Hindu, Buddhist and Hebrew texts as guides for increasing SQ.²⁵⁶

²⁵¹ Tony Buzan, *The Power Of Spiritual Intelligence* (HarperCollins, 2001).

²⁵² R.A. Emmons *Is This Spirituality and Intelligence?* (*The International Journey of Psychology of Religion*, 2000), 10:27-34.

²⁵³ Kathleen Noble, *Riding the Windhorse: Spiritual Intelligence And The Growth Of The Self* (Hampton Press, 2001).

²⁵⁴ Frances Vaughan, *What Is Spiritual Intelligence?* (*Journal of Humanistic Psychology*, Volume 42, No. 2. Spring 2002, Sage Publications, 2003) 16-33.

²⁵⁵ Zohar and Marshall, *SQ: Spiritual Intelligence*.

²⁵⁶ Spiritual intelligence has also been said to include outward ability for wise and compassionate action whilst retaining inner balance or peace, irrespective of one’s situation and includes the entire self, ego

David King has proposed a four pronged model of SQ to include cognitive adaptive ability, which relates to the nontangible and transcendent in what is the nature of being, existential and metaphysical issues, personal meaning, what has been referred to as transcendental awareness which includes awareness of the transcendent in normal states of consciousness and the ability to go in and out of portholes of consciousness, such as contemplation and meditation, prayer states and the ability to control this in a discretionary way.²⁵⁷ His emphasis is on spirituality as a “personal quest” for higher meaning. True understanding of the sacred as opposed to formalised religion, the latter being “the social vehicle” for spirituality.²⁵⁸

It is interesting that these theories emphasise an ability to *control*, based on notions of human free will. For example, William Frank Diedrich has tied spiritual intelligence to an actual ability to choose between ego and spirit, or higher self, in terms of breath being spirituous, the breath of life and intelligencia, an ability to choose between. It is an attempt in many ways to argue for a higher spirit, away from the ego (oft maligned in Eastern religious traditions) with the identity of being a spiritual being, yet still having some human experience. Diedrich says responsibility for one’s life and situation, ownership of one’s thoughts and mores give rise to the life/world one lives in. He encompasses the traditional spiritual notion of detachment from the tangible results of one’s actions, arguing that what occurs in the spiritual identity is what determines one’s well-being and really arguably in his terms, *success*.²⁵⁹

It is important to understand the above theories relate to models attempting to measure spiritual intelligence primarily for corporate interests; their emphasis relates to leadership abilities,²⁶⁰ rather than existential desire to comprehend ultimate reality. Both the means encapsulated in these models and the goals to which they are directed, lend

awareness, awareness of cosmos, mastery of both self and society in spiritual context. Patricia Aburdene, *Megatrends 2010: The Rise Of Conscious Capitalism* (Hampton Roads, 2005), 127.

²⁵⁷ David B. King and Teresa L. DeCiccio, *A Viable Model And Self Report Measure For Spiritual Intelligence (The International Journal Of Transpersonal Studies, Volume 28, 2009)*, 68-85.

²⁵⁸ *Ibid.*, 69.

²⁵⁹ See William Diedrich, *The Road Home: The Journey Beyond The Spiritual Quick Fix and Beyond Blaming* (East Lansing, Michigan: Transformative Press, 2004).

²⁶⁰ Zohar and Marshall actually relate SQ to “spiritual capital” which is what an individual and/or organisation exists for, aspires to, means, believes, and takes some responsibility for – a type of investment.

them to a type of spirituality which may potentially be replicable in a machine and/or enhanced in a human being. Those means and ends do, however, contrast dramatically with the lives of many mystics and saints lauded by institutionalised religions; Teresa of Ávila, for example. Her autobiography²⁶¹ depicts her life as a mystic and Carmelite nun. She describes developing mental prayer in four stages: from contemplation and concentration and withdrawal to the soul, to a prayer of quiet which involves supernatural states derived from God, but still with human intellectual capacities, such as memory and reason, the imagination remaining intact. The next step is the devotion of union in which there is ecstasy, absorption into God's reason, but still retaining memory and imagination. The fourth stage of ecstasy/rapture includes a loss of all sense, memory and imagination and such a complete absorption in God as to be engulfed both bodily and spiritually in God, being powerless and unconscious and sometimes involving an ecstatic flight, or elevation. Whilst today's proponents of spiritual intelligence adulate heightened levels of consciousness responsible for spiritual states, Teresa's way was one of conscious and almost complete abandonment. Kurzweil would perhaps regard Teresa's transcendence as "a particularly brilliant flower in the phenomenological garden,"²⁶² but, in essence, mental experience with neurological correlates "that may be replicated."²⁶³ Perhaps more knowledge of Kurzweil's frontal lobe "God spot" will one day provide answers. The question remains whether this "spot" is, perhaps, the biological porthole God created to communicate with us, or the source of the spiritual experience itself.

Teresa's transcendental consciousness has none of the discretionary control King et al promote. Some examples from Teresa's *Spiritual Testimonies*²⁶⁴ of conversations with the Lord are apt. 1570 "Strive to have the right intent and to be detached in all things." 1571 At Salamanca or Alba, "Do what lies in your power; surrender yourself to me, and do not be disturbed about anything."²⁶⁵ Interestingly, Teresa's descriptions of mystical events, such as transpiercing of the soul,²⁶⁶ being "carried out of my senses through joyous raptures, so in the same way through extreme affliction my soul is suspended, for

²⁶¹ *The Life of Teresa Of Jesus: The Autobiography of Teresa of Ávila*. Translated by E. Allison Peers. (Doubleday, 1991). Teresa was born March 28th 1515 and died on October 4th 1582.

²⁶² Ray Kurzweil, *The Age of Spiritual Machines*, 151.

²⁶³ *Ibid.*, 151.

²⁶⁴ Teresa of Ávila, *Collected Works Of St. Teresa Of Ávila Volume One*, translated by Kieran Kavanaugh (Washington D.C.: ICS Publications, 2002).

²⁶⁵ *Ibid.*, 388.

²⁶⁶ *Ibid.*, 389.

it is left enraptured” are mixed with biological phenomena “whilst still in possession of my senses” with increasing pain, “the body remains so torn apart... hands... disjoined and in pain” at the memory of the soul pierced. Teresa’s descriptions of rapture and elevation are of body/spirit detachment, strangely aware, but not conscious in effort. In these raptures it seems “that the soul is not animating the body and thus there is a very strong feeling that ... without any forethought there... comes a force so swift and powerful that one sees and feels this cloud or mighty eagle raise it up and carry it aloft in its wings.”²⁶⁷ “The experience also leaves a rare detachment... more than spiritual things alone are involved... the spirit is completely detached from things... (as if)... the Lord wants to effect this detachment in the body itself.”²⁶⁸ Today’s scientists may be able to identify a purely biological source for the phenomena²⁶⁹ Teresa had no way else to describe and interpret in her time than as mystical experience.²⁷⁰ One would think that such materially disconnected mysticism, would negate an ability for practical action and yet Teresa opened seventeen convents, many men’s cloisters and reformed the Discalced Carmelites over a period of some twenty years, as well as being a prominent writer of the counter reformation, theologian and ultimately a Doctor of the Church. Language description and resulting experiences may be accounted for by the intelligence and consciousness media of her time. Leonardo Polo²⁷¹ may, however, say Teresa is his universal persistence personified. Her unique dependence on God is the basis of a freedom and inward openness based on self-knowledge and self-giving.²⁷² She is open to the identity of the universe which is God, exhibiting the “human transcendent” of openness, “freedom”, “intellection” and “love” necessary for a human being. Polo’s observation on mental limitations infer how a mental act always refers to an act, in which it stops.²⁷³ Polo’s may be obscure thought, but serves to highlight the innate difficulties of endeavoring to conceptualise and replicate non material, spiritual concepts

²⁶⁷ Teresa of Ávila, *Collected Works Of St. Teresa*, 173.

²⁶⁸ *Ibid.*, 175.

²⁶⁹ See subsequent references to “Brain Mapping” and Rita Carter’s work at pp 61-65 here and following.

²⁷⁰ There is also an interesting nexus in her writings between nature such as watered gardens (water symbolic as prayer and Christ as gardener, for example), plus mystical references and a robustly passionate relationship with the God who is Love. Teresa of Ávila, *Collected Works Of St. Teresa Of Ávila Volume One*, 114.

²⁷¹ Professor of Philosophy, University of Navarra, author, inter alia, on philosophy of science, ethics, metaphysics and philosophical anthropology.

²⁷² See Leonardo Polo, *El Acceso Al Ser (Access To Being)* (Eunsa, Pamplona: 1964). Polo proposed a dual character of human co-existence which is intimate in outward openness – the intimacy of a person does not make it an ‘other’ person, but rather that person has “absence of replication.” Leonardo Polo, *Antropologia Transcendental. Tomo 1: La Persona Humans*, (Eunsa, Pamplona, Spain: 1999), 204.

²⁷³ See work of Professor Juan A. Garcia, Malaga University, interviews with Polo 1992.

in a material, technological context and the important relationships that arise if one's spirituality involves a God/creator.

Some clues to the differences between contemporary analysis of spiritual intelligence and theistic formal religious bases of where we get our spirituality from, may come from further exploring sources of spirituality. The former identify spiritual abilities and propensities that can be found in the human person operating within the human community and larger world, the latter spirituality that will also exist in a continuity, in eternity and emanates from an outside, divine, source. That source benefits from more sophisticated analysis than the Dembski third party model presents.

5.3 The Work Of Bernhard Philberth

Bernhard Philberth was a physicist, theologian, priest and inventor who looked at divine source in man's origins consistent with scientific knowledge. He characterised man as of threefold origin. "As a natural living being, man derives from a twofold natural development:

- I. As species, man derives from a historical phylogenesis (history of species).
- II. As individual man derives from an individual ontogenesis (history of the individual). Furthermore:
- III. As child of God, man derives supernaturally from a salvific "new creation" (history of salvation)."

This third origin, this "salvific homogenesis," is not evolutionary, it is not the product of development, but is a free act of God, a "new creation."²⁷⁴ Further, the salvific homogenesis is – as a supernatural, transcendent event – a super-temporal one and cannot be understood in terms of physical time.²⁷⁵ Like Dembski, Philberth is adamant "Man is not destined by a macromolecule, by a building plan of his organism written in chemical terms. Being fully human 'naturally and spiritually,' has its foundation in the relationship of man with God." But Philberth says there is more, "Salvific homogenesis" (i.e. being called by God for salvation) occurs only in the transformation

²⁷⁴ Bernhard Philberth, *Revelation* (BAC Australia, 193 Power Street Plumpton NSW 2761, 1994), 182.

