Visions Without Depth: Michio Kaku's Future

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Abstract

Using Inayatullah's Causal Layered Analysis, Marcus Anthony deconstructs Michio Kaku's Visions. At first glance Kaku seems to paint a utopian future for humanity based upon three pillars of modern science:quantum physics, DNA technology and the computer revolution. However, a deeper examination reveals that Kaku's vision is vitally lacking in depth, and reflects modern scientific cultures' obsession with technology at the expense of humane and spiritual values.

1. Introduction

Jeremy Rifkin argued some years ago that "scientism" had replaced a theological God with "God in a white coat," namely the scientist. (Rifkin, 1985) Scientism effectively banishes all competing non-scientific epistemologies to the waste bin of History whilst elevating the scientific method and culture to the position of exalted and sole purveyor of truth. In his book *Visions: How Science Will Revolutionise the 21st Century*, Michio Kaku unwittingly shows us that scientism is still alive and phenomenological. In his attempts to rely exclusively upon scientific culture and inquiry to depict the possible future, Kaku paints what initially seems a bright and glittering future for all of us. But a deeper reflection upon what this book offers reveals something rather less glamorous. That which is invisible to the eye is most essential, wrote Goethe, and much of what is both invisible and essential is left off the map in Kaku's *Visions*. Most essentially, deep social, ecological, moral and ontological issues are glossed over, or totally ignored. (1) What follows is a deconstruction of Kaku's *Visions* using Inayatullah's causal layered analysis (CLA). Kaku's philosophy is further examined through a comparison with several other popular books of science and physics, and also with various macrohistorians.

The methodology

Causal layered analysis is a post-structuralist methodology developed by Sohail Inayatullah. Its purpose is to find the deeper meanings imbedded within texts through an exploration of four specific components and to acknowledge other ways of knowing. (Inayatullah 1998, p. 815) The first component examines the litany or the rational/scientific, factual and quantitative aspects of the text. The second is the social level. This uncovers the economic, cultural, political and historical components. The third aspect of CLA examines the discourse/worldview of the author. The final component is the mythical/metaphorical level. This attempts to uncover hidden and explicit mythologies, stories, narratives, symbols and metaphors within the text. (Inayatullah 1998, pp. 820-821)

Causal Layered Analysis is particularly useful as a way to conduct inquiries into the nature of past, present and future. It opens up the present and the past to create the possibility of alternative futures. (Inayatullah,

1998, p. 815) It is for this reason that it was chosen as an ideal tool to deconstruct Kaku's vision of the future of humanity.

2. Deconstructed Visions

The litany:

Visions is by name a book of science, subtitled "How Science Will Revolutionise the 21st Century". Kaku describes it as "a book about the limitless future of science and technology." The book outlines the possible contributions of science to humanity in the next 100 years. In *Visions*, Kaku focuses upon the computer revolution (including artificial intelligence, cyborg technology and the development of the internet); the bio-molecular revolution (including DNA technology, molecular medicine, and genetic engineering); and the quantum revolution (including quantum physics' influence upon space travel, planetary civilization, and the mastery of space and time). Science and scientists constitute the subject and the voice. Over a ten-year period Kaku claims that he has interviewed over 150 scientists (Kaku, 1998, preface, p. 1X). His book is clearly referenced with over three hundred references, predominantly from scientific journals and books of a scientific nature.

The nature of consciousnesses

Kaku discusses pertinent matters related to the idea of consciousness and intelligence, artificial intelligence and cyborg technology. Kaku follows the accepted scientific conception that intelligence is localised and a product of brain physiology. He is confident that artificial intelligence will become a reality in the next century. This will occur with a synthesis of the two seemingly opposed schools of AI— the bottom-up and top-down approaches. The former attempts to construct intelligent robots by programming them, and giving them rules to follow that can be used to deal with the everyday problems associated with tasks in the physical world. The latter approach attempts to create self-learning machines, machines that can learn to solve problems themselves, by effective exploration of their own worlds and developing their own rules and experiential data.

