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Review of a Book on Fundamental Science Discoveries and Predictions as Authored by John W. McKee (1926-2009)

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ABSTRACT

This technical note is a review of a book on fundamental scientific discoveries and predictions written by a professional American physicist, John W. McKee (1926 – 2009). The book, entitled 'New Horizons in Science (From the Meaning of Spin to the Nature of Consciousness)', was published in 2004 by Professional Press, Chapel Hill, USA. The book is on technical physics and it's applications in the contemporary world. Dr. McKee's book has seven chapters. Their titles are, respectively, Over the Horizon, The Triple Challenge, Much Ado About Nothing, and The Mystery of Quantum Mechanics. The remaining three chapters are The Theory of Relativity, Let's Think About Thinking, and Table of Terms. By using the analogies of a King, Queen, Ace and Jack, the book author argued that Biology is the king of the Sciences while Mathematics is the Queen. Furthermore, he postulated that Physics/Physical Science is the Ace while Technology is the Jack. He thereafter contended that Physics is at the foundation of the other sciences, except Mathematics. Among others, the book author suggested further work on brain research via modeling the brain as a quantum computing device. He also argued in favour of what he called 'a new science of consciousness' which will incorporate, not only the natural sciences, but also metaphysics.

Keywords: *Book, Science Discoveries, Science Predictions, John W. McKee, Quantum Mechanics, Theory of Relativity.*

Reference Format:

Oluwade, Bamidele (2020), Review of a Book on Fundamental Science Discoveries and Predictions as Authored by John W. McKee (1926-2009), *Afr. J. MIS*, Vol. 2, Issue 3, pp. 1 - 11.

1. INTRODUCTION

This technical note is a review on a book on fundamental scientific discoveries and predictions written by a professional American physicist, John W. McKee (1926 – 2009). The title of the book is 'New Horizons in Science (From the Meaning of Spin to the Nature of Consciousness)'. The book was published in 2004 by Professional Press, Chapel Hill, USA (McKee, 2004). It is an 86-page book on A4 paper.

The book's author received a Doctor of Philosophy (Ph.D) degree in Physics and Biology in 1955 from the California Institute of Technology (CALTECH), USA. He had earlier obtained a Bachelor of Science degree in Physics and Electrical Engineering from the Iowa State University, USA. During his doctoral degree programme, he was privileged to have been influenced by the Nobel Physics Laureate, Richard P. Feynman (1918 - 1988) whose active research career was accomplished at CALTECH. Feynman has been credited with substantial scientific innovations, notable among which is his proposition on quantum computers (Feynman, 1982; Oluwade,

2002). In simple terms, a quantum computer is a computer which performs computation based on the principles of quantum mechanics/physics. Among others, Dr. McKee taught at the Medical School of University of California, Los Angeles and was Chief Scientific Officer at Boeing Company. An earlier tribute to him can be found in (Oluwade, 2018).

Dr. McKee's academic training coupled with his direct and indirect professional experience across the fields of Physics, Biology, Mathematics and Technology informed his fundamental thought on the significance of the above fields of study (Chapter 2). By using the analogies of a King, Queen, Ace and Jack, he submitted that Biology is the king of the Sciences while Mathematics is the Queen. Furthermore, he argued that Physics/Physical Science is the Ace while Technology is the Jack. He contended that Physics is at the foundation of the other sciences, except Mathematics.

The book is on technical physics and its applications in the contemporary world. However, it could be inferred that the author had a desire to communicate knowledge in the book to all lovers of science, not necessarily professional physicists and other natural scientists. In his words, 'physics and science in general should be lots of fun'. Although the author wrote the book from the perspective of a professional physicist, efforts will be made in this review to present the book with minimal technical physics, but with the plainest language accessible to both natural and social scientists. This will support the perceived desire of the book author to convey science to the laymen, based on the present reviewer's one-on-one interactions with the book author before his demise, as well as personal impression gathered from reading the book.

Essentially, the contents of the book reemphasize scientific thoughts of other scientists, as well as suggest new emphasis/predictions. Some of the discussions in the book relate to cosmology.