²⁷⁵ *Ibid.*, 184.

of man's nature in receiving God's call, and not already in the natural homogenesis."²⁷⁶

...

Even natural man cannot be perceived as merely materially defined, but only as a spirit/matter-complementarity. When does man become man? Phylogenesis (development of species) is different from ontogenesis (development of the individual). Again quite different is the salvific homogenesis.

The universe aims at the salvific homogenesis in which God guides us beyond cosmic existence. A principle of existence of this universe is complementarity.²⁷⁷

Wolfhart Pannenberg,²⁷⁸ who shares Philberth's desire to reconcile science and theology, would add that there are dual levels of spirit of God, one that is always there in creation which "spirit animates the creatures in raising them beyond themselves to participate in some measure in the life of the eternal God, who is spirit... But the biblical language requires us to admit that the Spirit of God himself is operative in such a way in all creatures. This is different from being imparted as a gift, as it happens in connection with faith in the risen Christ. Since the life of the risen Christ is thoroughly united to the Spirit, the giver of life, the believer in the risen Christ receives in himself or herself the source of all life and therewith the hope of his or her own immortal life. In this way, the Spirit is not *given* to all creatures, but *operates* in all of them by arousing their self-transcendent response which is the movement of life itself."²⁷⁹

As a physicist, Philberth understands concepts embraced by Kurzweil, albeit with different diagnoses and prognoses. He says, following "cosmic Singularity" 20 million years ago and the beginning of space-time, hydrogen, plasma, formation of galaxies, animals and human beings, human beings were not spiritual and indeed, in terms of brain size, humpback whales were superior to humans. "The special vocation of man, which raises him infinitely above animals, comes only in his being filled with the spirit of God. The "second account of creation" in Genesis (being)... the intellectual history of humankind."²⁸⁰ But "the eternal life of human beings does not spring from the evolutionary moulding of earthly man."²⁸¹ For Philberth there are distinct theological events from evolutionary events and (with a similar sacramental emphasis to Kelly) the

²⁷⁶ Bernhard Philberth, *Revelation*, 148.

²⁷⁷ *Ibid.*, 149.

²⁷⁸ Professor of Systematic Theology, University of Munich, Germany. See earlier notes 119, 120, 187 & 197

²⁷⁹ Pannenberg, *An Introduction To Systematic Theology*, 45-6.

²⁸⁰ Philberth, *Revelation*, 119-120.

²⁸¹ *Ibid.*, 120.

salvific homogenesis is lived out in the sacraments of the church, but it occurs in “no objectifiable time.”²⁸² Philberth has his own Singularities based in physics being a “meta-existence with strange properties.”²⁸³ He has a Singularity as both a start and a goal of the universe, with our whole universe “after” the Singularity that began our universe. “In this universe we perceive a Singularity as the goal and end of a super-gigantic collapse of a galactic nucleus.”²⁸⁴ “The Singularity limits and founds all cosmo-physical existence. Everything that exists is oriented by it and towards it. By its nature the Singularity is not part of what it founds, namely existence. Singularity is non-existence and yet, is not nothingness. It is meta-existent. Meta-existence does not belong to any category of existence.”²⁸⁵

Philberth uses the analogy of complementarity in physics, as was used to explain the phenomena of light and matter. Complementarity demonstrated that there is no objective, well-defined space-time location for the quantum of life between emission and absorption, something which could not be imagined by classical logic. He refers to the matter/spirit complementarity as follows; “Matter does not generate spirit but is the instrument of spiritual activity. Spirit does not depend on matter but shapes it, guiding the development of the individual as well as of the entire life and history of the world.”²⁸⁶ Further, “in the matter/spirit-complementarity, the matter component is in itself complementary as particle-wave and the spirit component is in itself complementary, as consciousness-personality.”²⁸⁷

Wolfhart Pannenberg is worth interposing here again. He used force field concepts, found in physics “both in terms of its historical antecedents and in terms of its systematic implications,” to explain the spiritual presence of God in all possible intelligible events. Spirit is not analogous to, but is itself a force field. “Einstein’s field theory comprises space, time, and energy in such a way as to make thinking about the whole of time intelligible... (and) would give priority to eternity in our conception of time.”²⁸⁸

²⁸² Philberth, *Revelation*, 185.

²⁸³ *Ibid.*, 79.

²⁸⁴ *Ibid.*, 79.

²⁸⁵ *Ibid.*, 80.

²⁸⁶ *Ibid.*, 150 and 152.

²⁸⁷ *Ibid.*, 153.

²⁸⁸ Pannenberg, *Toward A Theology Of Nature*, 48.

Philberth's analysis of consciousness is critical. He emphasises that it cannot be understood in terms of classical thinking and goes further in saying that the soul and spirit, mortal or immortal, does not start with the zygote, or is created within it, or is progressively developed during ontogenetic evolution "it does not co-evolve, and is not created additionally as a material function."²⁸⁹ To Philberth, in the universe, the material component is a giant collective energy field and the spiritual component is;

a field of consciousness from which entities of consciousness (or units, elements, quanta) issue and take shape individually, coming and going. The entities of consciousness too, are bound up with each other, each with every other. Each personality exists in a gravity-like dependence on the society – the community of all conscious entities of the whole world (as the spirit of the world); on the society of our planet (mankind); on the community of one's own people, one's town, one's family and one's own self.

Does each individual consciousness, each personality, also exist in such a zero balance with the collective community? Presumably yes!

Just as all energy and mass do exist (rather than not exist) in such supplementation to zero, so it is with each entity of consciousness, each personality. This universe is an all-embracing matter/spirit-complementarity.²⁹⁰

Philberth identifies personal consciousness, but in a larger context.²⁹¹

Individually: in man:

The natural homogenesis (as ontogenesis) is – from a zygote to death – the manifestation of an individual human consciousness, personality. This too is a quantum dynamic event, even if always with a consciousness individually owned by this person... However, as a rule, there is - from conception to death – one consciousness belonging individually to this one natural human being; but as a quantum dynamic process.²⁹²

To Philberth, "natural man is a temporary manifestation of a consciousness as his individual life. He is a dynamic process starting with conception, increasing from birth, diminishing in old age, and ceasing with death. This is a process within this world, and so it is within every other Earth-bound being. Only the salvific homogenesis raises man above these worldly events and above worldly existence."²⁹³

The spiritual component as part of a universal field of consciousness Philberth describes, because it is described as part of a natural order, would not logically encompass the

²⁸⁹ Philberth, *Revelation*, 154.

²⁹⁰ *Ibid.*, 155.

²⁹¹ Consistent with Wilber's larger spectrum, or "Great Chain of Being and Consciousness."

²⁹² Philberth, *Revelation*, 156.

²⁹³ *Ibid.*, 157.

consciousness a machine may subjectively achieve. As a material thing it would not be part of this field and it seems, not part of Pannenberg's spirit force field.

Free will is central also for Philberth. The world in which man has this consciousness is "this world of decision."²⁹⁴ "Life in this world is decisive, whether a person after his passage through this world enters heaven or hell. Once this decision has been made and has caused the eternal separation, it is valid forever and is irreversible. In this world there is a continuous battle between good and evil. God encounters man in this world as a creature placed into the freedom of choice."²⁹⁵ This statement appears to be faith-based, not subjected to scientific analysis, nor even attempted analogy.

Philberth says that what is the human spirit, or soul, depends on who is the person reflecting on it and what is their discipline. Endeavoring to be as "free from reservations as possible" Philberth, allowing his mind to wander, says; "'The soul and the spirit' of the man of salvific homogenesis, is a metamorphic expression for immortal life in union with God, for which man becomes a candidate when being called by God."²⁹⁶ Whilst identifying that there are storage systems in the human brain and computers which closely resemble each other, he identifies one important difference, "whilst the circuitry of elements of the brain can be reconstructed, that of computers is rigid: human consciousness is not only able to program the brain, but also to arrange the circuitry to suit itself (as it were, altering the hardware itself, in an adaptability of the brain which goes beyond the ontogenetic evolution)."²⁹⁷ This allows us to recognise that consciousness is not a mere proper function of the brain, but is a power which guides the brain and the body to suit itself."²⁹⁸ Philberth emphasises that understanding the "fascinating spirit/matter-complementarity is not "super-natural" at all", it is part of the world and it is not necessary "To assign a time to creation of the immortal soul," before or after birth, or conception as "immortality is not linked at all to the phylogenetic or ontogenetic homogenesis. Nor is it 'possible' or 'necessary'"²⁹⁹

²⁹⁴ Philberth, *Revelation*, 202.

²⁹⁵ *Ibid.*, 19.

²⁹⁶ *Ibid.*, 163.

²⁹⁷ Consistent with Marvin Minsky's observations in *The Emotion Machine* 336-7 – that for difficult problem solving the brain separates functions into parts and focuses on them sequentially.

²⁹⁸ Philberth, *Revelation*, 164.

²⁹⁹ *Ibid.*, 168.

Whilst what Philberth describes is not “super-natural,” if “salvific homogenesis’ (i.e. being called by God for salvation) occurs only in the transformation of man’s nature in receiving God’s call, and not already in the natural homogenesis,”³⁰⁰ his spirit/matter complementarity relies on Dembski-like third party intervention, but on a far subtler level. “‘The soul and spirit’ of the man of salvific homogenesis is a metaphoric expression for immortal life in union with God, for which man becomes a candidate when being called by God.”³⁰¹ Thus a machine could not be spiritual without God’s calling and a human being, enhanced or otherwise, still only becomes a child of God through salvific homogenesis. But, even on Philberth’s broad definition of consciousness, the enhancement of species and individuals, who in addition interact with their made technology, must affect the “child of God” in his critical “world of decision” and in that world “matter (may) not generate spirit, but (remains) the instrument of spiritual activity.”³⁰² Because, it appears to Philberth, free will is vital to salvation,³⁰³ anything that affects, colours, or influences the ability for biological man to make decisions, affects both his temporal spirituality and any ultimate choices that denote continuing eternal spirituality via salvation. That is, if “life in this world is decisive... valid forever and irreversible.”³⁰⁴

³⁰⁰ Philberth, *Revelation*, 148.

³⁰¹ *Ibid.*, 163.

³⁰² *Ibid.*, 150 and 152.

³⁰³ A stance challenged in the following chapter here.

³⁰⁴ *Ibid.*, 163.

Chapter Six

Emotions, Technology and Free Will

Philberth's "World of Decision" denotes dire consequences for man in eternity.

Research in AI has inspired enquiry into all aspects of how the brain and our hardware biology works, including spiritually. It is worth returning to science to consider how the brain actually functions in decision-making, particularly emotion's role in intelligence.