Clearly, according to both these approaches, consciousness/intelligence is the product of mechanical and electrical processes. The components of "the machine" work together to produce an intelligent robot. It is in this sense a reductionist philosophy (the microscale is viewed as more essential than the macroscale). Elsewhere Kaku, whilst exploring the world of DNA mapping, tells us that unraveling the DNA sequences of human beings is equivalent to revealing "the secret of life." This will give humans "God-like" powers to re-create themselves from the bottom up, and to "control our destinies." This is also a reductionist approach to the concept of life. Life emerges from the synthesis of the interactions and mechanisations of DNA molecules.

Kaku sees the development of a theory of everything as a key to humans becoming masters of space and time and in understanding the universe. (Kaku, 1998 pp.338-339) He quotes Stephen Hawking's famous words that the theory of everything will enable us to "read the mind of God". (Kaku, 1998 p. 345) What is hindering humanity's comprehension of the universe is the hitherto failure to elucidate the unified field theory. (Kaku, 1998 p. 346) Similarly Kaku believes that "the study of space-time may ultimately answer one of the most intriguing questions about the future: the final destiny of all intelligent life in the universe." (Kaku, 1998, p.339)

For Kaku mathematical and logical intelligences are the key to understanding the deepest ontological questions. Yet according to thinkers and mystics such as Ken Wilber, P.R. Sarkar, David R. Hawkins, Roger Penrose, and many others, logical intelligence is inadequate for this task. The fragmented nature of rational intelligence cannot deliver the insights of an integrated intelligence [2]. Typically these alternative thinkers suggest that integrated intelligence delivers a direct knowing through the collapse of the object/subject dichotomy. Observer and observed become one. Rational intelligence retains the object/subject separation and so cannot deliver any more than a superficial intellectual comprehension. If the mystical interpretation is correct, no mathematical model will ever be adequate to deliver the answers to the ultimate questions and to know "the mind of God."

Douglas Adams suggested this succinctly in *The Hitchhiker's Guide To The Galaxy* where the giant computer Great Thought, after one million years contemplation concludes that "the answer to life, the universe and everything" is "42". The absurdity of the answer suggests the limited nature of mathematical and logical intelligence to resolve deep ontological questions.

Kaku, Nature and Evolution

Kaku sees nature and evolution as blind forces that are now coming under the control of human consciousness:

> ...today we are on the cusp of an epoch-making transition, from being passive observers of Nature to being active choreographers of Nature. This is the central message of Visions. (Kaku, 1998p. 15)

It is significant that Kaku uses the term "visions" to name his book. Visions were usually the prerogative of mystics and sages, but in Kaku's world, the scientist has become the sage and guru, claiming even the domain of the visionary. He writes about "playing God—designer children and clones." (chapter 11) Further, he writes an entire chapter on our becoming "masters of space and time." (chapter 16), and another describing the human race as "choreographers of matter, life and intelligence." (chapter1). In chapter five he claims that the "Age of Mastery" will soon arrive. Truly the scientist has become "God in a white coat."

The obvious difference between Kaku's worldview and that of visionaries of by-gone eras is that revelation and spiritual guidance play no part in Kaku's universe. All mystics believed in some kind of integrated or divine intelligence. Kaku maintains the standard localised scientific view of intelligence. It is entirely up to humans, alienated from any sense of integrated consciousness to resolve profound ontological queries, and to control, manipulate and design their own realities and their own worlds.

Kaku's Universe.

Kaku is one of the original "strong" theorists. He writes about a universe that contains certain elements that may transcend common sense notions of space and time. These include wormholes, black holes, Einstein-Rosen bridges, doorways to other universes and time machines. (Kaku, 1998 pp.342, 343)

General relativity is based on the idea that space is curved, and that the "forces" we see around us, like gravity, are actually an illusion created by the bending of space and time. (quoted in Kaku, 1998 p.340)

But Kaku makes no attempt to find a place for consciousness (including integrated consciousness) in this universe. It is by implication a dualistic universe, where mind and the universe at large are separate and alienated, with consciousness inconsequential. For Kaku, the future frontiers of humanity lie completely within the physical and intellectual domains. It is the three revolutions—the computer, biomolecular and quantum mechanical—that will be "the first step toward making the universe truly our backyard." (Kaku, 1998 p.355) In light of the developments and debates in quantum physics about the nature of consciousness (Goswami, 2001, Aldworth, 2001), Kaku's vision of humanity's future contains a significant absence.