Dr. McKee's book has seven chapters. Their titles are, respectively, Over the Horizon, The Triple Challenge, Much Ado About Nothing, and The Mystery of Quantum Mechanics. The remaining three chapters are The Theory of Relativity, Let's Think About Thinking, and Table of Terms.

The author of this technical note was privileged to have received some complimentary copies of the book by post from the book author two years after its publication, which is three years before his demise. The review presented in this paper is based on the contents of the complimentary copies.

2. SCIENTIFIC PREDICTIONS AND DNA SCIENCE

This section discusses Chapters 1 and 2 of Dr. McKee's book.

In Chapter 1, the author makes a scientific prediction of what the world is expected to witness within the next 100 years, based on existing scientific knowledge at the time in which the book was published in 2004. The predictions are on four basic areas, namely nanotechnology, quantum computers, medical systems and public health, as well as space exploration and systems:

(i) Nanotechnology: This is a science of the manipulation and control of very tiny (minutiae) particles, as small as 1 nanometre (10^{-9}m). The author predicts several applications for small machines, of magnitude 2000 nanometre, in medicine. This is the size of a bacterium! In particular, he foresaw electronic devices which will be able to penetrate seemingly tight places like coronary arteries to repair human tissues. He also envisaged that microsurgery will become common by the year 2040. Nanodevices will also assist human travellers on space exploration/mission. Due to the light weight inherent in nanotechnology, the author envisaged a revolution in manufacturing technology, including the design of aircraft and spacecraft. This is with respect to the fabrication of light weight/tiny but complex machines (though stronger than existing machines constructed using steel materials) for myriad of applications including medicine.

The author emphasized trends on a 'new electronics', as championed by scientist H. J. De Los Santos (2003), which is an application of quantum phenomena to circuit hardware. The effect of this is the invention of devices which will improve classical (conventional) computing, signal processing, atomic level information storage etc. In addition, the new electronics was envisioned to lead to the development, at nanoscale, of mechanical and electronic appliances such as gears, motors and actuators.

(ii) Quantum Computers: As earlier simply defined, a quantum computer is a computer designed to operate via the basic principles of quantum mechanics/physics. It is similar to but distinct from

the conventional/classical computers (Oluwade, 2002; Oluwade, 2003A). The book author envisaged intense application of quantum computers to robotics. This is apart from the development of novel methods of cryptography (a science of sending secret information) and the improvement in the speed of logical computer operations. The author summarized the role and importance of quantum computers by likening them to the classical supercomputers, just as hydrogen bomb could be likened to chemical explosives.

The book author predicted that by 2025, based on trends, (industrial) robots will be in space to replace the functions hitherto performed by human beings. By 2030, five years after the projected existence of robots in space, he envisioned the widespread use of quantum computers in residences for robotic activities such as housekeeping, cooking, entertainment etc. By 2050, he predicted the usefulness of robotic systems to support the mentally ill and the aged. This will lead to the year 2105 which the author envisioned to usher in applications of very high performance robotic systems in performing routine duties in many homes and offices. Apart from the normal duties, the systems will be used for extra ordinary computational tasks, including unlimited language processing and logical operations.

(iii) Medical Systems and Public Health: The book author argued that 'the greatest benefit for people in the next one hundred years will be in the field of health care resulting from knowledge of how biological systems work'. That is, science will achieve enormous success in solving not only chemical and physical issues, but also emotional imbalances. He predicted that full blown realization of the above success will occur in the year 2050. However, progress in diagnostics, imaging, medical self-treatment, and development of tiny machines for medical and surgical procedures will exist before then. He also envisioned full use of fusion energy, away from the use of fossil fuels like oil and natural gas.

Furthermore, the book author predicted that human life expectancy at birth will be 95 years by 2055, while it will be 100 years by 2095 due to improvement in scientific knowledge.

(iv) Space Exploration Systems: The book author observed that there will be several major programs on space exploration within the next 100 years. In particular, this will be in the area of space tourism and adventures, especially the existence of space hotels and resorts. Specifically, he predicted that by 2050, there will be a few large 4-star hotels in high earth orbit, as well as many affordable hostels in low earth orbit. Furthermore, the book author envisioned that there will be yearly manned trips to the planet Mars by 2045. In addition, there will be a permanent manned lunar base on the moon by 2080, as well as a probe to one of the nearest stars by 2090.