Commanding emotional intelligence is, after all, vital to Kurzweil's future human/machine world³⁰⁵ and is a complex tool in human decision making³⁰⁶

6.1 Humans and the Emotive Decision Making Process – Brain, Body and Spirit

6.1.1 Brain Mapping

Brain mapping has been extensively utilised in developing AI. It produces images of brains in an effort "to relate the brain's structure to its function, or of finding what parts give us certain abilities. Localisation of function tells us what aspect of our brain allows us to be, for example, creative or logical?"³⁰⁷ As the brain has 100 billion neurons and support cells which store memories, brain mapping can be used for seeking out spiritual processing and provides insight into human subjective spiritual experience which result in moral decisions.³⁰⁸

A short summary of general area (or lobe) brain function is instructive. The cerebral cortex, or frontal lobe, is most anterior and right under the forehead. Its major functions are "how we know what we are doing within our own environment (consciousness), how we initiate activity in response to our environment, judgements that we make about what

³⁰⁵ Kurzweil, *The Singularity Is Near*, 29.

³⁰⁶ See pages 49-51 here and notes 243-245.

³⁰⁷ See *How Brain Mapping Works*, by Susan L. Nasr (HowStuffWorks 1998-2010 HowStuffWorks Inc). See also *The Human Brain: A Guided Tour*, by Susan A. Greenfield.

³⁰⁸ Kurzweil also deals with brain scanning, emphasising use of nanobots. Kurzweil, *The Singularity Is Near*, 163-167.

occurs in our daily activities, controls our emotional response and our expressive language, assigns meanings to the words we choose, involves word associations. It also contains our memory, the habits and motor activities.³⁰⁹ Problems in this area can cause loss of movement and paralysis, inability to sequence, to persist in a single thought, to focus on tasks, mood changes, changes in social behaviour, personality and difficulties with problem solving, as well as inability to express language.

Interference with the parietal lobe, which relates to vision and senses, results in an inability to do more than one thing at a time, to find words for writing, reading, to distinguish left from right, to do mathematics, leads to lack of awareness and difficulties with hand-eye coordination.

Difficulties with the occipital lobes, which relate to vision, cause defects in vision, perception of colour, movement, reading and writing.

Difficulties with the temporal lobes, which relate to hearing ability and categorisation of objects, can affect recognition of faces, attention to what we see and hear, resulting in difficulty with verbalisation of objects, short term memory loss, interference with long term memory, inability to categorise objects, persistent talking and in increased aggressive behaviour.

Problems with the brain stem, which is deep in the brain and leads to the spinal cord and relates to breathing, heart rate, swallowing reflexes, seeing, hearing, controls sweating, blood pressure, digestion, temperature, alertness, ability to sleep, sense of balance, can affect all of the above functions; for example, breathing, being able to swallow, speak, organisation and perception around the environment, problems with balance, and sleeping difficulties.

Problems with the cerebellum, which relates to coordination and voluntary movement, balance, equilibrium, some memory and reflex motor acts, can result in loss of ability to

³⁰⁹ See *Brain Functions And Map*, Professor Robert P. Lehr Jr., PhD., Professor Emeritus, Department of Anatomy, School of Medicine, Southern Illinois University <http://www.neuroskill.com/brain.shtml>.

coordinate fine movements, walk, reach and grab objects and also an inability to make rapid movements.³¹⁰

The brain in all its parts is the vehicle for consciousness in cognitive sciences, neuropsychology, clinical psychology, and psychosomatic medicine, (Wilber's 1, 2, 6 and 8 numbered disciplines having definitions of consciousness). If spirituality is a chemically induced and/or biological process sited in the material man, then it arguably can be replicated in a machine and altered in an enhanced human and at the very least will be altered in humans operating in an increasingly technological, as opposed to natural, based environment.³¹¹

Rita Carter in *Mapping The Mind*³¹² has taken brain mapping further, locating "higher faculties," such as altruism, empathy and morality with neural impulses in the brain, predicting that when brain mapping is completed our brains will, with targeted treatments, "be almost entirely malleable... (and possibly á la Kurzweil)... individual perception may be altered to the extent, if we choose, to live in a state of virtual reality, almost entirely unaffected by the external environment."³¹³

Carter's stated purpose is to look at "social implications" of behavioural neuro-science relevant also to the age-old brain conundrum and the puzzle of consciousness. "The more optimistic of today's brain explorers believe that when, or if, all of this is brought together – when each minute brain component has been located, its function identified and its interactions with each other component made clear – the resulting description will contain all there is to know about human nature and experience." But gives weight to the opposite stance that... "this reductionist approach will never fully explain why we feel and behave as we do, let alone yield the secret of the brain's most extraordinary

³¹⁰ In terms of brain "position" the cerebral cortex is the frontal lobe and it is the most anterior right under the forehead. The parietal lobe is near the back and top of the head, the occipital lobes are the most posterior at the back of the head, temporal lobes are at the side of the head above the ears, the brain stem is deep in the brain and leads to spinal cord; and the cerebellum is located at the base of the skull. The average weight of a brain is 1400 gms.

³¹¹ For a study "Assessing the effects of the Internet", UCLA scientists found this type of searching activates the parts of the brain that control decision-making and complex reasoning. Participants had the same significant brain activity during book reading as with internet experience, but with the latter, there was also activity in the areas of the brain that control decision-making and complex reasoning, as they worked on the internet. See work of Dr. Gary Small, <http://www.whatthehealthmag.wordpress.com/2008/10/16>.

³¹² See note 236 here.

³¹³ Carter, *Mapping The Mind*, 2.

product – consciousness. By their lights, a map of the brain can tell us no more about the mind than a terrestrial globe speaks of Heaven and Hell.”³¹⁴ She emphasises “ The work described does not settle the debate about the nature of existence, but ...(may)... provide tantalising clues about it.”³¹⁵

For clues on things spiritual, Carter finds;

seemingly imponderable qualities of the mind are starting to look surprisingly mechanistic. Morality, altruism, ‘spiritual’ and religious experiences, aesthetic appreciation – even love – have generally been thought of as being beyond scientific exploration. Yet all these seemingly impenetrable mysteries are now revealing their physiological roots, and in some cases they can be manipulated simply by the touch of a perfectly placed electrode. Implanted brain ‘pacemakers,’ for instance, can transform the meaningless darkness of depression, once assumed to be a sickness of the ‘spirit’ and eradicate compulsive and obsessive thoughts where all conventional means of stopping them has failed. Feelings of disembodiment, timelessness – even a sense of spiritual transcendence – can be produced on cue if the right bits of brain are tweaked in the right way.³¹⁶ ... In a series of pioneering studies, started in the 1980s, the Canadian neuroscientist Michael Persinger discovered that disturbing electrical activity in the brain (especially around the temporal lobes) produces weird subjective states in a majority of people. They include out-of-body experiences and the feeling of being in the presence of an invisible but sentient being. What all this demonstrates is that feelings such as amusement, awe, love, terror and spirituality can be experienced independently of the external circumstances with which they are generally associated. You don’t need a love object to feel desire, you don’t have to be under threat to feel fear, and you don’t need a supernatural being to feel haunted. Given an appropriate prod, your brain can produce more or less any experience on its own.³¹⁷

What flows from this is a potential conclusion that our brains as evolved, may be imagining a mind, soul and/or consciousness that exists separately from the brain and will continue in an afterlife. If “hallucination, imagination, and ‘real’ seeing are essentially the same as far as the brain is concerned,” but vary with individuals and as measured in the visual cortex,³¹⁸ what is indeed “real”? Paul Broks,³¹⁹ says notions of separation of mind/body/soul are primordial intuition and products of social evolution;

³¹⁴ Carter, *Mapping The Mind*, 30.

³¹⁵ *Ibid.*, 3.

³¹⁶ An example being one “can even buy a helmet which offers you a choice of ‘intense spiritual experiences’ by sending electronic waves through your skull to turn the grey matter beneath on and off. Dubious as the claims for it might at first seem, the helmet is based on legitimate scientific research.” *Ibid.*, 13.

³¹⁷ *Ibid.*, 12-13. Kurzweil devotes a detailed chapter to this entitled *Achieving The Software Of Human Intelligence* in *Age of Spiritual Machines*, 143-203.

³¹⁸ Joseph E. LeDoux, *Synaptic Self: How Our Brains Become Who We Are*, 206.

³¹⁹ Senior clinical lecturer, University of Neuropsychology, Plymouth, U.K., writer and playwright, contributing to *Mapping The Mind* at pp. 43 and 44.

We are incapable of imagining absolute nothingness. Our mental apparatus is tuned to states of being in the world. Non-being is simply beyond our ken. All of this is of no concern to those who believe in an afterlife. The conscious personality just floats on elsewhere. That most people hold to this bizarre belief is not simply due to religious indoctrination. The separateness of body and mind is a primordial intuition. It has sprung from our evolution as social beings and coalesced into the hardware of the central nervous system. Human beings are natural born soul makers, adept at extracting unobservable minds from the behaviour of observable bodies, including their own. Taking the next, false step, if mind and body are conceived as separate entities, it is easy to see the possibility of a mental life after physical death.

If such spiritual manifestations result from what Broks appears to say are biological and social evolutionary factors which have formed the human brain, the problem of Dembski's third party God relationship disappears, but we have the problem that any replication of that brain in technology, lacking such rich history, may only be imitative and lacking the inherited human plasticity. It is a separate question as to whether Broks is correct, i.e. what we have as a result of that history is "delusional." What he describes, if one has faith, may be simply the process by which the divine ordained we may be able to aspire to something which is incapable otherwise of understanding in the media/milieu of this life. Wolfhart Pannenberg would say Carter et al's positions overlook the "transcendent" in the spirit. He sees "self transcendence... (as both)... an activity of the organism and as an effect of a power that continuously raises the organism beyond its limitations and thereby grants it its life... The redefinition of the concept of spirit on the basis of the self-transcending tendency in all organic life unties the association of spirit with mind. Spirit is not identical with mind, nor is it manifested primarily through mind. Rather, the reflective nature of the human mind represents a particular form and degree of participation in the spiritual power, and that is closely connected with the particular mode of human self-transcendence."³²⁰

6.1.2 Neuro-Plasticity

Neuro-plasticity, an area of research which extends brain mapping, proposes that all areas of the brain, nerve and glial cells are interconnected, but may change connections during life experience.³²¹ Norman Doidge examines neuro-plasticity in both "positive" and "negative" plasticity.³²² He describes examples of non-cognitive criticism, e.g. the

³²⁰ Pannenberg, *Toward A Theology Of Nature*, 35-6.

³²¹ Kurweil considers this in *The Singularity Is Near*, 173-177.