The Social level

Kaku's forays into the social level can at best be described as rather shallow, and less flatteringly as a seemingly naive ignorance of the deeper social issues that may impinge upon humanity's future. Briefly he looks at the possible social implications of the computer revolution continuing along its present course for the next century. He also examines briefly some of the moral aspects affecting genetic engineering, DNA manipulation, artificial intelligence etc. Other social/political factors covered are the population explosion and diminishing resources.

Planetary Society

Kaku sees a planetary culture emerging, and communication technology will be the key to this. (Kaku, 1998 p.337) He quotes Bill Gates as suggesting that the information highway will break down the boundaries that inhibit the formation of a world culture. Further, totalitarian

states will see their power eroded by the decentralization of information that the internet provides.

Kaku identifies the ruling political elites as a conservative force that will be an obstacle to planetary unification. Ironically he suggests that the interests of the expanding middle class will help counter this. He admits that the interests of the middle class are also selfish. "When people taste a bit of affluence, they want more," he writes. It is with the increased means of communication—the internet, satellites, fax machines, etc., that their power will emerge. (Kaku, 1998 pp.335-336) Another factor assisting unification is the emergence of English as the first truly global language, and business as the driving motive behind the desire to learn English. (Kaku, 1998p.336)

Thus Kaku's vision of planetary unification is still one in which individuals and groups are selfish—"like all classes," he writes. (Kaku, 1998 p.336) The point must be asked whether a truly integrated society can emerge while individuals are competing against each other for profit and power.

Language may well transform the globe as Kaku says. Yet the medium of language works purely at the logical/linguistic level. It cannot be a truly "integrated" (transpersonal) system. It relies upon localised media for transmission—voices, telephones, television, satellites etc. Taoist, Tantric, Zen and Buddhist philosophies repeatedly point to the limitations of language as a medium for accessing transcendent knowledge. Thus, if this is true, Kaku's planetary society will still function at the same level of consciousness as the current world—limited by localised media with separate and individualized components of the system (people, races, nations etc) continuing to press for their separate and isolated agendas. The collapse of ego-centered consciousness (as Wilber, Maslow, Groff and others have stated) will occur only with the transcendence of ego-boundaries and ego-driven imperatives. Being comprehensively "wired" would seem an inadequate panacea for this problem.

Kaku's Galactic Future

Kaku suggests that by 2050 the frontiers of civilization will have spread to other stars and planets, "creating a Garden of Eden in space." (Kaku, 1998 p.308, 298) The key to this will lie in logistical concerns, such as finding cheap and reliable propulsion systems for interplanetary craft to fuel their massive energy requirements. (Kaku, 1998 p.304, pp.326-327). Kaku states that human civilisation will transcend its current "infancy" when sufficient "abundant wealth and energy resources are located". Quantum theory will be vital here. (Kaku, 1998 p.326, 266) However Kaku does concede that the political, social and economic disputes that characterize national and international conflicts in the late 20th century may be problematical. (Kaku, 1998 p.311)

Types of civilisations

Kaku's hierarchy of planetary civilisations reveals much about his worldview and the assumptions that underpin his visions and philosophies. He follows the model developed by Nikolai Kardachev, which uses energy consumption as the basic measure of civilisational development. There are four civilisational levels within this system, with each level having an energy output ten billion times greater than the previous level. Kaku expects that national and cultural differences will be reduced with each level, as abundant sources of energy and wealth are uncovered, and communication systems become instantaneous. Level three civilisations consume about 100 billion to a billion trillion times the energy output of a type 0 civilisation. By level three the evolution of civilisation will depend upon interstellar travel. Kaku subtitles this section "conquering the galaxy." A goal would be to find suitable star systems to "colonize." (Kaku,1998 pp.321-329)

Kaku factors in annual economic growth rate expectations to make his forecasts about the timing of the development of each level in the model. (Kaku, p.323) Kaku predicts an economic growth rate of five percent for the next 100 years, and "at that rate in a century the gross world product and energy consumption will grow by a factor of 130 times." Kaku sees this as ideal for world stability, as separatism will be difficult when people are "well fed and con-

tent." (Kaku, 1998 pp.329-330)