In particular, the book author drew attention to Sirius, a double star, which can be seen in the earth's northern hemisphere, and which is 8.6 light years away. By astronomical scale, this star is relatively a few years away! The time to get to the star has been calculated to be about 30 years, at an acceleration of $0.03g's = 0.29\ m/s^2$ at the start of the flight. A characteristic of this double star is that it has a star which is several times larger than the sun. It also has a white dwarf companion which is about the size of the earth. However, the mass of this dwarf is about that of the sun, and the dwarf has a radius of about 5000km. The star is one of the few nearest stars that are approaching the sun; this particular star approaches the sun at a relatively low rate of about 1.8km per second.

By 2050, the book author predicted that there will be preparations for a probe vehicle to one of the nearest stars.

In Chapter 2 of the book, the author focused on what he called 'the three great mysteries of science'. This is with respect to improvement in medical care, information technology and transportation. These mysteries relate to:

(i) Development of a method for merging the theory quantum mechanics with the theory of general relativity (gravity and spacetime). This is in view of the contrasting perceptions of the two theories. For instance, in quantum mechanics, matter exhibits both wave and particle characteristic (dual nature), and a particle's location may

be fuzzy. However in general relativity, a particle is never a wave, and is at a definite place.

(ii) Improvement in the understanding of the nature of human consciousness. This basically relates to knowledge about how the human brain works vis-à-vis human behaviour. This will be helpful in resolving medical, social, political, religious and related issues. Already, research has shown that the brains of higher animals and humans can change and learn. Such a brain consists of two similar halves, namely left hemisphere and right hemisphere, such that there are billions of individual neurons whose purpose is to conduct signals. This is the basis for the field of machine learning in computer science.

(iii) Improvement of the understanding of how DNA-driven systems control vital parts and activities of living organisms. The book author, among others, posed the following questions: 'Does DNA play a direct role in consciousness? Does quantum mechanics play an active direct role in the functions of the brain?' He recommends 'more ethical experiments' on the brain towards seeing how it works. He also canvassed for intense application of biochemistry to nanotechnology.

3. SOME SECRETS OF PHYSICAL SCIENCE AND QUANTUM PHENOMENA

This section reviews Chapter 3 and Chapter 4 of the book. In these chapters, the book author re-emphasizes some of the known and inferred facts of modern physics (a recent relevant article is Ball (2018)). These include:

(i) There is a huge amount of energy which resides everywhere in the zero point random fluctuating electromagnetic field of the vacuum. This field is little-noticed.

(ii) Two thirds of the matter in the universe is made up of the energy-mass in the zero point vacuum field in the form of dark matter.

(iii) The particle moves at the velocity of light randomly in all directions and carries the cloud with it.

(iv) The quantum theory of electrons in solids (i.e. Solid State Physics) has ushered in myriads of great inventions and products starting from the development of transistors and integrated circuits (ICs). Other contemporary inventions include nuclear weapons, lasers, television, flat panel display, computers, medical imaging systems etc.

(v) Ii is now a settled knowledge that quantum mechanics is a complete theory which doesn't have hidden variables and is thus probabilistic. This is contrary to the views held by some of the earlier great scientists of the 20th century, especially Albert Einstein (1879 – 1955). He had argued that quantum mechanics is an incomplete theory with hidden variables which make it deterministic. This is the basis of his famous saying that 'God does not play dice' (i.e. nature is not based on chance).

(vi) Quantum mechanics has not been completely reconciled with general relativity, thus creating gaps for improvement by contemporary scientists.