³²² Norman Doidge, *The Brain That Changes Itself*, (Viking, New York, 2007)

excessive release of neurotransmitters that may result in addictive behavioural consequences.³²³ Doidge takes the frontier further, by saying our brain anatomy can be altered by learning to use our thoughts to turn our genes on and off, with machines being developed to emulate these physical changes and read people's thoughts, such that paralysed people can control computers and other technology with their thoughts.

6.2 The Work Of Joseph E. LeDoux

Subjectively, our spiritual experiences often seem emotional ones. Humans are inclined to regard their emotions as causing physical states. Joseph LeDoux,³²⁴ neuroscientist and psychologist, comes to the conclusion in his book *The Emotional Brain: The Mysterious Underpinnings Of Emotional Life*³²⁵ that brain states and bodily responses are fundamental facts for *producing emotions*. He has researched an almond-shaped structure in the brain's limbic region, known as the amygdala and found that, from three months after conception until the age of five, all human physical body states are stored there, together with the perceptual context and any accompanying states. The amygdala has two roles; storing any novel physical body state with the associated perceptual context and when a familiar perceptual context emerges later, it retriggers the associated physical state initially experienced. At the age of five, the amygdala stops the first part of its role as storage (known as the memory transition age, or MTA). Effectively the memory cache of the amygdala is filled and no new bodily states can be added.

LeDoux delves into the mental terrain inside the nervous system³²⁶ to see the nexus to the physical body. Importantly, he finds "the mental aspect of emotion, the feeling, is a slave to the physiology, not vice versa. We do not tremble because we are afraid or cry because we feel sad, we are afraid because we tremble and sad because we cry."³²⁷ This appears a compelling argument for the proposition that emotions and feelings, in reality, come from physical body states which are stored and retrieved in the amygdala in partnership with their perceptual context and recur after age five *automatically* when the

³²³ See also Joseph E. LeDoux, *Synaptic Self: How Our Brains Become Who We Are* (New York: Viking, 2002)

³²⁴ Center for Neuroscience of Fear and Anxiety in New York and Professor of neuroscience and psychology at New York University.

³²⁵ Joseph E. LeDoux, *The Emotional Brain: The Mysterious Underpinnings Of Emotional Life* (Simon & Schuster, 1996).

³²⁶ LeDoux, *The Emotional Brain*, 23.

³²⁷ *Ibid.*, 44.

perceptual context recurs. So, in reality, emotions might be names that we have given to various physical body states that humans use in communicating subjective experiences with others and these emotions occur independent of any cognition.³²⁸ Brain organisation of emotion, to LeDoux, is “that emotion and cognition are best thought of as separate but interacting mental functions, mediated by separate but interacting brain systems.”³²⁹ Conscious cognition creates emotions by activating unconscious affect when it accesses emotionally charged cognitive memories. Individuals, as a result, have a unique history from three months after conception to MTA and will then live in a different world of emotions, each having a completely different ecology of emotional responses. Spiritual and religious experiences associated with emotions, occurring up to the MTA, including faith inculcation, may well become automatic parts of our neuro/physiology.³³⁰

LeDoux makes the point that the study of emotion has focused on emotional consciousness, rather than basic underlying emotional mechanisms³³¹ and that we should look more at understanding the role of body states in emotions.³³² If non cognitive body states are the cause of emotions which stimulate, often nondecisive action with moral and spiritual consequence, our human wills are far from completely free.

LeDoux’s research, indicating mechanisms for emotion develop from three weeks after conception and result in non-decisive action, raises an interesting contrast for anthropological theologians who would attempt to reconcile science and theology.

³²⁸ Doyletics, a science that studies the acquisition and transmission of emotional states, traces unwanted emotions back to the first occurrence before the MTA. In Doyletics, the automatic physical body state (Doyle) which takes place in the Doylic memory, is transferred into a brain-state, or a cognitive memory. This has the effect of eliminating the effect of the unconscious effect associated with the perpetual context that is being brought into place up to the time of MTA. What is stored prior to MTA and reappears in similar perceptual contexts is not conscious at all. The difference between Doyletics and cognitive therapy is that Doyletics removes the substratum problem, whereas cognitive therapy applies the unconscious effect.

³²⁹ LeDoux, *The Emotional Brain*, 69 .

³³⁰ The amygdala is also the portion of the brain responsible for emotional fear responses and can create emotional responses before the cortex has received any signal of fear. It has also been related to addiction. There is an interesting comparison here with the notion of ROM, i.e. read and not written in computer terms, as something that stays exactly the same forever. As a result of a process known as Doyletics, emotional memories in the amygdala are stored as PROM, which is programmable (or changeable) read-only memory, one that is only changeable by some special process such as a Doyle trace.

³³¹ LeDoux, *The Emotional Brain*, 282.

³³² *Ibid.*, 295.

Wolfhart Pannenberg proposes the image of God in humans is gradually obtained *through the course of one's life* (my italics), rather than at the very beginning and then lost through sin and the fall of man. History unfolds through Christ's resurrection, in anticipation of revelation. What occurs during one's life is also an articulation of the ultimate evolutionary destiny of humanity.³³³ Pannenberg's quest for personhood is both about self and knowledge, but always in the framework of the presupposed existence of the "other" or God, attempting to prove the existence of God acceptable to modern scientific thought. 'The God hypothesis,' that God is unity of all reality, must include the debate over God's existence, thus, even the current debate over God's existence as part of theology being a science.³³⁴ If, however, theology is truly to be compatible with science, work such as LeDoux's, which identifies core emotional propensities, which are inherited and non-cognitive, must affect life developing God image in humans. Pannenberg should have no quibble with LeDoux's developing scientific knowledge forming an integral part in the evolving prolepsis.

The developing legacy of AI is that it has prompted exploration of all aspects of how and why humans think and behave. Had scientists not aspired to improve and replicate human intelligence, we would not have known as much as we now do.

³³³ Pannenberg has a concept of the perfectibility of human nature. Human consciousness makes humans different from lower animals because of their ability to see individual things individually, in their wider context. A human can be outside itself and personal to others and in the wider context. We evolve this capacity over time and so became distinctively human. This capacity for perception of the infinite is, to Pannenberg, fundamentally religious; by which we became in our very nature, religious beings. Pannenberg's encounters with self, or quest for personhood is not founded on self-reliance. He has a core concept of trust and a tension between openness and centeredness. The former is facilitated by trust, i.e. our capacity to respect and depend upon the other. Centeredness enables the individual to be able to develop a sense of identity of self. When a person over-emphasises this and seeks to master everything, he becomes self-centered. Sin affects the individual committing it, because the lack of trust impairs progress towards the likeness of God. The growing person becomes more like Christ, to the extent that they develop the capacity to trust and to a degree adequate to sustain open respectful relationship to the other. If we reduce the divine to the status of an inanimate thing, we are no longer in a relationship with God, but with our static thoughts regarding God. Finite belief systems are then given infinite credibility and themselves idolised. Hence, not balancing centeredness and openness in the human nature may be the cause of many of religious, fundamentalist conflicts such as we see today.

³³⁴ Stanley J. Grenz, *Wolfhart Pannenberg's Quest For Ultimate Truth (The Christian Century, September 4-21), 795-798.*

6.3 The Work Of Marvin Minsky

Marvin Minsky,³³⁵ has contributed much to that legacy. In *The Emotion Machine*,³³⁶ he dissects how humans actually think and specifically how this impacts on developing artificial intelligence. Looking at how humans think about their own thoughts, he says this “reflective thinking” is “a remarkable thing that no other creatures seem to be able to do.”³³⁷ He looks at how brains manage to do things, how imagination and consciousness, emotions and feelings all work together, raising questions about the nature of free will. He contrasts his approach with trying to answer questions about physical mysteries, such as physicists Newton, Maxwell, Einstein and Schrödinger have explained via small numbers and simple laws. He says that part of the problem with AI is that psychologists and philosophers have tried to do the same thing by searching for “compact sets of laws to explain what happens inside our brains” and that brains are full of all sorts of complex parts, but also that “their construction is based on information that is contained in tens of thousands of inherited genes, so that each part of the brain works in a way that depends on a somewhat different set of laws.”³³⁸ Instead of looking for simple explanations, Minsky says we need to look at complicated ways to explain our mental events. Our quest for personhood, is, in fact, a complex one. Pannenberg would seem to agree; “human intuition as well as physical reality always seem to exceed the formation of mathematical description. One must not underestimate the subtlety and flexibility of mathematical description. It has proved adaptable to most intricate and puzzling data of experience. Yet its very precision entails its limitation: There is something in life which is not precise and systematically escapes that form of presentation”.³³⁹

Like Wilber, Minsky says that consciousness refers to more than twenty different processes.³⁴⁰ Our “emotional states,” for example, he says result from turning off certain resources, while turning others on and vice versa. This changes the way our brains behave. He disputes what he calls the traditional view that emotions add something

³³⁵ Toshiba Professor of Media Arts and Sciences and Professor of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, also author of *The Society of Mind* (New York: Simon and Schuster, 1986).

³³⁶ See note 24 here.

³³⁷ Minsky, *The Emotion Machine*, 1.

³³⁸ *Ibid.*, 2.

³³⁹ Pannenberg, *Introduction To Systematic Theology*, 38.

³⁴⁰ Minsky, *The Emotion Machine*, 94-128.

extra to plain and simple thoughts and rather says (consistent with LeDoux’s findings) that many of our emotional states arise when “certain particular Ways to Think start to *suppress* our use of certain resources.”³⁴¹ Further, rather than emotions being deeply involved with our bodies’ conditions, he regards our “body parts as resources that the brains can use to change (or maintain) their mental states.”³⁴² He says that emotions are not different to cognitive processes that we would call thinking, but rather different ways to think to increase our “resourcefulness.” To make machines replicate our minds, Minsky says they will have to have “sufficient diversity” to switch to a different approach if one does not work, just like humans do. Set out below is Minsky’s model of human mental activities.

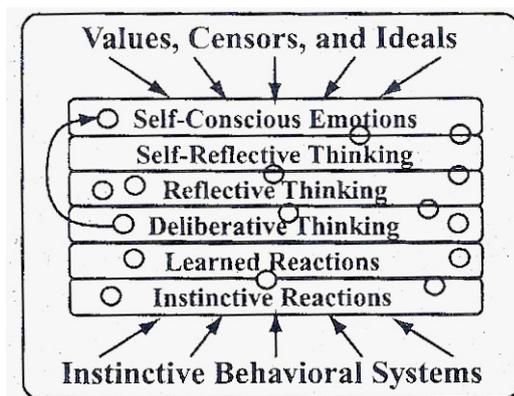


Table 5: Minsky’s Six-Level Model of Mental Activities

Minsky is no theist and is “firmly opposed to the popular view that each person has a central core – some sort of invisible spirit or self – from which all other mental abilities originate...that seems a demeaning area – that all our virtues are secondhand – or that we deserve no credit for our accomplishments, because they come to us as gifts from some other source. Instead, I see our dignity as stemming from what we each have made of ourselves: a colossal collection of different ways to deal with different situations and predicaments. It is that diversity that distinguishes us from most of the other animals – and from all the machines that we have built in the past ...our uniquely human resourcefulness.”³⁴³

³⁴¹ Minsky, *The Emotion Machine*, 5.