A Critique of Kaku's Galactic Future

For Kaku consumption (including energy consumption), economic growth, the capacity for colonization, and the development of science and technology are the key indicators of humanity's civilisational development. Yet these imperatives are largely modern, Western cultural values. Kaku defines humanity in terms of what it can achieve, and the ways in which it can manipulate the environment. Kaku's future civilisations are totally lacking in reference to value, meaning, purpose and spirituality in general. There is no attempt to analyse the psycho/spiritual factors which may underpin modern humanity's obsession with growth, control, manipulation of the environment and conquest. There are no inner worlds in Kaku's planetary future. All aspects are externalised, and lack depth. It is ultimately a projection of the machine metaphor that dominates science (Capra 1979,1982, Rifkin 1985, Sheldrake 1981). Indeed Kaku refers to the ubiquitous computing dominated future as "electronic ecology." (Kaku, 1998p.31) The alienation from nature, inner worlds, and spirituality seems complete.

Futurist Richard Slaughter has severely criticized western "instrumental rationality. This worldview sees knowledge, power and technique as the keys to the future.

"Values and futures have less reality than ghosts; what matters are the practical arrangements for getting things done. Here we see the foundations of dystopia, the machine-led view of the future, which leads inexorably to a world unfit for life." (Slaughter, 2000, pp. 246-247).

Ultimately Kaku's vision of the future is a socio-cultural projection, where humanity is driven by the need for economic growth and consumption. Kaku quotes Freeman Dyson:

> A diversified system of solar-electric spacecraft would make the entire solar system about as accessible for commerce or for exploration as the surface of the earth was in the age of steamships." (Kaku, 1998 p.306)

Kaku's own vision, despite its reference to scientific jargon and a technologically advanced civilisation, has shifted little from the consciousness of the sixteenth to twentieth centuries when European cultures colonized, conquered and plundered much of the rest of the world under the power of steam, sail and gunpowder. Kaku fails to examine the possibility that the continued projection of the manic and dissociated consciousness that underpins much of the contemporary problems of our pre-planetary society will most likely see a perpetuation of those same problems.

Discourse/worldview

Kaku is clearly writing from a scientific worldview where what is real and true is that which is amenable to scientific methodology. Viewpoints of thinkers and philosophers outside of the scientific world are largely excluded. The author complains that often in the popular press "an eccentric social critic's individual prejudices are substituted for the consensus within the scientific community." (Kaku, 1998 p.5) He criticizes the *New York Times Magazine* for having publishing an entire edition which was devoted:

> to life in the next 100 years. Journalists, sociologists, writers, fashion designers, artists, and philosophers all submitted their thoughts. Remarkably not a single scientist was consulted. (Kaku, *Visions*, p.5)

Yet Kaku commits the same error that he accuses the New York Times Magazine of committing. In his book Visions, it is the non-scientists who are excluded in favor of those with a scientific worldview. Quite clearly Kaku sees science as existing outside of a paradigmatic worldview. The consensus of the scientific community is clearly seen as being superior and separate from the ideas and thinking of those outside of the scientific community.

> ...predictions about the future made by professional scientists tend to be based much more substantially on the realities of scientific knowledge than those made by social critics, or even by those scientists of the past whose predictions were made before the fundamental scientific

> laws were completely known. (Kaku, *Visions*, p.5)

Kaku makes no attempt to critique the current visions and culture of science, nor to outline the worldviews of the scientists that influence the predictions that are being made. In this sense Kaku opens himself to making precisely the same mistakes that he accuses scientists of past eras of making—inaccurate visions based upon incomplete knowledge and false assumptions.

Kaku's vision is comprised of a worldview, a language and a paradigm. It does not float in a sea of objectivity. Kaku's work lacks the self-critical analysis of postmodernist scientific thought. In recent times thinkers such as Zia Sardar, Sohail Inayatullah, and Ronald S. Laura have added to the debate begun by Karl Popper, Thomas Kuhn and Michael Foucault. This debate has challenged contemporary science's claims to be an "absolute" truth. Kaku writes as if his depiction of science, humanity and the universe is universally accepted and confirmed. Kaku's vision reeks of scientism, with its "true-believer" style faith in the merits of objective scientific rationalism. In Kaku's world, science is the "grand-narrative", the ultimate purpose and purveyor of truth in a brave new world.