.The book author substantially reviewed the contributions of many great physicists and scientists of the 20th century to the development of quantum phenomena. These scientists, majority of whom were Nobel Laureates, are briefly described in Table 1 in Section 4 of this paper. The book author concludes Chapter 4 by re-echoing the likelihood of the development of new paths of application which will involve better ways of explaining and using quantum phenomena. He specifically mentioned paths like teleportation, cryptography, advanced communication and quantum computers. In particular, regular teleportation refers to a hypothetical transfer of matter/energy from one point to another even though there is no physical traversal of the distance between them; it is a phenomenon that is popularized in science fiction. On the other hand, quantum teleportation has been realized as the transfer of information which is necessary for the preparation of a microscopic target system in the same quantum state as the source system. Unlike regular teleportation, it doesn't transfer matter from one place to another (https://en.wikipedia.org/wiki).

4. EINSTEIN'S THEORY OF RELATIVITY AND THE NATURE OF CONSCIOUSNESS

This section focuses on Chapter 5 and Chapter 6 of the book.

Chapter 5 is on the theory of relativity as espoused by Albert Einstein (1879 – 1955). Indeed, this theory is one of the greatest intellectual achievements of mankind of all time. In fact, the book author argued definitely that the theory is in fact the greatest! The theory consists of both the Special Theory of Relativity (STR) (1905) and the General Theory of Relativity (GTR) (1915). Both theories were cogently discussed by the book author.

In reviewing STR, the book author first stated the two postulates which were used to propound the theory. These are: (i) the speed of light is the same for all observers, due to the fact that it is independent of the motion of both its source and observer (ii) the laws of physics (e.g. Maxwell's equations) are of the same functional form, and are independent of the uniform unaccelerated motion of the observer. The book author then proceeded to list the five main results of the theory, namely: (i) it unites energy and momentum into a 4-vector (ii) it unites electric and magnetic phenomena (iii) it shows that time is relative (iv) it provides a natural speed limit in nature (v) it establishes the famous equation for energy, $E = mc^2$, where m is mass and c is the speed of light.

Among others, the book author also stated the two postulates of GTR, namely (i) the constancy of the speed of light (ii) equivalence of the gravitational mass and the inertial mass. He thereafter reviewed Einstein's equation for general relativity, which is based on Riemannian geometry (i.e. tensors). Subsequently, he presented a diagram showing the well-known symmetry between gravity and quantum mechanics.

In Chapter 6, the book author discussed the nature of (human) consciousness which is a link between the physical sciences and psychology. Essentially, the chapter focuses on how human consciousness of self is formed from the beginning, using a newborn/ infant as a case study. The book author conjectured that awareness of self is a learned capability. It is a process which involves the newborn learning to grasp an object with volition and with instinct. The newborn then learns to walk, thereby forming neuronal activities which represent repeatable motor functions involving other skills. Thus, the neuronal activities are formed from sensory pathways. These activities persist as circuits or as chemical synthesis pathways thereby forming the beginning of memory. The concept of self is thereafter learned by the infant. This concept is an integrated neuronal activity that is associated with the visual, tactile (i.e. touch), auditory and internal sensory organs which form an interaction with the body. Thereafter, the body is associated with the memories, senses and thoughts of self, thereby leading to the formation of consciousness.

The book author, after reviewing some of the key works in the literature, identified the following (seeming) facts, among others:

(a) Consciousness is a separate function from the control of most muscles and of the internal organs.
(b) The human brain might be a quantum computer, due to its high performance.
(c) There is a partition of function between the brain's right hemisphere and left hemisphere. The consequences of these include: (i) an object could be visually identified as one thing (like a cube) by one of the two hemispheres of the brain (say, right hemisphere) and not capable of that identification by the other hemisphere (say, left hemisphere) (ii) a particular hemisphere is primarily the location of language.
(d) There are two levels of consciousness, namely, behaviour and experience.
(e) The brain is composed of several neurons, such that it is the neurons in superposed states which would be involved in quantum computing.

Based on the weight of scientific discoveries, the book author suggested further work on brain research via modeling the brain as a quantum computing device. He also argued in favour of what he called 'a new science of consciousness' which will incorporate, not only the natural science, but also metaphysics. He recommends a new form of scientific exploration which 'may bring much truth and beauty to mankind'. From a holistic and a lighter perspective, the book author might inadvertently be referring to mathematics as a way forward. This is in view of a saying by the British mathematical philosopher and 1950 Nobel Literature Laureate, Bertrand Russell (1872 – 1970): 'Mathematics…possesses not only truth, but supreme beauty, a beauty cold and austere like that of sculpture' (Russell, 1919). As acknowledged by the book author, mathematics as the 'queen' (and

language) of the sciences, hold a master key in unlocking hidden knowledge in virtually all knowledge domain. In particular, a way forward is the use of mathematical models supported with computer simulation.