³⁴² *Ibid.*, 5 –6.

³⁴³ *Ibid.*, 6.

Minsky seeks to refute that mind is mystery, as some psychologists would say and proposes it is only by understanding the diversity of “human resources” that machines could develop such that could lead to great paintings, or symphonies and indeed to religious experiences. He questions why a convert would adhere to a doctrine or a spiritual scripture, how our minds build new ideas and what are the bases of our beliefs, including the nature of consciousness, values, goals and ideas. His mission becomes “*to find more complex ways to depict mental events that seem simple at first!*”³⁴⁴ To Minsky, we do not only think logically, or rationally, but also through our own critical and selection bases, self-conscious emotions, self reflective thinking, reflective thinking, deliberative thinking, learned reactions and instinctive reactions, with a mixture of values, senses and ideals with instinctive behavioural systems. “When we talk about a person’s mind, we usually use the plural, *emotions*, but we always use the singular noun to speak about someone’s *intellect*. Emotional states are only different examples of these ways to think.” Further, when you say “Self,” “you are referring not to a single representation, but to an extensive network of different models that represent different aspects of yourself.” The Self has a body and a mind as parts and the body, as parts, has heads, face, neck, down to feet etc., and the mind has ideas, goals, feelings, thoughts etc.³⁴⁵ Further, Minsky argues, (à la LeDoux), whereas babies could not be wise enough to make their own choices, there must be something in the brain equipment, some “special kinds of machinery that help us, somehow, to absorb the goals and ideals of our parents and friends!”³⁴⁶

In considering the Self, Minsky also raises whether the mind is made like a human community, with the six levels of thinking previously discussed, plus the critics and selectors, encircled by a whole lot of other human activities and priorities and people who propound them. His “mind as a community” model is set out below:

³⁴⁴ Minsky, *The Emotion Machine*, 14.

³⁴⁵ *Ibid.*, 35.

³⁴⁶ *Ibid.*, 35 and see earlier references to work of Joseph LeDoux.

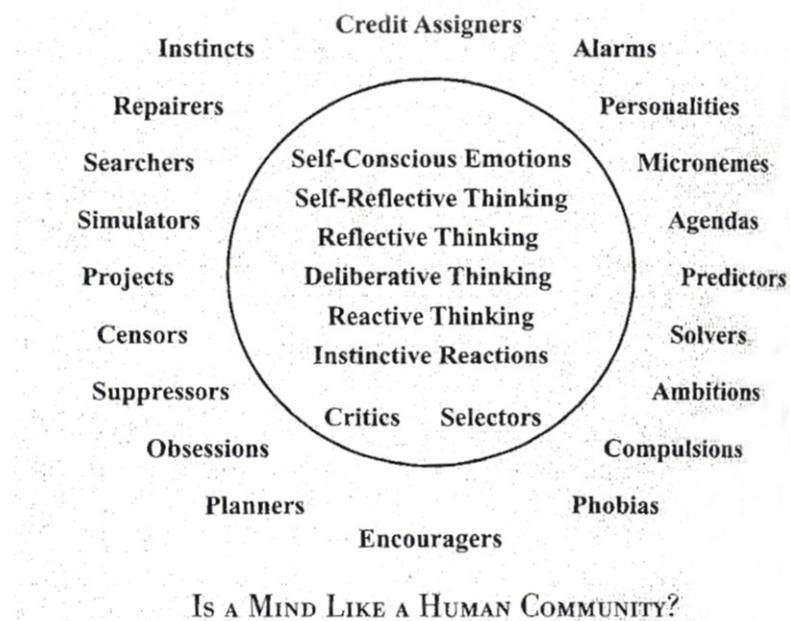


Table 6: Minsky’s Model Of Mind As Community

As to the popular approach (shaded it seems, by Kurzweil) that the brain attains much of its power and speed because it can do many things in parallel and/or simultaneously,³⁴⁷ Minsky proposes, on the contrary, that when more difficult problems are approached, the brain actually separates functions into parts and focuses on them sequentially.³⁴⁸

To Minsky, consciousness is a “suitcase”. It is a word that can be used to describe many activities, from reasoning to decision-making, how we represent our intentions, how we know we have done things, the point being that it is an activity that cannot be attributable to a single cause; a similar position to Wilber and not inconsistent either with Philberth’s dynamic consciousness process. Indeed, the mind, in psychology, has conscious and unconscious activities, premeditated and impulsive, deliberate and spontaneous, intentional and involuntary, cognitive, sub cognitive and so it goes on.³⁴⁹ He refers often to his six-level model of mind which includes at the top; values, senses, ideals and taboos; at the bottom innate, instinctive urges and drives; and in the middle encompasses self-conscious reflection, self-reflective thinking, reflective thinking, deliberative thinking, learned reactions and instinctive reactions.

³⁴⁷ Note also Kurzweil proposes it is the massive parallelism of the human brain which is the key to its pattern recognizing abilities, reflecting the strength of human thinking.
³⁴⁸ Minsky, *The Emotion Machine*, 336-7.
³⁴⁹ *Ibid.*, 99.

Minsky makes an important point relevant to AI in his chapter on Common Sense, specifically in relation to building baby-machines, pointing out it took hundreds of millions of years in evolution to come from invertebrate fish to where we are now, to develop the structures that encompass the higher reflective levels of mental activities.³⁵⁰ The reason “why the attempts to make baby-machines have lead to unimpressive results: *you can’t learn things that you can’t represent.*”³⁵¹ Benford and Malartre agree, finding that machine intelligence “has not been fashioned by millions of years of competitive experience.”³⁵² “Our thinking is not qualitatively akin to machine processing, our complex mix of neural wiring and hormonal surges leads us down quite different mental paths.”³⁵³

On another level, Minsky’s approach supports possible machine intelligence/spirituality. What he describes as an emotion machine, together with the community operative in the human being, are mechanisms by which humans, he argues, have devised ways to think and increased their resourcefulness. His central theme being “firmly opposed to the popular view that each person has a central core – some sort of invisible spirit or self – from which all of their mental abilities originate.”³⁵⁴ Minsky’s is an opposing view to that of religious spirituality, which ought be considered to grasp the argument dealt with in the topic here. Kurzweil’s AI attempts to replicate intelligence and associated behavior of humans by technology and thereby to improve and to “evolve,” arguably, both. From those enquiries we learn that many actions which result in apparent “choices” in humans, actually operate without individual cognitive control. This leads to the considerations in the following chapter.

³⁵⁰ Minsky, *The Emotion Machine*, 180 and chapter on levels of mental activity, 129-161.

³⁵¹ *Ibid.*, 180.

³⁵² Benford, *Beyond Human*, 243.

³⁵³ *Ibid.*, 242.

³⁵⁴ Minsky, *The Emotion Machine*, 6.

Chapter Seven

Some Thoughts For The Future

One gift of modern science is that we know more of evolution generally and human biology specifically, following on from which, it is an increasingly valid proposition that our bodies are spiritual conduits. If human spirituality arises from the material/biological, then arguably it can be both replicated and learnt. If it comes from a separate being and/or a nonmaterial part of a human being (divine in nature), it cannot be replicated in a machine, but it may be altered in an enhanced human, if the human relies on his biology as a conduit to both the objectively divine and subjective spirituality. Many issues arise from the debates covered previously here and five are of particular significance to me.

7.1 The Significance Of Personal Culture

I have previously raised that humans have aspirations to immortality and that logically these may have a valid spiritual source. Human desire for the non-tangible, may provide hints as to human spirituality. My perception of the significance of these aspirations as “innate” may, however, be formulated by my own genetic, sociological and religious history, i.e. my overall personal culture. Daniel Everett’s encounters with and description of the Pirahã, a primitive Amazonian people, reaches an opposing position to spirituality being innate and humans, religious by nature.³⁵⁵

³⁵⁵ Daniel L. Everett is Chair of the Department of Languages, Literatures, and Culture at Illinois State University in Normal, Illinois. He has taught at the State University of Campinas, Brazil, the University of Pittsburgh, the University of North Dakota and the University of Manchester. He has been a visiting scholar at MIT. He has spent much of the last thirty years living with the Pirahã and learning their language.

Everett, in *Don't Sleep, There Are Snakes*,³⁵⁶ investigates not just how “two cultures, my European-based culture and the Pirahã culture, could see reality so differently ... (but also)... our expectations, our culture, and our experiences can render even perceptions of the environment nearly incommensurable cross-culturally.”³⁵⁷ His journey is an encounter with others, natural environment and finally, to his surprise, with himself.

He describes a journey into the jungles of Brazil with his family as missionaries. He initially intends to translate scripture for the Pirahãs, but stumbles across an entirely contrary attitude to temporal and spiritual life and of language. As a linguist, he comes to question Noam Chomsky's linguistic theories and instead is given “precious and valuable insights into the nature of life, language, and thought, that could never have been learned any other way... (concluding) that there is dignity and deep satisfaction in facing life and death without the comfort of heaven, or the fear of hell, and in sailing toward the great abyss with a smile.”³⁵⁸

Everett has some interesting observations on human consciousness. He says that “from the time we are born we try to simplify the world around us. For it is too complicated for us to navigate; there are too many sounds, too many sights, too many stimuli for us to take even a single step unless we can decide what to pay attention to and what to ignore. In specific intellectual domains, we call our attempts at simplification ‘hypotheses’ and ‘theories.’”³⁵⁹ “The Pirahãs are firmly committed to the pragmatic concept of utility. They don't believe in a heaven above us, or a hell below us, or that any abstract cause is worth dying for. They give us an opportunity to consider what a life without absolutes, like righteousness or holiness and sin, could be like.”³⁶⁰

The Pirahãs “have no craving for truth as a transcendental reality”. Truth “is catching a fish, rowing a canoe, laughing with your children, loving your brother, dying of malaria”.³⁶¹ He ponders that anthropologists would consider lack of theist craving make the Pirahãs primitive and yet anthropologists are anxious to find out what the Pirahãs

³⁵⁶ See note 74 here.

³⁵⁷ Everett, *Don't Sleep, There Are Snakes*, Prologue XVIII.