Myth/metaphor

"Visions" is an appropriate title for the book in the sense that it projects an image of the future that is imaginative, but one that is not very empirical. The book is replete with projected scenarios of the future. For example early in the book Kaku describes a typical week in the life of a person in 2020 in the second person. This includes a fictional account of ubiquitous interactions with computers, "smart molecules" detecting and eradicating cancer, and an intelligent household system that directly gives feedback about everything from the cholesterol content of food to which people are compatible with. (Kaku, 1998 pp. 66-69)

Yet perhaps the greatest unconscious narrative running through *Visions* is the story of the machine. The machine is what will save us: computers for everyone everywhere, robots, A.I., genetically enhanced cyborgs, and space travel. Technology will reign supreme and rescue us from the perils of the human condition. The spirit will die (it was intangible and immeasurable after all) and the machine will live. This is Kaku's future.

Spiritual language

One of the ironic features of Kaku's vision is the seemingly unconscious use of spiritual and biblical references in his idealized future. The book is called Visions, a noun that was once exclusively the realm of mystics and spiritual disciplines. He refers to ubiquitous computing as "endowing the planet with a cosmic intelligence." (Kaku, 1998, p.43).

"...computers will become so powerful and widespread that the surface of the earth becomes a 'living' membrane, endowed with planetary 'intelligence', creating the fabled Magic Mirror featured often in fairy tales." (Kaku, 1998, p.42)

Further, we will "know the mind of God" when we finalise the equations to the theory of everything.

For Kaku human technology and information systems have replaced religious/spiritual concepts such as "God". The physicist/scientist dons the white coat of the new priesthood. Yet, as argued above, there is no attempt to delve into the possible psychological /spiritual ramifications of this.

Interestingly Kaku touches on the idea of a kind of "integrated" intelligence, but one that differs from traditional mystical depictions. Computers will be everywhere (including on and in the body), linking everybody and all aspects of society. They will be able to sense our presence, movements, and even feelings. (Kaku, 1998 pp.27, 32) Once again Kaku's simplistic understanding of the causes of human conflict surfaces when he writes that this "instantaneous communication linking society" will erase long standing cultural and national barriers, and humanity will leave its divisions and scars behind. (Kaku, 1998 pp. 325-326)

3. A Macrohistorical Perspective

If we were to give Kaku's vision a macrohis-

torical perspective, where would it "fit in"? What has he left out? Johan Galtung in his essay "Toward Eclecticism: Mapping Sarkar with Other Macrohistorians" has developed an approach to history which compares and contrasts the views of twenty prominent macrohistorians. Taking such an approach with Kaku, contrasting and comparing him with various other thinkers, what aspects of Kaku's vision and philosophy can be seen in a new light, with its strengths and weaknesses exposed?

Kaku's is essentially a linear theory, typical of Western models such as Adam Smith's, Marx's (with an underlying cyclical aspect) and even Darwin's. Kaku's civilisation/evolution is seen as developing from primitive to advanced, and the spreading out of mankind through space to a planetary and interplanetary civilisation is seen as the horizontal dimension of this. In fact, Kaku's vision is completely horizontal. There is no movement through plains of consciousness which could potentially represent a vertical dimension, such as with Wilber and David R. Hawkins. Kaku's Utopia seems to be an idealised future where humanity has achieved a kind of technological wonderland, traveling outward to the stars, consuming all that it requires, with all the benefits that technology may offer it. That future may contain human transformation and immortality via DNA modification, or ubiquitous computing and enhanced life-styles and life-experiences via cyborg technology; but essentially humanity will remain at its current level of consciousness.

Cyclical theories of History stand as a contrast to Kaku's. They promise declines and inclines. Rudolph Steiner was cyclical with an overriding linearity (Galtung in Inayatullah and Fitzgerald, 1999, p.35). Karl Marx and P.R. Sarkar refer to class upheavals. Spengler, Sorokin and Toynbee also write about societal declines if capital is not replenished. They, along with Ibn Khaldun (a 14th century macrohistorian) refer to eco-catastrophes, alienation and modernization diseases, the increasing disparity between rich and poor, and issues with welfare, materialism, individualism. (Galtung, in Inayatullah and Fitzgerald, 1999,p.30) In contrast Kaku sees only one way, namely up—or bust.