5. LISTS OF SOME GREAT SCIENTISTS AND KEY TECHNICAL TERMS USED IN THE BOOK

This section contains a table (Table 1) of some of the major scientists whose works were reviewed by the book author (https://en.wikipedia.org/wiki). These scientists are especially mentioned in Chapter 4, Chapter 5 and Chapter 6. The section also presents a table (Table 2) on the definitions of key physics terminologies used in the book. The table contains pages where the definitions can be found. Chapter 7 of the book is exclusively focused on these definitions. A total of 26 terms were defined.

Table 1: Description of Some Major Scientists Mentioned in the Book

S/N	NAME OF SCIENTIST	REMARK
1	Max Planck (1858 – 1947)	German theoretical physicist; 1918 Nobel Physics Laureate.
2	Albert Einstein (1879 – 1955)	German-born American theoretical physicist; 1921 Nobel Physics Laureate.
3	Niels Bohr (1885 – 1962)	Danish theoretical physicist; 1922 Nobel Physics Laureate.
4	Werner Heisenberg (1901 – 1976)	German theoretical physicist; 1932 Nobel Physics Laureate. He is the originator of the matrix approach to quantum mechanics. He is also credited with the famous Heisenberg uncertainty principle, which states that there is an uncertainty in measuring both the position and momentum of a particle at the same time.
5	Erwin Schrodinger (1887 – 1961)	Austrian-Irish theoretical physicist; winner of the 1933 Nobel Physics Prize with Paul Dirac. Schrodinger is the originator of the wave function approach to quantum mechanics.
6	Paul Dirac (1902 – 1984)	English theoretical physicist; winner of the 1933 Nobel Physics Prize, with Erwin Schrodinger.
7	Richard Feynman (1918 – 1988)	American theoretical physicist; winner of the 1965 Nobel Physics Prize with Julian Schwinger and Shinichiro Tomonaga. Among others, Feynman worked in the area of quantum electrodynamics (QED); he invented the path integral approach and is credited with the concept of Feynman diagrams.
8	Julian Schwinger (1918 – 1994)	American theoretical physicist; winner of the 1965 Nobel Physics Prize with Richard Feynman and Shinichiro Tomonaga.
9	Shinichiro Tomonaga (1906 – 1979)	Japanese theoretical physicist; winner of the 1965 Nobel Physics Prize with Richard Feynman and Julian Schwinger.
10	John Stewart Bell (1928 – 1990)	Northern Irish theoretical physicist; Fellow of the Royal Society; notable for Bell's Theorem, among others.
11	Isaac Newton (1642 – 1727)	English mathematician and physicist who laid the foundation of