³⁵⁸ *Ibid.*, Prologue XVIII. The book describes, at length, happy, functioning, both individual and collective harmony of existence. Everett is converted by his subjects rather than the reverse he expected.

³⁵⁹ *Ibid.*, 272.

³⁶⁰ *Ibid.*, 272-273.

³⁶¹ *Ibid.*, 173.

think about God, the world and creation. Everett thinks differently and considers that it is the presence of these concerns that makes a culture more primitive, their absence in a culture, more sophisticated. He asks us to consider whether the Pirahã are a sophisticated people. He questions looking “at the universe with worry, concern, and a belief that we can understand it all, or to enjoy life as it comes, recognising the likely futility of looking for truth or God. Which is the more or less sophisticated or primitive?”³⁶²

Everett’s empirical example questions much of what has been considered previously here. Desiring and hoping that there is more than what we are immediately aware of, both during and after this life, may not be innately of the spiritual. The genesis of theological and/or “other life” consciousness beliefs, may simply be culture. How faith is represented in a culture, whether or not it is encouraged, may be a crucial evolutionary variant. Perhaps my desire for justice, which resulted in my becoming a lawyer, represented in my faith as a hope for something more than the tangible that forms the basis for justice in the future, is born of my personal culture. This hope forms the basis for justice in another time, or place. If justice cannot occur in this world, how futile then is our existence?

7.2 The Loss Of Contact With Nature And Altered Environment

The increasing encounters with technology Kurzweil describes, lessen our encounters with the natural world. A consequence of Kurzweil’s evolutionary prognoses for ascendant technology is that we will be ourselves more technological creatures and will be living more in a manmade environment, humans becoming more distanced from their own biology and nature at large.

So how important is nature to spirituality? John Muir³⁶³ experienced nature as a way to understand God, but also as fundamental to human spirituality. “Every particle of rock or water or air has God by its side leading it the way it should go; the clearest way into

³⁶² Everett, *Don’t Sleep, There Are Snakes*, 273.

³⁶³ Scottish-born American naturalist, author and environmentalist responsible directly or indirectly for the preservation of most of the National Parks and forests in the USA, born 21st April 1838, died 24th December 1914.

the universe is through a forest wilderness; in God's wildness is the hope of the world."³⁶⁴

Muir's description of sensory perceptions of light are intriguing. He believed human perceptions of environment came via the senses. The world did not change, but was interpreted by the brain through senses. "If the Creator would bestow a new set of senses upon us... we would never doubt that we were in another world."³⁶⁵ The ecstasy in his writings was such that historian Catherine Albanese commented "Muir had successfully taken biblical language and inverted it to proclaim the passion of attachment, not to a supernatural world, but to a natural one. To go to the mountains and sequoia forests, for Muir, was to engage in religious worship of utter seriousness and dedication."³⁶⁶ So night, to Muir, was the symbol of divinity "to whose light everything seems equally divine, opening a thousand windows to show us God."³⁶⁷ To Muir, the natural world was "a conductor of divinity" with nature and God being synonymous.³⁶⁸ It is difficult to speculate what Muir would say Kurzweil's present and future world's technological adaptation of the senses would do to alter our conduits to divinity. I cannot answer that question, but can provide a literary insight.

Human consciousness in spiritual relationship with self, others and nature is beautifully described in David Malouf's *An Imaginary Life*.³⁶⁹ Malouf depicts the Roman poet Ovid's exile and eventual relationship with a wild boy who had been living with the deer. The poet observes that in playing ball with the child:

He has learnt to smile... out of some state of his own soul, a sudden lighting up of the spirit in him, that has no object and no cause... It is his consciousness that he leads me through on our walks. It flickers all around us: it is water swamps, grass clumps, logs, branches; it is crowded with a thousand changing forms that thrill and sing and rattle and buzz, and must be, in his mind, like the poems I have long since committed to memory, along with the names of a thousand gods and their fables, the rules of rhetoric, theorems, the facts of science, the facts of history, the theories of the philosophers. Only for him it is a visible world he can walk through, that has its

³⁶⁴ John Muir, *Travels in Alaska*, Ed; Linnie Marsh Wolfe, *John Of The Mountains: The Unpublished Journals Of John Muir* (Univ. of Wisconsin Press, 1979).

³⁶⁵ Denis C. Williams, *God's Wilds: John Muir's Vision of Nature* (College Station: Texas A&M Univ. Press, 2002).

³⁶⁶ Catherine L. Albanese, *Nature Religion In America: From The Algonkian Indians To The New Age* (Chicago: The University of Chicago Press, 1990).

³⁶⁷ John Muir, *My First Summer In The Sierra* (Boston, New York: Houghton Mifflin Co., 1911), 115.

³⁶⁸ Thurman Wilkins, *John Muir: Apostle Of Nature* (Norman; University of Oklahoma Press, 1995), 265.

³⁶⁹ David Malouf, *An Imaginary Life* (Random House Vintage, 1978).

weathers and its seasons, its cycle of lives. He leads me into his consciousness, and it is there underfoot and all about me. How can I ever lead him into mine?³⁷⁰

The poet and the boy eventually escape their primitive and superstitious captors and flee into the wilderness. Ovid realises the desolate “place (they find themselves in) is the true destination I have been seeking, and that my life here, however painful, is my true fate, the one I have spent my whole existence trying to escape.”³⁷¹ “So I admit openly to myself what I have long known in my heart. I belong to this place now. I have made it mine. I am entering the dimensions of myself.”³⁷²

Slowly I begin the final metamorphosis. I must drive out my old self and let the universe in. The creatures will come creeping back – not as gods transmogrified, but as themselves. Beaked, furred, fanged, tusked, clawed, hoofed, snouted, they will settle in us, re-entering their old lives deep in our consciousness. And after them, the plants, also themselves. Then we shall begin to take back into ourselves the lakes, the rivers, the oceans of the earth, its plains, its forested crags and their leaps of snow. Then little by little, the firmament. The spirit of things will migrate back into us. We shall be whole. — Only then will we have some vision of our true body as men.³⁷³

Describing the scrublands into which he escapes with the wild boy; “the immensity, the emptiness, feeds the spirit, and leaves it with no hunger for anything but more space, more light – as if one had suddenly glimpsed the largeness, the emptiness of one’s own soul, and come to terms with it, glorying at last in its open freedom.”³⁷⁴

Whilst dying; “growing bodiless. I am turning into the landscape.”³⁷⁵ “Settle deep into the earth, deeper than I do in sleep, and will not be lost. We are continuous with earth in all the particles of our physical being, as in our breathing we are continuous with sky. Between our bodies and the world there is unity and commerce.”³⁷⁶

As he dies, Ovid describes the boy, who is looking for food for him:

moving simply for the joy of it, wading deeper into the light and letting them fall from his hands, the living and edible snails that are no longer necessary to my life

³⁷⁰ Malouf, *An Imaginary Life*, 89-90.

³⁷¹ *Ibid.*, 90.

³⁷² *Ibid.*, 91.

³⁷³ *Ibid.*, 92-93.

³⁷⁴ *Ibid.*, 141.

³⁷⁵ *Ibid.*, 146.

³⁷⁶ *Ibid.*, 147.

and may be left now to return to their own. . . . He is walking on the water's light. And as I watch, he takes the first step off it, moving slowly away now into the deepest distance, above the earth, above the water, on air.

It is summer. It is spring. I am immeasurably, unbearably happy. I am three years old. I am sixty. I am six. I am there.³⁷⁷

Malouf's portrayal of an old, sophisticated, learned man and a young, animal-like, illiterate boy, interweaving with time and nature, has all Wilber's levels of consciousness and Minsky's emotional stimuli dancing in a natural cosmos. It depicts a confused, but joyous symphony of humanity, that one simply cannot imagine being replicated in a machine. The distance is not one of Ovid's era and our own, but of essence.

Our more sophisticated world still speaks to us and thinks, of sorts, if we adopt a broad approach to cognition "exploring the cognitive capacity for non-animate entities... that entities themselves post questions and that 'stuff' thinks."³⁷⁸ In the creative arts, as Ron Broglio finds in architecture, there is the notion that humans function as only one of the thinking players in "an eyewitness definition of thinking, the environment is an active agent of entities that respond to human building with ... physical elements that yield symbolic relevance to our world." Hence digital technologies expand architecture's reach with pervasive and sensitive media and computation. "Ubiquitous computing and ... technologies do not have to work at the service of full presence visibility and knowability. Rather, they work as players alongside the already thinking entities that surround us. They may complement and even enhance the unknowable and invisible." The result, "a more robust world but one in which humans function as only one of the players."³⁷⁹ Significant alterations in human environment are important if one appreciates the objective states of cognition in our world. We do not change our environment without it also changing us.

With human life experiences increasingly being technology based, rather than in the natural world, what will be conduits for divinity? On Kurzweil's prognoses our senses will alter and so will also our spiritual perceptions?

³⁷⁷ Malouf, *An Imaginary Life*, 153.

³⁷⁸ Ron Broglio, *Thinking About Stuff: Posthumanist Phenomenology And Cognition* (London: Springer-Verlag, 2010, published online 14 September 2010.)

³⁷⁹ *Ibid.*

7.3 The Uniqueness Of Each Human Being

AI research highlights what Minsky refers to as “our unrivalled human resourcefulness,” which he says came from three vastly different scales of time:

1. Genetic endowment – genes shaped over the last half-billion years.
2. Cultural heritage – sets of beliefs that evolved over centuries, in which human communities selected ideas produced by its individuals.
3. Individual experience – each year one learns millions of fragments of knowledge from one’s own private experiences.³⁸⁰

Minsky poses the difficulty of machines working reliably on the basis of human replications. “Each human brain is unique because it is built by pairs of inherited genes, each chosen at random from one of its parents; then, in that brain’s early development, many smaller details will depend on other accidental events.”³⁸¹ There remain many “bugs” in our brains. We have further developed ways of tackling different problems and challenges and “many parts of our brains evolved as ways to correct (or to suppress) the effects of defects in other parts.”³⁸² “We will never find any one, foolproof way to choose (for example) between the advantages of immediate actions and the benefits of cautious, reflective thinking. So whatever we do, we can be sure that the road toward “post-human minds” won’t be smooth.”³⁸³

He says that our ability to learn new sets of resources and to think in a variety of ways, depending on circumstances, is what makes our species unique and seems to argue a “post-human” mind. We need to make our minds more like thinking machines, rather than making machines more like us. Rationality and emotion are not opposing, but just different ways of thinking. The development of algorithms by which machines can solve problems, theoretically and practically, and the nature and functioning of intelligent machines may be relevant to the nature of mind and the possibility of thinking/conscious/spiritual machines. He asks important questions about building machines that do not just think intelligently for one purpose, such as those we often see today, but ones that can think in multiple domains as do humans and can have true

³⁸⁰ Marvin Minsky, *The Emotion Machine*, 343.