Kaku's vision is non-spiritual. We can place him alongside the anti-religion/spiritual macrohistorians such as Marx, Engels, Smith and Comte. Marx and Engels saw religion as "the opiate of the masses". Comte saw the "theological" as equating to the fictitious, characterized by spurious belief in the supernatural. For him speculative reasoning was itself a stepping stone to the "positive" or scientific state of human cultural evolution. For Kaku the spiritual and religious does not even rate a mention. By implication we can assume that it plays no part in Kaku's vision of the future. His depiction of typical days in the middle and late twentieth centuries are completely devoid of inner worlds and spiritual references. They simply describe interactions and activities, primarily with technology such as ubiquitous computing, which acts (ironically) a kind of omniscient guru or spiritual guide. There are no actual references to direct contact with other people, animals, plants or living organisms. At the very least one might ask, as did Weber, Gandhi, Sarkar, Khaldun and Steiner, whether a future devoid of the spiritual, including alienation from nature and other people, might create various psychological/spiritual dysfunctions.

Kaku's vision is seemingly positivistic and rational, devoid of affective domains and intuitive perceptions. Thus we can compare him with the enlightenment philosophers Comte, Descartes, Bacon and also to Hume and Kant. These individuals saw a positivistic science as the means of moving humanity into a better future. It is open to question whether humanity could ever function effectively in such overtly rational societies, considering the realities of our brain physiology which necessitates emotional/intuitive cognition; or indeed whether a galaxy full of Spockian, cyber-enhanced DNA-perfect people would in fact be a desirable future.

Alternatively we can contrast Kaku's philosophy to those philosophies with a spiritual bent to their history. de Chardin produced a Christian model which sought to integrate scientific aspects of the world. (Galtung, in Inayatullah and Fitzgerald, 1999, p.35). Sorokin saw humanity emerging from a socio-cultural civilisation to "the celestial spheres of the super-ideational", and then descending again. He stated that people

need more than just empirical truths. They also need theological and metaphysical truths. (Galtung, in Inayatullah and Fitzgerald, 1999, p.29). Sarkar, Steiner, Gandhi and Auribindo would no doubt agree on that. The vast majority of humanity that has a spiritual belief structure is left off Kaku's map, as if they are just a temporary aberration in the empirical march of scientific progress.

Khaldun pointed to a connection between epistemological states and socio-economic stages. Kaku does no such thing. Do people become empiricists because they are trying to prove something about their lack of power and privilege, as Galtung suggests? Further, sophistication tends to bring a yearning for simplicity. (Galtung, in Inayatullah and Fitzgerald, 1999, p29). Could a powerful "Ludditian" reaction form in the wake of the increasingly technologically complicated nature of life of the world? How will people react if computing is ubiquitous and every aspect of life dependent upon the machine? How will that affect personal relationships? How many people would be willing to leave Earth to travel for a lifetime in space-ships to have their off-spring populate new worlds? By failing to examine psychological/spiritual/social factors, Kaku is in danger of overlooking crucial aspects of technology's impact on humanity in the future.

Kaku's vision seems driven by economic /capitalistic imperatives. Unlike Marx, Kaku's vision seems rather capitalistic. Yet like Marx's it is decidedly materialistic and atheistic. Marx has a cyclical aspect, ending in the seemingly utopian advanced communism. Kaku's would seem to be a laissez-faire economic future. Governments and nation states are seen as potential obstacles to the onward march of progress. He would thus seem to have more in common with Smith than Keynes, although the latter advocated control and market regulation. Kaku's technological and "gadget" depiction of the future can in some ways compare with Smith's idea that capital determines the wealth of a society. Despite the lack of social insight Kaku does indicate a connection between affluence and social stability. This would seem to imply that the causes of social unrest are primarily economic, and that human well-being is dependent upon this factor only.