		classical mechanics.
12	Max Born (1882 – 1970)	German theoretical physicist; 1954 Nobel Physics Laureate.
13	Louis de Broglie (1892 – 1987)	French theoretical physicist; 1929 Nobel Physics Laureate.
14	Linus Pauling (1901 – 1994)	American scientist (chemist, biochemist, chemical engineer); 1954 Nobel Chemistry Laureate; also, 1962 Nobel Peace Laureate; he was one of the founders of quantum chemistry and molecular biology.
15	Eugene P. Wigner (1902 – 1995)	Hungarian-born American theoretical physicist; 1963 Nobel Physics Laureate; he and Hermann Weyl (1885 – 1955) introduced the mathematical theory of groups into physics.
16	Hugh Everett III (1930 – 1982)	American physicist; he conceived the concept of parallel universe, otherwise known as the relative state or many worlds interpretation.
17	Hendrik Lorentz (1853 – 1928)	Dutch physicist; he is credited with the famous Lorentz transformation; he shared the 1902 Nobel Physics Prize with another Dutch physicist, Pieter Zeeman (1865 – 1943), who is credited with the discovery of what is known as the Zeeman effect.
18	James Clerk Maxwell (1831 – 1879)	Scottish scientist; he is famous for the Maxwell equations in electromagnetism; Fellow of the Royal Society.
19	Albert A. Michelson (1852 – 1931)	American physicist; 1907 Nobel Physics Laureate; he is the first American to win the Nobel prize in the natural sciences.
20	Edward W. Morley (1838 – 1923)	American scientist (chemist and physicist); he and Michelson are credited with the famous 'Michelson-Morley experiment', which is a standard procedure for measuring the speed of light.
21	Robert Oppenhelmer (1904 – 1967)	American theoretical physicist; he is regarded as the 'father of the atomic bomb' due to his leadership role in the famous Manhattan Project in the USA.
22	Hermann Minkowsky (1864 – 1909)	German mathematician; he created the geometry of numbers which was used by Einstein, his former student, to explain the Special Theory of Relativity; this theory is a theory of 4-dimensional space-time; the geometry is known as Minkowski spacetime.
23	Wolfang Pauli (1900 – 1958)	Austrian-born American theoretical physicist; 1945 Nobel Physics Laureate; the Pauli Exclusion Principle is named after him.
24	Stephen Hawking (1942 – 2018)	Contemporary English physicist and cosmologist; founder and Director of Research at the Centre for Theoretical Cosmology, University

		of Cambridge, United Kingdom; he is credited with the concept named Hawking radiation, which arises from his theoretical prediction that black holes emit radiation; a black hole is a region of spacetime in which gravity is very strong such that nothing (including particles and electromagnetic radiation like light) can escape from it; by the theory of general relativity, a black hole can be formed via a deformation of spacetime by a sufficiently compact mass.
25	Roger Wolcott Sperry (1913 – 1994)	American neuropsychologist; recipient of the 1981 Nobel Prize in Physiology and Medicine for his work on split-brain research; he shared the prize with Canadian-American neurophysiologist, David Hunter Hubel (1926 – 2013) and Swedish neurophysiologist, Torsten Nils Wiesel (b. 1924).
26	Francis Crick (1916 – 2004)	British molecular biologist, biophysicist and neuroscientist; he is well-known for his 1953 co-authored paper (with James Watson) which showed that the DNA molecule has a double-helix structure; he shared the 1962 Nobel Prize in Physiology/Medicine with the American molecular biologist, geneticist and zoologist, James Watson (b. 1928) and with New Zealand-born British biophysicist, Maurice Wilkins (1916 – 2004).
27	Christof Koch (b. 1956)	Contemporary German-American neuroscientist; President/Chief Scientist of Allen Institute for Brain Science, USA – the scientific division of Allen Institute, a non-profit research organization

Table 2: Terms that were Defined in the Book and the Corresponding Pages where they were Defined

S/N	TERM	PAGE NUMBER(S)
1	Black Hole	65
2	Classical Physics	65-66
3	Decoherence	66
4	Entanglement	67
5	Exclusion Principle	67
6	Gravitational Wave Detection Observatories	67
7	Maxwell's Equations	68
8	Nearby Stars	68
9	Nanotechnology	68-69
10	Particles	69-70
11	Pendulum Decoherence	70-71
12	Planck's Constant (h)	71
13	Quantum Computation	71-72
14	Quantum Electrodynamics (QED)	72
15	Scanning Tip Microscope	73
16	Speed of Light (c)	73
17	Spin	73-74
18	Supreme Observer/Selector	74
19	Uncertainty Principle	74-75
20	Systems of Units	75
21	Visions of Technology to Come	75
22	Wave Function	75-76
23	Wavelength of a Particle	76
24	Wave-Particle Duality	76-77
25	White Dwarf	77

26	Zero Point Field of the Vacuum	77-78

6. DISCUSSION

On a positive side, one can say that the world has witnessed or tasted some of the forecasts in the book. The book brought to the fore the role and importance of physics, sciences, ICT and mathematics towards making the entire world more habitable and comfortable. In the view of the book author, 'Biology has taken the place of physics as the most important science in the popular imagination. Beginning in the 1920s until the 1950s, physics held out doable new challenges for the young person seeking a productive career in science. Now the solvable problems with great payoff are in biology, but physics will likely make a powerful comeback' (page 20). The book author's ability to easily move between physics and biology reflects the fact that he was a teacher at the Medical School of University of California, Los Angeles for some years.