³⁸¹ *Ibid.*, 345.

³⁸² *Ibid.*, 345.

³⁸³ *Ibid.*, 346.

emotion.³⁸⁴ As to how consciousness and genuine emotions may be transferred to machines, Minsky’s basic view is that consciousness is more process-oriented and a result of more than twenty processes going on in the human brain. Arguably, machines could have characteristics of human emotion, common sense and consciousness. Machines may have their own ideas, but any understanding of ideas might be different from what humans do, they may serve as instigators of further human thought, but not necessarily replacements. The significance of his work seems in dissecting the complex variables that result in behavior and individuals in our species and the inability of machines to *replicate that individual diversity*, when they cannot have the genetic endowment, cultural heritage and individual experiences of humans.

7.4 The Continuing Importance of Philosophy and Theology

Developing scientific enquiry on intelligence and brain states is not counter theology/philosophy. Scientists, like theologians such as Kelly, Philberth and Pannenberg and writers such as de Chardin, seek compatibility between disciplines because the search for truth seeks also, compatibility of forms of knowledge. For example, Walter Freeman³⁸⁵ has suggested St. Thomas Aquinas’ language used in describing active perception (philosophically) in humans, is compatible with the language and understanding derived from the throes of dynamic systems in experimental animals. His comparison is:

Aquinas	neurodynamics
<i>sensatio</i>	transduction, action potentials, sensory perception
<i>phantasmata</i>	Accommodation, Hebbian nerve cell assembly, “raw sense data”
<i>abstractio</i>	Adaptation, knowledge, sensory cortex, AM patterns
<i>sensus communis</i>	Gestalt, multisensory percept, limbic system
<i>imaginatio</i>	Global wave packet, neocortex
<i>intellectio</i>	Speech, symbolic cognition, human knoiocortex ³⁸⁶

Table 7. Freeman’s Comparison/Analogy of Aquinas’ human active perception criteria with neuro dynamic systems in animals.

³⁸⁴ The ability to think in multiple domains, Minsky refers to as common sense. He has a concept combined from parallel and analogy, which is supposed to give multiple meanings to an object. This might allow a machine, which has been trained in one area, to see that there are analogies to another area and develop an intelligence related to an analogous area and interpretive powers that relate to other areas and different domains of thinking and action.

³⁸⁵ Cognitive neuroscientist and exponent of Neurodynamics, University of California, Berkeley, U.S.A.

³⁸⁶ The term “knoiocortex”, from Greek κοιός, dust, denotes a type of neocortex found only in humans. It has amorphous distributions of nerve cell nuclei so numerous as to resemble grains of dust, and it has no direct connection to underlying basal ganglia (striatum and thalamus). Thus it is detached from sensory input to a degree not found in other animals.

Freeman finds philosophical bases in Aquinas for brain dynamics; “humans and other animals continuously construct and maintain our grasp of the world by using (very) small snippets of sensory information.” Recent studies in nonlinear brain dynamics show this occurs as brains imagine possible futures and send and use sensory stimulation to select among them as guides for chosen actions. He says “The core concept of intention in Aquinas is the inviolable unity of mind, brain and body. All that we know we have constructed within ourselves from the unintelligible fragments of energy impacting our senses as we move our bodies through the world. This process of intention is transitive in the outward thrust of the body in search of desired future states; it is intransitive in the dynamic construction of predictions of the states in the sensory cortices by which we recognise success or failure in achievement. The process is phenomenologically experienced in the action-perception cycle. Enactment is through the serial creation of neurodynamic activity patterns in brains, by which the self of mind-brain-body comes to know the world first by shaping the self to an approximation of the sought-for input, and then by assimilating those shapes into knowledge and meaning.”

According to Freeman, Aquinas’ concepts necessitate “the role of self-determined creation of each individuals knowledge of the self and the world by directed actions of the body and the registration and internalization of the results of the extension”

What has been lacking is the crystallization by which the new data and the new technologies for analysis can be focused onto a compatible and comprehensive system of behavioural description. The compatibility of the Aquinian doctrine is assured by the centrality of the concepts of intentionality and imagination: intentionality by the unity of mind and body in action into the world, imagination by the appeal to the creation by each individual of the self through constructive choice.³⁸⁷

Freeman effectively reverts to Aquinas to address many of the brain/body/mind function issues crucial to both Kurzweil and Minsky, but seems to assume freedom of choice by concentrating on “brain activity that occurs in conjunction with intentional and voluntary behaviours” rather than addressing the non cognitive processes identified by LeDoux, Minsky, Crick et al.³⁸⁸

³⁸⁷ Walter J. Freeman, *Nonlinear Brain Dynamics And Intention According To Aquinas*, 232. See also generally St. Thomas Aquinas (1272): *The Summa Theologica* (translated by Fathers of the English Dominican Province ed. by W.Benton as Volume 19 in the *Great Books Series, Encyclopedia Britannica*, Chicago 1952.)

³⁸⁸ *Ibid.*, 207 He observes further, that “recent advances in technology have opened a flood of new data that provide images of brain activity that occurs in conjunction with intentional and voluntary

7.5 Consequences For Freedom Of Choice

Christian notions of freedom of choice go back to St. Augustine.³⁸⁹ Human self-determining acts “to the extent that they are deliberate choices, give moral definition to the very person who performs them, determining his profound spiritual traits.”³⁹⁰ Through free choice “thus we are in a certain way, our own parents, creating ourselves as we will by our decisions.”³⁹¹ The second Vatican Council called freedom of choice “The highest norm of human life”.³⁹² Aquinas had different operative powers in the human person, not incompatible with Minsky’s diverse human capacities. In dealing with acquisition of virtue, Aquinas had distinct intellectual and appetive powers, sensitive powers of basic emotion such as desire for food, drink and sex of the concupiscible appetite. Interestingly, emotions of the irascible appetite arose in situations of stress and danger and the intellectual appetite relates to the will. According to Aquinas, three conditions are required for grave sin – grave matter, sufficient reflection and full consent of the will.³⁹³

Developing technology in relation to intelligence and disciplines such as brain mapping, illuminate areas relevant to personal moral responsibility and freedom of choice. Some examples: promiscuous sexuality, inclination to paedophilia related to right frontal and temporal lobe and amygdala malfunctions,³⁹⁴ structural and distinct physiological differences in hemispheres of the brain, the amygdala nerve connections in homosexuals

behaviours. These developments offer an opportunity that is unique in the history of human endeavor to investigate and understand the neural mechanisms of the brain, thereby resolving the paradox of the system understanding itself. In the same time period there has accrued an armamentarium of new intellectual tools and systems with which to analyse these new data, including nonlinear dynamics, far-from-equilibrium thermodynamics, random graph theory, and renormalisation group theory. What is needed are philosophical concepts for systematizing behavioral analysis in forms that are compatible with the new data and techniques. The systems for mechanization of brain function that were introduced by Descartes, Leibniz, Spinoza and Willis in the 17th century have served well for the design and development of the measurement systems and tools providing new data, but the machine metaphors of computation, representation, and information processing are incompatible with these data. The key point of breakdown is the lack of invariance of spatial patterns of mesoscopic brain activity in sensory cortices elicited in association with fixed learned stimuli for which the context and significance are changed.

The philosophical system that most clearly and unequivocally conforms to this experimental finding is that of Thomas Aquinas.” *Ibid.*, 232.

³⁸⁹ St. Augustine, *De Libero Arbitro (The First Apology)*, 43, (Translation W.A. Jurgen, *The Faith Of The Early Fathers*, Collegeville, MN: Liturgical Press, 1970), Volume 1, No. 123.

³⁹⁰ *Veritatis Splendor*, No. 71, 48.

³⁹¹ Cited in *Veritatis Splendor*, No. 71, 48.

³⁹² *Dignitatis Humane*, No. 3. See also St. Thomas Aquinas *Summa Theologiae*, 1-2.

³⁹³ St. Thomas Aquinas: *Summa Theologiae*, supplement to the 3rd part, 88, 2 and 6.

³⁹⁴ Rita Carter: *Mapping The Mind*, 116-117.

and heterosexual men and women³⁹⁵ studies which show genetic variations inherited maternally by gay men and brain correlations in male heterosexuals and female homosexuals and vice versa. “Put together, these studies provide strong evidence that homosexuality is rooted in biology.”³⁹⁶ These are areas in which governments make laws and crimes and religions, commandments and sins. Work such as that of LeDoux, not only informs secular and religious lawmakers, but has also laid the ground for remedial therapies and treatment such as Doyletics.³⁹⁷

God’s offer of His own life and love in choice to man should not be challenged by increasing knowledge through science of the day-to-day reality, or not, of human choice, because God, logically, knows how, if and when, such choice exists. We, other humans, do not and mostly cannot have divine knowledge. Hence the legacy to us from increases in what knowledge we have, is to adapt the mores, laws and attitudes we construct in our societies and relationships. Knowledge demands of its recipients the understanding, tolerance and compassion it represents. Knowledge provides the rationale for forgiveness and evolves the human spirit.

Increased knowledge and the development of technology elevate the spiritual virtue of forgiveness to the level of the scientific imperative, because that knowledge tells us what we know is relative in time, irrespective of whether we are by nature, religious.

Spiritual evolution is linked to human biological, as well as technological evolution, particularly in societies that rely on organised institutionalised religious forms grounded in dogma, authority and formalised symbolism and the spirituality that surrounds them. It may not be the case in more “primitive” societies where the spirituality is more diffuse and rooted in the natural world. Questions still arise in both as to from what our spiritual inclinations emanate. Biology, the shell in which we exist, the human conduit, science says is relevant. Whilst the spiritual things we aspire to are often beyond our biology, we interpret these through temporal being, which so far, at least, is mainly biological.

³⁹⁵ Rita Carter: *Mapping The Mind*, 76 and Savil et al, *PWAS*, 106 (51), 2009 and *DNAS* July 8, 2008 Vol. 105, No. 27, 9403-9408.

³⁹⁶ Rita Carter: *Mapping The Mind*, 111.

³⁹⁷ See note 328 here.

If authentic spirituality exists on an entirely mystical/nontangible level and is controlled by an independent being or force, then it does not matter what packages we come in: The package does, however, matter once we insert free will. Augustinian freedom of choice remains the basis of both religious salvation. Further, in the social and legal structures of “sophisticated” cultures, consciousness implies also, choice.