Kaku also makes very little attempt to examine the social implications of his vision. He is a little like the aloof sages and mystics such as Auribindo, Nisargadatta Maharaj, and many New Age philosophies who focus on the spiritual and dismiss the social as belonging to a lower sphere that can be transcended upon enlightenment. The difference is that Kaku sees the scientific/technological as transcending the social and economic. Apparently there is little relationship between the scientific/material, the social, political and psycho/spiritual aspects of society in Kaku's envisioned world.

Who will have the power in Kaku's future? Marx would have asked who will own the means of production? He would have looked for the power structures. Who will get rich, and at whose expense? Webber would have looked at differentiation and examined the possibility of privileged and non-privileged groups. (Galtung, in Inayatullah and Fitzgerald, 1999, p.28). Sarkar would also have looked for his four societal classes to see who held power. We can only infer from *Visions* that in Kaku's future scientists (and those who serve science) will be the most powerful.

4. Some Alternative popular science

While Kaku's vision seems narrow and devoid of deeper human values, there are numerous other popular depictions of science, the universe and the future that do attempt to paint a broader picture. Here are three of them.

Danah Zohar

With her books *The Quantum Society*, and *Spiritual Intelligence*. Danah Zohar takes the world of micro-physics in hand. Zohar extrapolates such a different view of the world and universe than Kaku that one might scarcely believe that they are examining the same data. Zohar emerges with a brave attempt to depict a culture and a Self, (complete with values and a morality). Zohar's concept of an organic spiritual intelligence, (an individual's ability to intuit deeper meanings about the nature of life and existence), touches upon the idea of an integrated intelligence.

Where Zohar's future contrasts most sharply with Kaku's occurs when she delves into the nature of consciousness itself and human spirituality. She points out that Western cultures and political systems have left individuals and societies with a sense of meaninglessness, and created a "spiritual vacuum." (Zohar, 1993, p.203) There is a need within people to find a sense of purpose, meaning and community that goes beyond the instrumental vacuity of alienated western cultures.

We cannot separate the sense of personal meaning and the value of personal freedom from the wider sense of public meaning and our more all-embracing democratic freedoms. Nor, I believe, can we separate either of these from a deeper sense of spiritual meaning, from a sense of what we value, what we think is good, how we define "the good life" or "good person", what we think our freedom is for, what we think society is for... (Zohar, 1993, pp. 203-205)

Zohar sees the interconnectedness of quantum reality as a model upon which we can found such a society on a "scientific" basis. Kaku examines the same data and sees it merely as an opportunity to build space ships to conquer and colonise the universe.

Rupert Sheldrake and Matthew Fox

Fox and Sheldrake scour the works of medieval theologians Dionysius the Areopagite, St. Thomas Aquinas and Hildegard of Bingin for parallels with modern quantum physics, in their book, *The Physics of Angels*. For example they compare the dual wave/particle nature of light to textual descriptions of angels' movements and locations and decide that angels, like light, have a localised and non-localised aspect. (Fox and Sheldrake, 1996, pp.99-104) Their thesis is that it may well be time to re-incorporate the idea of angels into our current cosmological maps, essentially assuming their existence as real. (Fox and Sheldrake, 1996, p.194)

Where Sheldrake and Fox present an interesting contrast to Kaku, is in their depiction of the interconnected nature of the universe and consciousness. The writers move beyond purely localised, mechanical and brain-based models of the mind. They incorporate intuition and revelation into their map and conclude that there are "receptive" modes of consciousness. (Fox and Sheldrake, 1996, pp.42-43) The universe is described as a "holarchy," an interconnected series of hierarchies, of which one consists of angelic intelligence. (Fox and Sheldrake, 1996, pp.36-37)

Timothy Ferris

Timothy Ferris' *The Whole Shebang: A State of the Universe's Report* attempts to depict the current scientific map of the universe for the lay reader. While Ferris' universe retains a distinctively mechanical flavor even in its depiction of "quantum weirdness", it does attempt to throw open the question of creation and Cosmic Intelligence. An afterward is added in which the cosmological evidence for the existence of God is examined, and the agnostic conclusion at least suggests that not all scientists are deriding theological and ontological questions. Ferris, somewhat tongue in cheek but nonetheless respectful, weighs up the arguments for and against the existence of God. Ultimately he concludes that cosmology can add nothing to the debate, dismissing the argument from design, cosmological proof and ontological proof as all inconclusive and largely ambiguous. (Ferris, 1997, pp.301-312) Yet like physicist Paul Davies (with his books such as The Mind of God), Ferris is at least touching upon deeper issues of human meaning and existence. It may be the mere dabbing of the toe into the metaphysical sea, but the success of the writings of Davies and Ferris suggest a subtle shift in consciousness both of the public and of the science writers.