In particular, the idea of regular teleportation and other concepts not yet physically realized may after all not be utopian! Many concepts (such as a robot, aeroplane) which only existed in the realm of science fiction not too long ago have now been physically realized. Thanks to science fiction writers like Isaac Asimov (1920 – 1992) - an American biochemist. In fact, many science fictions are believed to be real in the world of metaphysics. Thus, a way forward is indeed to overcome the limitations of physics by developing more scientific experiments to bring metaphysical phenomena to the realms of popular science.

In the definition of a 'Supreme Observer', the book author wrote: 'The description above [i.e. of a Supreme Observer/Selector] is not part of science. It is on the border where science, metaphysics, and religion come together. It is not part of science for there is no known experiment that can be done to falsify or confirm the concept' (page 74). In essence, for instance, physical cosmology is inadequate and therefore need to be complemented with mythological cosmology.

Interestingly, mythological cosmology is a research area where the present book reviewer has been formally active for over 20 years. His research involves development of mathematical models and scientific/thought experiments to clearly explain and prove phenomena which are not hitherto (fully) accepted by natural scientists. One of his efforts is establishing scientific basis for Ifa divination mythology, an ancient mystical practice of the traditional Yoruba people of South-western Nigeria (Oluwade, 2003B). A recent effort is a preliminary attempt to mathematically/scientifically trace and prove the single language spoken by the first set of humans on earth, before the present global multitude of languages (Oluwade, 2020).

It is important to state that European and American scientists who are interested in mythological cosmology research may need to draw their attention more to Africa (and other underdeveloped parts of the world), and learn from the African milieu. This is due to the relatively primitive environment which still exists in Africa, and which provides a natural environment for experimental study of metaphysics.

Despite the excellent contributions in the book with respect to physical sciences and biological sciences, it has some limitations from the perspective of a book written for all sciences - behavioural or non-behavioural science. These limitations may be improved in any possible (post-humous) future edition by the publisher. Essentially, the book does not sufficiently relate to results in parapsychology and other associated areas in the behavioural/social sciences. The book author, in fact, admitted this seeming limitation in the concluding paragraph of Chapter 6. Also, perhaps Chapter 7, which is on definition of key terms of the book, ought to be presented much earlier (at the beginning). And lastly, there are a few minor typographical errors such as the use of 'hugh' as against perhaps 'huge' (pages 9 and 64), and 'with' instead of 'was' (page 25).

7. CONCLUSION

This technical note has reviewed a book on fundamental scientific discoveries and predictions as written by John W. McKee (1926 – 2009). The book makes an interesting reading due to the relatively simple style of writing as well as its deep and rich contents. In general, the book is commended to all who seek to have basic knowledge and grasp of the 'wonders' of modern physics, as represented via quantum mechanics and relativity, and all who desire to expand and renew their present understanding. These include laymen who have no deep knowledge on natural science/physics (e.g. social scientists), as well as semi-professionals in areas related to physics (such as mathematicians and engineers), in addition to the professional physicist.

The book is suitable as a supplement to an advanced undergraduate or beginning (post)graduate course on modern physics. It will also be invaluable to biologists, medical scientists, psychologists and behavioural scientists working in areas related to neurosciences. Both students and practitioners/ professionals will benefit from the technical richness of the book.

Attempt has been made in this technical note to stimulate the interest of laymen who are lovers of natural science, without necessarily compromising the reading interest of professional natural scientists.

POSTSCRIPT/ACKNOWLEDGEMENT

This technical note writer/reviewer of Dr. McKee's book had an enduring physical chat with the book author during the 2001 Annual Meeting and Research Forum of Sigma Xi, The Scientific Research Society, Raleigh, USA. The chat arose from this writer's presentation during the conference (Oluwade, 2001). Dr. McKee was one of the participants who appreciated the presentation and came to discuss with the presenter in the conference hall. Academic friendship with the book author thus developed after the paper presentation.