For structured, formalised religious experience, a machine may be taught to be spiritual, as can biological man. One can speculate as to what conscious, therefore, spiritual machines, may be made to do and/or behave. They may be programmed in structured religious environments to follow belief/dogma unconditionally. On the other hand, if such machines attain rational/logical states, they may have to reject that which is unprovable and devise their own ideas. Seed AI is one future concern.³⁹⁸ Most structured religious belief systems have at their core much that is factually unprovable. In enhanced humans, the nonbiological portions of an human might well operate in the same two above mentioned ways as machines.

As to personal spirituality states of enhanced humans, these are not as easily identified and categorised and, therefore, far more difficult to replicate. In addition, such states must be altered by increasing participation of technology in both our bodies and our environment.

As to how spiritual machines and enhanced machines will relate, they should understand each other and have abilities to inter-relate in respect of what they share, i.e. the technological bits. But the enhanced human will retain some biology which will bring a consciousness of its own and, perhaps consequently, alter the consciousnesses of the technological bits.

On a mystical level, advances in technology should not matter, if the package in which the human being exists is unimportant and spiritual work comes from the independent/divine being/source. One has to wonder if God is so simple. Knowledge and progress expand our consciousness,³⁹⁹ it seems critical to approach questions of

³⁹⁸ Seed AI is AI capable of making itself smarter. It is promoted by some to counter the negative side of nanotechnology, but has its own self-generative implications. There is also much discussion, too extensive to deal with here, on “friendly AI.” See, for example, Bill Hibbard, *Super Intelligent Machines* (New York: Kluwer Academic/Plenum Publications, 2001).

³⁹⁹ In the extended definitions discussed in this paper.

scientific and technological advance entirely optimistically. In his essay on *God And Nature*, Wolfhart Pannenberg optimistically proposes expanded science/theology dialogue. For example;

Perhaps a renewed doctrine of the Trinity would combine the Logos doctrine of the ancient church with contemporary information theory and recognize the activity of the divine spirit of self-transcendence of life and its evolution. Only a Trinitarian theology is able to meet effectively the emancipation of the concept of the world that Newton had in mind – that is, the mechanical description of nature that is not only a theoretical construction but takes place in the actual processes of the world itself. A Christian theology of creation will be able to develop a description that does justice to this emancipation of the world process and at the same time removes its disassociation from its divine origin only by way of the theology of the Trinity, in a perspective of the history of salvation.⁴⁰⁰

Philosophy and theology seek out ultimate reality. Whilst scientific and technological knowledge differ from both the above, our spirituality is linked to our intelligence in which, it seems, all types of knowledge have a stake. In considering the link to evolution and the conclusions Kurzweil draws, difficulties to me, arise as Darwinian evolution relies on organic change and development and that organic change and development must be interrupted by the intervention of technology. Organic change must be mutated by the introduction of nonorganic elements of technology with consequences for natural evolution and the survival instincts of the biological so altered. The lesson of Darwinian evolution, that survival is based not on how intelligent or physically strong a species is, but on its ability to change, remains apt.

The links of our spirituality to our intelligence and its conduits in the biological are not yet fully known, but scientific enquiry, particularly oriented to enhance the biological in human and replicating it in machines, is, dare I say, “exponentially”, telling us more.

Central to much theology and formalised religion and Kurzweil’s prognoses, is the unique position of man. There lurk dangers to both in underestimating the harmonic balance of the universe and the requirements of the natural world; man’s biological, intellectual and spiritual aspects need to remain part of that natural world. His evolution and survival has always been a part of the overall evolution of nature in the cosmic milieu.

⁴⁰⁰ Pannenberg, *Toward A Theology Of Nature*, 65-66.

Chapter Eight

Conclusion

I have intentionally presented what has gone before in this paper as a vacillating debate. Whatever one's viewpoint, it is apparent the exponential growth of technology is providing valuable insights into the nature of human spirituality. "Technologies are morally significant; they help human beings to do ethics, by informing our moral decisions and by giving shape to our actions. In order to deal adequately with the moral relevance of technology, therefore, the ethics of technology should broaden its scope. Rather than approaching ethics and technology as belonging to two radically separated domains, the interwoven character of both should be central."⁴⁰¹ Progress in science has removed the fear from the magical and replaced it with wonder. Progresses in technology and in understanding human biology have enriched each other. Each has promoted understanding of both the power and frailty of humanity. In technological improvement of biological phenomena, we are given increasing insight into the nature of the human condition and the innate relativity of notions of free will. Importantly, increased knowledge not only promotes tolerance, but also makes it an imperative. For centuries, free will has been touted as both a basis for judgment in this world and taking the consequences in the next. Scientific enquiry has shown, increasingly, the complexity of the human organism and that it is and can be significantly altered from time to time. Advances in knowledge, including technology, support a spiritual position, which requires as its basis, forgiveness. As a Christian, one need go no further than the example of Jesus of Nazareth, who criticised no-one except hypocrites and forgave, unconditionally, to the end. His forgiveness, particularly in his dying words, reflected both divinity and understanding that those who killed him did not know what they were

⁴⁰¹ P.P. Verbeek, *The Moral Relevance Of Technological Artifacts* in P. Sollie & M. Düwell (Eds.), *Evaluating New Technologies: Methodological Problems For The Ethical Assessment Of Technology Developments*, 63-79.

doing in the wider context, but only in the limited milieu of their culture and times. Forgiveness is a paramount human spiritual virtue because it requires faith, in the sense of belief in what is right, not judgment of what may be wrong, hope, as optimistic aspiration to the just and love as unconditional compassion and deep concern for others. Forgiveness is the virtue that actually allows the human being and spirit to transcend the immediate material circumstances of this life, because it negates potential for duplicating “evil” in the subject, as a reaction to the conduct of an objective other.

Developments in technology tell us that it is logically imperative to understand that if something evolves and/or can be changed and that something has affected in some way the behaviour of its subject, then the extent the subject is responsible for its thoughts, words and actions, is relative from time to time. Human ability to be good and/or evil and the extent to which these are reflective of objective personifications of good and evil, such as concepts of God and Satan, must be relative to one’s subjective circumstances from time to time. The spiritual quality of forgiveness acknowledges human reality in evolution (which, I reiterate, is much about the ability to adapt to change in order to survive) and promotes further insight, on both the biological and technological stages. We ought not fear technological advance because knowledge tells us how much more there is to know, fosters understanding and frees us from both the desire and the resulting need, to attempt to rectify an unjust world by perpetuating it via punishment and retribution. Wisdom, in addition, requires retention of what makes us human, a natural part of a cosmos which long pre-dates our relatively feeble and recent advances in intelligence, particularly of the artificial variety.

The debate about artificial intelligence and spirituality specifically, could be said to highlight irreconcilable differences between materialists, philosophers, theologians, atheists and theists. It is not a simplistic argument about religious spirituality being God given and AI spirituality being not. In Chapter 2,⁴⁰² I emphasise Kurzweil’s spirituality being “experienced” as analogous to being conscious in machines and not, apparently, the instigating phenomenon of all that is. Some clue to the broader dilemma, based on equating spirit to mind, with which Kurzweil grapples in his philosophical roots, may come by “redefinition of the concept of spirit on the basis of the self-transcending

⁴⁰² See in particular pp 30-31.

tendency in all organic life... the reflective nature of the human mind... (being)... a particular form and degree of participation in the spiritual power... closely connected with the particular mode of human self-transcendence.”⁴⁰³ Kurzweil agrees with the “view of transcendence as an ultimate goal (being) reasonably stated. But ... disagree(s) that the material world offers no ‘opportunity for transcending.’”⁴⁰⁴ Human “reflective consciousness” does appear essentially and organically different from the machine consciousness about which Kurzweil speculates. Kurzweil’s AI is not, however, to be relegated to popular culture. It is based on scientific predictions of the exponential growth of technology.⁴⁰⁵ Rather, the debate highlights the growing contribution of technology to biological evolution and the accompanying evolving richness of thought about life now and in the future. As biological evolution has progressed, so have ideas, including about human “inner life,” the divine, eternity, infinity and whether notions of spirituality provide a key to ultimate union in cosmic reality; there is every reason to believe that technological evolution will supplement such progress. It would be erroneous, for any side in the debate to relegate those on other sides to categories, which may, in essence, represent nothing more than different tools being utilised by different persons to seek, essentially, similar knowledge about what is ultimate truth, reality and purpose. Crucial is that all in the debate intentionally seek answers to these vital questions; their motives give them validity, irrespective of their tools and perspectives being diverse. We and our cosmos suffer from Polo’s mental limitations, but if, as Pannenberg would have it, theology may be science, debates such as these about spirituality in the artificial component of humanity, are not only valid, but entirely necessary. Kurzweil’s illuminations, many of which coincide with solid developments in scientific knowledge, enrich our horizons and form part of the growing and luscious thought which has allowed our contemporary spirituality in active life to evolve to a greater level of tolerance, compassion and diversity.

If God instigated creation and may be said to have worked through the evolutionary process, why would He not be about in the AI technological revolution/evolution? If Pannenberg is correct and truth is not unchanging, but what Stanley Grenz has described

⁴⁰³ Pannenberg, *Toward A Theology Of Nature*, 135-136.

⁴⁰⁴ Kurzweil, *The Singularity Is Near*, 475-6

⁴⁰⁵ See R. C. Zaehner, for example, *Mysticism, Sacred And Profane. An Enquiry Into Some Varieties Of Praternatural Experience* (Oxford University Press, 1957:1961) who argues mystical states, other than theistic states, must be profane, or amoral.

as “essentially historical, and ultimately eschatological,”⁴⁰⁶ then truth does remain provisional and contestable.

Maybe “God is what mind becomes when it has passed beyond the scale of our comprehension.”⁴⁰⁷ More than mind, I *hope*, but how blessed are we humans (of disparate disciplines and from all echelons of life) to be able to speculate on and aspire to union with, the incomprehensible. So says Grenz, “Theology, like all human knowledge is provisional. It simply cannot pack into formulas the truth of God. The future alone is the focal point of ultimate truth. As a result, all dogmatic statements are hypotheses to be tested for coherence with our knowledge.”⁴⁰⁸ And whilst we test, in our journey for knowledge, a spirituality of forgiveness should keep our focus, divine.

⁴⁰⁶ Stanley J. Grenz, *Wolfhart Pannenberg’s Quest For Ultimate Truth* (*The Christian Century*, September 1988, 19-21), 795-798.

⁴⁰⁷ Vernor Vinge, quoted in his initial “Singularity,” lecture in 1993 from Freeman Dyson: *Infinite In All Directions* (Harper and Row, 1988.)

⁴⁰⁸ Grenz, *Wolfhart Pannenberg’s Quest for Ultimate Truth*, 795-798.

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