Kaku vs Zohar, Sheldrake and Fox, and Ferris

Looking back some decades, the popular writings of Fritjof Capra, David Bohm, Michael Talbot, Stanislav Grof and Gary Zukav have helped pioneer the way for people like Fox and Sheldrake, Zohar, and to a lesser degree Ferris and Davies. Despite flaws in these popular

works, they have effectively depicted some of the limitations of purely mechanical models of life and the universe. Kaku seems to choose to ignore such insights, just as he has ignored the "non-scientists" to write *Visions*.

5. Kaku's Success

No model that fails to address the spiritual needs, deepest ontological questions and the purpose of existence can serve as a sound basis for our future. Kaku commits precisely this error. In seeing the solutions to humanity's problems as essentially technological and logistical Kaku commits an oversight of such gargantuan proportions that one can only wonder how our society produces individuals capable of such myopia.

Why is it that Kaku's book has been so enduringly successful, despite its frighteningly obvious shortcomings? *Visions* is as much a product of a scientifically materialistic culture as Kaku is. As James Moffett has pointed out, contemporary education systems are devoid of meaning, value and purpose. Government controlled schools and institutions have avoided personal and spiritual development in favor of more immediate and practical outcomes - jobs and training, and economic imperatives. (Moffett, 1994, p.23-32) The result of this is a population that has no personal, spiritual or metaphysical awareness, and whose intellect and judgment are impaired. They cannot perceive holistically. (Moffett, 1994, p.43) To such a "retarded" population the only world that makes sense is "Flatland" (as Wilber calls it)—a spiritually void, mechanical world and universe. Such a system of indoctrination and education creates Kaku, and it creates his market, the people who buy his books.

6. Conclusion

In the end Visions tells us more about the present than the future, and the way that one man's view of the universe colors his perception of it. It thus informs us of the delusion that there are worldviews that fall within the domain of the purely "objective." Kaku's vision is no greater, and indeed no less than that of the "journalists, sociologists, writers, fashion designers, artists, and philosophers" that he criticizes. After all, the entire history of science is one imbued with a social/historical dynamic. And that is not to mention the metaphysical/spiritual dynamic that so many others throughout History have depicted.

Kaku opens and closes *Visions* quoting Newton's famous words that he (Newton) was like a mere child playing on the seashore gathering stones whilst "the great ocean of truth lay undiscovered" before him. (Kaku, 1998, pp. 3, 355). Yet Kaku seems to have forgotten those other famous words of Newton: "If I have seen further than others, it is because I have stood upon the shoulders of giants." Newton understood the historical and even spiritual aspects of his attempts to delve into the nature of the world and the universe. Kaku, apparently, has forgotten.

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Endnotes

1. In this essay the term "spiritual" will be used to describe these intangible but vital aspects of human existence. There are no specific religious connotations to this word as used in this essay.
2. Throughout the essay the term "integrated intelligence" is used. Integrated intelligence is a transpersonal intelligence that transcends the boundaries of individual intelligence. It is in effect a collective human and universal intelligence. It has most commonly been depicted in spiritual and mystical texts and forms a part of all mystical traditions. Though not scientifically "proven" it is becoming more frequently used in various guises in contemporary discussions within sciences, the humanities and spiritual discourses. The same or similar concepts have been discussed by various thinkers. Amongst numerous, these include "cosmic consciousness" (Bucke, 1991; and Sarkar in Inayatullah 1999, 2002); "non-local intelligence" (Dossey, 2001); "spiritual intelligence" (Zohar, 2000); "non-dual consciousness" (Goswami, 2001), "L energy" (Pearsall, 1998), "non-algorithmic intelligence" (Penrose,

1989), and "psychic" perception (Wilber, 2000, 2001A, 2001B).

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