The author of this book review will like to appreciate the Management of Sigma Xi, The Scientific Research Society, USA for providing full sponsorship (return tickets, hotel accommodation and feeding) for my participation in her 2001 Research Forum and Annual Meeting. I was at the time a lecturer at the Department of Mathematical Sciences (Prep Year Programme), King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia (KFUPM). The Sigma Xi meeting provided the opportunity for me to meet the book author, Dr. McKee, physically for the first and last time, during which we had a close one-on-one discussion on scientific knowledge.

We thereafter maintained our contact online (via email) after the conference. Thus in June 2006, I received from him complimentary copies of his 2004 book, which is herein reviewed. I had then returned to Nigeria. On the basis of his expertise and accessibility, Dr. McKee graciously accepted to contribute an article for the maiden edition of *African Journal of Computing and ICT* (McKee, 2008), whose founding Editor-in-Chief is this reviewer. Unfortunately however, the author transited to the world beyond in 2009, though at a fairly advanced age of 83 years.

The author of this technical note (book reviewer) is equally grateful to the authorities of KFUPM for providing the enabling environment for him to utilize the Sigma Xi sponsorship. He is appreciative of the exposure and opportunity arisen from his stay in the university. Also, appreciation goes to the authorities of the University of Ibadan, Nigeria, where this reviewer was affiliated with at the time of his trip to KFUPM.

REFERENCES

1. Ball, Philip (2018), 'Quantum Physics May be Even Spookier Than You Think', *Scientific American*, May; https://www.scientificamerican.com/article/quantum-physics-may-be-even-spookier-than-you-think/

2. De Los Santos, H. J. (2003), 'Nanoelectromechanical Quantum Circuits and Systems', *Proceedings of the IEEE*, 91, P. 1907.

3. Feynman, R. P. (1982), 'Simulating Physics with Computers', *International Journal of Theoretical Physics*, 21, p. 467.

4. McKee, John W. (2004), *New Horizons in Science* (From the Meaning of Spin to the Nature of Consciousness), Professional Press, Chapel Hill, USA.

5. McKee, John W. (2008), 'Expanding Nigerian Electronics Technology, *African Journal of Computing & ICT*, Vol. 1, No. 1, pp. 7-10.

6. Oluwade, Bamidele (2001), 'A Metaphysical Model of the General Communication System', *paper presented at the 2001 Annual Meeting and Research Forum of Sigma Xi, The Scientific Research Society*, held at the Sheraton Capital Centre, Raleigh, USA.

7. Oluwade, Bamidele (2002), *Design, Analysis and Uses of Classical and Quantum Computer Codes*, Conversion Project Report, M.Phil/PhD to PhD Degree in Computer Science, University of Ibadan, Ibadan, Nigeria.

8. Oluwade, 'Dele (Bamidele) (2003), *An Introductory Course on Computer Science*

(with exercises), PG Publishing, Ibadan; ISBN 978-006-314-5

9. Oluwade, 'Dele (Bamidele) and Longe, Olu (2003), 'On the Code Characteristics of the Ifa Divination Codes', *The Journal of Computer Science and Its Applications* (Journal of the Nigeria Computer Society), Vol. 9, No. 1, pp. 23 -28.

10. Oluwade, Bamidele (2018), 'Tributes to Dr. John W. McKee (1926 – 2009) of California and Dr. C. Clifton ('Cliff') Chancey (1955 – 2013) of Iowa, USA', *African Journal of Computing & ICT*, Vol. 11, No. 3, pp. 95-103.

11. Oluwade, Bamidele; Osofisan, Adenike; Ilori, S. A; Shola, P. B. and Akin-Ojo, R. (2020), 'A Computational Model for Studying the Characteristics of Languages using Coded Character Sets', *University of Ibadan Journal of Science and Logics in ICT Research* (Journal of the Department of Computer Science, University of Ibadan, Nigeria), Vol. 4, No. 1, 85-95.

12. Russell, Bertrand (1919), *Mysticism and Logic and other Essays*, Longman

13. https://en.wikipedia.org/wiki